



Multi-Purpose Logistics Module (MPLM)

The Italian Space Agency (ASI)-built Multi Purpose Logistics Module (MPLM) serves as the International Space Station's (ISS) "moving van," carrying laboratory racks filled with equipment, experiments and supplies to and from the Space Station aboard the Space Shuttle.

The Marshall Space Flight Center (MSFC) in Huntsville, Alabama working through agreements with the International Space Station Program (ISSP) Office provided technical oversight of MPLM development, acceptance and delivery. MSFC currently has technical oversight responsibility for Sustaining Engineering of the three (3) MPLM modules. The MPLM MSFC staff is part of the Flight Projects Directorate.

The un-piloted, reusable MPLM functions as both cargo carrier and space station module. Mounted in the Space Shuttle's cargo bay for launch and landing, the module is transferred to the station using the Shuttle or the ISS's robotic arm after the Shuttle has docked. While berthed to the station, racks of equipment and stowage items are unloaded from the module and racks and equipment may be reloaded to be transported back to Earth.

The MPLM is then detached from the station and positioned back into the Shuttle's cargo bay for the trip home. While in the cargo bay, the module is independent of the Shuttle cabin, and there is no passageway for Shuttle crew members to travel from the Shuttle cabin to the module. The cylindrical module is approximately 21 feet long and 15 feet in diameter, weighing almost 4.5 tons. It can carry up to 10 tons of cargo packed into 16 standard space station equipment racks. Of the 16 racks the module can carry, five slots can be furnished with power, data and fluid to support refrigerators, or freezers.

In order to function as an attached station module as well as a cargo transport, the logistics module also includes components that provide life support, fire detection and suppression, electrical power distribution and computer functions.

Although built in Italy, the logistics modules are owned by NASA. They were provided to the ISSP in exchange for Italian access to research time on the station.

The three MPLM modules are named Leonardo, Raffaello, and Donatello. The modules were named after famous Italians who lived before the year 1600 and who have been admired and respected for their contributions to our culture: Leonardo da Vinci; Donato di Niccolo di Betto Bardi; and Raffaello Sanzio.

Some people associate these names with cartoon characters from the film production and television series "The Teenage Mutant Ninja Turtles". Being able to link the MPLM module names to a popular



animated children's icon (The Teenage Mutant Ninja Turtles) presented a window of opportunity for the MPLM Sustaining Engineering Group to design their team logo to foster interest in their work at MSFC for the next generation of space explorers.



MPLM delivery to the Kennedy Space Center (KSC).



Exterior view of the MPLM



MPLM interior

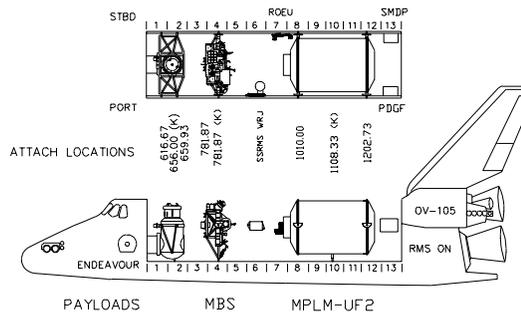
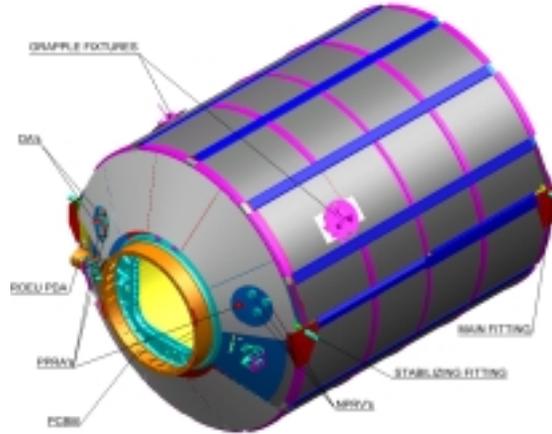


MPLM On-Orbit



STS-100 crew members in the emptied Raffaello

MULTI-PURPOSE LOGISTICS MODULE (MPLM) - The MPLM is a pressurized module used to transport cargo to/from the International Space Station (ISS). The MPLM is transported in the Space Shuttle cargo bay and then docked to the ISS for cargo transfer. It can transport up to 16 racks with a maximum payload weight of 20,000 lbs (9,072 kg) in a controlled (human-rated) operating environment. Marshall Space Flight Center is responsible for the sustaining engineering activities associated with the MPLM, including support to Cargo Element Integration for each flight and real-time mission support.



ODS - Orbiter Docking System
MBS - Mobile Remote Servicer (MRS) Base System
SSRMS WRJ - Space Station Remote Manipulator System Wrist/Roll Joint

Multi-Purpose Logistics Module (MPLM)



Leonardo- FM1
Raffaello – FM2
Donatello – FM3

NASA - MSFC
FLIGHT PROJECTS DIRECTORATE
FLIGHT SYSTEMS DEPARTMENT
PRESSURIZED CARRIERS GROUP