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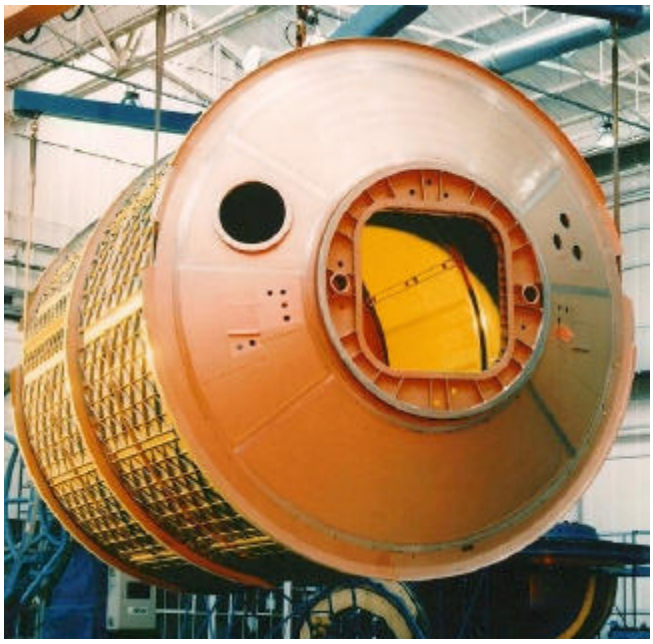
Leonardo Module: *A "Moving Van" for the International Space Station*

The Italian Space Agency (ASI)-built Leonardo Multipupose Logistics Module is the first of three such pressurized modules that will serve as the International Space Station's "moving vans," carrying laboratory racks filled with equipment, experiments and supplies to and from the station aboard the Space Shuttle.



Leonardo module under construction in Italy

The unpiloted, reusable logistics modules function as both a cargo carrier and a space station module when they are flown. Mounted in the Space Shuttle's cargo bay for launch and landing, they are berthed to the station using the Shuttle's robotic arm after the Shuttle has docked. While berthed to the station, racks of equipment are unloaded from the module and then old racks and equipment may be reloaded to be taken back to Earth. The logistics module is then detached from the station and positioned back into the Shuttle's cargo bay for the trip home. When in the cargo bay, the cargo module is independent of the Shuttle cabin, and there is no passageway for Shuttle crewmembers to travel from the Shuttle cabin to the module.

In order to function as an attached station module as well as a cargo transport, the logistics modules also include components that provide some life support, fire detection and suppression, electrical distribution and computer functions. Eventually, the modules also will carry refrigerator freezers for transporting experiment samples and food to and from the station. Although built in Italy, the logistics modules, technically known as Multipurpose Logistics Modules (MPLMs), are owned by the U.S. and provided in exchange for Italian access to U.S. research time on the station.

The Leonardo module will be launched on Shuttle mission STS-102 in March 2000. On that flight, Leonardo will be filled with equipment and supplies to outfit the U.S. laboratory module, which will have been carried to the station on a preceding Shuttle flight.

Construction of ASI's Leonardo module began in April 1996 at the Alenia Aerospazio factory in Turin, Italy. Leonardo was delivered to Kennedy from Italy in August 1998 by a special Beluga cargo aircraft. 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 can be furnished with power, data and fluid to support a refrigerator freezer. Construction of the second module, named Raffaello, already has begun and it is scheduled to arrive at Kennedy in 1999 and launch on the Space Shuttle Atlantis in April 2000 on mission STS-100. The third module, named Donnatello, is scheduled for delivery to Florida in 2000.

The Italian Space Agency chose the names of the modules because they denote some of the great talents in Italian history: Leonardo da Vinci, an extraordinary inventor-scientist, civil engineer, architect, military planner and weapons designer, and artist; Donato di Niccolo di Betto Bardi, one of the greatest sculptors of all time and one of the founders of modern sculpture; and Raffaello Sanzio, an artist whose work stands alone for its visual achievement of human grandeur, both in clarity of form and ease of composition.

Leonardo is being prepared for launch at KSC with engineering support from the Italian Space Agency, Alenia Aerospazio and Boeing. A major milestone for the module will include participation in multi-element prelaunch testing after the U.S. laboratory arrives later this year. Some continued assembly also will take place at KSC, such as the installation of debris shielding on the module. By mid-1999, launch preparations will begin in earnest for the Leonardo module. The most significant mechanical task to be performed on Leonardo in Kennedy's facility will be the installation and outfitting of the racks for carrying various experiments and cargo.

The** Italian Space Agency's **Leonardo logistics module as final testing and launch preparations begin at the Kennedy Space Center, Florida