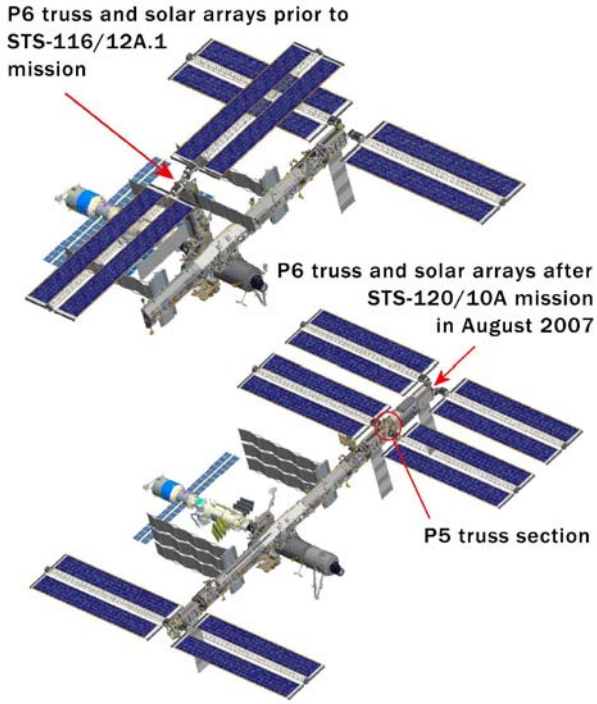
P5 Truss Section

The P5 truss section being moved by crane towards the payload canister (out of shot) in the Space Station Processing Facility of the Kennedy Space Center in Florida in October 2006. The canister will be used to transport the truss to the launch pad for loading into the Shuttle cargo bay.
(Image: NASA George Shelton)

The P5 truss section is the principle payload of the ISS 12A.1 assembly mission. It is an additional section to the ISS integrated truss structure, which acts as the backbone of the International Space Station for supporting eight sets of solar arrays that generate the primary power supply of the ISS.

The P5 truss section will be installed on the port- or left-hand side of the ISS and will act as a spacer or connecting piece between the P3/4 truss section and the P6 truss section, which both hold two sets of solar arrays. The P3/4 truss was attached to the ISS during the STS-115 mission in September 2006. The P6 truss has been an integral part of the Station since December 2000 (STS-97 mission), though not in its final location as it was installed to provide power for the ISS in its early assembly stages. As the P6 truss is already on orbit, the P5 truss becomes the final port side truss section to be launched.



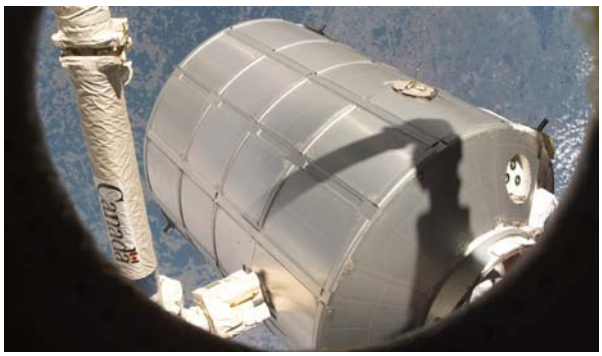
Graphic representations of P6 truss in early assembly location (Top) and P6 truss in final location on the integrated truss structure. (Image: NASA)

There are currently 4 sections installed on the integrated truss. The central section is called the S0 truss. On the right-hand or starboard side of this the S1 truss section is attached. On the left-hand or port side of the S0 truss, the S1 truss is attached, with the P3/4 truss section attached to P1. The P3/4 truss is in fact two truss sections integrated into one with a large rotary joint between. See ISS general Information for additional information on the ISS truss.

Spacehab Logistics Single Module – Pressurised payloads

Members of the STS-116 Crew standing in front of the Spacehab Single Module. Clockwise from front left: ESA astronaut Christer Fuglesang, and NASA astronauts Mark Polansky, William Oefelein and Robert Curbeam. (Image: NASA)

Spacehab is a pressurised cargo/research container designed to travel in the Space Shuttle's cargo bay. As such it shares many similarities with the European-built Spacelab and the Multi-Purpose Logistics Module or MPLM. However, while Spacelab and Spacehab's pressurised interior is accessed via a tunnel between the Shuttle's mid-deck and Spacelab or Spacehab, the pressurised interior of the MPLMs is accessed directly from the ISS. On arrival at the Station an MPLM would be removed from the Shuttle's cargo bay and attached directly to the ISS Node 1 where hatches between are opened.



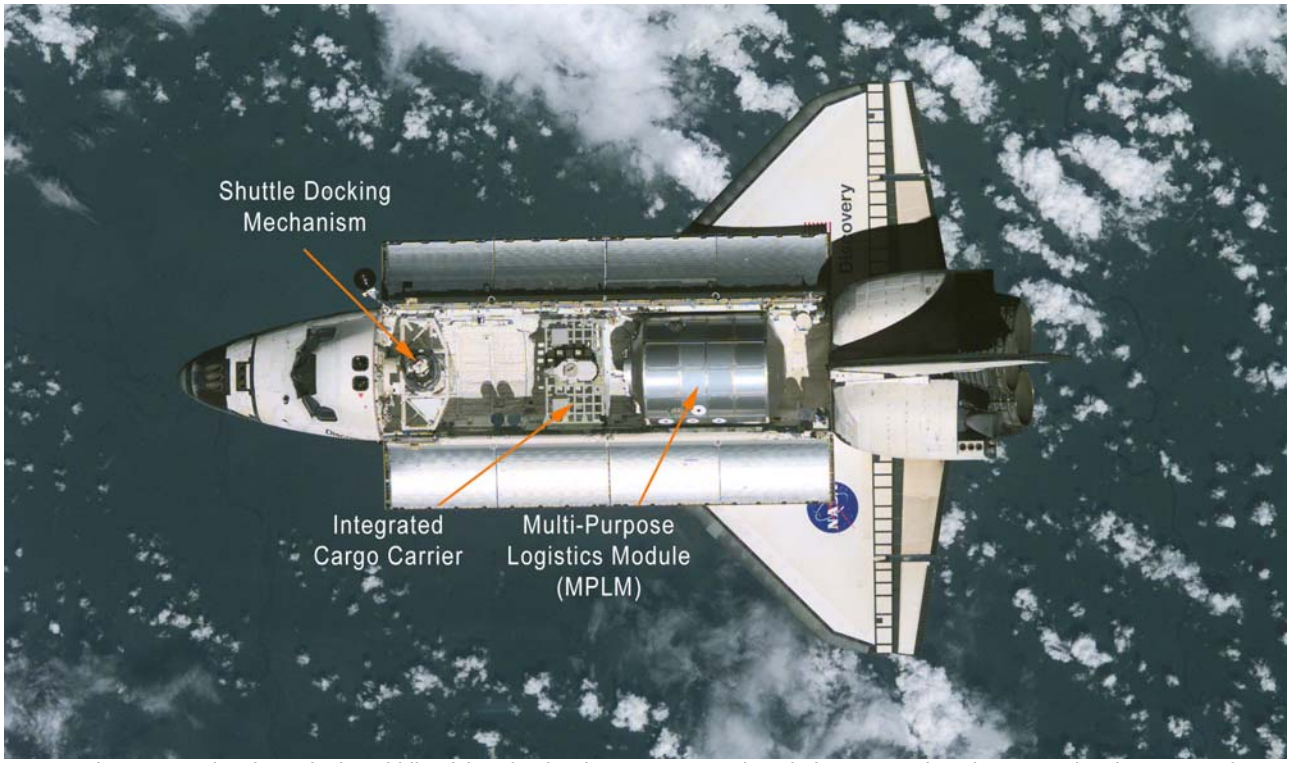
Multi-Purpose Logistics Module 'Leonardo' being undocked from the International Space Station on 14 July 2006 towards the end of the STS-121 mission. (Image: NASA)

Two principal configurations of the Spacehab pressurised module have been used in the past: the Spacehab Single Module, which had a cargo capacity of 2200 kg and the Spacehab Double Module with a cargo capacity of 4500 kg, about half that of an MPLM. For the STS-116 mission, the Spacehab Logistics Single Module will be used, the first time it has been flown to the Station. The last flight of a Spacehab Single Module was on the STS-95 mission in 1998 with ESA astronaut Pedro Duque as one of the crew. There have been three previous missions to the ISS with Spacehab but these utilised the Double Module, the last being on the STS-106 mission in September 2000.

ESA astronaut Pedro Duque talking with ground controllers while checking on an experiment in the Spacehab facility during the STS-95 mission (Top). Spacehab Single Module in Shuttle cargo bay during STS-95 mission (Bottom). (Images: NASA)

The 3 m x 4 m Spacehab Single Module contains systems necessary to provide a shirt-sleeve environment for astronauts, such as ventilation, lighting, and limited power, and can support powered payloads. The pressurised volume of the Single Module is about 30 cubic metres, which can hold 61 standard lockers or experiment racks or a combination of the two, with each locker having an internal volume of over 50 litres. Generally, two crew members are required for Spacehab operations.

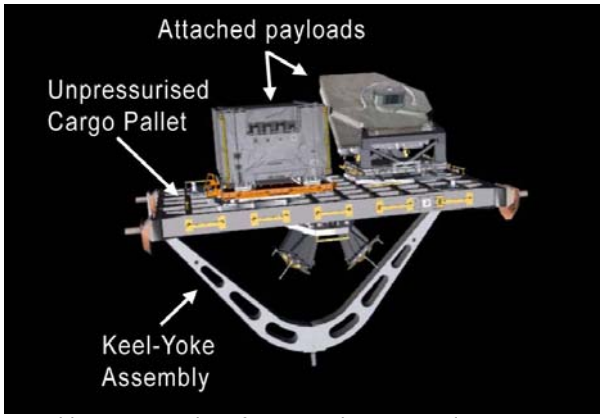
Integrated Cargo Carrier – Unpressurised payloads



Integrated Cargo Carrier shown in the middle of the Shuttle Discovery's cargo bay during approach to the International Space Station on 12 August 2001 during the STS-105 mission. (Image: NASA)

The Integrated Cargo Carrier or ICC is a platform that is mounted across the Shuttle's cargo bay for carrying smaller payloads into orbit that do not need to be transported in a pressurised environment such as inside the MPLMs or Spacehab. The ICC will be situated in at the back of the Shuttle cargo bay for the STS-116 mission, and will hold different payloads such as three bundles of Service Module Debris Panels, which will be installed outside the ISS during the third mission EVA and a number of NASA experiments to be deployed after undocking from the ISS.

Bundle of Service Module Debris Panels in fixation device.



Graphic representation of Integrated Cargo Carrier. (Image: NASA)

The Integrated Cargo Carrier is a two-part structure consisting of the aluminum Unpressurised Cargo Pallet onto which the payloads are attached and the Keel-Yoke assembly, which anchors the ICC into the Shuttle's cargo bay. The Integrated Cargo Carrier is 2.4 m long, 4.6 m wide and 25 cm thick. It has a capacity of up to 2.7 tonnes of attached payload. Cargo can be attached to both the top and bottom of the pallet.