

Soyuz at a glance

By Kendra Ceule

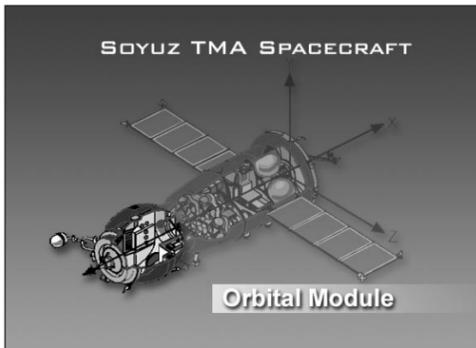
When the International Space Station's Expedition 6 crew returns to Earth in May, Astronauts Ken Bowersox and Don Pettit will become the first Americans to land in a Russian Soyuz spacecraft. The crew, including Cosmonaut Nikolai Budarin, will make use of the new Soyuz TMA-1 craft that has been docked at the ISS since November.

The Soyuz TMA replaced the Soyuz TM spacecraft, which had ferried crewmembers to the Russian space station Mir since 1986, and to the ISS since October 2000. The Soyuz TMA boasts such improvements as more efficient computers, new engines that reduce landing speeds and a color "glass cockpit." In addition, the TMA can accommodate larger individuals than the TM could and can spend roughly twice as long in space.

After being launched aboard a Soyuz rocket, the spacecraft usually takes two days to arrive at the ISS. The Soyuz can rendezvous and dock automatically, although the processes are monitored by the Russian Mission Control Center and the Soyuz crew can intervene for a manual docking if necessary.

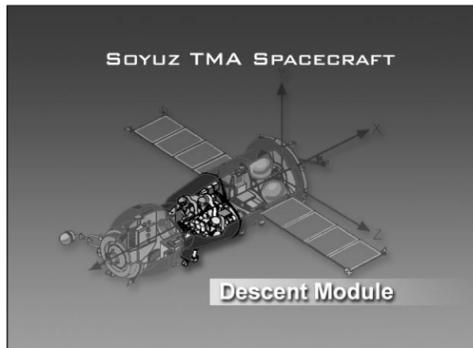
The spacecraft is broken down into three modules: the Orbital Module, the Descent Module and the Instrumentation/Propulsion Module. See an overview of each section below.

"Soyuz continues her legacy as the lifeboat for the ISS and as the transportation vehicles for crews," said Bill Gerstenmaier, ISS Program Manager. "Her service is emblematic of bringing together the best the world has to offer in spaceflight through the ISS partnership." ❖



The Orbital Module...

- ◆ has a volume of 230 cubic feet
- ◆ is used by the crew while on orbit during free-flight
- ◆ contains the docking mechanism and hatch
- ◆ uses antennas to aid in the automated, radar-based docking system
- ◆ has a window



The Descent Module...

- ◆ has a habitable volume of 141 cubic feet
- ◆ is where the crewmembers sit during launch, reentry and landing
- ◆ is where all controls and displays are located
- ◆ contains life support supplies, batteries and custom-fitted seat liners for each crewmember
- ◆ controls the spacecraft's attitude during descent (until parachute deployment) using its hydrogen peroxide thrusters
- ◆ is the only portion of the Soyuz that survives the return to Earth



The Instrumentation/Propulsion Module...

- ◆ contains oxygen storage tanks, control thrusters, electronics and communications equipment
- ◆ holds the primary guidance, navigation, control and computer systems
- ◆ is where the Soyuz radiator is located, along with the solar arrays and structural connection to the Soyuz rocket
- ◆ contains the propulsion system, which is used to perform rendezvous, dockings, deorbit burns and any other necessary maneuvers

Wearing a Russian Sokol suit, cosmonaut Nikolai Budarin, Expedition 6 Flight Engineer, is pictured in a Soyuz spacecraft that is docked to the International Space Station. Astronaut Ken Bowersox, Mission Commander, is visible at lower right.

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