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STS-132: Payloads For The Future

Mission: ISS Flight ULF4
Orbiter: Atlantis
Launch Pad: 39A
Launch: May 14, 2:21 PM EDT
Landing: 12 days later
Orbit Altitude: 225 miles
Orbit Inclination: 51.60°
Crew:
Kenneth Ham, CDR
Dominic Antonelli, PLT
Garrett Reisman, MS1
Michael Good, MS2
Stephen Bowen, MS3
Piers Sellers, MS4

Atlantis' 12-day mission will deliver the Russian-built Mini Research Module-1 that will provide additional storage space and a new docking port for Russian Soyuz and Progress spacecraft. MRM-1, also known as Rassvet, which means dawn in Russian, will be permanently attached to the bottom port of the station's Zarya module.

MRM-1 will carry important hardware on its exterior including a radiator, airlock and a European robotic arm. Atlantis also will deliver additional station hardware stored inside a cargo carrier. Three spacewalks are planned to stage spare components outside the station, including six spare batteries, a Ku-band antenna and spare parts for the Canadian Dextre robotic arm. Shuttle mission STS-132 is the final scheduled flight for Atlantis .

STS-132 Payload Overview

The Mini-Research Module-1 (MRM-1) is a new Russian module that will be delivered to the International Space Station by space shuttle Atlantis on the STS-132 mission.

MRM-1, which has been named Rassvet, a Russian word meaning dawn, will be used primarily for cargo storage and some payload operations. The module will be berthed to the Earth-facing port of the Zarya module using the station robotic arm on Flight Day 5.

Astronauts will use the Integrated Cargo Carrier (ICC) to help transfer unpressurized cargo such as Orbital Replacement Units (ORUs) from the space shuttle to the International Space Station and from the station to worksites on the truss assemblies. Such cargos include spare baatteries and communications antennas. The carrier also is used to return items to Earth for refurbishment.

Over the course of the three spacewalks of the STS-132 mission, Mission Specialists Garrett Reisman, Michael Good and Steve Bowen will spend a total of 19.5 hours outside the station on flight days 4, 6 and 8.

The spacewalks will require astronauts inside the station to be at the controls of the station's 58-foot-long robotic arm to maneuver equipment. Preparations will start the night before each spacewalk, when the astronauts spend time in the station's Quest Airlock. This practice is called the campout pre-breathe protocol and is used to purge nitrogen from the spacewalkers' systems and prevent decompression sickness, also known as "the bends."

Local Radio Stations
WMEL 1300 AM
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K4GCC 146.940 MHz (Ham)

Watching the Countdown
by Robert Osband

The countdown is actually the world's most complex "check-list". It starts at T-45 Hours four days before the launch (pronounced "T Minus 45" - that's "T" as in Time To Launch). That's *much* longer than 45 hours away, but there are many built-in "holds" in the count when things can be fixed, and still allow an on-time launch.

When you leave for your viewing site, turn on the radio for the news at the top of the hour, and see if they stopped "tanking". If they have not completed (or even started) filling the fuel tanks with liquid hydrogen fuel and liquid oxygen oxidizer, then you may as well turn around and head for the "Attractions", because there will be no launch today.

During the T-20 minute built-in hold, they will poll the Managers who will give their "Go" or "No-Go" report (usually "go"). It's during the hold at T-9 minutes when things get critical. The ones to listen for are "Weather" (who may not like the way the clouds are moving) and SRO.

The Superintendent of Range Operations (SRO) is the person responsible to watch for ships or aircraft traveling through the projected path of the Space Shuttle, or its jettisoned equipment. If the SRO is happy, then *everyone* is happy.

They can hold the count at T-5 minutes, and still launch ("Weather" likes to call for these), but at T-5 minutes, they call "Go for APU Start". When they start the Auxiliary Power Units to provide hydraulic power for gimballing (turning) the engines, and the rudder, they actually start consuming fuel. If they start the APU's, they actually plan to launch the shuttle.

That's not to say that the Ground Launch Sequencer computer handling the launch since the T-9 minute mark can't find a reason to stop the launch, or that the 4 on-board computers that take over at T-31 Seconds will not find a reason to shut down the launch - right up to the last half-second before Zero in the count. But chances are real good that they're going to "light the candle", and let the astronauts "take a ride up-hill".

Meet The Crew of STS-132

Attired in training versions of their shuttle launch and entry suits, the STS-132 crew members take a brief break for a portrait in the Space Vehicle Mock-up Facility at NASA's Johnson Space Center.

NASA astronaut Ken Ham, commander, holds the STS-132 mission logo. Also pictured (from the left) are NASA astronauts Piers Sellers, Garrett Reisman, both mission specialists; Tony Antonelli, pilot; Michael Good and Steve Bowen, both mission specialists.

Ken Ham
Commander (Captain, US Navy)
Age: 45, Born: Plainfield, NJ
Married with two children
Logged 5,000+ hours in 40 aircraft

Garrett Reisman (REESE-man)
Mission Specialist-1
Veteran ISS flight engineer
Age: 42, Hometown: Parsippany, NJ
Ph.D. in mechanical engineering, Caltech, 1997

Steve Bowen (bo-en)
Mission Specialist-3 (Captain, U.S. Navy)
U.S. Naval Academy graduate, 1986
Age: 46, Born: Cohasset, MA
Married with three children
First submarine officer selected as an astronaut

Tony Antonelli (an-tuh-NEL-lee)
Pilot (Commander, US Navy)
Born: Detroit MI
Married with two children
Logged 3,200+ hours in 41 aircraft

Michael Good
Mission Specialist-2 (Col, US Air Force, Ret.)
Age: 47, Hometown: Broadview Hts, OH
Married with three children
Logged 2,650+ hours in 30 aircraft

Piers Sellers (peers)
Mission Specialist-4
Age: 55; Born: Crowborough, Sussex, UK
Married with two children
Ph.D. in biometeorology, Leeds University,

Meet The Crew of ISS Expedition 23

Expedition 23 crew members from the left are Russian cosmonaut Mikhail Kornienko, NASA astronaut Tracy Caldwell Dyson, Russian cosmonaut Alexander Skvortsov, all flight engineers; Russian cosmonaut Oleg Kotov, commander; NASA astronaut T.J. Creamer and Japan Aerospace Exploration Agency (JAXA) astronaut Soichi Noguchi, both flight engineers. Image credit: NASA

Cosmonaut Oleg Kotov will serve as Expedition 23 commander and served as a Expedition 22 flight engineer. In 2007 Kotov served a six-month tour of duty aboard the International Space Station as an Expedition 15 flight

Japan Aerospace Exploration Agency astronaut Soichi Noguchi flew to the station aboard the Soyuz TMA-17 spacecraft to serve as a flight engineer for Expeditions 22 and 23. Previously, he flew on STS-114 Discovery in 2005 and participated in three spacewalks.

NASA astronaut T.J. Creamer flew to the International Space Station aboard the Soyuz TMA-17 spacecraft to serve as a flight engineer for Expeditions 22 and 23. This is his first spaceflight.

Previously assigned as an Expedition 21/22 backup crew member, Alexander Skvortsov will command the Soyuz TMA-18 spacecraft on a mission to the International Space Station to serve as an Expedition 23 flight engineer and commander of Expedition 24.

NASA astronaut Tracy Caldwell Dyson will fly to the International Space Station aboard the Soyuz TMA-18 spacecraft to serve as a flight engineer for Expeditions 23 and 24. In August 2007, Caldwell Dyson visited the station as an STS-118 Endeavour mission specialist.

Selected as a cosmonaut in 1991, Mikhail Kornienko will travel to the International Space Station aboard the Soyuz TMA-18 spacecraft to serve as a flight engineer for Expeditions 23 and 24. This will be Kornienko's first spaceflight.

The International Space Station

Metaphorically speaking, the ISS (International Space Station) is a "Port Of Call" in the vast ocean of space. It's a place where six astronaut/cosmonaut/scientists live, and research in the micro-gravity of space. Crew members of Expedition 22 are from Russia, the US, and Japan. Crews rotate about once every six months. They travel in a three man Soyuz capsule launched from Kazakhstan. Recently, a second Soyuz capsule brought other scientists to the ISS to perform experiments.

Each tour of duty is known as an "expedition", quite similar in nature to research expeditions to other hard to reach, and live in environments, such as the South Pole, and underwater research stations. In fact, part of training for a tour on board the ISS includes living in a NOAA (National Oceanographic and Atmospheric Administration) research station 30 feet below the ocean surface in the Florida Keys. Many astronauts have remarked how similar the environments are in the way the individual is cut off from civilization, with a large support team available by radio.

In 2005, Congress declared that the Destiny Laboratory aboard the ISS would join the ranks of the great National Laboratories, such as those at Oak Ridge, Fermilab, the National Institutes of Health, and others. It was meant to open up the lab to other federal research work, which those labs accomplish, as well as being an inspiration to researchers far and wide.

The station is very large, and can be seen with the naked eye as it passes over the earth, appearing as a "moving star" under certain conditions. First, if you can't see stars, you can't see Earth orbiting satellites, so if it's cloudy when a "pass" is scheduled, you may as well go back indoors.

Next, you have to be in darkness while the satellite is still in sunlight (while it's not in the Earth's shadow). Therefore, you can only see satellites before dawn, or after dusk. To find out when these conditions are right for you, visit **Heavens-Above.Com**, run by DLR, a space research company in Germany that does work for the European Space Agency. Be sure to set your watch accurately! www.Time.Gov is set to the atomic clocks of the National Institute of Standards & Technology as well as the US Naval Observatory Master Clock.

The web links you want are at **SpaceLaunchInfo.Com**

Visit The Space Walk Of Fame Museum
4 Main St, in Titusville

While you're in Titusville, visit the Space Walk Of Fame Museum, where the memorabilia of past space missions are on display. These items are on loan from the space workers who built the spacecraft that took America into orbit, and to the Moon.

Visit The Gift Shop, Too!
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When you buy postcards to send home, remember three extras - one for your Congressman, and one for each of your Senators. Let them know *you* were at the launch, and you want *them* to support the Space Program at budget time.

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