



STS-126 (27th ISS flight)

Endeavour

Pad 39A:

124th shuttle mission
22nd flight of OV-105
52nd landing at Edwards Air Force Base in California

Crew:

Chris Ferguson, commander (2nd shuttle flight)
Eric Boe, pilot (1st)
Steve Bowen, mission specialist (1st)
Shane Kimbrough, mission specialist (1st)
Heidemarie Stefanyshyn-Piper, mission specialist (2nd)
Donald Pettit, mission specialist (2nd)
Sandra Magnus, mission specialist (2nd) (up to ISS)
Gregory Chamitoff (down from ISS)

Orbiter Preparations:

Into OPF – 03/27/2008
OPF – 09/11/2008 (rollover)
VAB - 09/19/2008 (rollout to pad B); Endeavour was on pad B to serve as an emergency vehicle during the STS-125 Hubble servicing mission to launch from pad A. That mission was postponed, enabling Endeavour to move to pad A.
Rollaround to pad A – 10/23/2008

Launch:

Nov. 14, 2008, at 7:55 p.m. EST. Endeavour lit up the night sky with a flawless liftoff.

Landing:

Nov. 30, 2008, at 4:25 p.m. EST. After two landing opportunities were waved off at the primary landing site in Florida due to weather concerns, En-



deavour landed on a temporary runway adjacent to the concrete runway 22/04 at EAFB. The temporary runway is 12,000 feet long by 200 feet wide and is a concrete/asphalt runway with a 1,000-foot underrun and overrun capability for shuttle load bearing. Main gear touchdown was 4:25:06 p.m. EST. Nose gear touchdown was 4:25:21 p.m. Wheelstop was 4:26:03 p.m. Mission elapsed time was 15 days, 20 hours, 29 minutes and 37 seconds, covering 6.615 million miles.

Mission Highlights:

Prior to docking with the International Space Station, the crew conducted a five-hour inspection of Endeavour's heat shield using the shuttle's robotic arm and the Orbiter Boom Sensor System. Analysis of images taken during inspection revealed a small piece of thermal blanket was loose in the aft portion of the orbiter. Commander Chris Ferguson also flew the shuttle through a slow backflip so the station's Expedition 18 Commander Mike Fincke and Flight Engineer Greg Chamitoff could photograph the heat shield. Ground controllers reviewed the photos and determined there was no need for more inspection.

NASAfacts

Inside the station, crews worked to prepare for an expanded six-person station crew and completed other tasks. Latches on the Exposed Facility Berthing Mechanism for the Japanese Kibo laboratory were tested. The mechanism will be used to install an exterior science platform from the Japan Aerospace Exploration Agency next year.

A new Water Recovery System was installed to treat wastewater and provide recycled water clean enough to drink. Part of that system, the Urine Processor Assembly, shut down during initial test operations. Station and shuttle crews, as well as ground controllers, explored possible causes and cures for several days. Engineers believed motion of the centrifuge caused physical interference with the UPA, resulting in increased power draw and temperatures. The UPA was hard-mounted onto the WRS rack after grommets were removed. The UPA ran normally after the change.

On the 10th day of the mission, NASA managers decided to extend Endeavour's stay by one day to provide extra time for troubleshooting the Water Recovery System, if needed.

On a series of four spacewalks, Mission Specialists Heidemarie Stefanyshyn-Piper, Steve Bowen and Shane Kimbrough fixed the starboard Solar Alpha Rotary Joint, or SARJ, replaced a depleted nitrogen tank, relocated hand-propelled cards that run along the rails of the station's main truss, and lubricated the grapple fixture on the end of the station's Canadarm2.

EVA No. 1 — Nov. 18: 6 hours, 52 minutes

Piper and Bowen spent most of their time outside the station cleaning and lubricating part of the station's SARJ and removing two of the joint's 12 trundle-bearing assemblies, or TBAs. They also removed a depleted nitrogen tank from a stowage platform into Endeavour's cargo bay, moved a flex hose rotary coupler from the shuttle to the station's stowage platform, and removed insulation blankets from the common berthing mechanism on the Kibo laboratory.

About halfway into the spacewalk, one of the grease guns that Piper was preparing to use on the SARJ released some Braycote grease into her crew lock bag, which is the tool bag the spacewalkers use during their activities. As she was cleaning the inside of the bag, it drifted away from her toward the aft and starboard portion of the station. Inside the bag were two grease guns, scrapers, several wipes and tethers, and some tool caddies. Piper and Bowen spent the remainder of the spacewalk sharing a duplicate set of tools from the other crew lock bag they had with them.

EVA No. 2 — Nov. 20: 6 hours, 45 minutes

Spacewalkers Piper and Kimbrough moved two Crew and Equipment Translation Aid carts, lubricated the space station robotic arm's latching end effector snare, cleaned and lubricated the starboard SARJ race ring, and replaced four TBAs.

EVA No. 3 — Nov. 22: 6 hours, 57 minutes

Piper and Bowen replaced five TBAs and cleaned and lubricated race rings on the station's starboard SARJ.

EVA No. 4 — Nov. 24: 6 hours, 7 minutes

Kimbrough and Bowen replaced the final TBA on the station's starboard SARJ, lubricated the race rings on the port SARJ, mounted a video camera on the Port 1 truss, installed two Global Position Satellite antennae on the Japanese Experiment Module (JEM) Logistics Module, retracted a latch on the JEM Exposed Facility Berthing Mechanism and reinstalled the mechanism's cover.

On Nov. 25, the crew was informed the starboard SARJ, during a three-hour, two-orbit test, was automatically tracking the sun for the first time in more than a year. Also, the UPA had completed its second full run without shutdowns.

The combined crews celebrated Thanksgiving aboard the station. They also sent a special greeting to American military away from home and families. They thanked the service members for their commitment and dedication and wished them well.

The end of the mission concluded with moving the Multi-Purpose Logistics Module Leonardo back into Endeavour's payload bay and packing equipment and supplies into Endeavour.

Endeavour separated from the station at 9:47 a.m. EST Nov. 28. Boe, Pettit and Kimbrough completed the standard late inspection of Endeavour's thermal protection system using the shuttle's robotic arm and Orbiter Boom Sensor System extension. After examining the images, on Nov. 29 the Mission Management Team declared the heat shield safe for re-entry and landing.

As they prepared for landing, the crew deployed a small satellite, Picosat, designed to test space environment effects on new solar cell technologies. It will remain in orbit for several months.

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