National Aeronautics and Space Administration

NASAfacts

STS-120 (23rd Space Station Flight)

Discovery

Pad A:

120th shuttle mission
34th flight of OV-103
66th landing at Kennedy Space Center

Crew:

Pam Melroy, commander (3rd shuttle flight)
George Zamka, pilot (1st)
Scott Parazynski, mission specialist (5th)
Doug Wheelock, mission specialist (1st)
Stephanie Wilson, mission specialist (2nd)
Paolo Nespoli, ESA, mission specialist (1st)
Daniel Tani (2nd), up to ISS
Clay Anderson, down from ISS

Orbiter Preps:

OPF – Dec. 22, 2006 (STS-116 landing)
OPF Rollout – Sept. 23, 2007
VAB Rollout – Sept. 30, 2007

Launch:

Oct. 23, 2007, at 11:38 a.m. EDT.

Launch was on time and Discovery lifted off into a partly clouded sky, heading for the International Space Station on the 23rd assembly flight.

Landing:

Nov. 7, 2007, at 1:01 p.m. EST.

Discovery landed on Runway 33 at Kennedy Space Center. Main gear touchdown was 1:01:16 p.m. EST. Wheel stop was at 1:02:07 p.m. Mission elapsed time was 15 days, 2 hours, 24 minutes and 2 seconds, covering 6.25 million miles.

Mission Highlights:

During the mission, the STS-120 crew continued the construction of the station with the installation of the Harmony Node 2 module and the relocation of the P6 truss.

Station managers added a 360-degree visual inspection of the station's starboard solar alpha rotary joint, or SARJ, during the second spacewalk. The SARJ had shown increased friction for more than 30 days.

An extra day was added to the mission between the fourth and fifth spacewalks to provide the crew off-duty time and equipment preparation for the fifth spacewalk.

However, the objective of the fourth spacewalk changed in order to repair a torn solar array, and the fifth spacewalk was transferred to the station crew to perform after the shuttle left.

Teams on the ground worked around the clock to develop a plan for the repair. Astronauts constructed solar array hinge stabilizers using strips of aluminum, a hole punch, a bolt connector and 66 feet of wire. Working like a cuff link, the wire would feed through a hole on the solar array and be supported by the strip of aluminum.

They also positioned the station's mobile transporter and robotic arm at the end of the truss to serve as a base and "cherrypicker." Crew members insulated tools with Kapton tape to protect against electrical currents.

EVA No. 1 — Oct. 26: 6 hours, 14 minutes

Mission Specialists Scott Parazynski and Doug Wheelock installed the Harmony module in its temporary location, readied the P6 truss for its relocation two days later, retrieved a failed radio communications antenna and snapped shut a window cover on Harmony that had opened during launch.

EVA No. 2 — Oct. 28: 6 hours, 33 minutes

Parazynski and flight engineer Daniel Tani disconnected cables from the P6 truss to enable it to be removed from the Z1 truss.

Tani inspected the SARJ and collected "shavings" he found under the joint's multi-layer insulation covers. Mission managers limited the use of the SARJ while they assessed the anomaly.

The spacewalkers also outfitted the Harmony module, mated the power and data grapple fixture and reconfigured connectors on the S1 truss that will allow the radiator on S1 to be deployed from the ground at a later date.

EVA No. 3 — Oct. 30: 7 hours, 8 minutes

Parazynski and Wheelock installed the P6 truss segment with its set of solar arrays to its permanent home. They installed a spare main bus switching unit on a stowage platform for future use if needed.

Parazynski looked at the port SARJ to compare with the starboard joint. The port SARJ was clean.

When the P6 solar arrays were deployed at the end of the spacewalk, a tear appeared in a blanket. Deployment was halted so engineers could analyze what steps to take next.

Despite the 80-percent deployment, the array was producing nearly normal power.

After reentering the station, Wheelock noticed a small hole in the outer layer of his right glove thumb. Options would be considered before his next spacewalk.

EVA No. 4 — Nov. 3: 7 hours, 19 minutes

Prior to leaving the station, the orbiter boom sensor system was moved from the shuttle's robotic arm to the station arm. Parazynski and Wheelock then took 90 minutes to ride the arm to the torn array -- 165 feet down the truss and 90 feet up to the damage. Parazynski cut a snagged wire and installed homemade stabilizers to strengthen the array's structure and stability where the damage occurred. Ground controllers then were able to finish the deployment begun on Oct. 30 in increments of one half bay at a time. The procedure took 15 minutes.

Before the undocking, the shuttle crew transferred items to the shuttle: 2,020 pounds of equipment and scientific samples, including the metal shavings from the SARJ for engineers to study and try to determine the cause of resistance in the starboard rotary joint.

Discovery backed away from the station at 5:32 a.m. EST on Nov. 5.

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