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# SPACE CENTER Roundup

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## Map quest a success STS-99 brings home unrivaled imaging

NASA Photo S99E5475

Clockwise from right to left: Commander Kevin Kregel, Pilot Dom Gorie and Mission Specialist Mamoru Mohri, Janice Voss, Gerhard Thiele and Janet Kavandi.

Made of carbon fiber reinforced plastic, stainless steel, alpha titanium, and Invar, the Shuttle Radar Topography Mission mast is a truss structure that consists of 87 cube-shaped sections called bays. Unique latches on the diagonal members of the truss allow the mechanism to deploy bay-by-bay out of the mast canister to a length of 60 meters (200 feet), about the length of five school buses.

Marking an early success for the year 2000, STS-99 returned home last month concluding the first human space flight of the 21st Century and gathering Earth mapping and image data unlike any ever achieved before.

*Endeavour* lifted off with its six-member crew on February 11 to begin the Shuttle Radar Topography Mission—a project that will result in the most detailed and accurate map of our planet. The international STS-99 crew, including Commander Kevin Kregel, Pilot Dom Gorie and Mission Specialist Janice Voss, Janet Kavandi, Gerhard Thiele and Mamoru Mohri, split into two teams to complete the round-the-clock mapping efforts that when finished, would represent more than 70 percent of Earth's surface.

A main antenna assembly inside the payload bay anchored X-band and C-band radars aimed toward Earth. Outside, a

200-foot-long boom, the longest fixed structure ever deployed in space, protruded from the orbiter's payload bay. The boom supported an outboard antenna assembly to receive the reflected X-band and C-band radar signals. Combining the data from both radar bands received by both of the antennas will allow scientists on Earth to develop the highest-resolution, digital 3-D topographic Earth database.

The mapping, which promises to be 30 times more accurate and more unified than existing global maps, will be useful to scientists as well as in military and commercial applications.

The mapping activity began as early as flight day two and continued through stowage of the mast, resulting in 222 hours and 23 minutes of data gathering that mapped almost 100 percent of the originally targeted area. Scientists were elated by the results and the amount of mapping that was

achieved considering a launch delay and an in-flight anomaly almost compromised the mapping schedule.

SRTM program scientist Dr. Earnest Paylor described the mission as “a magnificent accomplishment,” noting that equatorial regions of the Earth previously unmapped due to constant cloud cover have been mapped by SRTM radar. Tom Hennig, SRTM program manager for the National Imagery and Mapping Agency, called the success of the mission “absolutely wonderful.”

EarthKAM, a digital camera mounted on *Endeavour's* flight deck, also had a successful run during STS-99. The camera, which is used by middle school students around the country, set a record, capturing more than 2,715 images during its 225 hours of operation in flight—more than were produced during its first four flights combined.

*Endeavour's* mission was remarkably successful. One issue was discovered on flight day two when controllers noted an anomaly with a small nitrogen thruster mounted at the tip of the radar's outboard antenna. The thruster was designed to help

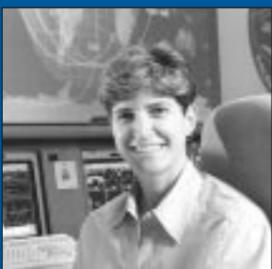
control the mast's attitude. Controllers determined that propellant was flowing; however, it was not resulting in any detected thrust.

The dilemma threatened to cut the mission short. Without the thruster, crewmembers would have had to fire the orbiter's thrusters more than expected, using fuel intended for shuttle maneuvering.

To mitigate the effects of the mast thruster failure, controllers developed and implemented propellant conservation measures. They also were able to ease requirements for mast thrusting due to the better-than-expected stability of the mast, and the mission ran its full 11 days.

After one waved off landing opportunity earlier in the day due to strong cross winds, the 4.7-million-statute-mile radar mapping mission concluded at sunset February 22. *Endeavour* touched down at 5:22 p.m. Central time on Runway 33 at the three-mile-long Shuttle Landing Facility at Kennedy Space Center.

The crew was welcomed home in Houston the following day at a crew return event at Ellington Field. ■



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