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STS-99 PAYLOADS

Shuttle Radar Topography Mission (SRTM)



Endeavour's open payload bay doors reveal [the payload](#) on the Shuttle Radar Topography Mission. The flight deck aft windows are visible at top.

Once in orbit, the Shuttle Radar Topography Mission payload will deploy a 60-meter, or 200-foot, long mast with C-band and X-band antennas at its tip. Using the Spaceborne Imaging Radar and X-Band Synthetic Aperture Radar, the SRTM will collect data that will be used to generate a 3-D topographic map. It will map the Earth's land surface with a resolution of 30 meters, or 100 feet.

[Data Recording, Processing and Products](#)

Once SRTM payload managers receive the radar echoes from both antennas, they will route the data through the Digital Data Handling System. That system puts the different channels together and then sends the data to the Recorder Interface Controller, a laptop in the flight deck of the shuttle. The laptop decides which of the three Payload High-Rate Recorders will get the data. The crew will monitor this and will change tapes as they become full. SRTM will record to about 300 tapes during the mission, which adds up to about 10 terabytes of data. Mission managers also will send a small amount of data to the ground during the flight in order to monitor the instrument.

[Main Antenna](#)

The [main antenna](#) actually consists of the three antennas and the avionics that compute the position of the antenna. Each antenna is made up of special panels that can transmit and receive radar signals. One antenna is called the L-band antenna. This antenna can transmit and receive radar wavelengths that are 25 centimeters long. Another antenna is called the C-band antenna, and it can transmit and receive radar wavelengths that are 5.6 centimeters long. The third antenna is the X-band antenna. This antenna can transmit and receive radar wavelengths that are 3 centimeters long. All three wavelengths were used in the SIR-C/X-SAR missions in 1994 for a variety of environmental studies. SRTM will only use the C-band and X-band antennas to collect its data.

[Mast](#)

The [mast](#) used on the SRTM mission is the Able Deployable Articulated Mast built by the AEC-Able Engineering Company, Inc. of Goleta, Calif. The 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, or 200 feet. The canister houses the mast during launch and landing, and it also deploys and retracts the mast.

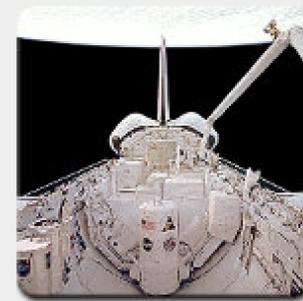
[Outboard Antenna](#)

The [outboard antenna](#) structure is connected to the end of the mast. It actually contains one C-band antenna, one X-band antenna, two Global Positioning System antennas, Light Emitting Diode targets and a corner-cube reflector. Both outboard antennas can only receive radar signals. Transmitting of radar signals is only done by the main antenna.

[EarthKAM](#)

[EarthKAM](#) is a NASA-sponsored program that enables middle school students to take photographs of the Earth from a camera aboard the space shuttle. During missions, students work collectively and use interactive Web pages to target images and investigate the Earth from the unique perspective of space.

What is a payload?



The formal designation as a "payload" indicates that the experiment will be accorded top priority in crew time and energies during the entire flight, along with all other experiments carrying the same "payload" designation.

Related Links

- [STS-99 KSC Electronic Photo File](#)
- [Hardware Overview \(JPL\)](#)
- [Payload Overview \(Shuttle Presskit\)](#)
- [EarthKAM Home Page](#)
- [EarthKAM School Participants](#)