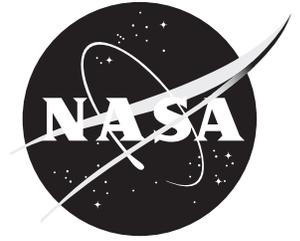


NASA Facts

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KidSat

Space Shuttle Atlantis, scheduled for launch on the STS-86 mission in September 1997, will support the third and final flight of KidSat, NASA's pilot education program that uses an electronic still camera aboard the Shuttle to bring the frontiers of space exploration to a growing number of U.S. middle school classrooms via the Internet.

KidSat is a NASA-sponsored research and development project that links middle school, high school and university students to Space Shuttle missions. The mission of KidSat is to understand and demonstrate how middle school students can actively make observations of the Earth by using mounted cameras onboard the Space Shuttle to conduct scientific inquiry in support of their middle school curricula. Students engage in a process to select and analyze images of the Earth during Shuttle flights and use the tools of modern science (computers, data analysis tools and the Internet) to widely disseminate the images and results. A team environment, modeling scientific research and space operations and promoting student growth, discovery and achievement, while helping students participate in solving real-world problems, is implemented.

These students remotely operate a Kodak electronic still camera, mounted in the right overhead window on the flight-deck of the Space Shuttle, to take digital photographs of the Earth. Middle school students are responsible for planning the photo requests, which involves calculating the longitude and latitude of a region, as well as the exact time the Shuttle flies over it. High school and university students then compile the requests into a single control file which is forwarded, by KidSat representatives at

the Johnson Space Center (JSC) in Houston, to the IBM Thinkpad connected to the camera. Using special flight software, the Thinkpad automatically commands the camera to snap the pictures requested by the middle schools. These pictures then retrace their path back down to Earth where they reach their final destination -- a computer archive. Students then can access their pictures from this archive, using the Internet.

KidSat has flown on two previous Shuttle missions: the first was in March 1996 (STS-76) and the second in January 1997 (STS-81). The third and final mission of this pilot program is planned in September 1997, (STS-86). Three U.S. middle schools participated in the first flight. Since then, KidSat has been growing; there were fifteen schools participating in STS-81, and 52 schools will participate in STS-86.

Over 300 photos were taken during STS-76, and another 500 were taken during STS-81. These can be accessed at the following URL:

<http://www.jpl.nasa.gov/kidsat/>

How Does KidSat Work?

The three-year pilot program is a partnership between NASA's Jet Propulsion Laboratory (JPL), the University of California at San Diego (UCSD) and the Johns Hopkins University Institute for the Academic Advancement of Youth (JHU-IAAY).

During the Shuttle mission, the KidSat mission operations center at UCSD is staffed by undergraduate and high school students. The center is modeled after Mission Control at JSC. The students receive telemetry from the Shuttle on their computer monitors

and can listen to and receive instructions from NASA's flight controllers over direct channels to JSC.

The KidSat mission operations team monitors the Shuttle's progress around the clock and continually provides up-to-date information to the middle schools, who are using the Internet to send instructions to photograph specific regions of the Earth. Since any change in the Shuttle's orbit can affect students' selections, UCSD constantly updates this information so that the middle schools may re-plan their photographic requests if necessary. This is done through a sophisticated World Wide Web site that allows students access to interactive maps of orbit ground tracks to aid in photo selection.

When the image requests have been verified by KidSat mission operations, they are compiled into a single camera control file and forwarded electronically to the KidSat representatives at JSC. They pass this file on to flight controllers who uplink it to an IBM Thinkpad connected to the KidSat camera. Software on the Thinkpad, developed by students working at JPL, uses these commands to control the camera. These same students trained the astronauts on the use

of the software and the installation of the KidSat camera in the Shuttle's overhead window.

After the photographs are taken, they are sent back down to the KidSat data system at JPL, staffed by high school students during the mission and posted on the World Wide Web for the students to study and analyze. The curriculum used by the middle school students and teachers is being developed by the JHU-IAAY and UCSD.

Some of the topics the students explored during the previous KidSat missions were weather, biomes, the relationship between history and geography and the patterns of rivers on the landscape. Additional interests for these missions included searching for impact craters and studying the relationships of center pivot irrigation fields to available water supply.

The KidSat pilot program is sponsored by NASA's Office of Human Resources and Education, with support from the Offices of Space Flight, Mission to Planet Earth and Space Science.

9-97 SRZ