High-Packed Digital Television (HI-PAC) Technical Demonstration

Purpose: To digitize up to six video input signals from experiments and Spacelab cameras onboard the Second United States Microgravity Laboratory and demonstrate future space real-time video downlinking options

Significance: Much has been said in the past few years about the "information superhighway" and the impact new communications technology will have on life on Earth in the near future. With this technical demonstration, the National Aeronautics and Space Administration extends the highway into low-Earth orbit, giving scientists on Earth the ability to view multiple channels of real-time video from the Spacelab module.

Currently, only one video channel can be sent down (*downlinked*) from the Spacelab, which limits the downlink of video data from experiments and other sources. Designed to operate from the Spacelab, high-packed digital television will provide researchers on the ground with up to six channels of video. The potential benefits include increasing the science return, allowing scientists to monitor and change experiment parameters, improving the quality and quantity of downlinked data, and providing the ability to downlink video from multiple sources simultaneously. The technology will serve the remaining Spacelab missions and will extend well into the space station era.

Using Spacelab's high-rate data system, HI-PAC converts standard analog video signals into digital signals, compressing the signal in the process and downlinking it in the same way as other digital data. When the signal is received in the Spacelab Mission Operations Control Center at the Marshall Space Flight Center, the digital data are converted back into an analog signal and distributed to scientists for viewing on monitors in the Science Operations Area.

Once on orbit, a crewmember will switch the closed-circuit television system from the standard analog video to the HI-PAC system. After the system has been checked out, the equipment will operate in the HI-PAC mode unless analog mode is required. The system can be switched easily from one mode to the other when necessary.