

The CAA includes a notebook computer that controls the rest of the system and can be used to process the data upon playback. The CAA software includes components that separately capture the video, audio, and position data streams and store them in files on the hard drive of this computer. Alternatively or in addition, the data can be stored on one or more external hard drive(s) or on a digital videodisk. Data can be played back from any of these storage media. The CAA can store data for an observation interval as long as two weeks.

In addition to the video image data, the video-data-storage software component records the times of individual frames from each camera, enabling syn-

chronization of the video data with the audio and position data during playback and analysis. The position-data-storage software component reads data from the six Cricket listener units, calculates the three-dimensional positions of the Cricket beacons according to the principle described above, and saves these positions in a text file. The position-data-storage software component also creates, reads, and writes a Cricket calibration-data file.

The CAA software further includes components for playback and analysis of the recorded data. One of these software components provides capabilities for searching and playback using the video, audio, and position data files as well as files that describe rectangular areas of

interest (AOIs) on the floor as defined by the user with the help of another software component. Several other components perform a variety of analyses of image data. Still another software component reads the position and AOI data files and generates reports on activities of interest represented in the data (e.g., it generates histograms of occupation of AOIs by crew members). The data in the reports can be saved in a format suitable for export to a spreadsheet program.

This work was done by James Murray and Alexander Kirillov of Foster-Miller, Inc. for Ames Research Center. Inquiries concerning rights for the commercial use of this invention should be addressed to Judith Gertler, Division Manager, Foster-Miller Inc. at (781) 684-4270. Refer to ARC-15162-1.

● Distributing Data to Hand-Held Devices in a Wireless Network

Lyndon B. Johnson Space Center, Houston, Texas

ADROIT is a developmental computer program for real-time distribution of complex data streams for display on Web-enabled, portable terminals held by members of an operational team of a spacecraft-command-and-control center who may be located away from the center. Examples of such terminals include personal data assistants, laptop computers, and cellular telephones. ADROIT would make it unnecessary to equip each terminal with platform-specific software for access to the data streams or with software that implements the information-sharing protocol used to deliver telemetry data to clients in the center.

ADROIT is a combination of middleware plus software specific to the center. (Middleware enables one application program to communicate with another by performing such functions as conversion, translation, consolidation, and/or integration.) ADROIT translates a data stream (voice, video, or alphanumeric data) from the center into Extensible Markup Language, effectuates a subscription process to determine who gets what data when, and presents the data to each user in real time. Thus, ADROIT is expected to enable distribution of operations and to reduce the cost of operations by reducing the number of persons required to be in the center.

This program was written by Mark Hodges and Layne Simmons of TenXsys, Inc. for Johnson Space Center. For further information, contact the JSC Innovative Partnerships Office at (281) 483-3809.

In accordance with Public Law 96-517, the contractor has elected to retain title to this invention. Inquiries concerning rights for its commercial use should be addressed to:

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Refer to MSC-24152-1, volume and number of this NASA Tech Briefs issue, and the page number.

➤ Reducing Surface Clutter in Cloud Profiling Radar Data

Radar data can be processed to study clouds closer to the surface.

NASA's Jet Propulsion Laboratory, Pasadena, California

An algorithm has been devised to reduce ground clutter in the data products of the CloudSat Cloud Profiling Radar (CPR), which is a nadir-looking radar instrument, in orbit around the Earth, that measures power backscattered by clouds as a function of distance from the instrument. Ground clutter contaminates the CPR data in the lowest 1 km of the atmospheric profile, heretofore making it impossible to use

CPR data to satisfy the scientific interest in studying clouds and light rainfall at low altitude.

The algorithm is based partly on the fact that the CloudSat orbit is such that the geodetic altitude of the CPR varies continuously over a range of approximately 25 km. As the geodetic altitude changes, the radar timing parameters are changed at intervals defined by flight software in order to keep the tro-

posphere inside a data-collection time window. However, within each interval, the surface of the Earth continuously "scans through" (that is, it moves across) a few range bins of the data time window. For each radar profile, only few samples [one for every range-bin increment ($\Delta r = 240$ m)] of the surface-clutter signature are available around the range bin in which the peak of surface return is observed, but samples in con-