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Title: A PC-Based Multispectral Scanner Data Evaluation Workstation:
Application to Daedalus Scanners

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In late 1989, a personal computer (PC)-based data evaluation workstation was developed to support post flight processing of Multispectral Atmospheric Mapping Sensor (MAMS) data. The MAMS Quick View System (QVS) (Jedlovec et al., 1989a) is an image analysis and display system designed to provide the capability to evaluate Daedalus scanner data immediately after an aircraft flight. Even in its original form, the QVS offered the portability of a personal computer with the advanced analysis and display features of a mainframe image analysis system. It was recognized, however, that the original QVS had its limitations, both in speed and processing of MAMS data. Recent efforts, documented here and visually displayed at the workshop, focus on overcoming earlier limitations and adapting the system to a new data tape structure. In doing so, the enhanced Quick View System (QVS2) will accommodate data from any of the four spectrometers used with the Daedalus scanner on the NASA ER2 platform (the MAMS, AOCI, TMS, and WILDFIRE (under development)).

The QVS2 is designed around the AST 486/33mhz CPU personal computer and comes with 10 EISA expansions slots, keyboard, and 4.0 mbytes of memory. Specialized PC-McIDAS software provides the main image analysis and display capability for the system. Additional hardware features for the QVS2 include 3-1/2 and 5-1/4 disk drives, expansion board with 4 mbytes memory (additional), a 1.2 gbyte hard disk and controller which is accessible through a SCSI interface, an AST/VGA color monitor and adapter card with 512 kbytes memory, and a Kensington bus mouse. AST OS/2 (version 1.2) and DOS 4.01 are also required as basic software packages.

Image analysis and display of the digital scanner data is accomplished with PC-McIDAS software. PC-McIDAS is the personal computer version of an imaging software package created for mainframe systems by the University of Wisconsin/ Space Science and Engineering Center. The mainframe package runs on an IBM host and provides many enhanced hardware and software capabilities for the analysis and display of all types of geophysical data (Suomi, et al., 1983). In 1985 SSEC produced a DOS version of McIDAS with much of the functionality of the mainframe package while running on IBM PC's. Early in 1989, UW/SSEC released a version for the PC which runs under the OS/2 operating system. This change allowed for greater compatibility between mainframe and PC software and for multiple task applications. With a VGA video interface and the power of the 80386 processor (IBM PS2/80 standard), PC-McIDAS now has impressive capabilities, similar to those of a mainframe McIDAS workstation.

In addition to the basic computer system, other hardware components are a necessary part of the QVS2. A frame grabber card and supporting software



should allow for windowing and scrolling of image data, features which were unavailable with the previous QVS. This allows for more useful displays of scanner data in the preview mode. The use of an OS2 supported frame grabber card allows for the immediate collection of digital data on the PC. It also allows for instantaneous switch to McIDAS to calibrate and display the image data. Communications with a host McIDAS system are possible from off-site with an external modem for real-time weather data. This capability has been demonstrated for both the UW/SSEC and MSFC/EADS/WetNet (Goodman *et al.*, 1990; and Young *et al.*, 1990) systems and will allow access to the entire real-time weather data bank available on these systems. This capability will provide invaluable during deployments in support aircraft flights and for flight planning.

The QVS2 system will allow for greater capability and more flexibility in the evaluation of scanner data after each aircraft flight. The first step in this evaluation is to get a preview of the image data throughout the flight. The QVS2 allows for the preview and side-by-side display of any two (of the twelve) channels in a moving window mode as the data is read from the flight recorder. The QVS2 will support a preview-to-collection speed of 8-1 (at 30 ips). Thus two channels can be previewed from a four hour flight in 30 minutes (factor of 8 increase over the original QVS). The preview mode will be used to verify the general performance of the scanner and to select specific scenes for more detailed evaluation. For detailed analysis of Daedalus scanner data, the data is ingested from the flight recorder through the SCSI interface using a menu drive set of panels. The user inputs the desired time or scanline for the data, the channels and number of scanlines to collect, and the destination file name. One to twelve channels can be collected and saved to disk. Additional processing is available with PC McIDAS for the analysis of image data (Jedlovec *et al.*, 1989a,b). The 1.2 gbyte of disk space will allow for the storage of data from one or more flights.

References

- Goodman, H. M., R. Spencer, J. Dodge, and J. Star, 1990: The WetNet Project. Preprints Sixth International Conference on Interactive Information and Processing Systems for Meteorology, Oceanography, and Hydrology, February 1990, Anaheim, California, AMS, Boston, 149-152.
- Jedlovec, G. J., R. J. Atkinson, M. W. James, and M. R. Smith, 1989a: The MAMS Quick View System (QVS): A PC based field evaluation workstation. Presentation and summary paper to the McIDAS Users Group Meeting, November 1989, Madison, Wisconsin, 9 pgs.
- Jedlovec, G. J., K. B. Batson, R. J. Atkinson, C. C. Moeller, W. P. Menzel, and M. W. James, 1989b: Improved capabilities of the Multispectral Atmospheric Mapping Sensor (MAMS). NASA Technical Memorandum 100352, Marshall Space Flight Center, Huntsville, AL, 80 pgs.
- Suomi, V. E., R. Fox, S. S. Lemaye, and W. L. Smith, 1983: McIDAS III: A modern interactive data access and analysis system. *J. Climo. Appl. Meteor.*, 22, 765-778.
- Young, J. T., R. Dengel, and D. A. Santek, 1990: WetNet System. Preprints Sixth International Conference on Interactive Information and Processing Systems for Meteorology, Oceanography, and Hydrology, February 1990, Anaheim, California, AMS, Boston, 57-60.