

N87-23160

**NASA REGIONAL PLANETARY IMAGE FACILITY
IMAGE RETRIEVAL AND PROCESSING SYSTEM**

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**NASA REGIONAL PLANETARY IMAGE
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IMAGE RETRIEVAL AND PROCESSING
SYSTEM**

- RPIFs were set up by NASA to house and maintain image data produced by space probes to moons and planets.
- There are currently nine RPIFs in the U.S. and four in Europe.
- In the near future, RPIFs will provide access to digital planetary image data.
- Washington U. and USGS Flagstaff are jointly developing a MicroVAXII based system to manage and analyze planetary image data.

**NASA RPIF
IMAGE WORKSTATION**

- Workstation main functions will include:
 - Search through database
 - Retrieval of digital images
 - Processing and display of digital images
- The MicroVAX effort is being done under the auspices of the Planetary Data System (PDS).
- The workstation will be used as a prototype RPIF image processing system in PDS Build One.
- The workstation will eventually be replicated at other RPIFs.

DESIGN CONSIDERATIONS

Types of information to be stored:

- General information about planets and planetary exploration
- Information about specific data sets

Types of data to be stored:

- Digital images on magnetic tape or CD
- Non-digital data such as photographic prints and maps

Types of users:

- Experienced users such as RPIF staff and scientists
- Occasional, knowledgeable users such as visiting scientists
- General public such as high school science teachers.

DESIGN CONSIDERATIONS

Data presentation:

- View single entries or tables of data
- Output to terminal, file or printer
- Some simple graphics

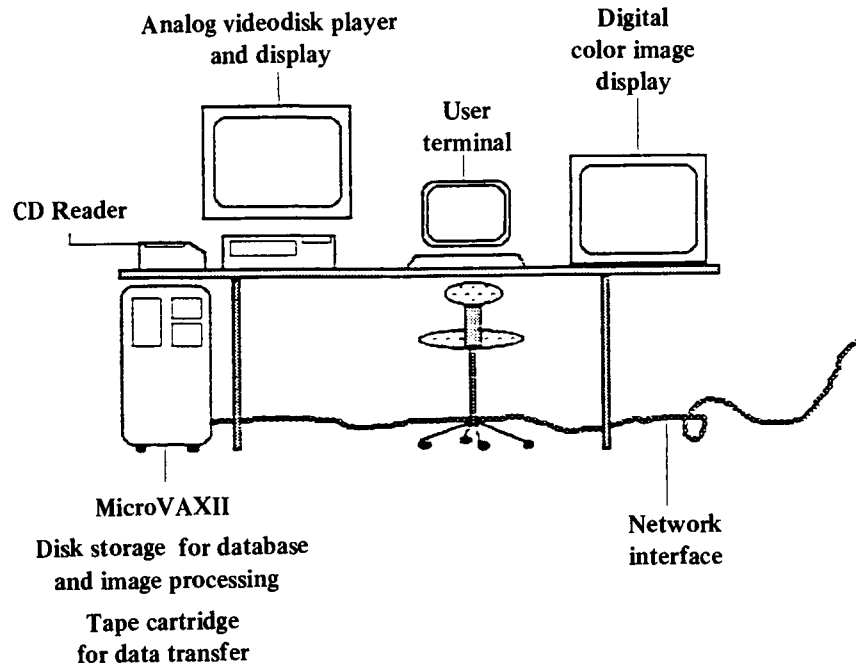
Browse capability

Access to digital data

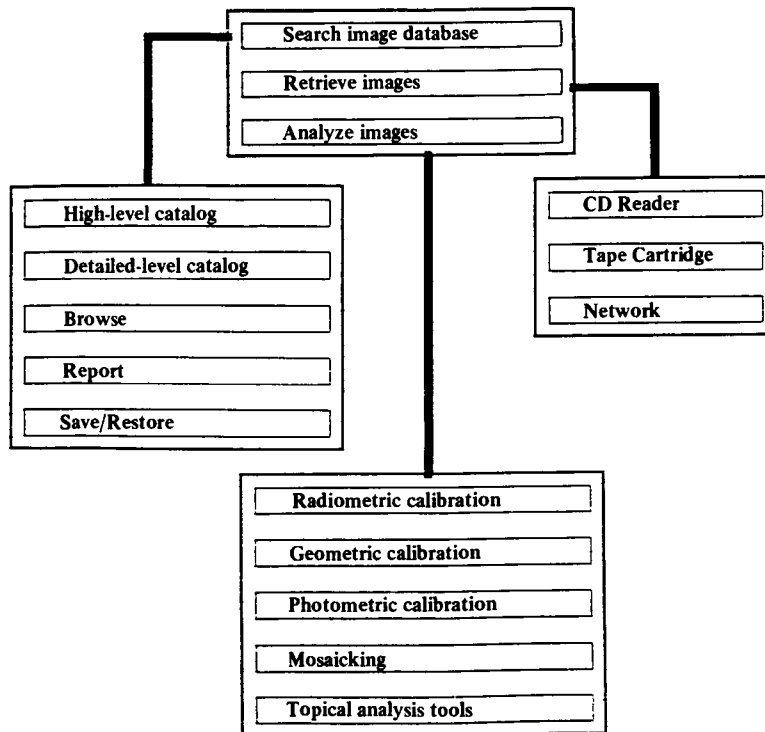
Image processing capabilities:

- Radiometric and geometric calibration
- Color image display

WORKSTATION COMPONENTS



MAJOR FUNCTIONS OF WORKSTATION



DATABASE DESIGN

The database is divided into **high-level** and **detailed-level** catalogs.

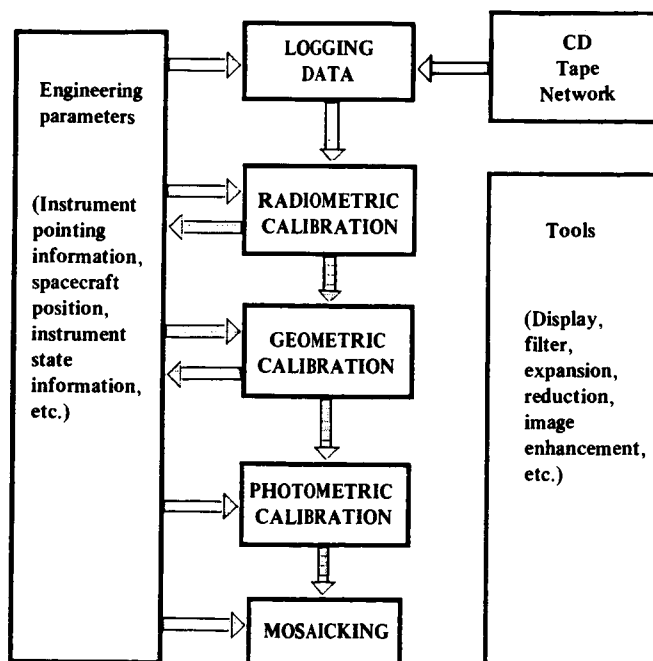
The high-level catalog is used to find out about planets and planetary exploration. It contains information on:

- planetary missions
- spacecraft
- instruments
- planets

The detailed-level catalog is used to find data to be analyzed. It contains information on:

- engineering parameters for images (picture location, filter, etc.)
- maps produced from planetary images
- mosaics of planetary images
- location and format of digital data

IMAGE ANALYSIS FUNCTIONS



Software developed by USGS Flagstaff

USES OF TAE IN WORKSTATION

- Menus used for main functions
- File access and image processing programs use TAE tutor screens to receive parameters from user, and TAE subroutines to pass parameters to programs.
- Database access and reporting programs use TAE tutor screens in conjunction with commercial database forms package
- PDS is evaluating TAE as a possible user interface for Build One

CURRENT STATUS OF DEVELOPMENT

- System hardware installed, including hard disk for image storage, CD-Reader for image retrieval, digital image display, and analog videodisk player and monitor.
- TAE and database management software installed on MicroVAXII. Installation of image processing software in progress.
- Database design for high-level and detailed-level catalogs in process
- Developed test programs to read and display digital images from CD.
- Prototype workstation expected to be completed by March 1987.