DISPLAY MANAGEMENT SUBSYSTEM, VERSION 1
A USER'S EYE VIEW

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A User's Eye View

- A Case for DMS
- Design and Functionality of DMS
- Support for DMS
- System Information
- Future Directions
- Summary

Typical Image Processing Environment

User

Image Data

Image Analysis
Terminal

Image Processing
Software
Typical Image Processing Environment

System Upgrade: A New IAT Is Added

Display Management Subsystem

User's Station

User's Image Data

CRT IAT

DISPLAY I/O

USER I/O

IMAGE I/O

Application Package

User

NEW DISPLAY I/O

NEW USER I/O

NEW IMAGE I/O

Application Package

User's Image Data
Without DMS

- How Many Memories?
- How Many LUTs?
- Where is Band 3 Stored?
- How Many Graphics?

Enter DMS

A Layered Software Design

<table>
<thead>
<tr>
<th>Device Independent Layer - XD/XO</th>
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<tbody>
<tr>
<td>Device Dependent Layer DD/DD/DO</td>
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ENTER DMS

A Layered Software Design

System Upgrade: A New IAT Is Added

Device Independent Layer - XD/XO

Device Dependent Layer - DD/DO

NEW Device Dependent Layer - DD/DO
ENTER DMS
System Upgrade: A New IAT Added

Display Management Subsystem

User

APPLICATION SOFTWARE

IMAGE DATA

Display Management Subsystem

Device

Independent

Layer - XD/XO

Device

Dependent

Layer

DD/DO

New Device

Dependent

Layer

DD/DO

With DMS
What Is DMS?

- Subsystem of TAE
- Device-Independent Interface
- Layered Software Design
- A Solution
- **Device Independent Interface**

  Provides Generic Services
  - Initiation and Termination
  - Image Transfer and Setup
  - Image Viewing/Alteration
  - Image Manipulation
  - Overlay Plane Support
  - Cursor/Interrupt Support

- **Layered Software Design**

  **Upper Layer**
  - Device Independent
  - Generic Services
  - C and FORTRAN Callable

  **Lower Layer**
  - Device Dependent
  - Specific Services
  - Data Structure Management
  - Image I/O Support
- A Solution

- Simple to Use
- Generic Applications Available for Performing Many Image Processing Tasks
- Easily Expandable to Meet Local Needs
- Callable by C and FORTRAN Applications
- Portable to Accommodate Different IAT's
- Modeling of Device-Specific and System-Specific Elements

- Structure of DMS

Device Independent Layer

<table>
<thead>
<tr>
<th>CXD/CXO</th>
<th>FXD/FXO</th>
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<tbody>
<tr>
<td>C INTERFACE</td>
<td>FORTRAN INTERFACE</td>
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Device Dependent Layer

<table>
<thead>
<tr>
<th>DD/DO</th>
<th>DM</th>
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<tr>
<td>DEVICE INTERFACE</td>
<td>DATA STRUCTURE MANAGEMENT</td>
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GENERIC SERVICES

SPECIFIC SERVICES
Structure of DMS

Application Functions

- 32 Currently Available

- Developed at EROS Data Center

- Coming Attraction: Mensuration Package
Display Management Subsystem

Application Functions

Some Examples

- ALLOC - Allocate a Display Device
- CURSOR - Turn the Cursor On or Off
- TODSP - Transfer a Disk Image File to Display Memory
- SAVING - Create an Entry for the Viewed Image in the ConfigurationTable
- FLICKR - Flicker Several Images on the Display
- HISTO - Draw a Histogram of an Image
- PIVOT - Pivot an Image
- SHOIMG - View an Image in Display Memory
- ZOOPAN - Expand or Pan a Portion of the Viewed Image Using a Pointing Device

DMS User Support

- Beta Test Sites With IIS
- Documentation
- GSFC User Support Office
  Phone (301) 286-6034
- Report Problems to USO
- User Network
- Request DMS thru USO
- Development is Ongoing
Details About the System

- Operates Under VMS and UNIX
- Uses 36,000 Disk Blocks
- Supports 3 Display Devices
  - IIS
  - RASTERTEK
  - DEANZA

Future Directions

- Generic Image I/O
- Multiple Device Handling
- Broader Graphics Support
- Single-User DMS
Why Does a User Want DMS?

- Ease of Use
- Stability
- Many Application Functions Available

Why Does an Application Programmer Want DMS?

- Ease of Application Development
- Flexibility
- Interfaces With C and FORTRAN
Summary

Why Does a System Developer Want DMS?

- Ease of Expansion
- Models System-Dependent Elements
- System Support Available
- Longevity/Durability