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

User's Station

CRT
IAT

DISPLAY I/O

USER I/O

IMAGE I/O

Application Package

User's Image Data

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/DO</td>
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</table>
Display Management Subsystem

ENTER DMS

A Layered Software Design

User

Display Management Subsystem

Device Independent Layer - XD/XO

Device Dependent Layer - DD/DDO

APPLICATION SOFTWARE

IMAGE DATA

Enter DMS

System Upgrade: A New IAT Is Added

Display Management Subsystem

Device Independent Layer - XD/XO

Device Dependent Layer - DD/DDO

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

Display Management Subsystem

APPLICATION SOFTWARE

User

Display Management Subsystem

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IMAGE DATA

With DMS
What Is DMS?

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

Subsystem of TAE
• 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

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### Structure of DMS

#### Device Independent Layer

<table>
<thead>
<tr>
<th>CXD/CXO</th>
<th>FXD/FXO</th>
<th>GENERIC SERVICES</th>
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</thead>
<tbody>
<tr>
<td>C INTERFACE</td>
<td>FORTRAN INTERFACE</td>
<td></td>
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</table>

#### Device Dependent Layer

<table>
<thead>
<tr>
<th>DD/DO</th>
<th>DM</th>
<th>SPECIFIC SERVICES</th>
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<tr>
<td>DEVICE INTERFACE</td>
<td>DATA STRUCTURE MANAGEMENT</td>
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Display Management Subsystem

Structure of DMS

Application Functions

- 32 Currently Available
- Developed at EROS Data Center
- Coming Attraction: Mensuration Package
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

- **SAVIMG**
  - Create an Entry for the Viewed Image in the Configuration Table

- **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