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

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Display Management Subsystem   **NASA**

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
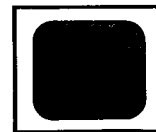
Image Processing Software

APPLICATION SOFTWARE

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Typical Image Processing Environment

CRT   IAT

User's Station

DISPLAY I/O

USER I/O

IMAGE I/O

Application Package

User's Image Data
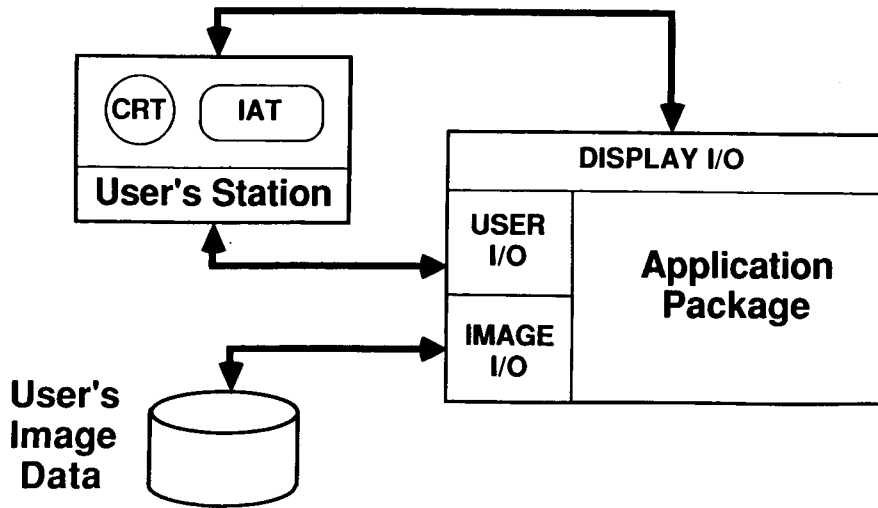
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Typical Image Processing Environment

System Upgrade: A New IAT Is Added

DISPLAY I/O

USER I/O

IMAGE I/O

Application Package

User

User's Image Data

NEW DISPLAY I/O

NEW USER I/O

NEW IMAGE I/O

Application Package
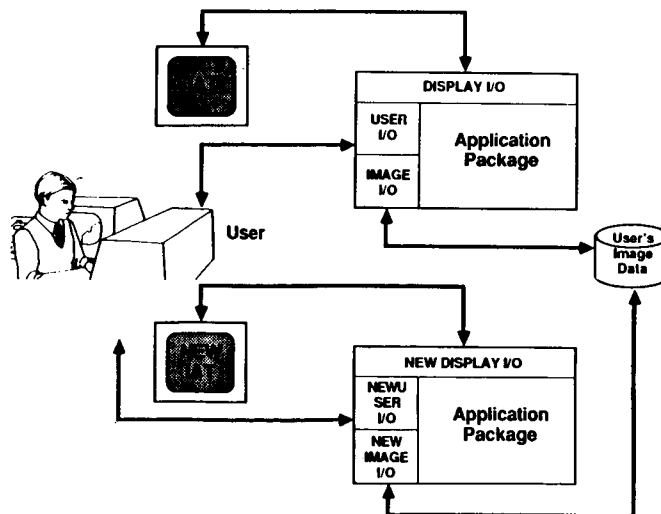
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Without DMS

How Many Memories?

How Many LUTs?

Where is Band 3 Stored?

How Many Graphics?
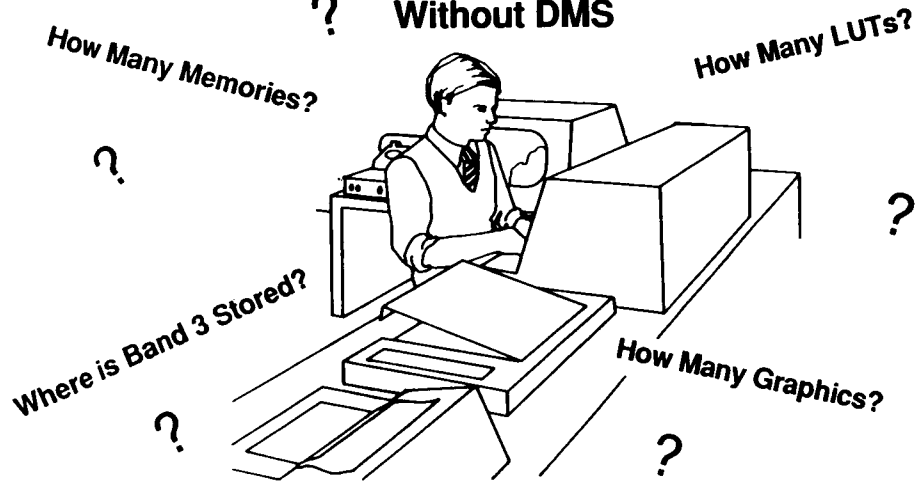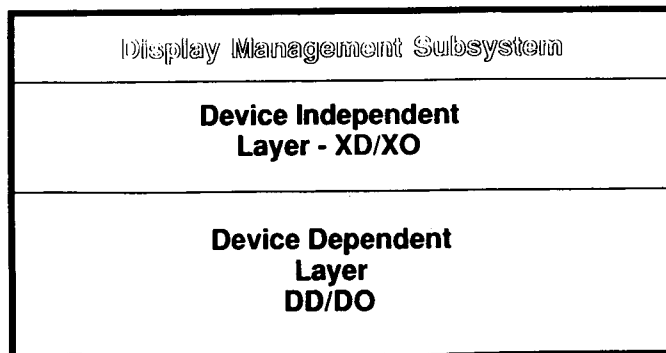
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Enter DMS

A Layered Software Design

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Device Independent Layer - XD/XO
Device Dependent Layer DD/DO

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ENTER DMS

A Layered Software Design

User

APPLICATION SOFTWARE

IMAGE DATA

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Device Independent Layer - XD/XO

Device Dependent Layer DD/DO
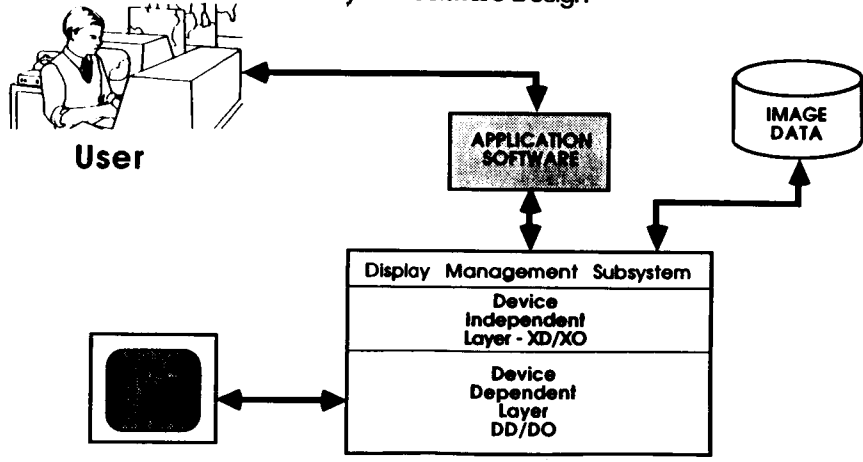

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Enter DMS

System Upgrade: A New IAT Is Added
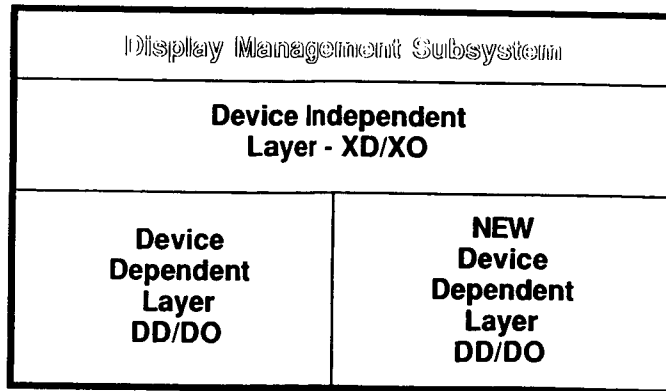
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Device Independent Layer - XD/XO	
Device Dependent Layer DD/DO	NEW Device Dependent Layer DD/DO

ENTER DMS
System Upgrade: A New IAT Added

User

APPLICATION SOFTWARE

IMAGE DATA

Display Management Subsystem	
Device Independent Layer - XD/XO	
Device Dependent Layer DD/DO	New Device Dependent Layer DD/DO

IAT

NEW IAT
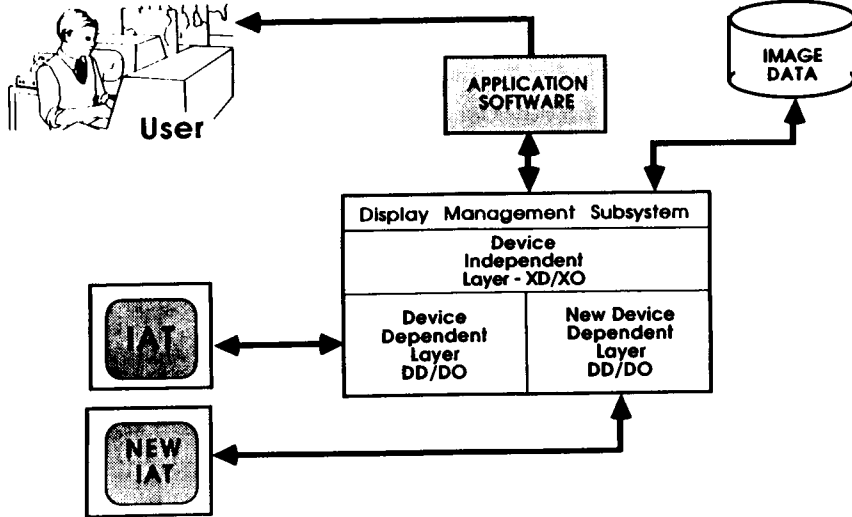
With DMS

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What Is DMS?

- Subsystem of TAE

- Device-Independent Interface

- Layered Software Design

- A Solution

• Subsystem of TAE

USER A ———— USER B

CRT | IAT DEVICE 1
USER'S STATION

CRT | IAT DEVICE 2
USER'S STATION

TAE

DMS APPLICATION PACKAGE

DMS DEVICE INDEPENDENT LAYER DD/DO DEVICE 1

DMS DEVICE INDEPENDENT LAYER DD/DO DEVICE 2

DMS DEVICE INDEPENDENT LAYER XD/XO
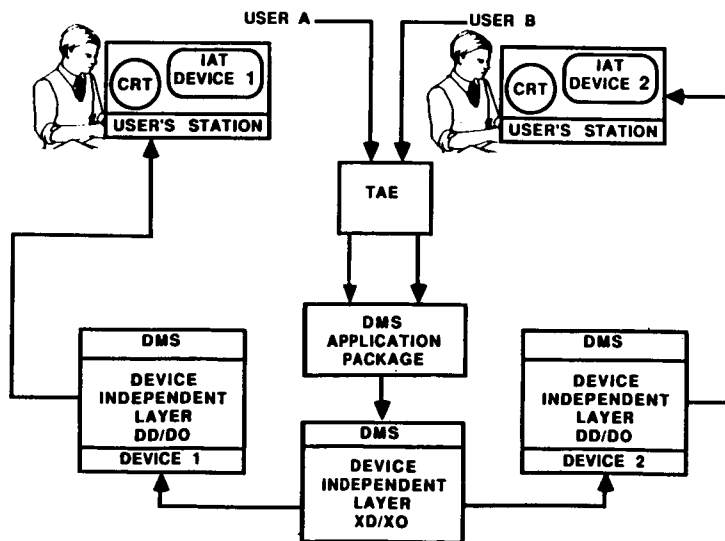
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• **Device Independent Interface**

Provides Generic Services

- • Initiation and Termination

- • Image Transfer and Setup

- • Image Viewing/Alteration

- • Image Manipulation

- • Overlay Plane Support

- • Cursor/Interrupt Support

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• **Layered Software Design**

<u>Upper Layer</u>
- • Device Independent

- • Generic Services

- • C and FORTRAN Callable

<u>Lower Layer</u>
- • Device Dependent

- • Specific Services

- • Data Structure Management

- • Image I/O Support

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• 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

CXD/CXO	FXD/FXO	GENERIC SERVICES
C INTERFACE	FORTRAN INTERFACE	

Device Dependent Layer

DD/DO	DM	SPECIFIC SERVICES
DEVICE INTERFACE	DATA STRUCTURE MANAGEMENT	

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Structure of DMS
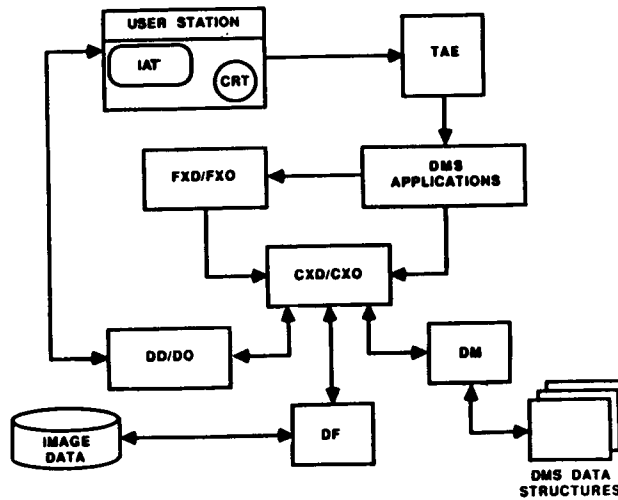
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Application Functions

- 32 Currently Available

- Developed at EROS Data Center

- Coming Attraction: Mensuration Package

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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 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

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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

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Details About the System

- Operates Under VMS and UNIX

- Uses 36,000 Disk Blocks

- Supports 3 Display Devices

  - IIS
  - RASTERTEK
  - DEANZA

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Future Directions

- Generic Image I/O

- Multiple Device Handling

- Broader Graphics Support

- Single-User DMS

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Summary

Why Does a User Want DMS?

- Ease of Use

- Stability

- Many Application Functions Available

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Summary

Why Does an Application Programmer Want DMS?

- Ease of Application Development

- Flexibility

- Interfaces With C and FORTRAN

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Summary

Why Does a System Developer Want DMS?

- **Ease of Expansion**

- **Models System-Dependent Elements**

- **System Support Available**

- **Longevity/Durability**