The graPHIGS Programming Interface: ISO PHIGS Subroutine Reference

SC33-8140-03

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Note
Before using this information and the product it supports, read the information in “Notices,” on page 529.

Fourth Edition (October 2000)

This edition applies to the IBM PEX/PHIGS for AIX Version 4, Program Number 5696-907, and to all subsequent releases of this product until otherwise indicated in new editions.

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About This Book

This book contains information you need to code your ISO PHIGS calls and to declare variables correctly. Each subroutine has information about error codes and functional relations to help you identify the source of errors resulting from data and program flow. Each subroutine description explains the result of the subroutine call and a list of the ISO PHIGS standard errors associated with the subroutine.

Who Should Use This Book

This book is intended for application programmers..

Highlighting

The following highlighting conventions are used in this book:

Bold	Identifies commands, subroutines, keywords, files, structures, directories, and other items whose names are predefined by the system. Also identifies graphical objects such as buttons, labels, and icons that the user selects.
Italics	Identifies parameters whose actual names or values are to be supplied by the user.
`Monospace`	Identifies examples of specific data values, examples of text similar to what you might see displayed, examples of portions of program code similar to what you might write as a programmer, messages from the system, or information you should actually type.

ISO 9000

ISO 9000 registered quality systems were used in the development and manufacturing of this product.

Related Publications

The following books contain information on graPHIGS API products:

- *The graPHIGS Programming Interface: Subroutine Reference*
- *The graPHIGS Programming Interface: Technical Reference*
- *The graPHIGS Programming Interface: Understanding Concepts*

Chapter 1. Introduction

This manual describes the syntax and operations of the subroutines available in the graPHIGS API ISO PHIGS interface.

Calling Conventions for ISO PHIGS Subroutines

The graPHIGS API supports C, FORTRAN 77, and FORTRAN 77 Subset bindings for ISO PHIGS defined subroutines. Each invocation consists of the subroutine name with the appropriate parameters required by the subroutine. Mnemonic conventions make the purpose of the subroutine calls evident in the names. In your application, you must use all the parameters specified in each subroutine and the parameters must be in the order shown in the subroutine description.

graPHIGS API Subroutines

For each ISO PHIGS subroutine, you will find the purpose of the subroutine with a description, the processing performed, a list and description of the parameters, a list of associated ISO-defined error codes and messages, and a list of related subroutines. Refer to the appendixes for enumerations and type definitions for the supported bindings. Binding errors and implementation errors are not listed with each subroutine. See Chapter 21. “Implementation Errors and graPHIGS API Messages for ISO PHIGS-Defined Errors” for a discussion of implementation errors and a list of binding errors. See Chapter 23. “graPHIGS API Deviations from the ISO PHIGS Standard” for a discussion of the handling of asynchronous errors. The ISO PHIGS subroutines have been grouped as follows:

- 1. Control
- 2. Output Primitives
- 3. Attribute Structure Elements
- 4. Miscellaneous Structure Elements
- 5. Structure Operations
- 6. Workstation Table Settings
- 7. Display
- 8. Transformation
- 9. Input
- 10. Utilities
- 11. Error Handling
- 12. Miscellaneous
- 13. Inquiries

In addition, this manual contains the following appendixes:

- A. Transformations for the C and FORTRAN bindings
- B. Format and content of Structure Element Records for the FORTRAN binding
- C. C binding enumerations and type definitions
- D. FORTRAN binding enumerations
- E. ISO PHIGS subroutines mapped to GP*xxxx* subroutines
- F. GP*xxxx* subroutines mapped to ISO PHIGS subroutines
- G. ISO PHIGS subroutine errors
- H. graPHIGS API extensions and the combining of GP*xxxx* subroutine with ISO PHIGS subroutines
- I. graPHIGS API deviations from the ISO PHIGS standard

Subroutine Descriptions

The page preceding each group of subroutines presents a brief overview of the purpose and result caused by invoking the subroutines referenced within the given section. This introductory material highlights important information that applies to all the subroutines in that section.

Reference Manual Abbreviations

The following abbreviations are used frequently:

ARCL
Archive Closed

AROP
Archive Open

ASAP
As Soon As Possible

ASF Attribute Source Flag

ASTI At Some Time

BNIG Before Next Interaction Globally

BNIL Before Next Interaction Locally

CIELUV
CIELUV color model system

CMY Cyan-Magenta-Yellow color model

CSID Character Set Identifier

CSS Centralized Structure Store

EDF External Defaults File

GDP Generalized Drawing Primitive

GSE Generalized Structure Element

HLHSR
Hidden Line Hidden Surface Removal

HSV Hue-Saturation-Value color model

NROP
Non-Retained Structure Open

PDT graPHIGS API Description Table

PET Prompt and Echo Type

PHCL
graPHIGS Closed

PHOP
graPHIGS Open

PSL graPHIGS API State List

RGB Red-Green-Blue color model

STCL Structure Closed

STOP Structure Open

USL Utility State List

WAIT When Application Requests It

WDT Workstation Description Table

WSCL
Workstation Closed

WSID Workstation Identifier

WSL Workstation State List

WSOP
Workstation Open

WSTYPE
Workstation Type

The following abbreviations for coordinate spaces are used:

MC Modeling Coordinates

WC World Coordinates

VC Viewing Coordinates

NPC Normalized Projection Coordinates

DC Device Coordinates

Note: For more information, see *The graPHIGS Programming Interface: Understanding Concepts*.

Chapter 2. Control Subroutines

The control subroutines allow your application to have access to and control over the graphical resources available when using the graPHIGS API*.

Your application can open and close the graPHIGS API.

When an application opens the graPHIGS API, a nucleus, which is the collection of resources available to your application, is connected to your application. When connected, you can open, update, or close workstation resources.

Also invoke these subroutines to affect the timing of update operations and to explicitly control the update and redraw operations on a workstation.

These subroutines do not store or modify graphics data.

CLOSE PHIGS (PHOP,WSCL,STCL,ARCL)

Purpose

Use Close PHIGS to terminate all graPHIGS API processing for this application process. This subroutine function detaches all attached resources created by the application and disconnects all nuclei connected to the application. Close PHIGS closes files and releases system resources, such as storage and locks. Close PHIGS sets the graPHIGS system state to graPHIGS Closed (PHCL). Reopen the graPHIGS API by invoking the Open PHIGS subroutine.

Language Bindings

C

pclose_phigs();

FORTRAN

PCLPH

Errors

4 FUNCTION REQUIRES STATE (PHOP,WSCL,STCL,ARCL)

Related Subroutines

- Open PHIGS

Close Workstation (PHOP,*,*,*)

Purpose

Use Close Workstation to close the specified workstation. The workstation updates automatically before closing.

This subroutine function releases the workstation state list and deletes the workstation's identifier from the set of opened workstations in the graPHIGS API state list. Additionally, it flushes the input queue of all events from all input devices on that workstation, and releases the connection to the workstation. If no workstation remains open, the workstation state is set to Workstation Closed (WSCL).

Close Workstation clears the workstation. For workstations that keep a local copy of the structure store, the graPHIGS API frees the structure storage at this time.

Language Bindings

C

pclose_ws(*ws_id*);

Input Parameters

Pint ws_id
Workstation identifier.

FORTRAN

pcwlk(*wkid*)

Input Parameters

integer wkid
Workstation identifier.

Errors

3 FUNCTION REQUIRES STATE (PHOP,WSOP,*,*)

54 SPECIFIED WORKSTATION IS NOT OPEN

256 WARNING, INPUT QUEUE HAS OVERFLOWED

Related Subroutines

- Open Workstation.
- Inquire Set of Open Workstations.

MESSAGE (PHOP,WSOP,*,*)

Purpose

Use Message to display a message on the specified workstation.

The message text appears in the lower left corner of the workstation viewport and the graPHIGS API clips the message text to this viewport.

Deferral state settings do not affect the message. The message remains displayed until removed by another message. Clear the message by calling Message with a length of zero.

The appearance (size and color) of the message text is workstation dependent. The graPHIGS API uses the workstation's primary character set to convert the text if necessary.

For more details, refer to the specificc device-support information in *The graPHIGS Programming Interface: Technical Reference*.

Language Bindings

C

pmessage (*ws_id, message*);

Input Parameters

Pint ws_id
Workstation identifier

*const char *message*
Message string to be displayed.

FORTRAN

pmsg (*wkid*, *mess*)

Input Parameters

integer wkid
Workstation identifier

character(*) mess*
Message string to be displayed.

FORTRAN Subset

pmsgs (*wkid, lstr, mess*)

Input Parameters

integer wkid
Workstation identifier

integer lstr
Length of the message string in characters.

character(*) mess*
Message string to be displayed.

Errors

3 FUNCTION REQUIRES STATE (PHOP,WSOP,*,*)

54 SPECIFIED WORKSTATION IS NOT OPEN

Related Subroutines

None

OPEN PHIGS (PHCL, WSCL, STCL, ARCL)

Purpose

Use Open PHIGS to open and initialize the graPHIGS API. Open PHIGS makes all the graPHIGS API subroutines available. Call Open PHIGS before invoking most other graPHIGS API subroutines.

This subroutine function initializes the graPHIGS API state list (PSL). Open PHIGS sets the system state to graPHIGS Open (PHOP), sets the workstation stae value to Workstation Closed (WSCL), sets the structure state value to Structure Closed (STCL), and sets the archive state value to Archive Closed (ARCL).

The External Defaults File (EDF) allows the application to modify the graPHIGS API system and workstation defaults. See *The graPHIGS Programming Interface: Technical Reference, ″*Defaults and Nicknames,″ for contents and formats of the External Defaults File (EDF).

When your application issues this Open PHIGS subroutine, the graPHIGS API implicitly connects to a private nucleus, unless the EDF explicitly controls the connection to a specified nucleus. For your application to use the 6090 workstation, you *must* indicate it by using the DEFNUC default in the External Defaults File (EDF).

With Open PHIGS you cannot suppress nucleus creation via the External Defaults File (EDF).

The error file parameter determines the target for logged error messages.

To determine if the Open PHIGS subroutine was successful, use the Inquire System State Value subroutine.

See *The graPHIGS Programming Interface: Technical Reference, ″*Defaults and Nicknames,″ for contents and formats of the External Defaults File (EDF).

Language Bindings

C

popen_phigs (*err_file, mem_units*);

Input Parameters

`const char *err_file`

Name of the error file. This parameter determines the target for logged error messages. Handling of error messages varies depending on the error file character string and the environment (where 0<*character string*<=80). This parameter looks like a Unix file descriptor which consists of a **[path]/filename[extension]. Path** is the route of directories through the file system on an AIX system. **Path** is optional and ignored for MVS and VM. An example of a fullfile descriptor:

/phigs/errors/appl1

where:

- **path** = **/phigs** which says go from the root directory to directory **phigs**
- **filename**
- **extension** = **.appl1**

The following rules apply to the name depending on which system the shell is running in:

AIX If you did not specify the path, then the graPHIGS API uses the default directory at the time of the execution of the subroutine.

MVS, MVS/XA

- `filename` - You must supply a filename. If you specify the extension, then as the filename you must specify the member name within a partition data set. If you do not specify the extension, then as the filename you must specify the DD-name of the partition data set.

- `extension` - The extension is optional. If you specify the extension, then you must specify it as the DD-name of the partition data set including the member filename.

VM/CMS

- `filename` - You must specify the filename.
- `extension` - The extension is optional. If you specify the extension, then it is the filetype. If you do not specify the extension, then the graPHIGS API uses a filetype of `AFMPELOG`.
- The graPHIGS API uses a filemode of A1.
- The graPHIGS API makes the `filename.extension` upper case.

`size_t mem_units`
size_t units of memory available for buffer space. The graPHIGS API ignores this parameter.

FORTRAN

popph (*errfil, bufa*)

Input Parameters

integer errfil
Name of the error file. This parameter determines the target for logged error messages. (`0=console, 1=afmerror`). Handling of error messages varies depending on the error file and the environment.

If the error file identifier has a value of 0:

AIX Messages are sent to **stderr**

MVS Messages are logged to the console.

VM Messages are logged to the console.

If the error file identifier has a value of 0:

AIX Filename `afmerror`.

MVS `AFMERROR` is the `DDNAME` of the dataset.

VM Filename `AFMERROR` and filetype `AFMPELOG`.

integer bufa
Amount of units of memory available for buffer area. The graPHIGS API ignores this parameter.

Errors

1 FUNCTION REQUIRES STATE (PHCL, WSCL, STCL, ARCL)

450 SPECIFIED ERROR FILE IS INVALID

Related Subroutines

- Close PHIGS
- Inquire System State Value

OPEN WORKSTATION (PHOP,*,*,*)

Purpose

Use Open Workstation to open and initialize a specified workstation. This subroutine function sets the workstation state value to Workstation Open (WSOP). The graPHIGS API requests the operating system to establish the specified connection. This subroutine function allocates and initializes the Workstation

State List (WSL) according to the Workstation Descriptor Table (WDT) for the specified type. The workstation is associated with the specified identifier. Open Workstation adds this specified identifier to the set of open workstations in the graPHIGS API state list.

The graPHIGS API External Defaults File (EDF) allows the application to denote, indirectly, the actual values of both the workstation type and the connection identifier. For more information, see *The graPHIGS Programming Interface: Technical Reference*, "Defaults and Nicknames," for contents and formats of the External Defaults File (EDF).

Language Bindings

C

popen_ws (*ws_id, conn_id, ws_type*);

Input Parameters

Pint ws_id
Workstation identifier.

*const void *conn_id*
Connection identifier indicates the physical device to be opened. See *The graPHIGS Programming Interface: Technical Reference* for valid connection identifiers. The connection identifier is a pointer to a character string.

Pint ws_type
One of the graPHIGS API supported workstation types (1=6090, 2=5080, 3=GDDM, 4=GDF, 5=CGM, 6=X, 8=XSOFT, 9=XPEX, 10=IMAGE). See *The graPHIGS Programming Interface; Technical Reference*, for explanations of these workstation types.

FORTRAN

popwk (*wkid, conid, wtype*);

integer wkid
Workstation identifier.

integer conid
Connection identifier indicates the physical device to be opened. Select any integer value between 1 and 99999999 for a connection identifier. An association between this integer and a valid connection string is then made via an EDF (External Defaults File). (See *The graPHIGS Programming Interface: Technical Reference* for valid connection strings and explanations of the EDF file).

For example, the connection identifier of '*' is attained if the EDF contains the line:

```
AFMMNICK CONNID=99, TOCONNID=*
```

and the application is coded:

```
WSID=1
CONID=99
WTYPE=6
POPWK=(WKID, CONID, WTYPE)
```

integer wtype
One of the graPHIGS API supported workstation types (1=6090, 2=5080, 3=GDDM, 4=GDF, 5=CGM, 6=X, 8=XSOFT, 9=XPEX, 10=IMAGE). See *The graPHIGS Programming Interface; Technical Reference*, for explanations of these workstation types.

Errors

None

Related Subroutines

Close Workstation, Inquire Workstation Connection and Type.

REDRAW ALL STRUCTURES (PHOP,WSOP,*,*)

Purpose

Use Redraw All Structures to redraw all structures on the specified workstation.

When your application invokes this subroutine, the graPHIGS API executes all the actions in the sequence outlined below:

1. The graPHIGS API executes all deferred actions for the specified workstation without an intermediate clearing of the display surface
2. If the control flag is set to *CONDITIONALLY*, and only if the Display Surface Empty entry in the Workstation State List (WSL) is set to *NOTEMPTY*, then the graPHIGS API clears the display surface. If the control flag is set to *ALWAYS*, then the graPHIGS API clears the display surface regardless of the setting of the Display Surface Empty entry. At the conclusion of this step, the graPHIGS API sets the entry in the WSL to `EMPTY`.
3. If the view orientation matrix, view mapping matrix, view clipping limits, x to y clipping indicator, back clipping indicator, or the front clipping indicator have changed for any view, then the graPHIGS API assigns the current entries in the Workstation State List (WSL) to the corresponding values from the requested entries. The Transformation Update State is set to `NOTPENDING`.
4. If the Hidden Line/Hidden Surface Removal (HLHSR) mode has changed, then the graPHIGS API assigns the current WSL entry to the corresponding value from the requested entry. The HLHSR Update State is set to `NOTPENDING`.
5. Finally the graPHIGS API retraverses all structures posted to this workstation. If the set of structures associated with this workstation is not empty, retraversal usually sets the Display Surface Empty entry in the WSL to `NOTEMPTY`. The graPHIGS API sets the state of visual representation in the WSL to `CORRECT`.

Language Bindings

C

predraw_all_structs (*ws_id, ctrl_flag*);

Input Parameters

`Pint ws_id`

Workstation identifier

`Pctrl_flag ctrl_flag`

Control flag (`0=PFLAG_COND, 1=PFLAG_ALWAYS`).

FORTRAN

prst (*wkid, cofl*)

Input Parameters

integer wkid
Workstation identifier.

integer cofl
Control flag (0=PCONDI, 1=PALWAY).

Errors

3 FUNCTION REQUIRES STATE (PHOP,WSOP,*,*)

54 SPECIFIED WORKSTATION IS NOT OPEN

59 SPECIFIED WORKSTATION DOES NOT HAVE OUTPUT CAPABILITY

Related Subroutines

- Update Workstation

SET DISPLAY UPDATE STATE (PHOP,WSOP,*,*)

Purpose

Use Set Display Update State to set the deferral state and modification mode for the specified workstation state list.

Possible deferral modes include: *AS SOON AS POSSIBLE, BEFORE NEXT INTERACTION GLOBALLY, BEFORE NEXT INTERACTION LOCALLY, AT SOME TIME,*and *WAIT*. Possible modification modes include: *NO IMMEDIATE VISUAL EFFECTS, UPDATE WITHOUT REGENERATION,* and *USE QUICK UPDATE METHOD.*

These settings determine when pending updates are processed for display on a workstation and how the workstation performs the modifications. For an explanation of the abbreviations and modes, see *The graPHIGS Programming Interface: Understanding Concepts*. For specific workstation information, see the section on “General Output Facilities” in *The graPHIGS Programming Interface: Technical Reference*. Quick update methods are discussed in *The graPHIGS Programming Interface: Writing Applications*.

Language Bindings

C

pset_disp_upd_st (*ws_id, def_mode, mod_mode*);

Input Parameters

Pint ws_id
Workstation identifier.

Pdefer_mode def_mode
Deferral mode (*0=PDEFER_ASAP, 1=PDEFER_BNIG, 2=PDEFER_BNIL, 3=PDEFER_ASTI, 4=PDEFER_WAIT*).

Pmod_mode mod_mode
Modification mode (*0=PMODE_NIVE, 1=PMODE_UWOR, 2=PMODE_UQUM*).

FORTRAN

PSDUS (*WKID, DEFMOD, MODMOD*)

Input Parameters

INTEGER WKID
Workstation identifier.

INTEGER DEFMOD
Deferral mode (*0=PASAP, 1=PBNIG, 2=PBNIL, 3=PASTI, 4=PWAITD*).

INTEGER MODMOD
Modification mode (*0=PNIVE, 1=PUWOR, 2=PUQUM*).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

Related Subroutines

- Inquire Display Update State
- Inquire Default Display Update State

UPDATE WORKSTATION(PHOP,WSOP,*,*)

Purpose

Use Update Workstation to update the specified workstation.

This subroutine function executes all deferred actions for the specified workstation without intermediate clearing of the display surface. If the regeneration flag is set to *PERFORM* and the state of visual representation in the Workstation State List (WSL) is *DEFERRED* or *SIMULATED*, then the graPHIGS API executes all the actions in the sequence outlined below:

1. If the Display Surface Empty entry in the Workstation State List (WSL) is set to *NOTEMPTY*, then the graPHIGS API clears the display surface. At the conclusion of this step (Step 1), the graPHIGS API sets the entry to *EMPTY*.
2. If the view orientation matrix, view mapping matrix, view clipping limits, *x* to *y* clipping indicator, back clipping indicator, or the front clipping indicator have changed for any view, then the graPHIGS API assigns the current entries in the Workstation State List (WSL) to the corresponding values from the requested entries. The Transformation Update State is set to *NOTPENDING.*
3. If the Hidden Line/Hidden Surface Removal (HLHSR) mode has changed, then the graPHIGS API assigns the current WSL entry to the corresponding value from the requested entry. The HLHSR Update State is set to *NOTPENDING*.
4. The graPHIGS API re-displays all structures posted to this workstation. Usually, this action sets the Display Surface Empty entry in the WSL to *NOTEMPTY*.
5. The state of visual representation is set to *CORRECT* in the WSL. If the state of visual representation in the Workstation State List (WSL) is *DEFERRED* or *SIMULATED* and the regeneration flag is set to *PERFORM*, then this subroutine is functionally equivalent to the Redraw All Structures subroutine.

When the regeneration flag is set to *POSTPONE*, the device sends the pending update information without forcing a retraversal if possible. This function is workstation dependent.

Language Bindings

C

pupd_ws (*ws_id, regen_flag*);

Input Parameters

Pint ws_id
Workstation identifier.

Pregen_flag regen_flag
Regeneration flag (*0=PFLAG_POSTPONE, 1=PFLAG_PERFORM*).

FORTRAN

PUWK(*WKID, REGFL*)

Input Parameters

INTEGER WKID
Workstation identifier.

INTEGER REGFL
Regeneration flag (*0=PPOSTP, 1=PPERFO*).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

Related Subroutines

- Inquire Display Update State

Chapter 3. Output Primitives

These subroutines address the specification and creation of output primitives, which are structure elements. Many have both two- and three-dimensional forms and are displayed when the structure elements defining them are encountered during structure traversal. To use primitive subroutines, the structure state must be Structure Open (STOP).

For all two-dimensional output primitive subroutines, the *z* coordinate is assumed to equal zero by default.

If a specified workstation does not support a requested output primitive in a structure, then the graPHIGS API updates only the element number in the graPHIGS traversal state list.

> **Note:** When the application inserts an element into the open structure following the element pointer, the pointer updates to that element.

ANNOTATION TEXT RELATIVE (PHOP,*,STOP,*)

Purpose

Use Annotation Text Relative to insert a two-dimensional Annotation Text Relative 2 structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with an Annotation Text Relative 2 structure element, depending on the current edit mode.

During structure traversal, this element annotates the specified reference point according to the annotation style in the traversal state list. The specified annotation offset determines the position of the annotation string. The annotation string defines the origin of a local text coordinate system relative to a specified reference point after transformation to Normalized Projection Coordinates (NPC). The text plane is always parallel to the *x*., *y* plane (*z*= transformed location) in NPC. If the resulting text position is outside the usable NPC space [0,1]x[0,1]x[0,1], then the graPHIGS API may clip part or all of the string.

The graPHIGS API positions and renders the text string in the local coordinate system according to the annotation text attributes in the traversal state list. If the graPHIGS API clips the specified reference point to NPC during structure traversal, then no representation for this primitive is displayed. If the graPHIGS API does not clip the reference point, then the graPHIGS API clips the displayed representation according to the rules for the corresponding primitive type (e.g., text, polyline, etc.).

The graPHIGS API treats control characters in a character string as undefined characters and displays the default for the character set. This default for the character set is the default character in the graPHIGS API character set file. For U.S. English, this is the hyphen character (*EBCDIC X'60'*, *ASCII X'2D'*).

If the annotation style attribute entry in the PHIGS traversal state list is set to *LEAD LINE*, then after transformation the graPHIGS API draws a single line segment from the specified reference point to the origin of the local text coordinate system using the polyline attributes in the PHIGS traversal state list.

Language Bindings

C

panno_text_rel(*ref_pt, offset, char_string*)

Input Parameters

const Ppoint *ref_pt
Reference point in MC.

const Pvec *offset
Annotation offset in NPC. Determines the position of the annotation character string.

const char *char_string
Annotation character string to be displayed.

FORTRAN

PATR(*rpx*, *rpy*, *apx*, *apy*, *chars*)

Input Parameters

real rpx
x coordinate of the reference location, in MC, that is to be annotated.

real rpy
y coordinate of the reference location, in MC, that is to be annotated.

real apx
x component of the annotation offset in NPC. Determines the position of the annotation character string (*x* component).

real apy
y component of the annotation offset in NPC. Determines the position of the annotation character string (*y* component).

character(*) chars*
Annotation character string to be displayed.

FORTRAN Subset

PATRS(*rpx*, *rpy*, *apx*, *apy*, *lstr*, *chars*)

Input Parameters

real rpx
x coordinate of the reference location, in MC, that is to be annotated.

real rpy
y coordinate of the reference location, in MC, that is to be annotated.

real apx
*x*component of the annotation offset in NPC. Determines the position of the annotation character string (*x*component).

real apy
*y*component of the annotation offset in NPC. Determines the position of the annotation character string (*y*component).

integer lstr
Length of string in characters.

*character*80 chars*
Annotation character string to be displayed.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Set Annotation Style

ANNOTATION TEXT RELATIVE 3 (PHOP,*,STOP,*)

Purpose

Use Annotation Text Relative 3 to insert an Annotation Text Relative 3 structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with an Annotation Text Relative 3 structure element, depending on the current edit mode.

During structure traversal, this element annotates the specified reference point according to the annotation style in the traversal state list. The specified annotation offset determines the position of the annotation string. The annotation string defines the origin of a local text coordinate system relative to the specified reference point after transformation to Normalized Projection Coordinates (NPC). The text plane is always parallel to the *x*., *y* plane in NPC. If the resulting text position is outside the usable NPC space [0,1]x[0,1]x[0,1], then the graPHIGS API may clip part or all of the string.

The graPHIGS API positions and renders the text string in the local coordinate system according to the annotation text attributes in the traversal state list. If the graPHIGS API clips the specified reference point to NPC during structure traversal, then no representation for this primitive is displayed. If the graPHIGS API does not clip the specified reference point, then the graPHIGS API clips the displayed representation according to the rules for the corresponding primitive type (e.g., text, polyline, etc.).

The graPHIGS API treats control characters in a character string as undefined characters and displays the default for the character set. This default for the character set is the default character in the graPHIGS API character set file. For U.S. English, this is the hyphen character (*EBCDIC X'60'*, *ASCII X'2D'*).

If the annotation style attribute entry in the PHIGS traversal state list is set to *LEAD LINE*, then after transformation the graPHIGS API draws a single line segment from the specified reference point to the origin of the local text coordinate system using the polyline attributes in the PHIGS traversal state list.

Language Bindings

C

panno_text_rel3(*ref_pt, offset, char_string*)

Input Parameters

const Ppoint3 *ref_pt
Reference point in MC.

const Pvec3 *offset
Annotation offset in NPC. Determines the position of the annotation character string.

const char *char_string
Annotation character string to be displayed.

FORTRAN

PATR3(*rpx*, *rpy*, *rpz*, *apx*, *apy*, *apz*, *chars*)

Input Parameters

real rpx
x coordinate of the reference location, in MC, that is to be annotated.

real rpy
y coordinate of the reference location, in MC, that is to be annotated.

real rpz
z coordinate of the reference location, in MC, that is to be annotated.

real apx
*x*component of the annotation offset in NPC. Determines the position of the annotation character string (*x*component).

real apy
*y*component of the annotation offset in NPC. Determines the position of the annotation character string (*y*component).

real apz
z component of the annotation offset in NPC. Determines the position of the annotation character string (*z* component).

character(*) chars*
Annotation character string to be displayed.

FORTRAN Subset

PATR3S(*rpx*, *rpy*, *rpz*, *apx*, *apy*, *apz*, *lstr*, *chars*)

Input Parameters

real rpx
x coordinate of the reference location, in MC, that is to be annotated.

real rpy
y coordinate of the reference location, in MC, that is to be annotated.

real rpz
z coordinate of the reference location, in MC, that is to be annotated.

real apx
*x*component of the annotation offset in NPC. Determines the position of the annotation character string (*x*component).

real apy
*y*component of the annotation offset in NPC. Determines the position of the annotation character string (*y*component).

real apz
z component of the annotation offset in NPC. Determines the position of the annotation character string (*z* component).

integer lstr
Length of string in characters.

*character*80 chars*
Annotation character string to be displayed.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Set Annotation Style

CELL ARRAY (PHOP,*,STOP,*)

Purpose

Use Cell Array to create a two-dimensional (*x*, *y*) cell array primitive with the *z* coordinate assumed to be zero, and insert it into the open structure following the element pointer or replace the element pointed at by the element pointer with a Cell Array structure element, depending on the current edit mode.

This structure element defines a two-dimensional array of cells with individual colors. The primitive is defined by two points, *P* and *Q*, which define a rectangle aligned with the modeling coordinate axes. This rectangle is conceptually divided into a grid of *DX* by *DY* cells. Each cell has a width of |*PX*-*QX*|/*DX*, and a height of |*PY*-*QY*|/*DY*, where (*PX*,*PY*) are the coordinates of the corner point *P*, and (*QX*,*QY*) are the coordinates of the corner point *Q*. The color of each cell is specified by the index of the corresponding element of the color index array. The color indexes are mapped into the two-dimensional cell array on a row-wise basis starting at corner (*PX*,*PY*) and proceeding to corner *Q* and so on. If an index is not present in the color table on a workstation, then the graPHIGS API uses an index value of 1 on that workstation.

When the graPHIGS API encounters an element of this type, it does a minimal simulation by drawing the transformed boundaries of the cell rectangle using polyline color, a line width value of 1, and a line type of *SOLID*.

Language Bindings

C

pcell_array (*rect, colr_array*)

Input Parameters

*const Prect *rect*
: Cell rectangle in MC.

*const Ppat_rep *colr_array*
: Color array.

FORTRAN

PCA (*px*, *py*, *qx*, *qy*, *dimx*, *dimy*, *isc*, *isr*, *dx*, *dy*, *colia*)

Input Parameters

real px
: *x* coordinate of the point *P* in MC.

real py
: *y* coordinate of the point *P* in MC.

real qx
: *x* coordinate of the point *Q* in MC.

real qy
: *y* coordinate of the point *Q* in MC.

integer dimx
: *x* dimension of *COLIA* which contains the cell array.

integer dimy
: *y* dimension of *COLIA* which contains the cell array.

integer isc
: Index of the start column of the cell array within *COLIA*.

integer isr
: Index of the start row of the cell array within *COLIA*.

integer dx
Number of cell array columns.

integer dy
Number of cell array rows.

integer colia(dimx,dimy)
Color index array containing the cell array.

Errors

5 Function Requires State (PHOP,*,STOP,*)

117 One Dimension Of Color Index Array < Zero

113 Color Index Value < ZERO

Related Subroutines

- Set Polyline Color Index

CELL ARRAY 3 (PHOP,*,STOP,*)

Purpose

Use Cell Array 3 to create a three-dimensional cell array primitive, and insert it into the open structure following the element pointer or replace the element pointed at by the element pointer with a Cell Array 3 structure element, depending on the current edit mode.

This structure element defines a two-dimensional array of cells with individual colors. The plane in which the Cell Array 3 primitive lies is defined by three points, *P*, *Q*, and *R*, given in modeling coordinates (MC). A parallelogram is defined by the points *P*, *Q*, and *R*, and (*QX*+*RX*-*PX*, *QY*+*RY*-*PY*, *QZ*+*RZ*-*PZ*). This parallelogram is conceptually divided into a grid of *DX* by *DY* cells, where *DX* and *DY* are the dimensions of the color index array. The color of each cell is specified by the index of the corresponding element of the color index array. The color indexes are mapped from the two-dimensional cell array on a row-wise basis starting at corner *P* and proceeding to corner *Q* and so on. If an index is not present in the color table on a workstation, then the graPHIGS API uses an index value of 1 on that workstation.

When the graPHIGS API encounters an element of this type, it does a minimal simulation by drawing the transformed boundaries of the cell parallelogram using polyline color, a line width value of 1, and a line type of *SOLID*.

Language Bindings

C

pcell_array3 (*paral, colr_array*)

Input Parameters

*const Pparal *paral*
Cell parallelogram in MC.

*const Ppat_rep *colr_array*
Color array.

FORTRAN

PCA3 (*cpxa*, *cpya*, *cpza*, *dimx*, *dimy*, *isc*, *isr*, *dx*, *dy*, *colia*)

Input Parameters

real cpxa(3)
x coordinates of the points *P*, *Q*, and *R* in MC.

real cpya(3)
y coordinates of the points *P*, *Q*, and *R*, in MC.

real cpza(3)
z coordinates of the points *P*, *Q*, and *R* in MC.

integer dimx
*x*dimension of *COLIA* which contains the cell array.

integer dimy
*y*dimension of *COLIA* which contains the cell array.

integer isc
Index of the start column of the cell array within *COLIA*.

integer isr
Index of the start row of the cell array within *COLIA*.

integer dx
Number of cell array columns.

integer dy
Number of cell array rows.

integer colia(dimx,dimy)
Color index array containing the cell array.

Errors

5 Function Requires State (PHOP,*,STOP,*)

117 One Dimension Of Color Index Array < Zero

113 Color Index Value < ZERO

Related Subroutines

- Set Polyline Color Index

FILL AREA (PHOP,*,STOP,*)

Purpose

Use Fill Area to specify a two-dimensional fill area primitive with the *z* coordinate assumed to be zero, and insert it into the open structure following the element pointer or replace the element pointed at by the element pointer with a Fill Area structure element, depending on the current edit mode.

This structure element defines the boundary of a contour which may be hollow or filled with a uniform color, a pattern, or a hatch style. The graPHIGS API displays the boundary of the primitive without an edge.

The graPHIGS API places all points specified in the *x-y* plane. The graPHIGS API applies interior attributes to this primitive.

Language Bindings

C

pfill_area (*point_list*)

Input Parameters

*const Ppoint_list *point_list*
List of points in MC.

FORTRAN

PFA (*n*, *pxa*, *pya*)

Input Parameters

integer n
Number of points.

real pxa(n)
x coordinates of points in MC.

real pya(n)
y coordinates of points in MC.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Set Interior Style
- Set Interior Style Index
- Set Interior Representation
- Set Interior Index
- Set Interior Color Index

FILL AREA 3 (PHOP,*,STOP,*)

Purpose

Use Fill Area 3 to specify a three-dimensional fill area 3 primitive element and insert it into the open structure following the element pointer or replace the element pointed at by the element pointer with a Fill Area 3 structure element, depending on the current edit mode.

This structure element defines the boundary of a contour which may be hollow or filled with a uniform color, a pattern, or a hatch style. The graPHIGS API displays the boundary of the primitive without an edge.

All points specified must lie in the same plane, but the graPHIGS API does not check to verify this. The system behavior is undefined when the points are not coplanar.

The graPHIGS API applies interior attributes to this primitive.

Language Bindings

C

pfill_area3 (*point_list*)

Input Parameters

*const Ppoint_list3 *point_list*
List of points in MC.

FORTRAN

PFA3 (*n*, *pxa*, *pya*, *pza*)

Input Parameters

integer n
Number of points.

real pxa (n)
x coordinates of points in MC.

real pya (n)
y coordinates of points in MC.

real pza (n)
z coordinates of points in MC.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Set Interior Style
- Set Interior Style Index
- Set Interior Representation
- Set Interior Index
- Set Interior Color Index

FILL AREA SET (PHOP,*,STOP,*)

Purpose

Use Fill Area Set to specify a two-dimensional fill area set primitive with the *z* coordinate assumed to be zero, and insert it into the open structure following the element pointer or replace the element pointed at by the element pointer with a Fill Area Set structure element, depending on the current edit mode.

This structure element defines the boundary of contours which may be hollow or filled with a uniform color, a pattern, or a hatch style. Each list of points defines a subarea and each subarea is implicitly closed. The graPHIGS API displays the boundary of the primitive with an edge.

The graPHIGS API places all points specified in the *x-y* plane. The graPHIGS API applies interior and edge attributes to this primitive.

Language Bindings

C

pfill_area_set (*point_list*)

Input Parameters

*const Ppoint_list_list *point_list_list*
List of point lists in MC.

FORTRAN

PFAS (*npl*, *ixa*, *pxa*, *pya*,)

Input Parameters

integer npl
Number of point lists.

integer ixa(npl)
Array of end indexes for the point lists.

real pxa (*)
x coordinates of points in MC.

real pya (*)
y coordinates of points in MC.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Set Interior Style
- Set Interior Style Index
- Set Interior Representation
- Set Interior Index
- Set Interior Color Index
- Set Edgewidth Scale Factor
- Set Edgetype
- Set Edge Color Index
- Set Edge Index

FILL AREA SET 3 (PHOP,*,STOP,*)

Purpose

Use Fill Area Set 3 to specify a three-dimensional fill area set primitive element and insert it into the open structure following the element pointer or replace the element pointed at by the element pointer with a Fill Area Set 3 structure element, depending on the current edit mode.

This structure element defines the boundary of contours which may be hollow or filled with a uniform color, a pattern, or a hatch style. Each list of points defines a subarea and each subarea is implicitly closed. The graPHIGS API displays the boundary of the primitive with an edge.

All points specified must lie in the same plane, but the graPHIGS API does not check to verify this. The system behavior is undefined when the points are not coplanar.

The graPHIGS API applies interior and edge attributes to this primitive.

Language Bindings

C

pfill_area_set3 (*point_list_list*)

Input Parameters

*const Ppoint_list_list3 *point_list_list*
List of point lists in MC.

FORTRAN

PFAS3 (*npl*, *ixa*, *pxa*, *pya*, *pza*)

Input Parameters

integer npl
Number of point lists.

integer ixa(npl)
Array of end indexes for the point lists.

real pxa (*)
x coordinates of points in MC.

real pya (*)
y coordinates of points in MC.

real pza (*)
z coordinates of points in MC.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Set Interior Style
- Set Interior Style Index
- Set Interior Representation
- Set Interior Index
- Set Interior Color Index
- Set Edgewidth Scale Factor
- Set Edgetype
- Set Edge Color Index
- Set Edge Index

GENERALIZED DRAWING PRIMITIVE (PHOP,*,STOP,*)

Purpose

Use Generalized Drawing Primitive to specify a two-dimensional generalized drawing primitive (GDP) element and insert it into the open structure following the element pointer or replace the element pointed at by the element pointer with a Generalized Drawing Primitive structure element, depending on the current edit mode.

There are no GDP identifiers currently defined by the graPHIGS API. Therefore, when the graPHIGS API encounters this type of element, it does not display the primitive nor does it generate an error. However, GDPs are available through the GP*xxxx* subroutines. See *The graPHIGS Programming Interface: Subroutine Reference* for details.

Language Bindings

C

pgdp (*point_list, gdp_id, gdp_data*)

Input Parameters

*const Ppoint_list *point_list*
List of points.

Pint gdp_id
GDP identifier.

*const Pgdp_data *gdp_data*
GDP data record.

FORTRAN

PGDP (*n*, *pxa*, *pya*, *primid*, *ldr*, *datrec*)

Input Parameters

integer n
Number of points (>=0).

real pxa (*)
x coordinates of points in MC.

real pya (*)
y coordinates of points in MC.

integer primid
GDP identifier.

integer ldr
Dimension of the GDP data record array.

*character*80 datrec(ldr)*
GDP data record.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- None

GENERALIZED DRAWING PRIMITIVE 3 (PHOP,*,STOP,*)

Purpose

Use Generalized Drawing Primitive 3 to specify a three-dimensional generalized drawing primitive (GDP 3) element and insert it into the open structure following the element pointer or replace the element pointed at by the element pointer with a Generalized Drawing Primitive 3 structure element, depending on the current edit mode.

There are no GDP 3 identifiers currently defined by the graPHIGS API. Therefore, when the graPHIGS API encounters this type of element, it does not display the primitive nor does it generate an error. However, GDPs are available through the GP*xxxx* subroutines. See *The graPHIGS Programming Interface: Subroutine Reference* for details.

Language Bindings

C

pgdp3 (*point_list, gdp3_id, gdp_data*)

Input Parameters

*const Ppoint_list3 *point_list*
List of points.

Pint gdp3_id
GDP 3 identifier.

*const Pgdp_data3 *gdp_data*
GDP 3 data record.

FORTRAN

PGDP3 (*n*, *pxa*, *pya*, *pza*, *primid*, *ldr*, *datrec*)

Input Parameters

integer n
Number of points (>=0).

real pxa (*)
x coordinates of points in MC.

real pya (*)
y coordinates of points in MC.

real pza (*)
z coordinates of points in MC.

integer primid
GDP 3 identifier.

integer ldr
Dimension of the GDP 3 data record array.

*character*80 datrec(ldr)*
GDP 3 data record.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- None

POLYLINE (PHOP,*,STOP,*)

Purpose

Use Polyline to create a two-dimensional polyline element and insert it into the open structure following the element pointer or replace the element pointed at by the element pointer with a Polyline structure element, depending on the current edit mode.

This structure element defines a list of two-dimensional points (*x*, *y*) (the *z* coordinate is assumed to be zero) that the graPHIGS API is to connect by straight lines starting with the first point and ending with the last point.

If the application specifies one or less points, then no output is generated. If two contiguous points are the same point, then the graPHIGS API generates a point of one pixel in size.

The graPHIGS API applies polyline attributes to this primitive.

Language Bindings

C

ppolyline (*point_list*)

Input Parameters

*const Ppoint_list *point_list*
List of points in MC.

FORTRAN

PPL (*n*, *pxa*, *pya*)

Input Parameters

integer n
Number of points (>=0).

real pxa (n)
x coordinates of points in MC.

real pya (n)
y coordinates of points in MC.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Set Linetype
- Set Linewidth Scale Factor
- Set Polyline Index

POLYLINE 3 (PHOP,*,STOP,*)

Purpose

Use Polyline 3 to create a three-dimensional polyline element and insert it into the open structure following the element pointer or replace the element pointed at by the element pointer with a Polyline 3 structure element, depending on the current edit mode.

This structure element defines a list of three-dimensional points (*x*, *y*, *z*) that the graPHIGS API is to connect by straight lines starting with the first point and ending with the last point.

If the application specifies one or less points, then no output is generated. If two contiguous points are the same point, then the graPHIGS API generates a point of one pixel in size.

The graPHIGS API applies polyline attributes to this primitive.

Language Bindings

C

ppolyline3 (*point_list*)

Input Parameters

*const Ppoint_list3 *point_list*
List of points in MC.

FORTRAN

PPL3 (*n*, *pxa*, *pya*, *pza*)

Input Parameters

integer n
Number of points (>=0).

real pxa (n)
x coordinates of points in MC.

real pya (n)
y coordinates of points in MC.

real pza (n)
z coordinates of points in MC.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Set Linetype
- Set Linewidth Scale Factor
- Set Polyline Color Index
- Set Polyline Index

POLYMARKER (PHOP,*,STOP,*)

Purpose

Use Polymarker to create a two-dimensional polymarker element and insert it into the open structure following the element pointer or replace the element pointed at by the element pointer with a Polymarker structure element, depending on the current edit mode.

This structure element defines a list of two-dimensional points (*x*, *y*) that the graPHIGS API identifies by markers and renders in Device Coordinate (DC) space parallel to the display surface.

If the primitive does not specify any points, then it is ignored.

The graPHIGS API applies polymarker attributes to this primitive.

Language Bindings

C

ppolymarker (*point_list*)

Input Parameters

*const Ppoint_list *point_list*
List of points in MC.

FORTRAN

PPM (*n*, *pxa*, *pya*)

Input Parameters

integer n
Number of points (>=0).

real pxa (n)
x coordinate of points in MC.

real pya (n)
y coordinates of points in MC.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Set Marker Type
- Set Marker Size Scale Factor
- Set Polymarker Color Index
- Set Polymarker Index

POLYMARKER 3 (PHOP,*,STOP,*)

Purpose

Use Polymarker 3 to create a three-dimensional polymarker element and insert it into the open structure following the element pointer or replace the element pointed at by the element pointer with a Polymarker 3 structure element, depending on the current edit mode.

This structure element defines a list of three-dimensional points (*x*, *y*, *z*) that the graPHIGS API identifies by markers and renders in Device Coordinate (DC) space parallel to the display surface.

If the primitive does not specify any points, then it is ignored.

The graPHIGS API applies polymarker attributes to this primitive.

Language Bindings

C

ppolymarker3 (*point_list*)

Input Parameters

*const Ppoint_list3 *point_list*
List of points in MC.

FORTRAN

PPM3 (*n*, *pxa*, *pya*, *pza*)

Input Parameters

integer n
Number of points (>=0).

real pxa (n)
x coordinates of points in MC.

real pya (n)
y coordinates of points in MC.

real pza (n)
z coordinates of points in MC.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Set Marker Type
- Set Marker Size Scale Factor
- Set Polymarker Color Index
- Set Polymarker Index

TEXT (PHOP,*,STOP,*)

Purpose

Use Text to insert a two-dimensional, geometric text element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Text structure element, depending on the current edit mode.

This structure element specifies a string of geometric text that the graPHIGS API draws at the specified location in the *x*, *y* plane.

The graPHIGS API treats control characters in a character string as undefined characters and displays the default for the character set. This default for the character set is the default character in the graPHIGS API character set file. For U.S. English, this is the hyphen character (EBCDIC X'*60*', ASCII X'*2D*').

Language Bindings

C

ptext (*text_pos, char_string*)

Input Parameters

*const Ppoint *text_pos*
Text position in MC.

*const char *char_string*
Character string.

FORTRAN

PTX (*px*, *py*, *chars*)

Input Parameters

real px
x coordinate of text position in MC.

real py
y coordinate of text position in MC.

character(*) chars*
Text to be displayed.

FORTRAN Subset

PTXS (*px*, *py*, *lstr*, *chars*)

Input Parameters

real px
x coordinate of text position in MC.

real py
y coordinate of text position in MC.

integer lstr
Length of text string in bytes (>=0).

*character*80 chars*
Text to be displayed.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Inquire Text Facilities
- Set Character Expansion Factor
- Set Character Height
- Set Character Spacing
- Set Character Up Vector
- Set Text Alignment
- Set Text Color Index
- Set Text Font
- Set Text Index
- Set Text Path
- Set Text Precision

TEXT 3 (PHOP,*,STOP,*)

Purpose

Use Text 3 to insert a three-dimensional, geometric text element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Text 3 structure element, depending on the current edit mode.

This structure element specifies a string of geometric text that the graPHIGS API draws on the plane defined by the specified text position and reference vectors.

Two vector definitions orient a local coordinate system, within which the text is positioned. The two reference vectors and the text position define the plane in which the text is drawn. The first vector defines the *x*axis of the local coordinate system. The second reference vector defines the half plane of the text in which the positive *y*axis lies. The directions specified by Character Up Vector and Text Path attributes are relative to this coordinate system.

If the direction vectors fail to define a local coordinate system (i.e., one of the vectors is zero in length or the vectors are parallel), then the graPHIGS API stores the values (1,0,0) and (0,1,0) in the element.

The graPHIGS API treats control characters in a character string as undefined characters and displays the default for the character set. This default for the character set is the default character in the graPHIGS API character set file. For U.S. English, this is the hyphen character (EBCDIC X'*60*', ASCII X'*2D*').

Language Bindings

C

ptext3 (*text_pos, text_dir, char_string*)

Input Parameters

*const Ppoint3 *text_pos*
Text position in MC.

const Pvec3 text_dir[2]
Text direction vectors in MC.

*const char *char_string*
Character string to be displayed.

FORTRAN

PTX3 (*px*, *py*, *pz*, *tdx*, *tdy*, *tdz*, *chars*)

Input Parameters

real px
x coordinate of text position in MC.

real py
y coordinate of text position in MC.

real pz
z coordinate of text position in MC.

real tdx(2)
x coordinates of the text direction vectors in MC.

real tdy(2)
y coordinates of the text direction vectors in MC.

real tdz(2)
z coordinates of the text direction vectors in MC.

character(*) chars*
Character string to be displayed.

FORTRAN Subset

PTX3S (*px*, *py*, *pztdx*, *tdy*, *tdz*, *lstr*, *chars*)

Input Parameters

real px
x coordinate of text position in MC.

real py
y coordinate of text position in MC.

real pz
z coordinate of text position in MC.

real tdx(2)
x coordinates of the text direction vectors in MC.

real tdy(2)
y coordinates of the text direction vectors in MC.

real tdz(2)
z coordinates of the text direction vectors in MC.

integer lstr
Length of text string in bytes (>=0).

*character*80 chars*
Character string to be displayed.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Inquire Text Facilities

- Set Character Expansion Factor
- Set Character Height
- Set Character Spacing
- Set Character Up Vector
- Set Text Alignment
- Set Text Color Index
- Set Text Font
- Set Text Index
- Set Text Path
- Set Text Precision

Chapter 4. Attribute Specification

Attribute values describe the appearance of output primitives, including size, shape, style, and color.

This group of subroutines creates structure elements and requires that the structure state is Structure Open (STOP). When the graPHIGS API encounters the elements in this section at structure traversal time, it modifies the current traversal time registers.

Your application can specify some attribute values directly through a structure element or indirectly by using an index to a bundle table in the Workstation State List (WSL). During structure traversal, the current Attribute Source Flag (ASF) setting determines whether the graPHIGS API draws a primitive using an individual or bundled value of an attribute. For a complete discussion of attributes, see *The graPHIGS Programming Interface: Understanding Concepts*.

For attribute values supported on a specific workstation, use the appropriate Inquiry programming subroutines or see *The graPHIGS Programming Interface: Technical Reference*.

ADD NAMES TO SET (PHOP,*,STOP,*)

Purpose

Use Add Names to Set to insert an Add Names to Set structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with an Add Names to Set structure element, depending on the current edit mode.

During structure traversal, this structure element adds the specified class names to the current class set. The traversal default is a null name set.

Class names let an application control the eligibility of a primitive for pickability (detectability), highlighting, and invisibility by associating the primitive with a class set.

When the graPHIGS API encounters a primitive during structure traversal, the primitive belongs to the classes contained in the current class set. If the workstation does not support a specified name, then the graPHIGS API ignores the name and the name has no affect on the primitive.

Also use names to create inclusion and exclusion filters for the specified workstation. The graPHIGS API uses these filters in conjunction with the class set traversal state to determine whether pickability, highlighting, and visibility apply. The filters act independently of each other. During structure traversal, the graPHIGS API compares the current class set to the current filters.

For a complete discussion of class names and filters, see *The graPHIGS Programming Interface: Understanding Concepts*.

Language Bindings

C

padd_names_set(*names*)

Input Parameters

const Pint_list *names
Name set to be added.

FORTRAN

PADS(*n*, *namset*)

Input Parameters

integer n
Number of names in the set.

integer namset(n)
Name set to be added.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Inquire PHIGS Facilities
- Remove Names From Set
- Set Highlighting Filter
- Set Invisibility Filter
- Set Pick Filter

REMOVE NAMES FROM SET (PHOP,*,STOP,*)

Purpose

Use Remove Names from Set to insert a Remove Names from Set structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Remove Names from Set structure element, depending on the current edit mode.

The class set traversal state consists of a list of class names. During structure traversal, this structure element removes one or more names from the list but does not completely replace the traversal state as other attributes do.

Class names let an application control the eligibility of a primitive for pickability (detectability), highlighting, and invisibility by associating the primitive with a class set. The child structures inherit the effects of adding a class name to or removing a class name from the current class set.

When the graPHIGS API encounters a primitive during structure traversal, it uses the list of class names in the class set to determine the pickability (detectability), highlighting, and invisibility aspects. If the workstation does not support a specified name, then the graPHIGS API ignores the name and the name has no effect on the primitive.

Also use class names to create inclusion and exclusion filters for the specified workstation. The graPHIGS API uses these filters in conjunction with the class set traversal state to determine whether pickability, highlighting, and visibility apply. The filters act independently of each other. During structure traversal, the graPHIGS API compares the current class set to the current filters. When root structure traversal begins, the current class set is null.

For a complete discussion of class names and filters, see *The graPHIGS Programming Interface: Understanding Concepts*.

Language Bindings

C

premove_names_set (*names*)

Input Parameters

*const Pint_list *names*
Name set to be removed.

FORTRAN

PRES (*n*, *namset*)

Input Parameters

integer n
Number of names in the set.

integer namset(n)
Name set to be removed.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Add Names To Set
- Inquire PHIGS Facilities

SET ANNOTATION STYLE (PHOP,*,STOP,*)

Purpose

Use Set Annotation Style to insert a Set Annotation Style structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Annotation Style structure element, depending on the current edit mode.

During structure traversal, this structure element sets the current annotation style entry in the graPHIGS traversal state list to the value specified by the annotation style parameter to render subsequent annotation text primitives. For annotation style *LEAD LINE*, the graPHIGS API uses the current polyline attributes to render the lead line.

The traversal default for annotation style is *UNCONNECTED*.

If the workstation does not support the specified annotation style or the specified style is outside the allowable range, then the annotation style defaults to *UNCONNECTED*.

Language Bindings

C

pset_anno_style (*anno_style*)

Input Parameters

Pint anno_style
Annotation style (*1=PANNO_STYLE_UNCONNECTED, 2=PANNO_STYLE_LEAD_LINE*).

FORTRAN

PSANS (*astyle*)

Input Parameters

integer astyle
Annotation style (*1=PUNCON, 2=PLDLN*).

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Annotation Text Relative
- Annotation Text Relative 3
- Inquire Annotation Facilities

SET ANNOTATION TEXT ALIGNMENT (PHOP,*,STOP,*)

Purpose

Use Set Annotation Text Alignment to insert a Set Annotation Text Alignment structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Annotation Text Alignment structure element, depending on the current edit mode.

At structure traversal time, this structure element specifies the alignment the graPHIGS API uses to render all subsequent annotation text primitives.

The alignment values affect the manner in which the graPHIGS API positions the annotation text extent rectangle in relation to the text position.

The traversal default for annotation alignment is *NORMAL* for both horizontal and vertical alignment.

For more information concerning annotation text and annotation text attributes, see *The graPHIGS Programming Interface: Understanding Concepts*.

Language Bindings

C

pset_anno_align (*text_align*)

Input Parameters

*const Ptext_align *text_align*
Annotation text alignment.

FORTRAN

PSATAL (*atalh*, *atalv*,)

Input Parameters

integer atalh
Horizontal annotation text alignment (*0=PAHNOR, 1=PALEFT, 2=PACENT, 3=PARITE*).

integer atalv
Vertical annotation text alignment (*0=PAVNOR, 1=PATOP, 2=PACAP, 3=PAHALF, 4=PABASE, 5=PABOTT*).

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Set Text Precision

SET ANNOTATION TEXT CHARACTER HEIGHT (PHOP,*,STOP,*)

Purpose

Use Set Annotation Text Character Height to insert a Set Annotation Text Character Height structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Annotation Text Character Height structure element, depending on the current edit mode.

The application specifies the annotation text character height with respect to the annotation text local coordinate system; that is a two-dimensional coordinate system parallel to the NPC (Normalized Projection Coordinates) *x-y* plane. The graPHIGS API multiplies the absolute value of the specified height by the scale factor of the current workstation transformation and then maps the result to the closest available height on the workstation.

The traversal default value for annotation text character height is 0.01.

For more information concerning annotation text and annotation text attributes, see *The graPHIGS Programming Interface: Understanding Concepts*.

Language Bindings

C

pset_anno_char_ht (*char_ht*)

Input Parameters

Pfloat char_ht
Annotation text character height.

FORTRAN

PSATCH (*atchh*)

Input Parameters

real atchh
Annotation text character height.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Inquire Annotation Facilities

SET ANNOTATION TEXT CHARACTER UP VECTOR (PHOP,*,STOP,*)

Purpose

Use Set Annotation Text Character Up Vector to insert a Set Annotation Text Character Up Vector structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Annotation Text Character Up Vector structure element, depending on the current edit mode.

At structure traversal time, this structure element specifies the y-axis direction of the text coordinate system for characters in a text string that the graPHIGS API uses to render all subsequent annotation text primitives. When rendering annotation text primitives, the graPHIGS API uses the annotation up vector along with a default annotation base vector set at right angles in the clockwise direction to the annotation up vector.

The traversal default value for annotation up vector is 0.0, 1.0 and for annotation base vector the traversal default value is 1.0, 0.0.

If the annotation up vector is invalid, then the vector value defaults to a value of 0.0, 1.0, and a base vector value of 1.0, 0.0.

The graPHIGS API normalizes the specified vector. If the application later inquires the content of this structure element, then the graPHIGS API returns the normalized vector, *not* the original vector specified by this subroutine.

For more information concerning annotation text and annotation text attributes, see *The graPHIGS Programming Interface: Understanding Concepts*.

Language Bindings

C

pset_anno_char_up_vec (*char_up_vec*)

Input Parameters

*const Pvec *char_up_vec*
Annotation text character up vector.

FORTRAN

PSATCU (*atchux*, *atchuy*)

Input Parameters

real atchux
x offset of the annotation text character up vector.

real atchuy
y offset of the annotation text character up vector.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Set Text Precision

SET ANNOTATION TEXT PATH (PHOP,*,STOP,*)

Purpose

Use Set Annotation Text Path to insert a Set Annotation Text Path structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Annotation Text Path structure element, depending on the current edit mode.

This structure element specifies the writing direction of characters in a text string relative to the Annotation Up Vector. At structure traversal time, the graPHIGS API uses this path value to render all subsequent annotation text primitives.

The traversal default for annotation path is *RIGHT*.

If the workstation does not support the specified path value or the specified value is outside the allowable range, then the annotation path value defaults to *RIGHT*.

For more information concerning annotation text and annotation text attributes, see *The graPHIGS Programming Interface: Understanding Concepts*.

Language Bindings

C

pset_anno_path (*text_path*)

Input Parameters

Ptext_path text_path
Annotation text path (*0=PPATH_RIGHT, 1=PPATH_LEFT, 2=PPATH_UP, 3=PPATH_DOWN*).

FORTRAN

PSATP (*atp*)

Input Parameters

integer atp
Annotation text path (*0=PRIGHT, 1=PLEFT, 2=PUP, 3=PDOWN*).

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Set Text Precision

SET CHARACTER EXPANSION FACTOR (PHOP,*,STOP,*)

Purpose

Use Set Character Expansion Factor to insert a Set Character Expansion Factor structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Character Expansion Factor structure element, depending on the current edit mode.

At structure traversal time, this structure element specifies the character expansion factor that the graPHIGS API uses to render all subsequent text primitives when the character expansion aspect source flag value is set to *INDIVIDUAL* (SET INDIVIDUAL ASF (PHOP,*,STOP,*)).

The value is a fraction of the width/height ratio that the font designer specified. A value of 1.0 reproduces the font designer's width/height ratio.

The traversal default value for character expansion factor is 1.0.

When the graPHIGS API encounters an element of this type, it uses the absolute value of the specified character expansion factor. If the workstation does not support a continuous range of character expansion factors, then the graPHIGS API uses the closest supported value.

Language Bindings

C

pset_char_expan (*char_expan*)

Input Parameters

Pfloat char_expan
Character expansion factor.

FORTRAN

PSCHXP (*chxp*)

Input Parameters

real chxp
Character expansion factor.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Inquire Annotation Facilities
- Inquire Predefined Text Representation
- Inquire Text Facilities
- Set Individual ASF
- Set Text Precision

SET CHARACTER HEIGHT (PHOP,*,STOP,*)

Purpose

Use Set Character Height to insert a Set Character Height structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Character Height structure element, depending on the current edit mode.

This structure element specifies the character height in Modeling Coordinate (MC) space that the graPHIGS API uses when rendering subsequent geometric text primitives.

The traversal default value for character height is 0.01.

When the graPHIGS API encounters an element of this type, it uses the absolute value of the specified character height. If the workstation does not support a continuous range of character heights, then the graPHIGS API uses the closest supported value.

Language Bindings

C

pset_char_ht (*char_ht*)

Input Parameters

Pfloat char_ht
Character height.

FORTRAN

PSCHH (*chh*)

Input Parameters

real chh
Character height.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Inquire Text Facilities

SET CHARACTER SPACING (PHOP,*,STOP,*)

Purpose

Use Set Character Spacing to insert a Set Character Spacing structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Character Spacing structure element, depending on the current edit mode.

At structure traversal time, this structure element specifies the additional amount of space that the graPHIGS API inserts between characters to render all subsequent text primitives when the character spacing aspect source flag value is set to *INDIVIDUAL* (Set Individual ASF).

This value is expressed as a fraction of the height.

The traversal default value for character spacing is 0.0.

Language Bindings

C

pset_char_space (*char_space*)

Input Parameters

Pfloat char_space
Character spacing.

FORTRAN

PSCHSP (*chsp*)

Input Parameters

real chsp
Character spacing.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Inquire Predefined Text Representation
- Set Individual ASF
- Set Text Precision

SET CHARACTER UP VECTOR (PHOP,*,STOP,*)

Purpose

Use Set Character Up Vector to insert a Set Character Up Vector structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Character Up Vector structure element, depending on the current edit mode.

During structure traversal, this structure element sets the current character up vector in the graPHIGS traversal state list to the specified value. The base vector entry is reset to the vector that is obtained by rotating the up vector 90 degrees clockwise.

The character up vector specifies the direction of the font coordinate y-axis within the text reference coordinate system. The character base vector specifies the direction of the font coordinate x-axis within the text reference coordinate system.

At structure traversal time, this structure element specifies the y-axis direction of the text coordinate system for characters in a text string that the graPHIGS API uses to render all subsequent geometric text primitives. The character up vector is a two-dimensional vector on the text plane specified by the text primitive. When rendering text primitives, the graPHIGS API uses the character up value along with a default annotation base vector set at right angles in the clockwise direction to the character up value.

The traversal default value for character up vector is 0.0, 1.0 and the traversal default value for character base vector is 1.0, 0.0.

If the character up vector is invalid, then the up vector value defaults to 0.0, 1.0 and the base vector value defaults to 1.0, 0.0.

The graPHIGS API normalizes the specified vector. If the application later inquires the content of this structure element, then the graPHIGS API returns the normalized vector, *not* the original vector specified by this subroutine.

Language Bindings

C

pset_char_up_vec (*char_up_vec*)

Input Parameters

*const Pvec *char_up_vec*
Character up vector.

FORTRAN

PSCHUP (*chux*, *chuy*)

Input Parameters

real chux
x offset of character up vector.

real chuy
y offset of character up vector.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Set Text Precision

SET EDGE COLOR INDEX (PHOP,*,STOP,*)

Purpose

Use Set Edge Color Index to insert a Set Edge Color Index structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Edge Color Index structure element, depending on the current edit mode.

This structure element specifies an entry in the workstation's rendering color table that defines the color the graPHIGS API will use to render the edges of all output primitives to which this attribute applies. At structure traversal time, the graPHIGS API uses this index to render the edges of output primitives when the edge color aspect source flag value is set to *INDIVIDUAL* (Set Individual ASF) and the edge flag is set to *ON* (Set Edge Flag).

The traversal default for edge color is a color index value of 1.

If the workstation does not support the specified color index value or the specified index is outside the color table limit, then the color index defaults to a value of 1.

Language Bindings

C

pset_edge_colr_ind (*edge_colr_ind*)

Input Parameters

Pint edge_colr_ind
Edge color index.

FORTRAN

PSEDCI (*coli*)

Input Parameters

integer coli
Edge color index.

Errors

5 Function Requires State (PHOP,*,STOP,*)

113 Color Index Value < ZERO

Related Subroutines

- Inquire Edge Representation
- Inquire Predefined Edge Representation
- Set Individual ASF

SET EDGE FLAG (PHOP,*,STOP,*)

Purpose

Use Set Edge Flag to insert a Set Edge Flag structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Edge Flag structure element, depending on the current edit mode.

This structure element indicates whether or not the graPHIGS API draws the edge of subsequent polygon primitives during structure traversal. The graPHIGS API uses the specified value if the aspect source flag value is set to *INDIVIDUAL* (Set Individual ASF).

The traversal default for edge flag is *OFF*.

If the workstation does not support the specified edge flag value or if the specified value is outside the allowable range, then the edge flag defaults to *OFF*.

Language Bindings

C

pset_edge_flag (*edge_flag*)

Input Parameters

Pedge_flag edge_flag
Edge flag (*0=PEDGE_OFF, 1=PEDGE_ON*).

FORTRAN

PSEDFG (*edflag*)

Input Parameters

integer edflag
Edge flag (*0=POFF, 1=PON*).

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Inquire Edge Facilities
- Inquire Predefined Edge Representation
- Set Individual ASF

SET EDGE INDEX (PHOP,*,STOP,*)

Purpose

Use Set Edge Index to insert a Set Edge Index structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Edge Index structure element, depending on the current edit mode.

This structure element specifies an entry in the workstation's edge bundle table. The entry contains attribute settings for edge flag, edge line type, edge scale factor, and edge color. At structure traversal time, the graPHIGS API uses these attribute settings to render all subsequent fill area set primitives for those attributes which have an aspect source flag value set to *BUNDLED* (Set Individual ASF).

The traversal default value for edge index is 1.

If the workstation does not support the specified index or the specified index is outside the edge table size, then the edge index defaults to a value of 1.

Language Bindings

C

pset_edge_ind (*edge_ind*)

Input Parameters

Pint edge_ind
Edge index (>=1).

FORTRAN

PSEDI (*edi*)

Input Parameters

integer edi
Edge index (>=1).

Errors

5 Function Requires State (PHOP,*,STOP,*)

100 Bundle Index Value Is Less Than One

Related Subroutines

- Inquire Edge Representation
- Inquire Workstation State Table Lengths
- Set edge Representation

SET EDGETYPE (PHOP,*,STOP,*)

Purpose

Use Set Edgetype to insert a Set Edgetype structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Edgetype structure element, depending on the current edit mode.

This structure element specifies an index into a workstation line type table that contains line types. The graPHIGS API uses this index to render the edges of all subsequent output primitives if the corresponding edge flag is set to *ON* (Set Edge Flag). At structure traversal time, the graPHIGS API uses this line type to render the edges of output primitives when the line type of an edge aspect source flag is set to *INDIVIDUAL* (Set Individual ASF). Possible edge line types include: *1=SOLID*, *2=DASHED*, *3=DOTTED*, and *4=DASHED-DOTTED*.

The traversal default for edge type is *SOLID*.

If the workstation does not support the specified index or the specified index is outside the allowable range, then the edge index defaults to *SOLID* (edgetype).

Language Bindings

C

pset_edgetype (*edgetype*)

Input Parameters

Pint edgetype
Edge type (*1=PLINE_SOLID, 2=PLINE_DASH, 3=PLINE_DOT, 4=PLINE_DASH_DOT*).

FORTRAN

PSEDT (*edtype*)

Input Parameters

integer edtype
Edge type (*1=PLSOLI, 2=PLDASH, 3=PLDOT, 4=PLDASD*).

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Inquire Edge Representation
- Inquire Predefined Edge Representation
- Set edge Representation
- Set Individual ASF

SET EDGEWIDTH SCALE FACTOR (PHOP,*,STOP,*)

Purpose

Use Set Edgewidth Scale Factor to insert a Set Edgewidth Scale Factor structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Edgewidth Scale Factor structure element, depending on the current edit mode.

This structure element specifies a value that the graPHIGS API uses to determine how wide to draw the edges of subsequent output primitives to which this attribute applies. At structure traversal time, the graPHIGS API uses this scale factor to determine the width of the edge when the edgewidth scale factor aspect source flag is set to *INDIVIDUAL* (Set Individual ASF).

The edge scale factor element specifies the edge's width as a fraction of the nominal edgewidth. The device support multiplies this scale factor times the nominal width of a line on the corresponding device to determine the requested width. The graPHIGS API maps the calculated value to the closest width available on the device. A scale factor value of 1.0, which is the traversal default, generates a nominal size line on any workstation.

Language Bindings

C

pset_edgewidth (*edgewidth*)

Input Parameters

Pfloat edgewidth
Edgewidth scale factor.

FORTRAN

PSEWSC (*ewidth*)

Input Parameters

real ewidth
Edgewidth scale factor.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Set Edge Flag
- Inquire Edge Representation

- Inquire Predefined Edge Representation
- Set edge Representation
- Set Individual ASF

SET HLHSR IDENTIFIER (PHOP,*,STOP,*)

Purpose

Use Set HLHSR Identifier to insert a Set HLHSR Identifier structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set HLHSR Identifier structure element, depending on the current edit mode. During structure traversal, the graPHIGS API sets the current Hidden Line/Hidden Surface Removal (HLHSR) identifier entry of the graPHIGS traversal state list to the specified parameter.

The application uses this value when creating subsequent output primitives in a view with a HLHSR mode *other than OFF*.

If the workstation does not support the specified HLHSR identifier or the specified identifier is outside the allowable range, then the HLHSR identifier defaults to a value of 0. In a view with HLHSR mode set to *OFF*, this value is ignored and has no affect on the visualization of primitives.

HLHSR processing is often implemented by use of a *z*-buffer and a frame buffer. The following table summarizes the effect of the various HLHSR identifiers on the z- buffer and the frame buffer:

Table 1. HLHSR Processing: Summary of when the frame buffer and the z-buffer are updated.

	z-buffer	**Frame buffer**
0=Visualize if not hidden	$Z_{prim} >= Z_{buf}$	$Z_{prim} >= Z_{buf}$
1=Visualize if hidden	$Z_{prim} < Z_{buf}$	Never
2=Visualize always	Always	Always
3=Not Visualize	Never	$Z_{prim} >= Z_{buf}$
4=Face-dependent Visualization		
Front-facing Areas	$Z_{prim} >= Z_{buf}$	$Z_{prim} >= Z_{buf}$
Back-facing Areas	$Z_{prim} > Z_{buf}$	$Z_{prim} > Z_{buf}$
5=No Update	Never	Never
6=Greater than	$Z_{prim} > Z_{buf}$	$Z_{prim} > Z_{buf}$
7=Equal to	$Z_{prim} = Z_{buf}$	$Z_{prim} = Z_{buf}$
8=Less than	$Z_{prim} < Z_{buf}$	$Z_{prim} < Z_{buf}$
9=Not Equal	$Z_{prim} <> Z_{buf}$	$Z_{prim} <> Z_{buf}$
10=Less than or Equal to	$Z_{prim} <= Z_{buf}$	$Z_{prim} <= Z_{buf}$

Note: The actual update of the *z*-buffer and/or the frame buffer may be prohibited by the use of the *z*-buffer protect mask and the frame buffer protect mask.

Language Bindings

C

pset_hlhsr_id (*hlhsr_id*)

Input Parameters

Pint hlhsr_id
HLHSR identifier.

FORTRAN

PSHRID(*hrid*)

Input Parameters

integer hrid
HLHSR identifier.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Inquire HLHSR Identifier Facilities
- Inquire HLHSR Mode Facilities
- Set HLHSR Mode

SET INDIVIDUAL ASF (PHOP,*,STOP,*)

Purpose

Use Set Individual ASF to insert a Set Individual ASF (Attribute Source Flag) structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Individual ASF structure element, depending on the current edit mode.

At structure traversal time, the current ASF setting determines the *BUNDLED* or *INDIVIDUAL* attributes that the graPHIGS API uses to draw an output primitive.

The traversal default for all attributes is *INDIVIDUAL*.

Attribute identifiers are:

Linetype
Linewidth scale factor
Polyline color index
Marker type
Marker size scale factor
Polymarker color index
Text font
Text precision
Character expansion factor
Character spacing
Text color index
Interior style
Interior style index
Interior color index
Edge flag
Edge linetype
Edgewidth scale factor
Edge color index

If any attribute identifier in the list is invalid, then the graPHIGS API ignores that entry. If any attribute source flag is invalid, then it defaults to *INDIVIDUAL*.

Language Bindings

C

pset_indiv_asf (*asf_id, asf_source*)

Input Parameters

Paspect asf_id
Aspect identifier (*0=PASPECT_LINETYPE, 1=PASPECT_LINEWIDTH, 2=PASPECT_LINE_COLR_IND, 3=PASPECT_MARKER_TYPE, 4=PASPECT_MARKER_SIZE, 5=PASPECT_MARKER_COLR_IND, 6=PASPECT_TEXT_FONT, 7=PASPECT_TEXT_PREC, 8=PASPECT_CHAR_EXPAN, 9=PASPECT_CHAR_SPACE, 10=PASPECT_TEXT_COLR_IND, 11=PASPECT_INT_STYLE, 12=PASPECT_INT_STYLE_IND, 13=PASPECT_INT_COLR_IND, 14=PASPECT_EDGE_FLAG, 15=PASPECT_EDGETYPE, 16=PASPECT_EDGEWIDTH, 17=PASPECT_EDGE_COLR_IND*).

Pasf asf_source
Aspect source flag value (*0=PASF_BUNDLED, 1=PASF_INDIV*).

FORTRAN

PSIASF (*aspcid*, *asfval*)

Input Parameters

integer aspcid
Aspect identifier (*0=PLN, 1=PLWSC, 2=PPLCI, 3=PMK, 4=PMKSC, 5=PPMCI, 6=PTXFN, 7=PTXPR, 8=PCHXP, 9=PCHSP, 10=PTXCI, 11=PIS, 12=PISI, 13=PICI, 14=PEDFG, 15=PEDT, 16=PEWSC, 17=PEDCI*).

integer asfval
Aspect source flag value (*0=PBUNDL, 1=PINDIV*).

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- None

SET INTERIOR COLOR INDEX (PHOP,*,STOP,*)

Purpose

Use Set Interior Color Index to insert a Set Interior Color Index structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Interior Color Index structure element, depending on the current edit mode. This structure element specifies an entry in the workstation's rendering color table. The graPHIGS API uses the color values contained in the color table to fill all subsequent area defining primitives if the interior style is set to *HOLLOW* (Set Interior Style) and edge is *OFF* (Set Edge Flag) or the interior style is set to *SOLID* or *HATCH*.

At structure traversal time, the graPHIGS API uses this index to render the interiors when the interior color aspect source flag is set to *INDIVIDUAL* (Set Individual ASF).

The traversal default for interior color is a color index value of 1.

If the workstation does not support the specified interior color index or the specified index is outside the color table limit, then the interior color index defaults to a value of 1.

Language Bindings

C

pset_int_colr_ind (*int_colr_ind*)

Input Parameters

Pint int_colr_ind
Interior color index (>=0).

FORTRAN

PSICI (*coli*)

Input Parameters

integer coli
Interior color index (>=0).

Errors

5 Function Requires State (PHOP,*,STOP,*)

113 Color Index Value < ZERO

Related Subroutines

- Inquire Workstation State Table Lengths
- Inquire Interior Representation
- Set Interior Representation

SET INTERIOR INDEX (PHOP,*,STOP,*)

Purpose

Use Set Interior Index to insert a Set Interior Index structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Interior Index structure element, depending on the current edit mode.

This structure element specifies an entry in the workstation's interior bundle table. The entry contains attribute settings for interior style, interior style index, and color. At structure traversal time, the graPHIGS API uses these attribute settings to render all subsequent fill area and fill area set primitives for those attributes when the aspect source flag is set to *BUNDLED* (Set Individual ASF).

The traversal default value for interior index is 1.

If the workstation does not support the specified interior index or the specified index is outside the interior table size, then the interior index defaults to a value of 1.

Language Bindings

C

pset_int_ind (*int_ind*)

Input Parameters

Pint int_ind
Interior index (>=1).

FORTRAN

PSII (*ii*)

Input Parameters

integer ii
Interior index (>=1).

Errors

5 Function Requires State (PHOP,*,STOP,*)

100 Bundle Index Value Is Less Than One

Related Subroutines

- Inquire Interior Representation
- Inquire Workstation State Table Lengths
- Set Interior Representation

SET INTERIOR STYLE (PHOP,*,STOP,*)

Purpose

Use Set Interior Style to insert a Set Interior Style structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Interior Style structure element, depending on the current edit mode.

At structure traversal time, this structure element specifies the way the graPHIGS API draws the interior of a polygon when rendering all subsequent fill area and fill area set primitives. At structure traversal time, the graPHIGS API uses this style value when the interior style aspect source flag is set to *INDIVIDUAL* (Set Individual ASF). Transformations do not affect interior styles of *HATCH* and *PATTERN*. For interior style *HOLLOW*, the bounding polyline is *SOLID* and the line width is the nominal line width for the workstation.

The traversal default for interior style is *HOLLOW*.

If the workstation does not support the specified interior style value or the specified value is outside the allowable range, then the interior style defaults to *HOLLOW*.

Language Bindings

C

pset_int_style (*int_style*)

Input Parameters

Pint_style int_style
Interior style (*0=PSTYLE_HOLLOW, 1=PSTYLE_SOLID, 2=PSTYLE_PAT, 3=PSTYLE_HATCH, 4=PSTYLE_EMPTY*).

FORTRAN

PSIS (*ints*)

Input Parameters

integer ints
Interior style (*0=PHOLLO, 1=PSOLID, 2=PPATTR, 3=PHATCH, 4=PISEMP*).

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Inquire Interior Facilities
- Inquire Interior Representation
- Inquire Predefined Interior Representation
- Set Individual ASF
- Set Interior Style Index

SET INTERIOR STYLE INDEX (PHOP,*,STOP,*)

Purpose

Use Set Interior Style Index to insert a Set Interior Style Index structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Interior Style Index structure element, depending on the current edit mode.

This structure element specifies an index into the workstation hatch table if the current interior style is *HATCH* (Set Interior Style) or it specifies an index into the workstation pattern table if the current interior style is *PATTERN*. At structure traversal time, the graPHIGS API uses this value when rendering all subsequent area defining primitives when the interior style index aspect source flag is set to *INDIVIDUAL*. (Set Individual ASF).

If the current interior style is *not PATTERN* or *HATCH*, then the graPHIGS API ignores this structure element and increments the element counter.

The traversal default value for interior style index is 1.

If the workstation does not support the specified interior style index value or the specified index is outside the table limit, then the interior style index defaults to a value of 1.

All workstations have available registered hatch styles 1-6.

- Horizontal equally spaced parallel lines
- Vertical equally spaced parallel lines
- Positive slope equally spaced parallel lines
- Negative slope equally spaced parallel lines
- Horizontal/vertical crosshatch
- Positive slope/negative slope crosshatch.

  Transformations do not affect interior styles *HATCH* and *PATTERN*.

  Language Bindings

C

pset_int_style_ind (*int_style_ind*)

Input Parameters

Pint int_style_ind
Interior style index.

FORTRAN

PSISI (*istyli*)

Input Parameters

integer istyli
Interior style index.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Inquire Interior Facilities
- Inquire Interior Representation
- Inquire Predefined Interior Representation
- Set Individual ASF
- Set Interior Representation
- Set Interior Style

SET LINETYPE (PHOP,*,STOP,*)

Purpose

Use Set Linetype to insert a Set Linetype structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Linetype structure element, depending on the current edit mode.

This structure element specifies an index into a workstation line type table that contains line types. The graPHIGS API uses this index to render all subsequent output primitives to which this attribute applies. At structure traversal time, the graPHIGS API uses this line type to render the output primitives when the line type aspect source flag is set to *INDIVIDUAL* (Set Individual ASF).

The traversal default for line type is *SOLID*.

If the workstation does not support the specified linetype entry or the specified entry is outside the allowable range, then the linetype defaults to *SOLID*.

Language Bindings

C

pset_linetype (*linetype*)

Input Parameters

Pint linetype
Line type (*1=PLINE_SOLID, 2=PLINE_DASH, 3=PLINE_DOT, 4=PLINE_DASH_DOT*).

FORTRAN

PSLN (*ltype*)

Input Parameters

integer ltype
Line type (*1=PLSOLI, 2=PLDASH, 3=PLDOT, 4=PLDASD*).

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Inquire Polyline Facilities
- Inquire Polyline Representation
- Set Individual ASF
- Set Polyline Representation

SET LINEWIDTH SCALE FACTOR (PHOP,*,STOP,*)

Purpose

Use Set Linewidth Scale Factor to insert a Set Linewidth Scale Factor structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Linewidth Scale Factor structure element, depending on the current edit mode.

The Linewidth Scale Factor specifies the width of the line as a fraction of the nominal. The device support multiplies this scale factor by the nominal line width on the corresponding device to determine the requested width. The graPHIGS API maps the calculated value to the closest width available on the device. A scale factor value of 1.0 generates a nominal size line on any workstation. At structure traversal time, the graPHIGS API uses this scale factor when the line width scale factor aspect source flag is set to *INDIVIDUAL* (Set Individual ASF).

The traversal default value for linewidth scale factor is 1.0.

Language Bindings

C

pset_linewidth (*linewidth*)

Input Parameters

Pfloat linewidth
Line width scale factor.

FORTRAN

PSLWSC (*lwidth*)

Input Parameters

real lwidth
Line width scale factor.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Inquire Polyline Facilities
- Inquire Polyline Representation
- Set Individual ASF
- Set Polyline Representation

SET MARKER SIZE SCALE FACTOR (PHOP,*,STOP,*)

Purpose

Use Set Marker Size Scale Factor to insert a Set Marker Size Scale Factor structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Marker Size Scale Factor structure element, depending on the current edit mode.

This structure element specifies the marker's size as a fraction of the nominal marker size. The device support multiplies this scale factor by the nominal size of markers on the corresponding device to determine the requested size. The graPHIGS API maps the calculated value to the closest size available on the device. A scale factor value of 1.0 generates a nominal size marker on any workstation. At structure traversal time, the graPHIGS API uses this marker size scale factor when the marker size scale factor aspect source flag is set to *INDIVIDUAL* (Set Individual ASF).

The traversal default value for marker size scale factor is 1.0.

Language Bindings

C

pset_marker_size (*marker_size*)

Input Parameters

Pfloat marker_size
Marker size scale factor.

FORTRAN

PSMKSC (*mszsf*)

Input Parameters

real mszsf
Marker size scale factor.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Inquire Polymarker Facilities
- Inquire Polymarker Representation
- Set Individual ASF

- Set Polyline Representation

SET MARKER TYPE (PHOP,*,STOP,*)

Purpose

Use Set Marker Type to insert a Set Marker Type structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Marker Type structure element, depending on the current edit mode.

This structure element specifies an index into a workstation markertype table that contains marker types that the graPHIGS API uses to render all subsequent polymarker primitives. At structure traversal time, the graPHIGS API uses this marker type to render the polymarker primitives when the marker type aspect source flag is set to *INDIVIDUAL* (Set Individual ASF).

The traversal default for marker type is *ASTERISK*.

If the workstation does not support the specified marker type entry or the specified entry is outside the allowable range, then the marker type entry defaults to *ASTERISK* (marker).

Language Bindings

C

pset_marker_type (*marker_type*)

Input Parameters

Pint marker_type
Marker type (*1=PMARKER_DOT, 2=PMARKER_PLUS, 3=PMARKER_ASTERISK, 4=PMARKER_CIRCLE, 4=PMARKER_CROSS*).

FORTRAN

PSMK (*mtype*)

Input Parameters

integer mtype
Marker type (*1=PPOINT, 2=PPLUS, 3=PAST, 4=POMARK, 5=PXMARK*).

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Inquire Polymarker Facilities
- Inquire Polymarker Representation
- Set Individual ASF
- Set Polyline Representation

SET PATTERN REFERENCE POINT (PHOP,*,STOP,*)

Purpose

Use Set Pattern Reference Point to insert a Set Pattern Reference Point structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Pattern Reference Point structure element, depending on the current edit mode.

This structure element specifies a two-dimensional pattern reference point. The *z* coordinate is assumed to be zero. The pattern reference vectors are assumed to be (1,0,0) and (0,1,0). At structure traversal time, the graPHIGS API uses this pattern reference point and assumed pattern reference vectors to display fill area and fill area set primitives when the currently selected interior style is set to *PATTERN* (Set Interior Style).

The traversal default value for pattern reference point is (0.0,0.0,0.0). The traversal default values for pattern reference vectors are (1,0,0) and (0,1,0).

Note: The graPHIGS API currently ignores this structure element at structure traversal time.

Language Bindings

C

pset_pat_ref_point (*pat_ref_point*)

Input Parameters

*const Ppoint *pat_ref_point*
Pattern reference point in MC.

FORTRAN

PSPARF (*rfx*, *rfy*)

Input Parameters

real rfx
x coordinate of the pattern reference point in MC.

real rfy
y coordinate of the pattern reference point in MC.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Set Pattern Reference Point And Vectors
- Set Pattern Size

SET PATTERN REFERENCE POINT AND VECTORS (PHOP,*,STOP,*)

Purpose

Use Set Pattern Reference Point and Vectors to insert a Set Pattern Reference Point and Vectors structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Pattern Reference Point and Vectors structure element, depending on the current edit mode.

This structure element specifies a three-dimensional pattern reference point and pattern reference vectors. At structure traversal time, the graPHIGS API uses this pattern reference point and pattern reference vectors to display fill area and fill area set primitives when the currently selected interior style is set to *PATTERN* (Set Interior Style). If one of the pattern reference vectors is zero in length or the vectors are parallel, then the graPHIGS API ignores this structure element.

The traversal default value for pattern reference point is (0,0,0). The traversal default values for pattern reference vectors are (1,0,0) and (0,1,0).

Note: The graPHIGS API currently ignores this structure element at structure traversal time.

Language Bindings

C

pset_pat_ref_point_vecs (*pat_ref_point, pat_ref_vec*)

Input Parameters

*const Ppoint3 *pat_ref_point*
Pattern reference point in MC.

const Pvec3 pat_ref_vec[2]
Reference vectors in MC (1=x-axis, 2=y-axis).

FORTRAN

PSPRPV (*rfx*, *rfy*, *rfz*, *rfvx*, *rfvy*, *rfvz*)

Input Parameters

real rfx
x coordinate of the pattern reference point in MC.

real rfy
y coordinate of the pattern reference point in MC.

real rfz
z coordinate of the pattern reference point in MC.

real pfvx(2)
x coordinates of the pattern reference vectors in MC.

real pfvy(2)
y coordinates of the pattern reference vectors in MC.

real rfvz(2)
z coordinates of the pattern reference vectors in MC.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Set Pattern Reference Point
- Set Pattern Size

SET PATTERN SIZE (PHOP,*,STOP,*)

Purpose

Use Set Pattern Size to insert a Set Pattern Size element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Pattern Size structure element, depending on the current edit mode.

This structure element specifies the pattern size dimensions. At structure traversal time, the graPHIGS API uses the specified pattern size in conjunction with the pattern reference point and pattern reference vectors to display fill area and fill area set primitives when the currently selected interior style is set to *PATTERN* (Set Interior Style). The graPHIGS API uses only the magnitudes of the pattern size components. If either of the components is zero, then the graPHIGS API ignores this structure element.

The traversal default value for pattern size is (1.0,1.0).

Note: The graPHIGS API currently ignores this structure element at structure traversal time.

Language Bindings

C

pset_pat_size (*pat_size*)

Input Parameters

const Pfloat_size *pat_size
Pattern size in MC.

FORTRAN

PSPA (*szx*, *szy*)

Input Parameters

real szx
x dimension of pattern size in MC.

real szy
y dimension of pattern size in MC.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Set Pattern Reference Point
- Set Pattern Reference Point And Vectors

SET PICK IDENTIFIER (PHOP,*,STOP,*)

Purpose

Use Set Pick Identifier to insert a Set Pick Identifier structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Pick Identifier structure element, depending on the current edit mode.

The graPHIGS API associates the pick identifier with all subsequent primitives and returns the pick identifier in each entry of a pick path. The returned pick identifier represents the pick identifier that was current when the application processed the corresponding structure element.

The traversal default for pick identifier is no pick identifier.

Language Bindings

C

pset_pick_id (*pick_id*)

Input Parameters

Pint pick_id
Pick identifier.

FORTRAN

PSPKID (*pkid*)

Input Parameters

integer pkid
Pick identifier.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- None

SET POLYLINE COLOR INDEX (PHOP,*,STOP,*)

Purpose

Use Set Polyline Color Index to insert a Set Polyline Color Index structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Polyline Color Index structure element, depending on the current edit mode.

This structure element specifies an entry in the workstation's rendering color table that defines the color values that the graPHIGS API uses to render all output primitives to which this attribute applies. At structure traversal time, the graPHIGS API uses this index to render the output primitives when the polyline color aspect source flag is set to *INDIVIDUAL* (Set Individual ASF).

The traversal default for polyline color is a color index value of 1.

If the workstation does not support the specified polyline color index or the specified index is outside the color table limit, then the polyline color index defaults to a value of 1.

Language Bindings

C

pset_line_colr_ind (*line_colr_ind*)

Input Parameters

Pint line_colr_ind
Polyline color index.

FORTRAN

PSPLCI (*coli*)

Input Parameters

integer coli
Polyline color index.

Errors

5 Function Requires State (PHOP,*,STOP,*)

113 Color Index Value < ZERO

Related Subroutines

- Inquire Polyline Facilities
- Inquire Polyline Representation
- Set Individual ASF
- Set Polyline Representation

SET POLYLINE INDEX (PHOP,*,STOP,*)

Purpose

Use Set Polyline Index to insert a Set Polyline Index structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Polyline Index structure element, depending on the current edit mode.

This structure element specifies an entry in the workstation's polyline bundle table. The entry contains attribute settings for line type, line width scale factor, and color. At structure traversal time, the graPHIGS API uses these attribute settings to render all subsequent polyline primitives for the attributes that have an aspect source flag set to *BUNDLED* (Set Individual ASF).

The traversal default value for polyline index is 1.

If the workstation does not support the specified polyline index or the specified index is outside the polyline bundle table size, then the polyline index defaults to a value of 1.

Language Bindings

C

pset_line_ind (*line_ind*)

Input Parameters

Pint line_ind
Polyline index (>=1).

FORTRAN

PSPLI (*pli*)

Input Parameters

integer pli
Polyline index (>=1).

Errors

5 Function Requires State (PHOP,*,STOP,*)

100 Bundle Index Value Is Less Than One

Related Subroutines

- Inquire Polyline Representation
- Inquire Workstation State Table Lengths
- Set Polyline Representation

SET POLYMARKER COLOR INDEX (PHOP,*,STOP,*)

Purpose

Use Set Polymarker Color Index to insert a Set Polymarker Color Index structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Polymarker Color Index structure element, depending on the current edit mode.

This structure element specifies an entry in the workstation's rendering color table that defines the color values that the graPHIGS API uses to render all polymarker primitives. At structure traversal time, the graPHIGS API uses this index to render the polymarker primitives when the polymarker color aspect source flag is set to *INDIVIDUAL* (Set Individual ASF).

The traversal default for polymarker color is a color index value of 1.

If the workstation does not support the specified polymarker color or the specified index is outside the color table limit, then the polymarker color index defaults to a value of 1.

Language Bindings

C

pset_marker_colr_ind (*marker_colr_ind*)

Input Parameters

Pint marker_colr_ind
Polymarker color index (>=0).

FORTRAN

PSPMCI (*coli*)

Input Parameters

integer coli
Polymarker color index (>=0).

Errors

5 Function Requires State (PHOP,*,STOP,*)

113 Color Index Value < ZERO

Related Subroutines

- Inquire Polymarker Facilities
- Inquire Polymarker Representation
- Set Individual ASF
- Set Polyline Representation

SET POLYMARKER INDEX (PHOP,*,STOP,*)

Purpose

Use Set Polymarker Index to insert a Set Polymarker Index structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Polymarker Index structure element, depending on the current edit mode.

This structure element specifies an entry in the workstation's polymarker bundle table. The entry contains attribute settings for marker type, marker size scale factor, and color. At structure traversal time, the graPHIGS API uses these attribute settings to render all subsequent polymarker primitives for the attributes that have an aspect source flag set to *BUNDLED* (Set Individual ASF).

The traversal default value for polymarker index is 1.

If the workstation does not support the specified polymarker index of the specified index is outside the polymarker bundle table size, then the polymarker index defaults to a value of 1.

Language Bindings

C

pset_marker_ind (*marker_ind*)

Input Parameters

Pint marker_ind
Polymarker index (>=1).

FORTRAN

PSPMI (*pmi*)

Input Parameters

integer pmi
Polymarker index (>=1).

Errors

5 Function Requires State (PHOP,*,STOP,*)

100 Bundle Index Value Is Less Than One

Related Subroutines

- Inquire Polymarker Representation
- Inquire Workstation State Table Lengths
- Set Polyline Representation

SET TEXT ALIGNMENT (PHOP,*,STOP,*)

Purpose

Use Set Text Alignment to insert a Set Text Alignment structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Text Alignment structure element, depending on the current edit mode.

At structure traversal time, the graPHIGS API uses the specified alignment in this structure element to render all subsequent geometric text primitives. This setting affects the manner in which the graPHIGS API positions the geometric text extent rectangle in relation to the text position.

The traversal default for geometric text horizontal and vertical alignment is *NORMAL*.

If the workstation does not support the specified text alignment or the specified value is outside the allowable range, then the text alignment defaults to *NORMAL* for both horizontal and vertical text alignment.

Language Bindings

C

pset_text_align (*text_align*)

Input Parameters

*const Ptext_align *text_align*
Text alignment.

FORTRAN

PSTXAL (*txalh*, *txalv*)

Input Parameters

integer txalh
Horizontal text alignment (*0=PAHNOR, 1=PALEFT, 2=PACENT, 3=PARITE*).

integer txalv
Vertical text alignment (*0=PAVNOR, 1=PATOP, 2=PACAP, 3=PAHALF, 4=PABASE, 5=PABOTT*).

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Set Text Precision

SET TEXT COLOR INDEX (PHOP,*,STOP,*)

Purpose

Use Set Text Color Index to insert a Set Text Color Index structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Text Color Index structure element, depending on the current edit mode.

This structure element specifies an entry in the workstation's rendering color table that defines the color the graPHIGS API uses to render all subsequent annotation and geometric text primitives. At structure traversal time, the graPHIGS API uses this index to render the text primitives when the text color aspect source flag is set to *INDIVIDUAL* (Set Individual ASF).

The traversal default for text color is a color index value of 1.

If the workstation does not support the specified text color index or the specified index is outside the color table limit, then the text color index defaults to a value of 1.

Language Bindings

C

pset_text_colr_ind (*text_colr_ind*)

Input Parameters

Pint text_colr_ind
Text color index (>=0).

FORTRAN

PSTXCI (*coli*)

Input Parameters

integer coli
Text color index (>=0).

Errors

5 Function Requires State (PHOP,*,STOP,*)

113 Color Index Value < ZERO

Related Subroutines

- Inquire Predefined Text Representation
- Inquire Text Representation
- Set Individual ASF
- Set Text Representation

SET TEXT FONT (PHOP,*,STOP,*)

Purpose

Use Set Text Font to insert a Set Text Font structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Text Font structure element, depending on the current edit mode.

At structure traversal time, the graPHIGS API uses the specified font identifier in this structure element to render all subsequent annotation and geometric text primitives when the text font aspect source flag is set to *INDIVIDUAL* (Set Individual ASF).

The traversal default for annotation and geometric text font is font 1.

The graPHIGS API implicitly makes available fonts 1 and 2 of the US English character set when an application issues an ISO PHIGS Open Workstation subroutine call (Open Workstation). For an illustration of those fonts refer to *The graPHIGS Programming Interface: Technical Reference*. In *The graPHIGS Programming Interface: Technical Reference*, the U.S. English character set is referred to as Character Set 1. This is the number associated with this character set when using the GP*xxxx* interface.

Language Bindings

C

pset_text_font (*font*)

Input Parameters

Pint font
Text font.

FORTRAN

PSTXFN (*font*)

Input Parameters

integer font
Text font.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Inquire Predefined Text Representation
- Inquire Text Representation
- Set Individual ASF
- Set Text Representation

SET TEXT INDEX (PHOP,*,STOP,*)

Purpose

Use Set Text Index to insert a Set Text Index structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Text Index structure element, depending on the current edit mode.

This structure element specifies an entry in the workstation's text bundle table. The entry contains attribute settings for text font, text precision, character expansion factor, character spacing, and color. At structure traversal time, the graPHIGS API uses these attribute settings to render all subsequent annotation and geometric text primitives for the attributes that have an aspect source flag set to *BUNDLED* (Set Individual ASF).

The traversal default value for text index is 1.

If the workstation does not support the specified text index or the specified index is outside the text bundle table size, then the text index defaults to a value of 1.

Language Bindings

C

pset_text_ind (*text_ind*)

Input Parameters

Pint text_ind
Text index (>=1).

FORTRAN

PSTXI (*txi*)

Input Parameters

integer txi
Text index (>=1).

Errors

5 Function Requires State (PHOP,*,STOP,*)

100 Bundle Index Value Is Less Than One

Related Subroutines

- Inquire Predefined Text Representation
- Inquire Text Representation
- Inquire Workstation State Table Lengths
- Set Text Representation

SET TEXT PATH (PHOP,*,STOP,*)

Purpose

Use Set Text Path to insert a Set Text Path structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Text Path structure element, depending on the current edit mode.

This structure element specifies the writing direction of the text string relative to the Character Up Vector. At structure traversal time, the graPHIGS API uses this path value to render all subsequent geometric text primitives.

The traversal default for text path is *RIGHT*.

If the workstation does not support the specified text path or the specified value is outside the allowable range, then the text path defaults to *RIGHT*.

Language Bindings

C

pset_text_path (*text_path*)

Input Parameters

Ptext_path text_path
Text path (*0=PPATH_RIGHT, 1=PPATH_LEFT, 2=PPATH_UP, 3=PPATH_DOWN*).

FORTRAN

PSTXP (*txp*)

Input Parameters

integer txp
Text path (*0=PRIGHT, 1=PLEFT, 2=PUP, 3=PDOWN*).

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Set Text Precision

SET TEXT PRECISION (PHOP,*,STOP,*)

Purpose

Use Set Text Precision to insert a Set Text Precision structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set Text Precision structure element, depending on the current edit mode.

The text precision specifies which attributes apply to annotation and geometric text primitives and the manner in which the graPHIGS API uses them. At structure traversal time, the graPHIGS API uses this precision when the text precision aspect source flag is set to *INDIVIDUAL* (Set Individual ASF).

Text precisions available are *STRING*, *CHARACTER*, and *STROKE*. The traversal default for text precision is *STRING*.

If the workstation does not support the specified text precision, then the graPHIGS API uses the highest available precision instead.

The following figure describes the attributes and precision for geometric text:

Geometric Text Attributes

precision	TEXT FONT	CHARACTER EXPANSION FACTOR	CHARACTER SPACING	COLOR	CHARACTER HEIGHT	CHARACTER UP VECTOR	TEXT PATH	TEXT ALIGNMENT	CHARACTER UP AND BASE VECTORS
STRING	Y **	N	N	Y	Y	N	N	N	N
CHARACTER	Y **	Y	Y	Y	Y	Y	Y	Y	Y
STROKE	Y **	Y	Y	Y	Y	Y	Y	Y	Y

The following keywords are used above to designate which attributes will be processed for a particular precision:

Y The attribute is applied for this precision.

N The attribute is not applied for this precision.

** The requested font will be applied if it is available on the requested workstation. Otherwise, the workstation will default to an alternate font.

The following figure describes the attributes and precision for annotation text:

Annotation Text Attributes

precision	TEXT FONT	CHARACTER EXPANSION FACTOR	CHARACTER SPACING	COLOR	ANNOTATION HEIGHT SCALE FACTOR	ANNOTATION UP VECTOR	ANNOTATION PATH	ANNOTATION ALIGNMENT	ANNOTATION HEIGHT
STRING	Y 4	N	N	Y	Y 1	N	N	N	Y 1
CHARACTER	Y 4	Y 1	Y 2	Y	Y 1	Y 2	Y 2	Y 2	Y 1
STROKE	Y 4	Y 3	Y 3	Y	Y 3	Y 3	Y 3	Y 3	Y 3

The following keywords are used above to designate which attributes will be processed for a particular precision:

The following keywords are used above to designate which attributes will be processed for a particular precision:

Y - The attribute is applied for this precision.

N - The attribute is not applied for this precision.

The following numbers are used above to describe how precisely an attribute will be applied:

1 - The attribute is applied as closely as possible for the entire text string.

2 - Whether these attributes are applied is workstation dependent. See *The graPHIGS Programming Interface: Technical Reference* for more information.

3 - The attribute is applied on a stroke-by-stroke basis, that is, exactly.

4 - The requested font will be applied if the font is available in the requested workstation; otherwise, the workstation will default to an alternate font.

Language Bindings

C

pset_text_prec (*prec*)

Input Parameters

Ptext_prec prec
Text precision (*0=PPREC_STRING, 1=PPREC_CHAR, 2=PPREC_STROKE*).

FORTRAN

PSTXPR (*prec*)

Input Parameters

integer prec
Text precision (*0=PSTRP, 1=PCHARP, 2=PSTRKP*).

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Inquire Annotation Facilities
- Inquire Predefined Text Representation
- Inquire Text Facilities
- Inquire Text Representation
- Set Individual ASF
- Set Text Representation

SET VIEW INDEX (PHOP,*,STOP,*)

Purpose

Use Set View Index to insert a Set View Index structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with a Set View Index structure element, depending on the current edit mode.

This structure elements specifies an entry in the workstation's text bundle table. The entry contains attribute settings for the view orientation matrix, view mapping matrix, viewport boundaries, and viewport clipping indicators. At structure traversal time, the graPHIGS API uses these attribute settings to render all subsequent output primitives.

The traversal default for the view index is entry 0 of the workstation's view table.

Language Bindings

C

pset_view_ind (*view_ind*)

Input Parameters

Pint view_ind
View index (>=0).

FORTRAN

PSVWI (*viewi*)

Input Parameters

integer viewi
View index (>=0).

Errors

5 Function Requires State (PHOP,*,STOP,*)

114 View Index Value < ZERO

Related Subroutines

- Set View Representation
- Set View Representation 3

Chapter 5. Miscellaneous Structure Element Subroutines

This section describes subroutines which generate structure elements which are *not* related to primitives or primitive attributes. The subroutines in this section generate elements which cause structure execution at traversal time, or elements which are used to store application specific information, or generalized structure elements.

APPLICATION DATA (PHOP,*,STOP,*)

Purpose

Use Application Data to insert an application data structure element into the open structure following the element pointer or replace the element pointed at by the element pointer with an Insert Application Data structure element, depending on the current edit mode.

This subroutine allows the insertion of application specific data into a structure element. The graPHIGS API ignores this data during structure traversal.

Language Bindings

C

pappl_data(*data*)

Input Parameters

*const Pdata *data*
Application data.

FORTRAN

PAP(*ldr*, *datrec*)

Input Parameters

integer ldr
Dimension of data record array.

*character*80 datrec(ldr)*
Data record.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- None

EXECUTE STRUCTURE (PHOP,*,STOP,*)

Purpose

Use Execute Structure to insert an Execute Structure element into the open structure following the element pointer or to replace the element pointed at by the element pointer with an Execute Structure element, depending on the current edit mode. If the specified structure does not exist, Execute Structure creates a new empty structure.

Traversal of the structure in which the Execute Structure element exists causes invocation of the target structure as soon as the Execute Structure element is encountered. Although the graPHIGS API does not allow recursive structure networks, no error is generated by the creation of such a network. When the application attempts to execute the open structure, the graPHIGS API generates an implementation error (-125). This is a graPHIGS API restriction. The behavior of the graPHIGS API when traversing a recursive structure network is undefined.

Language Bindings

C

pexec_struct (*struct_id*)

Input Parameters

Pint struct_id
Structure identifier.

FORTRAN

PEXST (*strid*)

Input Parameters

integer strid
Structure identifier.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- None

GENERALIZED STRUCTURE ELEMENT (PHOP,*,STOP,*)

Purpose

Use Generalized Structure Element to insert a Generalized Structure Element (GSE) into the open structure following the element pointer or to replace the element pointed at by the element pointer with a GSE, depending on the current edit mode.

The graPHIGS API currently does not support any GSEs through this subroutine. The graPHIGS API puts any elements generated by this subroutine into the open structure but ignores them at structure traversal time. Use the appropriate GP*xxxx* subroutine to generate a desired GSE supported by the graPHIGS API. See *The graPHIGS Programming Interface: Technical Reference*, for a list of the GSEs supported by the graPHIGS API. Also, because GSE support is workstation dependent, use the graPHIGS API Inquire List of Available GSEs (GPQGSE) subroutine to determine the specific GSEs supported by an open workstation.

Language Bindings

C

pgse (*id, gse_data*)

Input Parameters

Pint id
GSE identifier.

*const Pgse_data *gse_data*
GSE data record.

FORTRAN

PGSE (*gseid*, *ldr*, *datrec*)

Input Parameters

integer gseid
GSE identifier.

integer ldr
Dimension of data record array

*character*80 datrec(ldr)*
GSE data record.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Inquire Generalized Structure Element Facilities

Chapter 6. Structure Operation Subroutines

The subroutines included in this section let your application program manipulate structure content. Operations performed by these subroutines include:

- creating/deleting a structure
- creating structure hierarchies
- opening a structure for modification
- editing structure content

After opening a structure, the element pointer normally points to the last element in the structure. In order to modify a structure, the application must reposition the element pointer to a desired element. If the edit mode is set for insertion, then the graPHIGS API inserts an element in the open structure following the element pointer. Otherwise, if the edit mode is set for replacement, then an element replaces the element at the current element pointer.

If you plan to use both GP*xxxx* and ISO PHIGS subroutine calls, be aware of the compatibility issues as outlined in Chapter 22. ″graPHIGS API Extensions and Compatibility with the ISO PHIGS Standard″.

CHANGE STRUCTURE IDENTIFIER (PHOP,*,*,*)

Purpose

Use Change Structure Identifier to change the identifier of a structure (called the *original structure*) to a specified structure identifier (called the *resulting structure*). This subroutine does not affect execute structure-type elements that reference the original structure.

If the identifier of the original structure is the same as the identifier of the resulting structure and if the structure exists, then no action occurs. If the structure does not exist, however, then the graPHIGS API creates an empty structure with the identifier of the resulting structure.

If the original structure does not exist, then the graPHIGS API empties the resulting structure. If the original structure does exist, then the contents of the original structure replace the contents of the resulting structure and the graPHIGS API empties the original structure. If the original structure references the resulting structure, then the graPHIGS API generates an implementation error (-129)and no action occurs.

At the completion of this subroutine, the graPHIGS API deletes the original structure; *unless*, the original structure is the open structure, is referenced by any other structure, or is posted to a workstation.

If the *original* structure is the open structure, then the graPHIGS API sets the current element pointer to zero. If the *resulting* structure is the open structure, then the graPHIGS API sets the current element pointer to point to the last element in the structure.

Language Bindings

C

pchange_struct_id (*orig_struct_id, result_struct_id*)

Input Parameters

Pint orig_struct_id
Original structure identifier.

Pint result_struct_id
Resulting structure identifier.

FORTRAN

PCSTID (*oldsid*, *newsid*)

Input Parameters

integer oldsid
Original structure identifier.

integer newsid
Resulting structure identifier.

Errors

2 Function Requires State (PHOP,*,*,*)

Related Subroutines

- Empty Structure
- Execute Structure
- Post Structure

CHANGE STRUCTURE IDENTIFIER AND REFERENCES (PHOP,*,*,*)

Purpose

Use Change Structure Identifier and References to change all execute structure-type elements which reference a structure (called the *original structure*) with elements which reference a specified structure (called the *resulting structure*). This subroutine changes the identifier of the original structure to be that of the resulting structure. The effect of this subroutine is as though the application called the Change Structure References subroutine followed by a call to the Change Structure Identifier subroutine.

If the original structure references the resulting structure, then the graPHIGS API generates an implementation error (-129) and no action occurs. This error is generated to prevent an application from causing recursive traversal of a structure.

Language Bindings

C

pchange_struct_id_refs (*orig_struct_id, result_struct_id*)

Input Parameters

Pint orig_struct_id
Original structure identifier.

Pint result_struct_id
Resulting structure identifier.

FORTRAN

PCSTIR (*oldsid*, *newsid*)

Input Parameters

integer oldsid
Original structure identifier.

integer newsid
Resulting structure identifier.

Errors

2 Function Requires State (PHOP,*,*,*)

Related Subroutines

- Change Structure Identifier
- Change Structure References

CHANGE STRUCTURE REFERENCES (PHOP,*,*,*)

Purpose

Use Change Structure References to change all execute structure-type elements which reference a structure (called the *original structure*) with elements which reference a specified structure (called the *resulting structure*). This subroutine does not affect any references to the resulting structure that existed before the call.

If the identifier of the original structure and the identifier of the resulting structure are identical, then no action occurs. If the resulting structure references the original structure, then the graPHIGS API generates an implementation error (-129) and no action occurs. This error is generated to prevent an application from causing recursive traversal of a structure.

If there are references to the original structure and the resulting structure does not exist, then the graPHIGS API creates an empty structure with the identifier of the resulting structure. If the original structure does not exist or if there are no references to the original structure, then no action occurs.

If the resulting structure is posted to a workstation, then the resulting structure remains posted and the original structure, if posted to the workstation, is unposted. If the original structure is posted to a workstation but the resulting structure is not, then the graPHIGS API posts the resulting structure to that workstation and unposts the original structure from the workstation.

Language Bindings

C

pchange_struct_refs(*orig_struct_id, result_struct_id*)

Input Parameters

Pint orig_struct_id
Original structure identifier.

Pint result_struct_id
Resulting structure identifier.

FORTRAN

PCSTRF (*oldsid*, *newsid*)

Input Parameters

integer oldsid
Original structure identifier.

integer newsid
Resulting structure identifier.

Errors

2 Function Requires State (PHOP,*,*,*)

Related Subroutines

- Execute Structure
- Post Structure
- Unpost Structure

CLOSE STRUCTURE (PHOP,*,STOP,*)

Purpose

Use Close Structure to close a structure. The current structure state is set to Structure Closed (STCL).

Conditional editing is stopped if it had been started by the graPHIGS API extension Conditional Editing (*GPCEDT*. See ″Structure Operations″ in *The graPHIGS Programming Interface: Subroutine Reference*).

Once closed, your application cannot insert or replace structure elements in the structure until the structure is opened.

Language Bindings

C

pclose_struct()

FORTRAN

PCLST

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Open Structure

COPY ALL ELEMENTS FROM STRUCTURE (PHOP,*,STOP,*)

Purpose

Use Copy All Elements From Structure to copy the elements from the specified structure into the open structure following the current element pointer. The element pointer moves to the last element copied into the open structure.

If the structure you copy references the open structure (by the use of an execute structure-type element), then the graPHIGS API issues an implementation error message (-125) and does not perform the copy.

Language Bindings

C

pcopy_all_elems_struct (*struct_id*)

Input Parameters

Pint struct_id
Structure identifier.

FORTRAN

PCELST (*strid*)

Input Parameters

integer strid
Structure identifier.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Execute Structure

DELETE ALL STRUCTURES (PHOP,*,*,*)

Purpose

Use Delete All Structures to delete all existing structures from the structure store. This subroutine is equivalent to invoking the Delete Structure subroutine for each structure in the structure store.

Language Bindings

C

pdel_all_structs()

FORTRAN

PDAS

Errors

2 Function Requires State (PHOP,*,*,*)

Related Subroutines

- Delete Structure

DELETE ELEMENT (PHOP,*,STOP,*)

Purpose

Use Delete Element to delete the element indicated by the element pointer from the open structure. The element pointer moves to the element immediately preceding the deleted element. If the element pointer is zero, then the graPHIGS API deletes nothing and the element pointer does not move.

Language Bindings

C

pdel_elem ()

FORTRAN

PDEL

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- None

DELETE ELEMENT RANGE (PHOP,*,STOP,*)

Purpose

Use Delete Element Range to delete all structure elements between and including the elements indicated by the specified element numbers.

After deletion, the element pointer moves to the element immediately preceding any deleted elements. If both values point beyond the last element of the structure or both values are less than zero, then the graPHIGS API does not delete any elements and the element pointer remains the same. If one of the values is less than zero, then the element pointer defaults to a value of zero. If one of the values is greater than the number of elements in the open structure, then the graPHIGS API uses the element number of the last element in the open structure instead.

Language Bindings

C

pdel_elem_range (*elem_ptr1_value, elem_ptr2_value*)

Input Parameters

Pint elem_ptr1_value
Element pointer 1 value.

Pint elem_ptr2_value
Element pointer 2 value.

FORTRAN

PDELRA (*ep1*, *ep2*)

Input Parameters

integer ep1
Element position 1 value.

integer ep2
Element position 2 value.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- None

DELETE ELEMENTS BETWEEN LABELS (PHOP,*,STOP,*)

Purpose

Use Delete Elements Between Labels to delete all elements from the open structure between, but not including, the two specified labels. After deletion, the element pointer moves to the element specified by the label 1 identifier.

Starting from the current position of the element pointer, the graPHIGS API searches for label identifier 1. If the current position of the element pointer points to an occurrence of the label identifier 1, then the search starts at the next element. The search for label identifier 2 starts at the element following the label identifier 1 element. If neither label is found when the end of the structure is reached, then the graPHIGS API generates an error, does not perform the deletion, and does not change the current element pointer.

Language Bindings

C

pdel_elems_labels (*label1_id, label2_id*)

Input Parameters

Pint label1_id
Label 1 identifier.

Pint label2_id
Label 2 identifier.

FORTRAN

PDELLB (*label1*, *label2*)

Input Parameters

integer label1
Label 1 identifier.

integer label2
Label 2 identifier.

Errors

5 Function Requires State (PHOP,*,STOP,*)

206 Label(s) Not Between Element Pointer And End Of Structure

Related Subroutines

- Label

DELETE STRUCTURE (PHOP,*,*,*)

Purpose

Use Delete Structure to delete the specified structure, its identifier, and its contents. When you use this subroutine to delete a closed structure, the graPHIGS API removes all references to the deleted structure (execute structure-type elements) from all existing structures. The deleted structure is also unposted from all workstations.

When you delete a structure that is an open structure, the structure remains open and is emptied, but the graPHIGS API does not remove references to the deleted structure. The result is as though you had issued the following subroutine calls:

- Close Structure
- Delete Structure (structure identifier)
- Open Structure (structure identifier)

  If the specified structure does not exist, then no action occurs.

  If it is necessary to empty the contents of a specified structure and at the same time maintain its association with all workstations, use the Empty Structure subroutine (the structure remains posted).

  Language Bindings

C

pdel_struct (*struct_id*)

Input Parameters

Pint struct_id
: Structure identifier.

FORTRAN

PDST (*strid*)

Input Parameters

integer strid
: Structure identifier.

Errors

2 Function Requires State (PHOP,*,*,*)

Related Subroutines

- Empty Structure
- Execute Structure
- Unpost Structure

DELETE STRUCTURE NETWORK (PHOP,*,*,*)

Purpose

Use Delete Structure Network to delete the specified structure and to delete structures referenced, either directly or indirectly, by the specified structure, depending on the value of the reference handling flag:

- If the flag is set to *KEEP*, then this subroutine does not delete the structures in the network that are referenced by structures outside the structure network. However, this subroutine deletes all other structures in the network hierarchy as if the application called the Delete Structure subroutine for each of them.
- If the flag is set to *DELETE*, then this subroutine deletes all the structures in the network as if the application called the Delete Structure subroutine for each of the structures regardless of whether they were referenced by a structure outside the network hierarchy or not.

The graPHIGS API also deletes all execute structure-type elements referencing any of the deleted structures.

Language Bindings

C

pdel_struct_net (*struct_id, ref_flag*)

Input Parameters

Pint struct_id
Structure identifier.

Pref_flag ref_flag
Reference handling flag (*0=PFLAG_DEL, 1=PFLAG_KEEP*).

FORTRAN

PDSN (*strid*, *refhnf*).

Input Parameters

integer strid
Structure identifier.

integer refhnf
Reference handling flag (*0=PDELE, 1=PKEEP*).

Errors

2 Function Requires State (PHOP,*,*,*)

Related Subroutines

- Delete Structure

EMPTY STRUCTURE (PHOP,*,*,*)

Purpose

Use Empty Structure to empty the contents of the specified structure.

References to this now empty structure remain intact. If the specified structure is the open structure, then the graPHIGS API sets the element pointer to zero. If the specified structure does not exist, then the graPHIGS API creates a new empty structure.

Language Bindings

C

pempty_struct (*struct_id*)

Input Parameters

Pint struct_id
Structure identifier.

FORTRAN

PEMST (*strid*)

Input Parameters

integer strid
Structure identifier.

Errors

2 Function Requires State (PHOP,*,*,*)

Related Subroutines

- None

LABEL (PHOP,*,STOP,*)

Purpose

Use Label to insert a Label structure element into the open structure following the element pointer or to replace the element pointed at by the element pointer with a Label structure element, depending on the current edit mode.

This structure element defines a label that the application uses to reference and modify structure elements.

Language Bindings

C

plabel (*label_id*)

Input Parameters

Pint label_id
Label identifier.

FORTRAN

PLB (*label*)

Input Parameters

integer label
Label identifier.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Delete Elements Between Labels
- Set Element Pointer At Label

OFFSET ELEMENT POINTER (PHOP,*,STOP,*)

Purpose

Use Offset Element Pointer to move the element pointer to a new element relative to the current element pointer.

This subroutine adds the pointer offset value to the element pointer. It can either be positive, which moves the element pointer forward, or negative, which moves the element pointer backward. If the resultant value is less than zero, then the element pointer defaults to a value of zero. If the resultant value is greater than the number of elements in the open structure, then the graPHIGS API sets the pointer to the last element.

Language Bindings

C

poffset_elem_ptr (*elem_ptr_offset*)

Input Parameters

Pint elem_ptr_offset
Element pointer offset.

FORTRAN

POSEP (*epo*)

Input Parameters

integer epo
Element pointer offset.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Inquire Element Pointer

OPEN STRUCTURE (PHOP,*,STCL,*)

Purpose

Use Open Structure to open a structure. The structure state is set to Structure Open (STOP).

When the application opens a structure, the graPHIGS API sets the element pointer to the last element of the currently specified structure. If the specified structure does not exist, then the graPHIGS API creates an empty structure and sets the element pointer to zero.

The graPHIGS API sets no limit on the number of simultaneously definable structures.

Language Bindings

C

popen_struct (*struct_id*)

Input Parameters

Pint struct_id
Structure identifier.

FORTRAN

POPST (*strid*)

Input Parameters

integer strid
Structure identifier.

Errors

6 Function Requires State (PHOP,*,STCL,*)

Related Subroutines

- Close Structure

SET EDIT MODE (PHOP,*,*,*)

Purpose

Use Set Edit Mode to set the current edit mode entry of the graPHIGS API state list to *INSERT* or *REPLACE*. If the application does not use this subroutine, then the edit mode defaults to *INSERT*.

When the application moves an element into an open structure, the edit mode determines how the element is to be placed into the structure:

- If the edit mode is set to *REPLACE*, then the graPHIGS API deletes the element at the element pointer. The incoming element takes its place. The graPHIGS API does not move the element pointer (so if another element is to be placed into the structure, then it replaces the last element that was just placed into the structure). If the element pointer is set to element 0, then the graPHIGS API inserts the incoming element into the structure and sets the element pointer to element 1.
- If the edit mode is set to *INSERT*, then the graPHIGS API inserts the incoming element into the open structure after the element at the element pointer. The graPHIGS API then increments the element pointer by 1 to point to the new element.

  The edit mode does not affect elements copied into the open structure by the Copy All Elements From Structure subroutine.

  Language Bindings

C

pset_edit_mode (*edit_mode*)

Input Parameters

Pedit_mode edit_mode
Edit mode (*0=PEDIT_INSERT, 1=PEDIT_REPLACE*).

FORTRAN

PSEDM (*editmo*)

Input Parameters

integer editmo
Edit mode (*0=PINSRT, 1=PREPLC*).

Errors

2 Function Requires State (PHOP,*,*,*)

Related Subroutines

- Inquire Edit Mode

SET ELEMENT POINTER (PHOP,*,STOP,*)

Purpose

Use Set Element Pointer to set the element pointer to the specified element number.

If the value is less than zero, then the element pointer defaults to a value of zero. If the value is greater than the number of elements in the open structure, then the graPHIGS API sets the pointer to the last element.

Language Bindings

C

pset_elem_ptr (*elem_ptr_value*)

Input Parameters

Pint elem_ptr_value
Element pointer value.

FORTRAN

PSEP (*ep*)

Input Parameters

integer ep
Element pointer value.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Inquire Element Pointer

SET ELEMENT POINTER AT LABEL (PHOP,*,STOP,*)

Purpose

Use Set Element Pointer at Label to set the element pointer to the specified label identifier element within the open structure.

Starting at the position following the current element pointer, the graPHIGS API searches for the first occurrence of the specified label. If the element pointer is already positioned at an occurrence of the specified label, then the search starts at the next element. If the graPHIGS API does not find the label when the end of the structure is reached, then the graPHIGS API generates an error and does not change the position of the current element pointer.

Language Bindings

C

pset_elem_ptr_label (*label_id*)

Input Parameters

Pint label_id
Label identifier.

FORTRAN

PSEPLB (*ep*)

Input Parameters

integer label
Label identifier.

Errors

5 Function Requires State (PHOP,*,STOP,*)

205 Label Not Between Element Pointer And End Of Structure

Related Subroutines

- Inquire Element Pointer
- Label

Chapter 7. Workstation Table Settings

When your application open a workstation, the graPHIGS API automatically creates workstation tables to describe the workstation. Each workstation table has default settings. Use the subroutines in this section to modify some of the table entries according to your application's specifications.

Most workstation table indexes begin with 1. The following exceptions begin with 0:

- color tables
- view tables

Some table entries may not be modified.

The subroutines in this section do *not* create structure elements or modify structure content. The changed table values only take effect after you update the workstation. The application may inquire the default table settings by issuing the appropriate inquiry programming calls. For a listing of the default tables for each supported workstation type, see *The graPHIGS Programming Interface: Technical Reference*.

SET COLOR MODEL (PHOP,WSOP,*,*)

Purpose

Use Set Color Model to set the current color model for the specified workstation to the given color model. Possible color models include: *1=RGB*, *2=CIELUV*, and *3=HSV*. The *CMY* color model is supported via GP*xxxx* subroutines.

Use this subroutine to specify a color model. The graPHIGS API uses this color model to interpret the color parameters for color definition and inquiries pertaining to the specified workstation.

Language Bindings

C

pset_colr_model (*ws_id, colr_model*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint colr_model
Color model (*1=PMODEL_RGB, 2=PMODEL_CIELUV, 3=PMODEL_HSV*).

FORTRAN

PSCMD (*wkid*, *cmodel*)

Input Parameters

integer wkid
Workstation identifier.

integer cmodel
Color model (*1=PRGB, 2=PCIE, 3=PHSV*).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

110 Specified Color Model Not Available On Workstation

Related Subroutines

- Inquire Color Model

SET COLOR REPRESENTATION (PHOP,WSOP,*,*)

Purpose

Use Set Color Representation to set the specified color values at the specified color table entry of the workstation's color table. All currently supported color models require three floating-point components. Each component must be in the range [0.0, 1.0].

If the color model is Hue-Saturation-Value (HSV), then the graPHIGS API uses the first color component (hue) as a fraction of the total range available (that is, zero to one is used to represent zero degrees to 360 degrees). If the second color component is zero, then the graPHIGS API ignores the first color component.

Language Bindings

C

pset_colr_rep (*ws_id, colr_ind, colr_rep*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint colr_ind
Color index (>=0).

*Pcolr_rep *colr_rep*
Color representation.

FORTRAN

PSCR (*wkid*, *ci*, *nccs*, *cspec*)

Input Parameters

integer wkid
Workstation identifier.

integer ci
Color index (>=0).

integer nccs
Number of components of color specification.

real cspec(*)
Color specification.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

113 Color Index Value < ZERO

103 Exceeded Maximum Number Of Workstation Bundle Table Entries

118 Color Component Is Out Of Range

Related Subroutines

- Inquire Color Facilities
- Inquire Color Representation
- Inquire Color Model

SET EDGE REPRESENTATION (PHOP,WSOP,*,*)

Purpose

Use Set Edge Representation to set the given attribute values in the specified entry of the edge bundle table for the specified workstation.

Language Bindings

C

pset_edge_rep (*ws_id, edge_ind, edge_bundle*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint edge_ind
Edge bundle index (>=1).

*const Pedge_bundle *edge_bundle*
Edge representation.

FORTRAN

PSEDR (*wkid*, *edi*, *edflag*, *edtype*, *ewidth*, *coli*)

Input Parameters

integer wkid
Workstation identifier.

integer edi
Edge bundle index (>=1).

integer edflag
Edge flag (*0=POFF, 1=PON*).

integer edtype
Edge type (*1=PLSOLI, 2=PLDASH, 3=PLDOT, 4=PLDASD*).

real ewidth
Edge width scale factor.

integer coli
Edge color index (>=0).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

100 Bundle Index Value Is Less Than One

103 Exceeded Maximum Number Of Workstation Bundle Table Entries

113 Color Index Value < ZERO

107 Specified Edgetype Not Available On Workstation

Related Subroutines

- Inquire Edge Facilities
- Inquire Edge Representation
- Set Color Model
- Set Edge Color Index
- Set Edge Index
- Set Edgetype
- Set Edgewidth Scale Factor
- Set Individual ASF

SET HIGHLIGHTING FILTER (PHOP,WSOP,*,*)

Purpose

Use Set Highlighting Filter to set the inclusion and exclusion highlighting filters for the specified workstation. The new filters take effect when you update the workstation.

The filters consist of class names which indicate which classes the graPHIGS API includes or excludes from highlighting. The same class names may exist in both the inclusion and exclusion filter. If a class name is in both filters when you update the workstation, then the graPHIGS API excludes the class. For more information on classes and class names, see *The graPHIGS Programming Interface: Understanding Concepts*. Use the Inquire PHIGS Facilities subroutine to inquire the number of available names for name sets.

Language Bindings

C

pset_highl_filter (*ws_id, filter*)

Input Parameters

Pint ws_id
Workstation identifier.

*const Pfilter *filter*
Highlighting filter.

FORTRAN

PSHLFT (*wkid*, *isn*, *is*, *esn*, *es*)

Input Parameters

integer wkid
Workstation identifier.

integer isn
Number of names in the inclusion set (>=0).

integer is(isn)
Inclusion set.

integer esn
Number of names in the exclusion set (>=0).

integer es(esn)
Exclusion set.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

Related Subroutines

- Add Names To Set
- Inquire Highlighting Filter
- Inquire PHIGS Facilities
- Remove Names From Set

SET HLHSR MODE (PHOP,WSOP,*,*)

Purpose

Use Set HLHSR Mode to set the requested Hidden Line/Hidden Surface Removal (HLHSR) mode in the workstation state list to the value specified.

If the dynamic modification accepted for HLHSR mode in the workstation description table is set to Immediate (IMM), or if the display surface empty entry in the workstation state list is set to *EMPTY*, then the graPHIGS API sets the current HLHSR mode in the workstation state list to the specified value and sets the HLHSR update state to *NOTPENDING*. Otherwise, the graPHIGS API sets the HLHSR update state to *PENDING* and does not change the current HLHSR mode.

Language Bindings

C

pset_hlhsr_mode (*ws_id, hlhsr_mode*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint hlhsr_mode
HLHSR mode (*0=OFF, 1=ON THE FLY*).

FORTRAN

PSHRM (*wkid*, *hrm*)

Input Parameters

integer wkid
Workstation identifier.

integer hrm
HLHSR mode (*0=OFF, 1=ON THE FLY*).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

111 Specified HLHSR Mode Not Available On Workstation

Related Subroutines

- Inquire HLHSR Identifier Facilities
- Inquire HLHSR Mode Facilities
- Set HLHSR Identifier

SET INTERIOR REPRESENTATION (PHOP,WSOP,*,*)

Purpose

Use Set Interior Representation to set the given attribute values in the specified table entry of the specified workstation.

The *EMPTY* and *HOLLOW* interior styles display nothing for the interior. If the edge flag is set to *OFF* and the interior style is *EMPTY*, then the graPHIGS API generates no visual output. The interior is detectable when the graPHIGS API encounters a primitive with an interior style of *EMPTY* and the primitive is eligible for picking, as determined by its visibility and detectability.

If the edge flag is *OFF* and the interior style is *HOLLOW*, then the graPHIGS API draws the boundary. When the graPHIGS API encounters a primitive with an interior style of *HOLLOW* only the boundary of the primitive is eligible for picking, as determined by its visibility and detectability.

Language Bindings

C

pset_int_rep (*ws_id, int_ind, int_bundle*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint int_ind
Interior bundle index (>=1).

*const Pint_bundle *int_bundle*
Interior representation.

FORTRAN

PSIR (*wkid*, *ii*, *ints*, *styli*, *coli*)

Input Parameters

integer wkid
Workstation identifier.

integer ii
Interior index (>=1).

integer ints
Interior style (*0=PHOLLO, 1=PSOLID, 2=PPATTR, 3=PHATCH, 4=PISEMP*).

integer styli
Interior style index (>=1).

integer coli
Interior color index (>=0).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

100 Bundle Index Value Is Less Than One

103 Exceeded Maximum Number Of Workstation Bundle Table Entries

108 Specified Interior Style Not Available On Workstation

112 Pattern Index Value < ONE

113 Color Index Value < ZERO

Related Subroutines

- Inquire Interior Representation
- Set Color Model
- Set Individual ASF
- Set Interior Color Index
- Set Interior Index
- Set Interior Style Index

SET INVISIBILITY FILTER (PHOP,WSOP,*,*)

Purpose

Use Set Invisibility Filter to set the inclusion and exclusion invisibility filters for the specified workstation.

The new filters take effect when you update the workstation. The filters consist of class names which indicate which classes the graPHIGS API includes or excludes from invisibility. The same classes may exist in both the inclusion and exclusion filter. If a class is in both filters when you update the workstation, then the graPHIGS API excludes the class. For more information on classes and class names, see *The graPHIGS Programming Interface: Understanding Concepts*. Use the Inquire PHIGS Facilities subroutine to inquire the number of available names for name sets.

Language Bindings

C

pset_invis_filter (*ws_id, filter*)

Input Parameters

Pint ws_id
Workstation identifier.

*const Pfilter *filter*
Invisibility filter.

FORTRAN

PSIVFT (*wkid*, *isn*, *is*, *esn*, *es*)

Input Parameters

integer wkid
Workstation identifier.

integer isn
Number of names in the inclusion set (>=0).

integer is(isn)
Inclusion set.

integer esn
Number of names in the exclusion set (>=0).

integer es(esn)
Exclusion set.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

Related Subroutines

- Add Names To Set
- Inquire Invisibility Filter
- Inquire PHIGS Facilities
- Remove Names From Set

SET PATTERN REPRESENTATION (PHOP,WSOP,*,*)

Purpose

Use Set Pattern Representation to set a given pattern definition in the specified entry of the workstation's pattern table.

The pattern is a grid of color indexes. The color indexes point into the color table of the specified workstation.

If the workstation supports interior style *PATTERN*, then the pattern table in the workstation state list has predefined entries taken from the workstation description table. For every workstation of category *OUTPUT* or *OUTIN* supporting interior style *PATTERN*, the graPHIGS API predefines a number of pattern table entries. With this function, you can redefine the table entries.

During structure traversal, if a pattern color index specified in the pattern color index array is not available on the workstation, then the graPHIGS API uses a color index value of 1.

Some workstations require that the pattern fill is a fixed size. For these workstations, the graPHIGS API replicates the specified pattern to the fixed size. (See *The graPHIGS Programming Interface: Technical Reference* for interior pattern information).

Language Bindings

C

pset_pat_rep (*ws_id, pat_ind, pat_bundle*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint pat_ind
Pattern index (>=1).

*const Ppat_rep *pat_bundle*
Pattern representation (The pattern color index array must be in row order).

FORTRAN

PSPAR (*wkid*, *pai*, *dimx*, *dimy*, *isc*, *isr*, *dx*, *dy*, *colia*)

Input Parameters

integer wkid
Workstation identifier.

integer pai
Pattern index (>=1).

integer dimx
X dimension of *colia* which contains the pattern color index array (>=1).

integer dimy
Y dimension of *colia* which contains the pattern color index array (>=1).

integer isc
Index to start column (>=1).

integer isr
Index to start row (>=1).

integer dx
Number of columns used (>=1).

integer dy
Number of rows used (>=1).

integer colia(dimx, dimy)
Pattern color index array (A grid of *dimx* by *dimy* color indexes. The array must be in row order. The pattern within this array begins at position (*isc*, *isr*), and is of dimension *dx* by *dy*).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

112 Pattern Index Value < ONE

103 Exceeded Maximum Number Of Workstation Bundle Table Entries

116 One Dimension Of Pattern Color Index Array < ONE

113 Color Index Value < ZERO

Related Subroutines

- Inquire Pattern Representation

SET POLYLINE REPRESENTATION (PHOP,WSOP,*,*)

Purpose

Use Set Polyline Representation to set the given attribute values in the specified entry of the polyline bundle table.

Language Bindings

C

pset_line_rep (*ws_id, line_ind, line_bundle*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint line_ind
Polyline bundle index (>=1).

*const Pline_bundle *line_bundle*
Polyline representation.

FORTRAN

PSPLR (*wkid*, *pli*, *ltype*, *lwidth*, *coli*)

Input Parameters

integer wkid
Workstation identifier.

integer pli
Polyline bundle index (>=1).

integer ltype
Polyline line types (*1=PLSOLI, 2=PLDASH, 3=PLDOT, 4=PLDASD*).

real lwidth
Line width scale factor.

integer coli
Polyline color index (>=0).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

100 Bundle Index Value Is Less Than One

103 Exceeded Maximum Number Of Workstation Bundle Table Entries

104 Specified Linetype Not Available On Workstation

113 Color Index Value < ZERO

Related Subroutines

- Inquire Polyline Representation
- Set Color Model
- Set Individual ASF
- Set Linetype
- Set Linewidth Scale Factor
- Set Polyline Color Index
- Set Polyline Index

SET POLYMARKER REPRESENTATION (PHOP,WSOP,*,*)

Purpose

Use Set Polymarker Representation to set the given attribute values in the specified entry of the polymarker bundle table.

Language Bindings

C

pset_marker_rep (*ws_id, marker_ind, marker_bundle*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint marker_ind
Polymarker bundle index (>=1).

*const Pmarker_bundle *marker_bundle*
Polymarker representation.

FORTRAN

PSPMR (*wkid*, *pmi*, *mtype*, *mszsf*, *coli*)

Input Parameters

integer wkid
Workstation identifier.

integer pmi
Polymarker bundle index (>=1).

integer mtype
Marker type (*1=PPOINT, 2=PPLUS, 3=PAST, 4=POMARK, 5=PXMARK*).

real mszsf
Marker size scale factor.

integer coli
Polymarker color index (>=0).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

100 Bundle Index Value Is Less Than One

103 Exceeded Maximum Number Of Workstation Bundle Table Entries

105 Specified Marker Type Not Available On Workstation

113 Color Index Value < ZERO

Related Subroutines

- Inquire Polymarker Representation
- Set Color Model
- Set Individual ASF
- Set Marker Size Scale Factor
- Set Polymarker Color Index
- Set Polymarker Index

SET TEXT REPRESENTATION (PHOP,WSOP,*,*)

Purpose

Use Set Text Representation to set the given attribute values into the specified entry of the text bundle table.

If you specify a precision that the workstation does not support, then the graPHIGS API substitutes the font's highest available precision for that workstation.

Language Bindings

C

pset_text_rep (*ws_id, text_ind, text_bundle*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint text_ind
Text bundle index (>=1).

*const Ptext_bundle *text_bundle*
Text representation.

FORTRAN

PSTXR (*wkid*, *txi*, *font*, *prec*, *chxp*, *chsp*, *coli*)

Input Parameters

integer wkid
Workstation identifier.

integer text
Text bundle index (>=1).

integer font
Text font.

integer prec
Text precision (*0=PSTRP, 1=PCHARP, 2=PSTRKP*).

real chxp
Character expansion factor.

real chsp
Character spacing.

integer coli
Text color index (>=0).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

100 Bundle Index Value Is Less Than One

103 Exceeded Maximum Number Of Workstation Bundle Table Entries

106 Specified Font Not Available For Requested Text Precision

113 Color Index Value < ZERO

Related Subroutines

- Inquire Text Representation
- Set Character Expansion Factor
- Set Character Spacing
- Set Color Model
- Set Individual ASF

- Set Text Color Index
- Set Text Font
- Set Text Index
- Set Text Precision

SET VIEW REPRESENTATION (PHOP,WSOP,*,*)

Purpose

Use Set View Representation to set fields in the specified entry of the workstation's view table. The view orientation matrix and the view mapping matrix are first expanded to 4x4 matrixes. Then the graPHIGS API stores the specified values in the *REQUESTED* view table entry. The graPHIGS API sets the corresponding *CURRENT* values in the view table entry to the *REQUESTED* values when you update the workstation.

The clipping indicators determine to which boundaries the graPHIGS API clips the contents of the view. The graPHIGS API sets the Z portion of the requested view clipping limits for the specified view to the default values.

The workstation's view table is 0 based, however, you cannot change view entry 0. (See *The graPHIGS Programming Interface: Technical Reference* for the default values for view entry 0).

Language Bindings

C

pset_view_rep (*ws_id, view_ind, view_rep*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint view_ind
View index (>=1).

*const Pview_rep *view_rep*
View representation.

FORTRAN

PSVWR (*wkid*, *viewi*, *vwormt*, *vwmpmt*, *vwcplm*, *xyclpi*)

Input Parameters

integer wkid
Workstation identifier.

integer viewi
View index (>=1).

real vwormt(3,3)
View orientation matrix.

real vwmpmt(3,3)
View mapping matrix.

real vwcplm(4)
View clipping limits in NPC (*XMIN, XMAX, YMIN, YMAX*).

integer xyclpi
X-Y clipping indicator (*0=PNCLIP, 1=PCLIP*).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

57 Specified Workstation Is Of Category MI

115 View Index Value < ONE

150 Exceeded Maximum Number Of View Table Entries

153 Invalid View Clipping Limits: XMIN>=XMAX, YMIN>=YMAX OR ZMIN>ZMAX

154 View Clipping Limits Are Not Within NPC Range

Related Subroutines

- Inquire View Representation
- Set View Representation 3

SET VIEW REPRESENTATION 3 (PHOP,WSOP,*,*)

Purpose

Use Set View Representation 3 to set fields in the specified entry of the workstation's view table. The graPHIGS API stores the specified values in the *REQUESTED* view table entry. The graPHIGS API sets the corresponding *CURRENT* values in the view table entry to the *REQUESTED* values when you update the workstation.

The clipping indicators determine to which boundaries the graPHIGS API clips the contents of the view.

The workstation's view table is 0 based, however, you cannot change view entry 0. (See *The graPHIGS Programming Interface: Technical Reference* for the default values for view entry 0).

Language Bindings

C

pset_view_rep3 (*ws_id, view_ind, view_rep*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint view_ind
View index (>=1).

*const Pview_rep3 *view_rep*
View representation.

FORTRAN

PSVWR3 (*wkid*, *viewi*, *vwormt*, *vwmpmt*, *vwcplm*, *xyclpi*, *bclipi*, *fclipi*)

Input Parameters

integer wkid
Workstation identifier.

integer viewi
View index (>=1).

real vwormt(4,4)
View orientation matrix.

real vwmpmt(4,4)
View mapping matrix.

real vwcplm(6)
View clipping limits in NPC (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

integer xyclpi
X-Y clipping indicator (*0=PNCLIP, 1=PCLIP*).

integer bclipi
Back clipping indicator (*0=PNCLIP, 1=PCLIP*).

integer fclipi
Front clipping indicator (*0=PNCLIP, 1=PCLIP*).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

57 Specified Workstation Is Of Category MI

115 View Index Value < ONE

150 Exceeded Maximum Number Of View Table Entries

153 Invalid View Clipping Limits: XMIN>=XMAX, YMIN>=YMAX OR ZMIN>ZMAX

154 View Clipping Limits Are Not Within NPC Range

Related Subroutines

- Inquire View Representation
- Set View Representation

SET VIEW TRANSFORMATION INPUT PRIORITY (PHOP,WSOP,*,*)

Purpose

Use Set View Transformation Input Priority to modify the input priority of the specified view in relation to another view on the specified workstation. If the specified view index is the same as the reference view index, then this function has no effect.

This subroutine only changes the input priority of a view. The display surface shows no visual changes.

Language Bindings

C

pset_view_tran_in_pri (*ws_id, view_ind, ref_view_ind, rel_pri*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint view_ind
View index (>=0).

Pint ref_view_ind
Reference view index (>=0).

Prel_pri rel_pri
Relative priority (*0=PPRI_HIGHER, 1=PPRI_LOWER*).

FORTRAN

PSVTIP (*wkid*, *viewi*, *rfvwix*, *relpri*)

Input Parameters

integer wkid
Workstation identifier.

integer viewi
View index (>=0).

integer rfvwix
Reference view index (>=0).

integer relpri
Relative priority (*0=PHIGHR, 1=PLOWER*).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

57 Specified Workstation Is Of Category MI

114 View Index Value < ZERO

101 Specified Representation Has Not Been Defined

Related Subroutines

- Inquire List Of View Indices

Chapter 8. Structure Display Subroutines

The subroutines included in this section let your application program post or unpost a structure network for display on a workstation.

POST STRUCTURE (PHOP,WSOP,*,*)

Purpose

Use Post Structure to add the specified structure to the list of posted structures in the workstation state list (WSL) of the specified workstation. This subroutine adds the workstation identifier to the list of workstations to which the specified structure is posted. If the specified structure does not exist, then the graPHIGS API creates a new empty structure.

The graPHIGS API assigns the specified display priority to the structure network. The display priority indicates the relative importance of the posted structure network. If your application posts multiple structures for display to the same display space location, then the graPHIGS API displays the higher priority structure network. If two structures have the same priority, then the graPHIGS API considers the last posted structure to have the higher priority.

Upon second and subsequent posting of a structure, the graPHIGS API removes the structure from the list of posted structures, and then reposts it at the priority the application specifies.

Language Bindings

C

ppost_struct (*ws_id, struct_id, pri*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint struct_id
Structure identifier.

Pfloat pri
Display priority (0.0<=priority<=1.0).

FORTRAN

PPOST (*wkid*, *strid*, *priort*)

Input Parameters

integer wkid
Workstation identifier.

integer strid
Structure identifier.

real priort
Display priority (0.0<=priority<=1.0).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

208 Display Priority Is Out Of Range

Related Subroutines

- Inquire Number Of Display Priorities Supported
- Inquire Posted Structures
- Inquire Set Of Workstations To Which Posted
- Unpost All Structures
- Unpost Structure

UNPOST ALL STRUCTURES (PHOP,WSOP,*,*)

Purpose

Use Unpost All Structures to unpost all structures from the specified workstation. Unposting a structure does not delete the structure.

Language Bindings

C

punpost_all_structs (*ws_id*)

Input Parameters

Pint ws_id
Workstation identifier.

FORTRAN

PUPAST (*wkid*)

Input Parameters

integer wkid
Workstation identifier.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

Related Subroutines

- Inquire Posted Structures
- Inquire Set Of Workstations To Which Posted
- Post Structure
- Unpost Structure

UNPOST STRUCTURE (PHOP,WSOP,*,*)

Purpose

Use Unpost Structure to unpost the specified structure from the specified workstation. Unposting a structure does not delete the structure.

Language Bindings

C

punpost_struct (*ws_id, struct_id*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint struct_id
Structure identifier.

FORTRAN

PUPOST (*wkid*, *strid*)

Input Parameters

integer wkid
Workstation identifier.

integer strid
Structure identifier.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

Related Subroutines

- Inquire Posted Structures
- Inquire Set Of Workstations To Which Posted
- Post Structure
- Unpost Structure

Chapter 9. Structure Archiving Subroutines

The subroutines included in this section let your application program manipulate structure archive files.

Invoke these subroutines to:

- open/close archive files
- create structures and structure hierarchies in an archive file
- delete structures and structure hierarchies in an archive file
- set conflict resolution flags
- receive structure identifier and structure path information from an archive file

ARCHIVE ALL STRUCTURES (PHOP,*,*,AROP)

Purpose

Use Archive All Structures to store all structures from the structure store into the specified open archive file.

If any of the specified structures in the structure store already exists in the archive file, then the graPHIGS API resolves the conflict according to the value of the archive conflict resolution flag specified by the Set Conflict Resolution subroutine.

Language Bindings

C

par_all_structs(*archive_id*)

Input Parameters

Pint archive_id
Archive file identifier.

FORTRAN

PARAST(*afid*)

Input Parameters

integer afid
Archive file identifier.

Errors

7 Function Requires State (PHOP,*,*,AROP)

404 Specified Archive File Is Not Open

405 Name Conflict Occurred, Conflict Resolution Flag = Abandon

406 Warning, Archive File Is Full

Related Subroutines

- Archive Structure Networks
- Archive Structures

- Set Conflict Resolution

ARCHIVE STRUCTURE NETWORKS (PHOP,*,*,AROP)

Purpose

Use Archive Structure Networks to store one or more structure networks from the structure store into the specified open archive file.

If any of the specified root structures do not exist in the structure store, then the graPHIGS API issues a warning and no action is taken for the non-existing structures. If any of the specified structures in the structure network already exists in the archive file, then the graPHIGS API resolves the conflict according to the value of the archive conflict resolution flag specified by the Set Conflict Resolution subroutine.

If the archive file is not large enough to complete the archival process, then the graPHIGS API issues an error and does not archive any other structure networks. However, any structures that the graPHIGS API archived are archived completely.

Language Bindings

C

par_struct_nets(*archive_id, struct_ids*)

Input Parameters

Pint archive_id
Archive file identifier.

*cont Pint_list *struct_ids*
List of root structure identifiers.

FORTRAN

PARSN(*afid*, *n*, *lstrid*)

Input Parameters

integer afid
Archive file identifier.

integer n
Number of root structure identifiers in the list.

integer lstrid(n)
List of root structure identifiers.

Errors

7 Function Requires State (PHOP,*,*,AROP)

404 Specified Archive File Is Not Open

200 Warning, Ignoring Structures That Do Not Exist

405 Name Conflict Occurred, Conflict Resolution Flag = Abandon

406 Warning, Archive File Is Full

Related Subroutines

- Archive Structure Networks
- Archive Structures
- Set Conflict Resolution

ARCHIVE STRUCTURES (PHOP,*,*,AROP)

Purpose

Use Archive Structures to store one or more specified structures from the structure store into the specified open archive file.

If any of the specified structures do not exist in the structure store, then the graPHIGS API issues a warning and no action is taken for the non-existing structures. If any of the specified structures already exists in the archive file, then the graPHIGS API resolves the conflict according to the value of the archive conflict resolution flag specified by the Set Conflict Resolution subroutine.

If the archive file is not large enough to complete the archival process, then the graPHIGS API issues an error and does not archive any other structures. However, any structures that the graPHIGS API archived are archived completely.

Language Bindings

C

par_structs(*archive_id, struct_ids*)

Input Parameters

Pint archive_id
Archive file identifier.

*cont Pint_list *struct_ids*
List of structure identifiers.

FORTRAN

PARST(*afid*, *n*, *lstrid*)

Input Parameters

integer afid
Archive file identifier.

integer n
Number of structure identifiers in the list.

integer lstrid(n)
List of structure identifiers.

Errors

7 Function Requires State (PHOP,*,*,AROP)

404 Specified Archive File Is Not Open

200 Warning, Ignoring Structures That Do Not Exist

405 Name Conflict Occurred, Conflict Resolution Flag = Abandon

406 Warning, Archive File Is Full

Related Subroutines

- Archive Structure Networks
- Archive Structures
- Set Conflict Resolution

CLOSE ARCHIVE FILE (PHOP,*,*,AROP)

Purpose

Use Close Archive File to close the specified open archive file. The graPHIGS API removes the archive file identifier from the set of open archive files.

If no other archive files are open, then this subroutine sets the current archive state to Archive Closed (ARCL).

Language Bindings

C

pclose_ar_file (*archive_id*)

Input Parameters

Pint archive_id
Archive file identifier.

FORTRAN

PCLARF (*afid*)

Input Parameters

integer afid
Archive file identifier.

Errors

7 Function Requires State (PHOP,*,*,AROP)

404 Specified Archive File Is Not Open

Related Subroutines

- Open Archive File

DELETE ALL STRUCTURES FROM ARCHIVE (PHOP,*,*,AROP)

Purpose

Use Delete All Structures from Archive to delete all structures from the specified open archive file.

This subroutine is equivalent to invoking the Delete Structures from Archive for each structure in the selected structure store.

When this subroutine call is completed, the state of the archive file is as if your application just opened it for the first time.

Language Bindings

C

pdel_all_structs_ar (*archive_id*)

Input Parameters

Pint archive_id
Archive file identifier.

FORTRAN

PDASAR(*afid*)

Input Parameters

integer afid
Archive file identifier.

Errors

7 Function Requires State (PHOP,*,*,AROP)

404 Specified Archive File Is Not Open

Related Subroutines

- Delete Structure Networks From Archive
- Delete Structures From Archive

DELETE STRUCTURE NETWORKS FROM ARCHIVE (PHOP,*,*,AROP)

Purpose

Use Delete Structure Networks from Archive to delete one or more structure networks from the specified open archive file.

The graPHIGS API does not check if other structures in the archive file reference the deleted structures. Therefore, the graPHIGS API does not delete the execute structure elements in other archived structures that reference the deleted structures.

If the specified structure does not exist in the archive file, then the graPHIGS API issues a warning and no action is taken for the structure.

Language Bindings

C

pdel_struct_nets_ar (*archive_id, struct_ids*)

Input Parameters

Pint archive_id
Archive file identifier.

*cont Pint_list *struct_ids*
List of root structure identifiers.

FORTRAN

PDSNAR (*afid*, *n*, *lstrid*)

Input Parameters

integer afid
Archive file identifier.

integer n
Number of root structure identifiers in the list.

integer lstrid(n)
List of root structure identifiers.

Errors

7 Function Requires State (PHOP,*,*,AROP)

404 Specified Archive File Is Not Open

407 Warning, Some Specified Structures Do Not Exist On Archive File

Related Subroutines

- Delete All Structures From Archive
- Delete Structures From Archive
- Execute Structure

DELETE STRUCTURES FROM ARCHIVE (PHOP,*,*,AROP)

Purpose

Use Delete Structures from Archive to delete one or more structures from the specified open archive file.

The graPHIGS API does not check if other structures in the archive file reference the deleted structures. Therefore, the graPHIGS API does not delete the execute structure elements in other archived structures that reference the deleted structures.

If a specified structure does not exist in the archive file, then the graPHIGS API issues a warning and no action is taken for the structure.

Language Bindings

C

pdel_structs_ar (*archive_id, struct_ids*)

Input Parameters

Pint archive_id
Archive file identifier.

*cont Pint_list *struct_ids*
List of structure identifiers.

FORTRAN

PDSTAR (*afid*, *n*, *lstrid*)

Input Parameters

integer afid
Archive file identifier.

integer n
Number of structure identifiers in the list.

integer lstrid(n)
List of structure identifiers.

Errors

7 Function Requires State (PHOP,*,*,AROP)

404 Specified Archive File Is Not Open

407 Warning, Some Specified Structures Do Not Exist On Archive File

Related Subroutines

- Delete All Structures From Archive
- Delete Structures From Archive
- Execute Structure

OPEN ARCHIVE FILE (PHOP,*,*,*)

Purpose

Use Open Archive File to open a graPHIGS API archive file.

This subroutine function sets the current archive state to Archive Open (AROP). The graPHIGS API adds the archive file identifier to the set of open archive files.

The graPHIGS API External Defaults File (EDF) allows the application to denote, indirectly, the actual value of the file descriptor. For more information on the External Defaults File, see *The graPHIGS Programming Interface: Technical Reference* under ″Defaults and Nicknames″.

Language Bindings

C

popen_ar_file (*archive_id, archive_file*)

Input Parameters

Pint archive_id
Archive file identifier.

*const char *archive_file*
Archive file descriptor. This parameter looks like a Unix file descriptor which consists of a

[path]/filename[extension]. **Path** is the route of directories through the file system. **Path** is optional and ignored for MVS and VM. An example of a full file descriptor:

```
/phigs/file1.archive
```

where:

- **path** = **/phigs** which says go from the root directory to the directory phigs.
- **filename** = **file1**
- **extension** = **.archive**

The following rules apply to the descriptor, depending on which system the nucleus is running in:

- **AIX**

  If you did not specify the path, then the graPHIGS API uses the default directory at the time of the execution of the subroutine.
- **MVS**
  - *filename* - You must specify a filename. This is the DD-name of the BSAM data set of the archive file.
  - *extension* - Any extension is ignored.
- **VM/CMS**

  The file descriptor can have one of two forms:
  - *filename [filetype [filemode]]* or
  - *filename[.filetype[.filemode]]*

  If the filetype is missing, then the graPHIGS API uses a filetype of *ARCHIVE*.

  If the filemode is missing, then the graPHIGS API uses a filemode of *A1*.

FORTRAN

POPARF (*afid*, *arcfil*)

Input Parameters

integer afid
Archive file identifier.

integer arcfil
Archive file descriptor. An integer value for this descriptor. An association between this value and a valid file descriptor is then made via an External Defaults File (EDF).

For example, the file descriptor of **file1.archive** is attained if the EDF contains the following line:

```
AFMMDFT ARCHIVE=(99,file1.archive,)
```

and the application is coded:

```
CALL POPARF(1,99)
```

If the EDF does not contain a match for the integer value, then a filename is created based on the integer value using the following formula:

```
final value = Remainder (Absolute Value (original value) / 999)
```

The graPHIGS API uses this final value (000<=final value<=999) to create the filename (AFMAF*xxx*, where *xxx* is the final value).

Errors

2 Function Requires State (PHOP,*,*,*)

402 Archive File Identifier Already In Use

400 Archive File Cannot Be Opened

401 Exceeded Maximum Number Of Simultaneously Open Archive Files

403 Archive File Is Not A PHIGS Archive File

Related Subroutines

- Close Archive File

RETRIEVE ALL STRUCTURES (PHOP,*,*,AROP)

Purpose

Use Retrieve All Structures to retrieve all structures from the specified open archive file and place them into the structure store.

If any of the specified structures in the archive file already exists in the structure store, then the graPHIGS API resolves the conflict according to the value of the archive conflict resolution flag specified by the Set Conflict Resolution subroutine.

When you retrieve a structure that is the open structure, the structure is closed, emptied, retrieved, and reopened and the graPHIGS API maintains all references to the structure. The result is as though you had issued the following:

1. Close Structure
2. Empty Structure
3. Retrieve Structure
4. Open Structure

If the structure retrieved contains an execute structure element that references a non-existing structure, then the graPHIGS API creates an empty structure.

Language Bindings

C

pret_all_structs (*archive_id*)

Input Parameters

Pint archive_id
Archive file identifier.

FORTRAN

PRAST (*afid*)

Input Parameters

integer afid
Archive file identifier.

Errors

7 Function Requires State (PHOP,*,*,AROP)

404 Specified Archive File Is Not Open

405 Name Conflict Occurred, Conflict Resolution Flag = Abandon

Related Subroutines

- Retrieve Structure Networks
- Retrieve Structures
- Set Conflict Resolution

RETRIEVE PATHS TO ANCESTORS (PHOP,*,*,AROP)

Purpose

Use Retrieve Paths to Ancestors to retrieve the ancestral paths of the specified structure from the specified open archive file.

A path of ancestors of a structure *S* is a list of ordered pairs ((*A*1,*E*1), (*A*2,*E*2),..., (*Am*,*Em*),(*S*,0)) where each ordered pair consists of an identifier of a structure (*Ax*) that is an ancestor of the specified structure (*S*) and the position of an execute structure-type element (*Ex*) that references the next structure in the path. Ancestor structure *A1* is the top of the path (e.g., not referenced by any other structure) and *S* is the bottom of the path.

The path order and path depth determine the portion of each path that the graPHIGS API returns. Your application can specify the path order as *TOP_FIRST* or *BOTTOM_FIRST*. The path depth determines the maximum number of ordered pairs returned in any one path. Specifying a path depth of zero returns each path in its entirety. When truncation occurs, the path order determines whether the graPHIGS API returns the head or tail portion of the path. This truncation can result in two or more portions of paths having the same set of element references. The graPHIGS API returns only one such portion so that all the returned path portions are distinct.

Language Bindings

C

pret_paths_ances (*ar_id*, *struct_id*, *order*, *depth*, *store*, *paths*)

Input Parameters

Pint ar_id
: Archive file identifier.

Pint struct_id
: Structure identifier.

Ppath_order order
: Path order (*0=PORDER_TOP_FIRST, 1=PORDER_BOTTOM_FIRST*).

Pint depth
: Path depth (>=0).

Pstore store
: Handle to the store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See the Create Store subroutine for details on how the graPHIGS API uses this parameter.

Output Parameters

*Pelem_ref_list_list **paths*
Structure path list. The memory referenced by **paths* is managed by Store. If an error occurs, then **paths* is set to *NULL*.

FORTRAN

PREPAN (*afid*, *strid*, *pthord*, *pthdep*, *ipthsz*, *n*, *ol*, *apthsz*, *paths*)

Input Parameters

integer afid
Archive file identifier.

integer strid
Structure identifier.

integer pthord
Path order (*0=PPOTOP, 1=PPOBOT*).

integer pthdep
Path depth (>=0).

integer ipthsz
Maximum number of path entries that the buffer can hold.

integer n
Element of the list of paths.

Output Parameters

integer ol
Number of paths available

integer apthsz
Actual number of entries in the n^{th} structure path.

integer paths(2,ipthsz)
n^{th} structure path.

Errors

7 Function Requires State (PHOP,*,*,AROP)

201 Specified Structure Does Not Exist

207 Specified Path Depth < Zero

Related Subroutines

- Retrieve Paths To Descendants

RETRIEVE PATHS TO DESCENDANTS (PHOP,*,*,AROP)

Purpose

Use Retrieve Paths to Descendants to retrieve the descendant paths of the specified structure from the specified open archive file.

A path of descendants of a structure *S* is a list of ordered pairs ((*S*,*E*0), (*D*1,*E*1), (*D*2,*E*2),..., (*Dn*,0)) where each ordered pair consists of an identifier of a structure (*Dx*) that is a descendant of the specified structure

(*S*) and the position of an execute structure-type element (*Ex*) that references the next structure in the path The specified structure *S* is the top of the path and descendant structure *Dn* is the bottom of the path (e.g., it does not reference any other structure).

The path order and path depth determine the portion of each path that the graPHIGS API returns. Your application can specify the path order as *TOP_FIRST* or *BOTTOM_FIRST*. The path depth determines the maximum number of ordered pairs returned in any one path. Specifying a path depth of zero returns each path in its entirety. When truncation occurs, the path order determines whether the graPHIGS API returns the head or tail portion of the path. This truncation can result in two or more portions of paths having the same set of element references. The graPHIGS API returns only one such portion so that all the returned path portions are distinct.

Language Bindings

C

pret_paths_descs (*ar_id*, *struct_id*, *order*, *depth*, *store*, *paths*)

Input Parameters

Pint ar_id
Archive file identifier.

Pint struct_id
Structure identifier.

Ppath_order order
Path order (*0=PORDER_TOP_FIRST, 1=PORDER_BOTTOM_FIRST*).

Pint depth
Path depth (>=0).

Pstore store
Handle to the store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See the Create Store subroutine for details on how the graPHIGS API uses this parameter.

Output Parameters

*Pelem_ref_list_list **paths*
Structure path list. The memory referenced by **paths* is managed by Store. If an error occurs, then **paths* is set to *NULL*.

FORTRAN

PREPDE (*afid*, *strid*, *pthord*, *pthdep*, *ipthsz*, *n*, *ol*, *apthsz*, *paths*)

Input Parameters

integer afid
Archive file identifier.

integer strid
Structure identifier.

integer pthord
Path order (*0=PPOTOP, 1=PPOBOT*).

integer pthdep
Path depth (>=0).

integer ipthsz
Maximum number of path entries that the buffer can hold.

integer n
Element of the list of paths.

Output Parameters

integer ol
Number of paths available

integer apthsz
Actual number of entries in the n^{th} structure path.

integer paths(2,ipthsz)
n^{th} structure path.

Errors

7 Function Requires State (PHOP,*,*,AROP)

201 Specified Structure Does Not Exist

207 Specified Path Depth < Zero

Related Subroutines

- Retrieve Paths To Ancestors

RETRIEVE STRUCTURE IDENTIFIERS (PHOP,*,*,AROP)

Purpose

Use Retrieve Structure Identifiers to retrieve a list of structure identifiers in the specified open archive file.

Language Bindings

C

pret_struct_id (*archive_id, num_elems_appl_list, start_ind, ids, num_elems_impl_list*)

Input Parameters

Pint archive_id
Archive file identifier.

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint_list *ids*
List of structure identifiers.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PRSID (*afid*, *ilsize*, *n*, *lstrid*)

Input Parameters

integer afid
Archive file identifier.

integer ilsize
Size of the list (*lstrid*).

Output Parameters

integer n
Number of structure identifiers in list.

integer lstrid(*)
List of structure identifiers.

Errors

7 Function Requires State (PHOP,*,*,AROP)

404 Specified Archive File Is Not Open

Related Subroutines

- None

RETRIEVE STRUCTURE NETWORKS (PHOP,*,*,AROP)

Purpose

Use Retrieve Structure Networks to retrieve one or more structure networks from the specified open archive file and place them into the structure store.

If any of the specified root structures do not exist in the specified archive file and the specified structure identifier does not exist in the structure store, then the graPHIGS API issues a warning and creates an empty structure. If any of the specified root structures do not exist in the specified archive file and the specified structure identifier does exist in the structure store and the conflict resolution flag is set to *UPDATE*, then the graPHIGS API issues a warning and empties the structure.

If any of the specified structures in the structure network already exists in the structure store, then the graPHIGS API resolves the conflict according to the value of the archive conflict resolution flag specified by the Set Conflict Resolution subroutine.

When you retrieve a structure that is an open structure, the structure is closed, emptied, retrieved, and reopened and the graPHIGS API maintains all references to the structure. The result is as though you had issued the following:

1. Close Structure
2. Empty Structure
3. Retrieve Structure
4. Open Structure

If the structure retrieved contains an execute structure element that references a non-existing structure, then the graPHIGS API creates an empty structure.

Language Bindings

C

pret_struct_nets (*archive_id*, *struct_ids*)

Input Parameters

Pint archive_id
Archive file identifier.

*const Pint_list *struct_ids*
List of root structure identifiers.

FORTRAN

PRESN (*afid*, *n*, *lstrid*)

Input Parameters

integer afid
Archive file identifier.

integer n
Number of root structure identifiers in list.

integer lstrid(n)
List of root structure identifiers.

Errors

7 Function Requires State (PHOP,*,*,AROP)

404 Specified Archive File Is Not Open

405 Name Conflict Occurred, Conflict Resolution Flag = Abandon

408 Warning, Structure(s) Not In Archive, Empty One(s) To Be Created

Related Subroutines

- Retrieve All Structures
- Retrieve Structures
- Set Conflict Resolution

RETRIEVE STRUCTURES (PHOP,*,*,AROP)

Purpose

Use Retrieve Structures to retrieve one or more structures from the specified open archive file and place them into the structure store.

If any of the specified structures do not exist in the specified archive file and the specified structure identifier does not exist in the structure store, then the graPHIGS API issues a warning and creates an empty structure. If any of the specified structures do not exist in the specified archive file and the specified structure identifier does exist in the structure store and the conflict resolution flag is set to *UPDATE*, then the graPHIGS API issues a warning and empties the structure.

If any of the specified structures in the structure network already exists in the structure store, then the graPHIGS API resolves the conflict according to the value of the archive conflict resolution flag specified by the Set Conflict Resolution subroutine.

When you retrieve a structure that is an open structure, the structure is closed, emptied, retrieved, and reopened and the graPHIGS API maintains all references to the structure. The result is as though you had issued the following:

1. Close Structure
2. Empty Structure
3. Retrieve Structure
4. Open Structure

If the structure retrieved contains an execute structure element that references a non-existing structure, then the graPHIGS API creates an empty structure.

Language Bindings

C

pret_structs (*archive_id, struct_ids*)

Input Parameters

Pint archive_id
Archive file identifier.

*const Pint_list *struct_ids*
List of structure identifiers.

FORTRAN

PREST (*afid*, *n*, *lstrid*)

Input Parameters

integer afid
Archive file identifier.

integer n
Number of structure identifiers in list.

integer lstrid(n)
List of structure identifiers.

Errors

7 Function Requires State (PHOP,*,*,AROP)

404 Specified Archive File Is Not Open

405 Name Conflict Occurred, Conflict Resolution Flag = Abandon

408 Warning, Structure(s) Not In Archive, Empty One(s) To Be Created

Related Subroutines

- Retrieve All Structures
- Retrieve Structures
- Set Conflict Resolution

SET CONFLICT RESOLUTION (PHOP,*,*,*)

Purpose

Use Set Conflict Resolution to set the conflict resolution flags for use by all archive files. The graPHIGS API uses these flags to determine how to resolve conflicts when you are archiving or retrieving one or more structures (e.g., when a structure that exists in a specified archive file has the same identifier as a structure that exists in the structure store).

There are two conflict resolution flags: the archival conflict resolution for moving structure data to an archive file from the structure store and the retrieval conflict resolution for moving structure data from an archive file to the structure store. Your application can set either of these flags to: *MAINTAIN*, *ABANDON*, or *UPDATE*.

- If the value is set to *MAINTAIN*, then the graPHIGS API does not transfer any structures when a conflict occurs.
- If the value is set to *ABANDON*, then the graPHIGS API does not transfer any structures when a conflict occurs.
- If the value is set to *UPDATE*, then the graPHIGS API transfers all the structures and replaces any conflicting structures with the new ones.

If this subroutine is not used, then the archival conflict resolution flag defaults to a value of *UPDATE* and the retrieval conflict resolution flag defaults to a value of *ABANDON*.

Language Bindings

C

pset_conf_res (*archive_res, retrieval_res*)

Input Parameters

Pconf_res archive_res
: Archival conflict resolution. (*0=PRES_MAINTAIN, 1=PRES_ABANDON, 2=PRES_UPD*).

Pconf_res retrieval_res
: Retrieval conflict resolution (*0=PRES_MAINTAIN, 1=PRES_ABANDON, 2=PRES_UPD*).

FORTRAN

PSCNRS (*arccr*, *retcr*)

Input Parameters

integer arccr
: Archival conflict resolution (*0=PCRMNT, 1=PCRABA, 2=PCRUPD*).

integer retcr
: Retrieval conflict resolution (*0=PCRMNT, 1=PCRABA, 2=PCRUPD*).

Errors

2 Function Requires State (PHOP,*,*,*)

Related Subroutines

- Inquire Conflict Resolution

Chapter 10. Transformation Subroutines

The transformation and clipping subroutines found in this section fall into three general categories: modeling clipping, modeling transformations and workstation transformations.

Modeling Clipping

The modeling clipping subroutines create modeling clipping structure elements, which modify the current modeling clipping values that the graPHIGS API applies to primitives during traversal.

Modeling Transformations

The modeling transformation subroutines create transformation structure elements, which modify the current transformation values that the graPHIGS API applies to primitives during traversal.

When the graPHIGS API inserts a structure element into an open structure following the element pointer, the pointer moves to the new element.

Workstation Transformations

The workstation transformation subroutines allow the application to modify the mapping of Normalized Projection Coordinates (NPC) into Device Coordinates (DC) for a specified workstation.

RESTORE MODELING CLIPPING VOLUME (PHOP,*,STOP,*)

Purpose

Use Restore Modeling Clipping Volume to insert a Restore Modeling Clipping Volume structure element into the open structure following the element pointer, or to replace the element pointed at by the element pointer with a Restore Modeling Clipping Volume structure element, depending on the current edit mode.

During traversal, the Restore Modeling Clipping Volume structure element restores the current modeling clipping volume in the graPHIGS API traversal state list to the volume inherited by the structure. At structure traversal time, the graPHIGS API uses this volume to render all subsequent primitives.

Language Bindings

C

prestore_model_clip_vol();

FORTRAN

PRMCV

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

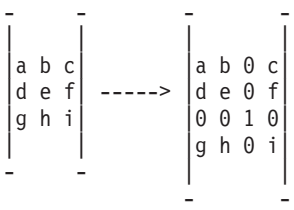
- Inquire Modeling Clipping Facilities
- Set Modeling Clipping Indicator

SET GLOBAL TRANSFORMATION (PHOP,*,STOP,*)

Purpose

Use Set Global Transformation to insert a two-dimensional Set Global Transformation structure element into the open structure following the element pointer, or replace the element pointed at by the element pointer with a Set Global Transformation structure element, depending on the current edit mode.

When the graPHIGS API encounters this element during traversal, the graPHIGS API expands it into a 4x4 matrix as follows:



and causes the expanded matrix to become the current global transformation for the current structure. The resultant matrix, in conjunction with the local modeling transformation, transforms all subsequent primitives from the Modeling Coordinate (MC) system to the World Coordinate (WC) system.

Language Bindings

C

pset_global_tran (*global_tran*)

Input Parameters

Pmatrix global_tran
Global transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

FORTRAN

PSGMT (*xfrmt*)

Input Parameters

real xfrmt(3,3)
Global transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- None

SET GLOBAL TRANSFORMATION 3 (PHOP,*,STOP,*)

Purpose

Use Set Global Transformation 3 to insert a three-dimensional Set Global Transformation 3 structure element into the open structure following the element pointer, or replace the element pointed at by the element pointer with a Set Global Transformation 3 structure element, depending on the current edit mode.

When encountered during traversal, this element causes the specified matrix to replace the current global transformation for the current structure. The resultant matrix, in conjunction with the local modeling transformation, transforms all subsequent primitives from the Modeling Coordinate (MC) system to the World Coordinate (WC) system.

Language Bindings

C

pset_global_tran3 (*global_tran*)

Input Parameters

Pmatrix3 global_tran
Global transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

FORTRAN

PSGMT3 (*xfrmt*)

Input Parameters

real xfrmt(4,4)
Global transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

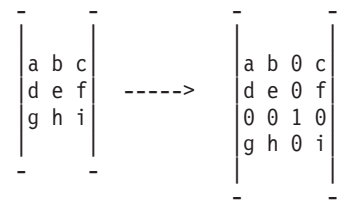
- None

SET LOCAL TRANSFORMATION (PHOP,*,STOP,*)

Purpose

Use Set Local Transformation to insert a two-dimensional Set Local Transformation structure element into the open structure following the element pointer, or replace the element pointed at by the element pointer with a Set Local Transformation structure element, depending on the current edit mode.

When the graPHIGS API encounters this element during traversal, the graPHIGS API expands it into a 4 X 4 matrix as follows:



Depending on the composition type, when the graPHIGS API encounters this element during traversal, the specified matrix replaces, is pre-concatenated with, or is post-concatenated with the current local modeling transformation matrix. The resultant matrix, in conjunction with the global modeling transformation, transforms all subsequent primitives from the Modeling Coordinate (MC) system to the World Coordinate (WC) system.

Language Bindings

C

pset_local_tran (*local_tran, compose_type*)

Input Parameters

Pmatrix local_tran
Local transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

Pcompose_type compose_type
Composition type (*0=PTYPE_PRECONCAT, 1=PTYPE_POSTCONCAT, 2=PTYPE_REPLACE*).

FORTRAN

PSLMT (*xfrmt*, *ctype*)

Input Parameters

real xfrmt(3,3)
Local transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

integer ctype
Composition type (*0=PCPRE, 1=PCPOST, 2=PCREPL*).

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- None

SET LOCAL TRANSFORMATION 3 (PHOP,*,STOP,*)

Purpose

Use Set Local Transformation 3 to insert a three-dimensional Set Local Transformation 3 structure element into the open structure following the element pointer, or replace the element pointed at by the element pointer with a Set Local Transformation 3 structure element, depending on the current edit mode.

Depending on the composition type, when the graPHIGS API encounters this element during traversal, the specified matrix replaces, is pre-concatenated with, or is post-concatenated with the current local modeling transformation matrix. The resultant matrix, in conjunction with the global modeling transformation, transforms all subsequent primitives from the Modeling Coordinate (MC) system to the World Coordinate (WC) system.

Language Bindings

C

pset_local_tran3 (*local_tran, compose_type*)

Input Parameters

Pmatrix3 local_tran
Local transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

Pcompose_type compose_type
Composition type (*0=PTYPE_PRECONCAT, 1=PTYPE_POSTCONCAT, 2=PTYPE_REPLACE*).

FORTRAN

PSLMT3 (*xfrmt*, *ctype*)

Input Parameters

real xfrmt(4,4)
Local transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

integer ctype
Composition type (*0=PCPRE, 1=PCPOST, 2=PCREPL*).

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- None

SET MODELING CLIPPING VOLUME (PHOP,*,STOP,*)

Purpose

Use Set Modeling Clipping Volume to insert a two-dimensional Set Modeling Clipping Volume structure element into the open structure following the element pointer, or to replace the element pointed at by the element pointer with a Set Modeling Clipping Volume structure element, depending on the current edit mode.

This structure element specifies the current modeling clipping volume. Each modeling clipping half-space contains a point and a vector defined in modeling coordinates (MC). The graPHIGS API expands each two-dimensional half-space to a three-dimensional half-space by setting the *z* coordinate of both the point and the vector to the value 0.0. The current modeling transformation transforms each pair of half-spaces (consisting of a point and vector) from the Modeling Coordinate (MC) system to the World Coordinate (WC) system, and defines a boundary (plane) in WC. The transformed point is on this plane and the transformed vector defines a normal to the plane which points into the acceptance half-space region. The clipping volume is obtained by intersecting all acceptance half-spaces in the list specified by this element.

During structure traversal, the volume specified by this element either replaces or intersects the current modeling clipping volume, depending on the value specified by the modeling clipping operator parameter. At structure traversal time, the graPHIGS API uses the resultant clipping volume to render subsequent primitives. Transformation elements encountered during traversal do not affect the resultant clipping volume. The resultant volume defines the *acceptance region*. The graPHIGS API clips portions of subsequent primitives that are outside of the acceptance region.

If the number of modeling clipping half-spaces is set to zero, then the acceptance region is all of world coordinate space (WC) and no clipping occurs.

During traversal, if the workstation does not support the specified modeling clipping operator, if the specified number of clipping half-spaces exceeds the maximum supported by the workstation, or if any half-space is found to be degenerate, then the graPHIGS API ignores this structure element.

During traversal, if the graPHIGS API encounters a Set Modeling Clipping Volume structure element and the current composite modeling transformation matrix is singular, then the graPHIGS API sets the effective clipping volume to the null volume and clips all subsequent primitives.

Language Bindings

C

pset_model_clip_vol (*op, half_spaces*)

Input Parameters

Pint op
Operator (*1=REPLACE, 2=INTERSECT*).

*const Phalf_space_list *half_spaces*
List of half-spaces.

FORTRAN

PSMCV (*op*, *nhalfs*, *halfsp*)

Input Parameters

integer op
Operator (*1=PMCREP, 2=PMCINT*).

integer nhalfs
Number of half-spaces in the list.

real halfsp(4,nhalfs)
List of half-spaces.

For the i^{th} modeling clipping half-space:

- *HALFSP(1,i)* is the x component of the point.
- *HALFSP(2,i)* is the y component of the point.
- *HALFSP(3,i)* is the Delta x component of the normal vector.
- *HALFSP(4,i)* is the Delta y component of the normal vector.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Inquire Modeling Clipping Facilities
- Set Modeling Clipping Indicator

SET MODELING CLIPPING VOLUME 3 (PHOP,*,STOP,*)

Purpose

Use Set Modeling Clipping Volume 3 to insert a three-dimensional Set Modeling Clipping Volume 3 structure element into the open structure following the element pointer, or to replace the element pointed at by the element pointer with a Set Modeling Clipping Volume 3 structure element, depending on the current edit mode.

This element specifies the current modeling clipping volume. Each modeling clipping half-space contains a point and a vector defined in modeling coordinates (MC). The current modeling transformation transforms each pair of half-spaces (consisting of a point and vector) from the Modeling Coordinate (MC) system to the World Coordinate (WC) system, and defines a boundary (plane) in WC. The transformed point is on this plane and the transformed vector defines a normal to the plane which points into the acceptance half-space region. The clipping volume is obtained by intersecting all acceptance half-spaces in the list specified by this element.

During structure traversal, the volume specified by this element either replaces or intersects the current modeling clipping volume, depending on the value specified by the modeling clipping operator parameter. At structure traversal time, the graPHIGS API uses the resultant volume to render subsequent primitives. Transformation elements encountered do not affect the resultant clipping volume. The resultant volume defines the *acceptance region*. The graPHIGS API clips portions of subsequent primitives that are outside of the acceptance region.

If the number of modeling clipping half-spaces is set to zero, then the acceptance region is all of world coordinate space (WC) and no clipping occurs.

During traversal, if the workstation does not support the specified modeling clipping operator, if the specified number of clipping half-spaces exceeds the maximum supported by the workstation, or if any half-space is found to be degenerate, then the graPHIGS API ignores this structure element.

During traversal, if the graPHIGS API encounters a Set Modeling Clipping Volume 3 structure element and the current composite modeling transformation matrix is singular, then the graPHIGS API sets the effective clipping volume to the null volume and clips all subsequent primitives.

Language Bindings

C

pset_model_clip_vol3 (*op, half_spaces*)

Input Parameters

Pint op
Operator (*1=REPLACE, 2=INTERSECT*).

*const Phalf_space_list3 *half_spaces*
List of half-spaces.

FORTRAN

PSMCV3 (*op*, *nhalfs*, *halfsp*)

Input Parameters

integer op
Operator (*1=PMCREP, 2=PMCINT*).

integer nhalfs
Number of half-spaces in the list.

real halfsp(6,nhalfs)
List of half-spaces.

For the i^{th} modeling clipping half-space:

- *HALFSP(1,i)* is the x component of the point.
- *HALFSP(2,i)* is the y component of the point.
- *HALFSP(3,i)* is the z component of the point.
- *HALFSP(4,i)* is the Delta x component of the normal vector.
- *HALFSP(5,i)* is the Delta y component of the normal vector.
- *HALFSP(6,i)* is the Delta z component of the normal vector.

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Inquire Modeling Clipping Facilities
- Set Modeling Clipping Indicator

SET MODELING CLIPPING INDICATOR (PHOP,*,STOP,*)

Purpose

Use Set Modeling Clipping Indicator to insert a Set Modeling Clipping Indicator structure element into the open structure following the element pointer, or to replace the element pointed at by the element pointer with a Set Modeling Clipping Indicator structure element, depending on the current edit mode.

Use this subroutine to set the value of the current modeling clipping indicator. During structure traversal, the graPHIGS API uses this value to determine whether or not to perform modeling clipping on subsequent output primitives.

The traversal default for the modeling clipping indicator is *NOCLIP*.

Note: Not all graPHIGS API workstations support modeling clipping. Use the graPHIGS API Inquire Workstation Description (**GPQWDT**) subroutine to determine if a particular workstation supports modeling clipping.

Language Bindings

C

pset_model_clip_ind (*clip_ind*)

Input Parameters

Pclip_ind clip_ind
Clipping indicator (*0=PIND_NO_CLIP, 1=PIND_CLIP*).

FORTRAN

PSMCLI (*mclipi*)

Input Parameters

integer mclipi
Modeling clipping indicator (*0=PNCLIP, 1=PCLIP*)

Errors

5 Function Requires State (PHOP,*,STOP,*)

Related Subroutines

- Inquire Modeling Clipping Facilities
- Set Modeling Clipping Volume
- Set Modeling Clipping Volume 3

SET WORKSTATION VIEWPORT (PHOP,WSOP,*,*)

Purpose

Use Set Workstation Viewport to set the requested two-dimensional workstation viewport for the specified workstation.

The graPHIGS API sets the *x*, *y* components of the current workstation viewport to the requested values when you update the workstation. The graPHIGS API does not change the *z* coordinates of the requested workstation viewport or the current workstation viewport.

Language Bindings

C

pset_ws_vp (*ws_id, ws_vp_limits*)

Input Parameters

Pint ws_id
Workstation identifier.

*const Plimit *ws_vp_limits*
Workstation viewport limits in DC.

FORTRAN

PSWKV (*wkid*, *xmin*, *xmax*, *ymin*, *ymax*)

Input Parameters

integer wkid
Workstation identifier.

real xmin
Minimum workstation viewport limit on the x-axis in DC.

real xmax
Maximum workstation viewport limit on the x-axis in DC.

real ymin
Minimum workstation viewport limit on the y-axis in DC.

real ymax
Maximum workstation viewport limit on the y-axis in DC.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

57 Specified Workstation Is Of Category MI

152 Invalid Viewport: XMIN >= XMAX, YMIN >= YMAX OR ZMIN > ZMAX

157 Workstation Viewport Is Not Within Display Space

Related Subroutines

- Inquire Workstation Transformation
- Inquire Workstation Transformation 3
- Set Workstation Viewport 3
- Set Workstation Window
- Set Workstation Window 3

SET WORKSTATION VIEWPORT 3 (PHOP,WSOP,*,*)

Purpose

Use Set Workstation Viewport 3 to set the requested three-dimensional workstation viewport for the specified workstation.

The graPHIGS API sets the current workstation viewport to the requested values when you update the workstation.

Language Bindings

C

pset_ws_vp3 (*ws_id, ws_vp_limits*)

Input Parameters

Pint ws_id
Workstation identifier.

*const Plimit3 *ws_vp_limits*
Workstation viewport limits in DC.

FORTRAN

PSWKV3 (*wkid*, *wkvp*)

Input Parameters

integer wkid
Workstation identifier.

real wkvp(6)
Workstation viewport limits in DC (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

57 Specified Workstation Is Of Category MI

152 Invalid Viewport: XMIN >= XMAX, YMIN >= YMAX OR ZMIN > ZMAX

157 Workstation Viewport Is Not Within Display Space

Related Subroutines

- Inquire Workstation Transformation
- Inquire Workstation Transformation 3
- Set Workstation Viewport
- Set Workstation Window
- Set Workstation Window 3

SET WORKSTATION WINDOW (PHOP,WSOP,*,*)

Purpose

Use Set Workstation Window to set the requested two-dimensional workstation window for the specified workstation.

The graPHIGS API sets the *x*, *y* components of the current workstation window to the requested values when you update the workstation. The graPHIGS API does not change the *z* coordinates of the requested workstation window or the current workstation window.

Language Bindings

C

pset_ws_win (*ws_id, ws_win_limits*)

Input Parameters

Pint ws_id
Workstation identifier.

*const Plimit *ws_win_limits*
Workstation window limits in NPC.

FORTRAN

PSWKW (*wkid*, *xmin*, *xmax*, *ymin*, *ymax*)

Input Parameters

integer wkid
Workstation identifier.

real xmin
Minimum workstation window limit on the x-axis in NPC.

real xmax
Maximum workstation window limit on the x-axis in NPC.

real ymin
Minimum workstation window limit on the y-axis in NPC.

real ymax
Maximum workstation window limit on the y-axis in NPC.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

57 Specified Workstation Is Of Category MI

151 Invalid Window: Minimum Value >= To Corresponding Maximum Value

156 Workstation Window Limits Are Not Within NPC Range

Related Subroutines

- Inquire Workstation Transformation
- Inquire Workstation Transformation 3
- Set Workstation Viewport
- Set Workstation Viewport 3
- Set Workstation Window 3

SET WORKSTATION WINDOW 3 (PHOP,WSOP,*,*)

Purpose

Use Set Workstation Window 3 to set the requested three-dimensional workstation window for the specified workstation.

The graPHIGS API sets the current workstation window to the requested values when you update the workstation.

Language Bindings

C

pset_ws_win3 (*ws_id, ws_win_limits*)

Input Parameters

Pint ws_id
Workstation identifier.

*const Plimit3 *ws_win_limits*
Workstation window limits in NPC.

FORTRAN

PSWKW3 (*wkid*, *wkwn*)

Input Parameters

integer wkid
Workstation identifier.

real wkwn(6)
Workstation window limits in NPC (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

57 Specified Workstation Is Of Category MI

151 Invalid Window: Minimum Value >= To Corresponding Maximum Value

156 Workstation Window Limits Are Not Within NPC Range

Related Subroutines

- Inquire Workstation Transformation 3
- Set Workstation Viewport
- Set Workstation Viewport 3
- Set Workstation Window

Chapter 11. Input Subroutines

Input subroutines allow users to supply input to your application. There are six logical input device classes: locator, stroke, valuator, choice, pick, and string. There are three modes of interaction with the input devices: sample, request, and event.

The subroutines discussed in this section perform the following operations:

- initialization of an input device
- setting the operating mode of an input device
- requesting input from a device
- sampling an input device's current value
- managing the event queue
- retrieving input values from the event queue

To determine the actual input capabilities of a specific workstation, use the appropriate inquiry subroutines.

The measure and trigger of each logical input device is described in terms of the physical devices available on a workstation. See *The graPHIGS Programming Interface: Technical Reference* for the details of each logical device supported on a workstation.

The default size of the input queue is 16K. You can control this size with the *IQSIZE* default, which is explained in the *The graPHIGS Programming Interface: Technical Reference*.

The input queue elements all have a header of 16 bytes. Use the information supplied in Appendix B of *The graPHIGS Programming Interface: Technical Reference* to interpret the information after the header.

AWAIT EVENT (PHOP,WSOP,*,*)

Purpose

Use Await Event to move the next event from the input queue into the current event report. If the input queue is empty, then the graPHIGS API is placed in a wait state until at least one of the following occurs:

1. The application adds an event to the input queue.
2. The time specified in the timeout parameter has elapsed.

If the timeout parameter specifies a value of zero or less, then no wait takes place. If the timeout parameter specifies a value greater than zero, then a wait takes place for the specified time interval. The maximum time interval is 55,800 seconds (15.5 hours).

The graPHIGS API uses the operating system's timing facility. (See *The graPHIGS Programming Interface: Writing Applications*).

When a timeout or error situation occurs, the graPHIGS API returns *NONE* for the input class parameter. Otherwise, the graPHIGS API returns the workstation identifier, input class, and the logical device number. Input classes include: *LOCATOR*, *STROKE*, *VALUATOR*, *CHOICE*, *PICK*, and *STRING*.

The application must use the appropriate ″Get″ subroutine call to obtain the value(s) of the input residing in the current event report (i.e., Get Choice, Get Locator 3, Get String).

Language Bindings

C

pawait_event(*timeout, ws_id, dev_class, in_num*)

Input Parameters

Pfloat timeout
Timeout interval in seconds.

Output Parameters

*Pint *ws_id*
Workstation identifier.

*Pin_class *dev_class*
Input device class (*0=PIN_NONE, 1=PIN_LOC, 2=PIN_STROKE, 3=PIN_VAL, 4=PIN_CHOICE, 5=PIN_PICK, 6=PIN_STRING*).

*Pint *in_num*
Logical input device number.

FORTRAN

PWAIT (*tout*, *wkid*, *icl*, *idnr*)

Input Parameters

real tout
Timeout interval in seconds.

Output Parameters

integer wkid
Workstation identifier.

integer icl
Input device class (*0=PNCLAS, 1=PLOCAT, 2=PSTROK, 3=PVALUA, 4=PCHOIC, 5=PPICK, 6=PSTRIN*).

integer idnr
Logical input device number.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

256 Warning, Input Queue Has Overflowed

Note: The graPHIGS API performs this operation even if error 256 occurs.

Related Subroutines

- Flush Device Events
- Get Choice
- Get Locator
- Get Locator 3
- Get Pick
- Get String
- Get Stroke

- Get Stroke 3
- Get Valuator
- Inquire Input Queue Overflow
- Inquire More Simultaneous Events
- Set Choice Mode
- Set Locator Mode
- Set Pick Mode
- Set String Mode
- Set Stroke Mode
- Set Valuator Mode

FLUSH DEVICE EVENTS (PHOP,WSOP,*,*)

Purpose

Use Flush Device Events to discard all input events from the specified logical input device.

This subroutines removes all events received from the specified input device, matching the specified device class, workstation identifier and device number, from the event queue. Input classes include: *LOCATOR*, *STROKE*, *VALUATOR*, *CHOICE*, *PICK*, and *STRING*.

If the current event report includes an event matching the specified input device, then the graPHIGS API also removes the current event report.

Language Bindings

C

pflush_events (*ws_id, dev_class, in_num*)

Input Parameters

Pint ws_id
Workstation identifier.

Pin_class dev_class
Input device class (*0=PIN_NONE, 1=PIN_LOC, 2=PIN_STROKE, 3=PIN_VAL, 4=PIN_CHOICE, 5=PIN_PICK, 6=PIN_STRING*).

Pint in_num
Logical input device number (>=1).

FORTRAN

PFLUSH (*wkid*, *icl*, *idnr*)

Input Parameters

integer wkid
Workstation identifier.

integer icl
Input device class (*1=PLOCAT, 2=PSTROK, 3=PVALUA, 4=PCHOIC, 5=PPICK, 6=PSTRIN*).

integer idnr
Logical input device number (>=1).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

256 Warning, Input Queue Has Overflowed

Note: The graPHIGS API performs this operation even if error 256 occurs.

Related Subroutines

- Inquire Number Of Available Logical Input Devices

GET CHOICE (PHOP,WSOP,*,*)

Purpose

Use Get Choice to retrieve a choice input value from the current event report. The graPHIGS API identified the device to which this value corresponds on the previous invocation of the Await Event subroutine call Await Event The graPHIGS API does not remove the event from the current event report until the next invocation of Await Event.

This subroutine returns a status parameter of *OK* or *NOCHOICE*.

Language Bindings

C

pget_choice (*in_status, choice*)

Output Parameters

*Pin_status *in_status*
Choice status (*1=PIN_STATUS_OK, 2=PIN_STATUS_NO_IN*).

*Pint *choice*
Choice number (>=1).

FORTRAN

PGTCH (*stat*, *chnr*)

Output Parameters

integer stat
Choice status (*1=POK, 2=PNCHOI*).

integer chnr
Choice number (>=1).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

259 Requested Device Class Not Current Input Report Class

Related Subroutines

- Await Event

GET LOCATOR (PHOP,WSOP,*,*)

Purpose

Use Get Locator to retrieve a locator input value from the current event report. The graPHIGS API does not remove the event from the current event report until the next invocation of the Await Event subroutine call.

The view index indicates the view table entry which has a matrix that the graPHIGS API used to convert the locator point from Device Coordinates (DC) to World Coordinates (WC). This was the view with the highest input priority at the indicated screen location.

The graPHIGS API identified the device to which this value corresponds on the previous invocation of Await Event Await Event.

This subroutine returns the locator input from the view with the highest input priority under the cursor. View zero is the highest priority view unless modified by your application.

> **Note:** This subroutine returns a two-dimensional result. The graPHIGS API discards the *z* coordinate of the locator position. The *x* and *y* values of the locator position are identical to those returned by the Get Locator 3 subroutine for the same operator action.

Language Bindings

C

pget_loc (*view_ind, loc_pos*)

Output Parameters

*Pint *view_ind*
: View index.

*Ppoint *loc_pos*
: Locator position in WC.

FORTRAN

PGTLC (*viewi*, *lpx*, *lpy*)

Output Parameters

integer viewi
: View index.

real lpx
: *x* coordinate of the locator position in WC.

real lpy
: *y* coordinate of the locator position in WC.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

259 Requested Device Class Not Current Input Report Class

Related Subroutines

- Await Event
- Get Locator 3
- Set View Transformation Input Priority

GET LOCATOR 3 (PHOP,WSOP,*,*)

Purpose

Use Get Locator 3 to retrieve a locator input value from the current event report. The graPHIGS API does not remove the event from the current event report until the next invocation of the Await Event subroutine call.

The view index indicates the view table entry which has a matrix that the graPHIGS API used to convert the locator point from Device Coordinates (DC) to World Coordinates (WC). This was the view with the highest input priority at the indicated screen location.

The graPHIGS API identified the device to which this value corresponds on the previous invocation of the Await Event subroutine call.

This subroutine returns the locator input from the view with the highest input priority under the cursor. View zero is the highest priority view unless modified by your application.

Language Bindings

C

pget_loc3 (*view_ind, loc_pos*)

Output Parameters

*Pint *view_ind*
View index.

*Ppoint3 *loc_pos*
Locator position in WC.

FORTRAN

PGTLC3 (*viewi*, *lpx*, *lpy*, *lpz*)

Output Parameters

integer viewi
View index.

real lpx
x coordinate of the locator position in WC.

real lpy
y coordinate of the locator position in WC.

real lpz
z coordinate of the locator position in WC.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

259 Requested Device Class Not Current Input Report Class

Related Subroutines

- Await Event
- Get Locator
- Set View Transformation Input Priority

GET PICK (PHOP,WSOP,*,*)

Purpose

Use Get Pick to retrieve a pick input value from the current event report. The graPHIGS API does not remove the event from the current event report until the next invocation of the Await Event subroutine.

This value consists of a pick status and pick path information describing the position of the picked primitive in the structure network. The pick status may be *OK* or *NOPICK*. The graPHIGS API returns the pick path in the order specified in the the Initialize Pick subroutine, that is, *TOP FIRST* or *BOTTOM FIRST*. If your application has not called the Initialize Pick subroutine, then the pick path order defaults to *TOP FIRST*. Each entry in the pickpath consists of a structure identifier, a pick identifier, and an element position.

The graPHIGS API identified the device to which this value corresponds on the previous invocation of Await Event.

Language Bindings

C

pget_pick (*depth, in_status, pick*)

Input Parameters

Pint depth
Maximum depth of the pick path to return.

Output Parameters

*Pin_status *in_status*
Pick status (*1=PIN_STATUS_OK, 2=PIN_STATUS_NO_IN*).

*Ppick_path *pick*
Pick path.

FORTRAN

PGTPK (*ippd*, *stat*, *ppd*, *pp*)

Input Parameters

integer ippd
Maximum depth of the pick path to return.

Output Parameters

integer stat
Pick status (*1=POK, 2=PNPICK*).

integer ppd
Depth of the actual pick path.

integer pp(3,ippd)
Pick path.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

259 Requested Device Class Not Current Input Report Class

Related Subroutines

- Await Event

GET STRING (PHOP,WSOP,*,*)

Purpose

Use Get String to retrieve a string input value from the current event report. The graPHIGS API does not remove the event from the current event report until the next invocation of the Await Event subroutine call.

The length of the returned string is less than, or equal to, the buffer size found in the string data record at the time the device was set to event mode.

The graPHIGS API identified the device to which this value corresponds on the previous invocation of Await Event.

Language Bindings

C

pget_string (*string*)

Output Parameters

*char *string*
String.

FORTRAN

PGTST (*lostr*, *str*)

Output Parameters

integer lostr
Number of characters returned.

character(*) str*
String.

FORTRAN Subset

PGTST (*lostr*, *str*)

Output Parameters

integer lostr
Number of characters returned.

*character*80 str*
String.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

259 Requested Device Class Not Current Input Report Class

Related Subroutines

- Await Event

GET STROKE (PHOP,WSOP,*,*)

Purpose

Use Get Stroke to retrieve a stroke input device value from the current event report. The graPHIGS API does not remove the event from the current event report until the next invocation of the Await Event subroutine call.

The graPHIGS API limits the number of returned points to the current input buffer size found in the stroke data record at the time the device was set to event mode. The view index indicates the view table entry which has a matrix that the graPHIGS API used to convert the stroke points from Device Coordinates (DC) to World Coordinates (WC). This view was the view with the highest input priority containing all the stroke locations.

The graPHIGS API identified the device to which this value corresponds on the previous invocation of Await Event.

View zero is the highest priority view unless modified by your application.

> **Note:** This function returns a two-dimensional result. The graPHIGS API discards the *z* coordinate of the stroke points. The *x* and *y* values of the stroke points are identical to those returned by the Get Stroke 3 subroutine for the same operator action.

Language Bindings

C

pget_stroke (*view_ind, stroke*)

Output Parameters

*Pint *view_ind*
View index.

*Ppoint_list *stroke*
Stroke.

FORTRAN

PGTSK (*n*, *viewi*, *np*, *pxa*, *pya*)

Input Parameters

integer n
Dimension of arrays for the stroke points (>=0).

Output Parameters

integer viewi
View index.

integer np
Number of points.

real pxa (n)
x coordinates of the points in the stroke in WC.

real pya (n)
y coordinates of the points in the stroke in WC.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

259 Requested Device Class Not Current Input Report Class

Related Subroutines

- Await Event
- Get Stroke 3
- Set View Transformation Input Priority

GET STROKE 3 (PHOP,WSOP,*,*)

Purpose

Use Get Stroke 3 to retrieve a stroke input device value from the current event report. The graPHIGS API does not remove the event from the current event report until the next invocation of the the Await Event subroutine call.

The graPHIGS API limits the number of returned points to the current input buffer size found in the stroke data record at the time the device was set to event mode. The view index indicates the view table entry which has a matrix that the graPHIGS API used to convert the stroke points from Device Coordinates (DC) to World Coordinates (WC). This view was the view with the highest input priority containing all the stroke locations.

The graPHIGS API identified the device to which this value corresponds on the previous invocation of Await Event.

View zero is the highest priority view unless modified by your application.

Language Bindings

C

pget_stroke3 (*view_ind, stroke*)

Output Parameters

*Pint *view_ind*
View index.

*Ppoint_list3 *stroke*
Stroke.

FORTRAN

PGTSK3 (*n*, *viewi*, *np*, *pxa*, *pya*, *pza*)

Input Parameters

integer n
Dimension of arrays for the stroke points (>=0).

Output Parameters

integer viewi
View index.

integer np
Number of points.

real pxa (n)
x coordinates of the points in the stroke in WC.

real pya (n)
y coordinates of the points in the stroke in WC.

real pza (n)
z coordinates of the points in the stroke in WC.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

259 Requested Device Class Not Current Input Report Class

Related Subroutines

- Await Event
- Get Stroke
- Set View Transformation Input Priority

GET VALUATOR (PHOP,WSOP,*,*)

Purpose

Use Get Valuator to retrieve a valuator input value from the current event report. The graPHIGS API does not remove the event from the current event report until the next invocation of the Await Event subroutine call.

The graPHIGS API returns a value within the range found in the valuator data record at the time the device was set to event mode.

The graPHIGS API identified the device to which this value corresponds on the previous invocation of Await Event.

Language Bindings

C

pget_val (*value*)

Output Parameters

*Pfloat *value*
Valuator value.

FORTRAN

PGTVL (*val*)

Output Parameters

real val
Valuator value.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

259 Requested Device Class Not Current Input Report Class

Related Subroutines

- Await Event

INITIALIZE CHOICE (PHOP,WSOP,*,*)

Purpose

Use Initialize Choice to specify initial values for the specified choice device.

The Initialize Choice subroutine stores the initial choice number, prompt/echo type, echo area, and data record in the workstation state list for the specified device. The *z* coordinates of the echo volume remain unchanged. For a keyboard choice device, an initial choice number less than 256 is interpreted using the workstation's input device character set. For details on the specific devices available on different workstation types, see *The graPHIGS Programming Interface: Technical Reference*, or use the appropriate inquiry subroutines.

This function supports the following prompt/echo types:

- Type One designates the current choice number using a workstation-dependent technique.
- Type Two lets you indicate choice numbers by invoking the prompting capability. The physical input devices that are most commonly used normally have a built-in prompting capability, such as lighted program function keys (LPFKs). If the value of the i^{th} element of the "prompt array" in the choice data record is *OFF*, then the graPHIGS API turns off prompting of the i^{th} alternative of the specified choice input device. If the value of the i^{th} element of the "prompt array" in the choice data record is *ON*, then the graPHIGS API turns on prompting of the i^{th} alternative of the specified choice input device. The first entry in the choice data record is the list of choice prompts.

  Note: The choice device must be in Request mode.

Language Bindings

C

pinit_choice (*ws_id, choice_num, init_status, init_choice, pet, echo_area, choice_data*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint choice_num
Choice device number(>=1).

Pin_status init_status
Initial choice status (*1=PIN_STATUS_OK, 2=PIN_STATUS_NO_IN*).

Pint init_choice
Initial choice device number (>=1).

Pint pet
Prompt and echo type.

*const Plimit *echo_area*
Echo area.

*const Pchoice_data *choice_data*
Data record.

FORTRAN

PINCH (*wkid*, *chdnr*, *istat*, *ichnr*, *pet*, *xmin*, *xmax*, *ymin*, *ymax*, *ldr*, *datrec*)

Input Parameters

integer wkid
Workstation identifier.

integer chdnr
Choice device number (>=1).

integer istat
Initial choice status (*1=POK, 2=PNCHOI*).

integer ichnr
Initial choice device number (>=1).

integer pet
Prompt and echo type.

real xmin
Minimum *x* coordinate determining echo area in DC.

real xmax
Maximum *x* coordinate determining echo area in DC.

real ymin
Minimum *y* coordinate determining echo area in DC.

real ymax
Maximum *y* coordinate determining echo area in DC.

integer ldr
Dimension of the data record array.

*character*80 datrec(ldr)*
Data record.

The *PPREC* parameters to build a ***choice input data record*** for *PET*=2 are as follows: (IL=*number of choice alternatives*, IA=*list of prompts(0=POFF, 1=PON)*, RL=0, RA=(), SL=0, LSTR=(), STR=()).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

251 Function Requires Input Device To Be In Request Mode

254 Invalid Echo Area/Volume: XMIN>=XMAX, YMIN>=YMAX OR ZMIN>ZMAX

255 Echo Area/Volume Boundary Point(s) Outside Device Range

253 Prompt/Echo Type Not Available On Specified Workstation

260 Input Device Data Record Field Is In Error

261 Initial Value Is Invalid

Related Subroutines

- Inquire Choice Device State
- Inquire Default Choice Device Data
- Inquire Display Space Size
- Inquire Number Of Available Logical Input Devices
- Pack Data Record
- Set Choice Mode

INITIALIZE CHOICE 3 (PHOP,WSOP,*,*)

Purpose

Use Initialize Choice 3 to specify initial values for a specified choice device.

The Initialize Choice 3 subroutine stores the initial choice number, prompt/echo type, echo volume, and data record in the workstation state list for the specified device. For a keyboard choice device, an initial choice number less than 256 is interpreted using the workstation's input device character set. For details on the specific devices available on different workstation types, see *The graPHIGS Programming Interface: Technical Reference*, or use the appropriate inquiry subroutines.

This function supports the following prompt/echo types:

- Type One designates the current choice number using a workstation-dependent technique.
- Type Two lets you indicate choice numbers by invoking the prompting capability. The physical input devices that are most commonly used normally have a built-in prompting capability, such as lighted program function keys (LPFKs). If the value of the i^{th} element of the "prompt array" in the choice data record is *OFF*, then the graPHIGS API turns off prompting of the i^{th} alternative of the specified choice input device. If the value of the i^{th} element of the "prompt array" in the choice data record is *ON*, then the graPHIGS API turns on prompting of the i^{th} alternative of the specified choice input device. The first entry in the choice data record is the list of choice prompts.

Note: The choice device must be in Request mode.

Language Bindings

C

pinit_choice3 (*ws_id, choice_num, init_status, init_choice, pet, echo_vol, choice_data*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint choice_num
Choice device number (>=1).

Pin_status init_status
Initial choice status (*1=PIN_STATUS_OK, 2=PIN_STATUS_NO_IN*).

Pint init_choice
Initial choice device number (>=1).

Pint pet
Prompt and echo type.

*const Plimit3 *echo_vol*
Echo volume in DC.

*const Pchoice_data3 *choice_data*
Data record.

FORTRAN

PINCH3 (*wkid*, *chdnr*, *istat*, *ichnr*, *pet*, *evol*, *ldr*, *datrec*)

Input Parameters

integer wkid
Workstation identifier.

integer chdnr
Choice device number (>=1).

integer istat
Initial choice status (*1=POK, 2=PNCHOI*).

integer ichnr
Initial choice device number (>=1).

integer pet
Prompt and echo type.

real evol(6)
Echo volume in DC (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

integer ldr
Dimension of the data record array.

*character*80 datrec(ldr)*
Data record.

The *PPREC* parameters to build a ***choice input data record*** for *PET*=2 are as follows: (IL=*number of choice alternatives*, IA=*list of prompts (0=POFF, 1=PON)*, RL=0, RA=(), SL=0, LSTR=(), STR=()).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

251 Function Requires Input Device To Be In Request Mode

254 Invalid Echo Area/Volume: XMIN>=XMAX, YMIN>=YMAX OR ZMIN>ZMAX

255 Echo Area/Volume Boundary Point(s) Outside Device Range

253 Prompt/Echo Type Not Available On Specified Workstation

260 Input Device Data Record Field Is In Error

261 Initial Value Is Invalid

Related Subroutines

- Inquire Choice Device State 3
- Inquire Default Choice Device Data 3
- Inquire Display Space Size 3
- Inquire Number Of Available Logical Input Devices
- Pack Data Record
- Set Choice Mode

INITIALIZE LOCATOR (PHOP,WSOP,*,*)

Purpose

Use Initialize Locator to initialize the specified locator device.

The Initialize Locator subroutine stores the initial locator position, initial view index, prompt/echo type, echo area, and locator data record in the workstation state list for the specified device. The *z* coordinates of both the echo volume and initial locator position remain unchanged.

Two positions are required for some locator prompt/echo types: the initial locator position, which remains fixed during input operation, and the current locator position, which varies dynamically as you use the locator.

This function supports the following prompt/echo types:

- Type One designates the current position of the locator using a workstation-dependent technique.
- Type Two, the cross hair, designates the current position of the locator by spanning the display surface or device echo area with both a vertical and a horizontal line. The lines intersect at the current locator position. Whether the cross hair spans the entire display surface or only the echo area depends on the capabilities of the workstation.
- Type Three designates the current position of the locator using a tracking cross.
- Type Four designates the current position of the locator using a rubber band line connecting the initial locator position given by this subroutine and the current locator position.

Note: The locator device must be in Request mode.

Language Bindings

C

pinit_loc (*ws_id, loc_num, init_view_ind, init_loc_pos, pet, echo_area, loc_data*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint loc_num
Locator device number (>=1).

Pint init_view_ind
Initial view index (>=0).

*const Ppoint *init_loc_pos*
Initial locator position in WC.

Pint pet
Prompt and echo type.

*const Plimit *echo_area*
Echo area in DC.

*const Ploc_data *loc_data*
Data record.

FORTRAN

PINLC (*wkid*, *lcdnr*, *iviewi*, *ipx*, *ipy*, *pet*, *xmin*, *xmax*, *ymin*, *ymax*, *ldr*, *datrec*)

Input Parameters

integer wkid
Workstation identifier.

integer lcdnr
Locator device number (>=1).

integer iviewi
Initial view index (>=0).

real ipx
x coordinate of the initial locator position in WC.

real ipy
y coordinate of the initial locator position in WC.

integer pet
Prompt and echo type.

real xmin
Minimum *x* coordinate determining echo area in DC.

real xmax
Maximum *x* coordinate determining echo area in DC.

real ymin
Minimum *y* coordinate determining echo area in DC.

real ymax
Maximum *y* coordinate determining echo area in DC.

integer ldr
Dimension of the data record array.

*character*80 datrec(ldr)*
Data record.

The *PPREC* parameters to build a ***locator input data record*** for *PET*=4 are as follows: (IL=7, IA=*unused, linetype ASF, line width scale factor ASF, polyline color index ASF, polyline index, line type, polyline color index*, RL=1, RA=*line width scale factor*, SL=0, LSTR=(), STR=()).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

251 Function Requires Input Device To Be In Request Mode

254 Invalid Echo Area/Volume: XMIN>=XMAX, YMIN>=YMAX OR ZMIN>ZMAX

255 Echo Area/Volume Boundary Point(s) Outside Device Range

253 Prompt/Echo Type Not Available On Specified Workstation

260 Input Device Data Record Field Is In Error

261 Initial Value Is Invalid

114 View Index Value < ZERO

Related Subroutines

- Inquire Locator Device State
- Inquire Default Locator Device Data
- Inquire Display Space Size
- Inquire Number Of Available Logical Input Devices
- Pack Data Record
- Set Locator Mode

INITIALIZE LOCATOR 3 (PHOP,WSOP,*,*)

Purpose

Use Initialize Locator 3 to initialize the specified locator device.

The Initialize Locator 3 subroutine stores the initial locator position, initial view index, prompt/echo type, echo volume, and locator data record in the workstation state list for the specified device.

Two positions are required for some locator prompt/echo types: the initial locator position, which remains fixed during input operation, and the current locator position, which varies dynamically as you use the locator.

This function supports the following prompt/echo types:

- Type One designates the current position of the locator using a workstation-dependent technique.

- Type Two, the cross hair, designates the current position of the locator by spanning the display surface or device echo area with both a vertical and a horizontal line. The lines intersect at the current locator position. Whether the cross hair spans the entire display surface or only the echo area depends on the capabilities of the workstation.
- Type Three designates the current position of the locator using a tracking cross.
- Type Four designates the current position of the locator using a rubber band line connecting the initial locator position given by this subroutine and the current locator position.

Note: The locator device must be in Request mode.

Language Bindings

C

pinit_loc3 (*ws_id, loc_num, init_view_ind, init_loc_pos, pet, echo_vol, loc_data*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint loc_num
Locator device number (>=1).

Pint init_view_ind
Initial view index (>=0).

*const Ppoint3 *init_loc_pos*
Initial locator position in WC.

Pint pet
Prompt and echo type.

*const Plimit3 *echo_vol*
Echo volume in DC.

*const Ploc_data3 *loc_data*
Data record.

FORTRAN

PINLC3 (*wkid*, *lcdnr*, *iviewi*, *ipx*, *ipy*, *ipz*, *pet*, *evol*, *ldr*, *datrec*)

Input Parameters

integer wkid
Workstation identifier.

integer lcdnr
Locator device number (>=1).

integer iviewi
Initial view index (>=0).

real ipx
x coordinate of the initial locator position in WC.

real ipy
y coordinate of the initial locator position in WC.

real ipz
z coordinate of the initial locator position in WC.

integer pet
Prompt and echo type.

real evol(6)
Echo volume (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

integer ldr
Dimension of the data record array.

*character*80 datrec(ldr)*
Data record.

The *PPREC* parameters to build a ***locator input data record*** for *PET*=4 are as follows: (IL=7, IA=*unused, linetype ASF, line width scale factor ASF, polyline color index ASF, polyline index, line type, polyline color index*, RL=1, RA=*line width scale factor*, SL=0, LSTR=(), STR=()).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

251 Function Requires Input Device To Be In Request Mode

254 Invalid Echo Area/Volume: XMIN>=XMAX, YMIN>=YMAX OR ZMIN>ZMAX

255 Echo Area/Volume Boundary Point(s) Outside Device Range

253 Prompt/Echo Type Not Available On Specified Workstation

260 Input Device Data Record Field Is In Error

261 Initial Value Is Invalid

114 View Index Value < ZERO

Related Subroutines

- Inquire Locator Device State 3
- Inquire Default Locator Device Data 3
- Inquire Display Space Size
- Inquire Number Of Available Logical Input Devices
- Pack Data Record
- Set Locator Mode

INITIALIZE PICK (PHOP,WSOP,*,*)

Purpose

Use Initialize Pick to initialize the specified pick device.

The Initialize Pick subroutine stores the prompt/echo type, echo area, initial pick path depth, initial pick path, pick data record and pick path order in the workstation state list for the specified device. The *z* coordinates of the echo volume remain unchanged.

The pick status may be initialized to *OK* or *NOPICK*. The pick path order is the order in which the graPHIGS API returns the elements of the pick path. If you specify the pick path order as *TOP FIRST*, then the structure specified in any pick path element is a parent of the structure specified in the subsequent pick path element. If you specify the pick path order as *BOTTOM FIRST*, then the structure specified in any pick path element is a child of the structure specified in the subsequent pick path element. Each pick path element consists of a structure identifier, a pick identifier, and an element position.

This function supports the following prompt/echo types:

- Type One uses a workstation-dependent technique that highlights the picked primitive. The graPHIGS API does not require a data record.

  Note: The pick device must be in Request Mode.

Language Bindings

C

pinit_pick (*ws_id, pick_num, init_status, init_pick, pet, echo_area, pick_data, order*)

Input Parameters

Pint ws_id
: Workstation identifier.

Pint pick_num
: Pick device number (>=1).

Pint init_status
: Initial pick status (*1=PIN_STATUS_OK, 2=PIN_STATUS_NO_IN*).

*const Ppick_path *init_pick*
: Initial pick path.

Pint pet
: Prompt and echo type.

*const Plimit *echo_area*
: Echo area in DC.

*const Ppick_data *pick_data*
: Data record.

Ppath_order order
: Pick path order (*0=PORDER_TOP_FIRST, 1=PORDER_BOTTOM_FIRST*).

FORTRAN

PINPK (*wkid*, *pkdnr*, *istat*, *ippd*, *pp*, *pet*, *xmin*, *xmax*, *ymin*, *ymax*, *ldr*, *datrec*, *ppordr*)

Input Parameters

integer wkid
: Workstation identifier.

integer pkdnr
: Pick device number (>=1).

integer istat
: Initial pick status (*1=POK, 2=PNPICK*).

integer ippd
Depth of initial pick path.

integer pp(3,ippd)
Initial pick path.

integer pet
Prompt and echo type.

real xmin
Minimum *x* coordinate determining echo area in DC.

real xmax
Maximum *x* coordinate determining echo area in DC.

real ymin
Minimum *y* coordinate determining echo area in DC.

real ymax
Maximum *y* coordinate determining echo area in DC.

integer ldr
Dimension of the data record array.

*character*80 datrec(ldr)*
Data record.

integer ppordr
Pick path order (*0=PPOTOP, 1=PPOBOT*).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

60 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

251 Function Requires Input Device To Be In Request Mode

254 Invalid Echo Area/Volume: XMIN>=XMAX, YMIN>=YMAX OR ZMIN>ZMAX

255 Echo Area/Volume Boundary Point(s) Outside Device Range

253 Prompt/Echo Type Not Available On Specified Workstation

260 Input Device Data Record Field Is In Error

261 Initial Value Is Invalid

Related Subroutines

- Add Names To Set
- Inquire Pick Device State
- Inquire Default Pick Device Data
- Inquire Display Space Size
- Inquire Number Of Available Logical Input Devices
- Pack Data Record
- Remove Names From Set
- Set Pick Filter
- Set Pick Identifier
- Set Pick Mode

INITIALIZE PICK 3 (PHOP,WSOP,*,*)

Purpose

Use Initialize Pick 3 to initialize the specified pick device.

The Initialize Pick 3 subroutine stores the prompt/echo type, echo volume, initial pick path depth, initial pick path, pick data record and pick path order in the workstation state list for the specified device.

The pick status may be initialized to *OK* or *NOPICK*. The pick path order is the order in which the graPHIGS API returns elements of the pick path. If you specify the pick path order as *TOP FIRST*, then the structure specified in any pick path element is a parent of the structure specified in the subsequent pick path element. If you specify the pick path order as *BOTTOM FIRST*, then the structure specified in any pick path element is a child of the structure specified in the subsequent pick path element. Each pickpath element consists of a structure identifier, a pick identifier, and an element position.

This function supports the following prompt/echo types:

- Type One uses a workstation-dependent technique that highlights the picked primitive. The graPHIGS API does not require a data record.

  Note: The pick device must be in Request Mode.

Language Bindings

C

pinit_pick3 (*ws_id, pick_num, init_status, init_pick, pet, echo_vol, pick_data, order*)

Input Parameters

Pint ws_id
: Workstation identifier.

Pint pick_num
: Pick device number (>=1).

Pint init_status
: Initial pick status (*1=PIN_STATUS_OK, 2=PIN_STATUS_NO_IN*).

*const Ppick_path *init_pick*
: Initial pick path.

Pint pet
: Prompt and echo type.

*const Plimit3 *echo_vol*
: Echo volume in DC.

*const Ppick_data3 *pick_data*
: Data record.

Ppath_order order
: Pick path order (*0=PORDER_TOP_FIRST, 1=PORDER_BOTTOM_FIRST*).

FORTRAN

PINPK3 (*wkid*, *pkdnr*, *istat*, *ippd*, *pp*, *pet*, *evol*, *ldr*, *datrec*, *ppordr*)

Input Parameters

integer wkid
Workstation identifier.

integer pkdnr
Pick device number (>=1).

integer istat
Initial pick status (*1=POK, 2=PNPICK*).

integer ippd
Depth of initial pick path.

integer pp(3,ippd)
Initial pick path.

integer pet
Prompt and echo type.

real evol(6)
Echo volume in DC (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

integer ldr
Dimension of the data record array.

*character*80 datrec(ldr)*
Data record.

integer ppordr
Pick path order (*0=PPOTOP, 1=PPOBOT*).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

60 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

251 Function Requires Input Device To Be In Request Mode

254 Invalid Echo Area/Volume: XMIN>=XMAX, YMIN>=YMAX OR ZMIN>ZMAX

255 Echo Area/Volume Boundary Point(s) Outside Device Range

253 Prompt/Echo Type Not Available On Specified Workstation

260 Input Device Data Record Field Is In Error

261 Initial Value Is Invalid

Related Subroutines

- Add Names To Set
- Inquire Pick Device State 3
- Inquire Default Pick Device Data 3
- Inquire Display Space Size
- Inquire Number Of Available Logical Input Devices
- Pack Data Record
- Remove Names From Set
- Set Pick Filter
- Set Pick Identifier

- Set Pick Mode

INITIALIZE STRING (PHOP,WSOP,*,*)

Purpose

Use Initialize String to initialize the specified string input device.

The Initialize String subroutine stores the initial string, prompt/echo type, echo area, and string data record in the workstation state list for the specified device. The *z* coordinates of the echo volume remain unchanged. The graPHIGS API uses the string device's input character set to interpret the initial string.

For all prompt and echo types, the first entry of the string data record is the input buffer size, which is an integer in the range (1..*n*). The graPHIGS API compares this against the available input buffer size for the specified string device. If the requested buffer size is greater, then the graPHIGS API records the available size in the workstation state list instead of the specified input buffer size. If the initial string is longer than the buffer size, then the graPHIGS API issues an error.

When the graPHIGS API receives string input, it obtains a buffer of the size defined by the input buffer size. The graPHIGS API copies the initial string into the buffer, and places the cursor at the initial editing position within the buffer. Replacement of characters begins at this initial position.

This function supports the following prompt/echo types:

- Type One displays the current string value within the echo area using a workstation-dependent technique.

  Note: The string device must be in Request mode.

Language Bindings

C

pinit_string (*ws_id, string_num, init_string, pet, echo_area, string_data*)

Input Parameters

Pint ws_id
: Workstation identifier.

Pint string_num
: String device number (>=1).

*const char *init_string*
: Initial string.

Pint pet
: Prompt and echo type.

*const Plimit *echo_area*
: Echo area in DC.

*const Pstring_data *string_data*
: Data record.

FORTRAN

PINST (*wkid*, *stdnr*, *lstr*, *istr*, *pet*, *xmin*, *xmax*, *ymin*, *ymax*, *ldr*, *datrec*)

Input Parameters

integer wkid
Workstation identifier.

integer stdnr
String device number (>=1).

integer lstr
Length of the initial string (>=0). The number of characters actually used is the minimum of *lstr* and the length of *istr*.

character(*) istr*
Initial string.

integer pet
Prompt and echo type.

real xmin
Minimum *x* coordinate determining echo area in DC.

real xmax
Maximum *x* coordinate determining echo area in DC.

real ymin
Minimum *y* coordinate determining echo area in DC.

real ymax
Maximum *y* coordinate determining echo area in DC.

integer ldr
Dimension of the data record array.

*character*80 datrec(ldr)*
Data record.

The *pprec* parameters used to build the ***string input data record*** are as follows: (IL=2, IA=*input buffer size, initial editing position*, RL=0, RA=(), SL=0, LSTR=(), STR=()).

FORTRAN Subset

PINST (*wkid*, *stdnr*, *lstr*, *istr*, *pet*, *xmin*, *xmax*, *ymin*, *ymax*, *ldr*, *datrec*)

Input Parameters

integer wkid
Workstation identifier.

integer stdnr
String device number (>=1).

integer lstr
Length of the initial string.

*character*80 istr*
Initial string.

integer pet
Prompt and echo type.

real xmin
Minimum *x* coordinate determining echo area in DC.

real xmax
Maximum *x* coordinate determining echo area in DC.

real ymin
Minimum *y* coordinate determining echo area in DC.

real ymax
Maximum *y* coordinate determining echo area in DC.

integer ldr
Dimension of the data record array.

*character*80 datrec(ldr)*
Data record.

The *pprec* parameters used to build the ***string input data record*** are as follows: (IL=2, IA=*input buffer size, initial editing position*, RL=0, RA=(), SL=0, LSTR=(), STR=()).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

251 Function Requires Input Device To Be In Request Mode

254 Invalid Echo Area/Volume: XMIN>=XMAX, YMIN>=YMAX OR ZMIN>ZMAX

255 Echo Area/Volume Boundary Point(s) Outside Device Range

253 Prompt/Echo Type Not Available On Specified Workstation

260 Input Device Data Record Field Is In Error

261 Initial Value Is Invalid

263 Length Of Initial String > Buffer Size

Related Subroutines

- Inquire String Device State
- Inquire Default String Device Data
- Inquire Display Space Size
- Inquire Number Of Available Logical Input Devices
- Pack Data Record
- Set String Mode

INITIALIZE STRING 3 (PHOP,WSOP,*,*)

Purpose

Use Initialize String 3 to initialize the specified string input device.

The Initialize String 3 subroutine stores the initial string, prompt/echo type, echo volume, and string data record in the workstation state list for the specified device. The graPHIGS API uses the string device's input character set to interpret the initial string and prompt strings.

For all prompt and echo types, the first entry of the string data record is the input buffer size, which is an integer in the range (1..n). The graPHIGS API compares this against the available input buffer size for the specified string device. If the requested buffer size is greater, then the graPHIGS API records the available size in the workstation state list instead of the specified input buffer size. If the initial string is longer than the buffer size, then the graPHIGS API issues an error.

When the graPHIGS API receives string input, it obtains a buffer of the size defined by the input buffer size. The graPHIGS API copies the initial string into the buffer, and places the cursor at the initial editing position within the buffer. Replacement of characters begins at this initial position.

This function supports the following prompt/echo types:

- Type One displays the current string value within the echo area using a workstation-dependent technique.

  Note: The string device must be in Request mode.

Language Bindings

C

pinit_string3 (*ws_id, string_num, init_string, pet, echo_vol, string_data*)

Input Parameters

Pint ws_id
: Workstation identifier.

Pint string_num
: String device number (>=1).

*const char *init_string*
: Initial string.

Pint pet
: Prompt and echo type.

*const Plimit3 *echo_vol*
: Echo volume in DC.

*const Pstring_data3 *string_data*
: Data record.

FORTRAN

PINST3 (*wkid*, *stdnr*, *lstr*, *istr*, *pet*, *evol*, *ldr*, *datrec*)

Input Parameters

integer wkid
: Workstation identifier.

integer stdnr
: String device number (>=1).

integer lstr
: Length of the initial string (>=0). The number of characters actually used is the minimum of *lstr* and the length of *istr*.

character(*) istr*
: Initial string.

integer pet
: Prompt and echo type.

real evol(6)
: Echo volume in DC (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

integer ldr
Dimension of the data record array.

*character*80 datrec(ldr)*
Data record.

The *pprec* parameters used to build the ***string input data record*** are as follows: (IL=2, IA=*input buffer size, initial editing position*, RL=0, RA=(), SL=0, LSTR=(), STR=()).

FORTRAN Subset

PINST3 (*wkid*, *stdnr*, *lstr*, *istr*, *pet*, *evol*, *ldr*, *datrec*)

Input Parameters

integer wkid
Workstation identifier.

integer stdnr
String device number (>=1).

integer lstr
Length of the initial string.

*character*80 istr*
Initial string.

integer pet
Prompt and echo type.

real evol(6)
Echo volume in DC (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

integer ldr
Dimension of the data record array.

*character*80 datrec(ldr)*
Data record.

The *pprec* parameters used to build the ***string input data record*** are as follows: (IL=2, IA=*input buffer size, initial editing position*, RL=0, RA=(), SL=0, LSTR=(), STR=()).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

251 Function Requires Input Device To Be In Request Mode

254 Invalid Echo Area/Volume: XMIN>=XMAX, YMIN>=YMAX OR ZMIN>ZMAX

255 Echo Area/Volume Boundary Point(s) Outside Device Range

253 Prompt/Echo Type Not Available On Specified Workstation

260 Input Device Data Record Field Is In Error

261 Initial Value Is Invalid

263 Length Of Initial String > Buffer Size

Related Subroutines

- Inquire String Device State 3
- Inquire Default String Device Data 3
- Inquire Display Space Size
- Inquire Number Of Available Logical Input Devices
- Pack Data Record
- Set String Mode

INITIALIZE STROKE (PHOP,WSOP,*,*)

Purpose

Use Initialize Stroke to initialize the specified stroke device.

The Initialize Stroke subroutine stores the initial stroke, initial view index, prompt/echo type, echo area and stroke data record in the workstation state list for the specified device. The *z* coordinates of the echo volume remain unchanged.

For all prompt and echo types, the first entry of the stroke data record is the input buffer size, which is an integer in the range (1..n). The graPHIGS API compares this against the available input buffer size for the specified stroke device. If the requested buffer size is greater, then the graPHIGS API records the available size in the workstation state list instead of the specified input buffer size. If the initial stroke is longer than the buffer size, then the graPHIGS API issues an error.

When a stroke measure process begins, it acquires a buffer of the current input buffer size. The graPHIGS API copies the initial stroke pointlist into this buffer, and places the editing position at the initial buffer editing position. The replacement of points begins at this initial position. The *x*, *y*, and time intervals (where possible) of the data record control the frequency and density of stroke points.

This function supports the following prompt/echo types:

- Type One displays the current stroke using a workstation-dependent technique.
- Type Three displays a marker at each point of the current stroke. The marker representation is selected by a marker index, which is stored in the stroke data record.
- Type Four displays a line joining successive points in the current stroke. A polyline index in the stroke data record selects the line representation used.

  Note: The stroke device must be in Request mode.

Language Bindings

C

pinit_stroke (*ws_id, stroke_num, init_view_ind, init_stroke, pet, echo_area, stroke_data*)

Input Parameters

Pint ws_id
: Workstation identifier.

Pint stroke_num
: Stroke device number (>=1).

Pint init_view_ind
: Initial view index (>=0).

*const Ppoint_list *init_stroke*
Initial stroke in WC.

Pint pet
Prompt and echo type.

*const Plimit *echo_area*
Echo area in DC.

*const Pstroke_data *stroke_data*
Data record.

FORTRAN

PINSK (*wkid*, *skdnr*, *iviewi*, *n*, *ipx*, *ipy*, *pet*, *xmin*, *xmax*, *ymin*, *ymax*, *ldr*, *datrec*)

Input Parameters

integer wkid
Workstation identifier.

integer skdnr
Stroke device number (>=1).

integer iviewi
Initial view index (>=0).

integer n
Number of coordinates of initial stroke.

real ipx(*)
x coordinates of initial stroke in WC. The actual arguments are dimensioned by at least *max(1,n)*.

real ipy(*)
y coordinates of initial stroke in WC. The actual arguments are dimensioned by at least *max(1,n)*.

integer pet
Prompt and echo type.

real xmin
Minimum *x* coordinate determining echo area in DC.

real xmax
Maximum *x* coordinate determining echo area in DC.

real ymin
Minimum *y* coordinate determining echo area in DC.

real ymax
Maximum *y* coordinate determining echo area in DC.

integer ldr
Dimension of the data record array.

*character*80 datrec(ldr)*
Data record.

The *pprec* parameters used to build the ***stroke input data record*** for *pet*= 1 are as follows: (IL=2, IA=*input buffer size, editing position*, RL=3, RA=*x interval, y interval, time interval in seconds*, SL=0, LSTR=(), STR=()).

The *pprec* parameters used to build the ***stroke input data record*** for *pet*=3 are as follows: (IL=9, IA=*input buffer size, editing position, unused, marker type ASF, marker size scale factor ASF,*

polymarker color index ASF, polymarker index, marker type, polymarker color index, RL=4, RA=*x interval, y interval, time interval in seconds, marker size scale factor*, SL=0, LSTR=(), STR=()).

The *pprec* parameters used to build the ***stroke input data record*** for *pet*=4 are as follows: (IL=9, IA=*input buffer size, editing position, unused, line type ASF, line width scale factor ASF, polyline color index ASF, polyline index, line type, polyline color index*, RL=4, RA=*x interval, y interval, time interval in seconds, line width scale factor*, SL=0, LSTR=(), STR=()).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

251 Function Requires Input Device To Be In Request Mode

254 Invalid Echo Area/Volume: XMIN>=XMAX, YMIN>=YMAX OR ZMIN>ZMAX

255 Echo Area/Volume Boundary Point(s) Outside Device Range

253 Prompt/Echo Type Not Available On Specified Workstation

260 Input Device Data Record Field Is In Error

261 Initial Value Is Invalid

262 Number Of Points In Initial Stroke > Buffer Size

114 View Index Value < ZERO

Related Subroutines

- Inquire Stroke Device State 3
- Inquire Default Stroke Device Data 3
- Inquire Display Space Size
- Inquire Number Of Available Logical Input Devices
- Pack Data Record
- Set Stroke Mode

INITIALIZE STROKE 3 (PHOP,WSOP,*,*)

Purpose

Use Initialize Stroke 3 to initialize the specified stroke device.

The Initialize Stroke 3 subroutine stores the initial stroke, initial view index, prompt/echo type, echo volume and stroke data record in the workstation state list for the specified device.

For all prompt and echo types, the first entry of the stroke data record is the input buffer size, which is an integer in the range(1..n). The graPHIGS API compares this against the available input buffer size for the specified stroke device. If the requested buffer size is greater, then the graPHIGS API records the available size in the workstation state list instead of the specified input buffer size. If the initial stroke is longer than the buffer size, then the graPHIGS API issues an error.

When a stroke measure process begins, it acquires a buffer of the current input buffer size. The graPHIGS API copies the initial stroke pointlist into this buffer, and places the editing position at the initial buffer editing position. The replacement of points begins at this initial position. The *x*, *y*, *z*, and time intervals (where possible) of the data record control the frequency and density of stroke points.

This function supports the following prompt/echo types:

- Type One displays the current stroke using a workstation-dependent technique.
- Type Three displays a marker at each point of the current stroke. The marker representation is selected by a marker index, which is stored in the stroke data record.
- Type Four displays a line joining successive points in the current stroke. A polyline index in the stroke data record selects the line representation used.

Note: The stroke device must be in Request mode.

Language Bindings

C

pinit_stroke3 (*ws_id, stroke_num, init_view_ind, init_stroke, pet, echo_vol, stroke_data*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint stroke_num
Stroke device number (>=1).

Pint init_view_ind
Initial view index (>=0).

*const Ppoint_list3 *init_stroke*
Initial stroke in WC.

Pint pet
Prompt and echo type.

*const Plimit3 *echo_vol*
Echo volume in DC.

*const Pstroke_data3 *stroke_data*
Data record.

FORTRAN

PINSK3 (*wkid*, *skdnr*, *iviewi*, *n*, *ipx*, *ipy*, *ipz*, *pet*, *evol*, *ldr*, *datrec*)

Input Parameters

integer wkid
Workstation identifier.

integer stdnr
Stroke device number (>=1).

integer iviewi
Initial view index (>=0).

integer n
Number of coordinates of initial stroke.

real ipx (*)
x coordinates of initial stroke in WC. The actual arguments are dimensioned by at least *max(1,n)*.

real ipy (*)
y coordinates of initial stroke in WC. The actual arguments are dimensioned by at least *max(1,n)*.

real ipz (*)
z coordinates of initial stroke in WC. The actual arguments are dimensioned by at least *max(1,n)*.

integer pet
Prompt and echo type.

real evol(6)
Echo volume in DC (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

integer ldr
Dimension of the data record array.

*character*80 datrec(ldr)*
Data record.

The *pprec* parameters used to build the ***stroke input data record*** for *pet*= 1 are as follows: (IL=2, IA=*input buffer size, editing position*, RL=3, RA=*x interval, y interval, time interval in seconds*, SL=0, LSTR=(), STR=()).

The *pprec* parameters used to build the ***stroke input data record*** for *pet*= 3 are as follows: (IL=9, IA=*input buffer size, editing position, unused, marker type ASF, marker size scale factor ASF, polymarker color index ASF, polymarker index, marker type, polymarker color index*, RL=4, RA=*x interval, y interval, time interval in seconds, marker size scale factor*, SL=0, LSTR=(), STR=()).

The *pprec* parameters used to build the ***stroke input data record*** for *pet*= 4 are as follows: (IL=9, IA=*input buffer size, editing position, unused, line type ASF, line width scale factor ASF, polyline color index ASF, polyline index, line type, polyline color index*, RL=5, RA=*x interval, y interval, time interval in seconds, line width scale factor*, SL=0, LSTR=(), STR=()).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

251 Function Requires Input Device To Be In Request Mode

254 Invalid Echo Area/Volume: XMIN>=XMAX, YMIN>=YMAX OR ZMIN>ZMAX

255 Echo Area/Volume Boundary Point(s) Outside Device Range

253 Prompt/Echo Type Not Available On Specified Workstation

260 Input Device Data Record Field Is In Error

261 Initial Value Is Invalid

262 Number Of Points In Initial Stroke > Buffer Size

114 View Index Value < ZERO

Related Subroutines

- Inquire Stroke Device State 3
- Inquire Default Stroke Device Data 3
- Inquire Display Space Size
- Inquire Number Of Available Logical Input Devices
- Pack Data Record
- Set Stroke Mode

INITIALIZE VALUATOR (PHOP,WSOP,*,*)

Purpose

Use Initialize Valuator to initialize the specified valuator device.

The Initialize Valuator subroutine stores the initial value, prompt/echo type, echo area, and valuator data record in the workstation state list for the specified workstation. The *z* coordinates of the echo volume remain unchanged.

For all valuator prompt/echo types a low value and a high value specify the range for input from that valuator. The graPHIGS API scales the values from the physical device linearly to the specified range.

This function supports the following prompt/echo types:

- Type One designates the current valuator value using a workstation-dependent technique.
- Type Three displays a numerical representation of the current valuator value within the echo area.

Note: The valuator device must be in Request mode.

Language Bindings

C

pinit_val (*ws_id, val_num, init_value, pet, echo_area, val_data*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint val_num
Valuator device number (>=1).

Pfloat init_value
Initial value.

Pint pet
Prompt and echo type.

*const Plimit *echo_area*
Echo area in DC.

*const Pval_data *val_data*
Data record.

FORTRAN

PINVL (*wkid*, *vldnr*, *ival*, *pet*, *xmin*, *xmax*, *ymin*, *ymax*, *ldr*, *datrec*)

Input Parameters

integer wkid
Workstation identifier.

integer vldnr
Valuator device number (>=1).

real ival
Initial value.

integer pet
Prompt and echo type.

real xmin
Minimum *x* coordinate determining echo area in DC.

real xmax
Maximum *x* coordinate determining echo area in DC.

real ymin
Minimum *y* coordinate determining echo area in DC.

real ymax
Maximum *y* coordinate determining echo area in DC.

integer ldr
Dimension of the data record array.

*character*80 datrec(ldr)*
Data record.

The *pprec* parameters used to build the ***valuator input data record*** are as follows: (IL=0, IA=(), RL=2, RA=*low value of valuator range, high value of valuator range*, SL=0, LSTR=(), STR=()).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

251 Function Requires Input Device To Be In Request Mode

254 Invalid Echo Area/Volume: XMIN>=XMAX, YMIN>=YMAX OR ZMIN>ZMAX

255 Echo Area/Volume Boundary Point(s) Outside Device Range

253 Prompt/Echo Type Not Available On Specified Workstation

260 Input Device Data Record Field Is In Error

261 Initial Value Is Invalid

Related Subroutines

- Inquire Valuator Device State
- Inquire Default Valuator Device Data
- Inquire Display Space Size
- Inquire Number Of Available Logical Input Devices
- Pack Data Record
- Set Valuator Mode

INITIALIZE VALUATOR 3 (PHOP,WSOP,*,*)

Purpose

Use Initialize Valuator 3 to initialize the specified valuator device.

The Initialize Valuator subroutine stores the initial value, prompt/echo type, echo volume, and valuator data record in the workstation state list for the specified workstation.

For all valuator prompt/echo types a low value and a high value specify the range for input from that valuator. The graPHIGS API scales the values from the physical device linearly to the specified range. This function supports the following prompt/echo types:

- Type One designates the current valuator value using a workstation-dependent technique.
- Type Three displays a numerical representation of the current valuator value within the echo volume.

Note: The valuator device must be in Request mode.

Language Bindings

C

pinit_val3 (*ws_id, val_num, init_value, pet, echo_vol, val_data*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint val_num
Valuator device number (>=1).

Pfloat init_value
Initial value.

Pint pet
Prompt and echo type.

*const Plimit3 *echo_vol*
Echo volume in DC.

*const Pval_data3 *val_data*
Data record.

FORTRAN

PINVL3 (*wkid*, *vldnr*, *ival*, *pet*, *evol*, *ldr*, *datrec*)

Input Parameters

integer wkid
Workstation identifier.

integer vldnr
Valuator device number (>=1).

real ival
Initial value.

integer pet
Prompt and echo type.

real evol(6)
Echo volume in DC (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

integer ldr
Dimension of the data record array.

*character*80 datrec(ldr)*
Data record.

The *pprec* parameters used to build the ***valuator input data record*** are as follows: (IL=0, IA=(), RL=2, RA=*low value of valuator range, high value of valuator range*, SL=0, LSTR=(), STR=()).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

251 Function Requires Input Device To Be In Request Mode

254 Invalid Echo Area/Volume: XMIN>=XMAX, YMIN>=YMAX OR ZMIN>ZMAX

255 Echo Area/Volume Boundary Point(s) Outside Device Range

253 Prompt/Echo Type Not Available On Specified Workstation

260 Input Device Data Record Field Is In Error

263 Length Of Initial String > Buffer Size

261 Initial Value Is Invalid

Related Subroutines

- Inquire Valuator Device State 3
- Inquire Default Valuator Device Data
- Inquire Display Space Size
- Inquire Number Of Available Logical Input Devices
- Pack Data Record
- Set Valuator Mode

REQUEST CHOICE (PHOP,WSOP,*,*)

Purpose

Use Request Choice to have the graPHIGS API execute a request to the specified choice device. The graPHIGS API returns the choice input value, which is the current measure of the choice device.

A status of *NONE* means that a break action occurred. If the measure of the choice device indicates no choice, then the graPHIGS API returns a status of *NOCHOICE*. Otherwise, the graPHIGS API returns a status of *OK* together with a choice number which the graPHIGS API sets according to the current measure of the choice device.

Language Bindings

C

preq_choice (*ws_id, choice_num, in_status, choice*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint choice_num
Choice device number (>=1).

Output Parameters

*Pin_status *in_status*
Choice status (*0=PIN_STATUS_NONE, 1=PIN_STATUS_OK, 2=PIN_STATUS_NO_IN*).

*Pint *choice*
Requested choice.

FORTRAN

PRQCH (*wkid*, *chdnr*, *stat*, *chnr*)

Input Parameters

integer wkid
Workstation identifier.

integer chdnr
Choice device number (>=1).

Output Parameters

integer stat
Choice status (*0=PNONE, 1=POK, 2=PNCHOI*).

integer chnr
Choice number (>=1).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

251 Function Requires Input Device To Be In Request Mode

Related Subroutines

- Initialize Choice
- Inquire Number Of Available Logical Input Devices
- Set Choice Mode

REQUEST LOCATOR (PHOP,WSOP,*,*)

Purpose

Use Request Locator to have the graPHIGS API execute a request to the specified locator device.

The graPHIGS API returns the locator position and the index of the view which the graPHIGS API used to convert the location from Device Coordinates (DC) to World Coordinates (WC).

The graPHIGS API returns the locator input from the view with the highest input priority under the cursor. View zero is the highest priority view unless modified by your application.

A status of *NONE* means that a break action occurred. Otherwise, the graPHIGS API returns a status of *OK* together with the logical input value which is the current measure of the locator device.

Note: This function returns a two-dimensional result. The graPHIGS API discards the *z* coordinate of the locator position. The *x* and *y* values of the locator position are identical to those returned by the Request Locator 3 subroutine for the same operator action.

Language Bindings

C

preq_loc (*ws_id, loc_num, in_status, view_ind, loc_pos*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint loc_num
Locator device number (>=1).

Output Parameters

*Pin_status *in_status*
Input status (*0=PIN_STATUS_NONE, 1=PIN_STATUS_OK*).

*Pint *view_ind*
View index (>=0).

*Ppoint *loc_pos*
Locator position in WC.

FORTRAN

PRQLC (*wkid*, *lcdnr*, *stat*, *viewi*, *px*, *py*)

Input Parameters

integer wkid
Workstation identifier.

integer lcdnr
Locator device number (>=1).

Output Parameters

integer stat
Input status (*0=PNONE, 1=POK*).

integer viewi
View index (>=0).

real px
x coordinate of the locator position in WC.

real py
y coordinate of the locator position in WC.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

251 Function Requires Input Device To Be In Request Mode

Related Subroutines

- Initialize Locator
- Inquire Number Of Available Logical Input Devices
- Set Locator Mode

REQUEST LOCATOR 3 (PHOP,WSOP,*,*)

Purpose

Use Request Locator 3 to have the graPHIGS API execute a request to the specified locator device.

The graPHIGS API returns the locator position and the index of the view which the graPHIGS API used to convert the location from Device Coordinates (DC) to World Coordinates (WC).

The graPHIGS API returns the locator input from the view with the highest input priority under the cursor. View zero is the highest priority view unless modified by your application.

A status of *NONE* means that a break action occurred. Otherwise, the graPHIGS API returns a status of *OK* together with the logical input value which is the current measure of the locator device.

Language Bindings

C

preq_loc3 (*ws_id, loc_num, in_status, view_ind, loc_pos*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint loc_num
Locator device number (>=1).

Output Parameters

*Pin_status *in_status*
Input status (*0=PIN_STATUS_NONE, 1=PIN_STATUS_OK*).

*Pint *view_ind*
View index (>=0).

*Ppoint3 *loc_pos*
Locator position in WC.

FORTRAN

PRQLC3 (*wkid*, *lcdnr*, *stat*, *viewi*, *px*, *py*, *pz*)

Input Parameters

integer wkid
Workstation identifier.

integer lcdnr
Locator device number (>=1).

Output Parameters

integer stat
Input status (*0=PNONE, 1=POK*).

integer viewi
View index (>=0).

real px
x coordinate of the locator position in WC.

real py
y coordinate of the locator position in WC.

real pz
z coordinate of the locator position in WC.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

251 Function Requires Input Device To Be In Request Mode

Related Subroutines

- Initialize Locator 3
- Inquire Number Of Available Logical Input Devices
- Set Locator Mode

REQUEST PICK (PHOP,WSOP,*,*)

Purpose

Use Request Pick to have the graPHIGS API execute a request to the specified pick device.

The graPHIGS API returns the pick path information in the order specified in the Initialize Pick subroutine, that is, *TOP FIRST* or *BOTTOM FIRST*. If your application has not called Initialize Pick, then the pick path defaults to *TOP FIRST*.

A status of *NONE* means that a break action occurred. If the measure of the pick device indicates no pick, then the graPHIGS API returns a status of *NOPICK*. Otherwise, the graPHIGS API returns a status of *OK* together with a pick path which the graPHIGS API sets according to the current measure of the pick device. Each entry in the pick path consists of a structure identifier, a pick identifier, and an element position.

Language Bindings

C

preq_pick (*ws_id, pick_num, depth, in_status, pick*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint pick_num
Pick device number (>=1).

Pint depth
Maximum depth of the returned pick path.

Output Parameters

*Pin_status *in_status*
Input status (*0=PIN_STATUS_NONE, 1=PIN_STATUS_OK, 2=PIN_STATUS_NO_IN*).

*Ppick_path *pick*
Requested pick path.

FORTRAN

PRQPK (*wkid*, *pkdnr*, *ippd*, *stat*, *ppd*, *pp*)

Input Parameters

integer wkid
Workstation identifier.

integer pkdnr
Pick device number (>=1).

integer ippd
Maximum depth of the returned pick path.

Output Parameters

integer stat
Input status (*0=PNONE, 1=POK, 2=PNPICK*).

integer ppd
Depth of the actual pick path.

integer pp (3,ippd)
Requested pick path.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

251 Function Requires Input Device To Be In Request Mode

Related Subroutines

- Add Names To Set
- Initialize Pick
- Inquire Number Of Available Logical Input Devices
- Remove Names From Set
- Set Pick Filter

- Set Pick Identifier
- Set Pick Mode

REQUEST STRING (PHOP,WSOP,*,*)

Purpose

Use Request String to have the graPHIGS API execute a request to the specified string device.

A status of *NONE* means that a break action occurred. Otherwise, the graPHIGS API returns a status of *OK* together with a character string which is set according to the current measure of the string device.

Language Bindings

C

preq_string (*ws_id, string_num, in_status, string*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint string_num
String device number (>=1).

Output Parameters

*Pin_status *in_status*
Input status (*0=PIN_STATUS_NONE, 1=PIN_STATUS_OK*).

*char *string*
Requested string. The application must allocate the memory for the character string returned. The Initialize String subroutine The Initialize String subroutine or the Initialize String 3 subroutine specifies the maximum size of the returned character string. The Inquire Default String Device Data subroutine or the Inquire Default String Device Data 3 subroutine returns the maximum size of a character string supported by the workstation.

FORTRAN

PRQST (*wkid*, *stdnr*, *stat*, *lostr*, *str*)

Input Parameters

integer wkid
Workstation identifier.

integer stdnr
String device number (>=1).

Output Parameters

integer stat
Input status (*0=PNONE, 1=POK*).

integer lostr
Number of characters returned.

character(*) str*
Character string.

FORTRAN Subset

PRQST (*wkid*, *stdnr*, *stat*, *lostr*, *str*)

Input Parameters

integer wkid
Workstation identifier.

integer stdnr
String device number (>=1).

Output Parameters

integer stat
Input status (*0=PNONE, 1=POK*).

integer lostr
Number of characters returned.

*character*80 str*
Character string.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

251 Function Requires Input Device To Be In Request Mode

Related Subroutines

- Initialize String
- Inquire Number Of Available Logical Input Devices
- Set String Mode

REQUEST STROKE (PHOP,WSOP,*,*)

Purpose

Use Request Stroke to have the graPHIGS API execute a request to the specified stroke device.

A status of *NONE* means that a break action occurred. Otherwise, the graPHIGS API returns a status of *OK* together with a sequence of World Coordinate (WC) points and the view table index which has a matrix that the graPHIGS API used to convert the stroke locations from Device Coordinates (DC) to World Coordinates. The graPHIGS API sets these values according to the current measure of the stroke device.

This subroutine returns the stroke input from the view with the highest input priority that contains all the points. View zero is the highest priority view unless modified by your application.

> **Note:** This function returns a two-dimensional result. The graPHIGS API discards the *z* coordinates of the stroke points. The *x* and *y* values of the stroke points are identical to those returned by the Request Stroke 3 subroutine for the same operator action.

Language Bindings

C

preq_stroke (*ws_id, stroke_num, in_status, view_ind, stroke*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint stroke_num
Stroke device number (>=1).

Output Parameters

*Pin_status *in_status*
Input status (*0=PIN_STATUS_NONE, 1=PIN_STATUS_OK*).

*Pint *view_ind*
View index.

*Ppoint_list *stroke*
Requested stroke point list. The application must allocate the memory for the point list returned. The Initialize Stroke subroutine specifies the maximum size of the returned stroke point list. The Inquire Default Stroke Device Data subroutine returns the maximum size of a stroke point list supported by the workstation.

FORTRAN

PRQSK (*wkid*, *skdnr*, *n*, *stat*, *viewi*, *np*, *pxa*, *pya*)

Input Parameters

integer wkid
Workstation identifier.

integer skdnr
Stroke device number (>=1).

integer n
Dimension of arrays for stroke points.

Output Parameters

integer stat
Input status (*0=PNONE, 1=POK*).

integer viewi
View index (>=0).

integer np
Number of points.

real pxa (n)
x coordinates of points in the stroke in WC.

real pya (n)
y coordinates of points in the stroke in WC.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

251 Function Requires Input Device To Be In Request Mode

Related Subroutines

- Initialize Stroke
- Inquire Number Of Available Logical Input Devices
- Set Stroke Mode

REQUEST STROKE 3 (PHOP,WSOP,*,*)

Purpose

Use Request Stroke 3 to have the graPHIGS API execute a request to the specified stroke device.

A status of *NONE* means that a break action occurred. Otherwise, the graPHIGS API returns a status of *OK* together with a sequence of World Coordinate (WC) points and the view table index which has a matrix that the graPHIGS API used to convert the stroke locations from Device Coordinates (DC) to World Coordinates. The graPHIGS API sets these values according to the current measure of the stroke device.

This subroutine returns the stroke input from the view with the highest input priority that contains all the points. View zero is the highest priority view unless modified by your application.

Language Bindings

C

preq_stroke3 (*ws_id, stroke_num, in_status, view_ind, stroke*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint stroke_num
Stroke device number (>=1).

Output Parameters

*Pin_status *in_status*
Input status (*0=PIN_STATUS_NONE, 1=PIN_STATUS_OK*).

*Pint *view_ind*
View index.

*Ppoint_list3 *stroke*
Requested stroke point list. The application must allocate the memory for the point list returned. The Initialize Stroke 3 subroutine specifies the maximum size of the returned stroke point list. The Inquire Default Stroke Device Data subroutine returns the maximum size of a stroke point list supported by the workstation.

FORTRAN

PRQSK3 (*wkid*, *skdnr*, *n*, *stat*, *viewi*, *np*, *pxa*, *pya*, *pza*)

Input Parameters

integer wkid
Workstation identifier.

integer skdnr
Stroke device number (>=1).

integer n
Dimension of arrays for stroke points.

Output Parameters

integer stat
Input status (*0=PNONE, 1=POK*).

integer viewi
View index (>=0).

integer np
Number of points.

real pxa (n)
x coordinates of points in the stroke in WC.

real pya (n)
y coordinates of points in the stroke in WC.

real pza (n)
z coordinates of points in the stroke in WC.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

251 Function Requires Input Device To Be In Request Mode

Related Subroutines

- Initialize Stroke 3
- Inquire Number Of Available Logical Input Devices
- Set Stroke Mode

REQUEST VALUATOR (PHOP,WSOP,*,*)

Purpose

Use Request Valuator to have the graPHIGS API execute a request to the specified valuator device.

A status of *NONE* means that a break action occurred. Otherwise, the graPHIGS API returns a status of *OK* together with the logical input value which is the current measure of the valuator device. The value returned is in the range specified by your application through the Initialize Valuator subroutine.

Language Bindings

C

preq_val (*ws_id, val_num, in_status, value*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint val_num
Valuator device number (>=1).

Output Parameters

*Pin_status *in_status*
Input status (*0=PIN_STATUS_NONE, 1=PIN_STATUS_OK*).

*Pfloat *value*
Requested valuator value.

FORTRAN

PRQVL (*wkid*, *vldnr*, *stat*, *val*)

Input Parameters

integer wkid
Workstation identifier.

integer vldnr
Valuator device number (>=1).

Output Parameters

integer stat
Input status (*0=PNONE, 1=POK*).

real val
Valuator value.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

251 Function Requires Input Device To Be In Request Mode

Related Subroutines

- Initialize Valuator
- Inquire Number Of Available Logical Input Devices
- Set Valuator Mode

SAMPLE CHOICE (PHOP,WSOP,*,*)

Purpose

Use Sample Choice to immediately retrieve the current measure of the specified choice device.

If the measure of the choice device indicates no choice, then the graPHIGS API returns a status of *NOCHOICE*. Otherwise, the graPHIGS API returns a status of *OK* together with a choice number which is set according to the current measure of the choice device.

Language Bindings

C

psample_choice (*ws_id, choice_num, choice_in_status, choice*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint choice_num
Choice device number (>=1).

Output Parameters

*Pin_status *choice_in_status*
Choice input status (*1=PIN_STATUS_OK, 2=PIN_STATUS_NO_IN*).

*Pint *choice*
Choice number.

FORTRAN

PSMCH (*wkid*, *chdnr*, *stat*, *chnr*)

Input Parameters

integer wkid
Workstation identifier.

integer chdnr
Choice device number (>=1).

Output Parameters

integer stat
Choice input status (*1=POK, 2=PNCHOI*).

integer chnr
Choice number.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

251 Function Requires Input Device To Be In Request Mode

Related Subroutines

- Inquire Number Of Available Logical Input Devices
- Set Choice Mode

SAMPLE LOCATOR (PHOP,WSOP,*,*)

Purpose

Use Sample Locator to immediately retrieve the current measure of the specified locator device.

The measure consists of a locator position in World Coordinates (WC) and the index of the view table entry which has a matrix that the graPHIGS API used to convert the location from Device Coordinates (DC) to World Coordinates.

This subroutine returns the locator input from the view with the highest input priority under the cursor. View zero is the highest priority view unless modified by your application.

Note: This function returns a two-dimensional result. The graPHIGS API discards the *z* coordinate of the locator position. The *x* and *y* values of the locator position are identical to those returned by the Sample Locator 3 subroutine for the same operator action.

Language Bindings

C

psample_loc (*ws_id, loc_num, view_ind, loc_pos*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint loc_num
Locator device number (>=1).

Output Parameters

*Pint *view_ind*
View index (>=0).

*Ppoint *loc_pos*
Locator position in WC.

FORTRAN

PSMLC (*wkid*, *lcdnr*, *viewi*, *lpx*, *lpy*)

Input Parameters

integer wkid
Workstation identifier.

integer lcdnr
Locator device number (>=1).

Output Parameters

integer viewi
View index (>=0).

real lpx
x coordinate of locator position in WC.

real lpy
y coordinate of locator position in WC.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

252 Function Requires Input Device To Be In Sample Mode

Related Subroutines

- Inquire Number Of Available Logical Input Devices
- Set Locator Mode

SAMPLE LOCATOR 3 (PHOP,WSOP,*,*)

Purpose

Use Sample Locator 3 to immediately retrieve the current measure of the specified locator device.

The measure consists of a locator position in World Coordinates (WC) and the index of the view table entry which has a matrix that the graPHIGS API used to convert the location from Device Coordinates (DC) to World Coordinates (WC).

This subroutine returns the locator input from the view with the highest input priority under the cursor. View zero is the highest priority view unless modified by your application.

Language Bindings

C

psample_loc3 (*ws_id, loc_num, view_ind, loc_pos*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint loc_num
Locator device number (>=1).

Output Parameters

*Pint *view_ind*
View index (>=0).

*Ppoint3 *loc_pos*
Locator position in WC.

FORTRAN

PSMLC3 (*wkid*, *lcdnr*, *viewi*, *lpx*, *lpy*, *lpz*)

Input Parameters

integer wkid
Workstation identifier.

integer lcdnr
Locator device number (>=1).

Output Parameters

integer viewi
View index (>=0).

real lpx
x coordinate of locator position in WC.

real lpy
y coordinate of locator position in WC.

real lpz
z coordinate of locator position in WC.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

252 Function Requires Input Device To Be In Sample Mode

Related Subroutines

- Inquire Number Of Available Logical Input Devices
- Set Locator Mode

SAMPLE PICK (PHOP,WSOP,*,*)

Purpose

Use Sample Pick to immediately retrieve the current measure of the specified pick device.

The graPHIGS API returns the pick path information in the order specified in the Initialize Pick subroutine, that is, *TOP FIRST* or *BOTTOM FIRST*. If your application has not called Initialize Pick, then the pick path order defaults to *TOP FIRST*.

If the measure of the pick device indicates no pick, then the graPHIGS API returns a status of *NOPICK* Otherwise, the graPHIGS API returns a status of *OK* together with a pick path which is set according to the current measure of the pick device. Each entry in the pick path consists of a structure identifier, a pick identifier, and an element position.

Language Bindings

C

psample_pick (*ws_id, pick_num, depth, pick_in_status, pick*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint pick_num
Pick device number (>=1).

Pint depth
Maximum depth of pick path to return.

Output Parameters

*Pin_status *pick_in_status*
Pick input status (*1=PIN_STATUS_OK, 2=PIN_STATUS_NO_IN*).

*Ppick_path *pick*
Pick path.

FORTRAN

PSMPK (*wkid*, *pkdnr*, *ippd*, *stat*, *ppd*, *pp*)

Input Parameters

integer wkid
Workstation identifier.

integer pkdnr
Pick device number (>=1).

integer ippd
Maximum depth of pick path to return.

Output Parameters

integer stat
Pick input status (*1=POK, 2=PNPICK*).

integer ppd
Depth of the actual pick path.

integer pp (3,ippd)
Pick path.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

252 Function Requires Input Device To Be In Sample Mode

Related Subroutines

- Inquire Number Of Available Logical Input Devices

- Set Pick Mode

SAMPLE STRING (PHOP,WSOP,*,*)

Purpose

Use Sample String to retrieve the current measure of the specified string device.

Language Bindings

C

psample_string (*ws_id, string_num, string*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint string_num
String device number (>=1).

Output Parameters

*char *string*
Character string. The application must allocate the memory for the character string returned. The Initialize String subroutine or the Initialize String 3 subroutine specifies the maximum size of the returned character size. The Inquire Default String Device Data subroutine or the Inquire Default String Device Data 3 subroutine returns the maximum size of a character string supported by the workstation.

FORTRAN

PSMST (*wkid*, *stdnr*, *lostr*, *str*)

Input Parameters

integer wkid
Workstation identifier.

integer stdnr
String device number (>=1).

Output Parameters

integer lostr
Number of characters returned.

character(*) str*
Character string.

FORTRAN Subset

PSMST (*wkid*, *stdnr*, *lostr*, *str*)

Input Parameters

integer wkid
Workstation identifier.

integer stdnr
String device number (>=1).

Output Parameters

integer lostr
Number of characters returned.

*character*80 str*
Character string.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

252 Function Requires Input Device To Be In Sample Mode

Related Subroutines

- Inquire Number Of Available Logical Input Devices
- Set String Mode

SAMPLE STROKE (PHOP,WSOP,*,*)

Purpose

Use Sample Stroke to immediately retrieve the current measure of the specified stroke device.

This measure consists of a sequence of stroke positions (not exceeding the current input buffer size) in World Coordinates (WC), and the index of the view table entry which has a matrix that the graPHIGS API used to convert the stroke locations from Device Coordinates (DC) to World Coordinates.

This subroutine returns the stroke input from the view with the highest input priority which contains all the points. View zero is the highest priority view unless modified by your application.

> **Note:** This function returns a two-dimensional result. The graPHIGS API discards the *z* coordinates of the stroke points. The *x* and *y* values of the stroke points are identical to those returned by the the Sample Stroke 3 subroutine for the same operator action.

Language Bindings

C

psample_stroke (*ws_id, stroke_num, view_ind, stroke*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint stroke_num
Stroke device number (>=1).

Output Parameters

*Pint *view_ind*
View index.

*Ppoint_list *stroke*
Stroke point list in WC. The application must allocate the memory for the point list returned. The Initialize Stroke subroutine specifies the maximum size of the returned stroke point list. The Inquire Default Stroke Device Data subroutine returns the maximum size of a stroke point list supported by the workstation.

FORTRAN

PSMSK (*wkid*, *skdnr*, *n*, *viewi*, *np*, *pxa*, *pya*)

Input Parameters

integer wkid
Workstation identifier.

integer skdnr
Stroke device number (>=1).

integer n
Dimension of arrays for stroke points.

Output Parameters

integer viewi
View index (>=0).

integer np
Number of points.

real pxa (n)
x coordinates of points in the stroke in WC.

real pya (n)
y coordinates of points in the stroke in WC.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

252 Function Requires Input Device To Be In Sample Mode

Related Subroutines

- Inquire Number Of Available Logical Input Devices
- Set Stroke Mode

SAMPLE STROKE 3 (PHOP,WSOP,*,*)

Purpose

Use Sample Stroke 3 to immediately retrieve the current measure of the specified stroke device.

This measure consists of a sequence of stroke positions (not exceeding the current input buffer size) in World Coordinates (WC), and the index of the view table entry which has a matrix that the graPHIGS API used to convert the stroke locations from Device Coordinates (DC) to World Coordinates.

This subroutine returns the stroke input from the view with the highest input priority which contains all the points. View zero is the highest priority view unless modified by your application.

Language Bindings

C

psample_stroke3 (*ws_id, stroke_num, view_ind, stroke*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint stroke_num
Stroke device number (>=1).

Output Parameters

*Pint *view_ind*
View index.

*Ppoint_list3 *stroke*
Stroke point list in WC. The application must allocate the memory for the point list returned. The Initialize Stroke 3 subroutine specifies the maximum size of the returned stroke point list. The Inquire Default Stroke Device Data 3 subroutine returns the maximum size of a stroke point list supported by the workstation.

FORTRAN

PSMSK3 (*wkid*, *skdnr*, *n*, *viewi*, *np*, *pxa*, *pya*, *pza*)

Input Parameters

integer wkid
Workstation identifier.

integer skdnr
Stroke device number (>=1).

integer n
Dimension of arrays for stroke points.

Output Parameters

integer viewi
View index (>=0).

integer np
Number of points.

real pxa (n)
x coordinates of points in the stroke in WC.

real pya (n)
y coordinates of points in the stroke in WC.

real pza (n)
z coordinates of points in the stroke in WC.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

252 Function Requires Input Device To Be In Sample Mode

Related Subroutines

- Inquire Number Of Available Logical Input Devices
- Set Stroke Mode

SAMPLE VALUATOR (PHOP,WSOP,*,*)

Purpose

Use Sample Valuator to retrieve the current measure of the specified valuator device.

The returned value is in the range specified for this device through the Initialize Valuator subroutine.

Language Bindings

C

psample_val (*ws_id, val_num, value*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint val_num
Valuator device number (>=1).

Output Parameters

*Pfloat *value*
Valuator value.

FORTRAN

PSMVL (*wkid*, *vldnr*, *val*)

Input Parameters

integer wkid
Workstation identifier.

integer vldnr
Valuator device number (>=1).

Output Parameters

real val
Valuator value.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

252 Function Requires Input Device To Be In Sample Mode

Related Subroutines

- Inquire Number Of Available Logical Input Devices
- Set Valuator Mode

SET CHOICE MODE (PHOP,WSOP,*,*)

Purpose

Use Set Choice Mode to set the operating mode of the specified choice input device.

After the choice mode is set, the graPHIGS API sets the echoing state to *ECHO* or *NOECHO*. Depending on the specified operating mode—Request, Sample, or Event— an interaction with the given device may begin or end.

> **Note:** The graPHIGS API resets the input device with the initialization values when your application calls the Description subroutine with the operating mode parameter set to *SAMPLE* or *EVENT*.

Language Bindings

C

pset_choice_mode (*ws_id, choice_num, op_mode, echo_switch*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint choice_num
Choice device number (>=1).

Pop_mode op_mode
Operating mode (*0=POP_REQ, 1=POP_SAMPLE, 2=POP_EVENT*).

Pecho_switch echo_switch
Echo switch (*0=PSWITCH_NO_ECHO, 1=PSWITCH_ECHO*).

FORTRAN

PSCHM (*wkid*, *chdnr*, *mode*, *esw*)

Input Parameters

integer wkid
Workstation identifier.

integer chdnr
Choice device number (>=1).

integer mode
Operating mode (*0=PREQU, 1=PSAMPL, 2=PEVENT*).

integer esw
Echo switch (*0=PNECHO, 1=PECHO*).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Related Subroutines

- Await Event
- Initialize Choice
- Initialize Choice 3
- Inquire Number Of Available Logical Input Devices
- Request Choice
- Sample Choice

SET LOCATOR MODE (PHOP,WSOP,*,*)

Purpose

Use Set Locator Mode to set the operating mode of the specified locator device.

After the Locator Mode is set, the graPHIGS API sets the echoing state to *ECHO* or *NOECHO*. Depending on the specified operating mode—Request, Sample, or Event—an interaction with the given device may begin or end.

> **Note:** The graPHIGS API resets the input device with the initialization values when your application calls the Description subroutine with the operating mode parameter set to *SAMPLE* or *EVENT*.

Language Bindings

C

pset_loc_mode (*ws_id, loc_num, op_mode, echo_switch*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint loc_num
Locator device number (>=1).

Pop_mode op_mode
Operating mode (*0=POP_REQ, 1=POP_SAMPLE, 2=POP_EVENT*).

Pecho_switch echo_switch
Echo switch (*0=PSWITCH_NO_ECHO, 1=PSWITCH_ECHO*).

FORTRAN

PSLCM (*wkid*, *lcdnr*, *mode*, *esw*)

Input Parameters

integer wkid
Workstation identifier.

integer lcdnr
Locator device number (>=1).

integer mode
Operating mode (*0=PREQU, 1=PSAMPL, 2=PEVENT*).

integer esw
Echo switch (*0=PNECHO, 1=PECHO*).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Related Subroutines

- Await Event
- Initialize Locator
- Initialize Locator 3
- Inquire Number Of Available Logical Input Devices
- Request Locator
- Request Locator 3
- Sample Locator
- Sample Locator 3

SET PICK FILTER (PHOP,WSOP,*,*)

Purpose

Use Set Pick Filter to set the pick inclusion and exclusion filters for the specified pick device.

The filters consist of class names which indicate which class names to include and which to exclude from pickability (detectability).

Language Bindings

C

pset_pick_filter (*ws_id, pick_num, filter*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint pick_num
Pick device number (>=1).

*const Pfilter *filter*
Pick filter.

FORTRAN

PSPKFT (*wkid*, *pkdnr*, *isn*, *is*, *esn*, *es*)

Input Parameters

integer wkid
Workstation identifier.

integer pkdnr
Pick device number (>=1).

integer isn
Number of names in the inclusion set (>=0).

integer is (isn)
Inclusion set.

integer esn
Number of names in the exclusion set (>=0).

integer es (esn)
Exclusion set.

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Related Subroutines

- Add Names To Set
- Inquire Number Of Available Logical Input Devices
- Remove Names From Set

SET PICK MODE (PHOP,WSOP,*,*)

Purpose

Use Set Pick Mode to set the operating mode of the specified pick device.

After the pick mode is set, the graPHIGS API sets the echoing state to *ECHO* or *NOECHO*. Depending on the specified operating mode—Request, Sample, or Event— an interaction with the given device may begin or end.

> **Note:** The graPHIGS API resets the input device with the initialization values when your application calls the Description subroutine with the operating mode parameter set to *SAMPLE* or *EVENT*.

Language Bindings

C

pset_pick_mode (*ws_id, pick_num, op_mode, echo_switch*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint pick_num
Pick device number (>=1).

Pop_mode op_mode
Operating mode (*0=POP_REQ, 1=POP_SAMPLE, 2=POP_EVENT*).

Pecho_switch echo_switch
Echo switch (*0=PSWITCH_NO_ECHO, 1=PSWITCH_ECHO*).

FORTRAN

PSPKM (*wkid*, *pkdnr*, *mode*, *esw*)

Input Parameters

integer wkid
Workstation identifier.

integer pkdnr
Pick device number (>=1).

integer mode
Operating mode (*0=PREQU, 1=PSAMPL, 2=PEVENT*).

integer esw
Echo switch (*0=PNECHO, 1=PECHO*).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Related Subroutines

- Await Event
- Initialize Pick
- Initialize Pick 3
- Inquire Number Of Available Logical Input Devices
- Request Pick
- Sample Pick

SET STRING MODE (PHOP,WSOP,*,*)

Purpose

Use Set String Mode to set the operating mode of the specified string device.

After the string mode is set, the graPHIGS API sets the echoing state to *ECHO* or *NOECHO*. Depending on the specified operating mode—Request, Sample, or Event— an interaction with the given device may begin or end.

> **Note:** The graPHIGS API resets the input device with the initialization values when your application calls the Description subroutine with the operating mode parameter set to *SAMPLE* or *EVENT*.

Language Bindings

C

pset_string_mode (*ws_id, string_num, op_mode, echo_switch*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint string_num
String device number (>=1).

Pop_mode op_mode
Operating mode (*0=POP_REQ, 1=POP_SAMPLE, 2=POP_EVENT*).

Pecho_switch echo_switch
Echo switch (*0=PSWITCH_NO_ECHO, 1=PSWITCH_ECHO*).

FORTRAN

PSSTM (*wkid*, *stdnr*, *mode*, *esw*)

Input Parameters

integer wkid
Workstation identifier.

integer stdnr
String device number (>=1).

integer mode
Operating mode (*0=PREQU, 1=PSAMPL, 2=PEVENT*).

integer esw
Echo switch (*0=PNECHO, 1=PECHO*).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Related Subroutines

- Await Event
- Initialize String
- Initialize String 3
- Inquire Number Of Available Logical Input Devices
- Request String
- Sample String

SET STROKE MODE (PHOP,WSOP,*,*)

Purpose

Use Set Stroke Mode to set the operating mode of the specified stroke device.

After the stroke mode is set, the graPHIGS API sets the echoing state to *ECHO* or *NOECHO*. Depending on the specified operating mode—Request, Sample, or Event— an interaction with the given device may either begin or end.

Note: The graPHIGS API resets the input device with the initialization values when your application calls the Description subroutine with the operating mode parameter set to *SAMPLE* or *EVENT*.

Language Bindings

C

pset_stroke_mode (*ws_id, stroke_num, op_mode, echo_switch*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint stroke_num
Stroke device number (>=1).

Pop_mode op_mode
Operating mode (*0=POP_REQ, 1=POP_SAMPLE, 2=POP_EVENT*).

Pecho_switch echo_switch
Echo switch (*0=PSWITCH_NO_ECHO, 1=PSWITCH_ECHO*).

FORTRAN

PSSKM (*wkid*, *skdnr*, *mode*, *esw*)

Input Parameters

integer wkid
Workstation identifier.

integer skdnr
Stroke device number (>=1).

integer mode
Operating mode (*0=PREQU, 1=PSAMPL, 2=PEVENT*).

integer esw
Echo switch (*0=PNECHO, 1=PECHO*).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Related Subroutines

- Await Event
- Initialize Stroke
- Initialize Stroke 3
- Inquire Number Of Available Logical Input Devices
- Request Stroke
- Request Stroke 3
- Sample Stroke
- Sample Stroke 3

SET VALUATOR MODE (PHOP,WSOP,*,*)

Purpose

Use Set Valuator Mode to set the operating mode of the specified valuator device.

After the valuator mode is set, the graPHIGS API sets the echoing state to *ECHO* or *NOECHO*. Depending on the specified operating mode—Request, Sample, or Event— an interaction with the given device may either begin or end.

Note: The graPHIGS API resets the input device with the initialization values when your application calls the Description subroutine with the operating mode parameter set to *SAMPLE* or *EVENT*.

Language Bindings

C

pset_valuator_mode (*ws_id, val_num, op_mode, echo_switch*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint val_num
Valuator device number (>=1).

Pop_mode op_mode
Operating mode (*0=POP_REQ, 1=POP_SAMPLE, 2=POP_EVENT*).

Pecho_switch echo_switch
Echo switch (*0=PSWITCH_NO_ECHO, 1=PSWITCH_ECHO*).

FORTRAN

PSVLM (*wkid*, *vldnr*, *mode*, *esw*)

Input Parameters

integer wkid
Workstation identifier.

integer vldnr
Valuator device number (>=1).

integer mode
Operating mode (*0=PREQU, 1=PSAMPL, 2=PEVENT*).

integer esw
Echo switch (*0=PNECHO, 1=PECHO*).

Errors

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Related Subroutines

- Await Event
- Initialize Valuator
- Initialize Valuator 3
- Inquire Number Of Available Logical Input Devices
- Request Valuator
- Sample Valuator

Chapter 12. Utility Subroutines

The subroutines in this category provide convenient mechanisms for modifying data or performing calculations.

Most subroutines perform transformations on matrixes. In addition, the Pack Data Record and Unpack Data Record utilities provide a convenient mechanism for the handling of data records used by input device initialization subroutines. These two utilities are defined only for the FORTRAN binding.

The Create Store and Delete Store utilities are defined only for the C binding. The graPHIGS API uses an object of type Store to facilitate the task of using a C binding subroutine which returns complex data.

BUILD TRANSFORMATION MATRIX (PHOP,*,*,*)

Purpose

Use Build Transformation Matrix to calculate a specified two-dimensional homogenous transformation matrix. The order of transformation is: scale, rotate (both relative to the specified fixed point), and shift.

If the graPHIGS API can compute the transformation matrix, then the graPHIGS API sets the error indicator to zero and returns the transformation matrix. If the graPHIGS API cannot compute the transformation matrix, then the values of the matrix are unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

pbuild_tran_matrix (*point, shift_vec, angle, scale_vec, err_ind, result_tran*)

Input Parameters

*const Ppoint *point*
: Fixed point.

*const Pvec *shift_vec*
: Shift vector.

Pfloat angle
: Rotation angle in radians (positive if counterclockwise).

*const Pvec *scale_vec*
: Scale vector.

Output Parameters

*Pint *err_ind*
: Error indicator.

Pmatrix result_tran
: Transformation matrix. (See Chapter 15. ″ISO PHIGS Transformations″ for a description of the storage of the transformation matrix).

FORTRAN

PBLTM (*x0*, *y0*, *dx*, *dy*, *phi*, *fx*, *fy*, *errind*, *xfrmt*)

Input Parameters

real x0
: *x* coordinate of the fixed point.

real y0
: *y* coordinate of the fixed point.

real dx
: *x* offset of the shift vector.

real dy
: *y* offset of the shift vector.

real phi
: Rotation angle in radians (positive if counterclockwise).

real fx x-axis scale factor.

real fy y-axis scale factor.

Output Parameters

integer errind
: Error indicator.

real xfrmt(3,3)
: Transformation matrix. (See Chapter 15. ″ISO PHIGS Transformations″ for a description of the storage of the transformation matrix).

Errors

None

Related Subroutines

- None

BUILD TRANSFORMATION MATRIX 3 (PHOP,*,*,*)

Purpose

Use Build Transformation Matrix 3 to calculate a specified three-dimensional homogenous transformation matrix. The order of transformation which is all relative to the specified fixed point is: scale, rotate *x*, rotate *y*, rotate *z*, and shift.

If the graPHIGS API can compute the transformation matrix, then the graPHIGS API sets the error indicator to zero and returns the transformation matrix. If the graPHIGS API cannot compute the transformation matrix, then the values of the matrix are unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

pbuild_tran_matrix3 (*point, shift_vec, x_angle, y_angle, z_angle, scale_vec, err_ind, result_tran*)

Input Parameters

*const Ppoint3 *point*
Fixed point.

*const Pvec3 *shift_vec*
Shift vector.

Pfloat x_angle
Rotation angle *x* in radians (positive if counterclockwise).

Pfloat y_angle
Rotation angle *y* in radians (positive if counterclockwise).

Pfloat z_angle
Rotation angle *z* in radians (positive if counterclockwise).

*const Pvec3 *scale_vec*
Scale vector.

Output Parameters

*Pint *err_ind*
Error indicator.

Pmatrix3 result_tran
Transformation matrix. (See Chapter 15. ″ISO PHIGS Transformations″ for a description of the storage of the transformation matrix).

FORTRAN

PBLTM3 (*x0*, *y0*, *z0*, *dx*, *dy*, *dz*, *phix*, *phiy*, *phiz*, *fx*, *fy*, *fz*, *errind*, *xfrmt*)

Input Parameters

real x0
x coordinate of the fixed point.

real y0
y coordinate of the fixed point.

real z0
z coordinate of the fixed point.

real dx
x offset of the shift vector.

real dy
y offset of the shift vector.

real dz
z offset of the shift vector.

real phix
Rotation angle *x* in radians (positive if counterclockwise).

real phiy
Rotation angle *y* in radians (positive if counterclockwise).

real phiz
Rotation angle *z* in radians (positive if counterclockwise).

real fx x-axis scale factor.

real fy y-axis scale factor.

real fz z-axis scale factor.

Output Parameters

integer errind
Error indicator.

real xfrmt(4,4)
Transformation matrix. (See Chapter 15. ″ISO PHIGS Transformations″ for a description of the storage of the transformation matrix).

Errors

None

Related Subroutines

- None

COMPOSE MATRIX (PHOP,*,*,*)

Purpose

Use Compose Matrix to perform a 3x3 matrix multiplication and return the result.

The graPHIGS API computes: Transformation Matrix A x Transformation Matrix and returns the result as the composed transformation matrix.

If the graPHIGS API can compute the transformation matrix, then the graPHIGS API sets the error indicator to zero and returns the composed transformation matrix. If the graPHIGS API cannot compute the transformation matrix, then the values of the matrix are unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

pcompose_matrix (*tran_a, tran_b, err_ind, result_tran*)

Input Parameters

Pmatrix tran_a
Transformation matrix A. (See Chapter 15. ″ISO PHIGS Transformations″ for a description of the storage of the transformation matrix).

Pmatrix tran_b
Transformation matrix B. (See Chapter 15. ″ISO PHIGS Transformations″ for a description of the storage of the transformation matrix).

Output Parameters

*Pint *err_ind*
Error indicator.

Pmatrix result_tran
Composed transformation matrix. (See Chapter 15. ″ISO PHIGS Transformations″ for a description of the storage of the transformation matrix).

FORTRAN

PCOM (*xfrmta*, *xfrmtb*, *errind*, *xfrmto*)

Input Parameters

real xfrmta(3,3)
Transformation matrix A. (See Chapter 15. ″ISO PHIGS Transformations″ for a description of the storage of the transformation matrix).

real xfrmtb(3,3)
Transformation matrix B. (See Chapter 15. ″ISO PHIGS Transformations″ for a description of the storage of the transformation matrix).

Output Parameters

integer errind
Error indicator.

real xfrmto(3,3)
Composed transformation matrix. (See Chapter 15. ″ISO PHIGS Transformations″ for a description of the storage of the transformation matrix).

Errors

None

Related Subroutines

- None

COMPOSE MATRIX 3 (PHOP,*,*,*)

Purpose

Use Compose Matrix 3 to perform a 4x4 matrix multiplication and return the results.

The graPHIGS API computes: Transformation Matrix A x Transformation Matrix B and returns the result as the composed transformation matrix.

If the graPHIGS API can compute the transformation matrix, then the graPHIGS API sets the error indicator to zero and returns the composed transformation matrix. If the graPHIGS API cannot compute the transformation matrix, then the values of the matrix are unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

pcompose_matrix3 (*tran_a, tran_b, err_ind, result_tran*)

Input Parameters

Pmatrix3 tran_a
Transformation matrix A. (See Chapter 15. ″ISO PHIGS Transformations″ for a description of the storage of the transformation matrix).

Pmatrix3 tran_b
Transformation matrix B. (See Chapter 15. ″ISO PHIGS Transformations″ for a description of the storage of the transformation matrix).

Output Parameters

*Pint *err_ind*
Error indicator.

Pmatrix3 result_tran
Composed transformation matrix. (See Chapter 15. ″ISO PHIGS Transformations″ for a description of the storage of the transformation matrix).

FORTRAN

PCOM3 (*xfrmta*, *xfrmtb*, *errind*, *xfrmto*)

Input Parameters

real xfrmta(4,4)
Transformation matrix A. (See Chapter 15. ″ISO PHIGS Transformations″ for a description of the storage of the transformation matrix).

real xfrmtb(4,4)
Transformation matrix B. (See Chapter 15. ″ISO PHIGS Transformations″ for a description of the storage of the transformation matrix).

Output Parameters

integer errind
Error indicator.

real xfrmto(4,4)
Composed transformation matrix. (See Chapter 15. ″ISO PHIGS Transformations″ for a description of the storage of the transformation matrix).

Errors

None

Related Subroutines

- None

COMPOSE TRANSFORMATION MATRIX (PHOP,*,*,*)

Purpose

Use Compose Transformation Matrix to compute a two-dimensional transformation matrix which is the composition of the specified matrix with the matrix defined by the fixed point, shift, rotate and scale parameters. The order of transformation is: scale, rotate (both relative to the specified fixed point), and shift.

If the graPHIGS API can compute the transformation matrix, then the graPHIGS API sets the error indicator to zero and returns the composed transformation matrix. If the graPHIGS API cannot compute the transformation matrix, then the values of the composed transformation matrix are unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

pcompose_tran_matrix (*tran, point, shift_vec, angle, scale_vec, err_ind, result_tran*)

Input Parameters

Pmatrix tran
Transformation matrix. (See Chapter 15. ″ISO PHIGS Transformations″ for a description of the storage of the transformation matrix).

*const Ppoint *point*
Fixed point.

*const Pvec *shift_vec*
Shift vector.

Pfloat angle
Rotation angle in radians (positive if counterclockwise).

*const Pvec *scale_vec*
Scale vector.

Output Parameters

*Pint *err_ind*
Error indicator.

Pmatrix result_tran
Composed transformation matrix. (See Chapter 15. ″ISO PHIGS Transformations″ for a description of the storage of the transformation matrix).

FORTRAN

PCOTM (*xfrmti*, *x0*, *y0*, *dx*, *dy*, *phi*, *fx*, *fy*, *errind*, *xfrmto*)

Input Parameters

real xfrmti(3,3)
Transformation matrix. (See Chapter 15. ″ISO PHIGS Transformations″ for a description of the storage of the transformation matrix).

real x0
x coordinate of the fixed point.

real y0
y coordinate of the fixed point.

real phi
Rotation angle in radians (positive if counterclockwise).

real fx x-axis scale factor.

real fy y-axis scale factor.

Output Parameters

integer errind
Error indicator.

real xfrmto(3,3)
Composed transformation matrix. (See Chapter 15. ″ISO PHIGS Transformations″ for a description of the storage of the transformation matrix).

Errors

None

Related Subroutines

- None

COMPOSE TRANSFORMATION MATRIX 3 (PHOP,*,*,*)

Purpose

Use Compose Transformation Matrix 3 to compute a three-dimensional transformation matrix which is the composition of the specified matrix with the matrix defined by the fixed point, shift, rotate and scale parameters. The order of transformation (all relative to the specified fixed point) is: scale, rotate *x*, rotate *y*, rotate *z*, and shift.

If the graPHIGS API can compute the transformation matrix, then the graPHIGS API sets the error indicator to zero, and returns the composed transformation matrix. If the graPHIGS API cannot compute the transformation matrix, then the values of the composed transformation matrix are unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

pcompose_tran_matrix3 (*tran, point, shift_vec, x_angle, y_angle, z_angle, scale_vec, err_ind, result_tran*)

Input Parameters

Pmatrix3 tran
Transformation matrix. (See Chapter 15. ″ISO PHIGS Transformations″ for a description of the storage of the transformation matrix).

*const Ppoint3 *point*
Fixed point.

*const Pvec3 *shift_vec*
Shift vector.

Pfloat x_angle
Rotation angle *x* in radians (positive if counterclockwise).

Pfloat y_angle
Rotation angle *y* in radians (positive if counterclockwise).

Pfloat z_angle
Rotation angle *z* in radians (positive if counterclockwise).

*const Pvec3 *scale_vec*
Scale vector.

Output Parameters

*Pint *err_ind*
Error indicator.

Pmatrix3 result_tran
Composed transformation matrix. (See Chapter 15. ″ISO PHIGS Transformations″ for a description of the storage of the transformation matrix).

FORTRAN

PCOTM3 (*xfrmti*, *x0*, *y0*, *z0*, *dx*, *dy*, *dz*, *phix*, *phiy*, *phiz*, *fx*, *fy*, *fz*, *errind*, *xfrmto*)

Input Parameters

real xfrmti(4,4)
Transformation matrix. (See Chapter 15. ″ISO PHIGS Transformations″ for a description of the storage of the transformation matrix).

real x0
x coordinate of the fixed point.

real y0
y coordinate of the fixed point.

real z0
z coordinate of the fixed point.

real phix
Rotation angle *x* in radians (positive if counterclockwise).

real phiy
Rotation angle *y* in radians (positive if counterclockwise).

real phiz
Rotation angle *z* in radians (positive if counterclockwise).

real fx x-axis scale factor.

real fy y-axis scale factor.

real fz z-axis scale factor.

Output Parameters

integer errind
Error indicator.

real xfrmto(4,4)
Composed transformation matrix. (See Chapter 15. ″ISO PHIGS Transformations″ for a description of the storage of the transformation matrix).

Errors

None

Related Subroutines

- None

CREATE STORE (PHOP,*,*,*)

Purpose

Use Create Store to create a new Store resource. The graPHIGS API uses the Store resource to manage the memory needed by the subroutines that return complex data. Use of the Store resource provides two levels of memory management: low level and high level. The graPHIGS API manages the memory at a low level because it uses, re-uses, allocates, and deallocates memory from the system in order to return data to the application. However, the application manages the memory at a high level because it creates and deletes the Stores. An application may create multiple Stores.

The application can pass the newly created Store resource as a parameter to a subroutine returning complex data. Another parameter to a subroutine returning complex data is a pointer to a pointer to a structure which defines the additional memory referenced by fields within the structure. The application accesses the returned data through its pointer to the structure. It does not use the Store resource to access the data.

A Store continues to hold the information from the function until the Delete Store subroutine deletes the Store or until the application uses the Store as a parameter to a subsequent subroutine which returns complex data. Then the graPHIGS API replaces the old information with the newly requested data. A Store resource only contains the results of the last subroutine.

If the graPHIGS API can create the Store resource, then the graPHIGS API sets the error indicator to zero and returns the Store handle. If the graPHIGS API cannot create the Store resource, then the value of the Store handle is unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

2203 Error While Allocating Store

Language Binding

C

pcreate_store (*err_ind, store*)

Output Parameters

*Pint *err_ind*
Error indicator.

*Pstore *store*
New Store.

Errors

None

Related Subroutines

- Delete Store

DELETE STORE (PHOP,*,*,*)

Purpose

Use Delete Store to delete a Store and all internal resources associated with it.

If the graPHIGS API can delete the Store resource, then the graPHIGS API sets the error indicator to zero and sets the Store parameter to *NULL*. If the graPHIGS API cannot delete the Store resource, then the Store parameter is unaffected and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Binding

C

pdel_store (*err_ind, store*)

Output Parameters

*Pint *err_ind*
Error indicator.

*Pstore *store*
Store to be deleted.

Errors

None

Related Subroutines

- Create Store

EVALUATE VIEW MAPPING MATRIX (PHOP,*,*,*)

Purpose

Use Evaluate View Mapping Matrix to create a two-dimensional view mapping matrix. Your application can use the matrix as input to the Set View Representation subroutine.

When calculating the view mapping matrix, the graPHIGS API:

- sets the *z* extents for the viewport to the *z* extents of the Normalized Projection Coordinates (NPC) range.
- sets the projection type to *PARALLEL*.
- places the projection reference point on a line perpendicular to the center of the specified window.
- sets the *z* value of the projection reference point to one-half of the maximum of the Umax-Umin and Vmax-Vmin.
- sets the view plane distance to zero.
- sets the far clipping plane to the negative of one-half of the maximum of the Umax-Umin and Vmax-Vmin.
- sets the near clipping plane to one-half of the maximum of the Umax-Umin and Vmax-Vmin.

If the graPHIGS API can compute the view mapping matrix, then the graPHIGS API sets the error indicator to zero and returns the view mapping matrix. If the graPHIGS API cannot compute the view mapping matrix, then the values of the matrix are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

151 Invalid Window: Minimum Value >= To Corresponding Maximum Value

152 Invalid Viewport: XMIN >= XMAX, YMIN >= YMAX OR ZMIN > ZMAX

155 Projection Viewport Limits Are Not Within NPC Range

Language Bindings

C

peval_view_map_matrix (*mapping, err_ind, result_tran*)

Input Parameters

*const Pview_map *mapping*
View mapping (window limits in VC and projection viewport limits in NPC).

Output Parameters

*Pint *err_ind*
Error indicator.

Pmatrix result_tran
View mapping matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

FORTRAN

PEVMM (*vwwnlm*, *pjvplm*, *errind*, *vwmpmt*)

Input Parameters

real vwwnlm(4)
Window limits in VC (*UMIN, UMAX, VMIN, VMAX*).

real pjvplm(4)
Projection viewport limits in NPC (*XMIN, XMAX, YMIN, YMAX*).

Output Parameters

integer errind
Error indicator.

real vwmpmt(3,3)
View mapping matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

Errors

None

Related Subroutines

- None

EVALUATE VIEW MAPPING MATRIX 3 (PHOP,*,*,*)

Purpose

Use Evaluate View Mapping Matrix 3 to create a view mapping matrix. Your application can use the matrix as input to the Set View Representation 3 subroutine.

If the graPHIGS API can compute the view mapping matrix, then the graPHIGS API sets the error indicator to zero and returns the view mapping matrix. If the graPHIGS API cannot compute the view mapping matrix, then the values of the matrix are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

151 Invalid Window: Minimum Value >= To Corresponding Maximum Value

152 Invalid Viewport: XMIN >= XMAX, YMIN >= YMAX OR ZMIN > ZMAX

158 Front Plane Distance = Back Plane Distance When Z-Extent Non-Zero

162 Projection Reference Point Between Front And Back Planes

163 Projection Reference Point Cannot Be Positioned On View Plane

164 Back Plane Is In Front Of The Front Plane

155 Projection Viewport Limits Are Not Within NPC Range

Language Bindings

C

peval_view_map_matrix3 (*mapping, err_ind, result_tran*)

Input Parameters

*const Pview_map3 *mapping*
View mapping (window limits in VC, projection viewport limits in NPC, projection type and projection reference point in VC, and view, front and back plane distances in VC).

Output Parameters

*Pint *err_ind*
Error indicator.

Pmatrix3 result_tran
View mapping matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

FORTRAN

PEVMM3 (*vwwnlm*, *pjvplm*, *pjtype*, *pjrx*, *pjry*, *pjrz*, *vpld*, *bpld*, *fpld*, *errind*, *vwmpmt*)

Input Parameters

real vwwnlm(4)
Window limits in VC (*UMIN, UMAX, VMIN, VMAX*).

real pjvplm(6)
Projection viewport limits in NPC (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

integer pjtype
Projection type (*PPARL, PPERS*).

real pjrx
x-axis projection reference point in VC.

real pjry
y-axis projection reference point in VC.

real pjrz
z-axis projection reference point in VC.

real vpld
View plane distance in VC.

real bpld
Back plane distance in VC.

real fpld
Front plane distance in VC.

Output Parameters

integer errind
Error indicator.

real vwmpmt(4,4)
View mapping matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

Errors

None

Related Subroutines

- None

EVALUATE VIEW ORIENTATION MATRIX (PHOP,*,*,*)

Purpose

Use Evaluate View Orientation Matrix to calculate a two-dimensional viewing matrix based on the specified orientation.

The matrix returned performs a change from the World Coordinate (WC) system to a Viewing Coordinate (VC) system in which the origin is the view reference point with a *z* coordinate of zero, the n-axis is the view plane normal assumed to be [0,0,1], and the v-axis lies in the half plane designated by the view up vector with a *z* coordinate of zero.

If the graPHIGS API can compute the view orientation matrix, then the graPHIGS API sets the error indicator to zero and returns the view orientation matrix. If the graPHIGS API cannot compute the view orientation matrix, then the values of the matrix are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

160 View UP Vector Has Length Zero

Language Bindings

C

peval_view_ori_matrix (*view_ref_point, view_up_vec, err_ind, result_tran*)

Input Parameters

*const Ppoint *view_ref_point*
View reference point in WC.

*const Pvec *view_up_vec*
View up vector in WC.

Output Parameters

*Pint *err_ind*
Error indicator.

Pmatrix result_tran
View orientation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

FORTRAN

PEVOM (*vwrx*, *vwry*, *vupx*, *vupy*, *errind*, *vwormt*)

Input Parameters

real vwrx
x coordinate of the view reference point in WC.

real vwry
y coordinate of the view reference point in WC.

real vupx
x-axis directional component of the view up vector in WC.

real vupy
y-axis directional component of the view up vector in WC.

Output Parameters

integer errind
Error indicator.

real vwormt(3,3)
View orientation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

Errors

None

Related Subroutines

- None

EVALUATE VIEW ORIENTATION MATRIX 3 (PHOP,*,*,*)

Purpose

Use Evaluate View Orientation Matrix 3 to calculate a three-dimensional viewing matrix based on the specified orientation.

The matrix returned performs a change from the World Coordinate (WC) system to a Viewing Coordinate (VC) system in which the origin is the view reference point, the n-axis is the view plane normal, and the v-axis lies in the half plane designated by the view up vector.

If the graPHIGS API can compute the view orientation matrix, then the graPHIGS API sets the error indicator to zero and returns the view orientation matrix. If the graPHIGS API cannot compute the view orientation matrix, then the values of the matrix are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

159 View Plane Normal Vector Has Length Zero

160 View UP Vector Has Length Zero

161 View UP AND View Plane Normal Vectors Are Parallel

Language Bindings

C

peval_view_ori_matrix3 (*view_ref_point, view_norm_vec, view_up_vec, err_ind, result_tran*)

Input Parameters

*const Ppoint3 *view_ref_point*
View reference point in WC.

*const Pvec3 *view_norm_vec*
View plane normal vector in WC.

*const Pvec3 *view_up_vec*
View up vector in WC.

Output Parameters

*Pint *err_ind*
Error indicator.

Pmatrix3 result_tran
View orientation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

FORTRAN

PEVOM3 (*vwrx*, *vwry*, *vwrz*, *vpnx*, *vpny*, *vpnz*, *vupx*, *vupy*, *vupz*, *errind*, *vwormt*)

Input Parameters

real vwrx
x coordinate of the view reference point in WC.

real vwry
y coordinate of the view reference point in WC.

real vwrz
z coordinate of the view reference point in WC.

real vpnx
x-axis directional component of the view plane normal in WC.

real vpny
y-axis directional component of the view plane normal in WC.

real vpnz
z-axis directional component of the view plane normal in WC.

real vupx
x-axis directional component of the view up vector in WC.

real vupy
y-axis directional component of the view up vector in WC.

real vupz
z-axis directional component of the view up vector in WC.

Output Parameters

integer errind
Error indicator.

real vwormt(4,4)
View orientation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

Errors

None

Related Subroutines

- None

PACK DATA RECORD (PHOP,*,*,*)

Purpose

Use Pack Data Record to construct a data record for passing to input device initialization routines. The data record constructed by Pack Data Record consists of a header identifying the number of integers, reals, and character strings in the data record, followed by the actual data. Your application can pass the *ldr* and *datrec* output parameters to the desired input device initialization subroutine.

Pack Data Record accepts as input a list of integers, a list of reals, and a list of character strings. The length of each character string is specified in a separate array of lengths (*lstr*).

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

2001 Output Parameter Size Insufficient

2003 Invalid Data Record

Note: This utility is defined only for the FORTRAN binding.

Language Binding

FORTRAN

PPREC (*il*, *ia*, *rl*, *ra*, *sl*, *lstr*, *str*, *mldr*, *errind*, *ldr*, *datrec*)

Input Parameters

integer il
Number of integer entries (>=0).

integer ia(*)
Array containing integer entries.

integer rl
Number of real entries (>=0).

real ra(*)
Array containing real entries.

integer sl
Number of character string entries (>=0).

integer lstr(*)
Lengths of each character string entry (>=0).

character(*) str(*)*
Character string entries.

integer mldr
Dimension of the data record array.

Output Parameters

integer errind
Error indicator.

integer ldr
Number of array elements used in *datrec*.

*character*80 datrec(mldr)*
Data record.

FORTRAN Subset

PPREC (*il*, *ia*, *rl*, *ra*, *sl*, *lstr*, *str*, *mldr*, *errind*, *ldr*, *datrec*)

Input Parameters

integer il
Number of integer entries (>=0).

integer ia (il)
Array containing integer entries.

integer rl
Number of real entries (>=0).

real ra (rl)
Array containing real entries.

integer sl
Number of character string entries (>=0).

integer lstr(sl)
Lengths of each character string entry (>=0).

*character*80 str(*)*
Character string entries.

integer mldr
Dimension of the data record array.

Output Parameters

integer errind
Error indicator.

integer ldr
Number of array elements used in *datrec*.

*character*80 datrec(mldr)*
Data record.

Errors

None

Related Subroutines

- Initialize Choice
- Initialize Choice 3
- Initialize Locator
- Initialize Locator 3
- Initialize Pick
- Initialize Pick 3
- Initialize String
- Initialize String 3
- Initialize Stroke
- Initialize Stroke 3
- Initialize Valuator
- Initialize Valuator 3
- Unpack Data Record

ROTATE (PHOP,*,*,*)

Purpose

Use Rotate to calculate a two-dimensional transformation matrix to perform the specified 2D-axis rotation.

If the graPHIGS API can compute the transformation matrix, then the graPHIGS API sets the error indicator to zero and returns the transformation matrix. If the graPHIGS API cannot compute the transformation matrix, then the values of the matrix are unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

protate (*angle, err_ind, result_tran*)

Input Parameters

Pfloat angle
Rotational angle in radians (positive if counterclockwise).

Output Parameters

*Pint *err_ind*
Error indicator.

Pmatrix result_tran
Transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

FORTRAN

PRO (*rotang*, *errind*, *xfrmt*)

Input Parameters

real rotang
Rotational angle in radians (positive if counterclockwise).

Output Parameters

integer errind
Error indicator.

real xfrmt(3,3)
Transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

Errors

None

Related Subroutines

- None

ROTATE X (PHOP,*,*,*)

Purpose

Use Rotate X to calculate a three-dimensional transformation matrix to rotate around the x-axis using a given angle of rotation.

If the graPHIGS API can compute the transformation matrix, then the graPHIGS API sets the error indicator to zero and returns the transformation matrix. If the graPHIGS API cannot compute the transformation matrix then the values of the matrix are unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

protate_x (*angle, err_ind, result_tran*)

Input Parameters

Pfloat angle
Rotational angle in radians (positive if counterclockwise).

Output Parameters

*Pint *err_ind*
Error indicator.

Pmatrix3 result_tran
Transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

FORTRAN

PROX (*rotang*, *errind*, *xfrmt*)

Input Parameters

real rotang
Rotational angle in radians (positive if counterclockwise).

Output Parameters

integer errind
Error indicator.

real xfrmt(4,4)
Transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

Errors

None

Related Subroutines

- None

ROTATE Y (PHOP,*,*,*)

Purpose

Use Rotate Y to calculate a three-dimensional transformation matrix to rotate around the y-axis using a given angle of rotation.

If the graPHIGS API can compute the transformation matrix, then the graPHIGS API sets the error indicator to zero and returns the transformation matrix. If the graPHIGS API cannot compute the transformation matrix then the values of the matrix are unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

protate_y (*angle, err_ind, result_tran*)

Input Parameters

Pfloat angle
Rotational angle in radians (positive if counterclockwise).

Output Parameters

*Pint *err_ind*
Error indicator.

Pmatrix3 result_tran
Transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

FORTRAN

PROY (*rotang*, *errind*, *xfrmt*)

Input Parameters

real rotang
Rotational angle in radians (positive if counterclockwise).

Output Parameters

integer errind
Error indicator.

real xfrmt(4,4)
Transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

Errors

None

Related Subroutines

- None

ROTATE Z (PHOP,*,*,*)

Purpose

Use Rotate Z to calculate a three-dimensional transformation matrix to rotate around the z-axis using a given angle of rotation.

If the graPHIGS API can compute the transformation matrix, then the graPHIGS API sets the error indicator to zero and returns the transformation matrix. If the graPHIGS API cannot compute the transformation matrix, then the values of the matrix are unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

protate_z (*angle, err_ind, result_tran*)

Input Parameters

Pfloat angle
Rotational angle in radians (positive if counterclockwise).

Output Parameters

*Pint *err_ind*
Error indicator.

Pmatrix3 result_tran
Transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

FORTRAN

PROZ (*rotang*, *errind*, *xfrmt*)

Input Parameters

real rotang
Rotational angle in radians (positive if counterclockwise).

Output Parameters

integer errind
Error indicator.

real xfrmt(4,4)
Transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

Errors

None

Related Subroutines

- None

SCALE (PHOP,*,*,*)

Purpose

Use Scale to calculate a two-dimensional transformation matrix to perform the specified 2D-axis scaling.

If the graPHIGS API can compute the transformation matrix, then the graPHIGS API sets the error indicator to zero and returns the transformation matrix. If the graPHIGS API cannot compute the transformation matrix, then the values of the matrix are unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

pscale (*scale_vec, err_ind, result_tran*)

Input Parameters

*const Pvec *scale_vec*
Scale factor vector.

Output Parameters

*Pint *err_ind*
Error indicator.

Pmatrix result_tran
Transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

FORTRAN

PSC (*fx*, *fy*, *errind*, *xfrmt*)

Input Parameters

real fx
x-axis scale factor.

real fy
y-axis scale factor.

Output Parameters

integer errind
Error indicator.

real xfrmt(3,3)
Transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

Errors

None

Related Subroutines

- None

SCALE 3 (PHOP,*,*,*)

Purpose

Use Scale 3 to calculate a three-dimensional transformation matrix to perform the specified 3D-axis scaling.

If the graPHIGS API can compute the transformation matrix, then the graPHIGS API sets the error indicator to zero and returns the transformation matrix. If the graPHIGS API cannot compute the transformation matrix, then the values of the matrix are unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

pscale3 (*scale_vec, err_ind, result_tran*)

Input Parameters

*const Pvec3 *scale_vec*
Scale factor vector.

Output Parameters

*Pint *err_ind*
Error indicator.

Pmatrix3 result_tran
Transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

FORTRAN

PSC3 (*fx*, *fy*, *fz*, *errind*, *xfrmt*)

Input Parameters

real fx
x-axis scale factor.

real fy
y-axis scale factor.

real fz
z-axis scale factor.

Output Parameters

integer errind
Error indicator.

real xfrmt(4,4)
Transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

Errors

None

Related Subroutines

- None

TRANSFORM POINT (PHOP,*,*,*)

Purpose

Use Transform Point to transform a point using a specified transformation matrix.

The graPHIGS API returns the result of multiplying the given point by the transformation. If the graPHIGS API cannot return the transformed point, then the values of the point are unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

ptran_point (*point, tran, err_ind, result*)

Input Parameters

*const Ppoint *point*
Point.

Pmatrix tran
Transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

Output Parameters

*Pint *err_ind*
Error indicator.

*Ppoint *result*
Transformed point.

FORTRAN

PTP (*xi*, *yi*, *xfrmt*, *errind*, *xo*, *yo*)

Input Parameters

real xi
x coordinate of the point.

real yi
y coordinate of the point.

real xfrmt(3,3)
Transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

Output Parameters

integer errind
Error indicator.

real xo
x coordinate of the transformed point.

real yo
y coordinate of the transformed point.

Errors

None

Related Subroutines

- None

TRANSFORM POINT 3 (PHOP,*,*,*)

Purpose

Use Transform Point 3 to transform a point using a specified transformation matrix.

The graPHIGS API returns the result of multiplying the given point by the transformation. If the graPHIGS API cannot return the transformed point, then the values of the point are unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

ptran_point3 (*point, tran, err_ind, result*)

Input Parameters

*const Ppoint3 *point*
Point.

Pmatrix3 tran
Transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

Output Parameters

*Pint *err_ind*
Error indicator.

*Ppoint3 *result*
Transformed point.

FORTRAN

PTP3 (*xi*, *yi*, *zi*, *xfrmt*, *errind*, *xo*, *yo*, *zo*)

Input Parameters

real xi
x coordinate of the point.

real yi
y coordinate of the point.

real zi
z coordinate of the point.

real xfrmt(4,4)
Transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

Output Parameters

integer errind
Error indicator.

real xo
x coordinate of the transformed point.

real yo
y coordinate of the transformed point.

real zo
z coordinate of the transformed point.

Errors

None

Related Subroutines

- None

TRANSLATE (PHOP,*,*,*)

Purpose

Use Translate to calculate a two-dimensional transformation matrix to perform the specified 2D-axis translation.

If the graPHIGS API cannot compute the transformation matrix, then the values of the matrix are unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

ptranslate (*trans_vec, err_ind, result_tran*)

Input Parameters

*const Pvec *trans_vec*
Translation vector.

Output Parameters

*Pint *err_ind*
Error indicator.

Pmatrix result_tran
Transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

FORTRAN

PTR (*dx*, *dy*, *errind*, *xfrmt*)

Input Parameters

real dx
x-axis translation vector.

real dy
y-axis translation vector.

Output Parameters

integer errind
Error indicator.

real xfrmt(3,3)
Transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

Errors

None

Related Subroutines

- None

TRANSLATE 3 (PHOP,*,*,*)

Purpose

Use Translate 3 to calculate a three-dimensional transformation matrix to perform the specified 3D-axis translation.

If the graPHIGS API cannot compute the transformation matrix, then the values of the matrix are unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

ptranslate3 (*trans_vec, err_ind, result_tran*)

Input Parameters

const Pvec3 *trans_vec
Translation vector.

Output Parameters

*Pint *err_ind*
Error indicator.

Pmatrix3 result_tran
Transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

FORTRAN

PTR3 (*dx*, *dy*, *dz*, *errind*, *xfrmt*)

Input Parameters

real dx
x-axis translation vector.

real dy
y-axis translation vector.

real dz
z-axis translation vector.

Output Parameters

integer errind
Error indicator.

real xfrmt(4,4)
Transformation matrix. (See Chapter 15. “ISO PHIGS Transformations” for a description of the storage of the transformation matrix).

Errors

None

Related Subroutines

- None

UNPACK DATA RECORD (PHOP,*,*,*)

Purpose

Use Unpack Data Record to unpack a data record returned by FORTRAN binding input device inquiries. The data record unpacked by Unpack Data Record consists of a header identifying the number of integers, reals, and character strings in the data record, followed by the actual data. The graPHIGS API can interpret the output parameters by using the data record information supplied with the FORTRAN input device initialization subroutines.

For input, Unpack Data Record accepts a data record, array addresses for integer, real and character arrays, and size specifications for those arrays.

Unpack Data Record and Pack Data Record are inverse functions.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

2001 Output Parameter Size Insufficient

2003 Invalid Data Record

2004 Input Parameter Size Out Of Range

Note: This utility is defined only for the FORTRAN binding.

Language Bindings

FORTRAN

PUREC (*ldr*, *datrec*, *iil*, *irl*, *isl*, *errind*, *il*, *ia*, *rl*, *ra*, *sl*, *lstr*, *str*)

Input Parameters

integer ldr
Number of array elements used in *datrec*.

*character*80 datrec(ldr)*
Data record.

integer iil
Dimension of integer array.

integer irl
Dimension of real array.

integer isl
Dimension of character array.

Output Parameters

integer errind
Error indicator.

integer il
Number of integer entries.

integer ia (iil)
Array containing integer entries.

integer rl
Number of real entries.

real ra (irl)
Array containing real entries.

integer sl
Number of character string entries.

integer lstr(isl)
Length of each character string entry.

character(*) str(isl)*
Character string entries.

FORTRAN Subset

PUREC (*ldr*, *datrec*, *iil*, *irl*, *isl*, *errind*, *il*, *ia*, *rl*, *ra*, *sl*, *lstr*, *str*)

Input Parameters

integer ldr
Number of array elements used in *datrec*.

*character*80 datrec(ldr)*
Data record.

integer iil
Dimension of integer array.

integer irl
Dimension of real array.

integer isl
Dimension of character array.

Output Parameters

integer errind
Error indicator.

integer il
Number of integer entries.

integer ia (iil)
Array containing integer entries.

integer rl
Number of real entries.

real ra (irl)
Array containing real entries.

integer sl
Number of character string entries.

integer lstr(isl)
Length of each character string entry.

*character*80 str(isl)*
Character string entries.

Errors

None

Related Subroutines

- Initialize Choice
- Initialize Choice 3
- Initialize Locator
- Initialize Locator 3
- Initialize Pick
- Initialize Pick 3
- Initialize String
- Initialize String 3
- Initialize Stroke
- Initialize Stroke 3
- Initialize Valuator
- Initialize Valuator 3
- Inquire Choice Device State
- Inquire Choice Device State 3
- Inquire Default Choice Device Data
- Inquire Default Choice Device Data 3
- Inquire Default Locator Device Data
- Inquire Default Locator Device Data 3
- Inquire Default Pick Device Data
- Inquire Default Pick Device Data 3
- Inquire Default String Device Data
- Inquire Default String Device Data 3
- Inquire Default Stroke Device Data

- Inquire Default Stroke Device Data 3
- Inquire Default Valuator Device Data
- Inquire Default Valuator Device Data 3
- Inquire Locator Device State
- Inquire Locator Device State 3
- Inquire Pick Device State
- Inquire Pick Device State 3
- Inquire String Device State
- Inquire String Device State 3
- Inquire Stroke Device State
- Inquire Stroke Device State 3
- Inquire Valuator Device State
- Inquire Valuator Device State 3
- Pack Data Record

Chapter 13. Error Control Subroutines

The subroutines in this category allow your application to modify the error handling characteristics of the graPHIGS API system. By default, the graPHIGS API gives the error handling function control when the graPHIGS API detects an error. The graPHIGS API provides the default error handling function. However, your application can provide an alternative error handling function which supersedes the default and receives control when the graPHIGS API detects an error.

The default error handling function provided by the graPHIGS API calls the Error Logging subroutine function. An application program supplied Error Handling function may invoke inquiry subroutines, the Error Logging function, and/or the Emergency Close PHIGS subroutine.

If desired, you can use the Set Error Handling Mode subroutine to set error handling *OFF*. When your application sets error handling *OFF*, processing continues until the graPHIGS API reaches a terminating condition. Generally, error handling should remain *ON* in a program development environment. By default, the graPHIGS API sets error handling to *ON*.

EMERGENCY CLOSE PHIGS (PHCL,WSCL,STCL,ARCL)

Purpose

Use Emergency Close PHIGS to terminate all PHIGS processing for this application process. The graPHIGS API closes any open structure and updates and closes all open workstations. The graPHIGS API detaches all resources attached to or created by your application. The graPHIGS API closes all PHIGS files and releases all system resources, such as storage or locks. The graPHIGS API sets the PHIGS system state to PHIGS Closed. Your application can reopen PHIGS by invoking the Open PHIGS subroutine ( ).

Language Bindings

C

pemergency_close_phigs ()

FORTRAN

PECLPH

Errors

None

Related Subroutines

- Close PHIGS
- Open PHIGS

ERROR HANDLING (PHCL,WSCL,STCL,ARCL)

Purpose

Either the graPHIGS API supplies the Error Handling function by default, or the application supplies the function. The graPHIGS API calls the Error Handling subroutine function whenever the graPHIGS API detects an error. The default or standard Error Handling function calls the Error Logging function with the

same parameters. An application supplied error handling function, which accepts the same arguments as the default error handler, may also call the Error Logging function.

See the Open PHIGS subroutine for error file specification for each supported binding. See Chapter 21. “Implementation Errors and graPHIGS API Messages for ISO PHIGS-Defined Errors” for details on implementation errors and ISO PHIGS defined errors.

Users of the FORTRAN binding may replace the default error handling subroutine with a user supplied subroutine of the same name, **PERHND**. C binding users may use the Set Error Handling subroutine to install a user supplied error handling function during execution time.

Language Bindings

C

perr_hand (*error_num, func_num, error_file*)

Input Parameters

Pint error_num
Error number.

Pint func_num
Identifier of function that detected the error (see Chapter 17. ISO PHIGS C Type and Macro Definitions reference #1).

*const char *error_file*
Name of the error file.

FORTRAN

PERHND (*errnr*, *fctid*, *errfil*)

Input Parameters

integer errnr
Error number.

integer fctid
Function identification (see Chapter 18. ISO PHIGS FORTRAN Enumeration Types.

integer errfil
Error file.

Errors

None

Related Subroutines

- Emergency Close PHIGS
- Error Logging
- Open PHIGS
- Set Error Handling
- Set Error Handling Mode

ERROR LOGGING (PHCL,WSCL,STCL,ARCL)

Purpose

Use Error Logging to print an error message to the specified error file. When your application invokes Error Logging, the graPHIGS API writes the specified error message along with the name of the function which caused the error to the specified file. If the graPHIGS API cannot open the specified file or the file is blank, then the graPHIGS API logs the error to the console from which the application was started.

This subroutine is available only to an Error Handling function.

Language Bindings

C

perr_log (*error_num, func_num, error_file*)

Input Parameters

Pint error_num
Error number.

Pint func_num
Identifier of function that detected the error (see **phigs.h** include file).

*const char *error_file*
Name of the error file.

FORTRAN

PERLOG (*errnr*, *fctid*, *errfil*)

Input Parameters

integer errnr
Error number.

integer fctid
Function identification (see **PHIGS** include file).

integer errfil
Error file.

Errors

None

Related Subroutines

- Error Handling
- Set Error Handling
- Set Error Handling Mode

SET ERROR HANDLING (PHCL,WSCL,STCL,ARCL)

Purpose

Use Set Error Handling to set the PHIGS error handling function to the specified new error handling function. The graPHIGS API returns the previous error handling function on this call.

The graPHIGS API gives control to this application specified routine when the graPHIGS API detects an error. The application defined error handler must accept the same arguments as the standard error handler, **perr_hand**. Refer to **perr_hand** for a description of those arguments. If your application has not defined an error handler, then the graPHIGS API uses the default, **perr_hand**, which logs an error in the file specified by the first parameter of the Open PHIGS subroutine ( ). An application defined error handler may invoke Inquiry subroutines ( ) and the Error Logging subroutine.

Note: This subroutines is defined only for the C binding.

Language Binding

C

pset_err_hand (*new_err_hand, old_err_hand*)

Input Parameters

*void (*new_err_hand) ()*
The address of the routine receiving control when the graPHIGS API detects an error.

Output Parameters

void (old_err_hand) ()**
The address of the previous error handling routine.

Errors

None

Related Subroutines

- Error Handling
- Error Logging
- Inquire Error Handling Mode
- Open PHIGS
- Set Error Handling Mode

SET ERROR HANDLING MODE (PHOP,*,*,*)

Purpose

Use Set Error Handling Mode to enable or disable graPHIGS API error handling.

The graPHIGS API sets the error handling mode in the Error State List to the value specified. If your application sets the error handling mode to *OFF*, then the graPHIGS API ignores any errors detected. By default, the graPHIGS API sets error handling mode to *ON*.

Language Bindings

C

pset_err_hand_mode (*error_mode*)

Input Parameters

Perr_mode error_mode
Error handling mode (*0=PERR_OFF, 1=PERR_ON*).

FORTRAN

PSERHM (*erhm*)

Input Parameters

integer erhm
Error handling mode (*0=POFF, 1=PON*).

Errors

2 Function Requires State (PHOP,*,*,*)

Related Subroutines

- Inquire Error Handling Mode
- Set Error Handling

Chapter 14. Special Interface Subroutines

This section contains the definition of an escape mechanism for allowing access to hardware specific features. The use of this mechanism reduces portability of your application program, but it does it in an easily identifiable manner.

ESCAPE (PHOP,WSCL,STCL,ARCL)

Purpose

Use Escape to perform an escape function. The specified escape subroutine is identified by way of the subroutine identifier parameter. In general, an escape subroutine accepts both an input data record and an output data record to place any output generated by the escape subroutine.

If the graPHIGS API does not support the specified escape identifier, then the graPHIGS API ignores this subroutine. Currently, the graPHIGS API does not support any escape identifiers. However, your application can access escapes through the Escape (GPES) subroutine. See *The graPHIGS Programming Interface: Subroutine Reference* for details on those escape functions.

Language Bindings

C

pescape (`func_id, in_data, store, out_data`);

Input Parameters

`Pint func_id`
Escape function identifier.

`const Pescape_in_data *in_data`
Input data for the function.

`Pstore store`
Handle to Store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See the Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for more information.

Output Parameters

`Pescape_out_data **out_data`
Output data of the function. The memory referenced by `*out_data` is managed by Store.

FORTRAN

PESC (`fctid, lidr, idr, mlodr, lodr, odr`)

Input Parameters

`integer fctid`
Function identification.

`integer lidr`
Dimension of the input data record array.

`character*80 idr(lidr)`
Input data record.

integer mlodr
Maximum length of the output data record.

Output Parameters

integer lodr
Number of array elements occupied in odr.

character*80 odr(mlodr)
Output data record.

Errors

2 Function Requires State (PHOP,*,*,*)

350 Warning, Specified Escape Unavailable On One Or More Workstations

351 One Of The Fields Within The Escape Data Record Is In Error

Related Subroutines

- None

Chapter 15. Inquire Subroutines

Inquiry programming subroutines allow application programs to obtain information such as the following:

- Default system characteristics
- Current state of the system
- Default workstation characteristics
- Current state of a workstation
- Configuration of a workstation
- Structure existence and relationships
- Structure content
- List of conflicting structures
- Ancestor and descendant path data
- Error state

Note: The graPHIGS API returns *SET* values for both *REALIZED* and *SET* output parameters.

General information for C binding inquiry subroutines

The graPHIGS API often requires a store parameter of type *Pstore* as input. See the Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

start_ind is an input parameter for inquiries that request simple lists. An index of zero specifies the first element in the graPHIGS API list, therefore, zero is a valid value for parameter *start_ind*. *start_ind* indicates the element in the graPHIGS API list that you want copied into index zero of the application's list.

General information for FORTRAN binding inquiry subroutines

If the n^{th} list element that you requested is unavailable, then the graPHIGS API returns the error 2002 in the error indicator parameter and also returns the implementation's list length.

If you request the 0^{th} list element, then the list element is undefined, but the graPHIGS API generates no error and returns the implementation's list length.

ELEMENT SEARCH (PHOP,*,*,*)

Purpose

Use Element Search to search through a specified structure for an element that matches a given criteria. The search starts at a specified element position and searches in a designated direction (*BACKWARD* or *FORWARD*) until the graPHIGS API either finds an element that matches the criteria or reaches the limits of the structure.

Search criteria: The graPHIGS API selects an element if the type of the element is in the element inclusion list and not in the element exclusion list.

Element exclusion: The graPHIGS API excludes an element if the element type is either not in the inclusion list or it is in the exclusion list.

Starting search position: The search starts at element position of zero if the specified starting position is less than zero. The search starts with the last element in the structure, if the specified starting position is larger than the number of elements in the structure.

If the search is successful, then the application sets the status indicator to *SUCCESS*, and the graPHIGS API returns the element position in the position parameter. Otherwise, the application sets the status indicator to *FAILURE* and the value returned in the position parameter is unpredictable.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

201 Specified Structure Does Not Exist

Language Bindings

C

pelem_search (*struct_id, start_elem, dir, incl, excl, err_ind, status, found_elem_ptr*);

Input Parameters

Pint struct_id
Structure identifier.

Pint start_elem
Starting element position (>=0).

Psearch_dir dir
Search direction (*0=PDIR_BACKWARD, 1=PDIR_FORWARD*).

*const Pelem_type_list *incl*
Element inclusion list (*0=PELEM_ALL, 1=PELEM_NIL, 2=PELEM_POLYLINE3, 3=PELEM_POLYLINE, 4=PELEM_POLYMARKER3, 5=PELEM_POLYMARKER, 6=PELEM_TEXT3, 7=PELEM_TEXT, 8=PELEM_ANNO_TEXT_REL3, 9=PELEM_ANNO_TEXT_REL, 10=PELEM_FILL_AREA3, 11=PELEM_FILL_AREA, 12=PELEM_FILL_AREA_SET3, 13=PELEM_FILL_AREA_SET, 14=PELEM_CELL_ARRAY3, 15=PELEM_CELL_ARRAY, 16=PELEM_GDP3, 17=PELEM_GDP, 18=PELEM_LINE_IND, 19=PELEM_MARKER_IND, 20=PELEM_TEXT_IND, 21=PELEM_INT_IND, 22=PELEM_EDGE_IND, 23=PELEM_LINETYPE, 24=PELEM_LINEWIDTH, 25=PELEM_LINE_COLR_IND, 26=PELEM_MARKER_TYPE, 27=PELEM_MARKER_SIZE, 28=PELEM_MARKER_COLR_IND, 29=PELEM_TEXT_FONT, 30=PELEM_TEXT_PREC, 31=PELEM_CHAR_EXPAN, 32=PELEM_CHAR_SPACE, 33=PELEM_TEXT_COLR_IND, 34=PELEM_CHAR_HT, 35=PELEM_CHAR_UP_VEC, 36=PELEM_TEXT_PATH, 37=PELEM_TEXT_ALIGN, 38=PELEM_ANNO_CHAR_HT, 39=PELEM_ANNO_CHAR_UP_VEC, 40=PELEM_ANNO_PATH, 41=PELEM_ANNO_ALIGN, 42=PELEM_ANNO_STYLE, 43=PELEM_INT_STYLE, 44=PELEM_INT_STYLE_IND, 45=PELEM_INT_COLR_IND, 46=PELEM_EDGE_FLAG, 47=PELEM_EDGETYPE, 48=PELEM_EDGEWIDTH, 49=PELEM_EDGE_COLR_IND, 50=PELEM_PAT_SIZE, 51=PELEM_PAT_REF_POINT_VECS, 52=PELEM_PAT_REF_POINT, 53=PELEM_ADD_NAMES_SET, 54=PELEM_REMOVE_NAMES_SET, 55=PELEM_INDIV_ASF, 56=PELEM_HLHSR_ID, 57=PELEM_LOCAL_MODEL_TRAN3, 58=PELEM_LOCAL_MODEL_TRAN, 59=PELEM_GLOBAL_MODEL_TRAN3, 60=PELEM_GLOBAL_MODEL_TRAN, 61=PELEM_MODEL_CLIP_VOL3, 62=PELEM_MODEL_CLIP_VOL, 63=PELEM_MODEL_CLIP_IND, 64=PELEM_RESTORE_MODEL_CLIP_VOL, 65=PELEM_VIEW_IND, 66=PELEM_EXEC_STRUCT, 67=PELEM_LABEL, 68=PELEM_APPL_DATA, 69=PELEM_GSE, 70=PELEM_PICK_ID*).

*const Pelem_type_list *excl*
Element exclusion list (Enumerated types are the same as that of the element inclusion list).

Output Parameters

*Pint *err_ind*
Error indicator.

*Psearch_status *status*
Search status indicator (*0=PSEARCH_STATUS_FAILURE, 1=PSEARCH_STATUS_SUCCESS*).

*Pint *found_elem_ptr*
Found element position.

FORTRAN

PELS (*strid*, *strtep*, *srcdir*, *eisn*, *eis*, *eesn*, *ees*, *errind*, *status*, *fndep*)

Input Parameters

integer strid
Structure identifier.

integer strtep
Start element position(>=0).

integer srcdir
Search direction (*0=PBWD, 1=PFWD*).

integer eisn
Number of elements in the element inclusion set.

integer eis(eisn)
Element inclusion set (*0=PEALL, 1=PENIL, 2=PEPL3, 3=PEPL, 4=PEPM3, 5=PEPM, 6=PETX3, 7=PETX, 8=PEATR3, 9=PEATR, 10=PEFA3, 11=PEFA, 12=PEFAS3, 13=PEFAS, 14=PECA3, 15=PECA, 16=PEGDP3, 17=PEGDP, 18=PEPLI, 19=PEPMI, 20=PETXI, 21=PEII, 22=PEEDI, 23=PELN, 24=PELWSC, 25=PEPLCI, 26=PEMK, 27=PEMKSC, 28=PEPMCI, 29=PETXFN, 30=PETXPR, 31=PECHXP, 32=PECHSP, 33=PETXCI, 34=PECHH, 35=PECHUP, 36=PETXP, 37=PETXAL, 38=PEATCH, 39=PEATCU, 40=PEATP, 41=PEATAL, 42=PEANST, 43=PEIS, 44=PEISI, 45=PEICI, 46=PEEDFG, 47=PEEDT, 48=PEEWSC, 49=PEEDCI, 50=PEPA, 51=PEPRPV, 52=PEPARF, 53=PEADS, 54=PERES, 55=PEIASF, 56=PEHRID, 57=PELMT3, 58=PELMT, 59=PEGMT3, 60=PEGMT, 61=PEMCV3, 62=PEMCV, 63=PEMCLI, 64=PERMCV, 65=PEVWI, 66=PEEXST, 67=PELB, 68=PEAP, 69=PEGSE, 70=PEPKID*).

integer eesn
Number of elements in the element exclusion set.

integer ees(eesn)
Element exclusion set (Enumerated types are the same as that of the element inclusion set).

Output Parameters

integer errind
Error indicator.

integer status
Status indicator (*0=PFAIL, 1=PSUCC*).

integer fndep
Found element position.

Errors

None

Related Subroutines

- None

INQUIRE ALL CONFLICTING STRUCTURES (PHOP,*,*,AROP)

Purpose

Use Inquire All Conflicting Structures to inquire a list of structure identifiers that exist in both the structure store and the specified open archive file.

If the inquire information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the inquired information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

7 Function Requires State (PHOP,*,*,AROP)

404 Specified Archive File Is Not Open

Language Bindings

C

pinq_all_conf_structs(*ar_id, num_elems_appl_list, start_ind, err_ind, ids, num_elems_impl_list*);

Input Parameters

Pint ar_id
Archive file identifier.

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint_list *ids*
List of conflicting structure identifiers.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQCST (*afid*, *n*, *errind*, *ol*, *ostrid*)

Input Parameters

integer afid
Archive file identifier.

integer n
Set member requested (>=0).

Output Parameters

integer errind
Error indicator.

integer ol
Number of structure identifiers in list.

integer ostrid
n^{th} structure identifier in list.

Errors

None

Related Subroutines

- Inquire Conflicting Structures in Network

INQUIRE ANNOTATION FACILITIES (PHOP,*,*,*)

Purpose

Use Inquire Annotation Facilities to inquire the list of annotation styles and the number and range of annotation text character heights supported by a workstation. If the number of annotation text character heights is zero, then the graPHIGS API supports a continuous range from the minimum height to the maximum height. Possible annotation styles include: *UNCONNECTED* and *LEAD LINE*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

62 This Information Not Available For MO Workstation Type

Language Bindings

C

pinq_anno_facs (*ws_type, num_elems_appl_list, start_ind, err_ind, styles, num_elems_impl_list, num_anno_char_hts, min_anno_char_ht, max_anno_char_ht*);

Input Parameters

Pint ws_type
Workstation type.

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint_list *styles*
List of annotation styles (*1=PANNO_STYLE_UNCONNECTED, 2=PANNO_STYLE_LEAD_LINE*).

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

*Pint *num_anno_char_hts*
Number of available annotation text character heights.

*Pfloat *min_anno_char_ht*
Minimum annotation text character height in DC.

*Pfloat *max_anno_char_ht*
Maximum annotation text character height in DC.

FORTRAN

PQANF (*wtype*, *n*, *errind*, *nas*, *as*, *nchh*, *minchh*, *maxchh*)

Input Parameters

integer wtype
Workstation type.

integer n
List element of the annotation styles requested (>=0).

Output Parameters

integer errind
Error indicator.

integer nas
Number of available annotation styles.

integer as
n^{th} element of the list of available annotation styles (*1=PUNCON, 2=PLDLN*).

integer nchh
Number of available annotation text character heights.

real minchh
Minimum annotation text character height in DC.

real maxchh
Maximum annotation text character height in DC.

Errors

None

Related Subroutines

- None

INQUIRE ARCHIVE FILES (PHOP,*,*,*)

Purpose

Use Inquire Archive Files to inquire the list of archive file identifiers and archive file names.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

pinq_ar_files (*store, err_ind, ar_files*);

Input Parameters

Pstore store
Handle to the Store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See the Create Store (PHOP,*,*,*) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Par_file_list **ar_files*
List of archive file names and identifiers. The memory referenced by **ar_files* is managed by the parameter *store*.

FORTRAN

PQARF (*n*, *errind*, *numberafid*, *arcfil*)

Input Parameters

integer n
List element requested (>=0).

Output Parameters

integer errind
Error indicator.

integer number
Number of archive files open.

integer afid
n^{th} open archive file identifier.

integer arcfil
n^{th} open archive file name.

Errors

None

Related Subroutines

- None

INQUIRE ARCHIVE STATE VALUE (PHCL,WSCL,STCL,ARCL)

Purpose

Use Inquire Archive State Value to inquire the current archive state value of the graPHIGS API. The archive state is either Archive Open (*AROP*) or Archive Closed (*ARCL*). If the state is *AROP*, then at least one archive file is open. If the state is *ARCL*, then no archive files are open.

Language Bindings

C

pinq_ar_st (*ar_st*)

Output Parameters

*Par_st *ar_st*
Archive state value (*0=PST_ARCL, 1=PST_AROP*).

FORTRAN

PQARS (*arsta*)

Output Parameters

integer arsta
Archive state value (*0=PARCL, 1=PAROP*).

Errors

None

Related Subroutines

- None

INQUIRE CHOICE DEVICE STATE (PHOP,WSOP,*,*)

Purpose

Use Inquire Choice Device State to inquire the current state of the specified choice device on the specified workstation.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Language Bindings

C

pinq_choice_st (*ws_id, choice_num, store, err_ind, op_mode, echo_switch, init_status, init_choice, prompt_echo, echo_area, choice_data*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint choice_num
Choice device number (>=1).

Pstore store
Handle to the Store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See the Create Store subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pop_mode *op_mode*
Operating mode (*0=POP_REQ, 1=POP_SAMPLE, 2=POP_EVENT*).

*Pecho_switch *echo_switch*
Echo switch (*0=PSWITCH_NO_ECHO, 1=PSWITCH_ECHO*).

*Pin_status *init_status*
Initial choice status (*1=PIN_STATUS_OK, 2=PIN_STATUS_NO_IN*).

*Pint *init_choice*
Initial choice number.

*Pint *prompt_echo*
Prompt and echo type.

*Plimit *echo_area*
Echo area.

*Pchoice_data3 **choice_data*
Data record. The memory referenced by **choice_data* is managed by the parameter *store*.

FORTRAN

PQCHS (*wkid*, *chdnr*, *mldr*, *errind*, *mode*, *esw*, *istat*, *ichnr*, *pet*, *earea*, *ldr*, *datrec*)

Input Parameters

integer wkid
Workstation identifier.

integer chdnr
Choice device number (>=1).

integer mldr
Dimension of data record array.

Output Parameters

integer errind
Error indicator.

integer mode
Operating mode (*0=PREQU, 1=PSAMPL, 2=PEVENT*).

integer esw
Echo switch (*0=PNECHO, 1=PECHO*).

integer istat
Initial choice status (*1=POK, 2=PNCHOI*).

integer ichnr
Initial choice number.

integer pet
Prompt and echo type.

real earea(4)
Echo area in DC (*XMIN, XMAX, YMIN, YMAX*).

integer ldr
Number of the array elements used in the data record.

*character*80 datrec(mldr)*
Data record.

Errors

None

Related Subroutines

- Initialize Choice
- Initialize Choice 3
- Inquire Choice Device State 3

INQUIRE CHOICE DEVICE STATE 3 (PHOP,WSOP,*,*)

Purpose

Use Inquire Choice Device State 3 to inquire the current state of the specified choice device on the specified workstation.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Language Bindings

C

pinq_choice_st3 (*ws_id, choice_num, store, err_ind, op_mode, echo_switch, init_status, init_choice, prompt_echo, echo_vol, choice_data*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint choice_num
Choice device number (>=1).

Pstore store
Handle to the Store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store CREATE STORE (PHOP,*,*,*) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pop_mode *op_mode*
Operating mode (*0=POP_REQ, 1=POP_SAMPLE, 2=POP_EVENT*).

*Pecho_switch *echo_switch*
Echo switch (*0=PSWITCH_NO_ECHO, 1=PSWITCH_ECHO*).

*Pin_status *init_status*
Initial choice status (*1=PIN_STATUS_OK, 2=PIN_STATUS_NO_IN*).

*Pint *init_choice*
Initial choice number.

*Pint *prompt_echo*
Prompt and echo type.

*Plimit3 *echo_vol*
Prompt and echo volume.

*Pchoice_data3 **choice_data*
Data record. The memory referenced by **choice_data* is managed by the parameter *store*.

FORTRAN

PQCHS3 (*wkid*, *chdnr*, *mldr*, *errind*, *mode*, *esw*, *istat*, *ichnr*, *pet*, *evol*, *ldr*, *datrec*)

Input Parameters

integer wkid
Workstation identifier.

integer chdnr
Choice device number (>=1).

integer mldr
Dimension of data record array.

Output Parameters

integer errind
Error indicator.

integer mode
Operating mode (*0=PREQU, 1=PSAMPL, 2=PEVENT*).

integer esw
Echo switch (*0=PNECHO, 1=PECHO*).

integer istat
Initial choice status (*1=POK, 2=PNCHOI*).

integer ichnr
Initial choice number.

integer pet
Prompt and echo type.

real evol(6)
Echo volume in DC (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

integer ldr
Number of the array elements used in the data record.

*character*80 datrec(mldr)*
Data record.

Errors

None

Related Subroutines

- Initialize Choice
- Initialize Choice 3
- Inquire Choice Device State 3

INQUIRE COLOR FACILITIES (PHOP,*,*,*)

Purpose

Use Inquire Color Facilities to inquire the color facilities of a specified workstation type.

The graPHIGS API returns the total number of available colors, the color status, (monochrome or color), the quantity of predefined color table entries in the workstation's default color table, and the primary colors for the workstation display. The graPHIGS API returns the primary colors as the *CIELUV* chromaticity coefficients *u'*, *v'* and luminance value *y*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

62 This Information Not Available For MO Workstation Type

Language Bindings

C

pinq_colr_facs (*ws_type, err_ind, fac*)

Input Parameters

Pint ws_type
Workstation type.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pcolr_facs *fac*
Color facilities.

FORTRAN

PQCF (*wtype*, *errind*, *ncoli*, *cola*, *npci*, *cc*)

Input Parameters

integer wtype
Workstation type.

Output Parameters

integer errind
Error indicator.

integer ncoli
Number of color indexes.

integer cola
Color available (*0=PMONOC, 1=PCOLOR*).

integer npci
Number of predefined color indexes.

real cc(9)
Primary colors. Chromaticity coefficients and luminance value for the primaries for the display device ($R_{u'}$, $R_{v'}$, R_Y, $G_{u'}$, $G_{v'}$, G_Y, $B_{u'}$, $B_{v'}$, B_Y).

Errors

None

Related Subroutines

- None

INQUIRE COLOR MODEL (PHOP,WSOP,*,*)

Purpose

Use Inquire Color Model to inquire the current color model for the specified workstation.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

Language Bindings

C

pinq_colr_model (*ws_id, err_ind, model*)

Input Parameters

Pint ws_id
Workstation identifier.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint *model*
Current color model (*1=PMODEL_RGB, 2=PMODEL_CIELUV, 3=PMODEL_HSV*).

FORTRAN

PQCMD (*wkid*, *errind*, *cmodel*)

Input Parameters

integer wkid
Workstation identifier.

Output Parameters

integer errind
Error indicator.

integer cmodel
Current color model (*1=PRGB, 2=PCIE, 3=PHSV*).

Errors

None

Related Subroutines

- Inquire Color Model Facilities
- Set Color Model

INQUIRE COLOR MODEL FACILITIES (PHOP,*,*,*)

Purpose

Use Inquire Color Model Facilities to inquire the list of available color models and the default color model on the specified workstation.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

62 This Information Not Available For MO Workstation Type

Language Bindings

C

pinq_colr_model_facs (*ws_type, num_elems_appl_list, start_ind, err_ind, models, num_elems_impl_list, def*)

Input Parameters

Pint ws_type
Workstation type.

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint_list *models*
List of color models (*1=PMODEL_RGB, 2=PMODEL_CIELUV, 3=PMODEL_HSV*).

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

*Pint *def*
Default color model (*1=PMODEL_RGB, 2=PMODEL_CIELUV, 3=PMODEL_HSV*).

FORTRAN

PQCMDF (*wtype*, *n*, *errind*, *ol*, *cmod*, *dfcmod*)

Input Parameters

integer wtype
Workstation type.

integer n
Element of the list of available color models (>=0).

Output Parameters

integer errind
Error indicator.

integer ol
Number of available color models.

integer cmod
n^{th} available color model (*1=PRGB, 2=PCIE, 3=PHSV*).

integer dfcmod
Default color model (*1=PRGB, 2=PCIE, 3=PHSV*).

Errors

None

Related Subroutines

- Inquire Color Model
- Set Color Model

INQUIRE COLOR REPRESENTATION (PHOP,WSOP,*,*)

Purpose

Use Inquire Color Representation to inquire the current color values in the specified workstation's color table. The color specification parameters are the coordinates of the color in the current color model at the workstation.

If the type of returned values is *REALIZED* and your application has neither predefined nor set the color associated with the color index, or the color index is greater than the range of the color table at the workstation, then the graPHIGS API sets the output color parameters to the color associated with color index 1.

If the type of returned values is *SET* and your application has predefined or set the color associated with the color index, then the graPHIGS API sets the output color parameters as closely as possible to the color associated with the color index as it was predefined or set. This may be the same as the case when the type of returned value is *REALIZED*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

113 Color Index Value < ZERO

101 Specified Representation Has Not Been Defined

Use Inquire Workstation State Table Lengths subroutine to determine the actual size of the workstation's color table.

Language Bindings

C

pinq_colr_rep (*ws_id, colr_ind, type, err_ind, colr_rep*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint colr_ind
Color index (>=0).

Pinq_type type
Type of returned values (*0=PINQ_SET, 1=PINQ_REALIZED*).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pcolr_rep *colr_rep*
Color representation.

FORTRAN

PQCR (*wkid*, *coli*, *ccsbsz*, *type*, *errind*, *ol*, *cspec*)

Input Parameters

integer wkid
Workstation identifier.

integer coli
Color index (>=0).

integer ccsbsz
Color component specification buffer size.

integer type
Type of returned values (*0=PSET, 1=PREALI*).

Output Parameters

integer errind
Error indicator.

integer ol
Number of color components in the color specification.

real cspec(ccsbsz)
Color specification.

Errors

None

Related Subroutines

- Set Color Representation

INQUIRE CONFLICT RESOLUTION (PHOP,*,*,*)

Purpose

Use Inquire Conflict Resolution to inquire the archival conflict resolution flag and the retrieval conflict resolution flag. Each flag may have the value *MAINTAIN*, *ABANDON*, or *UPDATE*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

pinq_conf_res (*err_ind, archive_res, retrieve_res*)

Output Parameters

*Pint *err_ind*
Error indicator.

*Pconf_res *archive_res*
Archival conflict resolution (*0=PRES_MAINTAIN, 1=PRES_ABANDON, 2=PRES_UPD*).

*Pconf_res *retrieve_res*
Retrieval conflict resolution (*0=PRES_MAINTAIN, 1=PRES_ABANDON, 2=PRES_UPD*).

FORTRAN

PQCNRS (*errind*, *arccr*, *retcr*)

Output Parameters

integer errind
Error indicator.

integer arccr
Archival conflict resolution (*0=PCRMNT, 1=PCRABA, 2=PCRUPD*).

integer retcr
Retrieval conflict resolution (*0=PCRMNT, 1=PCRABA, 2=PCRUPD*).

Errors

None

Related Subroutines

- None

INQUIRE CONFLICTING STRUCTURES IN NETWORK (PHOP,*,*,AROP)

Purpose

Use Inquire Conflicting Structures in Network to inquire a list of structure identifiers from a specified structure network that exists in both the structure store and the specified open archive file.

The value for the source determines whether the structure network originates from the structure store or from the archive file.

If the inquire information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the inquired information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

7 Function Requires State (PHOP,*,*,AROP)

201 Specified Structure Does Not Exist

404 Specified Archive File Is Not Open

Language Bindings

C

pinq_conf_structs_net(*ar_id, struct_id, source, num_elems_appl_list, start_ind, err_ind, ids, num_elems_impl_list*)

Input Parameters

Pint ar_id
Archive file identifier.

Pint struct_id
Structure identifier.

Pstruct_net_source source
Structure network source (*0=PNET_CSS, 1=PNET_AR*).

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint_list *ids*
List of conflicting structure identifiers.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQCSTN (*afid*, *strid*, *snsrc*, *n*, *errind*, *ol*, *ostrid*)

Input Parameters

integer afid
Archive file identifier.

integer strid
Structure identifier.

integer snsrc
Structure network source (*0=PCSS, 1=PARCHV*).

integer n
Set member requested (>=0).

Output Parameters

integer errind
Error indicator.

integer ol
Number of structure identifiers in list.

integer ostrid
n^{th} structure identifier in list.

Errors

None

Related Subroutines

- Inquire All Conflicting Structures

INQUIRE CURRENT ELEMENT CONTENT (PHOP,*,STOP,*)

Purpose

Use Inquire Current Element Content to retrieve the current structure element content that is indicated by the element pointer.

This subroutine returns the data contained in the current element. The graPHIGS API returns the data in a binding specific format. See Chapter 17. “ISO PHIGS C Type and Macro Definitions” for the C binding formats and see Chapter 16. “FORTRAN Structure Content Data Records” for the FORTRAN binding formats. Use the Inquire Current Element Type And Size subroutine to determine the element type and size.

To execute this subroutine, a structure must be open.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to the following error:

5 Function Requires State (PHOP,*,STOP,*)

Language Bindings

C

pinq_cur_elem_content (*store, err_ind, elem_data*)

Input Parameters

Pstore store
Handle to the Store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store CREATE STORE (PHOP,*,*,*) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pelem_data **elem_data*
Element data. The memory referenced by **elem_data* is managed by the parameter *store*.

FORTRAN

PQCECO (*iil*, *irl*, *isl*, *errind*, *il*, *ia*, *rl*, *ra*, *sl*, *lstr*, *str*)

Input Parameters

integer iil
Dimension of integer array (>=0).

integer irl
Dimension of real array (>=0).

integer isl
Dimension of character array (>=0).

Output Parameters

integer errind
Error indicator.

integer il
Number of integer entries.

integer ia(iil)
Array containing integer entries.

integer rl
Number of real entries.

integer ra(irl)
Array containing real entries.

integer sl
Number of character string entries.

integer lstr(isl)
Length of each character string entry.

character(*) str(isl)*
Character string entries.

FORTRAN Subset

PQCECO (*iil*, *irl*, *isl*, *errind*, *il*, *ia*, *rl*, *ra*, *sl*, *lstr*, *str*)

Input Parameters

integer iil
Dimension of integer array (>=0).

integer irl
Dimension of real array (>=0).

integer isl
Dimension of character array (>=0).

Output Parameters

integer errind
Error indicator.

integer il
Number of integer entries.

integer ia(iil)
Array containing integer entries.

integer rl
Number of real entries.

integer ra(irl)
Array containing real entries.

integer sl
Number of character string entries.

integer lstr(isl)
Length of each character string entry.

*character*80 str(isl)*
Character string entries.

Errors

None

Related Subroutines

- Inquire Current Element Type And Size

INQUIRE CURRENT ELEMENT TYPE AND SIZE (PHOP,*,STOP,*)

Purpose

Use Inquire Current Element Type and Size to inquire the type and size of the current element.

The graPHIGS API returns the element of the structure element pointed to by the element pointer. If elements of this type have no associated values, then the graPHIGS API returns a value of zero in the element size parameter. If the element pointer is currently zero, then the graPHIGS API returns a *NIL* value in the element type parameter. To retrieve the element contents, use the Inquire Current Element Content subroutine

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to the following error:

5 Function Requires State (PHOP,*,STOP,*)

Language Bindings

C

pinq_cur_elem_type_size (*err_ind, elem_type, elem_size*)

Output Parameters

*Pint *err_ind*
Error indicator.

*Pelem_type *elem_type*
Element type (*1=PELEM_NIL, 2=PELEM_POLYLINE3, 3=PELEM_POLYLINE, 4=PELEM_POLYMARKER3, 5=PELEM_POLYMARKER, 6=PELEM_TEXT3, 7=PELEM_TEXT, 8=PELEM_ANNO_TEXT_REL3, 9=PELEM_ANNO_TEXT_REL, 10=PELEM_FILL_AREA3, 11=PELEM_FILL_AREA, 12=PELEM_FILL_AREA_SET3, 13=PELEM_FILL_AREA_SET, 14=PELEM_CELL_ARRAY3, 15=PELEM_CELL_ARRAY, 16=PELEM_GDP3, 17=PELEM_GDP, 18=PELEM_LINE_IND, 19=PELEM_MARKER_IND, 20=PELEM_TEXT_IND, 21=PELEM_INT_IND, 22=PELEM_EDGE_IND, 23=PELEM_LINETYPE, 24=PELEM_LINEWIDTH, 25=PELEM_LINE_COLR_IND, 26=PELEM_MARKER_TYPE, 27=PELEM_MARKER_SIZE, 28=PELEM_MARKER_COLR_IND, 29=PELEM_TEXT_FONT, 30=PELEM_TEXT_PREC, 31=PELEM_CHAR_EXPAN, 32=PELEM_CHAR_SPACE, 33=PELEM_TEXT_COLR_IND, 34=PELEM_CHAR_HT, 35=PELEM_CHAR_UP_VEC, 36=PELEM_TEXT_PATH, 37=PELEM_TEXT_ALIGN, 38=PELEM_ANNO_CHAR_HT, 39=PELEM_ANNO_CHAR_UP_VEC,*

40=PELEM_ANNO_PATH, 41=PELEM_ANNO_ALIGN, 42=PELEM_ANNO_STYLE, 43=PELEM_INT_STYLE, 44=PELEM_INT_STYLE_IND, 45=PELEM_INT_COLR_IND, 46=PELEM_EDGE_FLAG, 47=PELEM_EDGETYPE, 48=PELEM_EDGEWIDTH, 49=PELEM_EDGE_COLR_IND, 50=PELEM_PAT_SIZE, 51=PELEM_PAT_REF_POINT_VECS, 52=PELEM_PAT_REF_POINT, 53=PELEM_ADD_NAMES_SET, 54=PELEM_REMOVE_NAMES_SET, 55=PELEM_INDIV_ASF, 56=PELEM_HLHSR_ID, 57=PELEM_LOCAL_MODEL_TRAN3, 58=PELEM_LOCAL_MODEL_TRAN, 59=PELEM_GLOBAL_MODEL_TRAN3, 60=PELEM_GLOBAL_MODEL_TRAN, 61=PELEM_MODEL_CLIP_VOL3, 62=PELEM_MODEL_CLIP_VOL, 63=PELEM_MODEL_CLIP_IND, 64=PELEM_RESTORE_MODEL_CLIP_VOL, 65=PELEM_VIEW_IND, 66=PELEM_EXEC_STRUCT, 67=PELEM_LABEL, 68=PELEM_APPL_DATA, 69=PELEM_GSE, 70=PELEM_PICK_ID).

*size_t *elem_size*
Element size in bytes.

FORTRAN

PQCETS (*erringd*, *eltype*, *il*, *rl*, *sl*)

Output Parameters

integer errind
Error indicator.

integer eltype
Element type (*1=PENIL, 2=PEPL3, 3=PEPL, 4=PEPM3, 5=PEPM, 6=PETX3, 7=PETX, 8=PEATR3, 9=PEATR, 10=PEFA3, 11=PEFA, 12=PEFAS3, 13=PEFAS, 14=PECA3, 15=PECA, 16=PEGDP3, 17=PEGDP, 18=PEPLI, 19=PEPMI, 20=PETXI, 21=PEII, 22=PEEDI, 23=PELN, 24=PELWSC, 25=PEPLCI, 26=PEMK, 27=PEMKSC, 28=PEPMCI, 29=PETXFN, 30=PETXPR, 31=PECHXP, 32=PECHSP, 33=PETXCI, 34=PECHH, 35=PECHUP, 36=PETXP, 37=PETXAL, 38=PEATCH, 39=PEATCU, 40=PEATP, 41=PEATAL, 42=PEANST, 43=PEIS, 44=PEISI, 45=PEICI, 46=PEEDFG, 47=PEEDT, 48=PEEWSC, 49=PEEDCI, 50=PEPA, 51=PEPRPV, 52=PEPARF, 53=PEADS, 54=PERES, 55=PEIASF, 56=PEHRID, 57=PELMT3, 58=PELMT, 59=PEGMT3, 60=PEGMT, 61=PEMCV3, 62=PEMCV, 63=PEMCLI, 64=PERMCV, 65=PEVWI, 66=PEEXST, 67=PELB, 68=PEAP, 69=PEGSE, 70=PEPKID*).

integer il
Dimension of integer array.

integer rl
Dimension of real array.

integer sl
Dimension of character array.

Errors

None

Related Subroutines

- Inquire Current Element Content

INQUIRE DEFAULT CHOICE DEVICE DATA (PHOP,*,*,*)

Purpose

Use Inquire Default Choice Device Data to inquire the default values for a specified choice device for the specified workstation type.

The graPHIGS API returns the default values for the requested choice device. For more information on the defaults, see *The graPHIGS Programming Interface: Technical Reference*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Language Bindings

C

pinq_def_choice_data (*ws_type, choice_num, store, err_ind, max_choices, pet_list, echo_area, choice_data*)

Input Parameters

Pint ws_type
Workstation type.

Pint choice_num
Choice device number (>=1).

Pstore store
Handle to the Store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store CREATE STORE (PHOP,*,*,*) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint *max_choices*
Maximum number of choice alternatives.

*Pint_list **pet_list*
List of prompt and echo types. The memory referenced by **pet_list* is managed by the parameter *store*.

*Plimit *echo_area*
Default echo area in DC.

*Pchoice_data **choice_data*
Default choice data record. The memory referenced by **choice_data* is managed by the parameter *store*.

FORTRAN

PQDCH (*wtype*, *devno*, *n*, *mldr*, *errind*, *malt*, *ol*, *pet*, *earea*, *ldr*, *datrec*)

Input Parameters

integer wtype
Workstation type.

integer devno
Choice device number (>=1).

integer n
List element requested (>=0).

integer mldr
Dimension of data record array (>=0).

Output Parameters

integer errind
Error indicator.

integer malt
Maximum number of choice alternatives.

integer ol
Number of available prompt and echo types.

integer pet
n^{th} element of the list of the available prompt and echo types.

real earea(4)
Default echo area in DC (*XMIN, XMAX, YMIN, YMAX*).

integer ldr
Number of array elements used in the data record.

*character*80 datrec(mldr)*
Default choice data record.

Errors

None

Related Subroutines

- Initialize Choice
- Initialize Choice 3
- Inquire Choice Device State
- Inquire Choice Device State 3
- Inquire Default Choice Device Data 3
- Inquire Workstation Connection And Type

INQUIRE DEFAULT CHOICE DEVICE DATA 3 (PHOP,*,*,*)

Purpose

Use Inquire Default Choice Device Data 3 to inquire the default values for a specified choice device for the specified workstation type.

The graPHIGS API returns the default values for the requested choice device. For more information on the defaults, see *The graPHIGS Programming Interface: Technical Reference*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Language Bindings

C

pinq_def_choice_data3 (*ws_type, choice_num, store, err_ind, max_choices, pet_list, echo_vol, choice_data*)

Input Parameters

Pint ws_type
Workstation type.

Pint choice_num
Choice device number (>=1).

Pstore store
Handle to the Store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

Pint *max_choices
Maximum number of choice alternatives.

*Pint_list **pet_list*
List of prompt and echo types. The memory referenced by **pet_list* is managed by the parameter *store*.

*Plimit3 *echo_vol*
Default echo volume in DC.

*Pchoice_data3 **choice_data*
Default choice data record. The memory referenced by **choice_data* is managed by the parameter *store*.

FORTRAN

PQDCH3 (*wtype*, *devno*, *n*, *mldr*, *errind*, *malt*, *ol*, *pet*, *evol*, *ldr*, *datrec*)

Input Parameters

integer wtype
Workstation type.

integer devno
Choice device number (>=1).

integer n
List element requested (>=0).

integer mldr
Dimension of data record array (>=0).

Output Parameters

integer errind
Error indicator.

integer malt
Maximum number of choice alternatives.

integer ol
Number of available prompt and echo types.

integer pet
n^{th} element of the list of the available prompt and echo types.

real evol(6)
Default echo volume in DC (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

integer ldr
Number of array elements used in the data record.

*character*80 datrec(mldr)*
Default choice data record.

Errors

None

Related Subroutines

- Initialize Choice
- Initialize Choice 3
- Inquire Choice Device State
- Inquire Choice Device State
- Inquire Default Choice Device Data 3
- Inquire Workstation Connection And Type

INQUIRE DEFAULT DISPLAY UPDATE STATE (PHOP,*,*,*)

Purpose

Use Inquire Default Display Update State to inquire the default values of the deferral state and modification mode for the specified workstation type.

For an explanation of the deferral states and modification modes see *The graPHIGS Programming Interface: Understanding Concepts*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

62 This Information Not Available For MO Workstation Type

Language Bindings

C

pinq_def_disp_upd_st (*ws_type, err_ind, def_mode, mod_mode*)

Input Parameters

Pint ws_type
Workstation type.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pdefer_mode *def_mode*
Default value for deferral mode (*0=PDEFER_ASAP, 1=PDEFER_BNIG, 2=PDEFER_BNIL, 3=PDEFER_ASTI, 4=PDEFER_WAIT*).

*Pmod_mode *mod_mode*
Default value for modification mode (*0=PMODE_NIVE, 1=PMODE_UWOR, 2=PMODE_UQUM*).

FORTRAN

PQDDUS (*wtype*, *errind*, *defmod*, *modmod*)

Input Parameters

integer wtype
Workstation type.

Output Parameters

integer errind
Error indicator.

integer defmod
Default value for deferral mode (*0=PASAP, 1=PBNIG, 2=PBNIL, 3=PASTI, 4=PWAITD*).

integer modmod
Default value for modification mode (*0=PNIVE, 1=PUWOR, 2=PUQUM*).

Errors

None

Related Subroutines

- Inquire Display Update State
- Inquire Workstation Connection And Type
- Set Display Update State

INQUIRE DEFAULT LOCATOR DEVICE DATA (PHOP,*,*,*)

Purpose

Use Inquire Default Locator Device Data to inquire the default value of the specified locator device for the specified workstation type.

The graPHIGS API returns the default values for the requested locator device. The default initial locator position is in view zero, which has the highest view input priority by default. For more information on the defaults, see *The graPHIGS Programming Interface: Technical Reference*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Language Bindings

C

pinq_def_loc_data (*ws_type, loc_num, store, err_ind, loc_pos, pet_list, echo_area, loc_data*)

Input Parameters

Pint ws_type
Workstation type.

Pint loc_num
Locator device number (>=1).

Pstore store
Handle to the Store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store CREATE STORE (PHOP,*,*,*) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Ppoint *loc_pos*
Default initial locator position in WC.

*Pint_list **pet_list*
List of prompt and echo types. The memory referenced by **pet_list* is managed by the parameter *store*.

*Plimit *echo_area*
Default echo area in DC.

*Ploc_data **loc_data*
Default locator data record. The memory referenced by **loc_data* is managed by the parameter *store*.

FORTRAN

PQDLC (*wtype*, *devno*, *n*, *mldr*, *errind*, *dpx*, *dpy*, *ol*, *pet*, *earea*, *ldr*, *datrec*)

Input Parameters

integer wtype
Workstation type.

integer devno
Locator device number (>=1).

integer n
List element requested (>=0).

integer mldr
Dimension of data record array (>=0).

Output Parameters

integer errind
Error indicator.

integer dpx
x coordinate of the default initial locator position in WC.

integer dpy
y coordinate of the default initial locator position in WC.

integer ol
Number of available prompt and echo types.

integer pet
n^{th} element of the list of the available prompt and echo types.

real earea(4)
Default echo area in DC (*XMIN, XMAX, YMIN, YMAX*).

integer ldr
Number of array elements used in the data record.

*character*80 datrec(mldr)*
Data record.

Errors

None

Related Subroutines

- Initialize Locator
- Initialize Locator 3
- Inquire Locator Device State
- Inquire Locator Device State 3
- Inquire Default Locator Device Data 3
- Inquire Workstation Connection And Type

INQUIRE DEFAULT LOCATOR DEVICE DATA 3 (PHOP,*,*,*)

Purpose

Use Inquire Default Locator Device Data 3 to inquire the default value of the specified locator device for the specified workstation type.

The graPHIGS API returns the default values for the requested locator device. The default initial locator position is in view zero, which has the highest view input priority by default. For more information on the defaults, see *The graPHIGS Programming Interface: Technical Reference*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Language Bindings

C

pinq_def_loc_data3 (*ws_type, loc_num, store, err_ind, loc_pos, pet_list, echo_vol, loc_data*)

Input Parameters

Pint ws_type
Workstation type.

Pint loc_num
Locator device number (>=1).

Pstore store
Handle to the Store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store CREATE STORE (PHOP,*,*,*) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Ppoint3 *loc_pos*
Default initial locator position in WC.

*Pint_list **pet_list*
List of prompt and echo types. The memory referenced by **pet_list* is managed by the parameter *store*.

*Plimit3 *echo_vol*
Default echo volume in DC.

*Ploc_data3 **loc_data*
Default locator data record. The memory referenced by **loc_data* is managed by the parameter *store*.

FORTRAN

PQDLC3 (*wtype*, *devno*, *n*, *mldr*, *errind*, *dpx*, *dpy*, *dpz*, *ol*, *pet*, *evol*, *ldr*, *datrec*)

Input Parameters

integer wtype
Workstation type.

integer devno
Locator device number (>=1).

integer n
List element requested (>=0).

integer mldr
Dimension of data record array (>=0).

Output Parameters

integer errind
Error indicator.

integer dpx
x coordinate of the default initial locator position in WC.

integer dpy
y coordinate of the default initial locator position in WC.

integer dpz
z coordinate of the default initial locator position in WC.

integer ol
Number of available prompt and echo types.

integer pet
n^{th} element of the list of the available prompt and echo types.

real evol(6)
Default echo volume in DC (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

integer ldr
Number of array elements used in the data record.

*character*80 datrec(mldr)*
Data record.

Errors

None

Related Subroutines

- Initialize Locator
- Initialize Locator 3
- Inquire Locator Device State
- Inquire Locator Device State 3
- Inquire Default Locator Device Data
- Inquire Workstation Connection And Type

INQUIRE DEFAULT PICK DEVICE DATA (PHOP,*,*,*)

Purpose

Use Inquire Default Pick Device Data to return the default values of the specified pick device for the specified workstation type.

The graPHIGS API returns the default values for the requested pick device. For more information on defaults, see *The graPHIGS Programming Interface: Technical Reference*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Language Bindings

C

pinq_def_pick_data (*ws_type, pick_num, store, err_ind, pet_list, echo_area, pick_data*)

Input Parameters

Pint ws_type
Workstation type.

Pint pick_num
Pick device number (>=1).

Pstore store
Handle to the Store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store CREATE STORE (PHOP,*,*,*) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint_list **pet_list*
List of prompt and echo types. The memory referenced by **pet_list* is managed by the parameter *store*.

*Plimit *echo_area*
Default echo area in DC.

*Ppick_data **pick_data*
Default pick data record. The memory referenced by **pick_data* is managed by the parameter *store*.

FORTRAN

PQDPK (*wtype*, *devno*, *n*, *mldr*, *errind*, *ol*, *pet*, *earea*, *ldr*, *datrec*)

Input Parameters

integer wtype
Workstation type.

integer devno
Pick device number (>=1).

integer n
List element requested (>=0).

integer mldr
Dimension of data record array (>=0).

Output Parameters

integer errind
Error indicator.

integer ol
Number of available prompt and echo types.

integer pet
n^{th} element of the list of the available prompt and echo types.

real earea(4)
Default echo area in DC (*XMIN, XMAX, YMIN, YMAX*).

integer ldr
Number of array elements used in the data record.

*character*80 datrec(mldr)*
Data record.

Errors

None

Related Subroutines

- Initialize Pick
- Initialize Pick 3
- Inquire Pick Device State
- Inquire Pick Device State 3
- Inquire Default Pick Device Data
- Inquire Workstation Connection And Type

INQUIRE DEFAULT PICK DEVICE DATA 3 (PHOP,*,*,*)

Purpose

Use Inquire Default Pick Device Data 3 to return the default values of the specified pick device for the specified workstation type.

The graPHIGS API returns the default values for the requested pick device. For more information on defaults, see *The graPHIGS Programming Interface: Technical Reference*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Language Bindings

C

pinq_def_pick_data3 (*ws_type, pick_num, store, err_ind, pet_list, echo_vol, pick_data*)

Input Parameters

Pint ws_type
Workstation type.

Pint pick_num
Pick device number(>=1).

Pstore store
Handle to the Store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint_list **pet_list*
List of prompt and echo types. The memory referenced by **pet_list* is managed by the parameter *store*.

*Plimit3 *echo_vol*
Default echo volume in DC.

*Ppick_data3 **pick_data*
Default pick data record. The memory referenced by **pick_data* is managed by the parameter *store*.

FORTRAN

PQDPK3 (*wtype*, *devno*, *n*, *mldr*, *errind*, *ol*, *pet*, *evol*, *ldr*, *datrec*)

Input Parameters

integer wtype
Workstation type.

integer devno
Pick device number (>=1).

integer n
List element requested (>=0).

integer mldr
Dimension of data record array (>=0).

Output Parameters

integer errind
Error indicator.

integer ol
Number of available prompt and echo types.

integer pet
n^{th} element of the list of the available prompt and echo types.

real evol(6)
Default echo volume in DC (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

integer ldr
Number of array elements used in the data record.

*character*80 datrec(mldr)*
Data record.

Errors

None

Related Subroutines

- Initialize Pick
- Initialize Pick 3
- Inquire Pick Device State
- Inquire Pick Device State 3
- Inquire Default Pick Device Data 3
- Inquire Workstation Connection And Type

INQUIRE DEFAULT STRING DEVICE DATA (PHOP,*,*,*)

Purpose

Use Inquire Default String Device Data to inquire the default values of the specified string device for the specified workstation type.

The graPHIGS API returns the default values for the requested string device. For more information on default values, see *The graPHIGS Programming Interface: Technical Reference*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Language Bindings

C

pinq_def_string_data (*ws_type, string_num, store, err_ind, max_buf_size, pet_list, echo_area, string_data*)

Input Parameters

Pint ws_type
Workstation type.

Pint string_num
String device number (>=1).

Pstore store
Handle to the Store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint *max_buf_size*
Available input buffer size.

*Pint_list **pet_list*
List of prompt and echo types. The memory referenced by **pet_list* is managed by the parameter *store*.

*Plimit *echo_area*
Default echo area in DC.

*Pstring_data **string_data*
Default string data record. The memory referenced by **string_data* is managed by the parameter *store*.

FORTRAN

PQDST (*wtype*, *devno*, *n*, *mldr*, *errind*, *mbuff*, *ol*, *pet*, *earea*, *ldr*, *datrec*)

Input Parameters

integer wtype
Workstation type.

integer devno
String device number (>=1).

integer n
List element requested (>=0).

integer mldr
Dimension of data record array (>=0).

Output Parameters

integer errind
Error indicator.

integer mbuff
Available string buffer size.

integer ol
Number of available prompt and echo types.

integer pet
n^{th} element of the list of the available prompt and echo types.

real earea(4)
Default echo area in DC (*XMIN, XMAX, YMIN, YMAX*).

integer ldr
Number of array elements used in the data record.

*character*80 datrec(mldr)*
Data record.

Errors

None

Related Subroutines

- Initialize String
- Initialize String 3
- Inquire String Device State
- Inquire String Device State 3
- Inquire Default String Device Data 3
- Inquire Workstation Connection And Type

INQUIRE DEFAULT STRING DEVICE DATA 3 (PHOP,*,*,*)

Purpose

Use Inquire Default String Device Data 3 to inquire the default values of the specified string device for the specified workstation type.

The graPHIGS API returns the default values for the requested string device. For more information on default values, see *The graPHIGS Programming Interface: Technical Reference*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Language Bindings

C

pinq_def_string_data3 (*ws_type, string_num, store, err_ind, max_buf_size, pet_list, echo_vol, string_data*)

Input Parameters

Pint ws_type
Workstation type.

Pint string_num
String device number (>=1).

Pstore store
Handle to the Store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint *max_buf_size*
Available input buffer size.

*Pint_list **pet_list*
List of prompt and echo types. The memory referenced by **pet_list* is managed by the parameter *store*.

*Plimit3 *echo_vol*
Default echo volume in DC.

*Pstring_data3 **string_data*
Default string data record. The memory referenced by **string_data* is managed by the parameter *store*.

FORTRAN

PQDST3 (*wtype*, *devno*, *n*, *mldr*, *errind*, *mbuff*, *ol*, *pet*, *evol*, *ldr*, *datrec*)

Input Parameters

integer wtype
Workstation type.

integer devno
String device number (>=1).

integer n
List element requested (>=0).

integer mldr
Dimension of data record array (>=0).

Output Parameters

integer errind
Error indicator.

integer mbuff
Available string buffer size.

integer ol
Number of available prompt and echo types.

integer pet
n^{th} element of the list of the available prompt and echo types.

real evol(6)
Default echo volume in DC (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

integer ldr
Number of array elements used in the data record.

*character*80 datrec(mldr)*
Data record.

Errors

None

Related Subroutines

- Initialize String
- Initialize String 3
- Inquire String Device State
- Inquire String Device State 3
- Inquire Default String Device Data
- Inquire Workstation Connection And Type

INQUIRE DEFAULT STROKE DEVICE DATA (PHOP,*,*,*)

Purpose

Use Inquire Default Stroke Device Data to inquire the default values of the specified stroke device for the specified workstation type.

The graPHIGS API returns the default values for the requested stroke device. For more information on defaults, see *The graPHIGS Programming Interface: Technical Reference*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Language Bindings

C

pinq_def_stroke_data (*ws_type, stroke_num, store, err_ind, max_buf_size, pet_list, echo_area, stroke_data*)

Input Parameters

Pint ws_type
Workstation type.

Pint stroke_num
Stroke device number (>=1).

Pstore store
Handle to the Store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint *max_buf_size*
Available input buffer size in points.

*Pint_list **pet_list*
List of prompt and echo types. The memory referenced by **pet_list* is managed by the parameter *store*.

*Plimit *echo_area*
Default echo area in DC.

*Pstroke_data **stroke_data*
Default stroke data record. The memory referenced by **stroke_data* is managed by the parameter *store*.

FORTRAN

PQDSK (*wtype*, *devno*, *n*, *mldr*, *errind*, *mbuff*, *ol*, *pet*, *earea*, *ldr*, *datrec*)

Input Parameters

integer wtype
Workstation type.

integer devno
Stroke device number (>=1).

integer n
List element requested (>=0).

integer mldr
Dimension of data record array (>=0).

Output Parameters

integer errind
Error indicator.

integer mbuff
Available stroke buffer size in points.

integer ol
Number of available prompt and echo types.

integer pet
n^{th} element of the list of the available prompt and echo types.

real earea(4)
Default echo area in DC (*XMIN, XMAX, YMIN, YMAX*).

integer ldr
Number of array elements used in the data record.

*character*80 datrec(mldr)*
Data record.

Errors

None

Related Subroutines

- Initialize Stroke
- Initialize Stroke 3
- Inquire Stroke Device State
- Inquire Stroke Device State 3
- Inquire Default Stroke Device Data 3
- Inquire Workstation Connection And Type

INQUIRE DEFAULT STROKE DEVICE DATA 3 (PHOP,*,*,*)

Purpose

Use Inquire Default Stroke Device Data 3 to inquire the default values of the specified stroke device for the specified workstation type.

The graPHIGS API returns the default values for the requested stroke device. For more information on defaults, see *The graPHIGS Programming Interface: Technical Reference*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Language Bindings

C

pinq_def_stroke_data3 (*ws_type, stroke_num, store, err_ind, max_buf_size, pet_list, echo_vol, stroke_data*)

Input Parameters

Pint ws_type
Workstation type.

Pint stroke_num
Stroke device number (>=1).

Pstore store
Handle to the Store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint *max_buf_size*
Available input buffer size in points.

*Pint_list **pet_list*
List of prompt and echo types. The memory referenced by **pet_list* is managed by the parameter *store*.

*Plimit3 *echo_vol*
Default echo volume in DC.

*Pstroke_data3 **stroke_data*
Default stroke data record. The memory referenced by **stroke_data* is managed by the parameter *store*.

FORTRAN

PQDSK3 (*wtype*, *devno*, *n*, *mldr*, *errind*, *mbuff*, *ol*, *pet*, *evol*, *ldr*, *datrec*)

Input Parameters

integer wtype
Workstation type.

integer devno
Stroke device number (>=1).

integer n
List element requested (>=0).

integer mldr
Dimension of data record array (>=0).

Output Parameters

integer errind
Error indicator.

integer mbuff
Available stroke buffer size in points.

integer ol
Number of available prompt and echo types.

integer pet
n^{th} element of the list of the available prompt and echo types.

real evol(6)
Default echo volume in DC (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

integer ldr
Number of array elements used in the data record.

*character*80 datrec(mldr)*
Data record.

Errors

None

Related Subroutines

- Initialize Stroke
- Initialize Stroke 3
- Inquire Stroke Device State
- Inquire Stroke Device State 3

- Inquire Default Stroke Device Data
- Inquire Workstation Connection And Type

INQUIRE DEFAULT VALUATOR DEVICE DATA (PHOP,*,*,*)

Purpose

Use Inquire Default Valuator Device Data to inquire the default values of the specified valuator device on the given workstation type.

The graPHIGS API returns the default values for the requested valuator device. For more information on default values, see *The graPHIGS Programming Interface: Technical Reference*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Language Bindings

C

pinq_def_val_data (*ws_type, val_num, store, err_ind, def_value, pet_list, echo_area, val_data*)

Input Parameters

Pint ws_type
Workstation type.

Pint val_num
Valuator device number (>=1).

Pstore store
Handle to the Store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pfloat *def_value*
Default initial value.

*Pint_list **pet_list*
List of prompt and echo types. The memory referenced by **pet_list* is managed by the parameter *store*.

*Plimit *echo_area*
Default echo area in DC.

*Pval_data **val_data*
Default valuator data record. The memory referenced by **val_data* is managed by the parameter *store*.

FORTRAN

PQDVL (*wtype*, *devno*, *n*, *mldr*, *errind*, *dval*, *ol*, *pet*, *earea*, *ldr*, *datrec*)

Input Parameters

integer wtype
Workstation type.

integer devno
Valuator device number (>=1).

integer n
List element requested (>=0).

integer mldr
Dimension of data record array (>=0).

Output Parameters

integer errind
Error indicator.

integer dval
Default initial value.

integer ol
Number of available prompt and echo types.

integer pet
n^{th} element of the list of the available prompt and echo types.

real earea(4)
Default echo area in DC (*XMIN, XMAX, YMIN, YMAX*).

integer ldr
Number of array elements used in the data record.

*character*80 datrec(mldr)*
Data record.

Errors

None

Related Subroutines

- Initialize Valuator
- Initialize Valuator 3
- Inquire Valuator Device State
- Inquire Valuator Device State 3
- Inquire Default Valuator Device Data 3
- Inquire Workstation Connection And Type

INQUIRE DEFAULT VALUATOR DEVICE DATA 3 (PHOP,*,*,*)

Purpose

Use Inquire Default Valuator Device Data 3 to inquire the default values of the specified valuator device on the given workstation type.

The graPHIGS API returns the default values for the requested valuator device. For more information on default values, see *The graPHIGS Programming Interface: Technical Reference*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Language Bindings

C

pinq_def_val_data3 (*ws_type, val_num, store, err_ind, def_value, pet_list, echo_vol, val_data*)

Input Parameters

Pint ws_type
Workstation type.

Pint val_num
Valuator device number (>=1).

Pstore store
Handle to the Store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pfloat *def_value*
Default initial value.

*Pint_list **pet_list*
List of prompt and echo types. The memory referenced by **pet_list* is managed by the parameter *store*.

*Plimit3 *echo_area*
Default echo volume in DC.

*Pval_data3 **val_data*
Default valuator data record. The memory referenced by **val_data* is managed by the parameter *store*.

FORTRAN

PQDVL3 (*wtype*, *devno*, *n*, *mldr*, *errind*, *dval*, *ol*, *pet*, *evol*, *ldr*, *datrec*)

Input Parameters

integer wtype
Workstation type.

integer devno
Valuator device number (>=1).

integer n
List element requested (>=0).

integer mldr
Dimension of data record array (>=0).

Output Parameters

integer errind
Error indicator.

integer dval
Default initial value.

integer ol
Number of available prompt and echo types.

integer pet
n^{th} element of the list of the available prompt and echo types.

real evol(6)
Default echo volume in DC (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

integer ldr
Number of array elements used in the data record.

*character*80 datrec(mldr)*
Data record.

Errors

None

Related Subroutines

- Initialize Valuator
- Initialize Valuator 3
- Inquire Valuator Device State
- Inquire Valuator Device State 3
- Inquire Default Valuator Device Data
- Inquire Workstation Connection And Type

INQUIRE DISPLAY SPACE SIZE (PHOP,*,*,*)

Purpose

Use Inquire Display Space Size to inquire the maximum display space size for the specified workstation type.

The graPHIGS API returns the maximum display space size in Device Coordinates (DC) and address units. Device Coordinate units are either *METER* or *OTHER*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

57 Specified Workstation Is Of Category MI

62 This Information Not Available For MO Workstation Type

Language Bindings

C

pinq_disp_space_size (*ws_type, err_ind, size*)

Input Parameters

Pint ws_type
Workstation type.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pdisp_space_size *size*
Display size.

FORTRAN

PQDSP (*wtype*, *errind*, *dcunit*, *dx*, *dy*, *rx*, *ry*)

Input Parameters

integer wtype
Workstation type.

Output Parameters

integer errind
Error indicator.

integer dcunit
Device coordinate units (*0=PMETRE, 1=POTHU*).

real dx
Maximum display space size in *x* direction in DC.

real dy
Maximum display space size in *y* direction in DC.

integer rx
Maximum display space size in *x* direction in raster units.

integer ry
Maximum display space size in *y* direction in raster units.

Errors

None

Related Subroutines

- Initialize Choice
- Initialize Locator
- Initialize Pick
- Initialize String
- Initialize Stroke
- Initialize Valuator
- Inquire Display Space Size 3
- Inquire Workstation Connection And Type

INQUIRE DISPLAY SPACE SIZE 3 (PHOP,*,*,*)

Purpose

Use Inquire Display Space Size 3 to inquire the maximum display space size for the specified workstation type.

The graPHIGS API returns the maximum display space size in Device Coordinates (DC) and address units. Device Coordinate units are either *METER* or *OTHER*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

57 Specified Workstation Is Of Category MI

62 This Information Not Available For MO Workstation Type

Language Bindings

C

pinq_disp_space_size3 (*ws_type, err_ind, size*)

Input Parameters

Pint ws_type
Workstation type.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pdisp_space_size3 *size*
Display size.

FORTRAN

PQDSP3 (*wtype*, *errind*, *dcunit*, *dx*, *dy*, *dz*, *rx*, *ry*, *rz*)

Input Parameters

integer wtype
Workstation type.

Output Parameters

integer errind
Error indicator.

integer dcunit
Device coordinate units (*0=PMETRE, 1=POTHU*).

real dx
Maximum display space size in *x* direction in DC.

real dy
Maximum display space size in *y* direction in DC.

real dz
Maximum display space size in *z* direction in DC.

integer rx
Maximum display space size in *x* direction in raster units.

integer ry
Maximum display space size in *y* direction in raster units.

integer rz
Maximum display space size in *z* direction in raster units.

Errors

None

Related Subroutines

- Initialize Choice 3
- Initialize Locator 3
- Initialize Pick 3
- Initialize String 3
- Initialize Stroke 3
- Initialize Valuator 3
- Inquire Display Space Size
- Inquire Workstation Connection And Type

INQUIRE DISPLAY UPDATE STATE (PHOP,WSOP,*,*)

Purpose

Use Inquire Display Update State to inquire the current deferral and update state values for the specified workstation.

Possible deferral modes include: *ASAP, BNIG, BNIL, ASTI,* and *WAIT*. Possible modification modes include: *NIVE, UWOR,* and *UQUM*. The display surface is either *EMPTY* or *NOT EMPTY*. Possible states of visual representation include: *CORRECT, DEFERRED,* and *SIMULATED*. If your application specifies both simulated and deferred actions, then the state of visual representation is *DEFERRED* (the pixel data returned is different from the graphical state of the workstation). For an explanation of the deferral states and modification modes see *The graPHIGS Programming Interface: Understanding Concepts*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

Language Bindings

C

pinq_disp_upd_st (*ws_id, err_ind, def_mode, mod_mode, disp_surf_empty, vis_st*)

Input Parameters

Pint ws_id
Workstation identifier.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pdefer_mode *def_mode*
Deferral mode (*0=PDEFER_ASAP, 1=PDEFER_BNIG, 2=PDEFER_BNIL, 3=PDEFER_ASTI, 4=PDEFER_WAIT*).

*Pmod_mode *mod_mode*
Modification mode (*0=PMODE_NIVE, 1=PMODE_UWOR, 2=PMODE_UQUM*).

*Pdisp_surf_empty *disp_surf_empty*
Display surface empty (*0=PSURF_NOT_EMPTY, 1=PSURF_EMPTY*).

*Pvisual_st *vis_st*
State of visual representation (*0=PVISUAL_ST_CORRECT, 1=PVISUAL_ST_DEFER, 2=PVISUAL_ST_SIMULATED*).

FORTRAN

PQDUS (*wkid*, *errind*, *defmod*, *modmod*, *dempty*, *stofvr*)

Input Parameters

integer wkid
Workstation identifier.

Output Parameters

integer errind
Error indicator.

integer defmod
Deferral mode (*0=PASAP, 1=PBNIG, 2=PBNIL, 3=PASTI, 4=PWAITD*).

integer modmod
Modification mode (*0=PNIVE, 1=PUWOR, 2=PUQOM*).

integer dempty
Display surface empty (*0=PNEMPT, 1=PEMPTY*).

integer stofvr
State of visual representation (*0=PVROK, 1=PVRDRF, 2=PVRSIM*).

Errors

None

Related Subroutines

- Inquire Default Display Update State
- Set Display Update State

INQUIRE DYNAMICS OF STRUCTURES (PHOP,*,*,*)

Purpose

Use Inquire Dynamics of Structures to inquire the dynamic modification supported by the specified workstation for the following categories of picture changes:

- structure content modification
- post structure
- unpost structure
- delete structure
- reference modification (structure identifier changes).

Possible dynamic modifications include: *IMPLICIT REGENERATION* (*IRG*), meaning that implicit regeneration is necessary; *IMMEDIATELY* (*IMM*), meaning that the action is performed immediately; and *CAN BE SIMULATED* (*CBS*), meaning that the change can be simulated. If a category has a dynamic modification of *IRG* or *CBS*, it is still possible that your application can immediately execute some changes correctly if the state of the picture allows it. (For example, if no structures are posted, most changes can be executed immediately.)

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

62 This Information Not Available For MO Workstation Type

Language Bindings

C

pinq_dyns_structs (*ws_type, err_ind, dyns*)

Input Parameters

Pint ws_type
Workstation type.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pdyns_structs *dyns*
Structure dynamics.

FORTRAN

PQDSTR (*wtype*, *errind*, *strcon*, *post*, *unpost*, *delete*, *refmod*)

Input Parameters

integer wtype
Workstation type.

Output Parameters

integer errind
Error indicator.

integer strcon
Structure content modification (*0=PIRG, 1=PIMM, 2=PCBS*).

integer post
Post structure (*0=PIRG, 1=PIMM, 2=PCBS*).

integer unpost
Unpost structure (*0=PIRG, 1=PIMM, 2=PCBS*).

integer delete
Delete structure (*0=PIRG, 1=PIMM, 2=PCBS*).

integer refmod
Reference modification (*0=PIRG, 1=PIMM, 2=PCBS*).

Errors

None

Related Subroutines

- Inquire Dynamics Of Workstation Attributes

INQUIRE DYNAMICS OF WORKSTATION ATTRIBUTES (PHOP,*,*,*)

Purpose

Use Inquire Dynamics of Workstation Attributes to inquire the dynamic modification supported by the specified workstation for the following categories of picture changes:

- view representation modification
- polyline bundle representation modification
- polymarker bundle representation modification
- text bundle representation modification

- interior bundle representation modification
- edge bundle representation modification
- pattern representation modification
- color representation modification
- workstation transformation modification
- highlighting filter modification
- invisibility filter modification
- HLHSR mode modification.

Possible dynamic modifications include: *IMPLICIT REGENERATION* (*IRG*), meaning that implicit regeneration is necessary; *IMMEDIATELY* (*IMM*), meaning that the action is performed immediately; and *CAN BE SIMULATED* (*CBS*), meaning that the change can be simulated. If a category has a dynamic modification of *IRG* or *CBS*, it is still possible that your application can immediately execute some changes correctly if the state of the picture allows it. (For example, if no structures are posted, most changes can be executed immediately.)

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

62 This Information Not Available For MO Workstation Type

Language Bindings

C

pinq_dyns_ws_attrs (*ws_type, err_ind, attr*)

Input Parameters

Pint ws_type
Workstation type.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pdyns_ws_attrs *attr*
Dynamics of workstation attributes.

FORTRAN

PQDSWA (*wtype*, *errind*, *plbun*, *pmbun*, *txbun*, *inbun*, *edbun*, *parep*, *colrep*, *vwrep*, *wktr*, *hlfltr*, *infltr*, *hlhsr*)

Input Parameters

integer wtype
Workstation type.

Output Parameters

integer errind
Error indicator.

integer plbun
Polyline bundle representation changeable (*0=PIRG, 1=PIMM, 2=PCBS*).

integer pmbun
Polymarker bundle representation changeable (*0=PIRG, 1=PIMM, 2=PCBS*).

integer txbun
Text bundle representation changeable (*0=PIRG, 1=PIMM, 2=PCBS*).

integer inbun
Interior bundle representation changeable (*0=PIRG, 1=PIMM, 2=PCBS*).

integer edbun
Edge bundle representation changeable (*0=PIRG, 1=PIMM, 2=PCBS*).

integer parep
Pattern representation changeable (*0=PIRG, 1=PIMM, 2=PCBS*).

integer colrep
Color representation changeable (*0=PIRG, 1=PIMM, 2=PCBS*).

integer vwrep
View representation changeable (*0=PIRG, 1=PIMM, 2=PCBS*).

integer wktr
Workstation transformation changeable (*0=PIRG, 1=PIMM, 2=PCBS*).

integer hifltr
Highlighting filter changeable (*0=PIRG, 1=PIMM, 2=PCBS*).

integer infltr
Invisibility filter changeable (*0=PIRG, 1=PIMM, 2=PCBS*).

integer hlhsr
HLHSR mode changeable (*0=PIRG, 1=PIMM, 2=PCBS*).

Errors

None

Related Subroutines

- Inquire Dynamics Of Structures

INQUIRE EDGE FACILITIES (PHOP,*,*,*)

Purpose

Use Inquire Edge Facilities to inquire the edge facilities for the specified workstation type.

The graPHIGS API returns a number indicating the total quantity of available edge types and their identifiers; the available number of edge widths and the nominal, minimum, and maximum values; and the number of predefined edge indexes. The graPHIGS API returns the width of lines in Device Coordinate (DC) units. Possible edge types include: *SOLID*, *DASHED*, *DOTTED*, or *DASHED-DOTTED*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

62 This Information Not Available For MO Workstation Type

Language Bindings

C

pinq_edge_facs (*ws_type, num_elems_appl_list, start_ind, err_ind, fac, num_elems_impl_list*)

Input Parameters

Pint ws_type
Workstation type.

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint index
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pedge_facs *fac*
Edge facilities.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQEDF (*wtype*, *n*, *errind*, *nedt*, *edt*, *nedw*, *nomedw*, *redwmn*, *npedi*)

Input Parameters

integer wtype
Workstation type.

integer n
List element requested (>=0).

Output Parameters

integer errind
Error indicator.

integer nedt
Number of available edge types.

integer edt
n^{th} element of the list of available edge types (*PLSOLI, 2=PLDASH, 3=PLDOT, 4=PLDASD*).

integer nedw
Number of available edge widths.

real nomedw
Nominal edge width.

real redwmn
Minimum edge width.

real redwmx
Maximum edge width.

integer npedi
Number of predefined edge indexes.

Errors

None

Related Subroutines

- Inquire Edge Representation
- Set edge Representation

INQUIRE EDGE REPRESENTATION (PHOP,WSOP,*,*)

Purpose

Use Inquire Edge Representation to inquire the current attribute values in the specified entry in the edge bundle table of the specified workstation. Returned values of type *SET* or *REALIZED* may be specified.

If the specified edge index is not present in the edge bundle table on the workstation and the specified type of returned values is *REALIZED*, then the graPHIGS API returns the representation values for edge index 1.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

100 Bundle Index Value Is Less Than One

101 Specified Representation Has Not Been Defined

Language Bindings

C

pinq_edge_rep (*ws_id, index, type, err_ind, edge_rep*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint index
Edge index (>=1).

Pinq_type type
Type of returned values (*0=PINQ_SET, 1=PINQ_REALIZED*).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pedge_bundle *edge_rep*
Edge representation.

FORTRAN

PQEDR (*wkid*, *edi*, *type*, *errind*, *edflag*, *edtype*, *ewidth*, *coli*)

Input Parameters

integer wkid
Workstation identifier.

integer edi
Edge index (>=1).

integer type
Type of returned values (*0=PSET, 1=PREALI*).

Output Parameters

integer errind
Error indicator.

integer edflag
Edge flag (*0=POFF, 1=PON*).

integer edtype
Edge type (*1=PLSOLI, 2=PLDASH, 3=PLDOT, 4=PLDASD*).

real edwidth
Edge width scale factor.

integer coli
Edge color index (>=0).

Errors

None

Related Subroutines

- Inquire Edge Facilities
- Set edge Representation

INQUIRE EDIT MODE (PHOP,*,*,*)

Purpose

Use Inquire Edit Mode to inquire the current edit mode. The edit mode is either *INSERT* or *REPLACE*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

pinq_edit_mode (*err_ind, edit_mode*)

Output Parameters

*Pint *err_ind*
Error indicator.

*Pedit_mode *edit_mode*
Edit mode (*0=PEDIT_INSERT, 1=PEDIT_REPLACE*).

FORTRAN

PQEDM (*errind*, *editmo*)

Output Parameters

integer errind
Error indicator.

integer editmo
Edit mode (*0=PINSRT, 1=PREPLC*).

Errors

None

Related Subroutines

- Set Edit Mode

INQUIRE ELEMENT CONTENT (PHOP,*,*,*)

Purpose

Use Inquire Element Content to inquire the contents of the specified structure element.

This subroutine returns the data contained in the specified structure element. The data is returned in a binding specific format. See Chapter 17. “ISO PHIGS C Type and Macro Definitions” for the C binding formats and see Chapter 16. “FORTRAN Structure Content Data Records” for the FORTRAN binding formats. Use the Inquire Element Type and Size subroutine (INQUIRE ELEMENT TYPE AND SIZE (PHOP,*,*,*)) to determine the element type and size.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

201 Specified Structure Does Not Exist

202 Specified Element Does Not Exist

Language Bindings

C

pinq_elem_content (*struct_id, elem_num, store, err_ind, elem_data*)

Input Parameters

Pint struct_id
Structure identifier.

Pint elem_num
Element number (>=0).

Pstore store
Handle to the Store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameter

*Pint *err_ind*
Error indicator.

*Pelem_data **elem_data*
Data record. The memory referenced by **elem_data* is managed by the parameter *store*.

FORTRAN

PQECO (*strid*, *elenum*, *iil*, *irl*, *isl*, *errind*, *il*, *ia*, *rl*, *ra*, *sl*, *lstr*, *str*)

Input Parameters

integer strid
Structure identifier.

integer elenum
Element position (>=0).

integer iil
Dimension of integer array (>=0).

integer irl
Dimension of real array (>=0).

integer isl
Dimension of character array (>=0).

Output Parameters

integer errind
Error indicator.

integer il
Number of integer entries.

integer ia (iil)
Array containing integer entries.

integer rl
Number of real entries.

real ra (irl)
Array containing real entries.

integer sl
Number of character string entries.

integer lstr (isl)
Length of each character string entry.

character(*) str(isl)*
Character string entries.

FORTRAN Subset

PQECO (*strid*, *elenum*, *iil*, *irl*, *isl*, *errind*, *il*, *ia*, *rl*, *ra*, *sl*, *lstr*, *str*)

Input Parameters

integer strid
Structure identifier.

integer elenum
Element position (>=0).

integer iil
Dimension of integer array (>=0).

integer irl
Dimension of real array (>=0).

integer isl
Dimension of character array (>=0).

Output Parameters

integer errind
Error indicator.

integer il
Number of integer entries.

integer ia (iil)
Array containing integer entries.

integer rl
Number of real entries.

real ra (irl)
Array containing real entries.

integer sl
Number of character string entries.

integer lstr (isl)
Length of each character string entry.

*character*80 str(isl)*
Character string entries.

Errors

None

Related Subroutines

- Inquire Element Type And Size

INQUIRE ELEMENT POINTER (PHOP,*,STOP,*)

Purpose

Use Inquire Element Pointer to inquire the value of the current element pointer in the structure store.

A structure must be open to invoke this subroutine.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameter. If the information is unavailable, then the value returned in the output parameter is unpredictable and the graPHIGS API sets the error indicator to the following error:

5 Function Requires State (PHOP,*,STOP,*)

Language Bindings

C

pinq_elem_ptr (*err_ind, elem_ptr_value*)

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint *elem_ptr_value*
Element pointer value.

FORTRAN

PQEP (*errind*, *ep*)

Output Parameters

integer errind
Error indicator.

integer ep
Element pointer value.

Errors

None

Related Subroutines

- None

INQUIRE ELEMENT TYPE AND SIZE (PHOP,*,*,*)

Purpose

Use Inquire Element Type and Size to inquire the type and size of the specified structure element.

This subroutine returns the element type of the specified element. If elements of this type have no associated values, then the graPHIGS API returns a value of zero in the element size parameter. If the element pointer is currently zero, then the graPHIGS API returns a value of *NIL* in the element type parameter. To retrieve the element contents, use the Inquire Element Content subroutine

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

201 Specified Structure Does Not Exist

202 Specified Element Does Not Exist

Language Bindings

C

pinq_elem_type_size (*struct_id, elem_num, err_ind, elem_type, elem_size*)

Input Parameters

Pint struct_id
Structure identifier.

Pint elem_num
Element number (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pelem_type *elem_type*
Element type (*1=PELEM_NIL, 2=PELEM_POLYLINE3, 3=PELEM_POLYLINE, 4=PELEM_POLYMARKER3, 5=PELEM_POLYMARKER, 6=PELEM_TEXT3, 7=PELEM_TEXT, 8=PELEM_ANNO_TEXT_REL3, 9=PELEM_ANNO_TEXT_REL, 10=PELEM_FILL_AREA3, 11=PELEM_FILL_AREA, 12=PELEM_FILL_AREA_SET3, 13=PELEM_FILL_AREA_SET, 14=PELEM_CELL_ARRAY3, 15=PELEM_CELL_ARRAY, 16=PELEM_GDP3, 17=PELEM_GDP, 18=PELEM_LINE_IND, 19=PELEM_MARKER_IND, 20=PELEM_TEXT_IND, 21=PELEM_INT_IND, 22=PELEM_EDGE_IND, 23=PELEM_LINETYPE, 24=PELEM_LINEWIDTH, 25=PELEM_LINE_COLR_IND, 26=PELEM_MARKER_TYPE, 27=PELEM_MARKER_SIZE, 28=PELEM_MARKER_COLR_IND, 29=PELEM_TEXT_FONT, 30=PELEM_TEXT_PREC, 31=PELEM_CHAR_EXPAN, 32=PELEM_CHAR_SPACE, 33=PELEM_TEXT_COLR_IND, 34=PELEM_CHAR_HT, 35=PELEM_CHAR_UP_VEC, 36=PELEM_TEXT_PATH, 37=PELEM_TEXT_ALIGN, 38=PELEM_ANNO_CHAR_HT, 39=PELEM_ANNO_CHAR_UP_VEC, 40=PELEM_ANNO_PATH, 41=PELEM_ANNO_ALIGN, 42=PELEM_ANNO_STYLE, 43=PELEM_INT_STYLE, 44=PELEM_INT_STYLE_IND, 45=PELEM_INT_COLR_IND, 46=PELEM_EDGE_FLAG, 47=PELEM_EDGETYPE, 48=PELEM_EDGEWIDTH, 49=PELEM_EDGE_COLR_IND, 50=PELEM_PAT_SIZE, 51=PELEM_PAT_REF_POINT_VECS, 52=PELEM_PAT_REF_POINT, 53=PELEM_ADD_NAMES_SET, 54=PELEM_REMOVE_NAMES_SET, 55=PELEM_INDIV_ASF, 56=PELEM_HLHSR_ID, 57=PELEM_LOCAL_MODEL_TRAN3, 58=PELEM_LOCAL_MODEL_TRAN, 59=PELEM_GLOBAL_MODEL_TRAN3, 60=PELEM_GLOBAL_MODEL_TRAN, 61=PELEM_MODEL_CLIP_VOL3, 62=PELEM_MODEL_CLIP_VOL, 63=PELEM_MODEL_CLIP_IND, 64=PELEM_RESTORE_MODEL_CLIP_VOL, 65=PELEM_VIEW_IND, 66=PELEM_EXEC_STRUCT, 67=PELEM_LABEL, 68=PELEM_APPL_DATA, 69=PELEM_GSE, 70=PELEM_PICK_ID*).

*size_t *elem_size*
Element size.

FORTRAN

PQETS (*strid*, *elenum*, *errind*, *eltype*, *il*, *rl*, *sl*)

Input Parameters

integer strid
Structure identifier.

integer elenum
Element position (>=0).

Output Parameters

integer errind
Error indicator.

integer eltype
Element type (*1=PENIL, 2=PEPL3, 3=PEPL, 4=PEPM3, 5=PEPM, 6=PETX3, 7=PETX, 8=PEATR3, 9=PEATR, 10=PEFA3, 11=PEFA, 12=PEFAS3, 13=PEFAS, 14=PECA3, 15=PECA, 16=PEGDP3, 17=PEGDP, 18=PEPLI, 19=PEPMI, 20=PETXI, 21=PEII, 22=PEEDI, 23=PELN, 24=PELWSC, 25=PEPLCI, 26=PEMK, 27=PEMKSC, 28=PEPMCI, 29=PETXFN, 30=PETXPR, 31=PECHXP, 32=PECHSP, 33=PETXCI, 34=PECHH, 35=PECHUP, 36=PETXP, 37=PETXAL, 38=PEATCH, 39=PEATCU, 40=PEATP, 41=PEATAL, 42=PEANST, 43=PEIS, 44=PEISI, 45=PEICI, 46=PEEDFG, 47=PEEDT, 48=PEEWSC, 49=PEEDCI, 50=PEPA, 51=PEPRPV, 52=PEPARF, 53=PEADS, 54=PERES, 55=PEIASF, 56=PEHRID, 57=PELMT3, 58=PELMT, 59=PEGMT3, 60=PEGMT, 61=PEMCV3, 62=PEMCV, 63=PEMCLI, 64=PERMCV, 65=PEVWI, 66=PEEXST, 67=PELB, 68=PEAP, 69=PEGSE, 70=PEPKID*).

integer il
Dimension of integer array.

integer rl
Dimension of real array.

integer sl
Dimension of character array.

Errors

None

Related Subroutines

- Inquire Element Content

INQUIRE ERROR HANDLING MODE (PHOP,*,*,*)

Purpose

Use Inquire Error Handling Mode to inquire if the error handling mode is set to either *ON* or *OFF*.

To set the mode, use the Set Error Handling Mode subroutine The default error handling mode is *ON*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the value in the output parameter. If the information is unavailable, then the value returned in the output parameter is unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

pinq_err_hand_mode (*err_ind, err_mode*)

Output Parameters

*Pint *err_ind*
Error indicator.

*Perr_mode *err_mode*
Error handling mode (*0=PERR_OFF, 1=PERR_ON*).

FORTRAN

PQERHM (*errind*, *erhm*)

Output Parameters

integer errind
Error indicator.

integer erhm
Error handling mode (*0=POFF, 1=PON*).

Errors

None

Related Subroutines

- Set Error Handling Mode

INQUIRE GENERALIZED DRAWING PRIMITIVE (PHOP,*,*,*)

Purpose

Use Inquire Generalized Drawing Primitive to inquire the list of sets of attributes used by the specified Generalized Drawing Primitive (GDP) on the specified workstation. Possible sets of attributes include: *POLYLINE*, *POLYMARKER*, *TEXT*, *INTERIOR* and/or *EDGE* attributes.

The graPHIGS API returns a list of the attributes used by the specified GDP. For registered GDP identifiers, the ISO International Register of Graphical Items defines the list of sets of attributes used. For implementation dependent GDP identifiers, the list of sets of attributes used is workstation dependent.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

64 Specified Workstation Type Cannot Generate Specified GDP

Language Bindings

C

pinq_gdp (*ws_type, gdp, err_ind, num_attr, attr*)

Input Parameters

Pint ws_type
Workstation type.

Pint gdp
GDP function identifier.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint *num_attr*
Number of sets of attributes used.

Pattrs attr[5]
List of sets of attributes used (*0=PATTR_LINE, 1=PATTR_MARKER, 2=PATTR_TEXT, 3=PATTR_INT, 4=PATTR_EDGE*).

FORTRAN

PQGDP (*wtype*, *gdp*, *errind*, *nbnd*, *bndl*)

Input Parameters

integer wtype
Workstation type.

integer gdp
GDP function identifier.

Output Parameters

integer errind
Error indicator.

integer nbnd
Number of sets of attributes used.

integer bndl(5)
List of sets of attributes used (*0=PPLATT, 1=PPMATT, 2=PTXATT, 3=PINATT, 4=PEDATT*).

Errors

None

Related Subroutines

- Generalized Drawing Primitive

INQUIRE GENERALIZED DRAWING PRIMITIVE 3 (PHOP,*,*,*)

Purpose

Use Inquire Generalized Drawing Primitive 3 to inquire the list of sets of attributes used by the specified Generalized Drawing Primitive 3 (GDP 3) on the specified workstation. Possible sets of attributes include: *POLYLINE*, *POLYMARKER*, *TEXT*, *INTERIOR* and/or *EDGE* attributes.

The graPHIGS API returns a list of the attributes used by the specified GDP 3. For registered GDP 3 identifiers, the ISO International Register of Graphical Items defines the list of sets of attributes used. For implementation dependent GDP 3 identifiers, the list of sets of attributes used is workstation dependent.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

64 Specified Workstation Type Cannot Generate Specified GDP

62 This Information Not Available For MO Workstation Type

Language Bindings

C

pinq_gdp3 (*ws_type, gdp, err_ind, num_attr, attr*)

Input Parameters

Pint ws_type
Workstation type.

Pint gdp
GDP 3 function identifier.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint *num_attr*
Number of sets of attributes used.

Pattrs attr[5]
List of sets of attributes used (*0=PATTR_LINE, 1=PATTR_MARKER, 2=PATTR_TEXT, 3=PATTR_INT, 4=PATTR_EDGE*).

FORTRAN

PQGDP3 (*wtype*, *gdp*, *errind*, *nbnd*, *bndl*)

Input Parameters

integer wtype
Workstation type.

integer gdp
GDP 3 function identifier.

Output Parameters

integer errind
Error indicator.

integer nbnd
Number of sets of attributes used.

integer bndl(5)
List of sets of attributes used (*0=PPLATT, 1=PPMATT, 2=PTXATT, 3=PINATT, 4=PEDATT*).

Errors

None

Related Subroutines

- Generalized Drawing Primitive 3

INQUIRE GENERALIZED STRUCTURE ELEMENT FACILITIES (PHOP,*,*,*)

Purpose

Use Inquire Generalized Structure Element Facilities to inquire the list of Generalized Structure Element (GSE) identifiers which are supported on the specified workstation. For each GSE identifier, the graPHIGS API returns a workstation dependent indicator which specifies if that particular GSE has actions which are workstation independent or workstation dependent.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

pinq_gse_facs (*num_elems_appl_list, start_ind, err_ind, gse, num_elems_impl_list*)

Input Parameters

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pgse_id_dep_list *gse*
List of GSE function identifiers and dependencies.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQGSEF (*n*, *errind*, *ol*, *gseid*, *wsdind*)

Input Parameters

integer n
Element requested from the list of GSEs (>=0).

Output Parameters

integer errind
Error indicator.

integer ol
Number of available GSEs.

integer gseid
GSE function identifier of the n^{th} element in the list of available GSEs.

integer wsdind
Workstation dependency indicator of the n^{th} element in the list of available GSEs (*0=PWKI, 1=PWKD*).

Errors

None

Related Subroutines

- Generalized Structure Element

INQUIRE HIGHLIGHTING FILTER (PHOP,WSOP,*,*)

Purpose

Use Inquire Highlighting Filter to inquire the current highlighting inclusion and exclusion filters on the specified workstation.

The graPHIGS API returns the inclusion filter list and the exclusion filter list.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

Language Bindings

C

pinq_highl_filter (*ws_id, store, err_ind, highl_filter*)

Input Parameters

Pint ws_id
Workstation identifier.

Pstore store
Handle to the store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

Pint *err_ind
Error indicator.

Pfilter **highl_filter
Highlighting filter. The memory referenced by **highl_filter* is managed by the parameter *store*.

FORTRAN

PQHLFT (*wkid*, *isbsz*, *esbsz*, *errind*, *isn*, *is*, *esn*, *es*)

Input Parameters

integer wkid
Workstation identifier.

integer isbsz
Inclusion set buffer size (>=0).

integer esbsz
Exclusion set buffer size (>=0).

Output Parameters

integer errind
Error indicator.

integer isn
Number of names in the inclusion set.

integer is (isbsz)
Inclusion set.

integer esn
Number of names in the exclusion set.

integer es (esbsz)
Exclusion set.

Errors

None

Related Subroutines

- Set Highlighting Filter

- Inquire PHIGS Facilities

INQUIRE HLHSR IDENTIFIER FACILITIES (PHOP,*,*,*)

Purpose

Use Inquire HLHSR Identifier Facilities to inquire the list of available Hidden Line/Hidden Surface Removal (HLHSR) identifiers on the specified workstation. See Set HLHSR Identifier subroutine for a listing of the possible HLHSR identifiers.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

57 Specified Workstation Is Of Category MI

62 This Information Not Available For MO Workstation Type

Language Bindings

C

pinq_hlhsr_id_facs (*ws_type, num_elems_appl_list, start_ind, err_ind, hlhsr_ids, num_elems_impl_list*)

Input Parameters

Pint ws_type
Workstation type.

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint_list *hlhsr_ids*
List of available HLHSR identifiers.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQHRIF (*wtype*, *ni*, *errind*, *nhrid*, *hrid*)

Input Parameters

integer wtype
Workstation type.

integer ni
List element requested (>=0).

Output Parameters

integer errind
Error indicator.

integer nhrid
Number of available HLHSR identifiers.

integer hrid
NIth element in the list of available HLHSR identifiers.

Errors

None

Related Subroutines

- Inquire HLHSR Mode Facilities
- Set HLHSR Identifier
- Set HLHSR Mode

INQUIRE HLHSR MODE (PHOP,WSOP,*,*)

Purpose

Use Inquire HLHSR Mode to inquire the current and requested Hidden Line/Hidden Surface Removal (HLHSR) mode, and the HLHSR update state on the specified workstation. Possible HLHSR modes include: *0=OFF* and *1=ON THE FLY*.

The HLHSR update state is *PENDING* if the application has requested an HLHSR mode change but the workstation has not yet provided that change. Otherwise, the update state is *NOT PENDING*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

57 Specified Workstation Is Of Category MI

Language Bindings

C

pinq_hlhsr_mode (*ws_id, err_ind, upd_st, cur_mode, req_mode*)

Input Parameters

Pint ws_id
Workstation identifier.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pupd_st *upd_st*
HLHSR update state (*0=PUPD_NOT_PEND, 1=PUPD_PEND*).

*Pint *cur_mode*
Current HLHSR mode.

*Pint *req_mode*
Requested HLHSR mode.

FORTRAN

PQHRM (*wkid*, *errind*, *hupd*, *chrm*, *rhrm*)

Input Parameters

integer wkid
Workstation identifier.

Output Parameters

integer errind
Error indicator.

integer hupd
HLHSR mode update state (*0=PNPEND, 1=PPEND*).

integer chrm
Current HLHSR mode.

integer rhrm
Requested HLHSR mode.

Errors

None

Related Subroutines

- Inquire HLHSR Mode Facilities
- Set HLHSR Mode

INQUIRE HLHSR MODE FACILITIES (PHOP,*,*,*)

Purpose

Use Inquire HLHSR Mode Facilities to inquire the list of available Hidden Line/Hidden Surface Removal (HLHSR) modes on the specified workstation. Possible HLHSR modes include: *0=OFF* and *1=ON THE FLY*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

57 Specified Workstation Is Of Category MI

62 This Information Not Available For MO Workstation Type

Language Bindings

C

pinq_hlhsr_mode_facs (*ws_type, num_elems_appl_list, start_ind, err_ind, hlhsr_modes, num_elems_impl_list*)

Input Parameters

Pint ws_type
Workstation type.

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint_list *hlhsr_modes*
List of available HLHSR modes.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQHRMF (*wtype*, *nm*, *errind*, *nhrmd*, *hrmd*)

Input Parameters

integer wtype
Workstation type.

integer nm
List element requested (>=0).

Output Parameters

integer errind
Error indicator.

integer nhrmd
Number of available HLHSR modes.

integer hrmd
NM^{th} element in the list of available HLHSR modes.

Errors

None

Related Subroutines

- Inquire HLHSR Mode Facilities
- Set HLHSR Identifier
- Set HLHSR Mode

INQUIRE INPUT QUEUE OVERFLOW (PHOP,WSOP,*,*)

Purpose

Use Inquire Input Queue Overflow to inquire identification of the event report causing the event queue overflow.

Once the event queue overflow occurs, the graPHIGS API will not add more events to the event queue until the application clears the overflow situation by emptying the event queue. The application can make the event queue empty by using the Await Event or Flush Device Events subroutines.

If the event queue has overflowed since Open PHIGS or the last invocation of this subroutine, then the graPHIGS API returns the identification of the logical input device that caused the overflow. Logical input device classes include: *LOCATOR*, *STROKE*, *VALUATOR*, *CHOICE*, *PICK*, and *STRING*.

The graPHIGS API does not report the event queue overflow to the application when the overflow occurs. It is reported on the next invocation of the following subroutines which may change the contents of the event queue:

- Await Event
- Flush Device Events
- Close Workstation

The graPHIGS API reports the event queue overflow to the application only once per event queue overflow situation.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

257 Input Queue Has Not Overflowed

258 Input Queue Has Overflowed, But Workstation Is Closed

Language Bindings

C

pinq_in_overf (*err_ind, ws_id, in_class, in_num*)

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint *ws_id*
Workstation identifier.

*Pin_class *in_class*
Input class (*1=PIN_LOC, 2=PIN_STROKE, 3=PIN_VAL, 4=PIN_CHOICE, 5=PIN_PICK, 6=PIN_STRING*).

Pint *in_num
Input device number.

FORTRAN

PQIQOV (*errind*, *wkid*, *icl*, *idn*)

Output Parameters

integer errind
Error indicator.

integer wkid
Workstation identifier.

integer icl
Input class (*1=PLOCAT, 2=PSTROK, 3=PVALUA, 4=PCHOIC, 5=PPICK, 6=PSTRIN*).

integer idn
Input device number.

Errors

None

Related Subroutines

- None

INQUIRE INTERIOR FACILITIES (PHOP,*,*,*)

Purpose

Use Inquire Interior Facilities to inquire the interior facilities for the specified workstation type.

The graPHIGS API returns data indicating the total number of available interior styles, the number of available hatch styles, and the total number of indexes predefined in the interior bundle table. Possible interior styles include: *HOLLOW*, *SOLID*, *PATTERN*, *HATCH*, and *EMPTY*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

62 This Information Not Available For MO Workstation Type

Language Bindings

C

pinq_int_facs (*ws_type, hatch_num_elems_appl_list, hatch_start_ind, err_ind, int_facs, hatch_num_elems_impl_list*)

Input Parameters

Pint ws_type
Workstation type.

Pint hatch_num_elems_appl_list
Number of elements in the application hatch style list (>=0).

Pint hatch_start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint_facs *int_facs*
Interior facilities.

*Pint *hatch_num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQIF (*wtype*, *ni*, *nh*, *errind*, *nis*, *is*, *nhs*, *hs*, *npfai*)

Input Parameters

integer wtype
Workstation type.

integer ni
List element of interior styles requested (>=0).

integer nh
List element of hatch styles requested (>=0).

Output Parameters

integer errind
Error indicator.

integer nis
Number of available interior styles.

integer is
NIth element in the list of available interior styles (*0=PHOLLO, 1=PSOLID, 2=PPATTR, 3=PHATCH, 4=PISEMP*).

integer nhs
Number of available hatch styles.

integer hs
NHth element in list of available hatch style indexes.

integer npfai
Number of predefined interior indexes.

Errors

None

Related Subroutines

- Inquire Workstation Connection And Type

INQUIRE INTERIOR REPRESENTATION (PHOP,WSOP,*,*)

Purpose

Use Inquire Interior Representation to inquire the current attribute values in the specified entry in the interior bundle table for the specified workstation. Your application may specify returned values of either type *SET* or *REALIZED*. Possible interior styles include: *HOLLOW*, *SOLID*, *PATTERN*, *HATCH*, and *EMPTY*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

100 Bundle Index Value Is Less Than One

101 Specified Representation Has Not Been Defined

Language Bindings

C

pinq_int_rep (*ws_id, index, type, err_ind, int_rep*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint index
Interior index (>=1).

Pinq_type type
Type of returned values (*0=PINQ_SET, 1=PINQ_REALIZED*).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint_bundle *int_rep*
Interior representation. (See Chapter 17. “ISO PHIGS C Type and Macro Definitions” for the type definitions).

FORTRAN

PQIR (*wkid*, *ii*, *type*, *errind*, *ints*, *istyli*, *coli*)

Input Parameters

integer wkid
Workstation identifier.

integer ii
Interior index (>=1).

integer type
Type of returned values (*0=PSET, 1=PREALI*).

Output Parameters

integer errind
Error indicator.

integer ints
Interior style (*0=PHOLLO, 1=PSOLID, 2=PPATTR, 3=PHATCH, 4=PISEMP*).

integer istyli
Interior style index.

integer coli
Interior color index.

Errors

None

Related Subroutines

- Set Interior Representation

INQUIRE INVISIBILITY FILTER (PHOP,WSOP,*,*)

Purpose

Use Inquire Invisibility Filter to inquire the current invisibility inclusion and exclusion filters on the specified workstation.

The graPHIGS API returns the inclusion filter list and the exclusion filter list.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

Language Bindings

C

pinq_invis_filter (*ws_id, store, err_ind, invis_filter*)

Input Parameters

Pint ws_id
Workstation identifier.

Pstore store
Handle to the store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pfilter **invis_filter*
Invisibility filter. The memory referenced by **invis_filter* is managed by the parameter *store*.

FORTRAN

PQIVFT (*wkid*, *isbsz*, *esbsz*, *errind*, *isn*, *is*, *esn*, *es*)

Input Parameters

integer wkid
Workstation identifier.

integer isbsz
Inclusion set buffer size (>=0).

integer esbsz
Exclusion set buffer size (>=0).

Output Parameters

integer errind
Error indicator.

integer isn
Number of names in the inclusion set.

integer is (isbsz)
Inclusion set.

integer esn
Number of names in the exclusion set.

integer es (esbsz)
Exclusion set.

Errors

None

Related Subroutines

- Set Invisibility Filter
- Inquire PHIGS Facilities

INQUIRE LIST OF AVAILABLE GENERALIZED DRAWING PRIMITIVES (PHOP,*,*,*)

Purpose

Use Inquire List of Available Generalized Drawing Primitives to inquire the available Generalized Drawing Primitives (GDPs) for the specified workstation type.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

62 This Information Not Available For MO Workstation Type

Language Bindings

C

pinq_list_avail_gdp (*ws_type, num_elems_appl_list, start_ind, err_ind, gdps, num_elems_impl_list*)

Input Parameters

Pint ws_type
Workstation type.

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

Pint_list gdps
List of GDPs.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQEGDP (*wtype*, *n*, *errind*, *ngdp*, *gdpl*)

Input Parameters

integer wtype
Workstation type.

integer n
List element requested (>=0).

Output Parameters

integer errind
Error indicator.

integer ngdp
Number of available GDPs.

integer gdpl
n^{th} element in the list of GDP identifiers.

Errors

None

Related Subroutines

- Inquire Workstation Connection And Type

INQUIRE LIST OF AVAILABLE GENERALIZED DRAWING PRIMITIVES 3 (PHOP,*,*,*)

Purpose

Use Inquire List of Available Generalized Drawing Primitives 3 to inquire the available Generalized Drawing Primitives 3 (GDP 3s) for the specified workstation type.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

62 This Information Not Available For MO Workstation Type

Language Bindings

C

pinq_list_avail_gdp3 (*ws_type, num_elems_appl_list, start_ind, err_ind, gdps, num_elems_impl_list*)

Input Parameters

Pint ws_type
Workstation type.

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

Pint_list gdps
List of available 3D GDPs.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQEGD3 (*wtype*, *n*, *errind*, *ngdp*, *gdpl*)

Input Parameters

integer wtype
Workstation type.

integer n
List element requested (>=0).

Output Parameters

integer errind
Error indicator.

integer ngdp
Number of available 3D GDPs.

integer gdpl
n^{th} element in the list of 3D GDP identifiers.

Errors

None

Related Subroutines

- Inquire Workstation Connection And Type

INQUIRE LIST OF AVAILABLE GENERALIZED STRUCTURE ELEMENTS (PHOP,*,*,*)

Purpose

Use Inquire List of Available Generalized Structure Elements to inquire a list of available Generalized Structure Element (GSE) identifiers for the specified workstation type.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

62 This Information Not Available For MO Workstation Type

Language Bindings

C

pinq_list_avail_gse (*ws_type, num_elems_appl_list, start_ind, err_ind, gses, num_elems_impl_list*)

Input Parameters

Pint ws_type
Workstation type.

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint_list *gses*
List of available GSEs.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQEGSE (*wtype*, *n*, *errind*, *ngse*, *gsel*)

Input Parameters

integer wtype
Workstation type.

integer n
List element requested (>=0).

Output Parameters

integer errind
Error indicator.

integer ngse
Number of available GSEs.

integer gsel
n^{th} element in the list of available GSE identifiers.

Errors

None

Related Subroutines

- Inquire Workstation Connection And Type

INQUIRE LIST OF AVAILABLE WORKSTATION TYPES (PHOP,*,*,*)

Purpose

Use Inquire List of Available Workstation Types to inquire a list of available generic workstation types that can be opened. The workstation types returned are those which your application may use as a workstation type parameter to the Open Workstation subroutine

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

pinq_list_avail_ws_types (*num_elems_appl_list, start_ind, err_ind, types, num_elems_impl_list*)

Input Parameters

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint_list *types*
List of available workstation types.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQEWK (*n*, *errind*, *number*, *wktyp*)

Input Parameters

integer n
List element requested (>=0).

Output Parameters

integer errind
Error indicator.

integer number
Number of workstation types.

integer wktyp
n^{th} element in the list of available workstation types.

Errors

None

Related Subroutines

- Open Workstation

INQUIRE LIST OF COLOR INDICES (PHOP,WSOP,*,*)

Purpose

Use Inquire List of Color Indices to inquire the list of color indexes existing on the workstation.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

Language Bindings

C

pinq_list_colr_inds (*ws_id, num_elems_appl_list, start_ind, err_ind, colr_ind, num_elems_impl_list*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint_list *colr_ind*
List of color indexes.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQECI (*wkid*, *n*, *errind*, *ol*, *coli*)

Input Parameters

integer wkid
Workstation identifier.

integer n
List element requested (>=0).

Output Parameters

integer errind
Error indicator.

integer ol
Number of color table entries.

integer coli
n^{th} element in the list of color indexes.

Errors

None

Related Subroutines

- Set Color Representation

INQUIRE LIST OF EDGE INDICES (PHOP,WSOP,*,*)

Purpose

Use Inquire List of Edge Indices to inquire the list of defined edge indexes existing on the workstation.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

Language Bindings

C

pinq_list_edge_inds (*ws_id, num_elems_appl_list, start_ind, err_ind, def_edge_ind, num_elems_impl_list*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint_list *def_edge_ind*
List of defined edge indexes.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQEEDI (*wkid*, *n*, *errind*, *ol*, *edi*)

Input Parameters

integer wkid
Workstation identifier.

integer n
List element requested (>=0).

Output Parameters

integer errind
Error indicator.

integer ol
Number of edge bundle table entries.

integer edi
n^{th} element in the list of defined edge indexes.

Errors

None

Related Subroutines

- Set edge Representation

INQUIRE LIST OF INTERIOR INDICES (PHOP,WSOP,*,*)

Purpose

Use Inquire List of Interior Indices to inquire the list of defined interior indexes existing on the workstation.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

Language Bindings

C

pinq_list_int_inds (*ws_id, num_elems_appl_list, start_ind, err_ind, def_int_ind, num_elems_impl_list*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint_list *def_int_ind*
List of defined interior indexes.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQEII (*wkid*, *n*, *errind*, *ol*, *ii*)

Input Parameters

integer wkid
Workstation identifier.

integer n
List element requested (>=0).

Output Parameters

integer errind
Error indicator.

integer ol
Number of interior bundle table entries.

integer ii
n^{th} element in the list of defined interior indexes.

Errors

None

Related Subroutines

- Set Interior Representation

INQUIRE LIST OF PATTERN INDICES (PHOP,WSOP,*,*)

Purpose

Use Inquire List of Pattern Indices to inquire the list of defined pattern indexes existing on the workstation.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

Language Bindings

C

pinq_list_pat_inds (*ws_id, num_elems_appl_list, start_ind, err_ind, def_pat_ind, num_elems_impl_list*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint_list *def_pat_ind*
List of defined pattern indexes.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQEPAI (*wkid*, *n*, *errind*, *ol*, *pai*)

Input Parameters

integer wkid
Workstation identifier.

integer n
List element requested (>=0)

Input Parameters

integer errind
Error indicator.

integer ol
Number of pattern table entries.

integer pai
n^{th} element in the list of pattern indexes.

Errors

None

Related Subroutines

- Set Pattern Representation

INQUIRE LIST OF POLYLINE INDICES (PHOP,WSOP,*,*)

Purpose

Use Inquire List of Polyline Indices to inquire the list of defined polyline indexes existing on the workstation.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

Language Bindings

C

pinq_list_line_inds (*ws_id, num_elems_appl_list, start_ind, err_ind, def_line_ind, num_elems_impl_list*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint_list *def_line_ind*
List of defined polyline indexes.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQEPLI (*wkid*, *n*, *errind*, *ol*, *pli*)

Input Parameters

integer wkid
Workstation identifier.

integer n
List element requested (>=0).

Output Parameters

integer errind
Error indicator.

integer ol
Number of polyline bundle table entries.

integer pli
n^{th} element in the list of defined polyline indexes.

Errors

None

Related Subroutines

- Set Polyline Representation

INQUIRE LIST OF POLYMARKER INDICES (PHOP,WSOP,*,*)

Purpose

Use Inquire List of Polymarker Indices to inquire the list of defined polymarker indexes existing on the workstation.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

Language Bindings

C

pinq_list_marker_inds (*ws_id, num_elems_appl_list, start_ind, err_ind, def_marker_ind, num_elems_impl_list*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint_list *def_marker_ind*
List of defined polymarker indexes.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQEPMI (*wkid*, *n*, *errind*, *ol*, *pmi*)

Input Parameters

integer wkid
Workstation identifier.

integer n
List element requested (>=0).

Output Parameters

integer errind
Error indicator.

integer ol
Number of polymarker bundle table entries.

integer pmi
n^{th} element in the list of defined polymarker indexes.

Errors

None

Related Subroutines

- Set Polymarker Representation

INQUIRE LIST OF TEXT INDICES (PHOP,WSOP,*,*)

Purpose

Use Inquire List of Text Indices to inquire the list of defined text indexes existing on the workstation.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

Language Bindings

C

pinq_list_text_inds (*ws_id, num_elems_appl_list, start_ind, err_ind, def_text_ind, num_elems_impl_list*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint_list *def_text_ind*
List of defined text indexes.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQETXI (*wkid*, *n*, *errind*, *ol*, *txi*)

Input Parameters

integer wkid
Workstation identifier.

integer n
List element requested (>=0).

Output Parameters

integer errind
Error indicator.

integer ol
Number of text bundle table entries.

integer txi
n^{th} element in the list of defined text indexes.

Errors

None

Related Subroutines

- Set Text Representation

INQUIRE LIST OF VIEW INDICES (PHOP,WSOP,*,*)

Purpose

Use Inquire List of View Indices to inquire the list of defined view indexes existing on the workstation.

The graPHIGS API returns the view indexes in a list, which is ordered by view transformation input priority, starting with the highest priority view.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

57 Specified Workstation Is Of Category MI

Language Bindings

C

pinq_list_view_inds (*ws_id, num_elems_appl_list, start_ind, err_ind, view_inds, num_elems_impl_list*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint_list *view_inds*
List of defined view indexes.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQEVWI (*wkid*, *n*, *errind*, *nvwix*, *viewi*)

Input Parameters

integer wkid
Workstation identifier.

integer n
List element requested (>=0).

Output Parameters

integer errind
Error indicator.

integer nvwix
Number of view bundle table entries.

integer viewi
n^{th} element in the list of defined view indexes.

Errors

None

Related Subroutines

- Set View Representation

INQUIRE LOCATOR DEVICE STATE (PHOP,WSOP,*,*)

Purpose

Use Inquire Locator Device State to inquire the current state of the specified locator device on the specified workstation.

Returned values of type *SET* or *REALIZED* may be specified.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Language Bindings

C

pinq_loc_st (*ws_id, loc_num, type, store, err_ind, op_mode, echo_switch, init_view_ind, init_loc_pos, prompt_echo, echo_area, loc_data*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint loc_num
Locator device number (>=1).

Pinq_type type
Type of returned values (*0=PINQ_SET, 1=PINQ_REALIZED*).

Pstore store
Handle to the store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pop_mode *op_mode*
Operating mode (*0=POP_REQ, 1=POP_SAMPLE, 2=POP_EVENT*).

*Pecho_switch *echo_switch*
Echo switch (*0=PSWITCH_NO_ECHO, 1=PSWITCH_ECHO*).

*Pint *init_view_ind*
Initial view index.

*Ppoint *init_loc_pos*
Initial locator position in WC.

*Pint *prompt_echo*
Prompt and echo type.

*Plimit *echo_area*
Echo area in DC.

*Ploc_data **loc_data*
Data record. The memory referenced by **loc_data* is managed by the parameter store.

FORTRAN

PQLCS (*wkid*, *lcdnr*, *type*, *mldr*, *errind*, *mode*, *esw*, *iviewi*, *ipx*, *ipy*, *pet*, *earea*, *ldr*, *datrec*)

Input Parameters

integer wkid
Workstation identifier.

integer lcdnr
Locator device number (>=1).

integer type
Type of returned values (*0=PSET, 1=PREALI*).

integer mldr
Dimension of data record array (>=0).

Output Parameters

integer errind
Error indicator.

integer mode
Operating mode (*0=PREQU, 1=PSAMPL, 2=PEVENT*).

integer esw
Echo switch (*0=PNECHO, 1=PECHO*).

integer iviewi
Initial view index.

real ipx
x coordinate of the initial locator position in WC.

real ipy
y coordinate of the initial locator position in WC.

integer pet
Prompt and echo type.

real earea(4)
Echo area in DC (*XMIN, XMAX, YMIN, YMAX*).

integer ldr
Number of array elements used in the data record.

*integer character*80 datrec(mldr)*
Data record.

Errors

None

Related Subroutines

- Initialize Locator
- Initialize Locator 3
- Inquire Default Locator Device Data
- Inquire Default Locator Device Data 3
- Inquire Locator Device State 3

INQUIRE LOCATOR DEVICE STATE 3 (PHOP,WSOP,*,*)

Purpose

Use Inquire Locator Device State 3 to inquire the current state of the specified locator device on the specified workstation. Returned values of type *SET* or *REALIZED* may be specified.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Language Bindings

C

pinq_loc_st3 (*ws_id, loc_num, type, store, err_ind, op_mode, echo_switch, init_view_ind, init_loc_pos, prompt_echo, echo_vol, loc_data*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint loc_num
Locator device number (>=1).

Pinq_type type
Type of returned values (*0=PINQ_SET, 1=PINQ_REALIZED*).

Pstore store
Handle to the store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pop_mode *op_mode*
Operating mode (*0=POP_REQ, 1=POP_SAMPLE, 2=POP_EVENT*).

*Pecho_switch *echo_switch*
Echo switch (*0=PSWITCH_NO_ECHO, 1=PSWITCH_ECHO*).

*Pint *init_view_ind*
Initial view index.

*Ppoint3 *init_loc_pos*
Initial locator position in WC.

*Pint *prompt_echo*
Prompt and echo type.

*Plimit3 *echo_vol*
Echo volume in DC.

*Ploc_data3 **loc_data*
Data record. The memory referenced by **loc_data* is managed by the parameter *store*.

FORTRAN

PQLCS3 (*wkid*, *lcdnr*, *type*, *mldr*, *errind*, *mode*, *esw*, *iviewi*, *ipx*, *ipy*, *ipz*, *pet*, *evol*, *ldr*, *datrec*)

Input Parameters

integer wkid
Workstation identifier.

integer lcdnr
Locator device number (>=1).

integer type
Type of returned values (*0=PSET, 1=PREALI*).

integer mldr
Dimension of data record array (>=0).

Output Parameters

integer errind
Error indicator.

integer mode
Operating mode (*0=PREQU, 1=PSAMPL, 2=PEVENT*).

integer esw
Echo switch (*0=PNECHO, 1=PECHO*).

integer iviewi
Initial view index.

real ipx
x coordinate of the initial locator position in WC.

real ipy
y coordinate of the initial locator position in WC.

real ipz
z coordinate of the initial locator position in WC.

integer pet
Prompt and echo type.

real evol(6)
Echo volume in DC (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

integer ldr
Number of array elements used in the data record.

*integer character*80 datrec(mldr)*
Data record.

Errors

None

Related Subroutines

- Initialize Locator
- Initialize Locator 3
- Inquire Default Locator Device Data
- Inquire Default Locator Device Data 3

- Inquire Locator Device State

INQUIRE MODELING CLIPPING FACILITIES (PHOP,*,*,*)

Purpose

Use Inquire Modeling Clipping Facilities to inquire the number and list of modeling clipping operators, and the number of distinct planes in the modeling clipping volume.

Although this inquiry returns two operations (*REPLACE* and *INTERSECT*) and six as the number of distinct planes in the modeling clipping volume, support differs by workstation. Therefore, use the graPHIGS API Inquire Workstation Description (**GPQWDT**) to inquire these values for a specific workstation.

If the inquired information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the inquired information is unavailable, then the values returned in the output parameters are invalid and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

pinq_model_clip_facs (*num_elems_appl_list, start_ind, err_ind, num_planes, ops, num_elems_impl_list*)

Input Parameters

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint *num_planes*
Number of distinct half planes in the modeling clipping volume.

*Pint_list *ops*
List of modeling clipping operators (*1=REPLACE, 2=INTERSECT*).

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQMCLF (*n*, *errind*, *ndpmcv*, *ol*, *mclpop*)

Input Parameters

integer n
Element list requested (>=0).

Output Parameters

integer errind
Error indicator.

integer ndpmcv
Number of distinct half planes in the modeling clipping volume.

integer ol
Number of modeling clipping operators

integer mclpop
n^{th} element in the list of modeling clipping operators. (*1=REPLACE, 2=INTERSECT*).

Errors

None

Related Subroutines

- Set Modeling Clipping Indicator
- Set Modeling Clipping Volume
- Set Modeling Clipping Volume 3

INQUIRE MORE SIMULTANEOUS EVENTS (PHOP,*,*,*)

Purpose

Use Inquire More Simultaneous Events to inquire whether additional simultaneous events are waiting in the input queue.

The graPHIGS API returns a value indicating whether additional events are waiting that occurred from the same device trigger as the event previously in the current event report (CEV).

Your application can call this subroutine after your application issued the appropriate “Get” subroutine to obtain the current event from the CEV.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the value in the output parameter. If the information is unavailable, then the value returned in the output parameter is unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

pinq_more_simult_events (*err_ind, simult_events*)

Output Parameters

*Pint *err_ind*
Error indicator.

*Pmore_simult_events *simult_events*
More simultaneous events (*0=PSIMULT_NO_MORE, 1=PSIMULT_MORE*).

FORTRAN

PQSIM (*errind*, *flag*)

Output Parameters

integer errind
Error indicator.

integer flag
More simultaneous events (*0=PNMORE, 1=PMORE*).

Errors

None

Related Subroutines

- None

INQUIRE NUMBER OF AVAILABLE LOGICAL INPUT DEVICES (PHOP,*,*,*)

Purpose

Use Inquire Number of Available Logical Input Devices to inquire the number of available logical input devices at the specified workstation.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

61 Specified Workstation Is Not Of Category Input Or Outin

Language Bindings

C

pinq_num_avail_in (*ws_type, err_ind, num_in*)

Input Parameters

Pint ws_type
Workstation type.

Input Parameters

*Pint *err_ind*
Error indicator.

*Pnum_in *num_in*
Number of input devices.

FORTRAN

PQLI (*wtype*, *errind*, *nlcd*, *nskd*, *nvld*, *nchd*, *npkd*, *nstd*)

Input Parameters

integer wtype
Workstation type.

Output Parameters

integer errind
Error indicator.

integer nlcd
Number of locator devices.

integer nskd
Number of stroke devices.

integer nvld
Number of valuator devices.

integer nchd
Number of choice devices.

integer npkd
Number of pick devices.

integer nstd
Number of string devices.

Errors

None

Related Subroutines

- Inquire Workstation Connection And Type

INQUIRE NUMBER OF DISPLAY PRIORITIES SUPPORTED (PHOP,*,*,*)

Purpose

Use Inquire Number of Display Priorities Supported to inquire the number of display priorities supported for the specified workstation type.

When posting a structure to a workstation, the application specifies a structure priority, which is a real number between 0.0 and 1.0. The graPHIGS API traverses the structures in order, from lowest to highest priority.

The graPHIGS API returns values indicating the total number of supported display priorities. For example, if a workstation uses a 4-bit mask to keep track of priorities, then it is able to support only 16 different priorities and must map the real number to one of 16 values. If a workstation can support a continuous range of display priorities, then the inquiry returns a zero.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

62 This Information Not Available For MO Workstation Type

Language Bindings

C

pinq_num_disp_pris (*ws_type, err_ind, num_pri*)

Input Parameters

Pint ws_type
Workstation type.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint *num_pri*
Number of display priorities supported.

FORTRAN

PQDP (*wtype*, *errind*, *nspsup*)

Input Parameters

integer wtype
Workstation type.

Output Parameters

integer errind
Error indicator.

integer nspsup
Number of display priorities supported.

Errors

None

Related Subroutines

- Inquire Workstation Connection And Type
- Post Structure

INQUIRE OPEN STRUCTURE (PHOP,*,*,*)

Purpose

Use Inquire Open Structure to inquire the identifier of the open structure.

If your application has opened a structure, then the open structure status is *OPEN* and the graPHIGS API returns the identifier of the open structure as a structure identifier. If your application has not opened a structure, then the graPHIGS API returns the open structure status as *NONE* and the structure identifier is undefined.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

pinq_open_struct (*err_ind, status, struct_id*)

Output Parameters

*Pint *err_ind*
Error indicator.

*Popen_struct_status *status*
Open structure status (*0=PSTRUCT_NONE, 1=PSTRUCT_OPEN*).

*Pint *struct_id*
Structure identifier.

FORTRAN

PQOPST (*errind*, *stype*, *strid*)

Output Parameters

integer errind
Error indicator.

integer stype
Open structure status (*0=PNONST, 1=POPNST*).

integer strid
Structure identifier.

Errors

None

Related Subroutines

- Open Structure
- Close Structure

INQUIRE PATHS TO ANCESTORS (PHOP,*,*,*)

Purpose

Use Inquire Paths to Ancestors to inquire the ancestral paths of a specified structure. A path of ancestors of a structure *S* is a list of ordered pairs: ((*A1,E1*),(*A2,E2*),...,(*Am,Em*&# 41;, (*S,0*)) where each ordered pair consists of an identifier of a structure (*Ax*) that is an ancestor of the specified structure (*S*) and the position of an execute structure-type element (*Ex*) that references the next structure in the path. Ancestor structure *A1* is the top of the path (i.e., it is not referenced by any other structure) and *S* is the bottom of the path.

The path order and path depth determine the portion of each path to be returned. Your application may specify the path order as *TOP FIRST* or *BOTTOM FIRST*. The path depth determines the maximum number of ordered pairs returned in any one path. Specifying a path depth of zero returns each path in its entirety. When truncation occurs, the path order determines whether the graPHIGS API returns the head or tail portion of the path. This truncation may result in two or more portions of paths having the same set of element references. The graPHIGS API returns only one such portion so that all of the returned path portions are distinct.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

201 Specified Structure Does Not Exist

207 Specified Path Depth < Zero

Language Bindings

C

pinq_paths_ances (*struct_id, order, depth, store, err_ind, paths*)

Input Parameters

Pint struct_id
Structure identifier.

Ppath_order order
Path order (*0=PORDER_TOP_FIRST, 1=PORDER_BOTTOM_FIRST*).

Pint depth
Path depth (>=0).

Pstore store
Handle to the store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pelem_ref_list_list **paths*
Structure path list. The memory referenced by **paths* is managed by the parameter *store*.

FORTRAN

PQPAN (*strid*, *pthord*, *pthdep*, *ipthsz*, *n*, *errind*, *ol*, *apthsz*, *paths*)

Input Parameters

integer strid
Structure identifier.

integer pthord
Path order (*0=PPOTOP, 1=PPOBOT*).

integer pthdep
Path depth (>=0).

integer ipthsz
Maximum number of path entries the buffer can contain.

integer n
Element of the list of paths.

Output Parameters

integer errind
Error indicator.

integer ol
Number of paths available.

integer apthsz
Actual number of entries of the n^{th} structure path returned.

integer paths(2,ipthsz)
n^{th} structure path.

Errors

None

Related Subroutines

- Inquire Paths To Descendants

INQUIRE PATHS TO DESCENDANTS (PHOP,*,*,*)

Purpose

Use Inquire Paths to Descendants to inquire the descendant paths of a specified structure. A path of descendants of a structure *S* is a list of ordered pairs: ((*S,E0*),(*D1,E1*),(*D2,E2*), ...,(*Dn,0*)), where each ordered pair consists of an identifier of a structure (*Dx*) that is a descendant of the specified structure (*S*) and the position of an execute structure-type element (*Ex*) that references the next structure in the path. The specified structure *S* is the top of the path and descendant structure *Dn* is the bottom of the path (i.e., it does not reference any other structure).

The path order and path depth determine the portion of each path to be returned. Your application may specify the path order as *TOP FIRST* or *BOTTOM FIRST*. The path depth determines the maximum number of ordered pairs returned in any one path. Specifying a path depth of zero returns each path in its entirety. When truncation occurs, the path order determines whether the graPHIGS API returns the head or tail portion of the path. This truncation may result in two or more portions of paths having the same set of element references. The graPHIGS API returns only one such portion so that all of the returned path portions are distinct.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

201 Specified Structure Does Not Exist

207 Specified Path Depth < Zero

Language Bindings

C

pinq_paths_descs (*struct_id, order, depth, store, err_ind, paths*)

Input Parameters

Pint struct_id
Structure identifier.

Ppath_order order
Path order (*0=PORDER_TOP_FIRST, 1=PORDER_BOTTOM_FIRST*).

Pint depth
Path depth (>=0).

Pstore store
Handle to the store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pelem_ref_list_list **paths*
Structure path list. The memory referenced by **paths* is managed by the parameter *store*.

FORTRAN

PQPDE (*strid*, *pthord*, *pthdep*, *ipthsz*, *n*, *errind*, *ol*, *apthsz*, *paths*)

Input Parameters

integer strid
Structure identifier.

integer pthord
Path order (*0=PPOTOP, 1=PPOBOT*).

integer pthdep
Path depth (>=0).

integer ipthsz
Maximum number of path entries the buffer can contain.

integer n
Element of the list of paths.

Output Parameters

integer errind
Error indicator.

integer ol
Number of paths available.

integer apthsz
Actual number of entries of the n^{th} structure path returned.

integer paths(2,ipthsz)
n^{th} structure path.

Errors

None

Related Subroutines

- Inquire Paths To Ancestors

INQUIRE PATTERN FACILITIES (PHOP,*,*,*)

Purpose

Use Inquire Pattern Facilities to inquire the pattern facilities for the specified workstation type.

The graPHIGS API returns the number of predefined pattern indexes for the specified workstation.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

62 This Information Not Available For MO Workstation Type

Language Bindings

C

pinq_pat_facs (*ws_type, err_ind, num_pred*)

Input Parameters

Pint ws_type
Workstation type.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint *num_pred*
Number of predefined pattern indexes.

FORTRAN

PQPAF (*wtype*, *errind*, *nppai*)

Input Parameters

integer wtype
Workstation type.

Output Parameters

integer errind
Error indicator.

integer nppai
Number of predefined pattern indexes.

Errors

None

Related Subroutines

- Inquire Workstation Connection And Type

INQUIRE PATTERN REPRESENTATION (PHOP,WSOP,*,*)

Purpose

Use Inquire Pattern Representation to inquire the current pattern representation in the specified entry in the pattern table of the specified workstation. Returned values of type *SET* or *REALIZED* may be specified.

If the specified pattern index is not present in the pattern table on the workstation and the specified type of returned values is *REALIZED*, then the graPHIGS API returns the representation for pattern index 1. Pattern index 1 is present if your workstation supports interior style *PATTERN*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

112 Pattern Index Value < ONE

101 Specified Representation Has Not Been Defined

109 Interior Style Pattern Not Supported On Workstation

Language Bindings

C

pinq_pat_rep (*ws_id, index, type, store, err_ind, pat_rep*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint index
Pattern index (>=1).

Pinq_type type
Type of returned values (*0=PINQ_SET, 1=PINQ_REALIZED*).

Pstore store
Handle to the store object. The graPHIGS API uses an object of type Store to facilitate the use of

subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Ppat_rep **pat_rep*
Pattern representation. The memory referenced by **pat_rep* is managed by the parameter *store*.

FORTRAN

PQPAR (*wkid*, *pai*, *type*, *dimx*, *dimy*, *errind*, *dx*, *dy*, *colia*)

Input Parameters

integer wkid
Workstation identifier.

integer pai
Pattern index (>=1).

integer type
Type of returned values (*0=PSET, 1=PREALI*).

integer dimx
Maximum column dimension in pattern array (>=0).

integer dimy
Maximum row dimension in pattern array (>=0).

Output Parameters

integer errind
Error indicator.

integer dx
Number of columns in pattern color index array.

integer dy
Number of rows in pattern color index array.

integer colia(dimx,dimy)
Pattern color index array.

Errors

None

Related Subroutines

- Set Pattern Representation

INQUIRE PHIGS FACILITIES (PHOP,*,*,*)

Purpose

Use Inquire PHIGS Facilities to inquire the graPHIGS API facilities.

The graPHIGS API returns the maximum number of simultaneously open workstations, the maximum number of simultaneously open archive files, the number of available names for name sets, the list of

available character sets, the maximum length of a normal filter list for Incremental Spatial Search (ISS), and the maximum length of an inverted filter list for ISS.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

pinq_phigs_facs (*num_elems_appl_list, start_ind, err_ind, max_open_ws, max_open_ar, num_avail_names, char_sets, num_elems_impl_list, iss_norm_max, iss_inv_max*)

Input Parameters

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
The error indicator.

*Pint *max_open_ws*
Maximum number of simultaneously opened workstations.

*Pint *max_open_ar*
Maximum number of simultaneously opened archive files.

*Pint *num_avail_names*
Number of available names for name sets.

*Pint_list *char_sets*
List of available character sets.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

*Pint *iss_norm_max*
Maximum length of the normal filter list for Incremental Spacial Search (ISS).

*Pint *iss_inv_max*
Maximum length of the inverted filter list for Incremental Spacial Search (ISS).

FORTRAN

PQPHF (*ncs*, *errind*, *simopw*, *simopa*, *namesn olcs*, *cs*, *nfln*, *ifln*)

Input Parameters

integer ncs
Character set requested.

Output Parameters

integer errind
Error indicator.

integer simopw
Maximum number of simultaneously opened workstations.

integer simopa
Maximum number of simultaneously opened archive files.

integer namesn
Maximum number of available names for name sets.

integer olcs
Number of available character sets.

integer cs
NCSth available character set.

integer nfln
Maximum length of the normal filter list for Incremental Spacial Search (ISS).

integer ifln
Maximum length of the inverted filter list for Incremental Spacial Search (ISS).

Errors

None

Related Subroutines

- None

INQUIRE PICK DEVICE STATE (PHOP,WSOP,*,*)

Purpose

Use Inquire Pick Device State to inquire the current state of the specified pick device on the specified workstation. Returned values of type *SET* or *REALIZED* may be specified.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

60 Specified Workstation Is Not Of Category Outin

250 Specified Device Not Available On Workstation

Language Bindings

C

pinq_pick_st (*ws_id, pick_num, type, store, err_ind, op_mode, echo_switch, pick_filter, init_status, init_pick, prompt_echo, echo_area, pick_data, order*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint pick_num
Pick device number (>=1).

Pinq_type type
Type of returned values (*0=PINQ_SET, 1=PINQ_REALIZED*).

Pstore store
Handle to the store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pop_mode *op_mode*
Operating mode (*0=POP_REQ, 1=POP_SAMPLE, 2=POP_EVENT*).

*Pecho_switch *echo_switch*
Echo switch (*0=PSWITCH_NO_ECHO, 1=PSWITCH_ECHO*).

*Pfilter **pick_filter*
Pick filter. The memory referenced by **pick_filter* is managed by the parameter *store*.

*Pin_status *init_status*
Initial pick status (*1=PIN_STATUS_OK, 2=PIN_STATUS_NO_IN*).

*Ppick_path **init_pick*
Initial pick path. The memory referenced by **init_pick* is managed by the parameter *store*.

*Pint *prompt_echo*
Prompt and echo type.

*Plimit *echo_area*
Echo area in DC.

*Ppick_data3 **pick_data*
Data record. The memory referenced by **pick_data* is managed by the parameter *store*.

*Ppath_order *order*
Pick path order (*0=PORDER_TOP_FIRST, 1=PORDER_BOTTOM_FIRST*).

FORTRAN

PQPKS (*wkid*, *pkdnr*, *type*, *mldr*, *ipissz*, *ipessz*, *ippsz*, *errind*, *mode*, *esw*, *pissz*, *pins*, *pessz*, *pes*, *istat*, *ppd*, *pp*, *pet*, *earea*, *ldr*, *datrec*, *ppordr*)

Input Parameters

integer wkid
Workstation identifier.

integer pkdnr
Pick device number (>=1).

integer type
Type of returned values (*0=PSET, 1=PREALI*).

integer mldr
Dimension of data record array (>=0).

integer ipissz
Pick inclusion set buffer size (>=0).

integer ipessz
Pick exclusion set buffer size (>=0).

integer ippsz
Pick path buffer size (>=0).

Output Parameters

integer errind
Error indicator.

integer mode
Operating mode (*0=PREQU, 1=PSAMPL, 2=PEVENT*).

integer esw
Echo switch (*0=PNECHO, 1=PECHO*).

integer pissz
Pick inclusion set size.

integer pins(ipissz)
Pick inclusion set.

integer pessz
Pick exclusion set size.

integer pes(ipessz)
Pick exclusion set.

integer istat
Initial pick status (*1=POK, 2=PNPICK*).

integer ppd
Initial pick path depth.

integer pp(3,ippsz)
Initial pick path.

integer pet
Prompt and echo type.

real earea(4)
Echo area in DC (*XMIN, XMAX, YMIN, YMAX*).

integer ldr
Number of array elements used in the data record.

*character*80 datrec(mldr)*
Data record.

integer ppordr
Pick path order (*0=PPOTOP, 1=PPOBOT*).

Errors

None

Related Subroutines

- Initialize Pick
- Initialize Pick 3
- Inquire Default Pick Device Data
- Inquire Default Pick Device Data 3
- Inquire Pick Device State 3

INQUIRE PICK DEVICE STATE 3 (PHOP,WSOP,*,*)

Purpose

Use Inquire Pick Device State 3 to inquire the current state of the specified pick device on the specified workstation. Returned values of type *SET* or *REALIZED* may be specified.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

60 Specified Workstation Is Not Of Category Outin

250 Specified Device Not Available On Workstation

Language Bindings

C

pinq_pick_st3 (*ws_id, pick_num, type, store, err_ind, op_mode, echo_switch, pick_filter, init_status, init_pick, prompt_echo, echo_vol, pick_data, order*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint pick_num
Pick device number (>=1).

Pinq_type type
Type of returned values (*0=PINQ_SET, 1=PINQ_REALIZED*).

Pstore store
Handle to the store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pop_mode *op_mode*
Operating mode (*0=POP_REQ, 1=POP_SAMPLE, 2=POP_EVENT*).

*Pecho_switch *echo_switch*
Echo switch (*0=PSWITCH_NO_ECHO, 1=PSWITCH_ECHO*).

*Pfilter **pick_filter*
Pick filter. The memory referenced by **pick_filter* is managed by the parameter *store*.

*Pin_status *init_status*
Initial pick status (*1=PIN_STATUS_OK, 2=PIN_STATUS_NO_IN*).

*Ppick_path **init_pick*
Initial pick path. The memory referenced by **init_pick* is managed by the parameter *store*.

*Pint *prompt_echo*
Prompt and echo type.

*Plimit3 *echo_vol*
Echo volume in DC.

*Ppick_data3 **pick_data*
Data record. The memory referenced by **pick_data* is managed by the parameter *store*.

*Ppath_order *order*
Pick path order (*0=PORDER_TOP_FIRST, 1=PORDER_BOTTOM_FIRST*).

FORTRAN

PQPKS3 (*wkid*, *pkdnr*, *type*, *mldr*, *ipissz*, *ipessz*, *ippsz*, *errind*, *mode*, *esw*, *pissz*, *pins*, *pessz*, *pes*, *istat*, *ppd*, *pp*, *pet*, *evol*, *ldr*, *datrec*, *ppordr*)

Input Parameters

integer wkid
Workstation identifier.

integer pkdnr
Pick device number (>=1).

integer type
Type of returned values (*0=PSET, 1=PREALI*).

integer mldr
Dimension of data record array (>=0).

integer ipissz
Pick inclusion set buffer size (>=0).

integer ipessz
Pick exclusion set buffer size (>=0).

integer ippsz
Pick path buffer size (>=0).

Output Parameters

integer errind
Error indicator.

integer mode
Operating mode (*0=PREQU, 1=PSAMPL, 2=PEVENT*).

integer esw
Echo switch (*0=PNECHO, 1=PECHO*).

integer pissz
Pick inclusion set size.

integer pins(ipissz)
Pick inclusion set.

integer pessz
Pick exclusion set size.

integer pes(ipessz)
Pick exclusion set.

integer istat
Initial status (*1=POK, 2=PNPICK*).

integer ppd
Initial pick path depth.

integer pp(3,ippsz)
Initial pick path.

integer pet
Prompt and echo type.

integer evol(6)
Echo volume in DC. (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

integer ldr
Number of array elements used in the data record.

*character*80 datrec(mldr)*
Data record.

integer ppordr
Pick path order (*0=PPOTOP, 1=PPOBOT*).

Errors

None

Related Subroutines

- Initialize Pick
- Initialize Pick 3
- Inquire Default Pick Device Data
- Inquire Default Pick Device Data 3
- Inquire Pick Device State

INQUIRE POLYLINE FACILITIES (PHOP,*,*,*)

Purpose

Use Inquire Polyline Facilities to inquire the polyline facilities for the specified workstation type.

The graPHIGS API returns the total number of available line types and their identifiers; the number of available line widths and the nominal, minimum, and maximum line width size; and the number of predefined polyline bundle table indexes for the specified workstation type.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

62 This Information Not Available For MO Workstation Type

Language Bindings

C

pinq_line_facs (*ws_type, num_elems_appl_list, start_ind, err_ind, fac, num_elems_impl_list*)

Input Parameters

Pint ws_type
Workstation type.

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pline_facs *fac*
Polyline facilities.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQPLF (*wtype*, *n*, *errind*, *nlt*, *lt*, *nlw*, *nomlw*, *rlwmin*, *rlwmax*, *nppli*)

Input Parameters

integer wtype
Workstation type.

integer n
List element requested (>=0).

Output Parameters

integer errind
Error indicator.

integer nlt
Number of available line types.

integer lt
n^{th} element in the list of available line types.

integer nlw
Number of available line widths.

real nomlw
Nominal line width in DC.

real rlwmin
Minimum value of a line width in DC.

real rlwmax
Maximum value of a line width in DC.

integer nppli
Number of predefined polyline indexes.

Errors

None

Related Subroutines

- Inquire Workstation Connection And Type

INQUIRE POLYLINE REPRESENTATION (PHOP,WSOP,*,*)

Purpose

Use Inquire Polyline Representation to inquire the current polyline representation in the specified entry in the polyline bundle table of the specified workstation. Returned values of type *SET* or *REALIZED* may be specified.

If the specified polyline index is not present in the polyline bundle table on the workstation and the specified type of returned values is *REALIZED*, then the graPHIGS API returns the representation for polyline index 1.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

100 Bundle Index Value Is Less Than One

101 Specified Representation Has Not Been Defined

Language Bindings

C

pinq_line_rep (*ws_id, index, type, errind, line_rep*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint index
Polyline index (>=1).

Pinq_type type
Type of returned values (*0=PINQ_SET, 1=PINQ_REALIZED*).

Output Parameters

*Pint *errind*
Error indicator.

*Pline_bundle *line_rep*
Polyline representation.

FORTRAN

PQPLR (*wkid*, *pli*, *type*, *errind*, *ltype*, *lwidth*, *coli*)

Input Parameters

integer wkid
Workstation identifier.

integer pli
Polyline index (>=1).

integer type
Type of returned values (*0=PSET, 1=PREALI*).

Output Parameters

integer errind
Error indicator.

integer ltype
Line type.

real lwidth
Line width scale factor.

integer coli
Polyline color index.

Errors

None

Related Subroutines

- Set Polyline Representation

INQUIRE POLYMARKER FACILITIES (PHOP,*,*,*)

Purpose

Use Inquire Polymarker Facilities to inquire the polymarker facilities for the specified workstation type.

The graPHIGS API returns data indicating the total number of available marker types and their identifiers; the nominal, minimum, and maximum marker sizes; and the number of predefined polymarker bundle table indexes for the specified workstation type. If the graPHIGS API returns a value of zero for the number of available marker sizes, then the workstation supports a continuous range of marker sizes.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

62 This Information Not Available For MO Workstation Type

Language Bindings

C

pinq_marker_facs (*ws_type, num_elems_appl_list, start_ind, err_ind, fac, num_elems_impl_list*)

Input Parameters

Pint ws_type
Workstation type.

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pmarker_facs *fac*
Polymarker facilities.

Pint num_elems_impl_list
Number of elements in the implementation list.

FORTRAN

PQPMF (*wtype*, *n*, *errind*, *nmt*, *mt*, *nms*, *nomms*, *rmsmin*, *rmsmax*, *nppmi*)

Input Parameters

integer wtype
Workstation type.

integer n
List element requested (>=0).

Output Parameters

integer errind
Error indicator.

integer nmt
Number of available marker types.

integer mt
n^{th} element in the list of available marker types.

integer nms
Number of available marker widths.

real nomms
Nominal marker width in DC.

real rmsmin
Minimum value of a marker width in DC.

real rmsmax
Maximum value of a marker width in DC.

integer nppmi
Number of predefined polymarker indexes.

Errors

None

Related Subroutines

- Inquire Workstation Connection And Type

INQUIRE POLYMARKER REPRESENTATION (PHOP,WSOP,*,*)

Purpose

Use Inquire Polymarker Representation to inquire the current polymarker representation in the specified entry in the polymarker bundle table of the specified workstation. Returned values of type *SET* or *REALIZED* may be specified.

If the specified polymarker index is not present in the polyline bundle table on the workstation and the specified type of returned values is *REALIZED*, then the graPHIGS API returns the representation for polymarker index 1.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

100 Bundle Index Value Is Less Than One

101 Specified Representation Has Not Been Defined

Language Bindings

C

pinq_marker_rep (*ws_id, index, type, *err_ind, *marker_rep*)

Input Parameters

Pint ws_id
Workstation identifier.

P*int index*
Polymarker index (>=1).

Pinq_type type
Type of returned values (*0=PINQ_SET, 1=PINQ_REALIZED*).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pmarker_bundle *marker_rep*
Polymarker representation.

FORTRAN

PQPMR (*wkid*, *pmi*, *type*, *errind*, *mtype*, *mszsf*, *coli*)

Input Parameters

integer wkid
Workstation identifier.

integer pmi
Polymarker index (>=1).

integer type
Type of returned values (*0=PSET, 1=PREALI*).

Output Parameters

integer errind
Error indicator.

integer mtype
Marker type.

real mszsf
Marker size scale factor.

integer coli
Polymarker color index.

Errors

None

Related Subroutines

- Set Polymarker Representation

INQUIRE POSTED STRUCTURES (PHOP,WSOP,*,*)

Purpose

Use Inquire Posted Structures to inquire the structure networks which have been identified for display on the specified workstation by the Post Structure subroutine.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

Language Bindings

C

pinq_posted_structs (*ws_id, num_elems_appl_list, start_ind, err_ind, struct_ids, num_elems_impl_list*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pposted_struct_list *struct_ids*
List of structures posted to the workstation.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQPOST (*wkid*, *n*, *errind*, *number*, *strid*, *priort*)

Input Parameters

integer wkid
Workstation identifier.

integer n
List element requested (>=0).

Output Parameters

integer errind
Error indicator.

integer number
Number of structures posted to the workstation.

integer strid
Identifier of the n^{th} structure posted to the workstation.

real priort
Input priority of the n^{th} structure posted to the workstation.

Errors

None

Related Subroutines

- Post Structure
- Unpost All Structures
- Unpost Structure

INQUIRE PREDEFINED COLOR REPRESENTATION (PHOP,*,*,*)

Purpose

Use Inquire Predefined Color Representation to inquire the color values in the predefined color table entry in the color table of the specified workstation. The color specification parameters are the coordinates of the color in the default color model as defined in the workstation description table (WDT).

The graPHIGS API returns the predefined color specification corresponding to the specified index.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

62 This Information Not Available For MO Workstation Type

113 Color Index Value < ZERO

102 Representation Has Not Been Predefined On This Workstation

Language Bindings

C

pinq_pred_colr_rep (*ws_type, colr_ind, err_ind, colr_rep*)

Input Parameters

Pint ws_type
Workstation type.

Pint colr_ind
Predefined color index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pcolr_rep *colr_rep*
Predefined color representation.

FORTRAN

PQPCR (*wtype*, *pci*, *ccsbsz*, *errind*, *ol*, *cspec*)

Input Parameters

integer wtype
Workstation type.

integer pci
Predefined color index (>=0).

integer ccsbsz
Color component specification buffer size (>=0).

`Output Parameters

integer errind
Error indicator.

integer ol
Number of color components in the color specification.

real cspec(ccsbsz)
Color specification.

Errors

None

Related Subroutines

- Inquire Workstation Connection And Type

INQUIRE PREDEFINED EDGE REPRESENTATION (PHOP,*,*,*)

Purpose

Use Inquire Predefined Edge Representation to inquire the predefined settings for the edge attributes in the edge bundle table of the specified workstation type.

The graPHIGS API returns the edge flag setting, edge line type, edge width scale factor, and edge color for the predefined edge bundle table. The returned attributes correspond to the requested bundle table index.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

62 This Information Not Available For MO Workstation Type

100 Bundle Index Value Is Less Than One

102 Representation Has Not Been Predefined On This Workstation

Language Bindings

C

pinq_pred_edge_rep (*ws_type, index, err_ind, bundle*)

Input Parameters

Pint ws_type
Workstation type.

Pint index
Predefined edge index (>=1).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pedge_bundle *bundle*
Predefined edge representation.

FORTRAN

PQPEDR (*wtype*, *pedi*, *errind*, *edflag*, *edtype*, *ewidth*, *coli*)

Input Parameters

integer wtype
Workstation type.

integer pedi
Predefined edge index (>=1).

Output Parameters

integer errind
Error indicator.

integer edflag
Edge flag (*0=POFF, 1=PON*).

integer edtype
Edge type.

real ewidth
Edge width scale factor.

integer coli
Edge color index.

Errors

None

Related Subroutines

- Inquire Workstation Connection And Type

INQUIRE PREDEFINED INTERIOR REPRESENTATION (PHOP,*,*,*)

Purpose

Use Inquire Predefined Interior Representation to inquire the predefined settings for the interior attributes in the interior bundle table of the specified workstation type.

The graPHIGS API returns the interior style, the style index, and the interior color index for the predefined interior bundle table. The returned attributes correspond to the requested bundle table index. Possible interior styles include: *HOLLOW*, *SOLID*, *PATTERN*, *HATCH*, and *EMPTY*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

62 This Information Not Available For MO Workstation Type

100 Bundle Index Value Is Less Than One

102 Representation Has Not Been Predefined On This Workstation

Language Bindings

C

pinq_pred_int_rep (*ws_type, index, err_ind, bundle*)

Input Parameters

Pint ws_type
Workstation type.

Pint index
Predefined interior index (>=1).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint_bundle *bundle*
Predefined interior representation.

FORTRAN

PQPIR (*wtype*, *pii*, *errind*, *style*, *stylid*, *coli*)

Input Parameters

integer wtype
Workstation type.

integer pii
Predefined interior index (>=1).

Output Parameters

integer errind
Error indicator.

integer style
Interior style (*0=PHOLLO, 1=PSOLID, 2=PPATTR, 3=PHATCH, 4=PISEMP*).

integer stylid
Interior style index.

integer coli
Interior color index.

Errors

None

Related Subroutines

- Inquire Workstation Connection And Type

INQUIRE PREDEFINED PATTERN REPRESENTATION (PHOP,*,*,*)

Purpose

Use Inquire Predefined Pattern Representation to inquire a predefined pattern table entry.

For a given workstation type, the graPHIGS API returns the values corresponding to the specified index of the predefined pattern table. The graPHIGS API returns the pattern color index array.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

62 This Information Not Available For MO Workstation Type

112 Pattern Index Value < ONE

102 Representation Has Not Been Predefined On This Workstation

Language Bindings

C

pinq_pred_pat_rep (*ws_type, index, store, err_ind, pat_rep*)

Input Parameters

Pint ws_type
Workstation type.

Pint index
Predefined pattern index (>=1).

Pstore store
Handle to the store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Ppat_rep **pat_rep*
Predefined pattern representation. The memory referenced by **pat_rep* is managed by the parameter *store*.

FORTRAN

PQPPAR (*wtype*, *ppai*, *dimx*, *dimy*, *errind*, *dx*, *dy*, *colia*)

Input Parameters

integer wtype
Workstation type.

integer ppai
Predefined pattern index (>=1).

integer dimx
Maximum x-axis dimension of *colia* (>=0).

integer dimy
Maximum y-axis dimension of *colia* (>=0).

Output Parameters

integer errind
Error indicator.

integer dx
x-axis dimension of the pattern color index array.

integer dy
y-axis dimension of the pattern color index array.

integer colia (dimx,dimy)
Pattern color index array.

Errors

None

Related Subroutines

- Inquire Workstation Connection And Type

INQUIRE PREDEFINED POLYLINE REPRESENTATION (PHOP,*,*,*)

Purpose

Use Inquire Predefined Polyline Representation to inquire the predefined polyline attributes in an entry of the bundle table for a specified workstation type.

The graPHIGS API returns the polyline type, width, and color for the specified index of the specified workstation type.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

62 This Information Not Available For MO Workstation Type

100 Bundle Index Value Is Less Than One

Language Bindings

C

pinq_pred_line_rep (*ws_type, index, err_ind, bundle*)

Input Parameters

Pint ws_type
Workstation type.

Pint index
Predefined polyline index (>=1).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pline_bundle *bundle*
Predefined polyline representation.

FORTRAN

PQPPLR (*wtype*, *pli*, *errind*, *ltype*, *lwidth*, *coli*)

Input Parameters

integer wtype
Workstation type.

integer pli
Predefined polyline index (>=1).

Output Parameters

integer errind
Error indicator.

integer ltype
Line type.

real lwidth
Line width scale factor.

integer coli
Polyline color index.

Errors

None

Related Subroutines

- Inquire Workstation Connection And Type

INQUIRE PREDEFINED POLYMARKER REPRESENTATION (PHOP,*,*,*)

Purpose

Use Inquire Predefined Polymarker Representation to inquire the predefined polymarker attributes corresponding to the specified entry in the predefined bundle table of the specified workstation type.

The graPHIGS API returns the polymarker type, size, and color for the specified index of the specified workstation type.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

62 This Information Not Available For MO Workstation Type

100 Bundle Index Value Is Less Than One

102 Representation Has Not Been Predefined On This Workstation

Language Bindings

C

pinq_pred_marker_rep (*ws_type, index, err_ind, bundle*)

Input Parameters

Pint ws_type
Workstation type.

Pint index
Predefined polymarker index (>=1).

Output Parameters

*Pint *errind*
Error indicator.

*Pmarker_bundle *bundle*
Predefined polymarker representation.

FORTRAN

PQPPMR (*wtype*, *pmi*, *errind*, *mtype*, *mszsf*, *coli*)

Input Parameters

integer wtype
Workstation type.

integer pmi
Predefined polymarker index (>=1).

Output Parameters

integer errind
Error indicator.

integer mtype
Marker type.

real mszsf
Marker size scale factor.

integer coli
Polymarker color index.

Errors

None

Related Subroutines

- Inquire Workstation Connection And Type

INQUIRE PREDEFINED TEXT REPRESENTATION (PHOP,*,*,*)

Purpose

Use Inquire Predefined Text Representation to inquire the predefined text attributes corresponding to the specified entry in the text bundle table for the specified workstation type.

The graPHIGS API returns text font, text precision, character expansion factor, character spacing, and text color for the specified entry. Possible text precisions include: *STRING*, *CHARACTER*, and *STROKE*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

62 This Information Not Available For MO Workstation Type

100 Bundle Index Value Is Less Than One

102 Representation Has Not Been Predefined On This Workstation

Language Bindings

C

pinq_pred_text_rep (*ws_type, index, err_ind, bundle*)

Input Parameters

Pint ws_type
Workstation type.

Pint index
Predefined text index (>=1).

Output Parameters

*Pint *err_ind*
Error indicator.

*Ptext_bundle *bundle*
Predefined text representation.

FORTRAN

PQPTXR (*wtype*, *ptxi*, *errind*, *font*, *prec*, *chxp*, *chsp*, *coli*)

Input Parameters

integer wtype
Workstation type.

integer ptxi
Predefined text index (>=1).

Output Parameters

integer errind
Error indicator.

integer font
Text font.

integer prec
Text precision. (*0=PSTRP, 1=PCHARP, 2=PSTRKP*).

real chxp
Character expansion factor.

real chsp
Character spacing.

integer coli
Text color index.

Errors

None

Related Subroutines

- Inquire Workstation Connection And Type

INQUIRE PREDEFINED VIEW REPRESENTATION (PHOP,*,*,*)

Purpose

Use Inquire Predefined View Representation to inquire the predefined view attributes corresponding to the specified view table entry for the specified workstation type.

The graPHIGS API returns the view orientation matrix, the view mapping matrix, the view clipping limits, the *x* to *y* clipping indicator, and the back and front clipping indicators for the specified entry.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

57 Specified Workstation Is Of Category MI

114 View Index Value < ZERO

101 Specified Representation Has Not Been Defined

62 This Information Not Available For MO Workstation Type

Language Bindings

C

pinq_pred_view_rep (*ws_type, index, err_ind, view*)

Input Parameters

Pint ws_type
Workstation type.

Pint index
Predefined view index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pview_rep3 *view*
View representation.

FORTRAN

PQPVWR (*wtype*, *pvwi*, *errind*, *vwormt*, *vwmpmt*, *vwcplm*, *xyclpi*, *bclipi*, *fclipi*)

Input Parameters

integer wtype
Workstation type

integer pvwi
Predefined view index (>=0).

Input Parameters

integer errind
Error indicator.

real vwormt(4,4)
View orientation matrix.

real vwmpmt(4,4)
View mapping matrix.

real vwcplm(6)
View clipping limits in NPC (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

integer xyclpi
x to *y* clipping indicator (*0=PNCLIP, 1=PCLIP*).

integer bclipi
Back clipping indicator (*0=PNCLIP, 1=PCLIP*).

integer fclipi
Front clipping indicator (*0=PNCLIP, 1=PCLIP*).

Errors

None

Related Subroutines

- Inquire Workstation Connection And Type

INQUIRE SET OF OPEN WORKSTATIONS (PHOP,*,*,*)

Purpose

Use Inquire Set of Open Workstations to inquire the set of currently open workstations.

The graPHIGS API returns data indicating the total number of open workstation identifiers and the requested set of workstation identifiers.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

pinq_open_wss (*num_elems_appl_list, start_ind, err_ind, open_ws_ids, num_elems_impl_list*)

Input Parameters

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint_list *open_ws_ids*
List of workstation identifiers.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQOPWK (*n*, *errind*, *ol*, *wkid*)

Input Parameters

integer n
Set member requested (>=0).

Output Parameters

integer errind
Error indicator.

integer ol
Number of open workstations.

integer wkid
n^{th} member in the set of open workstations.

Errors

None

Related Subroutines

- Open Workstation
- Close Workstation

INQUIRE SET OF WORKSTATIONS TO WHICH POSTED (PHOP,*,*,*)

Purpose

Use Inquire Set of Workstations to Which Posted to inquire the list of workstations to which the specified structure is posted.

This subroutine returns the number of workstations and the workstation identifiers to which the specified structure is posted.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

201 Specified Structure Does Not Exist

Language Bindings

C

pinq_wss_posted (*struct_id, num_elems_appl_list, start_ind, err_ind, ws, num_elems_impl_list*)

Input Parameters

Pint struct_id
Structure identifier.

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint_list *ws*
List of workstations to which the structure is posted.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQWKPO (*strid*, *n*, *errind*, *ol*, *wkid*)

Input Parameters

integer strid
Structure identifier.

integer n
Set member requested (>=0).

Output Parameters

integer errind
Error indicator.

integer ol
Number of workstations to which the structure is posted.

integer wkid
n^{th} member in the set of workstations to which the structure is posted.

Errors

None

Related Subroutines

- None

INQUIRE STRING DEVICE STATE (PHOP,WSOP,*,*)

Purpose

Use Inquire String Device State to inquire the current state of the specified string device on the specified workstation.

The graPHIGS API returns the current values of the specified device.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Language Bindings

C

pinq_string_st (*ws_id, string_num, store, err_ind, op_mode, echo_switch, init_string, prompt_echo, echo_area, string_data*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint string_num
String device number (>=1).

Pstore store
Handle to the store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pop_mode *op_mode*
Operating mode (*0=POP_REQ, 1=POP_SAMPLE, 2=POP_EVENT*).

*Pecho_switch *echo_switch*
Echo switch (*0=PSWITCH_NO_ECHO, 1=PSWITCH_ECHO*).

*char **init_string*
Initial string. The memory referenced by **init_string* is managed by the parameter *store*.

*Pint *prompt_echo*
Prompt and echo type.

*Plimit *echo_area*
Echo area in DC.

*Pstring_data **string_data*
Data record. The memory referenced by **string_data* is managed by the parameter *store*.

FORTRAN

PQSTS (*wkid*, *stdnr*, *mldr*, *errind*, *mode*, *esw*, *lostr*, *istr*, *pet*, *earea*, *ldr*, *datrec*)

Input Parameters

integer wkid
Workstation identifier.

integer stdnr
String device number (>=1).

integer mldr
Dimension of the data record array (>=0).

Output Parameters

integer errind
Error indicator.

integer mode
Operating mode (*0=PREQU, 1=PSAMPL, 2=PEVENT*).

integer esw
Echo switch (*0=PNECHO, 1=PECHO*).

integer lostr
Number of characters returned.

character(*) istr*
Initial string.

integer pet
Prompt and echo type

real earea(4)
Echo area in DC (*XMIN, XMAX, YMIN, YMAX*).

integer ldr
Number of array elements used in the data record.

*character*80 datrec(mldr)*
The data record.

FORTRAN Subset

PQSTS (*wkid*, *stdnr*, *mldr*, *errind*, *mode*, *esw*, *lostr*, *istr*, *pet*, *earea*, *ldr*, *datrec*)

Input Parameters

integer wkid
Workstation identifier.

integer stdnr
String device number (>=1).

integer mldr
Dimension of the data record array = ??>(>=0).

Output Parameters

integer errind
Error indicator.

integer mode
Operating mode (*0=PREQU, 1=PSAMPL, 2=PEVENT*).

integer esw
Echo switch (*0=PNECHO, 1=PECHO*).

integer lostr
Number of characters returned.

*character*80 istr*
Initial string.

integer pet
Prompt and echo type.

real earea(4)
Echo area in DC (*XMIN, XMAX, YMIN, YMAX*).

integer ldr
Number of array elements used in the data record.

*character*80 datrec(mldr)*
The data record.

Errors

None

Related Subroutines

- Initialize String
- Initialize String 3
- Inquire Default String Device Data
- Inquire Default String Device Data 3
- Inquire String Device State 3

INQUIRE STRING DEVICE STATE 3 (PHOP,WSOP,*,*)

Purpose

Use Inquire String Device State 3 to inquire the current state of the specified string device on the specified workstation.

The graPHIGS API returns the current values of the specified device.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Language Bindings

C

pinq_string_st3 (*ws_id, string_num, store, err_ind, op_mode, echo_switch, init_string, prompt_echo, echo_vol, string_data*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint string_num
String device number (>=1).

Pstore store
Handle to the store object. The graPHIGS API uses an object of type Store to facilitate the use of

subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pop_mode *op_mode*
Operating mode (*0=POP_REQ, 1=POP_SAMPLE, 2=POP_EVENT*).

*Pecho_switch *echo_switch*
Echo switch (*0=PSWITCH_NO_ECHO, 1=PSWITCH_ECHO*).

*char **init_string*
Initial string. The memory referenced by **init_string* is managed by the parameter *store*.

*Pint *prompt_echo*
Prompt and echo type.

*Plimit3 *echo_vol*
Echo volume in DC.

*Pstring_data3 **string_data*
Data record. The memory referenced by **string_data* is managed by the parameter *store*.

FORTRAN

PQSTS3 (*wkid*, *stdnr*, *mldr*, *errind*, *mode*, *esw*, *lostr*, *istr*, *pet*, *evol*, *ldr*, *datrec*)

Input Parameters

integer wkid
Workstation identifier.

integer stdnr
String device number (>=1).

integer mldr
Dimension of the data record array (>=0).

Output Parameters

integer errind
Error indicator.

integer mode
Operating mode (*0=PREQU, 1=PSAMPL, 2=PEVENT*).

integer esw
Echo switch (*0=PNECHO, 1=PECHO*).

integer lostr
Number of characters returned.

character(*) istr*
Initial string.

integer pet
Prompt and echo type.

real evol(6)
Echo volume in DC (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

integer ldr
Number of array elements used in the data record.

*character*80 datrec(mldr)*
The data record.

FORTRAN Subset

PQSTS3 (*wkid*, *stdnr*, *mldr*, *errind*, *mode*, *esw*, *lostr*, *istr*, *pet*, *evol*, *ldr*, *datrec*)

Input Parameters

integer wkid
Workstation identifier.

integer stdnr
String device number (>=1).

integer mldr
Dimension of the data record array (>=0).

Output Parameters

integer errind
Error indicator.

integer mode
Operating mode (*0=PREQU, 1=PSAMPL, 2=PEVENT*).

integer esw
Echo switch (*0=PNECHO, 1=PECHO*).

integer lostr
Number of characters returned.

*character*80 istr*
Initial string.

integer pet
Prompt and echo type

real evol(6)
Echo volume in DC (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

integer ldr
Number of array elements used in the data record.

*character*80 datrec(mldr)*
The data record.

Errors

None

Related Subroutines

- Initialize String
- Initialize String 3
- Inquire Default String Device Data
- Inquire Default String Device Data 3
- Inquire String Device State

INQUIRE STROKE DEVICE STATE (PHOP,WSOP,*,*)

Purpose

Use Inquire Stroke Device State to inquire the current state of the specified stroke device on the specified workstation. Returned values of type *SET* or *REALIZED* may be specified.

The graPHIGS API returns the current values for the specified device.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Language Bindings

C

pinq_stroke_st (*ws_id, stroke_num, type, store, err_ind, op_mode, echo_switch, init_view_ind, init_stroke, prompt_echo, echo_area, stroke_data*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint stroke_num
Stroke device number (>=1).

Pinq_type type
Type of returned values (*0=PINQ_SET, 1=PINQ_REALIZED*).

Pstore store
Handle to the store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pop_mode *op_mode*
Operating mode (*0=POP_REQ, 1=POP_SAMPLE, 2=POP_EVENT*).

*Pecho_switch *echo_switch*
Echo switch (*0=PSWITCH_NO_ECHO, 1=PSWITCH_ECHO*).

*Pint *init_view_ind*
Initial view index.

*Ppoint_list **init_stroke*
Initial stroke. The memory referenced by **init_stroke* is managed by the parameter *store*.

*Pint *prompt_echo*
Prompt and echo type.

*Plimit *echo_area*
Echo area in DC.

*Pstroke_data **stroke_data*
Data record. The memory referenced by **stroke_data* is managed by the parameter *store*.

FORTRAN

PQSKS (*wkid*, *skdnr*, *type*, *n*, *mldr*, *errind*, *mode*, *esw*, *iviewi*, *np*, *ipxa*, *ipya*, *pet*, *earea*, *ldr*, *datrec*)

Input Parameters

integer wkid
Workstation identifier.

integer skdnr
Stroke device number (>=1).

integer type
Type of returned values (*0=PSET, 1=PREALI*).

integer n
Maximum number of points (>=0).

integer mldr
Dimension of the data record array (>=0).

Output Parameters

integer errind
Error indicator.

integer mode
Operating mode (*0=PREQU, 1=PSAMPL, 2=PEVENT*).

integer esw
Echo switch (*0=PNECHO, 1=PECHO*).

integer iviewi
Initial view index.

integer np
Number of points.

real ipxa(n)
x coordinates of the initial stroke in WC.

real ipya(n)
y coordinates of the initial stroke in WC.

integer pet
Prompt and echo type.

real earea(4)
Echo area in DC. (*XMIN, XMAX, YMIN, YMAX*).

integer ldr
Number of array elements used in the data record.

*character*80 datrec(mldr)*
Data record.

Errors

None

Related Subroutines

- Initialize Stroke
- Initialize Stroke 3
- Inquire Default Stroke Device Data
- Inquire Default Stroke Device Data 3
- Inquire Stroke Device State 3

INQUIRE STROKE DEVICE STATE 3 (PHOP,WSOP,*,*)

Purpose

Use Inquire Stroke Device State 3 to inquire the current state of the specified stroke device on the specified workstation. Returned values of type *SET* or *REALIZED* may be specified.

The graPHIGS API returns the current values for the specified device.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Language Bindings

C

pinq_stroke_st3 (*ws_id, stroke_num, type, store, err_ind, op_mode, echo_switch, init_view_ind, init_stroke, prompt_echo, echo_vol, stroke_data*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint stroke_num
Stroke device number (>=1).

Pinq_type type
Type of returned values (*0=PINQ_SET, 1=PINQ_REALIZED*).

Pstore store
Handle to the store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pop_mode *op_mode*
Operating mode (*0=POP_REQ, 1=POP_SAMPLE, 2=POP_EVENT*).

*Pecho_switch *echo_switch*
Echo switch (*0=PSWITCH_NO_ECHO, 1=PSWITCH_ECHO*).

*Pint *init_view_ind*
Initial view index.

*Ppoint_list3 **init_stroke*
Initial stroke in WC. The memory referenced by **init_stroke* is managed by the parameter *store*.

*Pint *prompt_echo*
Prompt and echo type.

*Plimit3 *echo_vol*
Echo volume in DC.

*Pstroke_data3 **stroke_data*
Data record. The memory referenced by **stroke_data* is managed by the parameter *store*.

FORTRAN

PQSKS (*wkid*, *skdnr*, *type*, *n*, *mldr*, *errind*, *mode*, *esw*, *iviewi*, *np*, *ipxa*, *ipya*, *ipza*, *pet*, *evol*, *ldr*, *datrec*)

Input Parameters

integer wkid
Workstation identifier.

integer skdnr
Stroke device number (>=1).

integer type
Type of returned values (*0=PSET, 1=PREALI*).

integer n
Maximum number of points (>=0).

integer mldr
Dimension of the data record array (>=0).

Output Parameters

integer errind
Error indicator.

integer mode
Operating mode (*0=PREQU, 1=PSAMPL, 2=PEVENT*).

integer esw
Echo switch (*0=PNECHO, 1=PECHO*).

integer iviewi
Initial view index.

integer np
Number of points.

real ipxa(n)
x coordinates of the initial stroke in WC.

real ipya(n)
y coordinates of the initial stroke in WC.

real ipza(n)
z coordinates of the initial stroke in WC.

integer pet
Prompt and echo type.

real evol(6)
Echo volume in DC (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

integer ldr
Number of array elements used in the data record.

*character*80 datrec(mldr)*
Data record.

Errors

None

Related Subroutines

- Initialize Stroke
- Initialize Stroke 3
- Inquire Default Stroke Device Data
- Inquire Default Stroke Device Data 3
- Inquire Stroke Device State

INQUIRE STRUCTURE IDENTIFIERS (PHOP,*,*,*)

Purpose

Use Inquire Structure Identifiers to inquire the currently existing structure identifiers in the centralized structure store.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

pinq_struct_ids (*num_elems_appl_list, start_ind, err_ind, struct_ids, num_elems_impl_list*)

Input Parameters

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint_list *struct_ids*
List of structure identifiers.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQSID (*n*, *errind*, *number*, *strid*)

Input Parameters

integer n
Set member requested (>=0).

Output Parameters

integer errind
Error indicator.

integer number
Number of structure identifiers.

integer strid
n^{th} structure identifier.

Errors

None

Related Subroutines

- None

INQUIRE STRUCTURE STATE VALUE (PHCL,WSCL,STCL,ARCL)

Purpose

Use Inquire Structure State Value to inquire the structure state of the graPHIGS API. The structure state is either Structure Open (*STOP*) or Structure Closed (*STCL*).

Language Bindings

C

pinq_struct_st (*struct_st*)

Output Parameters

Pstruct_st *struct_st
Structure state value (*0=PSTRUCT_ST_STCL, 1=PSTRUCT_ST_STOP*).

FORTRAN

PQSTRS (*strsta*)

Output Parameters

integer strsta
Structure state value (*0=PSTCL, 1=PSTOP*).

Errors

None

Related Subroutines

- Open Structure
- Close Structure

INQUIRE STRUCTURE STATUS (PHOP,*,*,*)

Purpose

Use Inquire Structure Status to inquire whether or not the specified structure exists in the centralized structure store. If the specified structure does not exist, then the graPHIGS API sets the structure status indicator to *NON-EXISTENT*. If the structure exists and contains no elements, then the graPHIGS API sets the structure status indicator to *EMPTY*; otherwise, the graPHIGS API sets the structure status indicator to *NOT EMPTY*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the structure status value in the output parameter. If the information is unavailable, then the value returned in the output parameter is unpredictable and the graPHIGS API sets the error indicator to the following error:

2 Function Requires State (PHOP,*,*,*)

Language Bindings

C

pinq_struct_status (*struct_id, err_ind, status*)

Input Parameters

Pint struct_id
Structure identifier.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pstruct_status *status*
Structure status identifier (*0=PSTRUCT_STATUS_NON_EXISTENT, 1=PSTRUCT_STATUS_EMPTY, 2=PSTRUCT_STATUS_NOT_EMPTY*).

FORTRAN

PQSTST (*strid*, *errind*, *strsti*)

Input Parameters

integer strid
Structure identifier.

Output Parameters

integer errind
Error indicator.

integer strsti
Structure status identifier (*0=PSNOEX, 1=PSEMPT, 2=PSNEMP*).

Errors

None

Related Subroutines

- None

INQUIRE SYSTEM STATE VALUE (PHCL,WSCL,STCL,ARCL)

Purpose

Use Inquire System State Value to inquire the system state of the graPHIGS API. The system state is either PHIGS Open (*PHOP*) or PHIGS Closed (*PHCL*).

Language Bindings

C

pinq_sys_st (*sys_st*)

Output Parameters

*Psys_st *sys_st*
System state value (*0=PSYS_ST_PHCL, 1=PSYS_ST_PHOP*).

FORTRAN

PQSYS (*syssta*)

Output Parameters

integer syssta
System state value (*0=PPHCL, 1=PPHOP*).

Errors

None

Related Subroutines

- Close PHIGS
- Open PHIGS

INQUIRE TEXT EXTENT (PHOP,*,*,*)

Purpose

Use Inquire Text Extent to inquire the extent of the specified character string in the local 2D text coordinate system. The graPHIGS API uses the specified text attributes for the specified workstation type to compute the extent. *STROKE* precision is assumed. The text position is (0,0) in the local 2D text coordinate system.

Possible text path attributes include: *RIGHT*, *LEFT*, *UP* or *DOWN*. The horizontal alignment for the text may be set to *NORMAL*, *LEFT*, *CENTER*, or *RIGHT*, and the vertical text alignment may be set to *NORMAL*, *TOP*, *CAP*, *HALF*, *BASE* or *BOTTOM*.

The concatenation offset, with a suitable modeling transformation applied to account for the character up vector, indicates the text position for the concatenation of a subsequent text output primitive in the local 2D text coordinate system. This includes for text paths *RIGHT* and *LEFT*, a suitable modification to adjust for the intercharacter spacing of the last character as specified by the character spacing parameter.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

62 This Information Not Available For MO Workstation Type

106 Specified Font Not Available For Requested Text Precision

Language Bindings

C

pinq_text_extent (*ws_type, text_font, char_expan, char_space, char_ht, text_path, hor_text_align, vert_text_align, char_string, err_ind, rect, offset*)

Input Parameters

Pint ws_type
Workstation type.

Pint text_font
Text font.

Pfloat char_expan
Character expansion factor.

Pfloat char_space
Character spacing.

Pfloat char_ht
Character height.

Ptext_path text_path
Text path (*0=PPATH_RIGHT, 1=PPATH_LEFT, 2=PPATH_UP, 3=PPATH_DOWN*).

Phor_text_align hor_text_align
Horizontal text alignment (*0=PHOR_NORM, 1=PHOR_LEFT, 2=PHOR_CTR, 3=PHOR_RIGHT*).

Pvert_text_align vert_text_align
Vertical text alignment (*0=PVERT_NORM, 1=PVERT_TOP, 2=PVERT_CAP, 3=PVERT_HALF, 4=PVERT_BASE, 5=PVERT_BOTTOM*).

*const char *char_string*
Character string.

Output Parameters

*Pint *err_ind*
Error indicator.

*Prect *rect*
Extent rectangle.

*Ppoint *offset*
Concatenation offset.

FORTRAN

PQTXX (*wktype*, *font*, *chxp*, *chsp*, *chh*, *txp*, *txalh*, *txalv*, *str*, *errind*, *txexrx*, *txexry*, *copx*, *copy*)

Input Parameters

integer wktype
Workstation type.

integer font
Text font.

real chxp
Character expansion factor.

real chsp
Character spacing.

real chh
Character height.

integer txp
Text path (*0=PRIGHT, 1=PLEFT, 2=PUP, 3=PDOWN*).

integer txalh
Horizontal text alignment (*0=PAHNOR, 1=PALEFT, 2=PACENT, 3=PARITE*).

integer txalv
Vertical text alignment (*0=PAVNOR, 1=PATOP, 2=PACAP, 3=PAHALF, 4=PABASE, 5=PABOTT*).

character(*) str*
Character string.

Output Parameters

integer errind
Error indicator.

real txexrx(2)
x coordinates of the text extent rectangle.

real txexry(2)
y coordinates of the text extent rectangle.

real copx
x coordinate of the concatenation offset.

real copy
y coordinate of the concatenation offset.

FORTRAN Subset

PQTXXS (*wktype*, *font*, *chxp*, *chsp*, *chh*, *txp*, *txalh*, *txalv*, *lstr*, *str*, *errind*, *txexrx*, *txexry*, *copx*, *copy*)

Input Parameters

integer wktype
Workstation type.

integer font
Text font.

real chxp
Character expansion factor.

real chsp
Character spacing.

real chh
Character height.

integer txp
Text path (*0=PRIGHT, 1=PLEFT, 2=PUP, 3=PDOWN*).

integer txalh
Horizontal text alignment (*0=PAHNOR, 1=PALEFT, 2=PACENT, 3=PARITE*).

integer txalv
Vertical text alignment (*0=PAVNOR, 1=PATOP, 2=PACAP, 3=PAHALF, 4=PABASE, 5=PABOTT*).

integer lstr
Length of string (in characters).

*character*80 str*
Character string.

Output Parameters

integer errind
Error indicator.

real txexrx(2)
x coordinates of the text extent rectangle.

real txexry(2)
y coordinates of the text extent rectangle.

real copx
x coordinate of the concatenation offset.

real copy
y coordinate of the concatenation offset.

Errors

None

Related Subroutines

- None

INQUIRE TEXT FACILITIES (PHOP,*,*,*)

Purpose

Use Inquire Text Facilities to inquire the text facilities for the specified workstation type.

Only the highest supported precision for each font is present in the list of text font and precision pairs. Possible text precisions include: *STRING*, *CHARACTER*, or *STROKE*.

If the graPHIGS API returns a value of zero for the number of available character heights, then the workstation supports a continuous range of character heights. If the graPHIGS API returns a value of zero for the number of available character expansion factors, then the workstation supports a continuous range of character expansion factors.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

62 This Information Not Available For MO Workstation Type

Language Bindings

C

pinq_text_facs (*ws_type, num_elems_appl_list, start_ind, err_ind, fac, num_elems_impl_list*)

Input Parameters

Pint ws_type
Workstation type.

Pint num_elems_appl_list
Number of elements in the application list (>=0).

Pint start_ind
Starting index (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Ptext_facs *fac*
Text facilities.

*Pint *num_elems_impl_list*
Number of elements in the implementation list.

FORTRAN

PQTXF (*wtype*, *n*, *errind*, *nfpp*, *font*, *prec*, *nchh*, *minchh*, *maxchh*, *nchx*, *minchx*, *maxchx*, *nptxi*)

Input Parameters

integer wtype
Workstation type.

integer n
List element requested (>=0).

Output Parameters

integer errind
Error indicator.

integer nfpp
Number of text font and precision pairs.

integer font
n^{th} element in the list of text fonts.

integer prec
n^{th} element in the list of text precisions (*0=PSTRP, 1=PCHARP, 2=PSTRKP*).

integer nchh
Number of available character heights.

real minchh
Minimum character height in DC.

real maxchh
Maximum character height in DC.

integer nchx
Number of available character expansion factors.

real minchx
Minimum character expansion factor.

real maxchx
Maximum character expansion factor.

integer nptxi
Number of predefined text indexes.

Errors

None

Related Subroutines

- Inquire Workstation Connection And Type
- Set Text Representation
- Text
- Text 3

INQUIRE TEXT REPRESENTATION (PHOP,WSOP,*,*)

Purpose

Use Inquire Text Representation to inquire the current text attributes contained in the specified entry in the text bundle table of the specified workstation. Returned values of type *SET* or *REALIZED* may be specified.

The graPHIGS API returns data indicating the text font and precision, character expansion factor and spacing, and text color of the specified entry. Possible text precisions include: *STRING*, *CHARACTER*, and *STROKE*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

59 Specified Workstation Does Not Have Output Capability

100 Bundle Index Value Is Less Than One

101 Specified Representation Has Not Been Defined

Language Bindings

C

pinq_text_rep (*ws_id, index, type, err_ind, text_rep*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint index
Text index (>=1).

Pinq_type type
Type of returned values (*0=PINQ_SET, 1=PINQ_REALIZED*).

Output Parameters

*Pint *err_ind*
Error indicator.

*Ptext_bundle *text_rep*
Text representation.

FORTRAN

PQTXR (*wkid*, *txi*, *type*, *errind*, *font*, *prec*, *chxp*, *chsp*, *coli*)

Input Parameters

integer wkid
Workstation identifier.

integer txi
Text index (>=1).

integer type
Type of returned values (*0=PSET, 1=PREALI*).

Output Parameters

integer errind
Error indicator.

integer font
Text font.

integer prec
Text precision (*0=PSTRP, 1=PCHARP, 2=PSTRKP*).

real chxp
Character expansion factor.

real chsp
Character spacing.

integer coli
Text color index.

Errors

None

Related Subroutines

- Set Text Representation

INQUIRE VALUATOR DEVICE STATE (PHOP,WSOP,*,*)

Purpose

Use Inquire Valuator Device State to inquire the current state of the specified valuator device on the specified workstation.

The graPHIGS API returns the values of the specified device. The format and content of these values returned by the graPHIGS API depends on the prompt/echo type defined in the subroutine that initializes the input device.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Language Bindings

C

pinq_val_st (*ws_id, val_num, store, err_ind, op_mode, echo_switch, init_value, prompt_echo, echo_area, val_data*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint val_num
Valuator device number (>=1).

Pstore store
Handle to the store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pop_mode *op_mode*
Operating mode (*0=POP_REQ, 1=POP_SAMPLE, 2=POP_EVENT*).

*Pecho_switch *echo_switch*
Echo switch (*0=PSWITCH_NO_ECHO, 1=PSWITCH_ECHO*).

*Pfloat *init_value*
Initial value.

*Pint *prompt_echo*
Prompt and echo type.

*Plimit *echo_area*
Echo area in DC.

*Pval_data **val_data*
Data record. The memory referenced by **val_data* is managed by the parameter *store*.

FORTRAN

PQVLS (*wkid*, *vldnr*, *mldr*, *errind*, *mode*, *esw*, *ival*, *pet*, *earea*, *ldr*, *datrec*)

Input Parameters

integer wkid
Workstation identifier.

integer vldnr
Valuator device number (>=1).

integer mldr
Dimension of the data record array (>=0).

Output Parameters

integer errind
Error indicator.

integer mode
Operating mode (*0=PREQU, 1=PSAMPL, 2=PEVENT*).

integer esw
Echo switch (*0=PNECHO, 1=PECHO*).

real ival
Initial value.

integer pet
Prompt and echo type.

real earea(4)
Echo area in DC (*XMIN, XMAX, YMIN, YMAX*).

integer ldr
Number of array elements in the data record.

*character*80 datrec(mldr)*
Data record.

Errors

None

Related Subroutines

- Initialize Valuator
- Initialize Valuator 3
- Inquire Default Valuator Device Data
- Inquire Default Valuator Device Data 3
- Inquire Valuator Device State 3

INQUIRE VALUATOR DEVICE STATE 3 (PHOP,WSOP,*,*)

Purpose

Use Inquire Valuator Device State 3 to inquire the current state of the specified valuator device on the specified workstation.

The graPHIGS API returns the values of the specified device. The format and content of these values returned by the graPHIGS API depends on the prompt/echo type defined in the subroutine that initializes the input device.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

61 Specified Workstation Is Not Of Category Input Or Outin

250 Specified Device Not Available On Workstation

Language Bindings

C

pinq_val_st3 (*ws_id, val_num, store, err_ind, op_mode, echo_switch, init_value, prompt_echo, echo_vol, val_data*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint val_num
Valuator device number (>=1).

Pstore store
Handle to the store object. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pop_mode *op_mode*
Operating mode (*0=POP_REQ, 1=POP_SAMPLE, 2=POP_EVENT*).

*Pecho_switch *echo_switch*
Echo switch (*0=PSWITCH_NO_ECHO, 1=PSWITCH_ECHO*).

*Pfloat *init_value*
Initial value.

*Pint *prompt_echo*
Prompt and echo type.

*Plimit3 *echo_vol*
Echo volume in DC.

*Pval_data **val_data*
Data record. The memory referenced by **val_data* is managed by the parameter *store*.

FORTRAN

PQVLS3 (*wkid*, *vldnr*, *mldr*, *errind*, *mode*, *esw*, *ival*, *pet*, *evol*, *ldr*, *datrec*)

Input Parameters

integer wkid
Workstation identifier.

integer vldnr
Valuator device number (>=1).

integer mldr
Dimension of the data record array (>=0).

Output Parameters

integer errind
Error indicator.

integer mode
Operating mode (*0=PREQU, 1=PSAMPL, 2=PEVENT*).

integer esw
Echo switch (*0=PNECHO, 1=PECHO*).

real ival
Initial value.

integer pet
Prompt and echo type.

real evol(6)
Echo volume in DC (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

integer ldr
Number of array elements used in the data record.

*character*80 datrec(mldr)*
Data record.

Errors

None

Related Subroutines

- Initialize Valuator
- Initialize Valuator 3
- Inquire Default Valuator Device Data

- Inquire Default Valuator Device Data 3
- Inquire Valuator Device State

INQUIRE VIEW FACILITIES (PHOP,*,*,*)

Purpose

Use Inquire View Facilities to inquire the view facilities for the specified workstation type.

The graPHIGS API returns data indicating the number of predefined view indexes on the workstation.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the number in the output parameter. If the information is unavailable, then the value returned in the output parameter is unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

57 Specified Workstation Is Of Category MI

62 This Information Not Available For MO Workstation Type

Language Bindings

C

pinq_view_facs (*ws_type, err_ind, num_view_ind*)

Input Parameters

Pint ws_type
Workstation type.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pint *num_view_ind*
Number of predefined view indexes.

FORTRAN

PQVWF (*wtype*, *errind*, *npvwi*)

Input Parameters

integer wtype
Workstation type.

Output Parameters

integer errind
Error indicator.

integer npvwi
Number of predefined view indexes.

Errors

None

Related Subroutines

- Inquire Workstation Connection And Type
- Set View Representation

INQUIRE VIEW REPRESENTATION (PHOP,WSOP,*,*)

Purpose

Use Inquire View Representation to inquire the current and/or requested values from the specified view table entry of the specified workstation.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

57 Specified Workstation Is Of Category MI

114 View Index Value < ZERO

101 Specified Representation Has Not Been Defined

Language Bindings

C

pinq_view_rep (*ws_id, view_ind, err_ind, upd_st, cur_view, req_view*)

Input Parameters

Pint ws_id
Workstation identifier.

Pint view_ind
View index requested (>=0).

Output Parameters

*Pint *err_ind*
Error indicator.

*Pupd_st *upd_st*
Viewing transformation update state (*0=PUPD_NOT_PEND, 1=PUPD_PEND*).

*Pview_rep3 *cur_view*
Current view representation.

*Pview_rep3 *req_view*
Requested view representation

FORTRAN

PQVWR (*wkid*, *viewi*, *curq*, *errind*, *vwupd*, *vwormt*, *vwmpmt*, *vwcplm*, *xyclpi*, *bclipi*, *fclipi*)

Input Parameters

integer wkid
Workstation identifier.

integer viewi
View index requested (>=0).

integer curq
Specifies whether current or requested values are to be returned (*0=PCURVL, 1=PRQSVL*).

Output Parameters

integer errind
Error indicator.

integer vwupd
Viewing transformation update state (*0=PNPEND, 1=PPEND*).

real vwormt(4,4)
View orientation matrix.

real vwmpmt(4,4)
View mapping matrix.

real vwcplm(6)
View clipping limits in NPC (*XMIN, XMAX, YMIN, YMAX, ZMIN, ZMAX*).

integer xyclpi
x to *y* clipping indicator (*0=PNCLIP, 1=PCLIP*).

integer bclipi
Back clipping indicator (*0=PNCLIP, 1=PCLIP*).

integer fclipi
Front clipping indicator (*0=PNCLIP, 1=PCLIP*).

Errors

None

Related Subroutines

- Set View Representation

INQUIRE WORKSTATION CATEGORY (PHOP,*,*,*)

Purpose

Use Inquire Workstation Category to inquire the category of the specified workstation type.

The graPHIGS API returns the category of the workstation type indicating whether it is output (*OUTPUT*), input (*INPUT*), output and input (*OUTIN*), metafile output (*MO*), or metafile input (*MI*).

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the workstation category in the output parameter. If the information is unavailable, then the value returned in the output parameter is unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

Language Bindings

C

pinq_ws_cat (*ws_type, err_ind, cat*)

Input Parameters

Pint ws_type
Workstation type.

Input Parameters

*Pint *err_ind*
Error indicator

*Pws_cat *cat*
Workstation category (*0=PCAT_OUT, 1=PCAT_IN, 2=PCAT_OUTIN, 3=PCAT_MO, 4=PCAT_MI*).

FORTRAN

PQWKCA (*wtype*, *errind*, *wkcat*)

Input Parameters

integer wtype
Workstation type.

Output Parameters

integer errind
Error indicator.

integer wkcat
Workstation category (*0=POUTPT, 1=PINPUT, 2=POUTIN, 3=PMO, 4=PMI*).

Errors

None

Related Subroutines

- Inquire Workstation Connection And Type

INQUIRE WORKSTATION CLASSIFICATION (PHOP,*,*,*)

Purpose

Use Inquire Workstation Classification to inquire the display classification of the specified workstation type.

The graPHIGS API returns a value indicating the type of display technology utilized by the specified workstation type. Possible classifications include: *VECTOR*, *RASTER*, and *OTHER*.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the display classification in the output parameter. If the information is unavailable, then the value returned in the output parameter is unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

62 This Information Not Available For MO Workstation Type

Language Bindings

C

pinq_ws_class (*ws_type, err_ind, ws_class*)

Input Parameters

Pint ws_type
Workstation type.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pws_class *ws_class*
Workstation classification (*0=PCLASS_VEC, 1=PCLASS_RASTER, 2=PCLASS_OTHER*).

FORTRAN

PQWKCL (*wtype*, *errind*, *vrtype*)

Input Parameters

integer wtype
Workstation type.

Output Parameters

integer errind
Error indicator.

integer vrtype
Workstation classification (*0=PVECTR, 1=PRASTR, 2=POTHWK*).

Errors

None

Related Subroutines

- Inquire Workstation Connection And Type

INQUIRE WORKSTATION CONNECTION AND TYPE (PHOP,WSOP,*,*)

Purpose

Use Inquire Workstation Connection and Type to inquire the connection identifier and the realized workstation type of the specified workstation identifier. The realized workstation type is the type assigned by the graPHIGS API when the workstation is created by the Open Workstation subroutine.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

Language Bindings

C

pinq_ws_conn_type (*ws_id, store, err_ind, conn_id, ws_type*)

Input Parameters

Pint ws_id
Workstation identifier.

Pstore store
Handle to the Store identifier. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store (CREATE STORE (PHOP,*,*,*)) subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

*Pint *err_ind*
Error indicator.

*void **conn_id*
Connection identifier. The memory referenced by **conn_id* is managed by the parameter *store*.

*Pint *ws_type*
Workstation type.

FORTRAN

PQWKC (*wkid*, *errind*, *conid*, *wtype*)

Input Parameters

integer wkid
Workstation identifier.

Output Parameters

integer errind
Error indicator.

integer conid
Connection identifier.

integer wtype
Workstation type.

Errors

None

Related Subroutines

- None

INQUIRE WORKSTATION CONNECTION AND TYPE (PHOP,WSOP,*,*)

Purpose

Use Inquire Workstation Connection and Type to inquire the connection identifier and the realized workstation type of the specified workstation identifier. The realized workstation type is the type assigned by the graPHIGS API when the workstation is created by the Open Workstation subroutine.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 FUNCTION REQUIRES STATE (PHOP,WSOP,*,*)

54 SPECIFIED WORKSTATION IS NOT OPEN

Language Bindings

C

pinq_ws_conn_type (*ws_id, store, err_ind, conn_id, ws_type*);

Input Parameters

`Pint` `ws_id`

Workstation identifier.

`Pstore` `store`

Handle to the Store identifier. The graPHIGS API uses an object of type Store to facilitate the use of subroutines which return complex data. See Create Store subroutine for details on how the graPHIGS API uses this parameter on inquiries.

Output Parameters

`Pint` `*err_ind`

Error indicator.

`void` `**conn_id`

Connection identifier. The memory referenced by `*conn_id` is managed by the parameter `store`.

`Pint` `*ws_type`

Workstation type.

FORTRAN

pqwkc (*wkid, errind, conid, wtype*)

Input Parameters

integer wkid
Workstation identifier.

Output Parameters

integer errind
Error indicator.

integer conid
Connection identifier.

integer wtype
Workstation type.

Errors

None

Related Subroutines

None

INQUIRE WORKSTATION STATE TABLE LENGTHS (PHOP,*,*,*)

Purpose

Use Inquire Workstation State Table Lengths to inquire the maximum number of entries supported for workstation tables for the specified workstation type.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

2 Function Requires State (PHOP,*,*,*)

52 Workstation Type Not Recognized By Implementation

51 Information Not Available For Generic Workstation Type

59 Specified Workstation Does Not Have Output Capability

62 This Information Not Available For MO Workstation Type

Language Bindings

C

pinq_ws_st_table (*ws_type, err_ind, lengths*)

Input Parameters

Pint ws_type
Workstation type.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pws_st_tables *lengths*
Lengths of workstation tables.

FORTRAN

PQWKSL (*wtype*, *errind*, *mplbte*, *mpmbte*, *mtxbte*, *minbte*, *medbte*, *mpai*, *mcoli*, *vwtbi*)

Input Parameters

integer wtype
Workstation type.

Output Parameters

integer errind
Error indicator.

integer mplbte
Maximum number of polyline bundle table entries.

integer mpmbte
Maximum number of polymarker bundle table entries.

integer mtxbte
Maximum number of text bundle table entries.

integer minbte
Maximum number of interior bundle table entries.

integer medbte
Maximum number of edge bundle table entries.

integer mpai
Maximum number of pattern indexes.

integer mcoli
Maximum number of color indexes.

integer vwtbi
Maximum number of view table indexes.

Errors

None

Related Subroutines

- Inquire Workstation Connection And Type
- Set Color Representation
- Set edge Representation
- Set Interior Representation
- Set Polyline Representation
- Set Polymarker Representation
- Set Text Representation
- Set View Representation

INQUIRE WORKSTATION STATE VALUE (PHCL,WSCL,STCL,ARCL)

Purpose

Use Inquire Workstation State Value to inquire the current workstation state of the graPHIGS API. The workstation state is either Workstation Open (*WSOP*) or Workstation Closed (*WSCL*). then at least one workstation is open. If the state is *WSCL*, then no workstations are open.

Language Bindings

C

pinq_ws_st (*ws_st*)

Output Parameters

*Pws_st *ws_st*
Workstation state value (*0=PWS_ST_WSCL, 1=PWS_ST_WSOP*).

FORTRAN

PQWKST (*wksta*)

Output Parameters

integer wksta
Workstation state value (*0=PWSCL, 1=PWSOP*).

Errors

None

Related Subroutines

- Close Workstation
- Open Workstation

INQUIRE WORKSTATION TRANSFORMATION (PHOP,WSOP,*,*)

Purpose

Use Inquire Workstation Transformation to inquire the current and requested workstation transformation values of a specified workstation.

If your application has not updated the workstation, then the graPHIGS API returns a value of *PENDING*. In this case, the requested values reflect either the default settings or the settings established in the application by the Set Workstation Window, Set Workstation Window 3, Set Workstation Viewport and Set Workstation Viewport 3 subroutines. The current values reflect the workstation's current transformation values. As soon as the workstation is updated, the requested and current values are the same and the state is *NOT PENDING*. The values returned by the graPHIGS API are the window and viewport definitions.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

57 Specified Workstation Is Of Category MI

Language Bindings

C

pinq_ws_tran (*ws_id, err_ind, upd_st, req_win_lim, cur_win_lim, req_vp_lim, cur_vp_lim*)

Input Parameters

Pint ws_id
Workstation identifier.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pupd_st *upd_st*
Workstation transformation update state (*0=PUPD_NOT_PEND, 1=PUPD_PEND*).

*Plimit *req_win_lim*
Requested workstation window limits in NPC.

*Plimit *cur_win_lim*
Current workstation window limits in NPC.

*Plimit *req_vp_lim*
Requested workstation viewport limits in DC.

*Plimit *cur_vp_lim*
Current workstation viewport limits in DC.

FORTRAN

PQWKT (*wkid*, *errind*, *tus*, *rwindo*, *cwindo*, *rviewp*, *cviewp*)

Input Parameters

integer wkid
Workstation identifier.

Output Parameters

integer errind
Error indicator.

integer tus
Workstation transformation update state (*0=PNPEND, 1=PPEND*).

real rwindo(4)
Requested workstation window limits in NPC (*RWXMIN, RWXMAX, RWYMIN, RWYMAX*).

real cwindo(4)
Current workstation window limits in NPC. (*CWXMIN, CWXMAX, CWYMIN, CWYMAX*).

real rviewp(4)
Requested workstation viewport limits in DC (*RVXMIN, RVXMAX, RVYMIN, RVYMAX*).

real cviewp(4)
Requested workstation viewport limits in DC (*CVXMIN, CVXMAX, CVYMIN, CVYMAX*).

Errors

None

Related Subroutines

- Inquire Workstation Transformation 3
- Set Workstation Viewport
- Set Workstation Viewport 3

- Set Workstation Window
- Set Workstation Window 3

INQUIRE WORKSTATION TRANSFORMATION 3 (PHOP,WSOP,*,*)

Purpose

Use Inquire Workstation Transformation 3 to inquire the current and requested workstation transformation values of a specified workstation.

If your application has not updated the workstation, then the graPHIGS API returns a value of *PENDING*. In this case, the requested values reflect either the default settings or the settings established in the application by the Set Workstation Window, Set Workstation Window 3, Set Workstation Viewport, and Set Workstation Viewport 3, subroutines. The current values reflect the workstation's current transformation values. As soon as the workstation is updated, the requested and current values are the same and the state is *NOT PENDING*. The values returned by the graPHIGS API are the window and viewport definitions.

If the information is available, then the graPHIGS API sets the error indicator to zero and returns the values in the output parameters. If the information is unavailable, then the values returned in the output parameters are unpredictable and the graPHIGS API sets the error indicator to one of the following errors:

3 Function Requires State (PHOP,WSOP,*,*)

54 Specified Workstation Is Not Open

57 Specified Workstation Is Of Category MI

Language Bindings

C

pinq_ws_tran3 (*ws_id, err_ind, upd_st, req_win_lim, cur_win_lim, req_vp_lim, cur_vp_lim*)

Input Parameters

Pint ws_id
Workstation identifier.

Output Parameters

*Pint *err_ind*
Error indicator.

*Pupd_st *upd_st*
Workstation transformation update state (*0=PUPD_NOT_PEND, 1=PUPD_PEND*).

*Plimit3 *req_win_lim*
Requested workstation window limits in NPC.

*Plimit3 *cur_win_lim*
Current workstation window limits in NPC.

*Plimit3 *req_vp_lim*
Requested workstation viewport limits in DC.

*Plimit3 *cur_vp_lim*
Current workstation viewport limits in DC.

FORTRAN

PQWKT3 (*wkid*, *errind*, *tus*, *rwindo*, *cwindo*, *rviewp*, *cviewp*)

Input Parameters

integer wkid
Workstation identifier.

Output Parameters

integer errind
Error indicator.

integer tus
Workstation transformation update state (*0=PNPEND, 1=PPEND*).

real rwindo(6)
Requested workstation window limits in NPC (*RWXMIN, RWXMAX, RWYMIN, RWYMAX, RWZMIN, RWZMAX*).

real cwindo(6)
Current workstation window limits in NPC (*CWXMIN, CWXMAX, CWYMIN, CWYMAX, CWZMIN, CWZMAX*).

real rviewp(6)
Requested workstation viewport limits in DC (*RVXMIN, RVXMAX, RVYMIN, RVYMAX, RVZMIN, RVZMAX*).

real cviewp(6)
Requested workstation viewport limits in DC (*CVXMIN, CVXMAX, CVYMIN, CVYMAX, CVZMIN, CVZMAX*).

Errors

None

Related Subroutines

- Set Workstation Viewport
- Set Workstation Viewport 3
- Set Workstation Window
- Set Workstation Window 3

Chapter 16. ISO PHIGS Transformations

All coordinate data in an ISO PHIGS implementation is conceptually manipulated as three-dimensional data. An application specifies a coordinate as an *x*, *y*, *z* triplet, or if the application specifies a *x*, *y* pair, *z*=0 is assumed. All points are then represented mathematically as column vectors as prescribed by the ISO PHIGS standard. Storage of transformation matrixes which are applied to these points or column vectors is defined by the individual ISO PHIGS bindings and described below.

3-by-3 Matrix

Let the elements of an ISO PHIGS 3x3 matrix be:

```
 _          _
|  a  b  c   |
|  d  e  f   |
|_ g  h  i  _|
```

C Binding

The ISO PHIGS C binding specifies that these elements be stored such that:

```
m[0][0] = a;  m[0][1] = b;  m[0][2] = c;
m[1][0] = d;  m[1][1] = e;  m[1][2] = f;
m[2][0] = g;  m[2][1] = h;  m[2][2] = i;
```

where *m* is of type *Pmatrix*.

FORTRAN Binding

The ISO PHIGS FORTRAN binding specifies that these elements be stored such that:

```
p[1,1] = a    p[2,1] = b    p[3,1] = c
p[1,2] = d    p[2,2] = e    p[3,2] = f
p[1,3] = g    p[2,3] = h    p[3,3] = i
```

where *p* is a 3 X 3 *real* matrix.

4-by-4 Matrix

Let the elements of an ISO PHIGS 4 X 4 matrix be:

```
 _          _
|  a  b  c  d  |
|  e  f  g  h  |
|  i  j  k  l  |
|_ m  n  o  p _|
```

C Binding

The ISO PHIGS C binding specifies that these elements be stored such that:

```
q[0][0] = a;  q[0][1] = b;  q[0][2] = c; q[0][3] = d;

q[1][0] = e;  q[1][1] = f;  q[1][2] = g; q[1][3] = h;

q[2][0] = i;  q[2][1] = j;  q[2][2] = k; q[2][3] = l;

q[3][0] = m;  q[3][1] = n;  q[3][2] = o; q[3][3] = p;
```

where *q* is of type *Pmatrix3*.

FORTRAN Binding

The ISO PHIGS FORTRAN binding specifies that these elements be stored such that:

```
t[1,1] = a    t[2,1] = b    t[3,1] = c   t[4,1] = d
t[1,2] = e    t[2,2] = f    t[3,2] = g   t[4,2] = h
t[1,3] = i    t[2,3] = j    t[3,3] = k   t[4,3] = l
t[1,4] = m    t[2,4] = n    t[3,4] = o   t[4,4] = p
```

where *t* is a 4 X 4 *real* matrix.

Chapter 17. FORTRAN Structure Content Data Records

This appendix contains the output parameters for structure content data records returned by the graPHIGS API for the ISO PHIGS FORTRAN subroutines.

The data is organized numerically by element type.

PENIL=1: (Nil)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Nil*,

- IL = 0
- IA = ()
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PEPL3=2: (Polyline 3)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Polyline 3*,

- IL = 1
- IA(1) = number of points in the polyline 3
- RL = 3*IA(1)
- RA = elements 1 through IA(1) contain the *x* components of the polyline 3
  elements IA(1)+1 through 2*IA(1) contain the *y* components of the polyline 3
  elements 2*IA(1)+1 through 3*IA(1) contain the *z* components of the polyline 3
- SL = 0
- LSTR = ()
- STR = ()

PEPL=3: (Polyline)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Polyline*,

- IL = 1
- IA(1) = number of points in the polyline
- RL = 2*IA(1)
- RA = elements 1 through IA(1) contain the *x* components of the polyline
  elements IA(1)+1 through 2*IA(1) contain the *y* components of the polyline
- SL = 0
- LSTR = ()
- STR = ()

PEPM3=4: (Polymarker 3)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Polymarker 3*,

- IL = 1
- IA(1) = number of points in the polymarker 3
- RL = 3*IA(1)

- RA = elements 1 through IA(1) contain the *x* components of the polymarker 3
  elements IA(1)+1 through 2*IA(1) contain the *y* components of the polymarker 3
  elements 2*IA(1)+1 through 3*IA(1) contain the *z* components of the polymarker 3
- SL = 0
- LSTR = ()
- STR = ()

PEPM=5: (Polymarker)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Polymarker*,

- IL = 1
- IA(1) = number of points in the polymarker
- RL = 2*IA(1)
- RA = elements 1 through IA(1) contain the *x* components of the polymarker
  elements IA(1)+1 through 2*IA(1) contain the *y* components of the polymarker
- SL = 0
- LSTR = ()
- STR = ()

PETX3=6: (Text 3)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Text 3*,

- IL = 0
- IA = ()
- RL = 9
- RA(1) = *x* coordinate of text point (MC)
- RA(2) = *y* coordinate of text point (MC)
- RA(3) = *z* coordinate of text point (MC)
- RA(4) = *x* coordinate of first text direction vector (MC)
- RA(5) = *y* coordinate of first text direction vector (MC)
- RA(6) = *z* coordinate of first text direction vector (MC)
- RA(7) = *x* coordinate of second text direction vector (MC)
- RA(8) = *y* coordinate of second text direction vector (MC)
- RA(9) = *z* coordinate of second text direction vector (MC)
- SL = 1
- LSTR(1) = length of string
- STR(1) = string

PETX=7: (Text)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Text*,

- IL = 0
- IA = ()
- RL = 2
- RA(1) = *x* coordinate of text point (MC)
- RA(2) = *y* coordinate of text point (MC)
- SL = 1
- LSTR(1) = length of string

- STR(1) = string

PEATR3=8: (Annotation Text Relative 3)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Annotation Text Relative 3*,

- IL = 0
- IA = ()
- RL = 6
- RA(1) = *x* coordinate of reference point (MC)
- RA(2) = *y* coordinate of reference point (MC)
- RA(3) = *z* coordinate of reference point (MC)
- RA(4) = *x* coordinate of annotation point (NPC)
- RA(5) = *y* coordinate of annotation point (NPC)
- RA(6) = *z* coordinate of annotation point (NPC)
- SL = 1
- LSTR(1) = length of string
- STR(1) = string

PEATR=9: (Annotation Text Relative)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Annotation Text Relative*,

- IL = 0
- IA = ()
- RL = 4
- RA(1) = *x* coordinate of reference point (MC)
- RA(2) = *y* coordinate of reference point (MC)
- RA(3) = *x* coordinate of annotation point (NPC)
- RA(4) = *y* coordinate of annotation point (NPC)
- SL = 1
- LSTR(1) = length of string
- STR(1) = string

PEFA3=10: (Fill Area 3)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Fill Area 3*,

- IL = 1
- IA(1) = number of points in the fill area 3
- RL = 3*IA(1)
- RA = elements 1 through IA(1) contain the *x* components of the fill area 3
  elements IA(1) +1 through 2*IA(1) contain the *y* components of the fill area 3
  elements 2* IA(1)+1 through 3*IA(1) contain the *z* components of the fill area 3
- SL = 0
- LSTR = ()
- STR = ()

PEFA=11: (Fill Area)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Fill Area*,

- IL = 1
- IA(1) = number of points in the fill area
- RL = 2*IA(1)
- RA = elements 1 through IA(1) contain the *x* components of the fill area
  elements IA(1) +1 through 2*IA(1) contain the *y* components of the fill area
- SL = 0
- LSTR = ()
- STR = ()

PEFAS3=12: (Fill Area Set 3)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Fill Area Set 3*,

- IL = number of point lists in fill area set 3
- IA() = array of end indexes for point lists in fill area set 3
- RL = 3*(IA(IL))
- RA = elements 1 through (IA(IL)) contain the *x* components of the fill area set 3
  elements IA(IL) +1 through 2*(IA(IL)) contain the *y* components of the fill area set 3
  elements 2* IA(IL)+1 through 3*(IA()) contain the *z* components of the fill area set 3
- SL = 0
- LSTR = ()
- STR = ()

PEFAS=13: (Fill Area Set)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Fill Area Set*,

- IL = number of point lists in fill area set
- IA() = array of end indexes for point lists in fill area set
- RL = 2*(IA(IL))
- RA = elements 1 through (IA(IL)) contain the *x* components of the fill area set
  elements IA(IL) +1 through 2*(IA(IL)) contain the *y* components of the fill area set set
- SL = 0
- LSTR = ()
- STR = ()

PECA3=14: (Cell Array 3)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Cell Array 3*,

- IL = 2+(IA(1)*IA(2))
- IA(1) = *x* dimension of cell index array
- IA(2) = *y* dimension of cell index array
- IA(3) to IA(IA(1)*IA(2) +2) = cell index array in column major order (e.g.,IA(3) = COLIA(1,1), IA(4) = COLIA(2,1), ...)
- RL = 9
- RA(1) = *x* coordinate of P (MC)
- RA(2) = *y* coordinate of P (MC)
- RA(3) = *z* coordinate of P (MC)
- RA(4) = *x* coordinate of Q (MC)

- RA(5) = *y* coordinate of Q (MC)
- RA(6) = *z* coordinate of Q (MC)
- RA(7) = *x* coordinate of R (MC)
- RA(8) = *y* coordinate of R (MC)
- RA(9) = *z* coordinate of R (MC)
- SL = 0
- LSTR = ()
- STR = ()

PECA=15: (Cell Array)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Cell Array*,

- IL = 2+(IA(1)*IA(2))
- IA(1) = *x* dimension of cell index array
- IA(2) = *y* dimension of cell index array
- IA(3) to IA((IA(1)*IA(2))+2) = cell index array in column major order (e.g.,IA(3) = COLIA(1,1), IA(4) = COLIA(2,1), ...)
- RL = 4
- RA(1) = *x* coordinate of P (MC)
- RA(2) = *y* coordinate of P (MC)
- RA(3) = *x* coordinate of Q (MC)
- RA(4) = *y* coordinate of Q (MC)
- SL = 0
- LSTR = ()
- STR = ()

PEGDP3=16: (Generalized Drawing Primitive 3)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Generalized Drawing Primitive 3*,

- IL = 2
- IA(1) = number of points in the generalized drawing primitive 3
- IA(2) = generalized drawing primitive 3 identifier
- RL = 3*IA(1)
- RA = elements 1 through IA(1) contain the *x* components of the GDP3 point list
  elements IA(1) +1 through 2*IA(1) contain the *y* components of the GDP 3 point list
  elements 2*IA(1)+1 through 3*IA(1) contain the *z* components of the GDP 3 point list
- SL = number of 80 character data records(LDR for PGDP3 subroutine)
- LSTR(1) to LSTR(SL) = 80
- STR(1) to STR(SL) = GDP data records (DATREC(1) to DATREC(SL) for PGDP3 subroutine)

PEGDP=17: (Generalized Drawing Primitive)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Generalized Drawing Primitive*,

- IL = 2
- IA(1) = number of points in the generalized drawing primitive
- IA(2) = generalized drawing primitive identifier

- RL = 2*IA(1)
- RA = elements 1 through IA(1) contain the *x* components of the GDP point list
  elements IA(1) +1 through 2*IA(1) contain the *y* components of the GDP point list
- SL = number of 80 character data records(LDR for PGDP subroutine)
- LSTR(1) to LSTR(SL) = 80
- STR(1) to STR(SL) = GDP data records (DATREC(1) to DATREC(SL) for PGDP subroutine)

PEPLI=18: (Set Polyline Index)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Polyline Index*,

- IL = 1
- IA(1) = polyline index
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PEPMI=19: (Set Polymarker Index)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Polymarker Index*,

- IL = 1
- IA(1) = polymarker index
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PETXI=20: (Set Text Index)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Text Index*,

- IL = 1
- IA(1) = text index
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PEII=21: (Set Interior Index)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Interior Index*,

- IL = 1
- IA(1) = interior index
- RL = 0
- RA = ()
- SL = 0

- LSTR = ()
- STR = ()

PEEDI=22: (Set Edge Index)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Edge Index*,

- IL = 1
- IA(1) = edge index
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PELN=23: (Set Linetype)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Linetype*,

- IL = 1
- IA(1) = linetype
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PELWSC=24: (Set Linewidth Scale Factor)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Linewidth Scale Factor*,

- IL = 0
- IA = ()
- RL = 1
- RA(1) = linewidth scale factor
- SL = 0
- LSTR = ()
- STR = ()

PEPLCI=25: (Set Polyline Color Index)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Polyline Color Index*,

- IL = 1
- IA(1) = polyline color index
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PEMK=26: (Set Marker Type)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Marker Type*,

- IL = 1
- IA(1) = marker type
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PEMKSC=27: (Set Marker Size Scale Factor)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Marker Size Scale Factor*,

- IL = 0
- IA = ()
- RL = 1
- RA(1) = marker size scale factor
- SL = 0
- LSTR = ()
- STR = ()

PEPMCI=28: (Set Polymarker Color Index)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Polymarker Color Index*,

- IL = 1
- IA(1) = polymarker color index
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PETXFN=29: (Set Text Font)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Text Font*,

- IL = 1
- IA(1) = text font
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PETXPR=30: (Set Text Precision)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Text Precision*,

- IL = 1
- IA(1) = text precision(PSTRP,PCHARP,PSTRKP)
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PECHXP=31: (Set Character Expansion Factor)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Character Expansion Factor*,

- IL = 0
- IA = ()
- RL = 1
- RA(1) = character expansion factor
- SL = 0
- LSTR = ()
- STR = ()

PECHSP=32: (Set Character Spacing)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Character Spacing*,

- IL = 0
- IA = ()
- RL = 1
- RA(1) = character spacing
- SL = 0
- LSTR = ()
- STR = ()

PETXCI=33: (Set Text Color Index)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Text Color Index*,

- IL = 1
- IA(1) = text color index
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PECHH=34: (Set Character Height)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Character Height*,

- IL = 0
- IA = ()
- RL = 1

- RA(1) = character height
- SL = 0
- LSTR = ()
- STR = ()

PECHUP=35: (Set Character Up Vector)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Character Up Vector*,

- IL = 0
- IA = ()
- RL = 2
- RA(1) = *x* component of character up vector
- RA(2) = *y* component of character up vector
- SL = 0
- LSTR = ()
- STR = ()

PETXP=36: (Set Text Path)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Text Path*,

- IL = 1
- IA(1) = text path (*PRIGHT,PLEFT,PUP,PDOWN*)
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PETXAL=37: (Set Text Alignment)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Text Alignment*,

- IL = 2
- IA(1) = horizontal text alignment (*PAHNOR,PALEFT,PACENT,PARITE*)
- IA(2) = vertical text alignment (*PAVNOR,PATOP,PACAP,PAHALF,PABASE,PABOTT*)
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PEATCH=38: (Set Annotation Text Character Height)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Annotation Text Character Height*,

- IL = 0
- IA = ()
- RL = 1

- RA(1) = annotation text character height
- SL = 0
- LSTR = ()
- STR = ()

PEATCU=39: (Set Annotation Text Character Up Vector)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Annotation Text Character Up Vector*,

- IL = 0
- IA = ()
- RL = 2
- RA(1) = *x* component of annotation text character up vector
- RA(2) = *y* component of annotation text character up vector
- SL = 0
- LSTR = ()
- STR = ()

PEATP=40: (Set Annotation Text Path)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Annotation Text Path*,

- IL = 1
- IA(1) = annotation text path (*PRIGHT,PLEFT,PUP,PDOWN*)
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PEATAL=41: (Set Annotation Text Alignment)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Annotation Text Alignment*,

- IL = 2
- IA(1) = horizontal text alignment (*PAHNOR,PALEFT,PACENT,PARITE*)
- IA(2) = vertical text alignment (*PAVNOR,PATOP,PACAP,PAHALF,PABASE,PABOTT*)
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PEANST=42: (Set Annotation Style)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Annotation Style*,

- IL = 1
- IA(1) = annotation style
- RL = 0

- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PEIS=43: (Set Interior Style)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Interior Style*,
- IL = 1
- IA(1) = interior style (*PHOLLO,PSOLID,PPATTR,PHATCH,PISEMP*)
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PEISI=44: (Set Interior Style Index)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Interior Style Index*,
- IL = 1
- IA(1) = interior style index
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PEICI=45: (Set Interior Color Index)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Interior Color Index*,
- IL = 1
- IA(1) = interior color index
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PEEDFG=46: (Set Edge Flag)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Edge Flag*,
- IL = 1
- IA(1) = edge flag (*POFF,PON*)
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PEEDT=47: (Set Edgetype)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Edgetype*,

- IL = 1
- IA(1) = edgetype
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PEEWSC=48: (Set Edgewidth Scale Factor)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Edgewidth Scale Factor*,

- IL = 0
- IA = ()
- RL = 1
- RA(1) = edgewidth scale factor
- SL = 0
- LSTR = ()
- STR = ()

PEEDCI=49: (Set Edge Color Index)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Edge Color Index*,

- IL = 1
- IA(1) = edge color index
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PEPA=50: (Set Pattern Size)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Pattern Size*,

- IL = 0
- IA = ()
- RL = 2
- RA(1) = *x* component of pattern size (MC)
- RA(2) = *y* component of pattern size (MC)
- SL = 0
- LSTR = ()
- STR = ()

PEPRPV=51: (Set Pattern Reference Point and Vectors)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Pattern Reference Point and Vectors*,

- IL = 0
- IA = ()
- RL = 9
- RA(1) = *x* coordinate of pattern reference point (MC)
- RA(2) = *y* coordinate of pattern reference point (MC)
- RA(3) = *z* coordinate of pattern reference point (MC)
- RA(4) = *x* component of pattern reference vector 1 (MC) (i.e.,DVX(1))
- RA(5) = *y* component of pattern reference vector 1 (MC) (i.e.,DVY(1))
- RA(6) = *z* component of pattern reference vector 1 (MC) (i.e.,DVZ(1))
- RA(7) = *x* component of pattern reference vector 2 (MC) (i.e.,DVX(2))
- RA(8) = *y* component of pattern reference vector 2 (MC) (i.e.,DVY(2))
- RA(9) = *z* component of pattern reference vector 2 (MC) (i.e.,DVZ(2))
- SL = 0
- LSTR = ()
- STR = ()

PEPARF=52: (Set Pattern Reference Point)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Pattern Reference Point*,

- IL = 0
- IA = ()
- RL = 2
- RA(1) = *x* coordinate of pattern reference point (MC)(i.e.RFX)
- RA(2) = *y* coordinate of pattern reference point (MC)(i.e.RFY)
- SL = 0
- LSTR = ()
- STR = ()

PEADS=53: (Add Names To Set)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Add Names To Set*,

- IL = number of names in the set
- IA = array of name set elements
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PERES=54: (Remove Names From Set)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Remove Names From Set*,

- IL = number of names in the set
- IA = array of name set elements

- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PEIASF=55: (Set Individual ASF)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Individual ASF*,

- IL = 2
- IA(1) = attribute identifier (*PLN,PLWSC,PPLCI,PMK,PMKSC,PPMCI,PTXFN,PTXPR,PCHXP,PCHSP,PTXCI, PIS,PISI,PICI,PEDFG,PEDT,PEWSC,PEDCI*)
- IA(2) = aspect source flag value (*PBUNDL,PINDIV*)
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PEHRID=56: (Set HLHSR Identifier)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set HLHSR Identifier*,

- IL = 1
- IA(1) = HLHSR identifier
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PELMT3=57: (Set Local Transformation 3)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Local Transformation 3*,

- IL = 1
- IA(1) = composition type (*PCPRE,PCPOST,PCREPL*)
- RL = 16
- RA(1) = (1,1) component of local transformation matrix
- RA(2) = (2,1) component of local transformation matrix
- RA(3) = (3,1) component of local transformation matrix
- RA(4) = (4,1) component of local transformation matrix
- RA(5) = (1,2) component of local transformation matrix
- RA(6) = (2,2) component of local transformation matrix
- RA(7) = (3,2) component of local transformation matrix
- RA(8) = (4,2) component of local transformation matrix
- RA(9) = (1,3) component of local transformation matrix
- RA(10) = (2,3) component of local transformation matrix

- RA(11) = (3,3) component of local transformation matrix
- RA(12) = (4,3) component of local transformation matrix
- RA(13) = (1,4) component of local transformation matrix
- RA(14) = (2,4) component of local transformation matrix
- RA(15) = (3,4) component of local transformation matrix
- RA(16) = (4,4) component of local transformation matrix
- SL = 0
- LSTR = ()
- STR = ()

PELMT=58: (Set Local Transformation)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Local Transformation*,

- IL = 1
- IA(1) = composition type (*PCPRE,PCPOST,PCREPL*)
- RL = 9
- RA(1) = (1,1) component of local transformation matrix
- RA(2) = (2,1) component of local transformation matrix
- RA(3) = (3,1) component of local transformation matrix
- RA(4) = (1,2) component of local transformation matrix
- RA(5) = (2,2) component of local transformation matrix
- RA(6) = (3,2) component of local transformation matrix
- RA(7) = (1,3) component of local transformation matrix
- RA(8) = (2,3) component of local transformation matrix
- RA(9) = (3,3) component of local transformation matrix
- SL = 0
- LSTR = ()
- STR = ()

PEGMT3=59: (Set Global Transformation 3)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Global Transformation 3*,

- IL = 0
- IA = ()
- RL = 16
- RA(1) = (1,1) component of global transformation matrix
- RA(2) = (2,1) component of global transformation matrix
- RA(3) = (3,1) component of global transformation matrix
- RA(4) = (4,1) component of global transformation matrix
- RA(5) = (1,2) component of global transformation matrix
- RA(6) = (2,2) component of global transformation matrix
- RA(7) = (3,2) component of global transformation matrix
- RA(8) = (4,2) component of global transformation matrix
- RA(9) = (1,3) component of global transformation matrix
- RA(10) = (2,3) component of global transformation matrix

- RA(11) = (3,3) component of global transformation matrix
- RA(12) = (4,3) component of global transformation matrix
- RA(13) = (1,4) component of global transformation matrix
- RA(14) = (2,4) component of global transformation matrix
- RA(15) = (3,4) component of global transformation matrix
- RA(16) = (4,4) component of global transformation matrix
- SL = 0
- LSTR = ()
- STR = ()

PEGMT=60: (Set Global Transformation)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Global Transformation*,

- IL = 0
- IA = ()
- RL = 9
- RA(1) = (1,1) component of global transformation matrix
- RA(2) = (2,1) component of global transformation matrix
- RA(3) = (3,1) component of global transformation matrix
- RA(4) = (1,2) component of global transformation matrix
- RA(5) = (2,2) component of global transformation matrix
- RA(6) = (3,2) component of global transformation matrix
- RA(7) = (1,3) component of global transformation matrix
- RA(8) = (2,3) component of global transformation matrix
- RA(9) = (3,3) component of global transformation matrix
- SL = 0
- LSTR = ()
- STR = ()

PEMCV3=61: (Set Modeling Clipping Volume 3)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Modeling Clipping Volume 3*,

- IL = 2
- IA(1) = modeling clipping operator
- IA(2) = number of modeling clipping half-spaces in list
- RL = 6*IA(2)
- FOR i = 0 TO IA(2)—1
- RA((6*i)+1) = *x* coordinate of point defining plane of half-space (MC)
- RA((6*i)+2) = *y* coordinate of point defining plane of half-space (MC)
- RA((6*i)+3) = *z* coordinate of point defining plane of half-space (MC)
- RA((6*i)+4) = *dx* component of normal vector defining the plane of half-space (MC)
- RA((6*i)+5) = *dy* component of normal vector defining the plane of half-space (MC)
- RA((6*i)+6) = *dz* component of normal vector defining the plane of half-space (MC)
- SL = 0
- LSTR = ()

- STR = ()

PEMCV=62: (Set Modeling Clipping Volume)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Modeling Clipping Volume*,

- IL = 2
- IA(1) = modeling clipping operator
- IA(2) = number of modeling clipping half-spaces in list
- RL = 4*IA(2)
- FOR i = 0 TO IA(2)—1
- RA((4*i)+1) = *x* coordinate of point defining plane of half-space (MC)
- RA((4*i)+2) = *y* coordinate of point defining plane of half-space (MC)
- RA((4*i)+3) = *dx* component of normal vector defining the plane of half-space (MC)
- RA((4*i)+4) = *dy* component of normal vector defining the plane of half-space (MC)
- SL = 0
- LSTR = ()
- STR = ()

PEMCLI=63: (Set Modeling Clipping Indicator)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Modeling Clipping Indicator*,

- IL = 1
- IA(1) = modeling clipping indicator (*PNCLIP, PCLIP*)
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PERMCV=64: (Restore Modeling Clipping Volume)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Restore Modeling Clipping Volume*,

- IL = 0
- IA = ()
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PEVWI=65: (Set View Index)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set View Index*,

- IL = 1
- IA(1) = view index
- RL = 0

- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PEEXST=66: (Execute Structure)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Execute Structure*,
- IL = 1
- IA(1) = structure identifier
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PELB=67: (Label)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Label*,
- IL = 1
- IA(1) = label identifier
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

PEAP=68: (Application Data)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Application Data*,
- IL = 0
- IA = ()
- RL = 0
- RA = ()
- SL = number of application data records (LDR for PAP subroutine)
- LSTR(1) to LSTR(SL) = 80
- STR(1) to STR(SL) = application data records (DATREC(1) to DATREC(SL) for PAP subroutine)

PEGSE=69: (Generalized Structure Element)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Generalized Structure Element*,
- IL = 1
- IA(1) = generalized structure element identifier
- RL = 0
- RA = ()
- SL = number of GSE data records (LDR for PGSE subroutine)
- LSTR(1) to LSTR(SL) = 80

- STR(1) to STR(SL) = GSE data records (DATREC(1) to DATREC(SL) for PGSE subroutine)

PEPKID=70: (Set Pick Identifier)

Output parameters for *STRUCTURE CONTENT DATA RECORD* for element type *Set Pick Identifier*,

- IL = 1
- IA(1) = pick identifier
- RL = 0
- RA = ()
- SL = 0
- LSTR = ()
- STR = ()

Chapter 18. ISO PHIGS C Type and Macro Definitions

```
/*--------------------------------------------------------------------*/
/* ISO PHIGS C binding type definitions and macro definitions         */
/*--------------------------------------------------------------------*/

/* Environmental type definitions */
typedef float Pfloat;
typedef int   Pint;


/* Implementation dependent type definitions */

/*--Pchoice_data   CHOICE DATA RECORD---------------------------------*/
typedef struct {

  union Pchoice_pets  {

     struct Pchoice_pet_r1  {
        Pint           number;          /* number of whatever         */
     }  pet_r1;

     struct Pchoice_pet_r2  {
        Pint           num_prompts;     /* number of prompts          */
        Ppr_switch        *prompts;     /* array of prompts           */
     }  pet_r2;

     struct Pchoice_pet_r3  {
        Pint           num_strings;     /* number of choice strings   */
        char           **strings;       /* array of choice strings    */
     }  pet_r3;

     struct Pchoice_pet_r4  {
        Pint           num_strings;     /* number of choice strings   */
        char           **strings;       /* array of choice strings    */
     }  pet_r4;

     struct Pchoice_pet_r5  {
        Pint           struct_id;       /* structure identifier       */
        Pint           num_pick_ids;    /* number of pick identifiers */
        Pint           *pick_ids;       /* array of pick identifiers  */
     }  pet_r5;

  } pets;

} Pchoice_data;

/*--Pchoice_data3   CHOICE DATA RECORD 3------------------------------*/

typedef struct {

  union Pchoice3_pets  {

     struct Pchoice3_pet_r1  {
        Pint           number;          /* number of whatever         */
     }  pet_r1;

     struct Pchoice3_pet_r2  {
        Pint           num_prompts;     /* number of prompts          */
        Ppr_switch     *prompts;        /* array of prompts           */
     }  pet_r2;

     struct Pchoice3_pet_r3  {
        Pint           num_strings;     /* number of choice strings   */
        char           **strings;       /* array of choice strings    */
     }  pet_r3;
```

```
    struct Pchoice3_pet_r4  {
       Pint           num_strings;     /* number of choice strings   */
       char           **strings;       /* array of choice strings    */
    }  pet_r4;

    struct Pchoice3_pet_r5  {
       Pint           struct_id;       /* struct identifier          */
       Pint           num_pick_ids;    /* number of pick identifiers */
       Pint           *pick_ids;       /* array of pick identifiers  */
    }  pet_r5;

  } pets;

} Pchoice_data3;


/*--Pcolr_rep   COLOR REPRESENTATION---------------------------------*/

typedef union {

  Prgb       rgb;       /* Red Green Blue color specification         */
  Pcieluv    cieluv;    /* CIE L*U*V* color specification             */
  Phls       hls;       /* Hue Lightness Saturation color specificat. */
  Phsv       hsv;       /* Hue Saturation Value color specification.  */
  Pdata      unsupp;    /* Color in an unsupported color model        */

} Pcolr_rep;


/*--Pescape_in_data   ESCAPE INPUT DATA RECORD-----------------------*/

typedef union {

  struct Pescape_in_r1 {
     char        *string;           /* escape registration dependent  */
  } escape_in_r1;

} Pescape_in_data;

/*--Pescape_out_data   ESCAPE OUT DATA RECORD-------------------------*/

typedef union {

  struct Pescape_out_r1 {
     char        *string;           /* escape registration dependent  */
  } escape_out_r1;

  struct Pescape_out_r2 {
     Pint        ws_id;             /* workstation identifier         */
     char        *string;           /* escape output data record      */
  } escape_out_r2;

} Pescape_out_data;


/*--Pgdp_data   GDP DATA RECORD--------------------------------------*/

typedef union {

  struct Pgdp_r1 {
     char        *string;           /* registration dependent         */
  } gdp_r1;

  Pdata          unsupp;            /* unsupported GDP data record    */

} Pgdp_data;
```

```
/*--Pgdp_data3   GDP DATA RECORD 3-----------------------------------*/

typedef union {

  struct Pgdp3_r1 {
     char        *string;          /* registration dependent         */
  } gdp3_r1;

  Pdata          unsupp;           /* unsupported GDP3 data record   */

} Pgdp_data3;


/*--Pgse_data   GSE DATA RECORD--------------------------------------*/

typedef union {

  struct  Pgse_r1 {
     char        *string;          /* registration dependent         */
  } gse_r1;

  Pdata          unsupp;           /* unsupported GSE data record    */

} Pgse_data;


/*--Pitem_data   ITEM DATA RECORD------------------------------------*/

typedef union {

  char           *string;          /* Metafile Records               */

  Pdata          unsupp;           /* unsupported Metafile item data */

} Pitem_data;


/*--Ploc_data   LOCATOR DATA RECORD----------------------------------*/

typedef struct {

  union Ploc_pets  {

     struct Ploc_pet_r1  {
        Pint           number;          /* number of whatever         */
     }  pet_r1;

     struct Ploc_pet_r2  {
        Pint           number;          /* number of whatever         */
     }  pet_r2;

     struct Ploc_pet_r3  {
        Pint           number;          /* number of whatever         */
     }  pet_r3;

     struct Ploc_pet_r4  {
        Pline_attrs       line_attrs;   /* polyline attributes        */
     }  pet_r4;

     struct Ploc_pet_r5  {
        Pline_fill_ctrl_flag   line_fill_ctrl_flag; /* control flag   */
        union Ploc_attrs  {
           Pline_attrs line_attrs;      /* polyline attributes        */

           Pint_attrs  int_attrs;       /* interior attributes        */
```

```
            struct Ploc_fill_set {
               Pint_attrs   int_attrs;   /* interior attributes        */
               Pedge_attrs  edge_attrs;  /* edge attributes            */
            }  fill_set;

         }  attrs;
      }  pet_r5;

      struct Ploc_pet_r6  {
         Pint           number;          /* number of whatever         */
      }  pet_r6;

   }  pets;

} Ploc_data;

/*--Ploc_data3   LOCATOR DATA RECORD 3-------------------------------*/

typedef struct {

   union Ploc3_pets  {

      struct Ploc3_pet_r1  {
         Pint           number;          /* number of whatever         */
      }  pet_r1;

      struct Ploc3_pet_r2  {
         Pint           number;          /* number of whatever         */
      }  pet_r2;

      struct Ploc3_pet_r3  {
         Pint           number;          /* number of whatever         */
      }  pet_r3;

      struct Ploc3_pet_r4  {
         Pline_attrs       line_attrs;   /* polyline attributes        */
      }  pet_r4;

      struct Ploc3_pet_r5  {
         Pline_fill_ctrl_flag   line_fill_ctrl_flag; /* control flag   */

         union Ploc3_attrs  {
            Pline_attrs   line_attrs;    /* polyline attributes        */

            Pint_attrs  int_attrs;       /* interior attributes        */

            struct Ploc3_fill_set  {
               Pint_attrs   int_attrs;   /* interior attributes        */
               Pedge_attrs  edge_attrs;  /* edge attributes            */
            }  fill_set;

         }  attrs;

      }  pet_r5;

      struct Ploc3_pet_r6  {
         Pint           number;          /* number of whatever         */
      }  pet_r6;

   }  pets;

} Ploc_data3;


/*--Ppick_data   PICK DATA RECORD------------------------------------*/
```

```
typedef struct {

  union Ppick_pets {

     struct Ppick_pet_r1  {
        char           *string;         /* implementation dependent   */
     }  pet_r1;

  } pets;

}  Ppick_data;

/*--Ppick_data3   PICK DATA RECORD 3---------------------------------*/

typedef struct {

  union Ppick3_pets  {

     struct Ppick3_pet_r1  {
        char           *string;         /* implementation dependent   */
     }  pet_r1;

  } pets;

}  Ppick_data3;


/*--Pstring_data   STRING DATA RECORD---------------------------------*/

typedef struct {

  Pint                in_buf_size;
  Pint                init_pos;

  union Pstring_pets {

     struct Pstring_pet_r1    {
        char           **string;        /* implementation dependent   */
     }  pet_r1;

  } pets;

}  Pstring_data;


/*--Pstring_data3   STRING DATA RECORD 3-----------------------------*/

typedef struct {

  Pint                in_buf_size;
  Pint                init_pos;

  union Pstring3_pets  {

     struct Pstring3_pet_r1   {
        char           **string;        /* implementation dependent   */
     }  pet_r1;

  } pets;

}  Pstring_data3;


/*--Pstroke_data   STROKE DATA RECORD---------------------------------*/

typedef struct {
```

```
  Pint                in_buf_size;     /* input buffer size          */
  Pint                init_pos;        /* initial editing position   */
  Pfloat              x_interval;      /* x interval                 */
  Pfloat              y_interval;      /* y interval                 */
  Pfloat              time_interval;   /* time interval              */

  union Pstroke_pets  {

     struct Pstroke_pet_r1 {
        char           **string;        /* implementation dependent   */
     }  pet_r1;

     struct Pstroke_pet_r2  {
        char           **string;        /* implementation dependent   */
     }  pet_r2;

     struct Pstroke_pet_r3  {
        Pmarker_attrs  marker_attrs;    /* marker attributes          */
     }  pet_r3;

     struct Pstroke_pet_r4  {
        Pline_attrs    line_attrs;      /* line attributes            */
     }  pet_r4;

  } pets;

}  Pstroke_data;


/*--Pstroke_data3   STROKE DATA RECORD 3------------------------------*/

typedef struct {

  Pint                in_buf_size;     /* input buffer size          */
  Pint                init_pos;        /* initial editing position   */
  Pfloat              x_interval;      /* x interval                 */
  Pfloat              y_interval;      /* y interval                 */
  Pfloat              z_interval;      /* z interval                 */
  Pfloat              time_interval;   /* time interval              */

  union Pstroke3_pets  {

     struct Pstroke3_pet_r1  {
        char           **string;        /* implementation dependent   */
     }  pet_r1;

     struct Pstroke3_pet_r2  {
        char           **string;        /* implementation dependent   */
     }  pet_r2;

     struct Pstroke3_pet_r3 {
        Pmarker_attrs  marker_attrs;    /* marker attributes          */
     }  pet_r3;

     struct Pstroke3_pet_r4 {
        Pline_attrs    line_attrs;      /* line attributes            */
     }  pet_r4;

 } pets;

}  Pstroke_data3;


/*--Pval_data   VALUATOR DATA RECORD----------------------------------*/
```

```
typedef struct {

  Pfloat              low_value;       /* low value of valuator range */
  Pfloat              high_value;      /* high value of valuator range*/

  union Pval_pets  {

     struct Pval_pet_r1 {
        char          **string;         /* implementation dependent   */
     } pet_r1;

  } pets;

} Pval_data;


/*--Pval_data3   VALUATOR DATA RECORD 3------------------------------*/

typedef struct {

  Pfloat              low_value;       /* low value of valuator range */
  Pfloat              high_value;      /* high value of valuator range*/

  union Pval3_pets  {

     struct Pval3_pet_r1 {
        char          **string;         /* implementation dependent   */
     } pet_r1;

  } pets;

} Pval_data3;


/* Implementation independent type definitions */

/*--Par_file   ARCHIVE FILE------------------------------------------*/

typedef struct {

  Pint           id;                /* archive file identifier        */
  char           *name;             /* archive file name              */

} Par_file;


/*--Par_file_list   ARCHIVE FILE LIST--------------------------------*/

typedef struct {

  Pint           num_ar_files;      /* number of archive files        */
  Par_file       *ar_files;         /* list of archive files          */

} Par_file_list;


/*--Par_st   ARCHIVE STATE-------------------------------------------*/

typedef enum {
  PST_ARCL
  PST_AROP
} Par_st;


/*--Pasf   ASPECT SOURCE FLAG----------------------------------------*/

typedef enum {
```

```
  PASF_BUNDLED
  PASF_INDIV
} Pasf;


/*--Paspect   ASPECT-------------------------------------------------*/

typedef enum {
  PASPECT_LINETYPE
  PASPECT_LINEWIDTH
  PASPECT_LINE_COLR_IND
  PASPECT_MARKER_TYPE
  PASPECT_MARKER_SIZE
  PASPECT_MARKER_COLR_IND
  PASPECT_TEXT_FONT
  PASPECT_TEXT_PREC
  PASPECT_CHAR_EXPAN
  PASPECT_CHAR_SPACE
  PASPECT_TEXT_COLR_IND
  PASPECT_INT_STYLE
  PASPECT_INT_STYLE_IND
  PASPECT_INT_COLR_IND
  PASPECT_EDGE_FLAG
  PASPECT_EDGETYPE
  PASPECT_EDGEWIDTH
  PASPECT_EDGE_COLR_IND
} Paspect;

/*--Pattrs   ATTRIBUTES USED-----------------------------------------*/

typedef enum {
  PATTR_LINE
  PATTR_MARKER
  PATTR_TEXT
  PATTR_INT
  PATTR_EDGE
} Pattrs;


/*--Pcieluv   CIE L*U*V*---------------------------------------------*/

typedef struct {

  Pfloat         cieluv_x;           /* x coefficient               */
  Pfloat         cieluv_y;           /* y coefficient               */
  Pfloat         cieluv_y_lum;       /* y luminance                 */

} Pcieluv;


/*--Pclip_ind   CLIPPING INDICATOR-----------------------------------*/

typedef enum {
  PIND_NO_CLIP
  PIND_CLIP
} Pclip_ind;


/*--Pcolr_avail   COLOR AVAILABILITY---------------------------------*/

typedef enum {
  PAVAIL_MONOCHR
  PAVAIL_COLR
} Pcolr_avail;


/*--Pcolr_facs   COLOR FACILITIES-----------------------------------*/
```

```
typedef struct {

  Pint           num_colrs;     /* number of colors                  */
  Pcolr_avail    colr_avail;    /* color availability                */
  Pint           num_pred_inds; /* number of predefined color indexes */
  Pcieluv        prim_colrs[3]/* primary colors                     */
} Pcolr_facs;


/*--Pcompose_type   COMPOSITION TYPE---------------------------------*/

typedef enum {
  PTYPE_PRECONCAT
  PTYPE_POSTCONCAT
  PTYPE_REPLACE
} Pcompose_type;


/*--Pconf_res   CONFLICT RESOLUTION----------------------------------*/

typedef enum {
  PRES_MAINTAIN
  PRES_ABANDON
  PRES_UPD
} Pconf_res;


/*--Pctrl_flag   CONTROL FLAG----------------------------------------*/

typedef enum {
  PFLAG_COND
  PFLAG_ALWAYS
} Pctrl_flag;


/*--Pdata   DATA-----------------------------------------------------*/

typedef struct {

  size_t         size;              /* size of data                 */
  void           *data;             /* pointer to data              */

} Pdata;


/*--Pdc_units   DEVICE COORDINATE UNITS------------------------------*/

typedef enum {
  PDC_METRES
  PDC_OTHER
} Pdc_units;


/*--Pdefer_mode   DEFERRAL MODE--------------------------------------*/

typedef enum {
  PDEFER_ASAP
  PDEFER_BNIG
  PDEFER_BNIL
  PDEFER_ASTI
  PDEFER_WAIT
}  Pdefer_mode;


/*--Pdisp_space_size   DISPLAY SPACE SIZE----------------------------*/
```

```
typedef struct {

  Pdc_units      dc_units;        /* device coordinate units          */
  Pfloat_size    size_dc;         /* device size in coordinate units  */
  Pint_size      size_raster;     /* device size in raster units      */

} Pdisp_space_size;


/*--Pdisp_space_size3   DISPLAY SPACE SIZE 3-------------------------*/

typedef struct {

  Pdc_units      dc_units;        /* device coordinate units          */
  Pfloat_size3   size_dc;         /* device volume in coordinate units*/
  Pint_size3     size_raster;     /* device volume in raster units    */

} Pdisp_space_size3;


/*--Pdisp_surf_empty   DISPLAY SURFACE EMPTY-------------------------*/

typedef enum {
  PSURF_NOT_EMPTY
  PSURF_EMPTY
} Pdisp_surf_empty;


/*--Pdyns_structs   DYNAMICS OF STRUCTURES----------------------------*/

typedef struct {

  Pdyn_mod       content;           /* structure content             */
  Pdyn_mod       post;              /* post structure                */
  Pdyn_mod       unpost;            /* unpost structure              */
  Pdyn_mod       del;               /* delete structures             */
  Pdyn_mod       ref;               /* structure reference           */

} Pdyns_structs;


/*--Pdyns_ws_attrs   DYNAMICS OF WORKSTATION ATTRIBUTES--------------*/

typedef struct {

  Pdyn_mod       line_bundle;       /* polyline bundle representation */
  Pdyn_mod       marker_bundle;     /* polymarker bundle representatio*/
  Pdyn_mod       text_bundle;       /* text bundle representation     */
  Pdyn_mod       int_bundle;        /* interior bundle representation */
  Pdyn_mod       edge_bundle;       /* edge bundle representation     */
  Pdyn_mod       pat_rep;           /* pattern representation         */
  Pdyn_mod       colr_rep;          /* color representation           */
  Pdyn_mod       view_rep;          /* view representation            */
  Pdyn_mod       ws_tran;           /* workstation transform          */
  Pdyn_mod       highl_filter;      /* highlight filter               */
  Pdyn_mod       invis_filter;      /* invisibility filter            */
  Pdyn_mod       hlhsr_mode;        /* HLHSR mode                     */

} Pdyns_ws_attrs;


/*--Pdyn_mod   DYNAMIC MODIFICATION----------------------------------*/

typedef enum {
  PDYN_IRG
  PDYN_IMM
  PDYN_CBS
```

```
} Pdyn_mod;


/*--Pecho_switch   ECHO SWITCH---------------------------------------*/

typedef enum {
  PSWITCH_NO_ECHO
  PSWITCH_ECHO
} Pecho_switch;


/*--Pedge_attrs   EDGE ATTRIBUTES-----------------------------------*/

typedef struct {

  Pasf           flag_asf;          /* edge flag asf                */
  Pasf           type_asf;          /* edge type asf                */
  Pasf           width_asf;         /* edge width asf               */
  Pasf           colr_ind_asf;      /* edge color index asf         */
  Pint           ind;               /* edge index                   */
  Pedge_bundle   bundle;            /* edge bundle                  */

} Pedge_attrs;


/*--Pedge_bundle   EDGE BUNDLE---------------------------------------*/

typedef struct {

  Pedge_flag     flag;              /* edge flag                    */
  Pint           type;              /* edgetype                     */
  Pfloat         width;             /* edgewidth scale factor       */
  Pint           colr_ind;          /* edge color index             */

} Pedge_bundle;


/*--Pedge_facs   EDGE FACILITIES-------------------------------------*/

typedef struct {

  Pint_list   types;           /* list of edge types                */
  Pint        num_widths;      /* number of available edge widths   */
  Pfloat      nom_width;       /* nominal edge width                */
  Pfloat      min_width;       /* min edge width                    */
  Pfloat      max_width;       /* max edge width                    */
  Pint        num_pred_inds;   /* number of predefined bundle indexes */

} Pedge_facs;


/*--Pelem_data   ELEMENT DATA----------------------------------------*/

typedef union {

  Pint                int_data;            /* integer valued data    */
  Pfloat              float_data;          /* float valued data      */
  Ppoint_list3        point_list3;         /* list of 3d points      */
  Ppoint_list         point_list;          /* list of 2d points      */
  Ppoint_list_list3   point_list_list3;    /* list of 3d point lists */
  Ppoint_list_list    point_list_list;     /* list of 2d point lists */

  struct Pelem_text3 {
                      Ppoint3 pos;         /* text position          */
                      Pvec3   dir[2]      /* direction vectors      */
                      char    *char_string; /* char string           */
  } text3;
```

```
struct Pelem_text {
                    Ppoint  pos;          /* text position          */
                    char    *char_string; /* character string       */
} text;

struct Pelem_anno_text_rel3 {
                    Ppoint3  ref_point;    /* reference point        */
                    Pvec3    offset;       /* annotation offset      */
                    char     *char_string; /* character string       */
} anno_text_rel3;

struct Pelem_anno_text_rel {
                    Ppoint  ref_point;    /* reference point        */
                    Pvec    offset;       /* annotation offset      */
                    char    *char_string; /* character string       */
} anno_text_rel;
struct Pelem_cell_array3 {
                    Pparal   paral;       /* parallelogram          */
                    Ppat_rep colr_array;  /* color array            */
} cell_array3;

struct Pelem_cell_array {
                    Prect    rect;        /* rectangle              */
                    Ppat_rep colr_array;  /* color array            */
} cell_array;

struct Pelem_gdp3 {
                    Pint     id;                /* GDP3 id          */
                    Ppoint_list3  point_list;   /* point list       */
                    Pgdp_data3    data;         /* data record      */
} gdp3;

struct Pelem_gdp {
                    Pint     id;                /* GDP id           */
                    Ppoint_list   point_list;   /* point list       */
                    Pgdp_data     data;         /* data record      */
} gdp;

Ptext_prec          text_prec;             /* text precision        */
Pvec                char_up_vec;           /* character up vector   */
Ptext_path          text_path;             /* text path             */
Ptext_align         text_align;            /* text alignment        */
Pint_style          int_style;             /* interior style        */
Pedge_flag          edge_flag;             /* edge flag             */
Ppoint              pat_ref_point;         /* pattern refer. point  */
Pfloat_size         pat_size;              /* pattern size          */

struct Pelem_pat_ref_point_vecs {
                    Ppoint3  ref_point;    /* pattern refer. point  */
                    Pvec3    ref_vec[2]  /* vectors               */
} pat_ref_point_vecs;

Pint_list           names;                 /* name sets             */

struct Pelem_asf {
                    Paspect  id;           /* attribute id          */
                    Pasf     source;       /* attribute source      */
} asf;

struct Pelem_local_tran3 {
                    Pcompose_type compose_type; /* composition type */
                    Pmatrix3      matrix;       /* matrix           */
} local_tran3;

struct Pelem_local_tran {
                    Pcompose_type compose_type; /* composition type */
```

```
                    Pmatrix       matrix;       /* matrix           */
  } local_tran;

  Pmatrix3            global_tran3;          /* global transform3     */
  Pmatrix             global_tran;           /* global transform      */

  struct Pelem_model_clip3 {
                    Pint              op;          /* operator      */
                    Phalf_space_list3 half_spaces; /*half space list*/
  } model_clip3;
  struct Pelem_model_clip {
                    Pint              op;          /* operator      */
                    Phalf_space_list  half_spaces; /*half space list*/
  } model_clip;

  Pclip_ind           clip_ind;             /* clipping indicator    */
  Pdata               appl_data;            /* application data      */

  struct Pelem_gse {
                    Pint       id;        /* GSE id                */
                    Pgse_data  data;      /* GSE data record       */
  } gse;

} Pelem_data;


/*--Pelem_ref   ELEMENT REFERENCE-------------------------------------*/

typedef struct {

  Pint   struct_id;              /* structure id                     */
  Pint   elem_pos;               /* element position                 */

} Pelem_ref;


/*--Pelem_ref_list   ELEMENT REFERENCE LIST---------------------------*/

typedef struct {

  Pint      num_elem_refs;       /* number of element references      */
  Pelem_ref *elem_refs;          /* list of element references        */

} Pelem_ref_list;


/*--Pelem_ref_list_list   ELEMENT REFERENCE LIST LIST-----------------*/

typedef struct {

  Pint           num_elem_ref_lists; /* no. of element reference lists*/
  Pelem_ref_list *elem_ref_lists;     /* list of element refer. lists */

} Pelem_ref_list_list;


/*--Pelem_type   ELEMENT TYPE-----------------------------------------*/

typedef enum {
  PELEM_ALL
  PELEM_NIL
  PELEM_POLYLINE3
  PELEM_POLYLINE
  PELEM_POLYMARKER3
  PELEM_POLYMARKER
  PELEM_TEXT3
  PELEM_TEXT
```

```
  PELEM_ANNO_TEXT_REL3
  PELEM_ANNO_TEXT_REL
  PELEM_FILL_AREA3
  PELEM_FILL_AREA
  PELEM_FILL_AREA_SET3
  PELEM_FILL_AREA_SET
  PELEM_CELL_ARRAY3
  PELEM_CELL_ARRAY
  PELEM_GDP3
  PELEM_GDP
  PELEM_LINE_IND
  PELEM_MARKER_IND
  PELEM_TEXT_IND
  PELEM_INT_IND
  PELEM_EDGE_IND
  PELEM_LINETYPE
  PELEM_LINEWIDTH
  PELEM_LINE_COLR_IND
  PELEM_MARKER_TYPE
  PELEM_MARKER_SIZE
  PELEM_MARKER_COLR_IND
  PELEM_TEXT_FONT
  PELEM_TEXT_PREC
  PELEM_CHAR_EXPAN
  PELEM_CHAR_SPACE
  PELEM_TEXT_COLR_IND
  PELEM_CHAR_HT
  PELEM_CHAR_UP_VEC
  PELEM_TEXT_PATH
  PELEM_TEXT_ALIGN
  PELEM_ANNO_CHAR_HT
  PELEM_ANNO_CHAR_UP_VEC
  PELEM_ANNO_PATH
  PELEM_ANNO_ALIGN
  PELEM_ANNO_STYLE
  PELEM_INT_STYLE
  PELEM_INT_STYLE_IND
  PELEM_INT_COLR_IND
  PELEM_EDGE_FLAG
  PELEM_EDGETYPE
  PELEM_EDGEWIDTH
  PELEM_EDGE_COLR_IND
  PELEM_PAT_SIZE
  PELEM_PAT_REF_POINT_VECS
  PELEM_PAT_REF_POINT
  PELEM_ADD_NAMES_SET
  PELEM_REMOVE_NAMES_SET
  PELEM_INDIV_ASF
  PELEM_HLHSR_ID
  PELEM_LOCAL_MODEL_TRAN3
  PELEM_LOCAL_MODEL_TRAN
  PELEM_GLOBAL_MODEL_TRAN3
  PELEM_GLOBAL_MODEL_TRAN
  PELEM_MODEL_CLIP_VOL3
  PELEM_MODEL_CLIP_VOL
  PELEM_MODEL_CLIP_IND
  PELEM_RESTORE_MODEL_CLIP_VOL
  PELEM_VIEW_IND
  PELEM_EXEC_STRUCT
  PELEM_LABEL
  PELEM_APPL_DATA
  PELEM_GSE
  PELEM_PICK_ID
} Pelem_type;

/*--Pelem_type_list   ELEMENT TYPE LIST-------------------------------*/
```

```
typedef struct {

  Pint           num_elem_types;          /* number of element types */
  Pelem_type     *elem_types;             /* list of element types   */

} Pelem_type_list;


/*--Perr_mode   ERROR MODE-----------------------------------------*/

typedef enum {
  PERR_OFF
  PERR_ON
} Perr_mode;


/*--Pfilter   FILTER-----------------------------------------------*/

typedef struct {

  Pint_list      incl_set;          /* inclusion set                */
  Pint_list      excl_set;          /* exclusion set                */

} Pfilter;


/*--Pfilter_list   FILTER LIST-------------------------------------*/

typedef struct {

  Pint           num_filters;       /* number of filters            */
  Pfilter        *filters;          /* list of filters              */

} Pfilter_list;


/*--Pfloat_size   FLOAT SIZE---------------------------------------*/

typedef struct {

  Pfloat         size_x;            /* x size                       */
  Pfloat         size_y;            /* y size                       */

} Pfloat_size;


/*--Pfloat_size3   FLOAT SIZE 3------------------------------------*/

typedef struct {

  Pfloat         size_x;            /* x size                       */
  Pfloat         size_y;            /* y size                       */
  Pfloat         size_z;            /* z size                       */

} Pfloat_size3;


/*--Pgse_id_dep   GSE IDENTIFIER DEPENDENCY------------------------*/

typedef struct {

  Pint           id;             /* GSE identifier                  */
  Pws_dep_ind    ind;            /* WS independent/dependent indicator*/

} Pgse_id_dep;
```

```
/*--Pgse_id_dep_list   GSE IDENTIFIER DEPENDENCY LIST-----------------*/

typedef struct {

  Pint         num_id_facs;     /* # of identifiers/dependency element*/
  Pgse_id_dep  *id_facs;        /* list of GSE facilities             */

} Pgse_id_dep_list;


/*--Phalf_space   HALF SPACE-----------------------------------------*/

typedef struct {

  Ppoint         point;             /* point                         */
  Pvec           norm;              /* normal                        */

} Phalf_space;


/*--Phalf_space3   HALF SPACE 3--------------------------------------*/

typedef struct {

  Ppoint3        point;             /* point                         */
  Pvec3          norm;              /* normal                        */

} Phalf_space3;


/*--Phalf_space_list   HALF SPACE LIST-------------------------------*/

typedef struct {

  Pint           num_half_spaces;   /* number of half spaces         */
  Phalf_space    *half_spaces;      /* list of half spaces           */

} Phalf_space_list;


/*--Phalf_space_list3   HALF SPACE LIST 3----------------------------*/

typedef struct {

  Pint           num_half_spaces;   /* number of half spaces         */
  Phalf_space3   *half_spaces;      /* list of half spaces           */

} Phalf_space_list3;


/*--Phls   HUE LIGHTNESS SATURATION----------------------------------*/

typedef struct {

  Pfloat         hue;                /* hue                          */
  Pfloat         lightness;          /* lightness                    */
  Pfloat         satur;              /* saturation                   */

} Phls;

/*--Phor_text_align   HORIZONTAL TEXT ALIGNMENT----------------------*/

typedef enum {
  PHOR_NORM
  PHOR_LEFT
  PHOR_CTR
  PHOR_RIGHT
```

```
} Phor_text_align;


/*--Phsv   HUE SATURATION VALUE--------------------------------------*/

typedef struct {

  Pfloat         hue;               /* hue                          */
  Pfloat         satur;             /* saturation                   */
  Pfloat         value;             /* value                        */

} Phsv;


/*--Pinq_type   INQUIRE TYPE-----------------------------------------*/

typedef enum {
  PINQ_SET
  PINQ_REALIZED
} Pinq_type;


/*--Pint_attrs   INTERIOR ATTRIBUTES---------------------------------*/

typedef struct {

  Pasf           style_asf;         /* interior asf                 */
  Pasf           style_ind_asf;     /* interior style asf           */
  Pasf           colr_ind_asf;      /* interior color index asf     */
  Pint           ind;               /* interior index               */
  Pint_bundle    bundle;            /* interior bundle              */

} Pint_attrs;


/*--Pint_bundle   INTERIOR BUNDLE------------------------------------*/

typedef struct {

  Pint_style     style;             /* interior style               */
  Pint           style_ind;         /* interior style index         */
  Pint           colr_ind;          /* interior color index         */

} Pint_bundle;


/*--Pint_facs   INTERIOR FACILITIES----------------------------------*/

typedef struct {

  Pint           num_int_styles; /* number of interior styles       */
  Pint_style     int_styles[5] /* list of available interior styles */
  Pint_list      hatch_styles;   /* list of available hatch styles  */
  Pint           num_pred_inds; /* no. of predefined bundle indexes  */

} Pint_facs;


/*--Pint_list   INTEGER LIST-----------------------------------------*/

typedef struct {

  Pint           num_ints;          /* number of Pints in list      */
  Pint           *ints;             /* list of integers             */

} Pint_list;
```

```
/*--Pint_size   INTEGER SIZE----------------------------------------*/

typedef struct {

  Pint           size_x;           /* x size                       */
  Pint           size_y;           /* y size                       */

} Pint_size;


/*--Pint_size3   INTEGER SIZE 3------------------------------------*/

typedef struct {

  Pint           size_x;           /* x size                       */
  Pint           size_y;           /* y size                       */
  Pint           size_z;           /* z size                       */

} Pint_size3;


/*--Pint_style   INTERIOR STYLE------------------------------------*/

typedef enum {
  PSTYLE_HOLLOW
  PSTYLE_SOLID
  PSTYLE_PAT
  PSTYLE_HATCH
  PSTYLE_EMPTY
} Pint_style;


/*--Pin_class   INPUT CLASS----------------------------------------*/

typedef enum {
  PIN_NONE
  PIN_LOC
  PIN_STROKE
  PIN_VAL
  PIN_CHOICE
  PIN_PICK
  PIN_STRING
} Pin_class;


/*--Pin_status   INPUT STATUS--------------------------------------*/

typedef enum {
  PIN_STATUS_NONE
  PIN_STATUS_OK
  PIN_STATUS_NO_IN
} Pin_status;

/*--Plimit   LIMIT-------------------------------------------------*/

typedef struct {

  Pfloat         x_min;            /* x min                        */
  Pfloat         x_max;            /* x max                        */
  Pfloat         y_min;            /* y min                        */
  Pfloat         y_max;            /* y max                        */

} Plimit;


/*--Plimit3   LIMIT 3----------------------------------------------*/
```

```
typedef struct {

  Pfloat         x_min;             /* x min                          */
  Pfloat         x_max;             /* x max                          */
  Pfloat         y_min;             /* y min                          */
  Pfloat         y_max;             /* y max                          */
  Pfloat         z_min;             /* z min                          */
  Pfloat         z_max;             /* z max                          */

} Plimit3;


/*--Pline_attrs   POLYLINE ATTRIBUTES--------------------------------*/

typedef struct {

  Pasf           type_asf;           /* line type asf                 */
  Pasf           width_asf;          /* line width asf                */
  Pasf           colr_ind_asf;       /* line color index asf          */
  Pint           ind;                /* line index                    */
  Pline_bundle   bundle;             /* line bundle                   */

} Pline_attrs;


/*--Pline_bundle   POLYLINE BUNDLE-----------------------------------*/

typedef struct {

  Pint           type;               /* line type                     */
  Pfloat         width;              /* linewidth scale factor        */
  Pint           colr_ind;           /* color index                   */

} Pline_bundle;


/*--Pline_facs   POLYLINE FACILITIES---------------------------------*/

typedef struct {

  Pint_list      types;             /* list of line types             */
  Pint           num_widths;        /* number of available linewidths */
  Pfloat         nom_width;         /* nominal linewidth              */
  Pfloat         min_width;         /* min linewidth                  */
  Pfloat         max_width;         /* max linewidth                  */
  Pint           num_pred_inds;     /* no. of predefined bundle indexes*/

} Pline_facs;

/*--Pline_fill_ctrl_flag   POLYLINE FILL CONTROL FLAG----------------*/

typedef enum {
  PFLAG_LINE
  PFLAG_FILL
  PFLAG_FILL_SET
} Pline_fill_ctrl_flag;


/*--Pmarker_attrs   MARKER ATTRIBUTES--------------------------------*/

typedef struct {

  Pasf           type_asf;          /* marker type asf               */
  Pasf           size_asf;          /*marker style asf               */
  Pasf           colr_ind_asf;      /* marker color index asf        */
  Pint           ind;               /* marker index                  */
  Pmarker_bundle bundle;            /* marker bundle                 */
```

```
} Pmarker_attrs;


/*--Pmarker_bundle   POLYMARKER BUNDLE--------------------------------*/

typedef struct {

  Pint           type;              /* marker type                   */
  Pfloat         size;              /* marker size scale factor      */
  Pint           colr_ind;          /* color index                   */

} Pmarker_bundle;


/*--Pmarker_facs   POLYMARKER FACILITIES------------------------------*/

typedef struct {

  Pint_list      types;         /* list of marker types              */
  Pint           num_sizes;     /* number of available marker sizes  */
  Pfloat         nom_size;      /* nominal marker size               */
  Pfloat         min_size;      /* min marker size                   */
  Pfloat         max_size;      /* max marker size                   */
  Pint           num_pred_inds; /* number of predefined bundle indexes*/

} Pmarker_facs;


/*--Pmatrix   MATRIX--------------------------------------------------*/

typedef Pfloat Pmatrix [3][3]


/*--Pmatrix3   MATRIX 3-----------------------------------------------*/

typedef Pfloat Pmatrix3 [4][4]


/*--Pmod_mode   MODIFICATION MODE-------------------------------------*/

typedef enum {
  PMODE_NIVE
  PMODE_UWOR
  PMODE_UQUM
} Pmod_mode;


/*--Pmore_simult_events   MORE SIMULTANEOUS EVENTS--------------------*/

typedef enum {
  PSIMULT_NO_MORE
  PSIMULT_MORE
} Pmore_simult_events;


/*--Pnum_in   NUMBER OF INPUT DEVICES---------------------------------*/

typedef struct {

  Pint           loc;             /* locators                      */
  Pint           stroke;          /* strokes                       */
  Pint           val;             /* valuators                     */
  Pint           choice;          /* choices                       */
  Pint           pick;            /* picks                         */
  Pint           string;          /* strings                       */
```

```
} Pnum_in;


/*--Popen_struct_status   OPEN STRUCTURE STATUS----------------------*/

typedef enum {
  PSTRUCT_NONE
  PSTRUCT_OPEN
} Popen_struct_status;


/*--Pop_mode   OPERATING MODE----------------------------------------*/

typedef enum {
  POP_REQ
  POP_SAMPLE
  POP_EVENT
} Pop_mode;


/*--Pparal   PARALLELOGRAM-------------------------------------------*/

typedef struct {

  Ppoint3        p;                /* point p                       */
  Ppoint3        q;                /* point q                       */
  Ppoint3        r;                /* point r                       */

} Pparal;


/*--PPATH_ORDER   PATH ORDER-----------------------------------------*/

typedef enum {
  PORDER_TOP_FIRST
  PORDER_BOTTOM_FIRST
} Ppath_order;


/*--Ppat_rep   PATTERN REPRESENTATION--------------------------------*/

typedef struct {

  Pint_size      dims;             /* pattern's dimensions          */
  Pint           *colr_array;      /* color index array             */

} Ppat_rep;


/*--Ppick_path   PICK PATH-------------------------------------------*/

typedef struct {

  Pint            depth;           /* pick path depth               */
  Ppick_path_elem *path_list;      /* pick path list                */

} Ppick_path;


/*--Ppick_path_elem   PICK PATH ELEMENT------------------------------*/

typedef struct {

  Pint           struct_id;        /* structure identifier          */
  Pint           pick_id;          /* pick identifier               */
  Pint           elem_pos;         /* element sequence number       */
```

```
} Ppick_path_elem;

/*--Ppoint   POINT----------------------------------------------------*/

typedef struct {

  Pfloat         x;                /* x coordinate                  */
  Pfloat         y;                /* y coordinate                  */

} Ppoint;

/*--Ppoint3    POINT 3--------------------------------------------------*/

typedef struct {

  Pfloat         x;                /* x coordinate                  */
  Pfloat         y;                /* y coordinate                  */
  Pfloat         z;                /* z coordinate                  */

} Ppoint3;

/*--Ppoint_list   POINT LIST-----------------------------------------*/

typedef struct {

  Pint           num_points;       /* number of Ppoints in the list  */
  Ppoint         *points;          /* list of points                 */

} Ppoint_list;

/*--Ppoint_list3   POINT LIST 3--------------------------------------*/

typedef struct {

  Pint           num_points;       /* number of Ppoint3s in the list */
  Ppoint3        *points;          /* list of points                 */

} Ppoint_list3;

/*--Ppoint_list_list   POINT LIST LIST-------------------------------*/

typedef struct {

  Pint           num_point_lists;  /* number of point lists          */
  Ppoint_list    *point_lists;     /* list of point lists            */

} Ppoint_list_list;

/*--Ppoint_list_list3   POINT LIST LIST 3----------------------------*/

typedef struct {

  Pint           num_point_lists;  /* number of point lists          */
  Ppoint_list3   *point_lists;     /* list of point lists            */

} Ppoint_list_list3;

/*--Pposted_struct   POSTED STRUCTURE--------------------------------*/

typedef struct {
```

```
  Pint     id;                   /* structure id                    */
  Pfloat   disp_pri;             /* display priority                */

} Pposted_struct;


/*--Pposted_struct_list   POSTED STRUCTURE LIST----------------------*/

typedef struct {

  Pint           num_postings;    /* number of structure postings     */
  Pposted_struct *postings;       /* list of postings                 */

} Pposted_struct_list;


/*--Pproj_type   PROJECTION TYPE-------------------------------------*/

typedef enum {
  PTYPE_PARAL
  PTYPE_PERSPECT
} Pproj_type;


/*--Ppr_switch   PROMPT SWITCH---------------------------------------*/

typedef enum {
  PPR_OFF
  PPR_ON
} Ppr_switch;


/*--Prect   RECTANGLE------------------------------------------------*/

typedef struct {

  Ppoint         p;                /* point p                        */
  Ppoint         q;                /* point q                        */

} Prect;


/*--Pref_flag   REFERENCE FLAG---------------------------------------*/

typedef enum {
  PFLAG_DEL
  PFLAG_KEEP
} Pref_flag;


/*--Pregen_flag   REGENERATION FLAG----------------------------------*/

typedef enum {
  PFLAG_POSTPONE
  PFLAG_PERFORM
} Pregen_flag;


/*--Prel_pri   RELATIVE PRIORITY-------------------------------------*/

typedef enum {
  PPRI_HIGHER
  PPRI_LOWER
} Prel_pri;


/*--Prgb   RED GREEN BLUE--------------------------------------------*/
```

```
typedef struct {

  Pfloat         red;
  Pfloat         green;
  Pfloat         blue;

} Prgb;


/*--Psearch_dir   SEARCH DIRECTION-----------------------------------*/

typedef enum {
  PDIR_BACKWARD
  PDIR_FORWARD
} Psearch_dir;


/*--Psearch_status   SEARCH STATUS-----------------------------------*/

typedef enum {
  PSEARCH_STATUS_FAILURE
  PSEARCH_STATUS_SUCCESS
} Psearch_status;


/*--Pstore   STORE---------------------------------------------------*/

typedef void *Pstore;


/*--Pstruct_net_source   STRUCTURE NETWORK SOURCE--------------------*/

typedef enum {
  PNET_CSS
  PNET_AR
} Pstruct_net_source;

/*--Pstruct_st   STRUCTURE STATE-------------------------------------*/

typedef enum {
  PSTRUCT_ST_STCL
  PSTRUCT_ST_STOP
} Pstruct_st;


/*--Pstruct_status   STRUCTURE STATUS--------------------------------*/

typedef enum {
  PSTRUCT_STATUS_NON_EXISTENT
  PSTRUCT_STATUS_EMPTY
  PSTRUCT_STATUS_NOT_EMPTY
} Pstruct_status ;


/*--Psys_st   SYSTEM STATE-------------------------------------------*/

typedef enum {
  PSYS_ST_PHCL
  PSYS_ST_PHOP
} Psys_st;


/*--Ptext_align   TEXT ALIGNMENT-------------------------------------*/

typedef struct {
```

```
  Phor_text_align       hor;        /* horizontal component          */
  Pvert_text_align      vert;       /* vertical component            */

} Ptext_align;


/*--Ptext_bundle   TEXT BUNDLE--------------------------------------*/

typedef struct {

  Pint       font;               /* text font                       */
  Ptext_prec prec;               /* text precision                  */
  Pfloat     char_expan;         /* char expansion factor           */
  Pfloat     char_space;         /* character spacing               */
  Pint       colr_ind;           /* text color index                */

} Ptext_bundle;


/*--Ptext_facs   TEXT FACILITIES------------------------------------*/

typedef struct {

  Pint     num_font_precs;       /* number of fonts and precisions  */
  Ptext_font_prec *font_precs;   /* list of fonts and precisions    */
  Pint     num_char_hts;         /* number of character heights     */
  Pfloat   min_char_ht;          /* minimum  height                 */
  Pfloat   max_char_ht;          /* maximum height                  */
  Pint     num_char_expans;      /* # of character expansion factors */
  Pfloat   min_char_expan;       /* minimum expansion factor        */
  Pfloat   max_char_expan;       /* maximum expansion factor        */
  Pint     num_pred_inds;        /* no. of predefined bundle indexes */

} Ptext_facs;

/*--Ptext_font_prec   TEXT FONT AND PRECISION-----------------------*/

typedef struct {

  Pint           font;           /* text font                       */
  Ptext_prec     prec;           /* text precision                  */

} Ptext_font_prec;


/*--Ptext_path   TEXT PATH------------------------------------------*/

typedef enum {
  PPATH_RIGHT
  PPATH_LEFT
  PPATH_UP
  PPATH_DOWN
} Ptext_path;


/*--Ptext_prec   TEXT PRECISION-------------------------------------*/

typedef enum {
  PPREC_STRING
  PPREC_CHAR
  PPREC_STROKE
} Ptext_prec;


/*--Pupd_st   UPDATE STATE------------------------------------------*/

typedef enum {
```

```
  PUPD_NOT_PEND
  PUPD_PEND
} Pupd_st ;


/*--Pvec   VECTOR-----------------------------------------------------*/

typedef struct {

  Pfloat         delta_x;           /* delta x value                 */
  Pfloat         delta_y;           /* delta y value                 */

} Pvec;


/*--Pvec3   VECTOR 3--------------------------------------------------*/

typedef struct {

  Pfloat         delta_x;           /* delta x value                 */
  Pfloat         delta_y;           /* delta y value                 */
  Pfloat         delta_z;           /* delta z value                 */

} Pvec3;

/*--Pvert_text_align   VERTICAL TEXT ALIGNMENT-----------------------*/

typedef enum {
  PVERT_NORM
  PVERT_TOP
  PVERT_CAP
  PVERT_HALF
  PVERT_BASE
  PVERT_BOTTOM
}Pvert_text_align;


/*--Pview_map   VIEW MAPPING------------------------------------------*/

typedef struct {

  Plimit         win;               /* window limits                 */
  Plimit         proj_vp;           /* projection viewport limits    */

} Pview_map;


/*--Pview_map3   VIEW MAPPING 3---------------------------------------*/

typedef struct {

  Plimit         win;               /* window limits                 */
  Plimit3        proj_vp;           /* projection viewport limits    */
  Pproj_type     proj_type;         /* projection type               */
  Ppoint3        proj_ref_point;    /* projection reference point    */
  Pfloat         view_plane;        /* view plane distance           */
  Pfloat         back_plane;        /* back plane distance           */
  Pfloat         front_plane;       /* front plane distance          */

} Pview_map3;


/*--Pview_rep   VIEW REPRESENTATION-----------------------------------*/

typedef struct {

  Pmatrix        ori_matrix;        /* orientation matrix            */
```

```
  Pmatrix       map_matrix;       /* mapping matrix               */
  Plimit        clip_limit;       /* clipping limits              */
  Pclip_ind     xy_clip;          /* X-Y clipping indicator       */

} Pview_rep;


/*--Pview_rep3   VIEW REPRESENTATION 3-------------------------------*/

typedef struct {

  Pmatrix3      ori_matrix;       /* orientation matrix           */
  Pmatrix3      map_matrix;       /* mapping matrix               */
  Plimit3       clip_limit;       /* clipping limits              */
  Pclip_ind     xy_clip;          /* X-Y clipping indicator       */
  Pclip_ind     back_clip;        /* back clipping indicator      */
  Pclip_ind     front_clip;       /* front clipping indicator     */

} Pview_rep3;

/*--Pvisual_st   VISUAL STATE----------------------------------------*/

typedef enum {
  PVISUAL_ST_CORRECT
  PVISUAL_ST_DEFER
  PVISUAL_ST_SIMULATED
} Pvisual_st;


/*--Pws_cat   WORKSTATION CATEGORY-----------------------------------*/

typedef enum {
  PCAT_OUT
  PCAT_IN
  PCAT_OUTIN
  PCAT_MO
  PCAT_MI
} Pws_cat;


/*--Pws_class   WORKSTATION CLASS------------------------------------*/

typedef enum {
  PCLASS_VEC
  PCLASS_RASTER
  PCLASS_OTHER
} Pws_class;


/*--Pws_dep_ind   WORKSTATION DEPENDENCY INDICATOR-------------------*/

typedef enum {
  PWS_INDEP
  PWS_DEP
} Pws_dep_ind;


/*--Pws_st   WORKSTATION STATE---------------------------------------*/

typedef enum {
  PWS_ST_WSCL
  PWS_ST_WSOP
} Pws_st;


/*--Pws_st_tables   LENGTH OF WORKSTATION STATE TABLES---------------*/
```

```
typedef struct {

  Pint           line_bundles;      /* max.# of polyline table entries*/
  Pint           mark_bundles;      /* max.# of polymarker tbl entries*/
  Pint           text_bundles;      /* max.# of text table entries    */
  Pint           int_bundles;       /* max.# of interior table entries*/
  Pint           edge_bundles;      /* max.# of edge table entries    */
  Pint           pat_reps;          /* max.# of pattern table entries */
  Pint           colr_reps;         /* max.# of color table entries   */
  Pint           view_reps;         /* max.# of view table entries    */

} Pws_st_tables;
```

Function identifiers

/* Function identifiers */
(Ref #1.)

```
#define Pfn_open_phigs              (0)
#define Pfn_close_phigs             (1)
#define Pfn_open_ws                 (2)
#define Pfn_close_ws                (3)
#define Pfn_redraw_all_structs      (4)
#define Pfn_upd_ws                  (5)
#define Pfn_set_disp_upd_st         (6)
#define Pfn_message                 (7)
#define Pfn_polyline3               (8)
#define Pfn_polyline                (9)
#define Pfn_polymarker3            (10)
#define Pfn_polymarker             (11)
#define Pfn_text3                  (12)
#define Pfn_text                   (13)
#define Pfn_anno_text_rel3         (14)
#define Pfn_anno_text_rel          (15)
#define Pfn_fill_area3             (16)
#define Pfn_fill_area              (17)
#define Pfn_fill_area_set3         (18)
#define Pfn_fill_area_set          (19)
#define Pfn_cell_array3            (20)
#define Pfn_cell_array             (21)
#define Pfn_gdp3                   (22)
#define Pfn_gdp                    (23)
#define Pfn_set_line_ind           (24)
#define Pfn_set_marker_ind         (25)
#define Pfn_set_text_ind           (26)
#define Pfn_set_int_ind            (27)
#define Pfn_set_edge_ind           (28)
#define Pfn_set_linetype           (29)
#define Pfn_set_linewidth          (30)
#define Pfn_set_line_colr_ind      (31)
#define Pfn_set_marker_type        (32)
#define Pfn_set_marker_size        (33)
#define Pfn_set_marker_colr_ind    (34)
#define Pfn_set_text_font          (35)
#define Pfn_set_text_prec          (36)
#define Pfn_set_char_expan         (37)
#define Pfn_set_char_space         (38)
#define Pfn_set_text_colr_ind      (39)
#define Pfn_set_char_ht            (40)
#define Pfn_set_char_up_vec        (41)
#define Pfn_set_text_path          (42)
#define Pfn_set_text_align         (43)
#define Pfn_set_anno_char_ht       (44)
#define Pfn_set_anno_char_up_vec   (45)
#define Pfn_set_anno_path          (46)
#define Pfn_set_anno_align         (47)
#define Pfn_set_anno_style         (48)
```

```
#define Pfn_set_int_style          (49)
#define Pfn_set_int_style_ind      (50)
#define Pfn_set_int_colr_ind       (51)
#define Pfn_set_edge_flag          (52)
#define Pfn_set_edgetype           (53)
#define Pfn_set_edgewidth          (54)
#define Pfn_set_edge_colr_ind      (55)
#define Pfn_set_pat_size           (56)
#define Pfn_set_pat_ref_point_vecs (57)
#define Pfn_set_pat_ref_point      (58)
#define Pfn_add_names_set          (59)
#define Pfn_remove_names_set       (60)
#define Pfn_set_indiv_asf          (61)
#define Pfn_set_line_rep           (62)
#define Pfn_set_marker_rep         (63)
#define Pfn_set_text_rep           (64)
#define Pfn_set_int_rep            (65)
#define Pfn_set_edge_rep           (66)
#define Pfn_set_pat_rep            (67)
#define Pfn_set_colr_rep           (68)
#define Pfn_set_highl_filter       (69)
#define Pfn_set_invis_filter       (70)
#define Pfn_set_colr_model         (71)
#define Pfn_set_hlhsr_id           (72)
#define Pfn_set_hlhsr_mode         (73)
#define Pfn_set_local_tran3        (74)
#define Pfn_set_local_tran         (75)
#define Pfn_set_global_tran3       (76)
#define Pfn_set_global_tran        (77)
#define Pfn_set_model_clip_vol3    (78)
#define Pfn_set_model_clip_vol     (79)
#define Pfn_set_model_clip_ind     (80)
#define Pfn_restore_model_clip_vol (81)
#define Pfn_set_view_ind           (82)
#define Pfn_set_view_rep3          (83)
#define Pfn_set_view_rep           (84)
#define Pfn_set_view_tran_in_pri   (85)
#define Pfn_set_ws_win3            (86)
#define Pfn_set_ws_win             (87)
#define Pfn_set_ws_vp3             (88)
#define Pfn_set_ws_vp              (89)
#define Pfn_open_struct            (90)
#define Pfn_close_struct           (91)
#define Pfn_exec_struct            (92)
#define Pfn_label                  (93)
#define Pfn_appl_data              (94)
#define Pfn_gse                    (95)
#define Pfn_set_edit_mode          (96)
#define Pfn_copy_all_elems_struct  (97)
#define Pfn_set_elem_ptr           (98)
#define Pfn_offset_elem_ptr        (99)
#define Pfn_set_elem_ptr_label    (100)
#define Pfn_del_elem              (101)
#define Pfn_del_elem_range        (102)
#define Pfn_del_elems_labels      (103)
#define Pfn_empty_struct          (104)
#define Pfn_del_struct            (105)
#define Pfn_del_struct_net        (106)
#define Pfn_del_all_structs       (107)
#define Pfn_change_struct_id      (108)
#define Pfn_change_struct_refs    (109)
#define Pfn_change_struct_id_refs (110)
#define Pfn_post_struct           (111)
#define Pfn_unpost_struct         (112)
#define Pfn_unpost_all_structs    (113)
#define Pfn_open_ar_file          (114)
#define Pfn_close_ar_file         (115)
```

```
#define Pfn_ar_structs            (116)
#define Pfn_ar_struct_nets        (117)
#define Pfn_ar_all_structs        (118)
#define Pfn_set_conf_res          (119)
#define Pfn_ret_struct_ids        (120)
#define Pfn_ret_structs           (121)
#define Pfn_ret_struct_nets       (122)
#define Pfn_ret_all_structs       (123)
#define Pfn_ret_paths_ances       (124)
#define Pfn_ret_paths_descs       (125)
#define Pfn_del_structs_ar        (126)
#define Pfn_del_struct_nets_ar    (127)
#define Pfn_del_all_structs_ar    (128)
#define Pfn_set_pick_id           (129)
#define Pfn_set_pick_filter       (130)
#define Pfn_init_loc3             (131)
#define Pfn_init_loc              (132)
#define Pfn_init_stroke3          (133)
#define Pfn_init_stroke           (134)
#define Pfn_init_val3             (135)
#define Pfn_init_val              (136)
#define Pfn_init_choice3          (137)
#define Pfn_init_choice           (138)
#define Pfn_init_pick3            (139)
#define Pfn_init_pick             (140)
#define Pfn_init_string3          (141)
#define Pfn_init_string           (142)
#define Pfn_set_loc_mode          (143)
#define Pfn_set_stroke_mode       (144)
#define Pfn_set_val_mode          (145)
#define Pfn_set_choice_mode       (146)
#define Pfn_set_pick_mode         (147)
#define Pfn_set_string_mode       (148)
#define Pfn_req_loc3              (149)
#define Pfn_req_loc               (150)
#define Pfn_req_stroke3           (151)
#define Pfn_req_stroke            (152)
#define Pfn_req_val               (153)
#define Pfn_req_choice            (154)
#define Pfn_req_pick              (155)
#define Pfn_req_string            (156)
#define Pfn_sample_loc3           (157)
#define Pfn_sample_loc            (158)
#define Pfn_sample_stroke3        (159)
#define Pfn_sample_stroke         (160)
#define Pfn_sample_val            (161)
#define Pfn_sample_choice         (162)
#define Pfn_sample_pick           (163)
#define Pfn_sample_string         (164)
#define Pfn_await_event           (165)
#define Pfn_flush_events          (166)
#define Pfn_get_loc3              (167)
#define Pfn_get_loc               (168)
#define Pfn_get_stroke3           (169)
#define Pfn_get_stroke            (170)
#define Pfn_get_val               (171)
#define Pfn_get_choice            (172)
#define Pfn_get_pick              (173)
#define Pfn_get_string            (174)
#define Pfn_write_item            (175)
#define Pfn_get_item_type         (176)
#define Pfn_read_item             (177)
#define Pfn_interpret_item        (178)
#define Pfn_set_err_hand_mode     (179)
#define Pfn_escape                (180)
#define Pfn_set_err_hand          (181)
```

Error codes

```
/* Error codes                    */

/*                        <0       Implementation Dependent Errors */

#define PE_NO_ERROR        (0)   /* No Error                        */
/* State Errors */
#define PE_NOT_PHCL        (1)   /* Ignoring function, function re-  */
                                 /* quires state                     */
                                 /* (PHCL, WSCL, STCL, ARCL)         */

#define PE_NOT_PHOP        (2)   /* Ignoring function, function re-  */
                                 /* quires state                     */
                                 /* (PHOP, *, *, *)                  */

#define PE_NOT_WSOP        (3)   /* Ignoring function, function re-  */
                                 /* quires state                     */
                                 /* (PHOP, WSOP, *, *)               */

#define PE_NOT_CL          (4)   /* Ignoring function, function re-  */
                                 /* quires state                     */
                                 /* (PHOP, WSCL, STCL, ARCL)         */

#define PE_NOT_STOP        (5)   /* Ignoring function, function re-  */
                                 /* quires state                     */
                                 /* (PHOP, *, STOP, *)               */

#define PE_NOT_STCL        (6)   /* Ignoring function, function re-  */
                                 /* quires state                     */
                                 /* (PHOP, *, STCL, *)               */

#define PE_NOT_AROP        (7)   /* Ignoring function, function re-  */
                                 /* quires state                     */
                                 /* (PHOP, *, *, AROP)               */


/* Workstation Errors */
#define PE_BAD_CONN_ID     (50)  /* Ignoring function, connection    */
                                 /* identifier not recognized by the */
                                 /* implementation                   */

#define PE_WS_TYPE         (51)  /* Ignoring function, this informa- */
                                 /* tion is not yet available for    */
                                 /* this workstation type; open a    */
                                 /* workstation of this type and use */
                                 /* the specific workstation type    */

#define PE_BAD_WS_TYPE     (52)  /* Ignoring function, workstation   */
                                 /* type not recognized by the imple-*/
                                 /* mentation                        */

#define PE_DUP_WS_ID       (53)  /* Ignoring function, workstation   */
                                 /* identifier already in use        */


#define PE_WS_NOT_OPEN     (54)  /* Ignoring function, the specified */
                                 /* workstation is not open          */

#define PE_NO_OPEN_WS      (55)  /* Ignoring function, workstation   */
                                 /* can not be opened for an         */
                                 /* implementation dependent reason  */

#define PE_WS_NOT_MO       (56)  /* Ignoring function, specified     */
                                 /* workstation is not of category MO*/
```

```
#define PE_WS_MI           (57)  /* Ignoring function, specified     */
                                 /* workstation is of category MI    */

#define PE_WS_NOT_MI       (58)  /* Ignoring function, specified     */
                                 /* workstation is not of category MI*/


#define PE_WS_NO_OUTPUT    (59)  /* Ignoring function, the specified */
                                 /* workstation does not have output */
                                 /* capability (i.e. the workstation */
                                 /* category is neither OUTPUT, OUTIN*/
                                 /* nor MO)                          */

#define PE_WS_NOT_OUTIN    (60)  /* Ignoring function, specified     */
                                 /* workstation is not of category   */
                                 /* OUTIN                            */

#define PE_WS_NO_INPUT     (61)  /* Ignoring function, specified     */
                                 /* workstation is neither category  */
                                 /* INPUT nor category OUTIN         */

#define PE_WS_NOT_OUT      (62)  /* Ignoring function, specified     */
                                 /* workstation is neither category  */
                                 /* OUTPUT nor category OUTIN        */

#define PE_MAX_WS          (63)  /* Ignoring function, opening this  */
                                 /* workstation would exceed the     */
                                 /* maximum number of simultaneously */
                                 /* open workstations                */

#define PE_NO_GDP          (64)  /* Ignoring function, the specified */
                                 /* workstation type is not able to  */
                                 /* generate the specified           */
                                 /* generalized drawing primitive    */


/* Output Attribute Errors */
#define PE_BUN_IND_LT_1    (100) /* Ignoring function, the bundle    */
                                 /* index value is less than one     */

#define PE_REP_UNDEF       (101) /* Ignoring function, the specified */
                                 /* representation has not been      */
                                 /* defined.                         */

#define PE_REP_NOT_PREDEF  (102) /* Ignoring function, the specified */
                                 /* representation has not been      */
                                 /* predefined on this workstation   */

#define PE_MAX_BUN         (103) /* Ignoring function, setting this  */
                                 /* bundle table entry would exceed  */
                                 /* the maximum number of entries    */
                                 /* allowed in the workstation bundle*/
                                 /* table                            */

#define PE_BAD_LINETYPE    (104) /* Ignoring function, the specified */
                                 /* linetype is not available on the */
                                 /* specified workstation            */

#define PE_BAD_MARKER_TYPE (105) /* Ignoring function, the specified */
                                 /* marker type is not available on  */
                                 /* the specified workstation        */

#define PE_BAD_FONT        (106) /* Ignoring function, the specified */
                                 /* font is not available for the    */
                                 /* requested text precision on the  */
                                 /* specified workstation            */
```

```
#define PE_BAD_EDGETYPE    (107) /* Ignoring function, the specified */
                                 /* edgetype is not available on the */
                                 /* specified workstation            */


#define PE_BAD_INT_STYLE   (108) /* Ignoring function, the specified */
                                 /* interior style is not available  */
                                 /* on the workstation               */

#define PE_NO_PAT          (109) /* Ignoring function, interior style*/
                                 /* PATTERN is not supported on the  */
                                 /* workstation                      */

#define PE_BAD_COLR_MODEL  (110) /* Ignoring function, the specified */
                                 /* color model is not available on  */
                                 /* the workstation                  */

#define PE_BAD_HLHSR_MODE  (111) /* Ignoring function, the specified */
                                 /* HLHSR mode is not available on   */
                                 /* the specified workstation        */

#define PE_PAT_IND_LT_1    (112) /* Ignoring function, the pattern   */
                                 /* index value is less than one     */

#define PE_COLR_IND_LT_0   (113) /* Ignoring function, the color     */
                                 /* index value is less than zero    */

#define PE_VIEW_IND_LT_0   (114) /* Ignoring function, the view index*/
                                 /* value is less than zero          */

#define PE_VIEW_IND_LT_1   (115) /* Ignoring function, the view index*/
                                 /* value is less than one           */

#define PE_BAD_PAT_DIM     (116) /* Ignoring function, one of the    */
                                 /* dimensions of pattern color      */
                                 /* array is less than one           */

#define PE_BAD_COLR_DIM    (117) /* Ignoring function, one of the    */
                                 /* dimensions of the color index    */
                                 /* array is less than zero          */

#define PE_BAD_COLR        (118) /* Ignoring function, one of the    */
                                 /* components of the color specifi- */
                                 /* cation is out of range. The valid*/
                                 /* range is dependent upon the      */
                                 /* current color model              */


/* Transformations and Viewing Errors */
#define PE_MAX_VIEW         (150) /* Ignoring function, setting this */
                                  /* view table entry would exceed   */
                                  /* the maximum number of entries   */
                                  /* allowed in the workstations     */
                                  /* view table                      */

#define PE_INVALID_WINDOW   (151) /* Ignoring function,              */
                                  /* invalid window;                 */
                                  /* XMIN >= XMAX, YMIN >= YMAX or   */
                                  /* ZMIN > ZMAX                     */

#define PE_INVALID_VIEWPORT (152) /* Ignoring function, invalid view-*/
                                  /* port; XMIN >= XMAX, YMIN >= YMAX*/
                                  /* or ZMIN > ZMAX                  */
```

```
#define PE_INVALID_CLIP     (153) /* Ignoring function, invalid view */
                                  /* clipping limits; XMIN >= XMAX,  */
                                  /* YMIN >= YMAX or ZMIN > ZMAX     */

#define PE_BAD_CLIP         (154) /* Ignoring function, the view     */
                                  /* clipping limits are not within  */
                                  /* NPC range                       */

#define PE_BAD_PROJ_VIEWPORT (155) /* Ignoring function, the projec- */
                                   /* tion viewport limits are not   */
                                   /* within NPC range               */

#define PE_BAD_WS_WINDOW    (156) /* Ignoring function, the          */
                                  /* workstation window limits are   */
                                  /* not within NPC range            */

#define PE_BAD_WS_VIEWPORT  (157) /* Ignoring function, the          */
                                  /* workstation viewport is not     */
                                  /* within display space            */


#define PE_BAD_PLANES       (158) /* Ignoring function, front plane  */
                                  /* and back plane distances are    */
                                  /* equal when z-extent of the      */
                                  /* projection viewport is zero     */

#define PE_BAD_VPN          (159) /* Ignoring function, the view     */
                                  /* plane normal vector has length  */
                                  /* zero                            */

#define PE_BAD_VUP          (160) /* Ignoring function, the view up  */
                                  /* vector has length zero          */

#define PE_BAD_VUP_VPN      (161) /* Ignoring function, the view up  */
                                  /* and view plane normal vectors   */
                                  /* are parallel thus the viewing   */
                                  /* coordinate system cannot be     */
                                  /* established                     */

#define PE_BAD_PRP          (162) /* Ignoring function, the projection*/
                                  /* reference point is between the  */
                                  /* front and back planes           */

#define PE_PRP_VIEW_PLANE   (163) /* Ignoring function, the projection*/
                                  /* reference point cannot be posi- */
                                  /* tioned on the view plane        */

#define PE_FRONT_BACK       (164) /* Ignoring function, the back plane*/
                                  /* is in front of the front plane  */


/* Structure Errors */
#define PE_IGNORE_STRUCTS   (200) /* Warning, ignoring structures    */
                                  /* that do not exist               */

#define PE_BAD_STRUCT       (201) /* Ignoring function, the specified*/
                                  /* structure does not exist        */

#define PE_BAD_ELEMENT      (202) /* Ignoring function, the specified*/
                                  /* element does not exist          */

#define PE_BAD_PATH         (203) /* Ignoring function, specified    */
                                  /* starting path not found in CSS  */
#define PE_BAD_CEILING_IND  (204) /* Ignoring function, specified    */
                                  /* search ceiling index out of     */
                                  /* range                           */
```

```
#define PE_NO_LABEL         (205) /* Ignoring function, the label    */
                                  /* does not exist in the open      */
                                  /* structure between the element   */
                                  /* pointer and the end of the      */
                                  /* structure                       */

#define PE_NO_LABELS        (206) /* Ignoring function, one or both  */
                                  /* of the labels does not exist in */
                                  /* the open structure between the  */
                                  /* element pointer and the end of  */
                                  /* the structure                   */

#define PE_BAD_PATH_DEPTH   (207) /* Ignoring function, the specified*/
                                  /* path depth is less than zero (0)*/

#define PE_BAD_DISP_PRI     (208) /* Ignoring function, the display  */
                                  /* priority is out of range        */

/* Input Errors */
#define PE_NO_DEVICE        (250) /* Ignoring function, the specified*/
                                  /* device is not available on the  */
                                  /* specified workstation           */

#define PE_NOT_REQUEST      (251) /* Ignoring function, the function */
                                  /* requires the input device to be */
                                  /* in REQUEST mode                 */

#define PE_NOT_SAMPLE       (252) /* Ignoring function, the function */
                                  /* requires the input device to be */
                                  /* in SAMPLE mode                  */

#define PE_BAD_PET          (253) /* Warning, the specified prompt/  */
                                  /* echo type is not available on   */
                                  /* the specified workstation.      */
                                  /* Prompt/echo type one will be    */
                                  /* used in its place               */

#define PE_INVALID_ECHO     (254) /* Ignoring function, invalid echo */
                                  /* area/volume; XMIN >= XMAX,      */
                                  /* YMIN >= YMAX or ZMIN >= ZMAX    */

#define PE_BAD_ECHO         (255) /* Ignoring function, one of the   */
                                  /* echo area/volume boundary points*/
                                  /* is outside the range of the     */
                                  /* device                          */

#define PE_QUEUE_OFLOW      (256) /* Warning, the input queue has    */
                                  /* overflowed                      */


#define PE_NO_QUEUE_OFLOW   (257) /* Ignoring function, input queue  */
                                  /* has not overflowed              */

#define PE_OFLOW_NO_GO      (258) /* Ignoring function, input queue  */
                                  /* has overflowed, but associated  */
                                  /* workstation has been closed     */

#define PE_BAD_CLASS        (259) /* Ignoring function, the input    */
                                  /* device class of the current     */
                                  /* input report does not match the */
                                  /* class being requested           */

#define PE_BAD_DATA_REC     (260) /* Ignoring function, one of the   */
                                  /* fields within the input device  */
                                  /* data record is in error         */
```

```
#define PE_INVALID_VALUE    (261) /* Ignoring function, initial value*/
                                  /* is invalid                      */

#define PE_STROKE_BUF_SIZE  (262) /* Ignoring function, number of    */
                                  /* points in the initial stroke is */
                                  /* greater than the buffer size    */

#define PE_STRING_BUF_SIZE  (263) /* Ignoring function, length of    */
                                  /* the initial string is greater   */
                                  /* than the buffer size            */


/* Metafile Errors */
#define PE_ILLEGAL_ITEM_TYPE (300) /* Ignoring function, item type is*/
                                   /* not allowed for user items     */

#define PE_INVALID_ITEM_LENGTH (301) /*Ignoring function, item length*/
                                     /* is invalid                   */

#define PE_METAFILE_EMPTY   (302) /* Ignoring function, no item is   */
                                  /* left in metafile input          */


#define PE_INVALID_ITEM     (303) /* Ignoring function, metafile     */
                                  /* item is invalid                 */

#define PE_BAD_ITEM_TYPE    (304) /* Ignoring function, item type is */
                                  /* unknown                         */

#define PE_BAD_ITEM_REC     (305) /* Ignoring function, content of   */
                                  /* item data record is invalid for */
                                  /* the specified item type         */

#define PE_MAX_ITEM_LENGTH  (306) /* Ignoring function, maximum item */
                                  /* data record length is invalid   */

#define PE_USER_ITEM        (307) /* Ignoring function, user item    */
                                  /* can not be interpreted          */

/* Escape Errors */
#define PE_ESCAPE_NOT_AVAIL (350) /* Warning, the specified escape   */
                                  /* is not available on one or more */
                                  /* workstations in this implemen-  */
                                  /* tation.  The escape will be     */
                                  /* processed by those workstations */
                                  /* on which it is available        */

#define PE_BAD_ESCAPE_DATA  (351) /* Ignoring fucntion, one of the   */
                                  /* fields within the escape data   */
                                  /* record is in error              */


/* Archival and Retrieval Errors */
#define PE_AR_CANT_OPEN     (400) /* Ignoring function, the archive  */
                                  /* file cannot be opened           */

#define PE_MAX_AR           (401) /* Ignoring function, opening      */
                                  /* this archive file would exceed  */
                                  /* the maximum number of           */
                                  /* simultaneously open archive     */
                                  /* files                           */

#define PE_DUP_AR_ID        (402) /* Ignoring function, archive      */
                                  /* file identifier already in use  */

#define PE_BAD_AR           (403) /* Ignoring function, the archive  */
                                  /* file is not a PHIGS archive     */
```

```
                                /* file                          */

#define PE_AR_NOT_OPEN      (404) /* Ignoring function, the speci-  */
                                  /* fied archive file is not open  */

#define PE_NAME_CONFLICT    (405) /* Ignoring function, name con-   */
                                  /* flict occurred while conflict  */
                                  /* resolution flag has value      */
                                  /* ABANDON                        */

#define PE_AR_FULL          (406) /* Warning, the archive file is   */
                                  /* full. Any structures that were */
                                  /* archived were archived in      */
                                  /* total                          */

#define PE_AR_NO_STRUCT     (407) /* Warning, some of the specified */
                                  /* structures do not exist on the */
                                  /* archive file                   */

#define PE_AR_NO_STRUCT_EMPTY (408) /* Warning, some of the specified*/
                                    /* structures do not exist on the*/
                                    /* archive file.  graPHIGS will  */
                                    /* create empty structures in    */
                                    /* their places                  */


/* Miscellaneous Errors */
#define PE_BAD_ERROR_FILE   (450) /* Ignoring function, the speci-  */
                                  /* fied error file is invalid     */

/* System Errors */
#define PE_OFLOW_PHIGS      (900) /* Storage overflow has occurred  */
                                  /* in PHIGS                       */

#define PE_OFLOW_CSS        (901) /* Storage overflow has occurred  */
                                  /* in CSS                         */

#define PE_IO_ERROR_READ    (902) /* Input/Output error has         */
                                  /* occurred while reading         */

#define PE_IO_ERROR_WRITE   (903) /* Input/Output error has         */
                                  /* occurred while writing         */

#define PE_IO_ERROR_TO_WS   (904) /* Input/Output error has         */
                                  /* occurred while sending data    */
                                  /* to a workstation               */

#define PE_IO_ERROR_FROM_WS (905) /* Input/Output error has         */
                                  /* occurred while receiving data  */
                                  /* from a workstation             */

#define PE_IO_ERROR_LIB     (906) /* Input/Output error has         */
                                  /* occurred during program        */
                                  /* library management             */

#define PE_IO_ERROR_WDT     (907) /* Input/Output error has         */
                                  /* occurred while reading work-   */
                                  /* station description table      */

#define PE_ARITHMETIC_ERROR (908) /* Arithmetic error has occurred  */


/* Binding Specific Errors */
#define PE_START_IND_INVAL  (2200) /* Ignoring function, start index */
                                   /* is out of range               */
```

```
#define PE_LIST_LENGTH_LT_ZERO (2201) /* Ignoring function, the      */
                                      /* length of the application's */
                                      /* list is negative            */

#define PE_ENUM_TYPE_INVAL  (2202) /* Ignoring function, enumeration */
                                   /* type is out of range           */

#define PE_ALLOC_STORE      (2203) /* Ignoring function, error while */
                                   /* allocating a Store             */

#define PE_ALLOC_STORE_MEM  (2204) /* Ignoring function, error while */
                                   /* allocating memory for a Store  */


/* Miscellaneous                 */

/* Linetypes              */
#define PLINE_SOLID                    (1)
#define PLINE_DASH                     (2)
#define PLINE_DOT                      (3)
#define PLINE_DASH_DOT                 (4)



/* Marker types           */
#define PMARKER_DOT                    (1)
#define PMARKER_PLUS                   (2)
#define PMARKER_ASTERISK               (3)
#define PMARKER_CIRCLE                 (4)
#define PMARKER_CROSS                  (5)


/* Annotation styles      */
#define PANNO_STYLE_UNCONNECTED        (1)
#define PANNO_STYLE_LEAD_LINE          (2)


/* Color models           */
#define PMODEL_RGB                     (1)
#define PMODEL_CIELUV                  (2)
#define PMODEL_HSV                     (3)
#define PMODEL_HLS                     (4)


/* Prompt and Echo Types  */
#define PLOC_DEF                       (1)
#define PLOC_CROSS_HAIR                (2)
#define PLOC_TRACK_CROSS               (3)
#define PLOC_RUB_BAND                  (4)
#define PLOC_RECT                      (5)
#define PLOC_DIGIT                     (6)



#define PSTROKE_DEF                    (1)
#define PSTROKE_DIGIT                  (2)
#define PSTROKE_MARKER                 (3)
#define PSTROKE_LINE                   (4)



#define PVAL_DEF                       (1)
#define PVAL_GRAPH                     (2)
#define PVAL_DIGIT                     (3)


#define PCHOICE_DEF                    (1)
```

```
#define PCHOICE_PR_ECHO                 (2)
#define PCHOICE_STRING_PR               (3)
#define PCHOICE_STRING_IN               (4)
#define PCHOICE_STRUCT                  (5)



#define PPICK_DEF                       (1)
#define PPICK_GROUP_HIGHL               (2)
#define PPICK_STRUCT_NETWORK            (3)


#define PSTRING_DEF                     (1)


/* Default parameters of Open PHIGS  */
#define PDEF_MEM_SIZE                   ((size_t) (-1))
#define PDEF_ERR_FILE                   ((char *) (0))


/* Element enumeration               */
#define PFIRST_PHIGS_ELEM               PELEM_POLYLINE3
#define PLAST_PHIGS_ELEM                PELEM_PICK_ID
```

Chapter 19. ISO PHIGS FORTRAN Enumeration Types

```
C    ******************************************************
C    *        ISO PHIGS FORTRAN Enumeration Types         *
C    *                                                    *
C    *   All the enumeration types of PHIGS are mapped    *
C    * to Fortran INTEGERs.  The correspondence between   *
C    * PHIGS scalars and FORTRAN INTEGERs is as follows   *
C    * in a list of symbolic FORTRAN constants that may   *
C    * be included by an application program.  Also       *
C    * included is a mapping of PHIGS enumeration types   *
C    * to FORTRAN variable names.  Line type, marker type,*
C    * and color model are included for convenience even  *
C    * though PHIGS defines them as integer rather than   *
C    * as enumerations.  The numbering of all PHIGS       *
C    * functions is also given for use in the error       *
C    * handling procedures.                               *
C    *                                                    *
C    ******************************************************
C     ---- Annotation Style ----
      INTEGER   PUNCON,  PLDLN
      PARAMETER(PUNCON=1,PLDLN=2)

C     ---- Archive State ----
      INTEGER   PARCL,   PAROP
      PARAMETER(PARCL=0, PAROP=1)

C     ---- Aspect Identifier ----
      INTEGER   PLN,      PLWSC,    PPLCI,      PMK,     PMKSC,
     1          PPMCI,    PTXFN,    PTXPR,      PCHXP,   PCHSP,
     2          PTXCI,    PIS,      PISI,       PICI,    PEDFG,
     3          PEDT,     PEWSC,    PEDCI
      PARAMETER(PLN=0,    PLWSC=1,  PPLCI=2,    PMK=3,   PMKSC=4,
     1          PPMCI=5,  PTXFN=6,  PTXPR=7,    PCHXP=8, PCHSP=9,
     2          PTXCI=10, PIS=11,   PISI=12,    PICI=13, PEDFG=14,
     3          PEDT=15,  PEWSC=16, PEDCI=17)

C     ---- Aspect Source ----
      INTEGER   PBUNDL,   PINDIV
      PARAMETER(PBUNDL=0, PINDIV=1)

C     ---- Clipping Indicator ----
      INTEGER   PNCLIP,   PCLIP
      PARAMETER(PNCLIP=0, PCLIP=1)

C     ---- Color Available ----
      INTEGER   PMONOC,   PCOLOR
      PARAMETER(PMONOC=0, PCOLOR=1)

C     ---- Color Model ----
      INTEGER   PRGB,    PCIE,    PHSV,    PHLS
      PARAMETER(PRGB=1,  PCIE=2,  PHSV=3,  PHLS=4)

C     ---- Composition Type ----
      INTEGER   PCPRE,    PCPOST,    PCREPL
      PARAMETER(PCPRE=0,  PCPOST=1,  PCREPL=2)

C     ---- Conflict Resolution ----
      INTEGER   PCRMNT,    PCRABA,     PCRUPD
      PARAMETER(PCRMNT=0,  PCRABA=1,   PCRUPD=2)

C     ---- Control Flag ----
      INTEGER   PCONDI,    PALWAY
      PARAMETER(PCONDI=0,  PALWAY=1)

C     ---- Deferral Mode ----
```

```
      INTEGER   PASAP,   PBNIG,    PBNIL,    PASTI,    PWAITD
      PARAMETER(PASAP=0, PBNIG=1,  PBNIL=2,  PASTI=3,  PWAITD=4)

C     ---- Device Coordinate Units ----
      INTEGER   PMETRE,   POTHU
      PARAMETER(PMETRE=0, POTHU=1)

C     ---- Display Surface Empty ----
      INTEGER   PNEMPT,   PEMPTY
      PARAMETER(PNEMPT=0, PEMPTY=1)

C     ---- Dynamic Modification ----
      INTEGER   PIRG,    PIMM,    PCBS
      PARAMETER(PIRG=0,  PIMM=1,  PCBS=2)

C     ---- Echo Switch ----
      INTEGER   PNECHO,    PECHO
      PARAMETER(PNECHO=0,  PECHO=1)

C     ---- Edit Mode ----
      INTEGER   PINSRT,    PREPLC
      PARAMETER(PINSRT=0,  PREPLC=1)

C     ---- Element Type ----
      INTEGER   PEALL,    PENIL,     PEPL3,    PEPL,
     1          PEPM3,    PEPM,      PETX3,    PETX,
     2          PEATR3,   PEATR,     PEFA3,    PEFA,
     3          PEFAS3,   PEFAS,     PECA3,    PECA,
     4          PEGDP3,   PEGDP,     PEPLI,    PEPMI,
     5          PETXI,    PEII,      PEEDI,    PELN,
     6          PELWSC,   PEPLCI,    PEMK,     PEMKSC,
     7          PEPMCI,   PETXFN,    PETXPR,   PECHXP,
     8          PECHSP,   PETXCI,    PECHH,    PECHUP,
     9          PETXP,    PETXAL,    PEATCH,   PEATCU,
     a          PEATP,    PEATAL,    PEANST,   PEIS,
     b          PEISI,    PEICI,     PEEDFG,   PEEDT,
     c          PEEWSC,   PEEDCI,    PEPA,     PEPRPV,
     d          PEPARF,   PEADS,     PERES,    PEIASF,
     e          PEHRID,   PELMT3,    PELMT,    PEGMT3,
     f          PEGMT,    PEMCV3,    PEMCV,    PEMCLI,
     g          PERMCV,   PEVWI,     PEEXST,   PELB,
     h          PEAP,     PEGSE,     PEPKID
      PARAMETER(PEALL=0,  PENIL=1,   PEPL3=2,  PEPL=3,
     1          PEPM3=4,  PEPM=5,    PETX3=6,  PETX=7,
     2          PEATR3=8, PEATR=9,   PEFA3=10, PEFA=11,
     3          PEFAS3=12,PEFAS=13,  PECA3=14, PECA=15,
     4          PEGDP3=16,PEGDP=17,  PEPLI=18, PEPMI=19,
     5          PETXI=20, PEII=21,   PEEDI=22, PELN=23,
     6          PELWSC=24,PEPLCI=25, PEMK=26,  PEMKSC=27,
     7          PEPMCI=28,PETXFN=29, PETXPR=30,PECHXP=31,
     8          PECHSP=32,PETXCI=33, PECHH=34, PECHUP=35,
     9          PETXP=36, PETXAL=37, PEATCH=38,PEATCU=39,
     a          PEATP=40, PEATAL=41, PEANST=42,PEIS=43,
     b          PEISI=44, PEICI=45,  PEEDFG=46,PEEDT=47,
     c          PEEWSC=48,PEEDCI=49, PEPA=50,  PEPRPV=51,
     d          PEPARF=52,PEADS=53,  PERES=54, PEIASF=55,
     e          PEHRID=56,PELMT3=57, PELMT=58, PEGMT3=59,
     f          PEGMT=60, PEMCV3=61, PEMCV=62, PEMCLI=63,
     g          PERMCV=64,PEVWI=65,  PEEXST=66,PELB=67,
     h          PEAP=68,  PEGSE=69,  PEPKID=70)

C     ---- GDP Attributes ----
      INTEGER   PPLATT,    PPMATT,    PTXATT,    PINATT,    PEDATT
      PARAMETER(PPLATT=0,  PPMATT=1,  PTXATT=2,  PINATT=3,  PEDATT=4)


C     ---- Input Class ----
```

```
      INTEGER   PNCLAS,    PLOCAT,    PSTROK,    PVALUA,    PCHOIC,
     1          PPICK,     PSTRIN
      PARAMETER(PNCLAS=0,  PLOCAT=1,  PSTROK=2,  PVALUA=3,  PCHOIC=4,
     1          PPICK=5,   PSTRIN=6)

C     ---- Input Device Status ----
      INTEGER   PNONE,    POK,    PNPICK,    PNCHOI
      PARAMETER(PNONE=0,  POK=1,  PNPICK=2,  PNCHOI=2)

C     ---- Interior Style ----
      INTEGER   PHOLLO,    PSOLID,    PPATTR,    PHATCH,    PISEMP
      PARAMETER(PHOLLO=0,  PSOLID=1,  PPATTR=2,  PHATCH=3,  PISEMP=4)

C     ---- Linetype ----
      INTEGER   PLSOLI,    PLDASH,   PLDOT,    PLDASD
      PARAMETER(PLSOLI=1,  PLDASH=2, PLDOT=3,  PLDASD=4)

C     ---- Marker Type ----
      INTEGER   PPOINT,    PPLUS,    PAST,    POMARK,    PXMARK
      PARAMETER(PPOINT=1,  PPLUS=2,  PAST=3,  POMARK=4,  PXMARK=5)

C     ---- Modeling Clip Operator ----
      INTEGER   PMCREP,    PMCINT
      PARAMETER(PMCREP=1,  PMCINT=2)

C     ---- Modification Mode ----
      INTEGER   PNIVE,     PUWOR,    PUQUM
      PARAMETER(PNIVE=0,   PUWOR=1,  PUQUM=2)

C     ---- More Simultaneous Events ----
      INTEGER   PNMORE,    PMORE
      PARAMETER(PNMORE=0,  PMORE=1)

C     ---- Off/On Switch for Edge Flag and Error Handling ----
      INTEGER   POFF,    PON
      PARAMETER(POFF=0,  PON=1)

C     ---- Open Structure Status ----
      INTEGER   PNONST,   POPNST
      PARAMETER(PNONST=0, POPNST=1)

C     ---- Operating Mode ----
      INTEGER   PREQU,    PSAMPL,    PEVENT
      PARAMETER(PREQU=0,  PSAMPL=1,  PEVENT=2)

C     ---- Path Order ----
      INTEGER   PPOTOP,    PPOBOT
      PARAMETER(PPOTOP=0,  PPOBOT=1)

C     ---- Polyline/Fill Area Control Flag ----
      INTEGER   PPLINE,    PFILLA,    PFILAS
      PARAMETER(PPLINE=0,  PFILLA=1,  PFILAS=2)

C     ---- Presence of Invalid Values ----
      INTEGER   PABSNT,    PPRSNT
      PARAMETER(PABSNT=0,  PPRSNT=1)

C     ---- Reference Handling Flag ----
      INTEGER   PDELE,    PKEEP
      PARAMETER(PDELE=0,  PKEEP=1)

C     ---- Regeneration Flag ----
      INTEGER   PPOSTP,    PPERFO
      PARAMETER(PPOSTP=0,  PPERFO=1)


C     ---- Relative Input Priority ----
```

```
      INTEGER   PHIGHR,    PLOWER
      PARAMETER(PHIGHR=0,PLOWER=1)

C     ---- Search Direction ----
      INTEGER   PBWD,    PFWD
      PARAMETER(PBWD=0,  PFWD=1)

C     ---- Search Success Indicator ----
      INTEGER   PFAIL,    PSUCC
      PARAMETER(PFAIL=0,  PSUCC=1)

C     ---- State of Visual Representation ----
      INTEGER   PVROK,    PVRDFR,    PVRSIM
      PARAMETER(PVROK=0,  PVRDFR=1,  PVRSIM=2)

C     ---- Structure Network Source ----
      INTEGER   PCSS,     PARCHV
      PARAMETER(PCSS=0,   PARCHV=1)

C     ---- Structure State Value ----
      INTEGER   PSTCL,    PSTOP
      PARAMETER(PSTCL=0,  PSTOP=1)

C     ---- Structure Status Indicator ----
      INTEGER   PSNOEX,    PSEMPT,    PSNEMP
      PARAMETER(PSNOEX=0,  PSEMPT=1,  PSNEMP=2)

C     ---- System State Value ----
      INTEGER   PPHCL,    PPHOP
      PARAMETER(PPHCL=0,  PPHOP=1)

C     ---- Text Alignment Horizontal ----
      INTEGER   PAHNOR,    PALEFT,    PACENT,    PARITE
      PARAMETER(PAHNOR=0,  PALEFT=1,  PACENT=2,  PARITE=3)

C     ---- Text Alignment Vertical ----
      INTEGER   PAVNOR,   PATOP,   PACAP,   PAHALF,   PABASE,  PABOTT
      PARAMETER(PAVNOR=0, PATOP=1, PACAP=2, PAHALF=3, PABASE=4,PABOTT=5)

C     ---- Text Path ----
      INTEGER   PRIGHT,   PLEFT,   PUP,   PDOWN
      PARAMETER(PRIGHT=0, PLEFT=1, PUP=2, PDOWN=3)

C     ---- Text Precision ----
      INTEGER   PSTRP,   PCHARP,   PSTRKP
      PARAMETER(PSTRP=0, PCHARP=1, PSTRKP=2)

C     ---- Type of Returned Values ----
      INTEGER   PSET,   PREALI
      PARAMETER(PSET=0, PREALI=1)

C     ---- Update State ----
      INTEGER   PNPEND,   PPEND
      PARAMETER(PNPEND=0, PPEND=1)

C     ---- Vector/Raster/Other Type ----
      INTEGER   PVECTR,   PRASTR,   POTHWK
      PARAMETER(PVECTR=0, PRASTR=1, POTHWK=2)

C     ---- View Type ----
      INTEGER   PPARL,   PPERS
      PARAMETER(PPARL=0, PPERS=1)

C     ---- Workstation Category ----
      INTEGER   POUTPT,   PINPUT,   POUTIN,   PMO,   PMI
      PARAMETER(POUTPT=0, PINPUT=1, POUTIN=2, PMO=3, PMI=4)
```

```
C     ---- Workstation Dependency Indicator ----
      INTEGER   PWKI,   PWKD
      PARAMETER(PWKI=0, PWKD=1)

C     ---- Workstation State Value ----
      INTEGER   PWSCL,   PWSOP
      PARAMETER(PWSCL=0, PWSOP=1)

C     ---- Current/Requested ----
      INTEGER   PCURVL,   PRQSVL
      PARAMETER(PCURVL=0, PRQSVL=1)

C     ---- PHIGS Function Identifiers ----  (Ref
#2.)

      INTEGER   EOPPH,    ECLPH,     EOPWK,     ECLWK,      ERST
      PARAMETER(EOPPH=0,  ECLPH=1,   EOPWK=2,   ECLWK=3,    ERST=4)
      INTEGER   EUWK,     ESDUS,     EMSG,      EPL3,       EPL
      PARAMETER(EUWK=5,   ESDUS=6,   EMSG=7,    EPL3=8,     EPL=9)
      INTEGER   EPM3,     EPM,       ETX3,      ETX,        EATR3
      PARAMETER(EPM3=10,  EPM=11,    ETX3=12,   ETX=13,     EATR3=14)
      INTEGER   EATR,     EFA3,      EFA,       EFAS3,      EFAS
      PARAMETER(EATR=15,  EFA3=16,   EFA=17,    EFAS3=18,   EFAS=19)
      INTEGER   ECA3,     ECA,       EGDP3,     EGDP,       ESPLI
      PARAMETER(ECA3=20,  ECA=21,    EGDP3=22,  EGDP=23,    ESPLI=24)
      INTEGER   ESPMI,    ESTXI,     ESII,      ESEDI,      ESLN
      PARAMETER(ESPMI=25, ESTXI=26,  ESII=27,   ESEDI=28,   ESLN=29)
      INTEGER   ESLWSC,   ESPLCI,    ESMK,      ESMKSC,     ESPMCI
      PARAMETER(ESLWSC=30,ESPLCI=31, ESMK=32,   ESMKSC=33,  ESPMCI=34)
      INTEGER   ESTXFN,   ESTXPR,    ESCHXP,    ESCHSP,     ESTXCI
      PARAMETER(ESTXFN=35,ESTXPR=36, ESCHXP=37, ESCHSP=38,  ESTXCI=39)
      INTEGER   ESCHH,    ESCHUP,    ESTXP,     ESTXAL,     ESATCH
      PARAMETER(ESCHH=40, ESCHUP=41, ESTXP=42,  ESTXAL=43,  ESATCH=44)
      INTEGER   ESATCU,   ESATP,     ESATAL,    ESANS,      ESIS
      PARAMETER(ESATCU=45,ESATP=46,  ESATAL=47, ESANS=48,   EISI=49)
      INTEGER   ESISI,    ESICI,     ESEDFG,    ESEDT,      ESEWSC
      PARAMETER(ESISI=50, ESICI=51,  ESEDFG=52, ESEDT=53,   ESEWSC=54)
      INTEGER   ESEDCI,   ESPA,      ESPRPV,    ESPARF,     EADS
      PARAMETER(ESEDCI=55,ESPA=56,   ESPRPV=57, ESPARF=58,  EADS=59)
      INTEGER   ERES,     ESIASF,    ESPLR,     ESPMR,      ESTXR
      PARAMETER(ERES=60,  ESIASF=61, ESPLR=62,  ESPMR=63,   ESTXR=64)
      INTEGER   ESIR,     ESEDR,     ESPAR,     ESCR,       ESHLFT
      PARAMETER(ESIR=65,  ESEDR=66,  ESPAR=67,  ESCR=68,    ESHLFT=69)
      INTEGER   ESIVFT,   ESCMD,     ESHRID,    ESHRM,      ESLMT3
      PARAMETER(ESIVFT=70,ESCMD=71,  ESHRID=72, ESHRM=73,   ESLMT3=74)
      INTEGER   ESLMT,    ESGMT3,    ESGMT,     ESMCV3,     ESMCV
      PARAMETER(ESLMT=75, ESGMT3=76, ESGMT=77,  ESMCV3=78,  ESMCV=79)
      INTEGER   ESMCLI,   ERMCV,     ESVWI,     ESVWR3,     ESVWR
      PARAMETER(ESMCLI=80,ERMCV=81,  ESVWI=82,  ESVWR3=83,  ESVWR=84)
      INTEGER   ESVTIP,   ESWKW3,    ESWKW,     ESWKV3,     ESWKV
      PARAMETER(ESVTIP=85,ESWKW3=86, ESWKW=87,  ESWKV3=88,  ESWKV=89)
      INTEGER   EOPST,    ECLST,     EEXST,     ELB,        EAP
      PARAMETER(EOPST=90, ECLST=91,  EEXST=92,  ELB=93,     EAP=94)
      INTEGER   EGSE,     ESEDM,     ECELST,    ESEP,       EOSEP
      PARAMETER(EGSE=95,  ESEDM=96,  ECELST=97, ESEP=98,    EOSEP=99)
      INTEGER   ESEPLB,   EDEL,      EDELRA,    EDELLB,     EEMST
      PARAMETER(ESEPLB=100,EDEL=101, EDELRA=102,EDELLB=103, EEMST=104)
      INTEGER   EDST,     EDSN,      EDAS,      ECSTID,     ECSTRF
      PARAMETER(EDST=105, EDSN=106,  EDAS=107,  ECSTID=108, ECSTRF=109)
      INTEGER   ECSTIR,   EPOST,     EUPOST,    EUPAST,     EOPARF
      PARAMETER(ECSTIR=110,EPOST=111,EUPOST=112,EUPAST=113, EOPARF=114)
      INTEGER   ECLARF,   EARST,     EARSN,     EARAST,     ESCNRS
      PARAMETER(ECLARF=115,EARST=116,EARSN=117, EARAST=118, ESCNRS=119)
      INTEGER   ERSID,    EREST,     ERESN,     ERAST,      EREPAN
      PARAMETER(ERSID=120,EREST=121, ERESN=122, ERAST=123,  EREPAN=124)
      INTEGER   EREPDE,   EDSTAR,    EDSNAR,    EDASAR,     ESPKID
      PARAMETER(EREPDE=125,EDSTAR=126,EDSNAR=127,EDASAR=128,ESPKID=129)
```

```
INTEGER   ESPKFT,   EINLC3,    EINLC,     EINSK3,     EINSK
PARAMETER(ESPKFT=130,EINLC3=131,EINLC=132,EINSK3=133, EINSK=134)
INTEGER   EINVL3,    EINVL,    EINCH3,    EINCH,      EINPK3
PARAMETER(EINVL3=135,EINVL=136,EINCH3=137,EINCH=138,  EINPK3=139)
INTEGER   EINPK,     EINST3,   EINST,     ESLCM,      ESSKM
PARAMETER(EINPK=140, EINST3=141,EINST=142,ESLCM=143,  ESSKM=144)
INTEGER   ESVLM,     ESCHM,    ESPKM,     ESSTM,      ERQLC3
PARAMETER(ESVLM=145, ESCHM=146,ESPKM=147, ESSTM=148,  ERQLC3=149)
INTEGER   ERQLC,     ERQSK3,   ERQSK,     ERQVL,      ERQCH
PARAMETER(ERQLC=150, ERQSK3=151,ERQSK=152,ERQVL=153,  ERQCH=154)
INTEGER   ERQPK,     ERQST,    ESMLC3,    ESMLC,      ESMSK3
PARAMETER(ERQPK=155, ERQST=156,ESMLC3=157,ESMLC=158,  ESMSK3=159)
INTEGER   ESMSK,     ESMVL,    ESMCH,     ESMPK,      ESMST
PARAMETER(ESMSK=160, ESMVL=161,ESMCH=162, ESMPK=163,  ESMST=164)
INTEGER   EWAIT,     EFLUSH,   EGTLC3,    EGTLC,      EGTSK3
PARAMETER(EWAIT=165, EFLUSH=166,EGTLC3=167,EGTLC=168, EGTSK3=169)
INTEGER   EGTSK,     EGTVL,    EGTCH,     EGTPK,      EGTST
PARAMETER(EGTSK=170, EGTVL=171,EGTCH=172, EGTPK=173,  EGTST=174)
INTEGER   EWITM,     EGTITM,   ERDITM,    EIITM,      ESERHM
PARAMETER(EWITM=175, EGTITM=176,ERDITM=177,EIITM=178, ESERHM=179)
INTEGER   EESC,      EPREC,    EUREC
PARAMETER(EESC=180,  EPREC=181,EUREC=182)
```

Chapter 20. ISO PHIGS Subroutines to GPxxxx Subroutines

The following table associates ISO PHIGS subroutine calls with equivalent or approximately equivalent GP*xxxx* calls. Note that the calls may be *approximately* equivalent; there may be some variation in the call interface or in the functionality. Refer to *The graPHIGS Programming Interface: Subroutine Reference* and the individual ISO PHIGS subroutine calls for details.

The table IS arranged alphabetically by ISO PHIGS subroutine names. A missing ISO PHIGS subroutine implies that either it is not supported by the graPHIGS API, or there is no approximately equivalent GPxxxx subroutine call.

Table 2. ISO PHIGS Subroutines and Their Associated GPxxxx Subroutine Calls

ISO PHIGS Subroutine Call	**Associated GP*xxxx* Subroutine Call(s)**
Add Names to Set	GPADCN
Annotation Text Relative	GPANR2
Annotation Text Relative 3	GPANR3
Application Data	GPINAD
Archive All Structures	GPARAS
Archive Structure Networks	GPARSN
Archive Structures	GPARST
Await Event	GPAWEV
Change Structure Identifier	GPCSI
Change Structure Identifier And References	GPCSIR
Change Structure References	GPCSRS
Close Archive File	GPCLAR
Close PHIGS	GPCLPH
Close Structure	GPCLST
Close Workstation	GPCLWS
Compose Matrix	GPCMT2
Compose Matrix 3	GPCMT3
Copy All Elements From Structure	GPCPST
Delete All Structures	GPDAST
Delete All Structures from Archive	GPDASA
Delete Element	GPDLE
Delete Element Range	GPDLER
Delete Elements Between Labels	GPDLEG
Delete Structure	GPDLST
Delete Structure Network	GPDLNT, GPDLNC
Delete Structure Networks from Archive	GPDSNA
Delete Structures from Archive	GPDSAR
Element Search	GPELS
Emergency Close PHIGS	GPCLPH
Empty Structure	GPEST
Error Handling	GPEHND
Error Logging	GPELOG
Escape	GPES
Evaluate View Mapping Matrix	GPEVM2
Evaluate View Mapping Matrix 3	GPEVM3
Evaluate View Orientation Matrix	GPCVMT, GPVPLN, GPVR, GPVUP
Evaluate View Orientation Matrix 3	GPCVMT, GPVPLN, GPVR, GPVUP
Execute Structure	GPEXST
Fill Area Set	GPPG2
Fill Area Set 3	GPPG3
Flush Device Events	GPFLEV
Get Choice	GPGTCH

Table 2. ISO PHIGS Subroutines and Their Associated GPxxxx Subroutine Calls (continued)

ISO PHIGS Subroutine Call	**Associated GP*xxxx* Subroutine Call(s)**
Get Locator	GPGTLC
Get Locator 3	GPGTLC
Get Pick	GPGTPK
Get String	GPGTST
Get Stroke	GPGTSK
Get Stroke 3	GPGTSK
Get Valuator	GPGTVL
Initialize Choice 3	GPINCH
Initialize Locator 3	GPINLC
Initialize Pick 3	GPINPK
Initialize String 3	GPINST
Initialize Stroke 3	GPINSK
Initialize Valuator 3	GPINVL
Inquire All Conflicting Structures	GPQACA
Inquire Annotation Facilities	GPQANF, GPQXAF
Inquire Choice Device State	GPQCH
Inquire Choice Device State 3	GPQCH
Inquire Color Facilities	GPQLCF
Inquire Color Model	GPQCML
Inquire Color Representation	GPQXCR
Inquire Conflicting Structures in Network	GPQCNA
Inquire Current Element Content	GPQED
Inquire Current Element Type and Size	GPQEHD
Inquire Default Choice Device Data	GPQDCH
Inquire Default Choice Device Data 3	GPQDCH
Inquire Default Display Update State	GPQDDV
Inquire Default Locator Device Data	GPQDLC
Inquire Default Locator Device Data 3	GPQDLC
Inquire Default Pick Device Data	GPQDPK
Inquire Default Pick Device Data 3	GPQDPK
Inquire Default String Device Data	GPQDST
Inquire Default String Device Data 3	GPQDST
Inquire Default Stroke Device Data	GPQDSK
Inquire Default Stroke Device Data 3	GPQDSK
Inquire Default Valuator Device Data	GPQDVL
Inquire Default Valuator Device Data 3	GPQDVL
Inquire Display Space Size	GPQDS
Inquire Display Space Size 3	GPQDS
Inquire Display Update State	GPQDV
Inquire Edge Facilities	GPQEF
Inquire Edge Representation	GPQER
Inquire Edit Mode	GPQEDM
Inquire Element Content	GPQEDA
Inquire Element Pointer	GPQEP
Inquire Element Type and Size	GPQEHA
Inquire Error Handling Mode	GPQEMO
Inquire Highlighting Filter	GPQHLF
Inquire HLHSR Mode	GPQRVR GPQCVR
Inquire HLHSR(Mode) Facilities	GPQHMO
Inquire Input Queue Overflow	GPQIQO
Inquire Interior Facilities	GPQIF
Inquire Interior Representation	GPQXIR
Inquire Invisibility Filter	GPQIVF
Inquire List of Available Workstation Types	GPQWST

Table 2. ISO PHIGS Subroutines and Their Associated GPxxxx Subroutine Calls (continued)

ISO PHIGS Subroutine Call	**Associated GP*xxxx* Subroutine Call(s)**
Inquire List of View Indices	GPQRVE
Inquire Locator Device State	GPQLC
Inquire Locator Device State 3	GPQLC
Inquire Modeling Clipping Facilities	GPQWDT
Inquire More Simultaneous Events	GPQSEV
Inquire Number of Available Logical Input Devices	GPQLI
Inquire Number of Display Priorities Supported	GPQNSP
Inquire Open Structure	GPQOPS
Inquire Paths to Ancestors	GPQPAS
Inquire Paths to Descendants	GPQPDS
Inquire Pattern Facilities	GPQPAF
Inquire Pattern Representation	GPQPAR
Inquire Pick Device State	GPQPK
Inquire Pick Device State 3	GPQPK
Inquire Polyline Facilities	GPQPLF
Inquire Polyline Representation	GPQLR
Inquire Polymarker Facilities	GPQPMF
Inquire Polymarker Representation	GPQMR
Inquire Posted Structures	GPQRV
Inquire Predefined Color Representation	GPQPCR
Inquire Predefined Edge Representation	GPQPER
Inquire Predefined Interior Representation	GPQPIR
Inquire Predefined Pattern Representation	GPQPPR
Inquire Predefined Polyline Representation	GPQPLR
Inquire Predefined Polymarker Representation	GPQPMR
Inquire Predefined Text Representation	GPQPTR
Inquire Set of Open Workstations	GPQOPW
Inquire Set of Workstations To Which Posted	GPQWSA
Inquire String Device State	GPQST
Inquire String Device State 3	GPQST
Inquire Stroke Device State	GPQSK
Inquire Stroke Device State 3	GPQSK
Inquire Structure Identifiers	GPQSTI
Inquire Structure State Value	GPQSTV
Inquire Structure Status	GPQSTS
Inquire System State Value	GPQSYV
Inquire Text Facilities	GPQTXF, GPQGFC
Inquire Text Representation	GPQTR
Inquire Valuator Device State	GPQVL
Inquire Valuator Device State 3	GPQVL
Inquire View Representation	GPQCVR, GPQRVR
Inquire Workstation Category	GPQWC
Inquire Workstation Classification	GPQWD
Inquire Workstation Connection and Type	GPQRCT
Inquire Workstation State Table Lengths	GPQLW
Inquire Workstation State Value	GPQWSV
Inquire Workstation Transformation	GPQWSX
Inquire Workstation Transformation 3	GPQWSX
Label	GPINLB
Message	GPMSG
Offset Element Pointer	GPOEP
Open Archive File	GPOPAR
Open PHIGS	GPOPPH
Open Structure	GPOPST

Table 2. ISO PHIGS Subroutines and Their Associated GPxxxx Subroutine Calls (continued)

ISO PHIGS Subroutine Call	**Associated GP*xxxx* Subroutine Call(s)**
Open Workstation	GPOPWS
Pack Data Record	GPPREC
Polyline	GPPL2
Polyline 3	GPPL3
Polymarker	GPPM2
Polymarker 3	GPPM3
Post Structure	GPARV
Redraw All Structures	GPRAST
Remove Names from Set	GPRCN
Request Choice	GPRQCH
Request Locator	GPRQLC
Request Locator 3	GPRQLC
Request Pick	GPRQPK
Request String	GPRQST
Request Stroke	GPRQSK
Request Stroke 3	GPRQSK
Request Valuator	GPRQVL
Restore Modeling Clipping Volume	GPRMCV
Retrieve All Structures	GPRVAS
Retrieve Paths to Ancestors	GPQPAS
Retrieve Paths to Descendants	GPQPDS
Retrieve Structure Identifiers	GPRSTI
Retrieve Structure Networks	GPRVSN
Retrieve Structures	GPRVST
Rotate	GPROT2
Rotate X	GPROTX
Rotate Y	GPROTY
Rotate Z	GPROTZ
Sample Choice	GPSMCH
Sample Locator	GPSMLC
Sample Locator 3	GPSMLC
Sample Pick	GPSMPK
Sample String	GPSMST
Sample Stroke	GPSMSK
Sample Stroke 3	GPSMSK
Sample Valuator	GPSMVL
Scale	GPSC2
Scale 3	GPSC3
Set Annotation Text Alignment	GPAAL
Set Annotation Text Character Height	GPAH
Set Annotation Text Character Up Vector	GPAUP
Set Annotation Text Path	GPAPT
Set Annotation Text Style	GPAS
Set Character Expansion Factor	GPCHXP
Set Character Height	GPCHH
Set Character Spacing	GPCHSP
Set Character Up Vector	GPCHUP
Set Choice Mode	GPCHMO
Set Color Model	GPCML
Set Color Representation	GPCR
Set Conflict Resolution	GPCNRS
Set Display Update State	GPDF
Set Edge Color Index	GPECI
Set Edge Flag	GPEF

Table 2. ISO PHIGS Subroutines and Their Associated GPxxxx Subroutine Calls (continued)

ISO PHIGS Subroutine Call	**Associated GP*xxxx* Subroutine Call(s)**
Set Edge Index	GPEI
Set Edge Representation	GPER
Set Edgetype	GPELT
Set Edgewidth Scale Factor	GPESC
Set Edit Mode	GPEDMO
Set Element Pointer	GPEP
Set Element Pointer at Label	GPEPLG
Set Error Handling Mode	GPEMO
Set Global Transformation	GPGLX2
Set Global Transformation 3	GPGLX3
Set Highlighting Filter	GPHLF
Set HLHSR Identifier	GPHID
Set HLHSR Mode	GPXVR
Set Individual ASF	GPASF
Set Interior Color Index	GPICI
Set Interior Index	GPII
Set Interior Representation	GPIR
Set Interior Style	GPIS
Set Interior Style Index	GPISI
Set Invisibility Filter	GPIVF
Set Linetype	GPLT
Set Linewidth Scale Factor	GPLWSC
Set Local Transformation	GPMLX2
Set Local Transformation 3	GPMLX3
Set Locator Mode	GPLCMO
Set Marker Size Scale Factor	GPMSSC
Set Marker Type	GPMT
Set Modeling Clipping Indicator	GPMCI
Set Modeling Clipping Volume	GPMCV2
Set Modeling Clipping Volume 3	GPMCV3
Set Pattern Representation	GPPAR
Set Pick Filter	GPPKF
Set Pick Identifier	GPPKID
Set Pick Mode	GPPKMO
Set Polyline Color Index	GPPLCI
Set Polyline Index	GPPLI
Set Polyline Representation	GPPLR
Set Polymarker Color Index	GPPMCI
Set Polymarker Index	GPPMI
Set Polymarker Representation	GPPMR
Set String Mode	GPSTMO
Set Stroke Mode	GPSKMO
Set Text Alignment	GPTXAL
Set Text Color Index	GPTXCI
Set Text Font	GPTXFO
Set Text Index	GPTXI
Set Text Path	GPTXPT
Set Text Precision	GPTXPR
Set Text Representation	GPTXR
Set Valuator Mode	GPVLMO
Set View Index	GPVWI
Set View Representation	GPXVR
Set View Representation 3	GPXVR
Set View Transformation Input Priority	GPVIP

Table 2. ISO PHIGS Subroutines and Their Associated GPxxxx Subroutine Calls (continued)

ISO PHIGS Subroutine Call	**Associated GP*xxxx* Subroutine Call(s)**
Set Workstation Viewport	GPWSX2
Set Workstation Viewport 3	GPWSX3
Set Workstation Window	GPWSX2
Set Workstation Window 3	GPWSX3
Text	GPTX2
Text 3	GPTX3
Transform Point	GPXF2
Transform Point 3	GPXF3
Translate	GPTRL2
Translate 3	GPTRL3
Unpost All Structures	GPDARW
Unpost Structure	GPDRW
Update Workstation	GPUPWS

Chapter 21. GPxxxx Subroutines to ISO PHIGS Subroutines

The following table associates GP*xxxx* subroutine calls with equivalent or approximately equivalent ISO PHIGS subroutines. Note that the calls may be *approximately* equivalent; there may be some variation in the call interface or in the functionality. Refer to *The graPHIGS Programming Interface: Subroutine Reference* and the ISO PHIGS subroutines for details on individual calls.

The tables are arranged alphabetically by GP*xxxx* subroutine calls. A missing GP*xxxx* subroutine call implies that there is no approximately equivalent ISO PHIGS subroutine.

Table 3. GPxxxx Subroutine Calls and Their Associated ISO PHIGS Subroutines

xxxx **Subroutine Call**	*xxxx* **Subroutine Call Description**	**Associated ISO PHIGS Subroutine Call(s)**
GPAAL	Set Annotation Alignment	Set Annotation Text Alignment
GPADCN	Add Class Name to Set	Add Names to Set
GPAH	Set Annotation Height	Set Annotation Text Character Height
GPAN2	Annotation Text 2	Annotation Text Relative
GPAN3	Annotation Text 3	Annotation Text Relative 3
GPANR2	Annotation Text Relative 2	Annotation Text Relative
GPANR3	Annotation Text Relative 3	Annotation Text Relative 3
GPAPT	Set Annotation Path	Set Annotation Text Path
GPARAS	Archive All Structures	Archive All Structures
GPARSN	Archive Structure Networks	Archive Structure Networks
GPARST	Archive Structures	Archive Structures
GPARV	Associate Root with View	Post Structure
GPAS	Set Annotation Style	Set Annotation Style
GPASF	Set Aspect Source Flag	Set Individual ASF
GPAUP	Set Annotation Up Vector	Set Annotation Text Character Up Vector
GPAWEV	Await Event	Await Event
GPCHH	Set Character Height	Set Character Height
GPCHMO	Set Choice Mode	Set Choice Mode
GPCHSP	Set Character Spacing	Set Character Spacing
GPCHUP	Set Character Up Vector	Set Character Up Vector
GPCHXP	Set Character Expansion Factor	Set Character Expansion Factor
GPCLAR	Close Archive File	Close Archive File
GPCLPH	Close graPHIGS	Close PHIGS, Emergency Close PHIGS
GPCLST	Close Structure	Close Structure
GPCLWS	Close Workstation	Close Workstation
GPCML	Set Color Model	Set Color Model
GPCMT2	Compose Matrix 2	Compose Matrix
GPCMT3	Compose Matrix 3	Compose Matrix 3
GPCNRS	Set Conflict Resolution	Set Conflict Resolution
GPCPST	Copy Structure	Copy All Elements from Structure
GPCR	Set Color Representation	Set Color Representation
GPCRWS	Create Workstation	Open Workstation
GPCSI	Change Structure Identifier	Change Structure Identifier
GPCSIR	Change Structure Identifier and References	Change Structure Identifier and References
GPCSRS	Change Structure References	Change Structure References
GPCVMT	Compute View Matrix	Evaluate View Orientation Matrix 3
GPDARW	Disassociate All Roots from Workstation	Unpost All Structures
GPDASA	Delete All Structures from Archive	Delete All Structures from Archive

Table 3. GPxxxx Subroutine Calls and Their Associated ISO PHIGS Subroutines (continued)

xxxx **Subroutine Call**	*xxxx* **Subroutine Call Description**	**Associated ISO PHIGS Subroutine Call(s)**
GPDAST	Delete All Structures	Delete All Structures
GPDELB	Delete Element Between Labels	Delete Elements Between Labels
GPDF	Set Deferral State	Set Display Update State
GPDLE	Delete Element	Delete Element
GPDLEG	Delete Element Group	Delete Elements Between Labels
GPDLER	Delete Element Range	Delete Element Range
GPDLNC	Delete Structure Network Conditionally	Delete Structure Network
GPDLNT	Delete Structure Network	Delete Structure Network
GPDLST	Delete Structure	Delete Structure
GPDRAV	Disassociate Root from All Views	Unpost Structure
GPDRV	Disassociate Root from View	Unpost Structure
GPDRW	Disassociate Root from Workstation	Unpost Structure
GPDSAR	Delete Structures from Archive	Delete Structures from Archive
GPDSNA	Delete Structure Networks from Archive	Delete Structure Networks from Archive
GPEAV	Empty All Views	Unpost All Structures
GPECI	Set Edge Color Index	Set Edge Color Index
GPEDMO	Set Edit Mode	Set Edit Mode
GPEF	Set Edge Flag	Set Edge Flag
GPEHND	Set Error Handling Function	Error Handling
GPEI	Set Edge Index	Set Edge Index
GPELOG	Error Logging	Error Logging
GPELS	Element Search	Element Search
GPELT	Set Edge Linetype	Set Edgetype
GPEMO	Set Error Handling Mode	Set Error Handling Mode
GPEP	Set Element Pointer	Set Element Pointer
GPEPLB	Set Element Pointer at Label	Set Element Pointer at Label
GPEPLG	Generalized Set Element Pointer at Label	Set Element Pointer at Label
GPER	Set Edge Representation	Set Edge Representation
GPES	Escape	Escape
GPESC	Set Edge Scale Factor	Set Edgewidth Scale Factor
GPEST	Empty Structure	Empty Structure
GPEV	Empty View	Unpost All Structures
GPEVM2	Evaluate View Mapping Matrix 2	Evaluate View Mapping Matrix
GPEVM3	Evaluate View Mapping Matrix 3	Evaluate View Mapping Matrix 3
GPEXST	Execute Structure	Execute Structure
GPFLEV	Flush Device Events	Flush Device Events
GPGLX2	Set Global Transformation 2	Set Global Transformation
GPGLX3	Set Global Transformation 3	Set Global Transformation 3
GPGTCH	Get Choice	Get Choice
GPGTLC	Get Locator	Get Locator 3
GPGTPK	Get Pick	Get Pick
GPGTSK	Get Stroke	Get Stroke 3
GPGTST	Get String	Get String
GPGTVL	Get Valuator	Get Valuator
GPHID	Set HLHSR Identifier	Set HLHSR Identifier
GPHLF	Set Highlighting Filter	Set Highlighting Filter
GPICI	Set Interior Color Index	Set Interior Color Index
GPII	Set Interior Index	Set Interior Index
GPINAD	Insert Application Data	Application Data
GPINCH	Initialize Choice	Initialize Choice 3
GPINLB	Insert Label	Label

Table 3. GPxxxx Subroutine Calls and Their Associated ISO PHIGS Subroutines (continued)

xxxx **Subroutine Call**	*xxxx* **Subroutine Call Description**	**Associated ISO PHIGS Subroutine Call(s)**
GPINLC	Initialize Locator	Initialize Locator 3
GPINPK	Initialize Pick	Initialize Pick 3
GPINSK	Initialize Stroke	Initialize Stroke 3
GPINST	Initialize String	Initialize String 3
GPINVL	Initialize Valuator	Initialize Valuator 3
GPIR	Set Interior Representation	Set Interior Representation
GPIS	Set Interior Style	Set Interior Style
GPISI	Set Interior Style Index	Set Interior Style Index
GPIVF	Set Invisibility Filter	Set Invisibility Filter
GPLCMO	Set Locator Mode	Set Locator Mode
GPLT	Set Linetype	Set Linetype
GPLWSC	Set Linewidth Scale Factor	Set Linewidth Scale Factor
GPMCI	Set Modeling Clipping Indicator	Set Modeling Clipping Indicator
GPMCV2	Set Modeling Clipping Volume 2	Set Modeling Clipping Volume
GPMCV3	Set Modeling Clipping Volume 3	Set Modeling Clipping Volume 3
GPMLX2	Set Modeling Transformation 2	Set Local Transformation
GPMLX3	Set Modeling Transformation 3	Set Local Transformation 3
GPMSG	Message	Message
GPMSSC	Set Marker Size Scale Factor	Set Marker Size Scale Factor
GPMT	Set Marker Type	Set Marker Type
GPOEP	Offset Element Pointer	Offset Element Pointer
GPOPAR	Open Archive File	Open Archive File
GPOPPH	Open graPHIGS	Open PHIGS
GPOPST	Open Structure	Open Structure
GPOPWS	Open Workstation	Open Workstation
GPPAR	Set Pattern Representation	Set Pattern Representation
GPPG2	Polygon 2	Fill Area Set
GPPG3	Polygon 3	Fill Area Set 3
GPPKF	Set Pick Filter	Set Pick Filter
GPPKID	Set Pick Identifier	Set Pick Identifier
GPPKMO	Set Pick Mode	Set Pick Mode
GPPLCI	Set Polyline Color Index	Set Polyline Color Index
GPPLI	Set Polyline Index	Set Polyline Index
GPPLR	Set Polyline Representation	Set Polyline Representation
GPPL2	Polyline 2	Polyline
GPPL3	Polyline 3	Polyline 3
GPPMCI	Set Polymarker Color Index	Set Polymarker Color Index
GPPMI	Set Polymarker Index	Set Polymarker Index
GPPMR	Set Polymarker Representation	Set Polymarker Representation
GPPM2	Polymarker 2	Polymarker
GPPM3	Polymarker 3	Polymarker 3
GPPREC	Pack Data Record	Pack Data Record
GPQACA	Inquire All Conflicting Structures in Archive	Inquire All Conflicting Structures
GPQANF	Inquire Annotation Facilities	Inquire Annotation Facilities
GPQARF	Inquire Archive Files	Inquire Archive Files
GPQCF	Inquire Color Facilities	Inquire Color Facilities
GPQCH	Inquire Choice Device State	Inquire Choice Device State 3
GPQCML	Inquire Color Model	Inquire Color Model
GPQCNA	Inquire Conflicting Structures in Network in Archive	Inquire Conflicting Structures in Network
GPQCNR	Inquire Conflict Resolution	Inquire Conflict Resolution
GPQCR	Inquire Color Representation	Inquire Color Representation

Table 3. GPxxxx Subroutine Calls and Their Associated ISO PHIGS Subroutines (continued)

xxxx **Subroutine Call**	*xxxx* **Subroutine Call Description**	**Associated ISO PHIGS Subroutine Call(s)**
GPQCVE	Inquire Current View Table Entries	Inquire List of View Indices
GPQCVR	Inquire Current View Representation	Inquire View Representation
GPQCVX	Inquire Current Viewing Transformation	Inquire View Representation
GPQDCH	Inquire Default Choice Device Data	Inquire Default Choice Device Data 3
GPQDDV	Inquire Default Deferral State Values	Inquire Default Display Update State
GPQDLC	Inquire Default Locator Device Data	Inquire Default Locator Device Data 3
GPQDPK	Inquire Default Pick Device Data	Inquire Default Pick Device Data 3
GPQDS	Inquire Maximum Display Surface Size	Inquire Display Space Size
GPQDSK	Inquire Default Stroke Device Data	Inquire Default Stroke Device Data 3
GPQDST	Inquire Default String Device Data	Inquire Default String Device Data 3
GPQDV	Inquire Deferral and Update State Value	Inquire Display Update State
GPQDVL	Inquire Default Valuator Device Data	Inquire Default Valuator Device Data 3
GPQE	Inquire Element Content	Inquire Current Element Content
GPQED	Inquire Element Data	Inquire Current Element Content
GPQEDA	Inquire List of Element Data For Any Structure	Inquire Element Content
GPQEDM	Inquire Edit Mode	Inquire Edit Mode
GPQEF	Inquire Edge Facilities	Inquire Edge Facilities
GPQEHA	Inquire List of Element Headers For Any Structure	Inquire Element Type and Size
GPQEHD	Inquire List of Element Headers	Inquire Current Element Type and Size
GPQEMO	Inquire Error Handling Mode	Inquire Error Handling Mode
GPQEP	Inquire Element Pointer	Inquire Element Pointer
GPQER	Inquire Edge Representation	Inquire Edge Representation
GPQETS	Inquire Element Type and Size	Inquire Current Element Type and Size
GPQEXS	Inquire Executed Structures	Inquire Paths to Descendants
GPQGFC	Inquire Geometric Font Characteristics	Inquire Text Facilities
GPQHLF	Inquire Highlighting Filter	Inquire Highlighting Filter
GPQHMO	Inquire HLHSR Modes	Inquire HLHSR (Mode) Facilities
GPQIF	Inquire Interior Facilities	Inquire Interior Facilities
GPQIQO	Inquire Input Queue Overflow	Inquire Input Queue Overflow
GPQIR	Inquire Interior Representation	Inquire Interior Representation
GPQIVF	Inquire Invisibility Filter	Inquire Invisibility Filter
GPQLC	Inquire Locator Device State	Inquire Locator Device State 3
GPQLCF	Inquire List of Color Facilities	Inquire Color Facilities
GPQLI	Inquire List of Logical Input Devices	Inquire Number of Available Logical Input Devices
GPQLR	Inquire Polyline Representation	Inquire Polyline Representation
GPQLW	Inquire Length of Workstation State Tables	Inquire Workstation State Table Lengths
GPQMR	Inquire Polymarker Representation	Inquire Polymarker Representation
GPQNCN	Inquire Number of Available Class Names	Inquire PHIGS Facilities
GPQNSP	Inquire Number of Structure Priorities Supported	Inquire Number of Display Priorities Supported
GPQNV	Inquire Number of Definable View Table Entries	Inquire Workstation State Table Lengths
GPQOPS	Inquire Open Structure	Inquire Open Structure
GPQOPW	Inquire Set of Open Workstations	Inquire Set of Open Workstations

Table 3. GPxxxx Subroutine Calls and Their Associated ISO PHIGS Subroutines (continued)

xxxx **Subroutine Call**	*xxxx* **Subroutine Call Description**	**Associated ISO PHIGS Subroutine Call(s)**
GPQPAR	Inquire Pattern Representation	Inquire Pattern Representation
GPQPAS	Inquire Ancestors of Structure	Inquire Paths to Ancestors
GPQPCR	Inquire Predefined Color Representation	Inquire Predefined Color Representation
GPQPDS	Inquire Descendants of Structure	Inquire Paths to Descendants
GPQPER	Inquire Predefined Edge Representation	Inquire Predefined Edge Representation
GPQPIR	Inquire Predefined Interior Representation	Inquire Predefined Interior Representation
GPQPK	Inquire Pick Device State	Inquire Pick Device State 3
GPQPLF	Inquire Polyline Facilities	Inquire Polyline Facilities
GPQPLR	Inquire Predefined Polyline Representation	Inquire Predefined Polyline Representation
GPQPMF	Inquire Polymarker Facilities	Inquire Polymarker Facilities
GPQPMR	Inquire Predefined Polymarker Representation	Inquire Predefined Polymarker Representation
GPQPPR	Inquire Predefined Pattern Representation	Inquire Predefined Pattern Representation
GPQPTR	Inquire Predefined Text Representation	Inquire Predefined Text Representation
GPQRCT	Inquire Realized Connection and Type	Inquire Workstation Connection and Type
GPQRST	Inquire Referencing Structure	Inquire Paths to Ancestors
GPQRV	Inquire Set of Roots in View	Inquire Posted Structures
GPQRVE	Inquire Requested View Table Entries	Inquire List of View Indices
GPQRVR	Inquire Requested View Representation	Inquire View Representation , Inquire HLHSR Mode
GPQSEV	Inquire More Simultaneous Events	Inquire More Simultaneous Events
GPQSK	Inquire Stroke Device State	Inquire Stroke Device State 3
GPQST	Inquire String Device State	Inquire String Device State 3
GPQSTE	Inquire Structure Existence	Inquire Structure Status
GPQSTI	Inquire Structure Identifiers	Inquire Structure Identifiers
GPQSTS	Inquire Structure Status	Inquire Structure Status
GPQSTV	Inquire Structure State Value	Inquire Structure State Value
***xxxx* Subroutine Call**	***xxxx* Subroutine Call Description**	**Associated ISO PHIGS Subroutine Call(s)**
GPQSYV	Inquire System State Value	Inquire System State Value
GPQTR	Inquire Text Representation	Inquire Text Representation
GPQTXF	Inquire Text Facilities	Inquire Text Facilities
GPQVL	Inquire Valuator Device State	Inquire Valuator Device State 3
GPQWC	Inquire Workstation Category	Inquire Workstation Category
GPQWD	Inquire Workstation Display Classification	Inquire Workstation Classification
GPQWDT	Inquire Workstation Description	Inquire Modeling Clipping Facilities
GPQWSA	Inquire Set of Workstations to Which Associated	Inquire Set of Workstations to Which Posted
GPQWST	Inquire List of Available Workstation Types	Inquire List of Available Workstation Types
GPQWSV	Inquire Workstation State Value	Inquire Workstation State Value
GPQWSX	Inquire Workstation Transformation	Inquire Workstation Transformation 3
GPQXAF	Inquire Extended Annotation Font Characteristics	Inquire Annotation Facilities
GPQXCR	Inquire Extended Color Representation	Inquire Color Representation

Table 3. GPxxxx Subroutine Calls and Their Associated ISO PHIGS Subroutines (continued)

xxxx **Subroutine Call**	*xxxx* **Subroutine Call Description**	**Associated ISO PHIGS Subroutine Call(s)**
GPQXER	Inquire Extended Edge Representation	Inquire Edge Representation
GPQXIR	Inquire Extended Interior Representation	Inquire Interior Representation
GPQXLR	Inquire Extended Polyline Representation	Inquire Polyline Representation
GPQXMR	Inquire Extended Polymarker Representation	Inquire Polymarker Representation
GPQXTR	Inquire Extended Text Representation	Inquire Text Representation
GPRAS	Retrieve Ancestors to Structures	Retrieve Ancestors to Structures
GPRAST	Redraw All Structures	Redraw All Structures
GPRCN	Remove Class Name from Set	Remove Names from Set
GPRDS	Retrieve Descendants to Structures	Retrieve Descendants to Structures
GPROTX	Rotate X	Rotate X
GPROTY	Rotate Y	Rotate Y
GPROTZ	Rotate Z	Rotate Z
GPROT2	Rotate 2	Rotate
GPRQCH	Request Choice	Request Choice
GPRQLC	Request Locator	Request Locator 3
GPRQPK	Request Pick	Request Pick
GPRQSK	Request Stroke	Request Stroke 3
GPRQST	Request String	Request String
GPRQVL	Request Valuator	Request Valuator
GPRMCV	Restore Modeling Clipping Volume	Restore Modeling Clipping Volume
GPRSTI	Retrieve Structure Identifiers	Retrieve Structure Identifiers
GPRVSN	Retrieve Structure Networks	Retrieve Structure Networks
GPRVST	Retrieve Structures	Retrieve Structures
GPSC2	Scale 2	Scale
GPSC3	Scale 3	Scale 3
GPSKMO	Set Stroke Mode	Set Stroke Mode
GPSMCH	Sample Choice	Sample Choice
GPSMLC	Sample Locator	Sample Locator 3
GPSMPK	Sample Pick	Sample Pick
GPSMSK	Sample Stroke	Sample Stroke 3
GPSMST	Sample String	Sample String
GPSMVL	Sample Valuator	Sample Valuator
GPSTMO	Set String Mode	Set String Mode
GPTRL2	Translate 2	Translate
GPTRL3	Translate 3	Translate 3
GPTXAL	Set Text Alignment	Set Text Alignment
GPTXCI	Set Text Color Index	Set Text Color Index
GPTXFO	Set Text Font	Set Text Font
GPTXI	Set Text Index	Set Text Index
GPTXPR	Set Text Precision	Set Text Precision
GPTXPT	Set Text Path	Set Text Path
GPTXR	Set Text Representation	Set Text Representation
GPTX2	Text 2	Text
GPTX3	Text 3	Text 3
GPUPWS	Update Workstation	Update Workstation
GPVCH	Set View Characteristics	Set View Representation, Set View Representation 3
GPVIP	Set View Input Priority	Set View Transformation Input Priority
GPVLMO	Set Valuator Mode	Set Valuator Mode

Table 3. GPxxxx Subroutine Calls and Their Associated ISO PHIGS Subroutines (continued)

xxxx **Subroutine Call**	*xxxx* **Subroutine Call Description**	**Associated ISO PHIGS Subroutine Call(s)**
GPVMP2	Set View Mapping 2	Set View Representation, Evaluate View Mapping Matrix
GPVMP3	Set View Mapping 3	Set View Representation 3, Evaluate View Mapping Matrix 3
GPVMT2	Set View Matrix 2	Set View Representation, Evaluate View Orientation Matrix
GPVMT3	Set View Matrix 3	Set View Representation 3, Evaluate View Orientation Matrix 3
GPVP	Set View Priority	Set View Transformation Input Priority
GPVPLN	Set View Plane Normal	Evaluate View Orientation Matrix 3
GPVR	Set View Reference Point	Evaluate View Orientation Matrix 3
GPVUP	Set View Up	Evaluate View Orientation Matrix 3
GPVWI	Set View Index	Set View Index
GPWSX2	Set Workstation Transformation 2	Set Workstation Viewport
GPWSX3	Set Workstation Transformation 3	Set Workstation Viewport 3
GPXCR	Set Extended Color Representation	Set Color Representation
GPXER	Set Extended Edge Representation	Set Edge Representation
GPXF2	Transform Point 2	Transform Point
GPXF3	Transform Point 3	Transform Point 3
GPXIR	Set Extended Interior Representation	Set Interior Representation
GPXPLR	Set Extended Polyline Representation	Set Polyline Representation
GPXPMR	Set Extended Polymarker Representation	Set Polymarker Representation
GPXTXR	Set Extended Text Representation	Set Text Representation
GPXVCH	Set Extended View Characteristics	Set View Representation, Set View Representation 3
GPXVR	Set Extended View Representation	Set View Representation, Set View Representation 3, Set HLHSR Mode

Chapter 22. Implementation Errors and graPHIGS API Messages for ISO PHIGS-Defined Errors

ISO PHIGS error numbers are divided into the following ranges:

Errors <0
Implementation dependent

Errors 1-1999
ISO PHIGS standard errors

Errors 2000-3999
Language binding errors

The absolute value of a negative error number refers to a GP*xxxx* message number listed in *The graPHIGS Programming Interface: Messages and Codes*.

The following tables list the graPHIGS API messages for ISO PHIGS standard errors, ISO PHIGS C binding errors, and ISO PHIGS FORTRAN binding errors. The graPHIGS API ignores functions which cause errors, unless the error message specifically says that it is a WARNING. See the ISO PHIGS standard and ISO PHIGS FORTRAN and C bindings for more information on the errors.

Table 4. graPHIGS API Messages for ISO PHIGS Standard Errors

Error Number	Message
1	FUNCTION REQUIRES STATE (PHCL,WSCL,STCL,ARCL)
2	FUNCTION REQUIRES STATE (PHOP,*,*,*)
3	FUNCTION REQUIRES STATE (PHOP,WSOP,*,*)
4	FUNCTION REQUIRES STATE (PHOP,WSCL,STCL,ARCL)
5	FUNCTION REQUIRES STATE (PHOP,*,STOP,*)
6	FUNCTION REQUIRES STATE (PHOP,*,STCL,*)
7	FUNCTION REQUIRES STATE (PHOP,*,*,AROP)
50	CONNECTION IDENTIFIER NOT RECOGNIZED BY IMPLEMENTATION
51	INFORMATION NOT AVAILABLE FOR GENERIC WORKSTATION TYPE
52	WORKSTATION TYPE NOT RECOGNIZED BY IMPLEMENTATION
53	WORKSTATION IDENTIFIER ALREADY IN USE
54	SPECIFIED WORKSTATION IS NOT OPEN
55	WORKSTATION NOT OPENED FOR IMPLEMENTATION DEPENDENT REASON
56	SPECIFIED WORKSTATION IS NOT OF CATEGORY MO
57	SPECIFIED WORKSTATION IS OF CATEGORY MI
58	SPECIFIED WORKSTATION IS NOT OF CATEGORY MI
59	SPECIFIED WORKSTATION DOES NOT HAVE OUTPUT CAPABILITY
60	SPECIFIED WORKSTATION IS NOT OF CATEGORY OUTIN
61	SPECIFIED WORKSTATION IS NOT OF CATEGORY INPUT OR OUTIN
62	THIS INFORMATION NOT AVAILABLE FOR MO WORKSTATION TYPE
63	EXCEEDED MAXIMUM NUMBER OF SIMULTANEOUSLY OPEN WORKSTATIONS
64	SPECIFIED WORKSTATION TYPE CANNOT GENERATE SPECIFIED GDP
100	BUNDLE INDEX VALUE IS LESS THAN ONE
101	SPECIFIED REPRESENTATION HAS NOT BEEN DEFINED
102	REPRESENTATION HAS NOT BEEN PREDEFINED ON THIS WORKSTATION
103	EXCEEDED MAXIMUM NUMBER OF WORKSTATION BUNDLE TABLE ENTRIES
104	SPECIFIED LINETYPE NOT AVAILABLE ON WORKSTATION
105	SPECIFIED MARKER TYPE NOT AVAILABLE ON WORKSTATION
106	SPECIFIED FONT NOT AVAILABLE FOR REQUESTED TEXT PRECISION
107	SPECIFIED EDGETYPE NOT AVAILABLE ON WORKSTATION
108	SPECIFIED INTERIOR STYLE NOT AVAILABLE ON WORKSTATION
109	INTERIOR STYLE PATTERN NOT SUPPORTED ON WORKSTATION

Table 4. graPHIGS API Messages for ISO PHIGS Standard Errors (continued)

Error Number	Message
110	SPECIFIED COLOUR MODEL NOT AVAILABLE ON WORKSTATION
111	SPECIFIED HLHSR MODE NOT AVAILABLE ON WORKSTATION
112	PATTERN INDEX VALUE < ONE
113	COLOUR INDEX VALUE < ZERO
114	VIEW INDEX VALUE < ZERO
115	VIEW INDEX VALUE < ONE
116	ONE DIMENSION OF PATTERN COLOUR INDEX ARRAY < ONE
117	ONE DIMENSION OF COLOUR INDEX ARRAY < ZERO
118	COLOUR COMPONENT IS OUT OF RANGE
150	EXCEEDED MAXIMUM NUMBER OF VIEW TABLE ENTRIES
151	INVALID WINDOW: MINIMUM VALUE >= TO CORRESPONDING MAXIMUM VALUE
152	INVALID VIEWPORT: XMIN >= XMAX, YMIN >= YMAX OR ZMIN > ZMAX
153	INVALID VIEW CLIPPING LIMITS: XMIN>=XMAX, YMIN>=YMAX or ZMIN>ZMAX
154	VIEW CLIPPING LIMITS ARE NOT WITHIN NPC RANGE
155	PROJECTION VIEWPORT LIMITS ARE NOT WITHIN NPC RANGE
156	WORKSTATION WINDOW LIMITS ARE NOT WITHIN NPC RANGE
157	WORKSTATION VIEWPORT IS NOT WITHIN DISPLAY SPACE
158	FRONT PLANE DISTANCE = BACK PLANE DISTANCE WHEN Z EXTENT NON ZERO
159	VIEW PLANE NORMAL VECTOR HAS LENGTH ZERO
160	VIEW UP VECTOR HAS LENGTH ZERO
161	VIEW UP AND VIEW PLANE NORMAL VECTORS ARE PARALLEL
162	PROJECTION REFERENCE POINT BETWEEN FRONT AND BACK PLANES
163	PROJECTION REFERENCE POINT CANNOT BE POSITIONED ON VIEW PLANE
164	BACK PLANE IS IN FRONT OF THE FRONT PLANE
200	WARNING, IGNORING STRUCTURES THAT DO NOT EXIST
201	SPECIFIED STRUCTURE DOES NOT EXIST
202	SPECIFIED ELEMENT DOES NOT EXIST
203	SPECIFIED STARTING PATH NOT FOUND IN CSS
204	SPECIFIED SEARCH CEILING INDEX OUT OF RANGE
205	LABEL NOT BETWEEN ELEMENT POINTER AND END OF STRUCTURE
206	LABEL(S) NOT BETWEEN ELEMENT POINTER AND END OF STRUCTURE
207	SPECIFIED PATH DEPTH < ZERO
208	DISPLAY PRIORITY IS OUT OF RANGE
250	SPECIFIED DEVICE NOT AVAILABLE ON WORKSTATION
251	FUNCTION REQUIRES INPUT DEVICE TO BE IN REQUEST MODE
252	FUNCTION REQUIRES INPUT DEVICE TO BE IN SAMPLE MODE
253	PROMPT/ECHO TYPE NOT AVAILABLE ON SPECIFIED WORKSTATION
254	INVALID ECHO AREA/VOLUME: XMIN>=XMAX, YMIN>=YMAX OR ZMIN>ZMAX
255	ECHO AREA/VOLUME BOUNDARY POINT(S) OUTSIDE DEVICE RANGE
256	WARNING, INPUT QUEUE HAS OVERFLOWED
257	INPUT QUEUE HAS NOT OVERFLOWED
258	INPUT QUEUE HAS OVERFLOWED, BUT WORKSTATION IS CLOSED
259	REQUESTED DEVICE CLASS NOT CURRENT INPUT REPORT CLASS
260	INPUT DEVICE DATA RECORD FIELD IS IN ERROR
261	INITIAL VALUE IS INVALID
262	NUMBER OF POINTS IN INITIAL STROKE > BUFFER SIZE
263	LENGTH OF INITIAL STRING > BUFFER SIZE
300	ITEM TYPE IS NOT ALLOWED FOR USER ITEMS
301	ITEM LENGTH IS INVALID
302	NO ITEM IS LEFT IN METAFILE INPUT
303	METAFILE ITEM IS INVALID
304	ITEM TYPE IS UNKNOWN
305	CONTENT OF ITEM DATA RECORD INVALID FOR SPECIFIED ITEM TYPE
306	MAXIMUM ITEM DATA RECORD LENGTH IS INVALID

Table 4. graPHIGS API Messages for ISO PHIGS Standard Errors (continued)

Error Number	Message
307	USER ITEM CANNOT BE INTERPRETED
350	WARNING, SPECIFIED ESCAPE UNAVAILABLE ON ONE OR MORE WORKSTATIONS
351	ONE OF THE FIELDS WITHIN THE ESCAPE DATA RECORD IS IN ERROR
400	ARCHIVE FILE CANNOT BE OPENED
401	EXCEEDED MAXIMUM NUMBER OF SIMULTANEOUSLY OPEN ARCHIVE FILES
402	ARCHIVE FILE IDENTIFIER ALREADY IN USE
403	ARCHIVE FILE IS NOT A PHIGS ARCHIVE FILE
404	SPECIFIED ARCHIVE FILE IS NOT OPEN
405	NAME CONFLICT OCCURRED, CONFLICT RESOLUTION FLAG = ABANDON
406	WARNING, ARCHIVE FILE IS FULL
407	WARNING, SOME SPECIFIED STRUCTURES DO NOT EXIST ON ARCHIVE FILE
408	WARNING, STRUCTURE(S) NOT IN ARCHIVE, EMPTY ONE(S) TO BE CREATED
450	SPECIFIED ERROR FILE IS INVALID
900	STORAGE OVERFLOW HAS OCCURRED IN PHIGS
901	STORAGE OVERFLOW HAS OCCURRED IN CSS
902	INPUT/OUTPUT ERROR OCCURRED WHILE READING
903	INPUT/OUTPUT ERROR OCCURRED WHILE WRITING
904	INPUT/OUTPUT ERROR OCCURRED WHILE SENDING DATA TO A WORKSTATION
905	INPUT/OUTPUT ERROR OCCURRED WHILE RECEIVING DATA FROM A WORKSTATION
906	INPUT/OUTPUT ERROR OCCURRED DURING PROGRAM LIBRARY MANAGEMENT
907	INPUT/OUTPUT ERROR OCCURRED WHILE READING THE WDT
908	ARITHMETIC ERROR HAS OCCURRED

The following table lists the graPHIGS API messages for ISO PHIGS FORTRAN binding errors. See the ISO/IEC FORTRAN binding for more information on these errors.

Table 5. graPHIGS API Messages for ISO PHIGS FORTRAN Binding Errors

Error Number	Message
2000	ENUMERATION TYPE OUT OF RANGE
2001	OUTPUT PARAMETER SIZE INSUFFICIENT
2002[1]	LIST OR SET ELEMENT NOT AVAILABLE
2003	INVALID DATA RECORD
2004	INPUT PARAMETER SIZE OUT OF RANGE
2005	INVALID LIST OF POINT LISTS
2006	INVALID LIST OF FILTERS

Note: [1]If this error occurs, the total number in the list is still returned, but the requested element is not returned.

The following table lists the graPHIGS API messages for ISO PHIGS C binding errors.

Table 6. graPHIGS API Messages for ISO PHIGS C Binding Errors

Error Number	Message
2200	START INDEX IS OUT OF RANGE
2201	LENGTH OF THE APPLICATION'S LIST IS NEGATIVE
2202	ENUMERATION TYPE OUT OF RANGE
2203	ERROR WHILE ALLOCATING STORE
2204	ERROR WHILE ALLOCATING MEMORY FOR STORE

Chapter 23. graPHIGS API Extensions and Compatibility with the ISO PHIGS Standard

You can write applications that combine GP*xxxx* subroutine calls and ISO PHIGS subroutine calls. All of the GP*xxxx* subroutines (documented in *The graPHIGS Programming Interface: Subroutine Reference*) are available as extensions to the ISO PHIGS library of subroutine calls. This chapter identifies some graPHIGS API extensions and discusses considerations for combining GP*xxxx* subroutine calls and ISO PHIGS subroutine calls.

Helpful Hints
Enumerations in ISO PHIGS subroutine calls are not necessarily the same as in GP*xxxx* subroutine calls.

Matrixes in ISO PHIGS apply to a column vector, while GP*xxxx* matrixes apply to a row vector. In addition, the order in which the matrix is stored is determined by the binding. See Chapter 15. ″ISO PHIGS Transformations″ for a description of the storage of a transformation matrix.

graPHIGS API Extensions to the ISO PHIGS Standard

Many GP*xxxx* subroutine calls offer features beyond the ISO PHIGS standard. These include:

ISO PHIGS PLUS functions
- Advanced primitives (NURBS curves/surfaces, triangle strip, . . .)
- Lighting and shading
- Hidden-line/hidden-surface removal (HLHSR)
- Depth cueing
- Direct color.

Other features
- More primitives (spheres, grids, composite fill, polyhedron edge, . ..)
- Proportional/filled fonts
- Conditional traversal
- Image display
- Integration with X-Windows
- Distributed architecture for networked processing
- Sharing of graphical resources between processes
- Enhanced structure editing
- View-based traversal.

Compatibility between graPHIGS API Extensions and the ISO PHIGS Standard

When writing an application that uses both GP*xxxx* subroutine calls and ISO PHIGS subroutine calls, there are several considerations you should be aware of:

The architecture
To provide for distributed processing, the graPHIGS API separates its code into the graPHIGS API shell and the graPHIGS API nucleus. For more information about the graPHIGS API shell and the graPHIGS API nucleus, see *The graPHIGS Programming Interface: Understanding Concepts*. Many of the considerations which are listed below are directly related to the implementation of this distributed architecture.

View specification

Two approaches are available in the area of view specification. ISO PHIGS and GP*xxxx* subroutines provide an approach whereby structures are posted to workstations and then traversed for display. Display traversal begins with a default view index which may change during traversal due to Set View Index structure elements. For a discussion of Set View Index processing within the graPHIGS API environment, see Appendix C of *The graPHIGS Programming Interface: Understanding Concepts*.

In addition, through GP*xxxx* subroutines, the view specification may be handled in another way. Root structures may be posted to views within workstations by using the Associate Root to View (**GPARV**) subroutine function. Views are then traversed in output priority order. View-based traversal allows the graPHIGS API to optimize updates by redrawing only views with changed data.

The following sections describe:

- Considerations for combining the two types of subroutines, listed by type of function.
- Rules used by the graPHIGS API when reporting errors to an application that combines subroutine calls.

See Chapter 19. ″ISO PHIGS Subroutines to GPxxxx Subroutines″ and Chapter 20. ″GPxxxx Subroutines to ISO PHIGS Subroutines″ for listings of ISO PHIGS subroutines and their GP*xxxx* equivalents or approximate equivalents, and vice versa.

Control Subroutines

Issuing Open Workstation

Opening a workstation with the ISO PHIGS Open Workstation subroutine results in the following differences in default values used at the workstation as compared to the defaults assumed when the workstation is opened using either **GPOPWS** or **GPCRWS**.

Table 12. Default values when opening (creating) the workstation.

	ISO PHIGS Open Workstation	graPHIGS API GPOPWS or GPCRWS
Number of line types available	4	7
Number of edge types available	4	7
Default Mapping Matrixes	Maps WC cube [*0,1*] x [*0,1*] x [*0,1*] to the cube in NPC space of [*0,1*] x [*0,1*] x [*0,1*].	Maps WC cube [*-1,1*] x [*-1,1*] x [*-1,1*] to the cube in NPC space of [*0,1*] x [*0,1*] x [*0,1*].
Workstation viewport	All of DC space.[1]	Largest square in DC space.[1]
View input	Active for each view.	Active only for view *0*.
Annotation text character height default	0.01	The nominal annotation text character height for the open workstation.
Hatch table defaults	Hatch table indexes *1-6* are as described by the Set Interior Style Index (**GPISI**) subroutine (SET INTERIOR STYLE INDEX (PHOP,*,STOP,*)), and the remaining indexes of the hatch table are defaulted to a hatch index value of *1*.	See ″Interior Facilities″ in *The graPHIGS Programming Interface: Technical Reference*.

Note:
[1]Although visual presentation on the screen is identical, the initial values in the workstation state list are different.

Issuing Open graPHIGS

If you issue the Open graPHIGS (**GPOPPH**) subroutine with suppression of the nucleus and structure store creation via defaults, you must create a structure store with an id value of *1* before issuing any ISO PHIGS subroutine call that attempts to access the structure store. Otherwise the graPHIGS API generates implementation errors (-11 or -12).

Since connecting to a nucleus is not an ISO PHIGS concept, when you issue an ISO PHIGS Open PHIGS subroutine call, the graPHIGS API connects to a nucleus with an id value of *1* by default. If a program issues the Open graPHIGS (**GPOPPH**) subroutine with suppression of the nucleus and structure store creation via defaults, and then fails to create a nucleus with an id value of *1*, the graPHIGS API generates implementation error (-202) on every ISO PHIGS subroutine call that assumes a nucleus with an id value of *1*. Inquire PHIGS Facilities is an ISO PHIGS subroutine call that could generate such an error.

Asynchronous Errors

Some errors from the nucleus may not be reported during the subroutine call which forced the error. The following rules are followed when reporting such an error to an application that combines GP*xxxx* subroutine calls and ISO PHIGS subroutine calls. (For details on the timing of error reporting, see Appendix B of *The graPHIGS Programming Interface: Understanding Concepts*).

- If the application has opened PHIGS with ISO PHIGS Open PHIGS, the error is returned as an ISO PHIGS error, and the subroutine name is an ISO PHIGS subroutine call.
- If the application has opened PHIGS with **GPOPPH**, the error is returned as a GP*xxxx* error, and the subroutine name is a GP*xxxx* subroutine call.
- These error logs have an asterisk after the subroutine name to alert the user that this is an error being returned asynchronously from the graPHIGS API nucleus, and as such the error reported and the subroutine name follow the above rules.

The following examples illustrate these rules:

Delete Elements Between Labels and Set Element Pointer at Label could cause asynchronous GP*xxxx* error 130 (*LABEL IDENTIFIER CANNOT BE FOUND IN THE OPEN STRUCTURE*). ISO PHIGS has two distinct errors (205 and 206) defined instead. The graPHIGS API issues error 130 if you used **GPOPPH**, otherwise the graPHIGS API issues the mapped ISO PHIGS error.

Initialize input device subroutine calls could cause asynchronous GP*xxxx* error 141 (*INPUT DEVICE NOT IN CORRECT MODE*). ISO PHIGS defines error 251. If you used **GPOPPH**, then the graPHIGS API issues GP*xxxx* error 141, otherwise the graPHIGS API issues ISO PHIGS error 251.

Workstation Settings

The graPHIGS API supports workstations that have hatch, polymarker, and linetype tables that you can set. The following GP*xxxx* subroutine calls can change default entries in these tables:

GPLTR
(Set Linetype Representation)

GPMTR
(Set Marker Type Representation)

GPHR (Set Hatch Representation)

If an application uses the GP*xxxx* interface to alter these tables, then the representation that ISO PHIGS defines for a line type, marker type, or hatch value has been altered.

Note: For workstations opened by an ISO PHIGS Open Workstation subroutine call, the default representations for the line type, marker type, and hatch tables are as defined by the ISO PHIGS standard.

HLHSR

ISO PHIGS has only one HLHSR mode for a workstation, whereas the GP*xxxx* interface has an HLHSR mode per view. If your application uses an ISO PHIGS subroutine call to set the HLHSR mode, the graPHIGS API automatically assigns this mode to view *0*. The ISO PHIGS inquiry for the HLHSR mode returns the mode for view *0*. The only way to set or inquire the mode of a view other than view *0* is through GP*xxxx* subroutine calls.

Issuing Inquires

You must be careful when your application combines GP*xxxx* subroutines with ISO PHIGS inquiries. Any element placed into a structure by an ISO PHIGS subroutine may always be inquired through the GP*xxxx* interface as well as through ISO PHIGS. However, using ISO PHIGS inquiries to obtain data that only could have been placed in a structure or into a workstation table via a GP*xxxx* subroutine call, generates implementation error -606.

Implementation error -606 implies that the graPHIGS API is ignoring this function, and you should use the appropriate GPQ*xxx* inquiry to obtain the data.

Examples of error -606 on workstation inquiries:

- **Inquire Polyline Representation**: GP*xxxx* subroutine calls can set polyline representations to values unknown to ISO PHIGS. Using ISO PHIGS Inquire Polyline Representation to inquire such a polyline representation generates error -606.
- **Inquire Polymarker Representation**: GP*xxxx* subroutine calls can set polymarker representations to values unknown to ISO PHIGS. Using ISO PHIGS Inquire Polymarker Representation to inquire such a polymarker representation generates error -606.
- **Inquire Text Representation**: GP*xxxx* subroutine calls can set text representations to values unknown to ISO PHIGS. Using ISO PHIGS Inquire Text Representation to inquire such a text representation generates error -606.
- **Inquire Interior Representation**: GP*xxxx* subroutine calls can set interior representations to values unknown to ISO PHIGS. Using ISO PHIGS Inquire Interior Representation to inquire such an interior representation generates error -606.
- **Inquire Edge Representation**: GP*xxxx* subroutine calls can set edge representations to values unknown to ISO PHIGS. Using ISO PHIGS Inquire Edge Representation to inquire such an edge representation produces error -606.
- **Inquire Color Model set to CMY**: GP*xxxx* subroutine calls support the CMY color model, which is unknown to ISO PHIGS. Using ISO PHIGS Inquire Color Model to inquire the color model which has been set to CMY generates error -606.
- **Inquire state of locator device**: You may issue the Initialize Locator (**GPINLC**) subroutine to initialize a locator device with prompt/echo types or data record variations which are not defined in ISO PHIGS. Using ISO PHIGS subroutines to inquire the state of such a locator device generates error -606.
- **Inquire state of stroke device**: You may issue the Initialize Stroke (**GPINSK**) subroutine to initialize a stroke device with prompt/echo types or data record variations which are not defined in ISO PHIGS. Using ISO PHIGS subroutines to inquire the state of such a stroke device generates error -606.
- **Inquire state of valuator device**: You may issue the Initialize Valuator (**GPINVL**) subroutine to initialize a valuator device with prompt/echo types or data record variations which are not defined in ISO PHIGS. Using ISO PHIGS subroutines to inquire the state of such a valuator device generates error -606.
- **Inquire state of string device**: You may issue the Initialize String (**GPINST**) subroutine to initialize a string device with prompt/echo types or data record variations which are not defined in ISO PHIGS. Using ISO PHIGS subroutines to inquire the state of such a string device generates error -606.

Examples of error -606 on structure store inquiries:

- **Inquire element type and size or element content generated by Attribute Source Flag Setting**: You may issue the Attribute Source Flag Setting (**GPASF**) subroutine to generate a structure element containing 0, 1, 2, or more *id*/*flag* pairs. ISO PHIGS Set Individual ASF requires exactly one *id*/*flag* pair.

Thus, if the structure element placed into the structure via **GPASF** contains zero or more than one *id*/*flag* pair, inquiring the type and size, or the contents of this element through ISO PHIGS generates error -606.

- **Inquire contents of element generated by Set Edge Flag**: You may issue the Set Edge Flag (**GPEF**) subroutine to set the edge flag to *GEOMETRY ONLY* in addition to the values known to ISO PHIGS Set Edge Flag. If the structure element placed into the structure via **GPEF** has the edge flag indicated as *GEOMETRY ONLY*, then using ISO PHIGS subroutines to inquire the contents of this element generates error -606.
- **Inquire type and size or contents of Polygon 2/3**: You may issue the Polygon 2 (**GPPG2**) and Polygon 3 (**GPPG3**) subroutines to generate structure elements with zero contours and contours with 0, 1 or 2 points. All of these are unavailable through ISO PHIGS. If the contents or the type and size of such elements are inquired via ISO PHIGS, then the graPHIGS API generates error -606.

  Note: An element type may be known to both ISO PHIGS and the GP*xxxx* interface, but the GP*xxxx* interface may only know the data within the type. If such an element is inquired through ISO PHIGS, then the graPHIGS API generates error -606.

Additional information, for FORTRAN Binding Only:

- **Inquire element type and size or content set by Insert Application Data**: Application data generated by the Insert Application Data (**GPINAD**) subroutine may appear to have more data when inquired by the Inquire Element Content (PQECO), the Inquire Current Element Content (PQCECO), the Inquire Element Type and Size (PQETS), or the Inquire Current Element Type and Size (PQCETS) subroutine. The length of ISO PHIGS application data is in multiples of 80 bytes. The equivalent GP*xxxx* subroutine call, Insert Application Data (**GPINAD**) specifies the exact length of application data. The GP*xxxx* data length is rounded up to the nearest multiple of 80 when the element is set by **GPINAD** and then inquired by an ISO PHIGS FORTRAN subroutine.
- **Inquire workstation connection and type**: The connection identifier (integer) returned by the ISO PHIGS FORTRAN Inquire Workstation Connection and Type (**PQWKC**) subroutine is unique to ISO PHIGS. If you opened your workstation using Open Workstation (**GPOPWS**) or Create Workstation (**GPCRWS**), then the connection identifier returned by **PQWKC** is not usable as the connection identifier for the ISO PHIGS FORTRAN Open Workstation (**POPWK**) ( ). If you opened your workstation using the ISO PHIGS Open Workstation (**POPWK**) subroutine, then **PQWKC** returns the connection identifier used on that subroutine call.

Display Subroutines

The following table lists display-related ISO PHIGS calls and their equivalent GP*xxxx* subroutine calls:

Table 7. Display-related ISO PHIGS subroutines and their equivalent GPxxxx subroutines.

ISO PHIGS Subroutine	**Equivalent GP*xxxx* Subroutine**
Post Structure	**GPARV** (Associate Root with View) with a view parameter of *0*
Unpost Structure	**GPDRW** (Disassociate Root from Workstation)
Unpost All Structures	**GPDARW** (Disassociate All Roots from Workstation)
Inquire Posted Structures	**GPQRV** (Inquire Set of Roots in View) with a requested view of *0*

Input Events

For programs that combine GP*xxxx* subroutines and ISO PHIGS subroutines, the ISO PHIGS Await Event subroutine could return such events as Link Switch In, Link Switch Out, Update Completion, Input Overflow Events, Broadcast Message, Private Message, and Threshold Exceeded. For more information on events supported by the graPHIGS API, see *The graPHIGS Programming Interface: Technical Reference*.

Chapter 24. graPHIGS API Deviations from the ISO PHIGS Standard

This chapter describes the following graPHIGS API deviations from the ISO PHIGS standard:

- Unsupported subroutines
- Structure building
- Color components
- Input
- Traversal defaults
- Errors

Unsupported Subroutines

The graPHIGS API implementation of ISO PHIGS does not support the functionality required for:

- Metafile subroutine functions
- Incremental spatial search functions.

The C and FORTRAN bindings are supported, but the functionality is not implemented. A complete list of unsupported functions follows:

Metafile Functions

- Get Item Type From Metafile
- Interpret Item
- Read Item From Metafile
- Write Item To Metafile

Incremental Spatial Search Subroutines

- Incremental Spatial Search
- Incremental Spatial Search 3

Structure Building

For Set Annotation Text Character Up Vector and Set Character Up Vector, the graPHIGS API stores only the normalized vectors. Therefore, on the inquiry for these elements, the normalized vectors are returned. In addition, if the application passes a vector of length *0*, the default vector is stored in the element. On a subsequent inquiry for the element, the graPHIGS API returns the default vector.

For Text 3, only the normalized text reference vectors are stored into the element. These normalized vectors are returned on an inquiry for the element. If the text reference vectors are linearly dependent (e.g., one vector is *0*, or they are parallel) the default vectors of [*1,0,0*] and [*0,1,0*] are stored. An inquiry for this element returns the default vectors. In either case, the display is identical.

Color Components

Inquired color components of type *SET* may differ from the parameters passed to the setting routine due to conversions between the color model in which color components are stored and the model at the time the set and inquiry routines are called. either subroutine call. In most cases these differences are due to numerical roundoff and truncation, and are slight. Differences can be large when *CIELUV* coordinates are

outside the gamut of the monitor primaries. The *u'* and *v'* coordinates are desaturated toward white to obtain a color within the gamut without changing the luminosity *y*. The resulting RGB coordinates are saved and inquired.

Input

The ISO PHIGS Await Event subroutine call could return a class of Input Overflow Events in the graPHIGS API. See *The graPHIGS Programming Interface: Technical Reference* for additional information.

Initial pick path is ignored by the graPHIGS API. Therefore, on an inquiry for the pick device data, the pick path set by the application on the Initialize Pick is not returned.

A sample input device subroutine call forces an invalid mode error if the device is in request mode, but no error is issued if the device is in event or sample mode. The ISO PHIGS standard defines a 252 error if not in sample mode, but the graPHIGS API does not issue the error if the device is sampled while in event or sample mode.

A request input device subroutine call never forces an invalid mode error. ISO PHIGS defines a 251 error if you are not in request mode.

Traversal Defaults

During traversal, if a text precision is not available in the current font, then the graPHIGS API uses the highest precision available for that font. ISO PHIGS states that *STRING* precision of font 1 should be the default.

During traversal, if a text font is not available, the graPHIGS API substitutes font 1 at the same precision. ISO PHIGS states that *STRING* precision of font 1 should be used.

Errors

Copy All Elements from Structure and Execute Structure have no error defined in ISO PHIGS for ″an attempt to execute the open structure″. The graPHIGS API rejects such an attempt and issues implementation error -125.

The following is a list of functions and related errors which can be detected only by a graPHIGS API nucleus. Therefore, it is possible that the error may not be generated during the subroutine call which caused it.

Subroutine Function	Error Number
Initialize Input Device Subroutine functions	251
Delete Element Between Labels	206
Set Element Pointer at Label	205
Copy All Elements from Structure	-125
Change Structure Identifier	-129
Change Structure Identifier and References	-129
Change Structure References	-129

Appendix. Notices

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