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**Information technology — Computer  
graphics — Programmer's Hierarchical  
Interactive Graphics System (PHIGS)  
language bindings —**

**Part 4:  
C**

**AMENDMENT 2:  
Incorporation of PHIGS amendments**

*Technologies de l'information — Infographie — Interfaces langage avec  
PHIGS —*

*Partie 4: C*

*AMENDEMENT 2: Incorporation des amendements de PHIGS*

## Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Amendment 2 to ISO/IEC 9593-4:1991 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 24, *Computer graphics and image processing*.

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# Information technology - Computer graphics - Programmer's Hierarchical Interactive Graphics System (PHIGS) language bindings -

## Part 4:

C

### Amendment 2: Incorporation of PHIGS amendments

Page 2

#### 2 Normative references

*The number of the first reference is changed to ISO/IEC 9592-1:1996.*

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#### 3 The C language binding of PHIGS

##### 3.1 Conformance

*The following text replaces the content of 3.1:*

“This binding incorporates the rules of conformance defined in the PHIGS Standard (ISO/IEC 9592) for PHIGS implementations, with those additional requirements specifically defined for C language implementations of PHIGS.

The following criteria are established for determining conformance of an implementation to this binding:

- a) In order to conform to the *Basic PHIGS profile*, an implementation of the C binding of PHIGS shall implement at least the functionality defined for the *Basic PHIGS profile* as specified in ISO/IEC

9592-1. It shall make visible all of the declarations in the C binding specified in clauses 5, 6, and 7 of this part of ISO/IEC 9593.

b) In order to conform to the *PHIGS PLUS profile*, an implementation of the C binding of PHIGS shall implement at least the functionality defined for the *PHIGS PLUS profile* as specified in ISO/IEC 9592-1. It shall make visible all of the declarations in the C binding specified in clauses 5 through 10 of this part of ISO/IEC 9593.

c) In order to conform to the *Full PHIGS profile*, an implementation of the C binding of PHIGS shall implement all of the functionality defined for the *Full PHIGS profile* as specified in ISO/IEC 9592-1. It shall make visible all of the declarations in the C binding specified in this part of ISO/IEC 9593.

d) The syntax of the function names shall be precisely as specified in this part of ISO/IEC 9593 and the parameters shall be of the data types stated in this part of ISO/IEC 9593.

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## 4 Tables

### 4.2 Table of abbreviations

The following abbreviations are added alphabetically to Table 1

“

**Table 1 - Abbreviations ordered alphabetically**

| Word or Phrase         | Abbreviation |
|------------------------|--------------|
| acknowledgement        | ack          |
| address                | addr         |
| associate              | assoc        |
| association            | assoc        |
| attribute              | attr         |
| automatic              | auto         |
| background             | backg        |
| boundary               | bound        |
| buffer                 | buf          |
| centre                 | ctr          |
| channel                | chan         |
| complete               | comp         |
| composition            | compos       |
| conditions             | conds        |
| configuration          | config       |
| continuity             | cont         |
| correlate, correlation | corr         |
| define                 | def          |
| destination            | dest         |
| disassociate           | disassoc     |
| disposition            | dispos       |

**Table 1 - Abbreviations ordered alphabetically (Continued)**

| <b>Word or Phrase</b> | <b>Abbreviation</b> |
|-----------------------|---------------------|
| distance              | dist                |
| frequency             | freq                |
| group                 | grp                 |
| groups                | grps                |
| heuristics            | heur                |
| include               | incl                |
| incompatible          | incompat            |
| incomplete            | incomp              |
| indicator             | indic               |
| instance              | inst                |
| logical input device  | lid                 |
| manipulation          | manip               |
| measure               | meas                |
| non-atomic            | na                  |
| non-retained          | nr                  |
| non-retained data     | nrd                 |
| optimization          | opt                 |
| parameterization      | param               |
| parameters            | params              |
| picture               | pict                |
| posting               | post                |
| process, processing   | proc                |
| reference             | ref                 |
| registered            | reg                 |
| render, rendering     | rend                |
| resource              | res                 |
| sampling              | sampl               |
| source                | src                 |
| target                | targ                |
| texture               | textr               |
| transfer              | trans               |
| traverse, traversal   | trav                |
| trigger               | trig                |
| uncompressed          | uncomp              |
| undefine              | undef               |
| weight                | wt                  |
| which                 | NULL                |

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## 4.3 Function names

### 4.3.1 List ordered alphabetically by bound name

The following function names are merged alphabetically by bound name in Table 2

“

**Table 2 - Function names ordered by bound name**

| C Name                                  | PHIGS and PHIGS PLUS Name                   |
|-----------------------------------------|---------------------------------------------|
| passoc_image_res (...)                  | ASSOCIATE IMAGE RESOURCE                    |
| passoc_trav_res (...)                   | ASSOCIATE TRAVERSAL RESOURCE                |
| pattach_lid_to_light_src (...)          | ATTACH LOGICAL INPUT DEVICE TO LIGHT SOURCE |
| pattach_lid_to_view (...)               | ATTACH LOGICAL INPUT DEVICE TO VIEW         |
| pcircle (...)                           | CIRCLE                                      |
| pcircle3 (...)                          | CIRCLE 3                                    |
| pcircular_arc (...)                     | CIRCULAR ARC                                |
| pcircular_arc3 (...)                    | CIRCULAR ARC 3                              |
| pcircular_arc_close (...)               | CIRCULAR ARC CLOSE                          |
| pcircular_arc_close3 (...)              | CIRCULAR ARC CLOSE 3                        |
| pclear_targ (...)                       | CLEAR TARGET                                |
| pclose_di_struct (...)                  | CLOSE DIRECT INTERPRETATION STRUCTURE       |
| pcond_exec_struct (...)                 | CONDITIONAL EXECUTE STRUCTURE               |
| pcond_inst_struct (...)                 | CONDITIONAL INSTANCE STRUCTURE              |
| pcond_return (...)                      | CONDITIONAL RETURN                          |
| pcond_skip_elements (...)               | CONDITIONAL SKIP ELEMENTS                   |
| pcond_skip_to_label (...)               | CONDITIONAL SKIP TO LABEL                   |
| pcopy_elem_struct (...)                 | COPY ELEMENT FROM STRUCTURE                 |
| pcopy_elem_range_struct (...)           | COPY ELEMENT RANGE FROM STRUCTURE           |
| pcopy_elems_between_labels_struct (...) | COPY ELEMENTS BETWEEN LABELS FROM STRUCTURE |
| pcopy_targ (...)                        | COPY TARGET                                 |
| pcreate_composite_measure (...)         | CREATE COMPOSITE MEASURE                    |
| pcreate_mipmap_texture (...)            | CREATE MIPMAP TEXTURE                       |
| pcreate_set_measure (...)               | CREATE SET MEASURE                          |
| pcreate_targ (...)                      | CREATE TARGET                               |
| pdefine_choice (...)                    | DEFINE CHOICE                               |
| pdefine_composite (...)                 | DEFINE COMPOSITE                            |
| pdefine_linetype (...)                  | DEFINE LINETYPE                             |
| pdefine_locator (...)                   | DEFINE LOCATOR                              |
| pdefine_marker_type (...)               | DEFINE MARKER TYPE                          |
| pdefine_pick (...)                      | DEFINE PICK                                 |
| pdefine_post_grp (...)                  | DEFINE POSTING GROUP                        |
| pdefine_set (...)                       | DEFINE SET                                  |
| pdefine_string (...)                    | DEFINE STRING                               |
| pdefine_stroke (...)                    | DEFINE STROKE                               |

Table 2 - Function names ordered by bound name (Continued)

| C Name                           | PHIGS and PHIGS PLUS Name                     |
|----------------------------------|-----------------------------------------------|
| pdefine_valuator (...)           | DEFINE VALUATOR                               |
| pdestroy_composite_measure (...) | DESTROY COMPOSITE MEASURE                     |
| pdestroy_set_measure (...)       | DESTROY SET MEASURE                           |
| pdestroy_targ (...)              | DESTROY TARGET                                |
| pdetach_lid_from_light_src (...) | DETACH LOGICAL INPUT DEVICE FROM LIGHT SOURCE |
| pdetach_lid_from_view (...)      | DETACH LOGICAL INPUT DEVICE FROM VIEW         |
| pdisable_di_pick (...)           | DISABLE DIRECT INTERPRETATION PICK            |
| pdisassoc_image_res (...)        | DISASSOCIATE IMAGE RESOURCE                   |
| pdisassoc_trav_res (...)         | DISASSOCIATE TRAVERSAL RESOURCE               |
| pellipse (...)                   | ELLIPSE                                       |
| pellipse3 (...)                  | ELLIPSE 3                                     |
| pelliptical_arc (...)            | ELLIPTICAL ARC                                |
| pelliptical_arc3 (...)           | ELLIPTICAL ARC 3                              |
| pelliptical_arc_close (...)      | ELLIPTICAL ARC CLOSE                          |
| pelliptical_arc_close3 (...)     | ELLIPTICAL ARC CLOSE 3                        |
| penable_di_pick (...)            | ENABLE DIRECT INTERPRETATION PICK             |
| pend_watch_on_elem_range (...)   | END WATCH ON ELEMENT RANGE                    |
| pfill_circle (...)               | FILL CIRCLE                                   |
| pfill_circle3 (...)              | FILL CIRCLE 3                                 |
| pfill_ellipse (...)              | FILL ELLIPSE                                  |
| pfill_ellipse3 (...)             | FILL ELLIPSE 3                                |
| pget_composite (...)             | GET COMPOSITE                                 |
| pget_composite3 (...)            | GET COMPOSITE 3                               |
| pget_set (...)                   | GET SET                                       |
| pget_set3 (...)                  | GET SET 3                                     |
| pinit_composite (...)            | INITIALIZE COMPOSITE                          |
| pinit_composite3 (...)           | INITIALIZE COMPOSITE 3                        |
| pinit_di_pick (...)              | INITIALIZE DIRECT INTERPRETATION PICK         |
| pinit_di_pick3 (...)             | INITIALIZE DIRECT INTERPRETATION PICK 3       |
| pinit_set (...)                  | INITIALIZE SET                                |
| pinit_set3 (...)                 | INITIALIZE SET 3                              |
| pinq_alpha_fac (...)             | INQUIRE ALPHA FACILITIES                      |
| pinq_appl_filter (...)           | INQUIRE APPLICATION FILTER                    |
| pinq_assoc_image_res (...)       | INQUIRE ASSOCIATED IMAGE RESOURCES            |
| pinq_back_clip_indicator (...)   | INQUIRE BACK CLIPPING INDICATOR               |
| pinq_back_plane_dist (...)       | INQUIRE BACK PLANE DISTANCE                   |
| pinq_choice_fac (...)            | INQUIRE CHOICE FACILITIES                     |
| pinq_composite_fac (...)         | INQUIRE COMPOSITE FACILITIES                  |
| pinq_composite_meas_def (...)    | INQUIRE COMPOSITE MEASURE DEFINITION          |
| pinq_composite_st (...)          | INQUIRE COMPOSITE DEVICE STATE                |
| pinq_composite_st3 (...)         | INQUIRE COMPOSITE DEVICE STATE 3              |
| pinq_cond_trav_fac (...)         | INQUIRE CONDITIONAL TRAVERSAL FACILITIES      |
| pinq_config_setting_fac (...)    | INQUIRE CONFIGURATION SETTING FACILITIES      |
| pinq_dc_clip_regions (...)       | INQUIRE DEVICE COORDINATE CLIP REGIONS        |
| pinq_dc_clip_regions3 (...)      | INQUIRE DEVICE COORDINATE CLIP REGIONS 3      |

Table 2 - Function names ordered by bound name (Continued)

| C Name                               | PHIGS and PHIGS PLUS Name                              |
|--------------------------------------|--------------------------------------------------------|
| pinq_dc_clip_regions_facs(...)       | INQUIRE DEVICE COORDINATE CLIP REGIONS FACILITIES      |
| pinq_def_composite_data (...)        | INQUIRE DEFAULT COMPOSITE DEVICE DATA                  |
| pinq_def_composite_data3 (...)       | INQUIRE DEFAULT COMPOSITE DEVICE DATA 3                |
| pinq_def_di_pick_data (...)          | INQUIRE DEFAULT DIRECT INTERPRETATION PICK DATA        |
| pinq_def_di_pick_data3 (...)         | INQUIRE DEFAULT DIRECT INTERPRETATION PICK DATA 3      |
| pinq_def_set_data (...)              | INQUIRE DEFAULT SET DEVICE DATA                        |
| pinq_def_set_data3 (...)             | INQUIRE DEFAULT SET DEVICE DATA 3                      |
| pinq_def_targ_disp (...)             | INQUIRE DEFAULT TARGET DISPOSITION                     |
| pinq_di_mode (...)                   | INQUIRE DIRECT INTERPRETATION MODE                     |
| pinq_di_pick_corr_point (...)        | INQUIRE DIRECT INTERPRETATION PICK CORRELATION POINT   |
| pinq_di_pick_corr_point3 (...)       | INQUIRE DIRECT INTERPRETATION PICK CORRELATION POINT 3 |
| pinq_di_pick_set_status (...)        | INQUIRE DIRECT INTERPRETATION PICK SET STATUS          |
| pinq_di_pick_st (...)                | INQUIRE DIRECT INTERPRETATION PICK STATE               |
| pinq_di_pick_st3 (...)               | INQUIRE DIRECT INTERPRETATION PICK STATE 3             |
| pinq_disp_targ (...)                 | INQUIRE DISPLAY TARGET                                 |
| pinq_di_trav_facs (...)              | INQUIRE DIRECT INTERPRETATION TRAVERSAL FACILITIES     |
| pinq_dyns_post_grps (...)            | INQUIRE DYNAMICS OF POSTING GROUPS                     |
| pinq_dyns_ws_attrs_texture (...)     | INQUIRE DYNAMICS OF WORKSTATION ATTRIBUTES TEXTURE     |
| pinq_edge_rep_full (...)             | INQUIRE EDGE REPRESENTATION FULL                       |
| pinq_ext_pat_facs (...)              | INQUIRE EXTENDED PATTERN FACILITIES                    |
| pinq_ext_pat_rep (...)               | INQUIRE EXTENDED PATTERN REPRESENTATION                |
| pinq_front_clip_indicator (...)      | INQUIRE FRONT CLIPPING INDICATOR                       |
| pinq_front_plane_dist (...)          | INQUIRE FRONT PLANE DISTANCE                           |
| pinq_grps_posted (...)               | INQUIRE SET OF GROUPS TO WHICH POSTED                  |
| pinq_highl_facs (...)                | INQUIRE HIGHLIGHTING FACILITIES                        |
| pinq_highl_rep (...)                 | INQUIRE HIGHLIGHTING REPRESENTATION                    |
| pinq_image_res (...)                 | INQUIRE IMAGE RESOURCE                                 |
| pinq_image_res_facs (...)            | INQUIRE IMAGE RESOURCE FACILITIES                      |
| pinq_lid_attached_to_light_src (...) | INQUIRE LOGICAL INPUT DEVICE ATTACHED TO LIGHT SOURCE  |
| pinq_lid_attached_to_view (...)      | INQUIRE LOGICAL INPUT DEVICE ATTACHED TO VIEW          |
| pinq_lid_def (...)                   | INQUIRE LOGICAL INPUT DEVICE DEFINITION                |
| pinq_line_rep_full (...)             | INQUIRE POLYLINE REPRESENTATION FULL                   |
| pinq_linetype_def (...)              | INQUIRE LINETYPE DEFINITION                            |
| pinq_linetype_def_facs (...)         | INQUIRE LINETYPE DEFINITION FACILITIES                 |
| pinq_linetype_def_support (...)      | INQUIRE LINETYPE DEFINITION SUPPORT                    |
| pinq_list_def_appl_filters (...)     | INQUIRE LIST OF DEFINED APPLICATION FILTERS            |
| pinq_list_highl_inds (...)           | INQUIRE LIST OF HIGHLIGHTING INDICES                   |

Table 2 - Function names ordered by bound name (Continued)

| C Name                                  | PHIGS and PHIGS PLUS Name                                         |
|-----------------------------------------|-------------------------------------------------------------------|
| pinq_list_post_grps (...)               | INQUIRE POSTED STRUCTURES FROM POSTING GROUP                      |
| pinq_list_texture_inds (...)            | INQUIRE LIST OF TEXTURE INDICES                                   |
| pinq_lists_avail_lids (...)             | INQUIRE LISTS OF AVAILABLE LOGICAL INPUT DEVICES                  |
| pinq_loc_facs (...)                     | INQUIRE LOCATOR FACILITIES                                        |
| pinq_marker_type_def (...)              | INQUIRE MARKER TYPE DEFINITION                                    |
| pinq_marker_type_def_facs (...)         | INQUIRE MARKER TYPE DEFINITION FACILITIES                         |
| pinq_marker_type_def_support (...)      | INQUIRE MARKER TYPE DEFINITION SUPPORT                            |
| pinq_mipmap_facs (...)                  | INQUIRE MIPMAP FACILITIES                                         |
| pinq_num_avail_na_in (...)              | INQUIRE NUMBER OF AVAILABLE NON-ATOMIC LOGICAL INPUT DEVICES      |
| pinq_num_def_linetypes (...)            | INQUIRE NUMBER OF DEFINED LINETYPES                               |
| pinq_num_def_marker_types (...)         | INQUIRE NUMBER OF DEFINED MARKER TYPES                            |
| pinq_num_pred_appl_filters (...)        | INQUIRE NUMBER OF PREDEFINED APPLICATION FILTERS                  |
| pinq_pick_facs (...)                    | INQUIRE PICK FACILITIES                                           |
| pinq_pick_mapping_facs (...)            | INQUIRE PICK MAPPING FACILITIES                                   |
| pinq_pick_mapping_state (...)           | INQUIRE PICK MAPPING STATE                                        |
| pinq_pict_status (...)                  | INQUIRE PICTURE STATUS                                            |
| pinq_posted_di_struct (...)             | INQUIRE POSTED DIRECT INTERPRETATION STRUCTURE                    |
| pinq_posted_structs_from_post_grp (...) | INQUIRE POSTED STRUCTURES FROM POSTING GROUP                      |
| pinq_post_grp (...)                     | INQUIRE POSTING GROUP                                             |
| pinq_post_grp_facs (...)                | INQUIRE POSTING GROUP FACILITIES                                  |
| pinq_pred_appl_filter (...)             | INQUIRE PREDEFINED APPLICATION FILTER                             |
| pinq_pred_assoc_targ_trav_res (...)     | INQUIRE PREDEFINED ASSOCIATION OF TARGET WITH TRAVERSAL RESOURCES |
| pinq_pred_assoc_trav_res_targ (...)     | INQUIRE PREDEFINED ASSOCIATION OF TRAVERSAL RESOURCE WITH TARGET  |
| pinq_pred_composite_meas_def (...)      | INQUIRE PREDEFINED COMPOSITE MEASURE DEFINITION                   |
| pinq_pred_edge_rep_full (...)           | INQUIRE PREDEFINED EDGE REPRESENTATION FULL                       |
| pinq_pred_ext_pat_rep (...)             | INQUIRE PREDEFINED EXTENDED PATTERN REPRESENTATION                |
| pinq_pred_highl_rep (...)               | INQUIRE PREDEFINED HIGHLIGHTING REPRESENTATION                    |
| pinq_pred_image_res (...)               | INQUIRE PREDEFINED IMAGE RESOURCE                                 |
| pinq_pred_line_rep_full (...)           | INQUIRE PREDEFINED POLYLINE REPRESENTATION FULL                   |
| pinq_pred_linetype_def (...)            | INQUIRE PREDEFINED LINETYPE DEFINITION                            |
| pinq_pred_marker_type_def (...)         | INQUIRE PREDEFINED MARKER TYPE DEFINITION                         |
| pinq_pred_post_grp (...)                | INQUIRE PREDEFINED POSTING GROUP                                  |
| pinq_pred_set_meas_def (...)            | INQUIRE PREDEFINED SET MEASURE DEFINITION                         |
| pinq_pred_texture_rep (...)             | INQUIRE PREDEFINED TEXTURE REPRESENTATION                         |

Table 2 - Function names ordered by bound name (Continued)

| C Name                             | PHIGS and PHIGS PLUS Name                                                   |
|------------------------------------|-----------------------------------------------------------------------------|
| pinq_proj_ref_point (...)          | INQUIRE PROJECTION REFERENCE POINT                                          |
| pinq_proj_type (...)               | INQUIRE PROJECTION TYPE                                                     |
| pinq_proj_vp (...)                 | INQUIRE PROJECTION VIEWPORT                                                 |
| pinq_proj_vp3 (...)                | INQUIRE PROJECTION VIEWPORT 3                                               |
| pinq_rend_targ (...)               | INQUIRE RENDERING TARGET                                                    |
| pinq_set_fac3 (...)                | INQUIRE SET FACILITIES                                                      |
| pinq_set_meas_def (...)            | INQUIRE SET MEASURE DEFINITION                                              |
| pinq_set_st (...)                  | INQUIRE SET DEVICE STATE                                                    |
| pinq_set_st3 (...)                 | INQUIRE SET DEVICE STATE 3                                                  |
| pinq_string_fac3 (...)             | INQUIRE STRING FACILITIES                                                   |
| pinq_stroke_fac3 (...)             | INQUIRE STROKE FACILITIES                                                   |
| pinq_targ_assoc_trav_res (...)     | INQUIRE TARGET ASSOCIATED WITH TRAVERSAL RESOURCE                           |
| pinq_targ_dispos (...)             | INQUIRE TARGET DISPOSITION                                                  |
| pinq_targ_fac3 (...)               | INQUIRE TARGET FACILITIES                                                   |
| pinq_targ_manip_mode (...)         | INQUIRE TARGET MANIPULATION MODE                                            |
| pinq_targ_st (...)                 | INQUIRE TARGET STATE                                                        |
| pinq_texture_fac3 (...)            | INQUIRE TEXTURE FACILITIES                                                  |
| pinq_texture_map_fac3 (...)        | INQUIRE TEXTURE MAPPING FACILITIES                                          |
| pinq_texture_rep (...)             | INQUIRE TEXTURE REPRESENTATION                                              |
| pinq_transparency_mode (...)       | INQUIRE TRANSPARENCY MODE                                                   |
| pinq_transparency_thresholds (...) | INQUIRE TRANSPARENCY THRESHOLDS                                             |
| pinq_trav_res_assoc_targ (...)     | INQUIRE TRAVERSAL RESOURCES ASSOCIATED WITH TARGET                          |
| pinq_trav_res_fac3 (...)           | INQUIRE TRAVERSAL RESOURCE FACILITIES                                       |
| pinq_val_fac3 (...)                | INQUIRE VALUATOR FACILITIES                                                 |
| pinq_view_plane_dist (...)         | INQUIRE VIEW PLANE DISTANCE                                                 |
| pinq_view_plane_norm (...)         | INQUIRE VIEW PLANE NORMAL                                                   |
| pinq_view_ref_point (...)          | INQUIRE VIEW REFERENCE POINT                                                |
| pinq_view_ref_point3 (...)         | INQUIRE VIEW REFERENCE POINT 3                                              |
| pinq_view_status (...)             | INQUIRE VIEW STATUS                                                         |
| pinq_view_up_vec (...)             | INQUIRE VIEW UP VECTOR                                                      |
| pinq_view_up_vec3 (...)            | INQUIRE VIEW UP VECTOR 3                                                    |
| pinq_view_win_limits (...)         | INQUIRE VIEW WINDOW LIMITS                                                  |
| pinq_watch_elem_range (...)        | INQUIRE WATCH ON ELEMENT RANGE                                              |
| pinq_watch_range_st (...)          | INQUIRE WATCH RANGE STATE                                                   |
| pinq_wss_di_struct_posted (...)    | INQUIRE SET OF WORKSTATIONS TO WHICH DIRECT INTERPRETATION STRUCTURE POSTED |
| pinq_ws_st_table_highl (...)       | INQUIRE WORKSTATION STATE TABLE LENGTHS HIGHLIGHTING                        |
| pinq_ws_st_table_texture (...)     | INQUIRE WORKSTATION STATE TABLE LENGTHS TEXTURE                             |
| pinq_xy_clip_indicator (...)       | INQUIRE X-Y CLIPPING INDICATOR                                              |
| pinst_struct (...)                 | INSTANCE STRUCTURE                                                          |
| pmanip_trav_res (...)              | MANIPULATE TRAVERSAL RESOURCE                                               |
| pmap_dc_point_to_pick_paths (...)  | MAP DEVICE COORDINATE POINT TO PICK PATHS                                   |

Table 2 - Function names ordered by bound name (Continued)

| C Name                                  | PHIGS and PHIGS PLUS Name                           |
|-----------------------------------------|-----------------------------------------------------|
| pmap_dc_to_wc (...)                     | MAP DEVICE COORDINATES TO WORLD COORDINATES         |
| pmap_dc_to_wsc (...)                    | MAP DEVICE COORDINATES TO WINDOW SYSTEM COORDINATES |
| pmap_wsc_to_dc (...)                    | MAP WINDOW SYSTEM COORDINATES TO DEVICE COORDINATES |
| pmark_multi_pass_compl (...)            | MARK MULTI-PASS COMPLETION                          |
| pmark_multi_pass_start (...)            | MARK MULTI-PASS START                               |
| pmark_pass_compl (...)                  | MARK PASS COMPLETION                                |
| pmark_pass_start (...)                  | MARK PASS START                                     |
| pmove_elem_struct (...)                 | MOVE ELEMENT FROM STRUCTURE                         |
| pmove_elem_range_struct (...)           | MOVE ELEMENT RANGE FROM STRUCTURE                   |
| pmove_elems_between_labels_struct (...) | MOVE ELEMENTS BETWEEN LABELS FROM STRUCTURE         |
| popen_di_struct (...)                   | OPEN DIRECT INTERPRETATION STRUCTURE                |
| ppop_st (...)                           | POP STATE                                           |
| ppost_di_struct (...)                   | POST DIRECT INTERPRETATION STRUCTURE                |
| ppost_struct_to_grp (...)               | POST STRUCTURE TO GROUP                             |
| ppush_st (...)                          | PUSH STATE                                          |
| predraw_all_from_grp_on_targ (          | REDRAW ALL STRUCTURES FROM POSTING GROUP ON TARGET  |
| predraw_all_structs_from_grp (...)      | REDRAW ALL STRUCTURES FROM POSTING GROUP            |
| predraw_all_structs_on_targ (...)       | REDRAW ALL STRUCTURES ON TARGET                     |
| prenew_di_state (...)                   | RENEW DIRECT INTERPRETATION STATE                   |
| preq_composite (...)                    | REQUEST COMPOSITE                                   |
| preq_composite3 (...)                   | REQUEST COMPOSITE 3                                 |
| preq_set (...)                          | REQUEST SET                                         |
| preq_set3 (...)                         | REQUEST SET 3                                       |
| preset_all_trav_res (...)               | RESET ALL TRAVERSAL RESOURCES                       |
| pret_num_passes_req (...)               | RETRIEVE NUMBER OF PASSES REQUIRED                  |
| pret_window_system_colr (...)           | RETRIEVE WINDOW SYSTEM COLOUR                       |
| psample_composite (...)                 | SAMPLE COMPOSITE                                    |
| psample_composite3 (...)                | SAMPLE COMPOSITE 3                                  |
| psample_set (...)                       | SAMPLE SET                                          |
| psample_set3 (...)                      | SAMPLE SET 3                                        |
| pset_active_textures (...)              | SET ACTIVE TEXTURES                                 |
| pset_alpha_data_sel_ind (...)           | SET ALPHA DATA SELECTION INDEX                      |
| pset_alpha_src_sel (...)                | SET ALPHA SOURCE SELECTOR                           |
| pset_appl_filter (...)                  | SET APPLICATION FILTER                              |
| pset_appl_int (...)                     | SET APPLICATION INTEGER                             |
| pset_appl_real (...)                    | SET APPLICATION REAL                                |
| pset_back_active_textures (...)         | SET BACK ACTIVE TEXTURES                            |
| pset_back_clip_indicator (...)          | SET BACK CLIPPING INDICATOR                         |
| pset_back_plane_dist (...)              | SET BACK PLANE DISTANCE                             |
| pset_back_transparency (...)            | SET BACK TRANSPARENCY                               |
| pset_composite_mode (...)               | SET COMPOSITE MODE                                  |

Table 2 - Function names ordered by bound name (Continued)

| C Name                               | PHIGS and PHIGS PLUS Name                          |
|--------------------------------------|----------------------------------------------------|
| pset_composite_pick_filter (...)     | SET COMPOSITE PICK FILTER                          |
| pset_cond_flags (...)                | SET CONDITION FLAGS                                |
| pset_cond_flags_from_tests (...)     | SET CONDITION FLAGS FROM TESTS                     |
| pset_dc_clip_regions (...)           | SET DEVICE COORDINATE CLIP REGIONS                 |
| pset_dc_clip_regions3 (...)          | SET DEVICE COORDINATE CLIP REGIONS 3               |
| pset_depth_cue_rep_mask (...)        | SET DEPTH CUE REPRESENTATION MASK                  |
| pset_di_mode (...)                   | SET DIRECT INTERPRETATION MODE                     |
| pset_di_pick_corr_point (...)        | SET DIRECT INTERPRETATION PICK CORRELATION POINT   |
| pset_di_pick_corr_point3 (...)       | SET DIRECT INTERPRETATION PICK CORRELATION POINT 3 |
| pset_di_pick_filter (...)            | SET DIRECT INTERPRETATION PICK FILTER              |
| pset_disp_targ (...)                 | SET DISPLAY TARGET                                 |
| pset_edgcap (...)                    | SET EDGE CAP                                       |
| pset_edgejoin (...)                  | SET EDGE JOIN                                      |
| pset_edgemitre_limit (...)           | SET EDGEMITRE LIMIT                                |
| pset_edge_rep_full (...)             | SET EDGE REPRESENTATION FULL                       |
| pset_edge_rep_mask (...)             | SET EDGE REPRESENTATION MASK                       |
| pset_edgetype_adapt (...)            | SET EDGETYPE ADAPTABILITY                          |
| pset_edgetype_cont (...)             | SET EDGETYPE CONTINUITY                            |
| pset_edgetype_offset (...)           | SET EDGETYPE OFFSET                                |
| pset_ext_pat_rep (...)               | SET EXTENDED PATTERN REPRESENTATION                |
| pset_front_clip_indicator (...)      | SET FRONT CLIPPING INDICATOR                       |
| pset_front_plane_dist (...)          | SET FRONT PLANE DISTANCE                           |
| pset_highl_ind (...)                 | SET HIGHLIGHTING INDEX                             |
| pset_highl_method (...)              | SET HIGHLIGHTING METHOD                            |
| pset_highl_rep (...)                 | SET HIGHLIGHTING REPRESENTATION                    |
| pset_int_rep_mask (...)              | SET INTERIOR REPRESENTATION MASK                   |
| pset_linecap (...)                   | SET LINE CAP                                       |
| pset_linejoin (...)                  | SET LINE JOIN                                      |
| pset_linemitre_limit (...)           | SET LINEMITRE LIMIT                                |
| pset_line_rep_full (...)             | SET POLYLINE REPRESENTATION FULL                   |
| pset_line_rep_mask (...)             | SET POLYLINE REPRESENTATION MASK                   |
| pset_linetype_adapt (...)            | SET LINETYPE ADAPTABILITY                          |
| pset_linetype_cont (...)             | SET LINETYPE CONTINUITY                            |
| pset_linetype_offset (...)           | SET LINETYPE OFFSET                                |
| pset_marker_rep_mask (...)           | SET POLYMARKER REPRESENTATION MASK                 |
| pset_pat_rep_mask (...)              | SET PATTERN REPRESENTATION MASK                    |
| pset_pick_mapping_data (...)         | SET PICK MAPPING DATA                              |
| pset_post_grp_backg_method (...)     | SET POSTING GROUP BACKGROUND METHOD                |
| pset_post_grp_backg_style (...)      | SET POSTING GROUP BACKGROUND STYLE                 |
| pset_post_grp_border_ind (...)       | SET POSTING GROUP BORDER INDEX                     |
| pset_post_grp_border_indicator (...) | SET POSTING GROUP BORDER INDICATOR                 |
| pset_post_grp_priority (...)         | SET POSTING GROUP PRIORITY                         |
| pset_post_grp_status (...)           | SET POSTING GROUP STATUS                           |
| pset_proj_ref_point (...)            | SET PROJECTION REFERENCE POINT                     |
| pset_proj_type (...)                 | SET PROJECTION TYPE                                |

Table 2 - Function names ordered by bound name (Continued)

| C Name                             | PHIGS and PHIGS PLUS Name                       |
|------------------------------------|-------------------------------------------------|
| pset_proj_vp (...)                 | SET PROJECTION VIEWPORT                         |
| pset_proj_vp3 (...)                | SET PROJECTION VIEWPORT 3                       |
| pset_refl_rep_mask (...)           | SET REFLECTANCE REPRESENTATION MASK             |
| pset_rend_targ (...)               | SET RENDERING TARGET                            |
| pset_set_mode (...)                | SET SET MODE                                    |
| pset_set_pick_filter (...)         | SET SET PICK FILTER                             |
| pset_st_visual_rep (...)           | SET STATE OF VISUAL REPRESENTATION              |
| pset_targ_dispos (...)             | SET TARGET DISPOSITION                          |
| pset_targ_manip_mode (...)         | SET TARGET MANIPULATION MODE                    |
| pset_targ_st_visual_rep (...)      | SET TARGET STATE OF VISUAL REPRESENTATION       |
| pset_text_rep_mask (...)           | SET TEXT REPRESENTATION MASK                    |
| pset_texture_binding (...)         | SET TEXTURE BINDING                             |
| pset_texture_composition (...)     | SET TEXTURE COMPOSITION                         |
| pset_texture_param (...)           | SET TEXTURE PARAMETRIZATION                     |
| pset_texture_perspect_corr (...)   | SET TEXTURE PERSPECTIVE CORRECTION              |
| pset_texture_rep (...)             | SET TEXTURE REPRESENTATION                      |
| pset_texture_rep_mask (...)        | SET TEXTURE REPRESENTATION MASK                 |
| pset_texture_res_opt_heur (...)    | SET TEXTURE RESOURCE OPTIMIZATION<br>HEURISTICS |
| pset_texture_sampling (...)        | SET TEXTURE SAMPLING                            |
| pset_texture_sampling_freq (...)   | SET TEXTURE SAMPLING FREQUENCY                  |
| pset_transparency (...)            | SET TRANSPARENCY                                |
| pset_transparency_mode (...)       | SET TRANSPARENCY MODE                           |
| pset_transparency_thresholds (...) | SET TRANSPARENCY THRESHOLDS                     |
| pset_view_plane_dist (...)         | SET VIEW PLANE DISTANCE                         |
| pset_view_plane_norm (...)         | SET VIEW PLANE NORMAL                           |
| pset_view_ref_point (...)          | SET VIEW REFERENCE POINT                        |
| pset_view_ref_point3 (...)         | SET VIEW REFERENCE POINT 3                      |
| pset_view_up_vec (...)             | SET VIEW UP VECTOR                              |
| pset_view_up_vec3 (...)            | SET VIEW UP VECTOR 3                            |
| pset_view_win_limits (...)         | SET VIEW WINDOW LIMITS                          |
| pset_watch_on_elem_range (...)     | SET WATCH ON ELEMENT RANGE                      |
| pset_xy_clip_indicator (...)       | SET X-Y CLIPPING INDICATOR                      |
| ptrans_di_pick_set (...)           | TRANSFER DIRECT INTERPRETATION PICK SET         |
| pundefine_choice (...)             | UNDEFINE CHOICE                                 |
| pundefine_composite (...)          | UNDEFINE COMPOSITE                              |
| pundefine_locator (...)            | UNDEFINE LOCATOR                                |
| pundefine_pick (...)               | UNDEFINE PICK                                   |
| pundefine_post_grp (...)           | UNDEFINE POSTING GROUP                          |
| pundefine_set (...)                | UNDEFINE SET                                    |
| pundefine_string (...)             | UNDEFINE STRING                                 |
| pundefine_stroke (...)             | UNDEFINE STROKE                                 |
| pundefine_valuator (...)           | UNDEFINE VALUATOR                               |
| punpost_all_structs_from_grp (...) | UNPOST ALL STRUCTURES FROM GROUP                |
| punpost_di_struct (...)            | UNPOST DIRECT INTERPRETATION STRUCTURE          |
| punpost_structs_from_grps (...)    | UNPOST STRUCTURES FROM GROUPS                   |

**Table 2 - Function names ordered by bound name (Continued)**

| <b>C Name</b>          | <b>PHIGS and PHIGS PLUS Name</b> |
|------------------------|----------------------------------|
| pupd_targ (...)        | UPDATE TARGET                    |
| pupd_view_rep (...)    | UPDATE VIEW REPRESENTATION       |
| pws_type_create (...)  | WORKSTATION TYPE CREATE          |
| pws_type_destroy (...) | WORKSTATION TYPE DESTROY         |
| pws_type_get (...)     | WORKSTATION TYPE GET             |
| pws_type_set (...)     | WORKSTATION TYPE SET             |

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### 4.3.2 List ordered alphabetically by PHIGS and PHIGS PLUS name

The following function names are merged alphabetically by function name in Table 3:

“

**Table 3 - Function names ordered by PHIGS and PHIGS PLUS function name**

| PHIGS and PHIGS PLUS Name                   | C Name                                  |
|---------------------------------------------|-----------------------------------------|
| ASSOCIATE IMAGE RESOURCE                    | passoc_image_res (...)                  |
| ASSOCIATE TRAVERSAL RESOURCE                | passoc_trav_res (...)                   |
| ATTACH LOGICAL INPUT DEVICE TO LIGHT SOURCE | pattach_lid_to_light_src (...)          |
| ATTACH LOGICAL INPUT DEVICE TO VIEW         | pattach_lid_to_view (...)               |
| CIRCLE                                      | pcircle (...)                           |
| CIRCLE 3                                    | pcircle3 (...)                          |
| CIRCULAR ARC                                | pcircular_arc (...)                     |
| CIRCULAR ARC 3                              | pcircular_arc3 (...)                    |
| CIRCULAR ARC CLOSE                          | pcircular_arc_close (...)               |
| CIRCULAR ARC CLOSE 3                        | pcircular_arc_close3 (...)              |
| CLEAR TARGET                                | pclear_targ (...)                       |
| CLOSE DIRECT INTERPRETATION STRUCTURE       | pclose_di_struct (...)                  |
| CONDITIONAL EXECUTE STRUCTURE               | pcond_exec_struct (...)                 |
| CONDITIONAL INSTANCE STRUCTURE              | pcond_inst_struct (...)                 |
| CONDITIONAL RETURN                          | pcond_return (...)                      |
| CONDITIONAL SKIP ELEMENTS                   | pcond_skip_elements (...)               |
| CONDITIONAL SKIP TO LABEL                   | pcond_skip_to_label (...)               |
| COPY ELEMENT FROM STRUCTURE                 | pcopy_elem_struct (...)                 |
| COPY ELEMENT RANGE FROM STRUCTURE           | pcopy_elem_range_struct (...)           |
| COPY ELEMENTS BETWEEN LABELS FROM STRUCTURE | pcopy_elems_between_labels_struct (...) |
| COPY TARGET                                 | pcopy_targ (...)                        |
| CREATE COMPOSITE MEASURE                    | pcreate_composite_measure (...)         |
| CREATE MIPMAP TEXTURE                       | pcreate_mipmap_texture (...)            |
| CREATE SET MEASURE                          | pcreate_set_measure (...)               |
| CREATE TARGET                               | pcreate_targ (...)                      |
| DEFINE CHOICE                               | pdefine_choice (...)                    |
| DEFINE COMPOSITE                            | pdefine_composite (...)                 |
| DEFINE LINETYPE                             | pdefine_linetype (...)                  |
| DEFINE LOCATOR                              | pdefine_locator (...)                   |
| DEFINE MARKER TYPE                          | pdefine_marker_type (...)               |
| DEFINE PICK                                 | pdefine_pick (...)                      |
| DEFINE POSTING GROUP                        | pdefine_post_grp (...)                  |
| DEFINE SET                                  | pdefine_set (...)                       |
| DEFINE STRING                               | pdefine_string (...)                    |
| DEFINE STROKE                               | pdefine_stroke (...)                    |
| DEFINE VALUATOR                             | pdefine_valuator (...)                  |
| DESTROY COMPOSITE MEASURE                   | pdestroy_composite_measure (...)        |
| DESTROY SET MEASURE                         | pdestroy_set_measure (...)              |

**Table 3 - Function names ordered by PHIGS and PHIGS PLUS function name (Continued)**

| <b>PHIGS and PHIGS PLUS Name</b>                  | <b>C Name</b>                    |
|---------------------------------------------------|----------------------------------|
| DESTROY TARGET                                    | pdestroy_targ (...)              |
| DETACH LOGICAL INPUT DEVICE FROM LIGHT SOURCE     | pdetach_lid_from_light_src (...) |
| DETACH LOGICAL INPUT DEVICE FROM VIEW             | pdetach_lid_from_view (...)      |
| DISABLE DIRECT INTERPRETATION PICK                | pdisable_di_pick (...)           |
| DISASSOCIATE IMAGE RESOURCE                       | pdisassoc_image_res (...)        |
| DISASSOCIATE TRAVERSAL RESOURCE                   | pdisassoc_trav_res (...)         |
| ELLIPSE                                           | pellipse (...)                   |
| ELLIPSE 3                                         | pellipse3 (...)                  |
| ELLIPTICAL ARC                                    | pelliptical_arc (...)            |
| ELLIPTICAL ARC 3                                  | pelliptical_arc3 (...)           |
| ELLIPTICAL ARC CLOSE                              | pelliptical_arc_close (...)      |
| ELLIPTICAL ARC CLOSE 3                            | pelliptical_arc_close3 (...)     |
| ENABLE DIRECT INTERPRETATION PICK                 | penable_di_pick (...)            |
| END WATCH ON ELEMENT RANGE                        | pend_watch_on_elem_range (...)   |
| FILL CIRCLE                                       | pfill_circle (...)               |
| FILL CIRCLE 3                                     | pfill_circle3 (...)              |
| FILL ELLIPSE                                      | pfill_ellipse (...)              |
| FILL ELLIPSE 3                                    | pfill_ellipse3 (...)             |
| GET COMPOSITE                                     | pget_composite (...)             |
| GET COMPOSITE 3                                   | pget_composite3 (...)            |
| GET SET                                           | pget_set (...)                   |
| GET SET 3                                         | pget_set3 (...)                  |
| INITIALIZE COMPOSITE                              | pinit_composite (...)            |
| INITIALIZE COMPOSITE 3                            | pinit_composite3 (...)           |
| INITIALIZE DIRECT INTERPRETATION PICK             | pinit_di_pick (...)              |
| INITIALIZE DIRECT INTERPRETATION PICK 3           | pinit_di_pick3 (...)             |
| INITIALIZE SET                                    | pinit_set (...)                  |
| INITIALIZE SET 3                                  | pinit_set3 (...)                 |
| INQUIRE ALPHA FACILITIES                          | pinq_alpha_facs (...)            |
| INQUIRE APPLICATION FILTER                        | pinq_appl_filter (...)           |
| INQUIRE ASSOCIATED IMAGE RESOURCES                | pinq_assoc_image_res (...)       |
| INQUIRE BACK CLIPPING INDICATOR                   | pinq_back_clip_indicator (...)   |
| INQUIRE BACK PLANE DISTANCE                       | pinq_back_plane_dist (...)       |
| INQUIRE CHOICE FACILITIES                         | pinq_choice_facs (...)           |
| INQUIRE COMPOSITE DEVICE STATE                    | pinq_composite_st (...)          |
| INQUIRE COMPOSITE DEVICE STATE 3                  | pinq_composite_st3 (...)         |
| INQUIRE COMPOSITE FACILITIES                      | pinq_composite_facs (...)        |
| INQUIRE COMPOSITE MEASURE DEFINITION              | pinq_composite_meas_def (...)    |
| INQUIRE CONDITIONAL TRAVERSAL FACILITIES          | pinq_cond_trav_facs (...)        |
| INQUIRE CONFIGURATION SETTING FACILITIES          | pinq_config_setting_facs (...)   |
| INQUIRE DEFAULT COMPOSITE DEVICE DATA             | pinq_def_composite_data (...)    |
| INQUIRE DEFAULT COMPOSITE DEVICE DATA 3           | pinq_def_composite_data3 (...)   |
| INQUIRE DEFAULT DIRECT INTERPRETATION PICK DATA   | pinq_def_di_pick_data (...)      |
| INQUIRE DEFAULT DIRECT INTERPRETATION PICK DATA 3 | pinq_def_di_pick_data3 (...)     |
| INQUIRE DEFAULT SET DEVICE DATA                   | pinq_def_set_data (...)          |
| INQUIRE DEFAULT SET DEVICE DATA 3                 | pinq_def_set_data3 (...)         |

**Table 3 - Function names ordered by PHIGS and PHIGS PLUS function name (Continued)**

| <b>PHIGS and PHIGS PLUS Name</b>                             | <b>C Name</b>                        |
|--------------------------------------------------------------|--------------------------------------|
| INQUIRE DEFAULT TARGET DISPOSITION                           | pinq_def_targ_disp (...)             |
| INQUIRE DEVICE COORDINATE CLIP REGIONS                       | pinq_dc_clip_regions (...)           |
| INQUIRE DEVICE COORDINATE CLIP REGIONS 3                     | pinq_dc_clip_regions3 (...)          |
| INQUIRE DEVICE COORDINATE CLIP REGIONS FACILITIES            | pinq_dc_clip_regions_fac (...)       |
| INQUIRE DIRECT INTERPRETATION MODE                           | pinq_di_mode (...)                   |
| INQUIRE DIRECT INTERPRETATION PICK CORRELATION POINT         | pinq_di_pick_corr_point (...)        |
| INQUIRE DIRECT INTERPRETATION PICK CORRELATION POINT 3       | pinq_di_pick_corr_point3 (...)       |
| INQUIRE DIRECT INTERPRETATION PICK SET STATUS                | pinq_di_pick_set_status (...)        |
| INQUIRE DIRECT INTERPRETATION PICK STATE                     | pinq_di_pick_st (...)                |
| INQUIRE DIRECT INTERPRETATION PICK STATE 3                   | pinq_di_pick_st3 (...)               |
| INQUIRE DIRECT INTERPRETATION TRAVERSAL FACILITIES           | pinq_di_trav_fac (...)               |
| INQUIRE DISPLAY TARGET                                       | pinq_disp_targ (...)                 |
| INQUIRE DYNAMICS OF POSTING GROUPS                           | pinq_dyns_post_grps (...)            |
| INQUIRE DYNAMICS OF WORKSTATION ATTRIBUTES TEXTURE           | pinq_dyns_ws_attrs_texture (...)     |
| INQUIRE EDGE REPRESENTATION FULL                             | pinq_edge_rep_full (...)             |
| INQUIRE EXTENDED PATTERN FACILITIES                          | pinq_ext_pat_fac (...)               |
| INQUIRE EXTENDED PATTERN REPRESENTATION                      | pinq_ext_pat_rep (...)               |
| INQUIRE FRONT CLIPPING INDICATOR                             | pinq_front_clip_indicator (...)      |
| INQUIRE FRONT PLANE DISTANCE                                 | pinq_front_plane_dist (...)          |
| INQUIRE HIGHLIGHTING FACILITIES                              | pinq_highl_fac (...)                 |
| INQUIRE HIGHLIGHTING REPRESENTATION                          | pinq_highl_rep (...)                 |
| INQUIRE IMAGE RESOURCE                                       | pinq_image_res (...)                 |
| INQUIRE IMAGE RESOURCE FACILITIES                            | pinq_image_res_fac (...)             |
| INQUIRE LINETYPE DEFINITION                                  | pinq_linetype_def (...)              |
| INQUIRE LINETYPE DEFINITION FACILITIES                       | pinq_linetype_def_fac (...)          |
| INQUIRE LINETYPE DEFINITION SUPPORT                          | pinq_linetype_def_support (...)      |
| INQUIRE LIST OF DEFINED APPLICATION FILTERS                  | pinq_list_def_appl_filters (...)     |
| INQUIRE LIST OF HIGHLIGHTING INDICES                         | pinq_list_highl_inds (...)           |
| INQUIRE LIST OF POSTING GROUPS                               | pinq_list_post_grps (...)            |
| INQUIRE LIST OF TEXTURE INDICES                              | pinq_list_texture_inds (...)         |
| INQUIRE LISTS OF AVAILABLE LOGICAL INPUT DEVICES             | pinq_lists_avail_lids (...)          |
| INQUIRE LOCATOR FACILITIES                                   | pinq_loc_fac (...)                   |
| INQUIRE LOGICAL INPUT DEVICE ATTACHED TO LIGHT SOURCE        | pinq_lid_attached_to_light_src (...) |
| INQUIRE LOGICAL INPUT DEVICE ATTACHED TO VIEW                | pinq_lid_attached_to_view (...)      |
| INQUIRE LOGICAL INPUT DEVICE DEFINITION                      | pinq_lid_def (...)                   |
| INQUIRE MARKER TYPE DEFINITION                               | pinq_marker_type_def (...)           |
| INQUIRE MARKER TYPE DEFINITION FACILITIES                    | pinq_marker_type_def_fac (...)       |
| INQUIRE MARKER TYPE DEFINITION SUPPORT                       | pinq_marker_type_def_support (...)   |
| INQUIRE MIPMAP FACILITIES                                    | pinq_mipmap_fac (...)                |
| INQUIRE NUMBER OF AVAILABLE NON-ATOMIC LOGICAL INPUT DEVICES | pinq_num_avail_na_in (...)           |
| INQUIRE NUMBER OF DEFINED LINETYPES                          | pinq_num_def_linetypes (...)         |

**Table 3 - Function names ordered by PHIGS and PHIGS PLUS function name (Continued)**

| <b>PHIGS and PHIGS PLUS Name</b>                                            | <b>C Name</b>                           |
|-----------------------------------------------------------------------------|-----------------------------------------|
| INQUIRE NUMBER OF DEFINED MARKER TYPES                                      | pinq_num_def_marker_types (...)         |
| INQUIRE NUMBER OF PREDEFINED APPLICATION FILTERS                            | pinq_num_pred_appl_filters (...)        |
| INQUIRE PICK FACILITIES                                                     | pinq_pick_facs (...)                    |
| INQUIRE PICK MAPPING FACILITIES                                             | pinq_pick_mapping_facs (...)            |
| INQUIRE PICK MAPPING STATE                                                  | pinq_pick_mapping_state (...)           |
| INQUIRE PICTURE STATUS                                                      | pinq_pict_status (...)                  |
| INQUIRE POLYLINE REPRESENTATION FULL                                        | pinq_line_rep_full (...)                |
| INQUIRE POSTED DIRECT INTERPRETATION STRUCTURE                              | pinq_posted_di_struct (...)             |
| INQUIRE POSTED STRUCTURES FROM POSTING GROUP                                | pinq_posted_structs_from_post_grp (...) |
| INQUIRE POSTING GROUP                                                       | pinq_post_grp (...)                     |
| INQUIRE POSTING GROUP FACILITIES                                            | pinq_post_grp_facs (...)                |
| INQUIRE PREDEFINED APPLICATION FILTER                                       | pinq_pred_appl_filter (...)             |
| INQUIRE PREDEFINED ASSOCIATION OF TARGET WITH TRAVERSAL RESOURCES           | pinq_pred_assoc_targ_trav_res (...)     |
| INQUIRE PREDEFINED ASSOCIATION OF TRAVERSAL RESOURCE WITH TARGET            | pinq_pred_assoc_trav_res_targ (...)     |
| INQUIRE PREDEFINED COMPOSITE MEASURE DEFINITION                             | pinq_pred_composite_meas_def (...)      |
| INQUIRE PREDEFINED EDGE REPRESENTATION FULL                                 | pinq_pred_edge_rep_full (...)           |
| INQUIRE PREDEFINED EXTENDED PATTERN REPRESENTATION                          | pinq_pred_ext_pat_rep (...)             |
| INQUIRE PREDEFINED HIGHLIGHTING REPRESENTATION                              | pinq_pred_highl_rep (...)               |
| INQUIRE PREDEFINED IMAGE RESOURCE                                           | pinq_pred_image_res (...)               |
| INQUIRE PREDEFINED LINETYPE DEFINITION                                      | pinq_pred_linetype_def (...)            |
| INQUIRE PREDEFINED MARKER TYPE DEFINITION                                   | pinq_pred_marker_type_def (...)         |
| INQUIRE PREDEFINED POLYLINE REPRESENTATION FULL                             | pinq_pred_line_rep_full (...)           |
| INQUIRE PREDEFINED POSTING GROUP                                            | pinq_pred_post_grp (...)                |
| INQUIRE PREDEFINED SET MEASURE DEFINITION                                   | pinq_pred_set_meas_def (...)            |
| INQUIRE PREDEFINED TEXTURE REPRESENTATION                                   | pinq_pred_texture_rep (...)             |
| INQUIRE PROJECTION REFERENCE POINT                                          | pinq_proj_ref_point (...)               |
| INQUIRE PROJECTION TYPE                                                     | pinq_proj_type (...)                    |
| INQUIRE PROJECTION VIEWPORT                                                 | pinq_proj_vp (...)                      |
| INQUIRE PROJECTION VIEWPORT 3                                               | pinq_proj_vp3 (...)                     |
| INQUIRE RENDERING TARGET                                                    | pinq_rend_targ (...)                    |
| INQUIRE SET DEVICE STATE                                                    | pinq_set_st (...)                       |
| INQUIRE SET DEVICE STATE 3                                                  | pinq_set_st3 (...)                      |
| INQUIRE SET FACILITIES                                                      | pinq_set_facs (...)                     |
| INQUIRE SET MEASURE DEFINITION                                              | pinq_set_meas_def (...)                 |
| INQUIRE SET OF GROUPS TO WHICH POSTED                                       | pinq_grps_posted (...)                  |
| INQUIRE SET OF WORKSTATIONS TO WHICH DIRECT INTERPRETATION STRUCTURE POSTED | pinq_wss_di_struct_posted (...)         |
| INQUIRE STRING FACILITIES                                                   | pinq_string_facs (...)                  |
| INQUIRE STROKE FACILITIES                                                   | pinq_stroke_facs (...)                  |
| INQUIRE TARGET ASSOCIATED WITH TRAVERSAL RESOURCE                           | pinq_targ_assoc_trav_res (...)          |
| INQUIRE TARGET DISPOSITION                                                  | pinq_targ_dispos (...)                  |
| INQUIRE TARGET FACILITIES                                                   | pinq_targ_facs (...)                    |
| INQUIRE TARGET MANIPULATION MODE                                            | pinq_targ_manip_mode (...)              |

**Table 3 - Function names ordered by PHIGS and PHIGS PLUS function name (Continued)**

| <b>PHIGS and PHIGS PLUS Name</b>                      | <b>C Name</b>                           |
|-------------------------------------------------------|-----------------------------------------|
| INQUIRE TARGET STATE                                  | pinq_targ_st (...)                      |
| INQUIRE TEXTURE FACILITIES                            | pinq_texture_facs (...)                 |
| INQUIRE TEXTURE MAPPING FACILITIES                    | pinq_texture_map_facs (...)             |
| INQUIRE TEXTURE REPRESENTATION                        | pinq_texture_rep (...)                  |
| INQUIRE TRANSPARENCY MODE                             | pinq_transparency_mode (...)            |
| INQUIRE TRANSPARENCY THRESHOLDS                       | pinq_transparency_thresholds (...)      |
| INQUIRE TRAVERSAL RESOURCE FACILITIES                 | pinq_trav_res_facs (...)                |
| INQUIRE TRAVERSAL RESOURCES ASSOCIATED WITH TARGET    | pinq_trav_res_assoc_targ (...)          |
| INQUIRE VALUATOR FACILITIES                           | pinq_val_facs (...)                     |
| INQUIRE VIEW PLANE DISTANCE                           | pinq_view_plane_dist (...)              |
| INQUIRE VIEW PLANE NORMAL                             | pinq_view_plane_norm (...)              |
| INQUIRE VIEW REFERENCE POINT                          | pinq_view_ref_point (...)               |
| INQUIRE VIEW REFERENCE POINT 3                        | pinq_view_ref_point3 (...)              |
| INQUIRE VIEW STATUS                                   | pinq_view_status (...)                  |
| INQUIRE VIEW UP VECTOR                                | pinq_view_up_vec (...)                  |
| INQUIRE VIEW UP VECTOR 3                              | pinq_view_up_vec3 (...)                 |
| INQUIRE VIEW WINDOW LIMITS                            | pinq_view_win_limits (...)              |
| INQUIRE WATCH ON ELEMENT RANGE                        | pinq_watch_elem_range (...)             |
| INQUIRE WATCH RANGE STATE                             | pinq_watch_range_st (...)               |
| INQUIRE WORKSTATION STATE TABLE LENGTHS HIGHLIGHTING  | pinq_ws_st_table_highl (...)            |
| INQUIRE WORKSTATION STATE TABLE LENGTHS TEXTURE       | pinq_ws_st_table_texture (...)          |
| INQUIRE X-Y CLIPPING INDICATOR                        | pinq_xy_clip_indicator (...)            |
| INSTANCE STRUCTURE                                    | pinst_struct (...)                      |
| MANIPULATE TRAVERSAL RESOURCE                         | pmanip_trav_res (...)                   |
| MAP DEVICE COORDINATE POINT TO PICK PATHS             | pmap_dc_point_to_pick_paths (...)       |
| MAP DEVICE COORDINATES TO WINDOW SYSTEM COORDINATES   | pmap_dc_to_wsc (...)                    |
| MAP DEVICE COORDINATES TO WORLD COORDINATES           | pmap_dc_to_wc (...)                     |
| MAP WINDOW SYSTEM COORDINATES TO DEVICE COORDINATES   | pmap_wsc_to_dc (...)                    |
| MARK MULTI-PASS COMPLETION                            | pmark_multi_pass_compl (...)            |
| MARK MULTI-PASS START                                 | pmark_multi_pass_start (...)            |
| MARK PASS COMPLETION                                  | pmark_pass_compl (...)                  |
| MARK PASS START                                       | pmark_pass_start (...)                  |
| MOVE ELEMENT FROM STRUCTURE                           | pmove_elem_struct (...)                 |
| MOVE ELEMENT RANGE FROM STRUCTURE                     | pmove_elem_range_struct (...)           |
| MOVE ELEMENTS BETWEEN LABELS FROM STRUCTURE           | pmove_elems_between_labels_struct (...) |
| OPEN DIRECT INTERPRETATION STRUCTURE                  | popen_di_struct (...)                   |
| POP STATE                                             | ppop_st (...)                           |
| POST DIRECT INTERPRETATION STRUCTURE                  | ppost_di_struct (...)                   |
| POST DIRECT INTERPRETATION STRUCTURE TO POSTING GROUP | ppost_di_struct_to_grp (...)            |
| POST STRUCTURE TO GROUP                               | ppost_struct_to_grp (...)               |
| PUSH STATE                                            | ppush_st (...)                          |

Table 3 - Function names ordered by PHIGS and PHIGS PLUS function name (Continued)

| PHIGS and PHIGS PLUS Name                          | C Name                             |
|----------------------------------------------------|------------------------------------|
| REDRAW ALL STRUCTURES FROM POSTING GROUP           | predraw_all_structs_from_grp (...) |
| REDRAW ALL STRUCTURES FROM POSTING GROUP ON TARGET | predraw_all_from_grp_on_targ (...) |
| REDRAW ALL STRUCTURES ON TARGET                    | predraw_all_structs_on_targ (...)  |
| RENEW DIRECT INTERPRETATION STATE                  | prenew_di_state (...)              |
| REQUEST COMPOSITE                                  | preq_composite (...)               |
| REQUEST COMPOSITE 3                                | preq_composite3 (...)              |
| REQUEST SET                                        | preq_set (...)                     |
| REQUEST SET 3                                      | preq_set3 (...)                    |
| RESET ALL TRAVERSAL RESOURCES                      | preset_all_trav_res (...)          |
| RETRIEVE NUMBER OF PASSES REQUIRED                 | pret_num_passes_req (...)          |
| RETRIEVE WINDOW SYSTEM COLOUR                      | pret_window_system_colr (...)      |
| SAMPLE COMPOSITE                                   | psample_composite (...)            |
| SAMPLE COMPOSITE 3                                 | psample_composite3 (...)           |
| SAMPLE SET                                         | psample_set (...)                  |
| SAMPLE SET 3                                       | psample_set3 (...)                 |
| SET ACTIVE TEXTURES                                | pset_active_textures (...)         |
| SET ALPHA DATA SELECTION INDEX                     | pset_alpha_data_sel_ind (...)      |
| SET ALPHA SOURCE SELECTOR                          | pset_alpha_src_sel (...)           |
| SET APPLICATION FILTER                             | pset_appl_filter (...)             |
| SET APPLICATION INTEGER                            | pset_appl_int (...)                |
| SET APPLICATION REAL                               | pset_appl_real (...)               |
| SET BACK ACTIVE TEXTURES                           | pset_back_active_textures (...)    |
| SET BACK CLIPPING INDICATOR                        | pset_back_clip_indicator (...)     |
| SET BACK PLANE DISTANCE                            | pset_back_plane_dist (...)         |
| SET BACK TRANSPARENCY                              | pset_back_transparency (...)       |
| SET COMPOSITE MODE                                 | pset_composite_mode (...)          |
| SET COMPOSITE PICK FILTER                          | pset_composite_pick_filter (...)   |
| SET CONDITION FLAGS                                | pset_cond_flags (...)              |
| SET CONDITION FLAGS FROM TESTS                     | pset_cond_flags_from_tests (...)   |
| SET DEPTH CUE REPRESENTATION MASK                  | pset_depth_cue_rep_mask (...)      |
| SET DEVICE COORDINATE CLIP REGIONS                 | pset_dc_clip_regions (...)         |
| SET DEVICE COORDINATE CLIP REGIONS 3               | pset_dc_clip_regions3 (...)        |
| SET DIRECT INTERPRETATION MODE                     | pset_di_mode (...)                 |
| SET DIRECT INTERPRETATION PICK CORRELATION POINT   | pset_di_pick_corr_point (...)      |
| SET DIRECT INTERPRETATION PICK CORRELATION POINT 3 | pset_di_pick_corr_point3 (...)     |
| SET DIRECT INTERPRETATION PICK FILTER              | pset_di_pick_filter (...)          |
| SET DISPLAY TARGET                                 | pset_disp_targ (...)               |
| SET EDGE CAP                                       | pset_edgcap (...)                  |
| SET EDGE JOIN                                      | pset_edgejoin (...)                |
| SET EDGEMITRE LIMIT                                | pset_edgemitre_limit (...)         |
| SET EDGE REPRESENTATION FULL                       | pset_edge_rep_full (...)           |
| SET EDGE REPRESENTATION MASK                       | pset_edge_rep_mask (...)           |
| SET EDGETYPE ADAPTABILITY                          | pset_edgetype_adapt (...)          |
| SET EDGETYPE CONTINUITY                            | pset_edgetype_cont (...)           |

**Table 3 - Function names ordered by PHIGS and PHIGS PLUS function name (Continued)**

| <b>PHIGS and PHIGS PLUS Name</b>             | <b>C Name</b>                        |
|----------------------------------------------|--------------------------------------|
| SET EDGETYPE OFFSET                          | pset_edgetype_offset (...)           |
| SET EXTENDED PATTERN REPRESENTATION          | pset_ext_pat_rep (...)               |
| SET FRONT CLIPPING INDICATOR                 | pset_front_clip_indicator (...)      |
| SET FRONT PLANE DISTANCE                     | pset_front_plane_dist (...)          |
| SET HIGHLIGHTING INDEX                       | pset_highl_ind (...)                 |
| SET HIGHLIGHTING METHOD                      | pset_highl_method (...)              |
| SET HIGHLIGHTING REPRESENTATION              | pset_highl_rep (...)                 |
| SET INTERIOR REPRESENTATION MASK             | pset_int_rep_mask (...)              |
| SET LINECAP                                  | pset_linecap (...)                   |
| SET LINEJOIN                                 | pset_linejoin (...)                  |
| SET LINEMITRE LIMIT                          | pset_linemitre_limit (...)           |
| SET LINETYPE ADAPTABILITY                    | pset_linetype_adapt (...)            |
| SET LINETYPE CONTINUITY                      | pset_linetype_cont (...)             |
| SET LINETYPE OFFSET                          | pset_linetype_offset (...)           |
| SET PATTERN REPRESENTATION MASK              | pset_pat_rep_mask (...)              |
| SET PICK MAPPING DATA                        | pset_pick_mapping_data (...)         |
| SET POLYLINE REPRESENTATION FULL             | pset_line_rep_full (...)             |
| SET POLYLINE REPRESENTATION MASK             | pset_line_rep_mask (...)             |
| SET POLYMARKER REPRESENTATION MASK           | pset_marker_rep_mask (...)           |
| SET POSTING GROUP BACKGROUND METHOD          | pset_post_grp_backg_method (...)     |
| SET POSTING GROUP BACKGROUND STYLE           | pset_post_grp_backg_style (...)      |
| SET POSTING GROUP BORDER INDEX               | pset_post_grp_border_ind (...)       |
| SET POSTING GROUP BORDER INDICATOR           | pset_post_grp_border_indicator (...) |
| SET POSTING GROUP PRIORITY                   | pset_post_grp_priority (...)         |
| SET POSTING GROUP STATUS                     | pset_post_grp_status (...)           |
| SET PROJECTION REFERENCE POINT               | pset_proj_ref_point (...)            |
| SET PROJECTION TYPE                          | pset_proj_type (...)                 |
| SET PROJECTION VIEWPORT                      | pset_proj_vp (...)                   |
| SET PROJECTION VIEWPORT3                     | pset_proj_vp3 (...)                  |
| SET REFLECTANCE REPRESENTATION MASK          | pset_refl_rep_mask (...)             |
| SET RENDERING TARGET                         | pset_rend_targ (...)                 |
| SET SET MODE                                 | pset_set_mode (...)                  |
| SET SET PICK FILTER                          | pset_set_pick_filter (...)           |
| SET STATE OF VISUAL REPRESENTATION           | pset_st_visual_rep (...)             |
| SET TARGET DISPOSITION                       | pset_targ_dispos (...)               |
| SET TARGET MANIPULATION MODE                 | pset_targ_manip_mode (...)           |
| SET TARGET STATE OF VISUAL REPRESENTATION    | pset_targ_st_visual_rep (...)        |
| SET TEXT REPRESENTATION MASK                 | pset_text_rep_mask (...)             |
| SET TEXTURE BINDING                          | pset_texture_binding (...)           |
| SET TEXTURE COMPOSITION                      | pset_texture_composition (...)       |
| SET TEXTURE PARAMETRIZATION                  | pset_texture_param (...)             |
| SET TEXTURE PERSPECTIVE CORRECTION           | pset_texture_perspect_corr (...)     |
| SET TEXTURE REPRESENTATION                   | pset_texture_rep (...)               |
| SET TEXTURE REPRESENTATION MASK              | pset_texture_rep_mask (...)          |
| SET TEXTURE RESOURCE OPTIMIZATION HEURISTICS | pset_texture_res_opt_heur (...)      |
| SET TEXTURE SAMPLING                         | pset_texture_sampling (...)          |

**Table 3 - Function names ordered by PHIGS and PHIGS PLUS function name (Continued)**

| <b>PHIGS and PHIGS PLUS Name</b>        | <b>C Name</b>                      |
|-----------------------------------------|------------------------------------|
| SET TEXTURE SAMPLING FREQUENCY          | pset_texture_sampling_freq (...)   |
| SET TRANSPARENCY                        | pset_transparency (...)            |
| SET TRANSPARENCY MODE                   | pset_transparency_mode (...)       |
| SET TRANSPARENCY THRESHOLDS             | pset_transparency_thresholds (...) |
| SET VIEW PLANE DISTANCE                 | pset_view_plane_dist (...)         |
| SET VIEW PLANE NORMAL                   | pset_view_plane_norm (...)         |
| SET VIEW REFERENCE POINT                | pset_view_ref_point (...)          |
| SET VIEW REFERENCE POINT 3              | pset_view_ref_point3 (...)         |
| SET VIEW UP VECTOR                      | pset_view_up_vec (...)             |
| SET VIEW UP VECTOR 3                    | pset_view_up_vec3 (...)            |
| SET VIEW WINDOW LIMITS                  | pset_view_win_limits (...)         |
| SET WATCH ON ELEMENT RANGE              | pset_watch_on_elem_range (...)     |
| SET X-Y CLIPPING INDICATOR              | pset_xy_clip_indicator (...)       |
| TRANSFER DIRECT INTERPRETATION PICK SET | ptrans_di_pick_set (...)           |
| UNDEFINE CHOICE                         | pundefine_choice (...)             |
| UNDEFINE COMPOSITE                      | pundefine_composite (...)          |
| UNDEFINE LOCATOR                        | pundefine_locator (...)            |
| UNDEFINE PICK                           | pundefine_pick (...)               |
| UNDEFINE POSTING GROUP                  | pundefine_post_grp (...)           |
| UNDEFINE SET                            | pundefine_set (...)                |
| UNDEFINE STRING                         | pundefine_string (...)             |
| UNDEFINE STROKE                         | pundefine_stroke (...)             |
| UNDEFINE VALUATOR                       | pundefine_valuator (...)           |
| UNPOST ALL STRUCTURES FROM GROUP        | punpost_all_structs_from_grp (...) |
| UNPOST DIRECT INTERPRETATION STRUCTURE  | punpost_di_struct (...)            |
| UNPOST STRUCTURES FROM GROUPS           | punpost_structs_from_grps (...)    |
| UPDATE TARGET                           | pupd_targ (...)                    |
| UPDATE VIEW REPRESENTATION              | pupd_view_rep (...)                |
| WORKSTATION TYPE CREATE                 | pws_type_create (...)              |
| WORKSTATION TYPE DESTROY                | pws_type_destroy (...)             |
| WORKSTATION TYPE GET                    | pws_type_get (...)                 |
| WORKSTATION TYPE SET                    | pws_type_set (...)                 |

”

Page 27

## 5 C PHIGS type definitions

Change the clause heading to “C Basic PHIGS profile type definitions”.

### 5.1 Mapping of PHIGS data types

Change the subclause heading to “Mapping of Basic PHIGS profile data types”.

The following text replaces the text of the first paragraph:

“The *Basic PHIGS profile* specifies a set of abstract data types. Table 4 gives the mapping from those data types defined in the *Basic PHIGS profile*.”

Change the table title to “**Table - 4 Mapping of Basic PHIGS profile data types to C**”.

Change the left table heading to “**Basic PHIGS profile data type**”.

Page 27

## 5.2 Environmental type definitions

Append the phrase “of all profiles” to the second sentence of the first paragraph.

Page 28

## 5.3 Implementation dependent type definitions

Change the subclause heading to “**Implementation dependent Basic PHIGS profile type definitions**”.

The following text replaces the phrases of the “xxx” description concerned with the escape data records.

‘, “escape\_in” for ESCAPE input data records, “escape\_out” for ESCAPE output data records, “targ\_op” for target operation types, “trav\_res\_op” for traversal resource operations, “in\_type” for new classes of input measures’

Pages 29 and 30

The following type definitions replace the Pchoice\_data and Pchoice\_data3 type definitions:

“

---

Pchoice\_data **CHOICE DATA RECORD**

```
typedef struct {
    union Pchoice_pets {
        struct Pchoice_pet_other {
            Pint        unused;
        } pet_other; /* When no echo-specific data is required */
        struct Pchoice_pet_r1{
            . . .      /* impl. dependent */
        } pet_r1; /* For PET 1 */
        struct Pchoice_pet_r2 {
            Pint        num_prompts; /* number of prompts*/
            Ppr_switch  *prompts;    /* array of prompts*/
            . . .          /* impl. defined*/
        } pet_r2; /* For PET 2 */
    }
}
```

```

    struct Pchoice_pet_r3 {
        Pint      num_strings;      /* number of choice strings*/
        char      **strings;        /* array of choice strings*/
        . . . . .                  /* impl. defined*/
    } pet_r3; /* For PET 3 */
    struct Pchoice_pet_r4 {
        Pint      num_strings;      /* number of alternatives*/
        char      **strings;        /* array of strings*/
        . . . . .                  /* impl. defined*/
    } pet_r4; /* For PET 4 */
    struct Pchoice_pet_r5 {
        Pint      struct_id;        /* structure identifier*/
        Pint      num_pick_ids;     /* number of alternatives*/
        Pint      *pick_ids;        /* array of pick identifiers*/
        . . . . .                  /* impl. defined*/
    } pet_r5; /* For PET 5 */
    . . . /* data for impl. defined pets */
} pets;

union Pchoice_measure_data {
    struct Pchoice_meas_other {
        Pint      unused;
    } meas_other; /* When no measure-specific data is required */
    . . . /* data for impl. defined measure processes */
} measure_data;

union Pchoice_trigger_data {
    struct Pchoice_trig_other {
        Pint      unused;
    } trig_other; /* When no trigger-specific data is required */
    . . . /* data for impl. defined trigger processes */
} trigger_data;

union Pchoice_ack_data {
    struct Pchoice_ack_other {
        Pint      unused;
    } ack_other; /* When no ack.-specific data is required */
    . . . /* data for impl. defined ack. processes */
} acknowledgement_data;
} Pchoice_data;

```

## Pchoice\_data3 CHOICE DATA RECORD 3

```

typedef struct {
    union Pchoice3_pets {
        struct Pchoice3_pet_other {
            Pint        unused;
        } pet_other; /* When no echo-specific data is required */
        struct Pchoice3_pet_r1{
            . . . . . /* impl. dependent*/
        } pet_r1; /* For PET 1 */
        struct Pchoice3_pet_r2 {
            Pint        num_prompts; /* number of prompts*/
            Ppr_switch*prompts; /* array of prompts*/
            . . . . . /* impl. defined*/
        } pet_r2; /* For PET 2 */
        struct Pchoice3_pet_r3 {
            Pint        num_strings; /* number of choice strings*/
            char        **strings; /* array of choice strings*/
            . . . . . /* impl. defined*/
        } pet_r3; /* For PET 3 */
        struct Pchoice3_pet_r4 {
            Pint        num_strings; /* number of alternatives*/
            char        **strings; /* array of strings*/
            . . . . . /* impl. defined*/
        } pet_r4; /* For PET 4 */
        struct Pchoice3_pet_r5 {
            Pint        struct_id; /* structure identifier*/
            Pint        num_pick_ids; /* number of alternatives*/
            Pint        *pick_ids; /* array of pick identifiers*/
            . . . . . /* impl. defined*/
        } pet_r5; /* For PET 5 */
        . . . . . /* data for impl. defined pets */
    } pets;
    union Pchoice3_measure_data {
        struct Pchoice_meas_other {
            Pint        unused;
        } meas_other; /* When no measure-specific data is required */
        . . . . . /* data for impl. defined measure processes */
    } measure_data;
}

```

```

union Pchoice3_trigger_data {
    struct Pchoice3_trig_other {
        Pint        unused;
    } trig_other; /* When no trigger-specific data is required */
    . . .        /* data for impl. defined trigger processes */
} trigger_data;
union Pchoice3_ack_data {
    struct Pchoice3_ack_other {
        Pint        unused;
    } ack_other; /* When no ack.-specific data is required */
    . . .        /* data for impl. defined ack. processes */
} acknowledgement_data;

} Pchoice_data3;”

```

Pages 33 and 34

The following type definition replaces the definitions of *Ploc\_data* and *Ploc\_data3* respectively:

“

#### **Ploc\_data LOCATOR DATA RECORD**

```

typedef struct {
    union Ploc_pets {
        struct Ploc_pet_other {
            Pint        unused;
        } pet_other; /* When no echo-specific data is required */
        struct Ploc_pet_r1 {
            . . .        /* impl. dependent*/
        } pet_r1; /* Supports standard PET 1 */
        struct Ploc_pet_r2 {
            . . .        /* impl. dependent*/
        } pet_r2; /* Supports standard PET 2 */
        struct Ploc_pet_r3 {
            . . .        /* impl. dependent*/
        } pet_r3; /* Supports standard PET 3 */
        struct Ploc_pet_r4 {
            Pline_attrs line_attrs; /* polyline attributes*/
            . . .        /* impl. dependent*/
        } pet_r4; /* Supports standard PET 4 */
    };
};

```

```

struct Ploc_pet_r5 {
    Pline_fill_ctrl_flag line_fill_ctrl_flag; /* ctrl. 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;
    . . . /* data for impl. defined PET's */
} pet_r5; /* Supports standard PET 5 */
struct Ploc_pet_r6 {
    . . . /* impl. dependent*/
} pet_r6; /* Supports standard PET 6 */
. . . /* data for impl. defined PET's */
} pets;

union Ploc_measure_data {
    struct Ploc_meas_other {
        Pint unused;
    } meas_other; /* When no measure-specific data is required */
    . . . /* data for impl. defined measure processes */
} measure_data;

union Ploc_trigger_data{
    struct Ploc_trig_other{
        Pint unused;
    } trig_other; /* When no trigger-specific data is required */
    . . . /* data for impl. defined trigger processes */
} trigger_data;

union Ploc_ack_data {
    struct Ploc_ack_other {
        Pint unused;
    } ack_other; /* When no ack.-specific data is required */
    . . . /* data for impl. defined ack. processes */
} acknowledgement_data;
} Ploc_data;

```

## Ploc\_data3 LOCATOR DATA RECORD 3

```

typedef struct {
    union Ploc3_pets {
        struct Ploc3_pet_other {
            Pint        unused;
        } pet_other;    /* When no echo-specific data is required */
        struct Ploc3_pet_r1 {
            . . .        /* impl. dependent*/
        } pet_r1;       /* Supports standard PET 1 */
        struct Ploc3_pet_r2 {
            . . .        /* impl. dependent*/
        } pet_r2;       /* Supports standard PET 2 */
        struct Ploc3_pet_r3 {
            . . .        /* impl. dependent*/
        } pet_r3;       /* Supports standard PET 3 */
        struct Ploc3_pet_r4 {
            Pline_attrs line_attrs;    /* polyline attributes*/
            . . .        /* impl. dependent*/
        } pet_r4;       /* Supports standard PET 4 */
        struct Ploc3_pet_r5 {
            Pline_fill_ctrl_flag line_fill_ctrl_flag; /* ctrl. 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;
            . . .        /* data for impl. defined PET's */
        } pet_r5;       /* Supports standard PET 5 */
        struct Ploc3_pet_r6 {
            . . .        /* impl. dependent*/
        } pet_r6;       /* Supports standard PET 6 */
        . . .        /* data for impl. defined PET's */
    } pets;
    union Ploc3_measure_data {
        struct Ploc3_meas_other {
            Pint        unused;
        } meas_other; /* When no measure-specific data is required */
    };
};

```

```

        . . .      /* data for impl. defined measure processes */
    } measure_data;
    union Ploc3_trigger_data {
        struct Ploc3_trig_other {
            Pint      unused;
        } trig_other; /* When no trigger-specific data is required */
        . . .      /* data for impl. defined trigger processes */
    } trigger_data;
    union Ploc3_ack_data {
        struct Ploc3_ack_other {
            Pint      unused;
        } ack_other; /* When no ack.-specific data is required */
        . . .      /* data for impl. defined ack. processes */
    } acknowledgement_data;
} Ploc_data3;”

```

Pages 35 through 38

The following type definitions replace the corresponding definitions respectively:

“

---

#### Ppick\_data **PICK DATA RECORD**

```

typedef struct {
    union Ppick_pets {
        struct Ppick_pet_other {
            Pint      unused;
        } pet_other; /* When no echo-specific data is required */
        struct Ppick_pet_r1 {
            . . .      /* impl. dependent*/
        } pet_r1; /* For PET 1 */
        . . .      /* data for impl. defined pets */
        struct Ppick_pet_r2 {
            . . .      /* implementation dependent*/
        } pet_r2; /* For PET 2 */
        struct Ppick_pet_r3 {
            . . .      /* implementation dependent*/
        } pet_r3; /* For PET 3 */
    }
} Ppick_data;

```

```

    struct Ppick_pet_r4 {
        Pint        highl_ind;           /* highlighting index*/
        . . . . .                       /* impl. dependent*/
    } pet_r4; /* For PET 4 */
    struct Ppick_pet_r5 {
        Pint        highl_ind;           /* highlighting index*/
        . . . . .                       /* impl. dependent*/
    } pet_r5; /* For PET 5 */
    struct Ppick_pet_r6 {
        Pint        highl_ind;           /* highlighting index*/
        . . . . .                       /* impl. dependent*/
    } pet_r6; /* For PET 6 */
    . . .                               /* implementation defined PET's*/
} pets;

union Ppick_measure_data {
    struct Ppick_meas_other {
        Pint        unused;
    } meas_other; /* When no measure-specific data is required */
    . . .         /* data for impl. defined measure processes */
} measure_data;

union Ppick_trigger_data {
    struct Ppick_trig_other {
        Pint        unused;
    } trig_other; /* When no trigger-specific data is required */
    . . .         /* data for impl. defined pick processes */
} trigger_data;

union Ppick_ack_data {
    struct Ppick_ack_other {
        Pint        unused;
    } ack_other; /* When no ack.-specific data is required */
    . . .         /* data for impl. defined ack. processes */
} acknowledgement_data;
} Ppick_data;

```

Ppick\_data3 **PICK DATA RECORD 3**

```

typedef struct {
    union Ppick3_pets {
        struct Ppick3_pet_other {
            Pint        unused;
        } pet_other; /* When no echo-specific data is required */
        struct Ppick3_pet_r1 {
            . . .
        } pet_r1; /* For PET 1 */
        struct Ppick3_pet_r2 {
            . . .
        } pet_r2; /* For PET 2 */
        struct Ppick3_pet_r3 {
            . . .
        } pet_r3; /* For PET 3 */
        struct Ppick3_pet_r4 {
            Pint        highl_ind;
            . . .
        } pet_r4; /* For PET 4 */
        struct Ppick3_pet_r5 {
            Pint        highl_ind;
            . . .
        } pet_r5; /* For PET 5 */
        struct Ppick3_pet_r6 {
            Pint        highl_ind;
            . . .
        } pet_r6;
        . . . /* data for impl. defined pets */
    } pets; /* For PET 6 */
    union Ppick3_measure_data {
        struct Ppick3_meas_other {
            Pint        unused;
        } meas_other; /* When no measure-specific data is required */
        . . . /* data for impl. defined measure processes */
    } measure_data;
    union Ppick3_trigger_data {
        struct Ppick3_trig_other {
            Pint        unused;
        } trig_other; /* When no trigger-specific data is required */
    }

```

```

    . . .      /* data for impl. defined pick processes */
} trigger_data;
union Ppick3_ack_data {
    struct Ppick3_ack_other {
        Pint      unused;
    } ack_other; /* When no ack.-specific data is required */
    . . .      /* data for impl. defined ack. processes */
} acknowledgement_data;
} Ppick_data3;

```

---

#### Pstring\_data **STRING DATA RECORD**

```

typedef struct {
    Pint          in_buf_size; /* input buffer size*/
    Pint          init_pos;    /* initial editing position*/
    union Pstring_pets {
        struct Pstring_pet_other {
            Pint      unused;
        } pet_other; /* When no echo-specific data is required */
        struct Pstring_pet_r1{
            . . .      /* impl. dependent*/
        } pet_r1; /* For PET 1 */
        . . .      /* data for impl. defined pets */
    } pets;
    union Pstring_measure_data {
        struct Pstring_meas_other {
            Pint      unused;
        } meas_other; /* When no measure-specific data is required */
        . . .      /* data for impl. defined measure processes */
    } measure_data;
    union Pstring_trigger_data {
        struct Pstring_trig_other {
            Pint      unused;
        } trig_other; /* When no trigger-specific data is required */
        . . .      /* data for impl. defined trigger processes */
    } trigger_data;

```

```

union Pstring_ack_data {
    struct Pstring_ack_other {
        Pint        unused;
    } ack_other; /* When no ack.-specific data is required */
    . . .        /* data for impl. defined ack. processes */
} acknowledgement_data;
} Pstring_data;

```

---

### Pstring\_data3 STRING DATA RECORD 3

```

typedef struct {
    Pint        in_buf_size; /* input buffer size*/
    Pint        init_pos;    /* initial editing position*/
    union Pstring3_pets {
        struct Pstring_pet_other {
            Pint        unused;
        } pet_other; /* When no echo-specific data is required */
        struct Pstring3_pet_r1{
            . . .        /* impl. dependent*/
        } pet_r1; /* For PET 1 */
        . . .        /* data for impl. defined pets */
    } pets;
    union Pstring3_measure_data {
        struct Pstring3_meas_other {
            Pint        unused;
        } meas_other; /* When no measure-specific data is required */
        . . .        /* data for impl. defined measure processes */
    } measure_data;
    union Pstring3_trigger_data {
        struct Pstring3_trig_other {
            Pint        unused;
        } trig_other; /* When no trigger-specific data is required */
        . . .        /* data for impl. defined trigger processes */
    } trigger_data;
    union Pstring3_ack_data {
        struct Pstring3_ack_other {
            Pint        unused;
        } ack_other; /* When no ack.-specific data is required */
    }

```

```

    . . .      /* data for impl. defined ack. processes */
} acknowledgement_data;

} Pstring_data3;

```

---

## Pstroke\_data STROKE DATA RECORD

```

typedef struct {
    Pint          buffer_size; /* input buffer size */
    Pint          init_pos;    /* initial editing position */
    Pfloat        x_interval;  /* x trigger interval */
    Pfloat        y_interval;  /* y trigger interval */
    Pfloat        time_interval; /* time trigger interval */
    union {
        struct Pstroke_pet_other {
            Pint          unused;
        } pet_other; /* When no echo-specific data is required */
        struct Pstroke_pet_r1 {
            . . .      /* impl. dependent */
        } pet_r1; /* For std PET 1 */
        struct Pstroke_pet_r2 {
            . . .      /* impl. dependent */
        } pet_r2; /* For std PET 2 */
        struct Pstroke_pet_r3 {
            Pmarker_attrs marker_attrs; /* marker attributes */
            . . .      /* impl. dependent */
        } pet_r3; /* For std PET 3 */
        struct Pstroke_pet_r4 {
            Pline_attrs line_attrs; /* line attributes */
            . . .      /* impl. dependent */
        } pet_r4; /* For std PET 4 */
        . . .      /* data for impl. defined PET's */
    } pets;
    union Pstroke_measure_data {
        struct Pstroke_meas_other {
            Pint          unused;
        } meas_other; /* When no measure-specific data is required */
        . . .      /* data for impl. defined measure processes */
    } measure_data;
}

```

```

union Pstroke_trigger_data {
    struct Pstroke_trig_other {
        Pint        unused;
    } trig_other; /* When no trigger-specific data is required */
    . . .        /* data for impl. defined trigger processes */
} trigger_data;
union Pstroke_ack_data {
    struct Pstroke_ack_other {
        Pint        unused;
    } ack_other; /* When no ack.-specific data is required */
    . . .        /* data for impl. defined ack. processes */
} acknowledgement_data;
} 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 trigger interval*/
    Pfloat      y_interval;  /* y trigger interval*/
    Pfloat      z_interval;  /* z trigger interval*/
    Pfloat      time_interval; /* time trigger interval*/
    union Pstroke3_pets {
        struct Pstroke3_pet_other {
            Pint        unused;
        } pet_other; /* When no echo-specific data is required */
        struct Pstroke3_pet_r1 {
            . . .        /* impl. dependent*/
        } pet_r1; /* For std PET 1 */
        struct Pstroke3_pet_r2 {
            . . .        /* impl. dependent */
        } pet_r2; /* For std PET 2 */
        struct Pstroke3_pet_r3 {
            Pmarker_attrs marker_attrs; /* marker attributes*/
            . . .        /* impl. dependent*/
        } pet_r3; /* For std PET 3 */
    }
}

```

```

    struct Pstroke3_pet_r4 {
        Pline_attrs line_attrs;    /* line attributes*/
        . . .                    /* impl. dependent*/
    } pet_r4; /* For std PET 4 */
    . . . /* data for impl. defined PET's */
} pets;
union Pstroke3_measure_data {
    struct Pstroke3_meas_other {
        Pint unused;
    } meas_other; /* When no measure-specific data is required */
    . . . /* data for impl. defined measure processes */
} measure_data;
union Pstroke3_trigger_data {
    struct Pstroke3_trig_other {
        Pint unused;
    } trig_other; /* When no trigger-specific data is required */
    . . . /* data for impl. defined trigger processes */
} trigger_data;
union Pstroke3_ack_data {
    struct Pstroke3_ack_other {
        Pint unused;
    } ack_other; /* When no ack.-specific data is required */
    . . . /* data for impl. defined ack. processes */
} acknowledgement_data;
} Pstroke_data3;

```

---

#### Pval\_data VALUATOR DATA RECORD

```

typedef struct {
    Pfloat low; /* Low value of valuator range*/
    Pfloat high; /* High value of valuator range*/
    union Pval_pets {
        struct Pval_pet_other {
            Pint unused;
        } pet_other; /* When no echo-specific data is required */
        . . . /* data for impl. defined pets */
    } pets;
}

```

```

union Pval_measure_data {
    struct Pval_measure_other {
        Pint        unused;
    } meas_other; /* When no measure-specific data is required */
    . . .         /* data for impl. defined measure processes */
} measure_data;
union Pval_trigger_data {
    struct Pval_trig_other {
        Pint        unused;
    } trig_other; /* When no trigger-specific data is required */
    . . .         /* data for impl. defined trigger processes */
} trigger_data;
union Pval_ack_data {
    struct Pval_ack_other {
        Pint        unused;
    } ack_other; /* When no ack.-specific data is required */
    . . .         /* data for impl. defined ack. processes */
} acknowledgement_data;
} Pval_data;

```

---

### Pval\_data3 VALUATOR DATA RECORD 3

```

typedef struct {
    Pfloat        low;           /* Low value of valuator range*/
    Pfloat        high;          /* High value of valuator range*/
    union Pval3_pets {
        struct Pval3_pet_other {
            Pint        unused;
        } pet_other; /* When no echo-specific data is required */
        . . .         /* data for impl. defined pets */
    } pets;
    union Pval3_measure_data {
        struct Pval3_measure_other {
            Pint        unused;
        } meas_other; /* When no measure-specific data is required */
        . . .         /* data for impl. defined measure processes */
    } measure_data;
}

```

```

union Pval3_trigger_data {
    struct Pval3_trig_other {
        Pint        unused;
    } trig_other; /* When no trigger-specific data is required */
    . . .        /* data for impl. defined trigger processes */
} trigger_data;
union Pval3_ack_data {
    struct Pval3_ack_other {
        Pint        unused;
    } ack_other; /* When no ack.-specific data is required */
    . . .        /* data for impl. defined ack. processes */
} acknowledgement_data;

} Pval_data3;”

```

Page 38

## 5.4 Implementation independent type definitions

Change the subclause heading to “**Implementation independent Basic PHIGS profile type definitions**”.

Page 65

The following text replaces item PSTRUCT\_ST\_STOP in the definition of Pstruct\_st:

```

“PSTRUCT_ST_STOP,
 PSTRUCT_ST_DISO”

```

Page 73

## 6 C PHIGS macro definitions

Change the clause heading to “**C Basic PHIGS profile macro definitions**”.

Page 83

### 6.3 Linetypes

#### 6.3.1 Linetypes

The following entry is appended:

```

“
#define PLINE_DASH_DOT_DOT
(5)”

```

Page 76

## 6.4 Error codes

The following definition replaces error 5:

```
“
#define PE_NOT_STOP          (5)    /* Ignoring function, function requires
                                     state (PHOP,*,STOP | DISO,*) */”
```

Page 85

## 7 C PHIGS functions

Change the clause heading to “**C Basic PHIGS profile functions**”.

Page 17 (ISO/IEC 9593-4:1992/Amd. 1:1994)

## 8 C PHIGS PLUS type definitions

Change the subclause heading to “**C PHIGS PLUS profile type definitions**”.

### 8.1 Mapping of PHIGS PLUS data types

Change the clause heading to “**Mapping of PHIGS PLUS profile data types**”.

The following text replaces the text of the first paragraph:

“The *PHIGS PLUS profile* specifies a set of abstract data types beyond the types defined in the *Basic PHIGS profile*. Table 4 gives the mapping from those additional data types defined in the *PHIGS PLUS profile*.”

Change the table title to “**Table - 4 Mapping of PHIGS PLUS profile data types to C**”.

Change the left table heading to “**PHIGS PLUS profile data type**”.

Page 18 (ISO/IEC 9593-4:1992/Amd. 1:1994)

### 8.2 Modifications to PHIGS data types

Change the subclause heading to “**Modifications to Basic PHIGS profile data types**”.

Page 24 (ISO/IEC 9593-4:1992/Amd. 1:1994)

### 8.3 Implementation dependent PHIGS PLUS type definitions

Change the subclause heading to “**Implementation dependent PHIGS PLUS profile type definitions**”.

Page 34 (ISO/IEC 9593-4:1992/Amd. 1:1994)

#### **8.4 Implementation independent PHIGS PLUS type definitions**

*Change the subclause heading to “Implementation independent PHIGS PLUS profile type definitions”.*

*Page 56 (ISO/IEC 9593-4:1992/Amd. 1:1994)*

#### **9 C PHIGS PLUS macro definitions**

*Change the clause heading to “C PHIGS PLUS profile macro definitions”.*

*Page 63 (ISO/IEC 9593-4:1992/Amd. 1:1994)*

#### **10 C PHIGS PLUS functions**

*Change the clause heading to “C PHIGS PLUS profile functions”.*

STANDARDSISO.COM : Click to view the full PDF of ISO/IEC 9593-4:1991/AMD2:1998

Page 95 (ISO/IEC 9593-4:1992/Amd. 2:1994)

The following new clauses are inserted following clause 10.

“

## 11 C Full PHIGS profile type definitions

### 11.1 Mapping of Full PHIGS profile data types

The Full PHIGS profile specifies a set of abstract data types beyond the types defined in the PHIGS PLUS profile. Table 4 gives the mapping from those additional data types defined in the Full PHIGS profile.

**Table 4 - Mapping of Full PHIGS profile data types to C**

| PHIGS data type |                            | C binding data type |
|-----------------|----------------------------|---------------------|
| @t              | location of t              | *t                  |
| AP              | acknowledgement process    | Pack_process        |
| BIT             | bit                        | unsigned int:1      |
| CF              | configuration setting list | Pconfig_settings    |
| CFT             | condition flag test        | Pcond_test          |
| EP              | echo process               | Pecho_process       |
| M               | measure                    | Pmeasure            |
| MD              | marker descriptor          | Pmarker_desc        |
| MP              | measure process            | Pmeas_process       |
| MS              | measure set                | Pmeasure_set        |
| TA              | target address             | Ptarg_addr          |
| TO              | target operation           | Ptarg_op            |
| TP              | trigger process            | Ptrig_process       |
| TR              | traversal resource         | Ptrav_res           |

## 11.2 Modifications to *Basic PHIGS profile* type definitions

### Paspect ASPECT

---

```
typedef enum {
    /* start of PHIGS enumerations */
    ...,
    /* end of PHIGS enumerations */
    /* start of PHIGS PLUS enumerations */
    ...,
    /* end of PHIGS PLUS enumerations */
    /* start of PHIGS FULL enumerations */
    PASPECT_HIGHL_METHOD
    /* end of PHIGS FULL enumerations */
} Paspect;
```

---

### Pcolr\_rep COLOUR REPRESENTATION

```
typedef union {
    /* start of Basic PHIGS union members */
    Prgb      rgb;      /* RGB colour specification */
    Pcielv    cielv;    /* CIE L*u*v* colour specification */
    Phls      hls;      /* HLS colour specification */
    Phsv      hsv;      /* HSV colour specification */
    /* end of Basic PHIGS union members */
    /* start of Full PHIGS union members */
    Prgba     rgba;     /* RGB specification with alpha */
    Pcieluva  cieluva;  /* CIE L*u*v* colour specification with alpha */
    Phlsa     hlsa;     /* HLS colour specification with alpha */
    Phsva     hsva;     /* HSV colour specification with alpha */
    /* end of Full PHIGS union members */
    ...          /* implementation defined */
} Pcolr_rep;
```

---

### Pelem\_data ELEMENT DATA

```
typedef union {
    /* start of Basic PHIGS element data */
    ...
    /* end of Basic PHIGS element data */
}
```

```

/* start of PHIGS PLUS element data */
...
/* end of PHIGS PLUS element data */
/* start of Full PHIGS element data */
struct Pappl_int {
    Pint    integer_id;    /* application integer identifier */
    Pint    value;        /* value for application integer */
} appl_int;
struct Pappl_real {
    Pint    real_id;      /* application real identifier */
    Pfloat  value;        /* value for application real */
} appl_real;
struct Pcircle3 {
    Ppoint3  center_point; /* center point */
    Pfloat   radius;        /* radius */
    Pvec3    ref_vecs[2];   /* reference vectors */
} circle3;
struct Pcircle {
    Ppoint   center_point; /* center point */
    Pfloat   radius;        /* radius */
} circle;
struct Pcircular_arc3 {
    Ppoint3  center_point; /* center point */
    Pfloat   radius;        /* radius */
    Pvec3    ref_vecs[2];   /* reference vectors */
    Pfloat   start;         /* start angle */
    Pfloat   end;           /* end angle */
} circular_arc3;
struct Pcircular_arc {
    Ppoint   center_point; /* center point */
    Pfloat   radius;        /* radius */
    Pfloat   start;         /* start angle */
    Pfloat   end;           /* end angle */
} circular_arc;
struct Pellipse3 {
    Ppoint3  center_point; /* center point */
    Pvec3    major_ref_vec; /* major axis reference vector */
    Pvec3    minor_ref_vec; /* minor axis reference vector */
} ellipse3;
struct Pellipse {
    Ppoint   center_point; /* center point */
    Pvec     major_ref_vec; /* major axis reference vector */
    Pvec     minor_ref_vec; /* minor axis reference vector */
} ellipse;

```

```

struct Pelliptical_arc3 {
    Ppoint3      center_point;      /* center point          */
    Pvec3        major_ref_vec;      /* major axis reference vector */
    Pvec3        minor_ref_vec;      /* minor axis reference vector */
    Pfloat       start;              /* start angle            */
    Pfloat       end;                /* end angle              */
} elliptical_arc3;

struct Pelliptical_arc {
    Ppoint      center_point;      /* center point          */
    Pvec        major_ref_vec;      /* major axis reference vector */
    Pvec        minor_ref_vec;      /* minor axis reference vector */
    Pfloat      start;              /* start angle            */
    Pfloat      end;                /* end angle              */
} elliptical_arc;

struct Pfill_circle3 {
    Ppoint3      center_point;      /* center point          */
    Pfloat       radius;             /* radius                 */
    Pvec3        ref_vecs[2];        /* reference vectors      */
} fill_circle3;

struct Pfill_circle {
    Ppoint      center_point;      /* center point          */
    Pfloat      radius;             /* radius                 */
} fill_circle;

struct Pcircular_arc_close3 {
    Ppoint3      center_point;      /* center point          */
    Pfloat       radius;             /* radius                 */
    Pvec3        ref_vecs[2];        /* reference vectors      */
    Pfloat       start;              /* start angle            */
    Pfloat       end;                /* end angle              */
    Pclosure     type;              /* closure type           */
} circular_arc_close3;

struct Pcircular_arc_close {
    Ppoint      center_point;      /* center point          */
    Pfloat      radius;             /* radius                 */
    Pfloat      start;              /* start angle            */
    Pfloat      end;                /* end angle              */
    Pclosure     type;              /* closure type           */
} circular_arc_close;

struct Pfill_ellipse3 {
    Ppoint3      center_point;      /* center point          */
    Pvec3        major_ref_vec;      /* major axis reference vector */
    Pvec3        minor_ref_vec;      /* minor axis reference vector */
} fill_ellipse3;

struct Pfill_ellipse {
    Ppoint      center_point;      /* center point          */
    Pvec        major_ref_vec;      /* major axis reference vector */
    Pvec        minor_ref_vec;      /* minor axis reference vector */
} fill_ellipse;

```

```

struct Pelliptical_arc_close3 {
    Ppoint3      center_point;      /* center point */
    Pvec3        major_ref_vec;     /* major axis reference vector */
    Pvec3        minor_ref_vec;     /* minor axis reference vector */
    Pfloat       start;             /* start angle */
    Pfloat       end;               /* end angle */
    Pclosure     type;              /* closure type */
} elliptical_arc_close3;

struct Pelliptical_arc_close {
    Ppoint      center_point;      /* center point */
    Pvec        major_ref_vec;     /* major axis reference vector */
    Pvec        minor_ref_vec;     /* minor axis reference vector */
    Pfloat      start;             /* start angle */
    Pfloat      end;               /* end angle */
    Pclosure    type;              /* closure type */
} elliptical_arc_close;

Plinetype_adapt  linetype_adapt;  /* linetype adaptability */
Plinetype_cont   linetype_cont;   /* linetype continuity */
Phighl_method    highl_method;    /* highlighting method */
Pint_list        active_textures; /* active textures */
Pint_list        back_active_textures; /* back active textures */
Pperspect_corr   perspect_corr;   /* textr perspective correction */

struct Ptexture_res_opt_heur {
    Pint      opt_hint;      /* optimization hint */
    Pint_list usage_priorities; /* texture usage priorities */
} texture_res_opt_heur;

Pint_list      alpha_src_sel; /* alpha source selector */

struct Pcond_exec_struct {
    Pint      struct_id;      /* structure identifier */
    Ptest     test;           /* condition test */
} cond_exec_struct;

struct Pcond_inst_struct {
    Pint      struct_id;      /* structure identifier */
    Ptest     test;           /* condition test */
} cond_inst_struct;

Ptest      cond_return; /* condition test */

struct Pcond_skip_elems {
    Pint      skip_count; /* number of elements to skip */
    Ptest     test;       /* condition test */
} cond_skip_elems;

```

```

struct Pcond_skip_to_label {
    Pint      label;          /* label to which to skip      */
    Ptest     test;          /* condition test              */
} cond_skip_to_label;
/* end of Full PHIGS element data */

} Pelem_data;

```

---

## Pelem\_type ELEMENT TYPE

```

typedef enum {
    /* start of PHIGS enumerations */
    ...,
    /* end of PHIGS enumerations */
    /* start of PHIGS PLUS enumerations */
    ...,
    /* end of PHIGS PLUS enumerations */
    /* start of Full PHIGS enumerations */
    PELEM_APPL_INT,
    PELEM_APPL_REAL,
    PELEM_CIRCLE3,
    PELEM_CIRCLE,
    PELEM_CIRCULAR_ARC3,
    PELEM_CIRCULAR_ARC,
    PELEM_ELLIPSE3,
    PELEM_ELLIPSE,
    PELEM_ELLIPTICAL_ARC3,
    PELEM_ELLIPTICAL_ARC,
    PELEM_FILL_CIRCLE3,
    PELEM_FILL_CIRCLE,
    PELEM_CIRCULAR_ARC_CLOSE3,
    PELEM_CIRCULAR_ARC_CLOSE,
    PELEM_FILL_ELLIPSE3,
    PELEM_FILL_ELLIPSE,
    PELEM_ELLIPTICAL_ARC_CLOSE3,
    PELEM_ELLIPTICAL_ARC_CLOSE,
    PELEM_HIGHL_IND,
    PELEM_LINETYPE_ADAPT,
    PELEM_LINETYPE_CONT,
    PELEM_LINETYPE_OFFSET,

```

```

PELEM_HIGHL_METHOD,
PELEM_ACTIVE_TEXTURES,
PELEM_BACK_ACTIVE_TEXTURES,
PELEM_TEXTURE_PERSPECT_CORR,
PELEM_TEXTURE_SAMPLING_FREQ,
PELEM_TEXTURE_RES_OPT_HEUR,
PELEM_TRANSPARENCY,
PELEM_BACK_TRANSPARENCY,
PELEM_ALPHA_SRC_SEL,
PELEM_ALPHA_DATA_SEL_IND,
PELEM_INST_STRUCT,
PELEM_COND_EXEC_STRUCT,
PELEM_COND_INST_STRUCT,
PELEM_COND_RETURN,
PELEM_COND_SKIP_ELEMS,
PELEM_COND_SKIP_TO_LABEL,
PELEM_PUSH_ST,
PELEM_POP_ST
/* end of Full PHIGS enumerations */

} Pelem_type;

```

---

#### Pin\_class **INPUT CLASS**

```

typedef enum {
    /* start of Basic PHIGS enumerations */
    PIN_NONE,
    PIN_LOC,
    PIN_STROKE,
    PIN_VAL,
    PIN_CHOICE,
    PIN_PICK,
    PIN_STRING,
    /* end of Basic PHIGS enumerations */
    /* start of Full PHIGS enumerations */
    PIN_SET,
    PIN_COMPOSITE
    /* end of Full PHIGS enumerations */
} Pin_class;

```

---

**Pint\_style INTERIOR STYLE**

```
typedef enum {  
    /* start of Basic PHIGS enumerations */  
    ...  
    /* end of Basic PHIGS enumerations */  
    /* start of Full PHIGS enumerations */  
    PSTYLE_TEXTURE  
    /* end of Full PHIGS PLUS enumerations */  
}  
Pint_style;
```

---

**Popen\_struct\_status OPEN STRUCTURE STATUS**

```
typedef enum {  
    /* start of Basic PHIGS enumerations */  
    PSTRUCT_NONE,  
    PSTRUCT_OPEN,  
    /* end of Basic PHIGS enumerations */  
    /* start of Full PHIGS enumerations */  
    PSTRUCT_DI_OPEN  
    /* end of Full PHIGS enumerations */  
}  
Popen_struct_status;
```

### 11.3 Modifications to *PHIGS PLUS* profile type definitions

---

#### Pcolr\_rep\_ptr COLOUR REPRESENTATION POINTER

```
typedef union {
    /* start of PHIGS PLUS union members */
    Prgb      *rgb;           /* pointer to RGB colour values */
    Pcielvuv  *cielvuv;      /* pointer to CIELUV pointer values */
    Phls      *hls;          /* pointer to HLS pointer values */
    Phsv      *hsv;          /* pointer to HSV pointer values */
    /* end of PHIGS PLUS union members */
    /* start of Full PHIGS union members */
    Prgba     *rgba;         /* pointer to RGBA colour values */
    Pcieluva  *cieluva;      /* pointer to CIELUVA pointer values */
    Phlsa     *hlsa;         /* pointer to HLSA pointer values */
    Phsva     *hsva;         /* pointer to HSVa pointer values */
    /* end of Full PHIGS union members */
    ...                /* implementation defined */
} Pcolr_rep_ptr;
```

---

#### Ppat\_rep\_plus PATTERN REPRESENTATION PLUS

```
typedef Pgcolr_array Ppat_rep_plus;
```

### 11.4 Implementation dependent *Full PHIGS* profile type definitions

---

#### Pbackg\_method POSTING GROUP BACKGROUND METHOD

```
typedef struct {
    Pint      method;        /* background method */
    union Pbackg_method_data {
        struct Pcolr_table_0 {
            Pint      unused; /* unused */
        } colr_table_0;
        struct Pcolr_ind {
            Pint      colr_ind; /* colour index */
        } colr_ind;
        struct Pcolr {
            Pcolr_rep colr_rep; /* target address */
        } colr;
    };
};
```

```

    struct Pimage_resource {
        Pint      image_resource_id; /* image resource identifier */
    } image_resource;
    ...                               /* implementation defined */
} data;
} Pbackg_method;

```

---

#### Pclamp\_method **BOUNDARY CLAMP METHOD DATA RECORD**

```

typedef struct {
    Pint      method;                /* clamp method */
    union Pclamp_method_data {
        Pint      unused;            /* used by method 1 */
        Pcolour   clamp_colour;      /* used by method 2 */
        ...       /* implementation defined */
    } data;
} Pclamp_method;

```

---

#### Pcoord\_src **COORDINATE SOURCE DATA RECORD**

```

typedef struct {
    Pint      coord_src;             /* coordinate source */
    union Pcoord_src_data {          /* coordinate source data record */
        Pint      unused;            /* used by coord sources 1 - 5 */
        Pint      coord_ind;         /* used by coord source 6 */
        Pmatrix3   refl_matrix;      /* used by coord sources 7 and 8 */
        ...       /* implementation defined */
    } data;
} Pcoord_src;

```

---

#### Pdi\_pick\_data **DIRECT INTERPRETATION PICK DATA RECORD**

```

typedef struct {
    union Pdi_pick_pets {
        struct Pdi_pick_pet_other {
            Pint      unused;
        } pet_other; /* When no echo-specific data is required */
    }
}

```

```

    struct Pdi_pick_pet_r1 {
        . . . /* impl. dependent */
    } pet_r1; /* For PET 1 */
    . . . /* implementation defined PET's */
} pets;

union Pdi_pick_measure_data {
    struct Pdi_pick_meas_other {
        Pint unused;
    } meas_other; /* When no measure-specific data is required */
    . . . /* data for impl. defined measure processes */
} measure_data;

union Pdi_pick_trigger_data {
    struct Pdi_pick_trig_other {
        Pint unused;
    } trig_other; /* When no trigger-specific data is required */
    . . . /* data for impl. defined di_pick processes */
} trigger_data;

union Pdi_pick_ack_data {
    struct Pdi_pick_ack_other {
        Pint unused;
    } ack_other; /* When no ack.-specific data is required */
    . . . /* data for impl. defined ack. processes */
} acknowledgement_data;
} Pdi_pick_data;

```

---

### Pdi\_pick\_data3 DIRECT INTERPRETATION PICK DATA RECORD 3

```

typedef struct {
    union Pdi_pick3_pets {
        struct Pdi_pick3_pet_other {
            Pint unused;
        } pet_other; /* When no echo-specific data is required */
        struct Pdi_pick3_pet_r1 {
            . . . /* impl. dependent */
        } pet_r1; /* For PET 1 */
        . . . /* data for impl. defined pets */
    } pets;

    union Pdi_pick3_measure_data {
        struct Pdi_pick3_meas_other {
            Pint unused;
        } meas_other; /* When no measure-specific data is required */
    }

```

```

    . . .      /* data for impl. defined measure processes */
} measure_data;
union Pdi_pick3_trigger_data {
    struct Pdi_pick3_trig_other {
        Pint      unused;
    } trig_other; /* When no trigger-specific data is required */
    . . .      /* data for impl. defined di_pick processes */
} trigger_data;
union Pdi_pick3_ack_data {
    struct Pdi_pick3_ack_other {
        Pint      unused;
    } ack_other; /* When no ack.-specific data is required */
    . . .      /* data for impl. defined ack. processes */
} acknowledgement_data;
} Pdi_pick_data3;

```

---

#### Phighl\_method **HIGHLIGHTING METHOD**

```

typedef struct {
    Pint      method;
    union _Phighl_data {
        Pint      unused;
        Pfloat     blink_rate;
        Pint      colr_ind;
        Pgcolr     colr;
        struct _Phighl_blink_colr {
            Pfloat     blink_rate;
            Pgcolr     blink_colr;
        } highl_blink_colr;
        ...      /* implementation defined methods */
    } highl_data;
} Phighl_method;

```

---

**Pimage\_res IMAGE RESOURCE**

```

typedef struct {
    Pint image_spec_method;
    union _Pimage_data {
        struct Puncomp_colr_ind_array {
            Pint *colr_ind_array; /* uncompressed array of colour indices */
        } uncomp_colr_ind_array;
        struct Puncomp_colr_array {
            Pgcolr_array *colr_array; /* uncompressed array of colours */
        } uncomp_colr_array;
        struct Pwindow_sys_bitmap {
            Pint handle; /* bitmap handle */
        } window_sys_bitmap;
        struct Pvideo_sig_chan_id {
            Pint chan_id; /* video signal channel id */
        } video_sig_chan_id;
        struct Pluminance {
            Pfloat_array *lum_values; /* uncompressed array of luminance values */
        } luminance;
        struct Pluminance_alpha {
            Plum_alpha_array *lum_values; /* uncompressed array of luminance values */
        } luminance_alpha;
        struct Pmipmap_colrs {
            Pgcolr_array_set colr_arrays; /* set of uncompressed colour arrays */
        } mipmap_colrs;
        struct Pmipmap_luminance {
            Pfloat_array_set lum_values; /* set of uncompressed luminance arrays */
        } mipmap_luminance;
        struct Pmipmap_luminance_alpha {
            Plum_alpha_array_set lum_values; /* set of uncompressed luminance/alpha arrays */
        } mipmap_luminance_alpha;
        ... /* implementation defined methods */
    } image_data;
} Pimage_res;

```

---

**Pin\_class\_data INPUT CLASS DATA RECORD**

```

typedef union _Pin_class_data {
    Pint          unused;
    Ploc_data     loc;
    Ploc_data3    loc3;
    Pstroke_data  stroke;
    Pstroke_data3 stroke3;
    Pval_data     val;
    Pval_data3    val3;
    Pchoice_data  choice;
    Pchoice_data3 choice3;
    Ppick_data    pick;
    Ppick_data3   pick3;
    Pstring_data  string;
    Pstring_data3 string3;
    Pset_data     set;
    Pcomposite_data composite;
    ...           /* other classes of input data */
} Pin_class_data;

```

---

**Pin\_class\_measure INPUT CLASS MEASURE**

```

typedef union _Pin_class_measure {
    struct {
        Pint          view_ind;
        Ppoint        loc_pos;
    } loc;
    struct {
        Pint          view_ind;
        Ppoint3       loc_pos;
    } loc3;
    struct {
        Pint          view_ind;
        Ppoint list    points;
    } stroke;
}

```

```

    struct {
        Pint          view_ind;
        Ppoint_list3 points;
    } stroke3;
    Pfloat          val;
    struct {
        Pin_status    istat;
        Pint          selection;
    } choice;
    struct {
        Pin_status    istat;
        Ppick_path    *path;
    } pick;
    char            *string;
    Pset_measure     *set;
    Pcomposite_measure *composite;
    ...             /* other classes which may be added */
} Pin_class_measure;

```

---

#### Pmarker\_data **MARKER DATA**

```

typedef struct {
    Pint          shape_type;    /* shape type */
    union _Pshape_data {
        Ppoint_list polyline;    /* for PSHAPE_POLYLINE */
        Ppoint_list fill_area;    /* for PSHAPE_FILL_AREA */
        Ppoint_list convex_fill_area; /* for PSHAPE_CONVEX_FILL_AREA */
        ...                /* implementation defined */
    } shape_data;    /* marker shape data */
} Pmarker_data;

```

---

**Ppattern PATTERN**

```

typedef struct {
    Pint          type;          /* pattern type */
    union _Ppattern_data {
        struct Ppat_colr_ind_array {
            Ppat_rep pat_rep;    /* pattern representation */
        } pat_colr_ind_array;
        struct Ppat_colr_array {
            Ppat_rep_plus pat_rep_plus; /* pattern representation plus */
        } pat_colr_array;
        struct Ppat_image_res {
            Pint image_res_id;    /* pattern image resource */
        } pat_image_res;
        ... /* implementation defined */
    } data; /* pattern data */
} Ppattern;

```

---

**Ptarg\_op TARGET OPERATION**

```

typedef struct {
    Pint          type;          /* target operation type */
    union _Ptarget_op_data {
        struct Prend_targ {
            Ptarg_addr targ_addr; /* target address */
        } rend_targ;
        struct Pdisp_targ {
            Ptarg_addr targ_addr; /* target address */
        } disp_targ;
        struct Pclear_targ {
            Ptarg_addr targ_addr; /* target address */
        } clear_targ;
        struct Pcopy_targ {
            Ptarg_addr src_targ_addr; /* source target address */
            Ptarg_addr dest_targ_addr; /* destination target address */
        } copy_targ;
        ... /* implementation defined */
    } data; /* target operation data */
} Ptarg_op;

```

## Ptest TEST

```

typedef struct {
    Pint          method;          /* test method          */
    union _Ptest_data {
        struct Ptest_always_fail {
            Pint          unused;
        } test_always_fail;
        struct Ptest_always_succeed {
            Pint          unused;
        } test_always_succeed;
        struct Ptest_extent_3 {
            Plimit3       rect;          /* extent rectangle    */
            Ptest_comp    relation;      /* test relation        */
            Pfloat        threshold;     /* threshold value     */
        } test_extent_3;
        struct Ptest_extent {
            Plimit        rect;          /* extent rectangle    */
            Ptest_comp    relation;      /* test relation        */
            Pfloat        threshold;     /* threshold value     */
        } test_extent;
        struct Ptest_bounds_3 {
            Ppoint_list_list3 point_lists; /* test object        */
            Pclip_cond     cond;          /* test condition      */
        } test_bounds_3;
        struct Ptest_bounds {
            Ppoint_list_list point_lists; /* test object        */
            Pclip_cond     cond;          /* test condition      */
        } test_bounds;
        struct Ptest_nameset {
            Pint          filter_type;    /* type of filter      */
            Pint          filter_id;      /* filter identifier    */
            Pfilter_op    cond;          /* test condition      */
        } test_nameset;
        struct Ptest_appl_int {
            Pint          appl_id;        /* appl. integer selector */
            Ptest_comp_rel comparison;    /* test comparison      */
            Pint          data;          /* appl integer data value */
        } test_appl_int;
        struct Ptest_appl_real {
            Pint          appl_id;        /* appl. real selector  */
            Ptest_comp_rel comparison;    /* test comparison      */
            Pfloat        data;          /* appl real data value  */
        } test_appl_real;
    };
}

```

```

    struct Ptest_cond_flags {
        Pcond_flags_eval_op op;      /* condition flags eval. op. */
    } test_cond_flags;
    struct Ptest_appl_int_as_logical {
        Pint          appl_id;      /* appl. integer selector */
        Ptest_comp_logical comparison; /* test comparison */
        Pint          data;         /* appl integer data value */
    } test_appl_int;
    ...                            /* implementation defined */
} test_data;                      /* test data record*/

} Ptest;

```

---

#### Ptexture\_compos **TEXTURE COMPOSITION DATA RECORD**

```

typedef struct {
    Pint          method;          /* composition method */
    union {
        Pint          unused;      /* used by methods 1, 2, and 4 */
        struct {
            Pgcolr     environ;    /* used by method 3 */
            Pint        gamma_chan_sel; /* gamma channel selector */
        } blend_env;
        Pgcolr        background_colr; /* used by method 5 */
        ...           /* implementation defined */
    } data;
} Ptexture_compos;

```

---

#### Ptrav\_res\_op **TRAVERSAL RESOURCE OPERATION**

```

typedef struct {
    Pint          type;            /* trav. res. operation type */
    union Ptrav_res_op_data {
        struct Ptrav_res_clear {
            Pint          res_id;    /* traversal resource id. */
        } trav_res_clear;
        struct Ptrav_res_copy {
            Pint          src_res_id; /* source traversal res. id. */
            Pint          dest_res_id; /* destination trav. res. id. */
        } trav_res_copy;
    }
}

```

```

        ...                               /* implementation defined */
    } data;                               /* trav. res. operation data */
} Ptrav_res_op;

```

## 11.5 Implementation independent type definitions

---

### Paccess\_flag ACCESS FLAG

```

typedef enum {
    PACCESS_REFERENCED = 0,
    PACCESS_COPIED = 1
} Paccess_flag;

```

---

### Pack\_process ACKNOWLEDGEMENT PROCESS

```

typedef struct {
    Pack_type      type;
    Pint           process_id;
} Pack_process;

```

---

### Pack\_process\_list ACKNOWLEDGEMENT PROCESS LIST

```

typedef struct {
    Pint           count;
    Pack_process   *procs;
} Pack_process_list;

```

---

### Pack\_type ACKNOWLEDGEMENT TYPE

```

typedef enum {
    P_ACK_ACCEPTANCE = 0,
    P_ACK_NONACCEPTANCE = 1
} Packnowledgement_type;

```

---

**Palpha\_facs ALPHA FACILITIES**

```
typedef struct {
    Pint_list  alpha_srcs;      /* list available alpha sources      */
    Pint_list  transp_modes;    /* list transparency modes supported */
} Palpha_facs;
```

---

**Passoc\_flag ASSOCIATION FLAG**

```
typedef enum {
    PNOTASSOCIATED = 0,
    PASSOCIATED = 1
} Passoc_flag;
```

---

**Patomic\_lid\_facs ATOMIC LOGICAL INPUT DEVICE FACILITIES**

```
typedef struct {
    Pint      max_simul_trig,    /* max simul. trigger procs          */
    Pint      max_simul_echo,    /* max simul. echo procs              */
    Pint      max_simul_ack,     /* max simul. acknowledgement procs  */
    Pint_list meas_proc_ids,     /* available measure process ids      */
    Pint_list trig_proc_ids,     /* available trigger process ids      */
    Pint_list echo_proc_ids,     /* available echo process ids         */
    Pint_list ack_proc_ids      /* available acknowledgement process ids */
} Patomic_lid_facs;
```

---

**Pbackg\_redisplay BACKGROUND REDISPLAY FLAG**

```
typedef enum {
    PBACKG_REDISPLAY_OFF = 0,
    PBACKG_REDISPLAY_ON = 1
} Pbackg_redisplay;
```

---

**Pbackg\_style BACKGROUND STYLE**

```
typedef enum {  
    PBACKG_STYLE_TRANSPARENT = 0,  
    PBACKG_STYLE_OPAQUE = 1  
} Pbackg_style;
```

---

**Pboolean BOOLEAN**

```
typedef enum {  
    PFALSE = 0,  
    PTRUE = 1  
} Pboolean;
```

---

**Pborder\_indic BORDER INDICATOR**

```
typedef enum {  
    PBORDER_OFF = 0,  
    PBORDER_ON = 1  
} Pborder_indic;
```

---

**Pcieluva CIE L\*U\*V\* WITH ALPHA**

```
typedef struct {  
    Pfloat cieluv_x; /* x coefficient */  
    Pfloat cieluv_y; /* y coefficient */  
    Pfloat cieluv_y_lum; /* y luminance */  
    Pfloat alpha; /* alpha */  
} Pcieluva;
```

---

**Pclip\_cond CLIP CONDITION**

```
typedef enum {  
    PCLIPCOND_IS_NOT_CLIPPED = 0,  
    PCLIPCOND_IS_PARTIALLY_CLIPPED = 1,  
    PCLIPCOND_IS_FULLY_CLIPPED = 2  
} Pclip_cond;
```

---

**Pclosure CLOSURE TYPE**

```
typedef enum {  
    PCLOSURE_PIE = 0,  
    PCLOSURE_SEGMENT = 1  
} Pclosure;
```

---

**Pcomposite\_data COMPOSITE DATA**

```
typedef struct {  
    Pint count;  
    Pcomposite_individual *individual;  
} Pcomposite_data;
```

---

Pcomposite\_fac **COMPOSITE FACILITIES**

```

typedef struct {
    Pint      max_simul_meas,      /* max simul. measure procs      */
    Pint      max_simul_trig,      /* max simul. trigger procs      */
    Pint      max_simul_echo,      /* max simul. echo procs        */
    Pint      max_simul_ack,      /* max simul. acknowledgement procs */
    Pint_list loc_meas_proc_ids,   /* avail. locator measure proc. ids */
    Pint_list stroke_meas_proc_ids, /* avail. stroke measure proc. ids */
    Pint_list val_meas_proc_ids,   /* avail. valuator measure proc. ids */
    Pint_list choice_meas_proc_ids, /* avail. choice measure proc. ids */
    Pint_list pick_meas_proc_ids,  /* avail. pick measure proc. ids */
    Pint_list string_meas_proc_ids, /* avail. string measure proc. ids */
    Pint_list set_meas_proc_ids,   /* avail. set measure proc. ids */
    Pint_list composite_meas_proc_ids, /* avail. composite meas. proc. ids */
    Pint_list trig_proc_ids,      /* available trigger process ids */
    Pint_list loc_echo_proc_ids,  /* available locator echo proc. ids */
    Pint_list stroke_echo_proc_ids, /* available stroke echo proc. ids */
    Pint_list val_echo_proc_ids,   /* available valuator echo proc. ids */
    Pint_list choice_echo_proc_ids, /* available choice echo proc. ids */
    Pint_list pick_echo_proc_ids,  /* available pick echo proc. ids */
    Pint_list string_echo_proc_ids, /* available string echo proc. ids */
    Pint_list set_echo_proc_ids,   /* available set echo proc. ids */
    Pint_list comp_echo_proc_ids,  /* available composite echo proc. ids */
    Pint_list ack_proc_ids        /* available ack. proc. ids */
} Pcomposite_fac;

```

---

**Pcomposite\_individual COMPOSITE INDIVIDUAL**

```
typedef struct _Pcomposite_individual {
    Pint_class      class;
    _Pint_class_data *data;
} Pcomposite_individual;
```

---

**Pcomposite\_measure COMPOSITE MEASURE**

```
typedef struct _Pcomposite_measure {
    Pint      count;                /* number of measure components*/
    _Pmeasure *measures;           /* list of measure components */
} Pcomposite_measure;
```

---

**Pcond\_trav\_facs CONDITIONAL TRAVERSAL FACILITIES**

```
typedef struct {
    Pint      num_invis_filters; /*number of avail. invisibility filters
                                */
    Pint      num_highl_filters; /*number of avail. highlighting filters
                                */
    Pint      num_pick_filters; /*number of avail. pick filters      */
    Pint      num_appl_filters; /*number of avail. application filters
                                */
    Pint      num_appl_integers; /*number of application integer
                                /* values supported
    Pint      num_appl_reals; /* number of application real values
                                /* supported
    Pint_list test_methods; /* list of test methods available
} Pcond_trav_facs;
```

---

**Pcond\_flags\_eval\_op CONDITION FLAGS EVALUATION OPERATOR**

```
typedef enum {  
    PCOND_ALL_ENABLED,  
    PCOND_ALL_DISABLED,  
    PCOND_NOT_ALL_DISABLED,  
    PCOND_NOT_ALL_ENABLED,  
    PCOND_ALWAYS_PASS,  
    PCOND_NEVER_PASS  
} Pcond_flags_eval_op;
```

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---

**Pcond\_flag\_mask CONDITION FLAG MASK**

```
typedef union {  
    unsigned int mask;  
    struct _Pcond_flag_set {  
        unsigned int flag0:1;  
        unsigned int flag1:1;  
        unsigned int flag2:1;  
        unsigned int flag3:1;  
        unsigned int flag4:1;  
        unsigned int flag5:1;  
        unsigned int flag6:1;  
        unsigned int flag7:1;  
        unsigned int flag8:1;  
        unsigned int flag9:1;  
        unsigned int flag10:1;  
        unsigned int flag11:1;  
        unsigned int flag12:1;  
        unsigned int flag13:1;  
        unsigned int flag14:1;  
        unsigned int flag15:1;  
        unsigned int flag16:1;  
        unsigned int flag17:1;  
        unsigned int flag18:1;  
        unsigned int flag19:1;  
        unsigned int flag20:1;  
        unsigned int flag21:1;  
        unsigned int flag22:1;  
        unsigned int flag23:1;  
        unsigned int flag24:1;  
        unsigned int flag25:1;  
        unsigned int flag26:1;  
        unsigned int flag27:1;  
        unsigned int flag28:1;  
        unsigned int flag29:1;  
        unsigned int flag30:1;  
        unsigned int flag31:1;  
    } flags;  
} Pcond_flag_mask;
```

---

**Pcond\_flags CONDITION FLAGS**

```

typedef struct {
    Pcond_flag_mask    enable_mask;    /* condition flag enable mask */
    Pcond_flag_mask    disable_mask;   /* condition flag disable mask */
} Pcond_flags;

```

---

**Pcond\_flag\_test CONDITION FLAG TEST**

```

typedef struct {
    Ptest              test;            /* test operation */
    Pcond_flags        mask;            /* condition test mask */
} Pcond_flag_test;

```

---

**Pcond\_test\_list CONDITION TEST LIST**

```

typedef struct {
    Pint              num_tests;        /* number of condition test */
    Pcond_flag_test  *tests;           /* list of condition flag tests */
} Pcond_test_list;

```

---

**Pconfig\_name CONFIGURATION NAME**

```

typedef struct {
    Pint              name_size;        /* size of name */
    char              *name;           /* configuration setting name */
} Pconfig_name;

```

---

**Pconfig\_name\_list CONFIGURATION NAME LIST**

```

typedef struct {
    Pint              list_size;        /* number of names */
    Pconfig_name      *name;           /* configuration name list */
} Pconfig_name_list;

```

---

**Pconfig\_setting\_fac** CONFIGURATION SETTING FACILITIES

```
typedef struct {
    Pint          num_supported; /* number of simultaneously supported
                                */
                                /* device coordinate clip regions */
} Pconfig_setting_fac;
```

---

**Pconfig\_settings** CONFIGURATION SETTINGS

```
typedef struct {
    char          *name;          /* configuration setting name */
    Pconfig_value *value;         /* configuration setting value */
} Pconfig_settings;
```

---

**Pconfig\_value** CONFIGURATION VALUE

```
typedef union {
    Pint      int_value;          /* integer configuration value */
    Pfloat    real_value;         /* real configuration value */
    char      *string_value;      /* string configuration value */
} Pconfig_value;
```

---

**Pdc\_clip\_fac** DEVICE COORDINATE CLIP REGION FACILITIES

```
typedef struct {
    Pint          num_supported; /* number of simultaneously sup-
                                ported*/
                                /* device coordinate clip regions */
} Pdc_clip_fac;
```

---

**Pdepth\_cue\_mask DEPTH CUE MASK**

```
typedef struct {
    unsigned int mode:1;
    unsigned int ref_planes:1;
    unsigned int scale:1;
    unsigned int gcolr:1;
    unsigned int :28;
} Pdepth_cue_mask;
```

---

**Pdi\_mode DIRECT INTERPRETATION MODE**

```
typedef enum {
    PDIM_INTERPRET_NONE = 0,
    PDIM_INTERPRET_STATE = 1,
    PDIM_INTERPRET_ALL = 2
} Pdi_mode;
```

---

**Pdi\_trav\_fac DIRECT INTERPRETATION TRAVERSAL FACILITIES**

```
typedef struct {
    Pint    num_trav_procs;        /* number of simultaneously posted
                                   */
                                   /* traversal processes */
    Pint    num_rend_algorithms;   /* number of multi-pass algorithms
                                   */
                                   /* supported for rendering */
    Pint    num_pick_algorithms;   /* number of multi-pass algortihms
                                   */
                                   /* supported for picking */
} Pdi_trav_fac;
```

---

**Pdyns\_post\_grps DYNAMICS OF POSTING GROUPS**

```
typedef struct {
    Pdyn_mod    posting_status; /* posting status modification */
} Pdyns_post_grps;
```

---

**Pdyns\_ws\_attrs\_texture DYNAMICS OF WORKSTATION ATTRIBUTES TEXTURE**

```
typedef struct {
    Pdyn_mod    texture_rep;          /* texture representation      */
} Pdyns_ws_attrs_texture;
```

---

**Pecho\_measure\_proc ECHO MEASURE PROCESS**

```
typedef struct {
    Pint        dev_class; /* input class */
    Pint        instance; /* i = ith of class in LID def. */
} Pecho_measure_proc;
```

---

**Pecho\_process ECHO PROCESS**

```
typedef struct {
    Pint        pet;
    Pecho_measure_proc *measures_echoed;
    Pint        process_id;
} Pecho_process;
```

---

**Pecho\_process\_list ECHO PROCESS LIST**

```
typedef struct {
    Pint        count;
    Pecho_process *procs;
} Pecho_process_list;
```

---

**Pedge\_bundle\_full EDGE BUNDLE FULL**

```

typedef struct {
    Pedge_flag      flag;           /* edge flag                */
    Pint            type;           /* edgetype                  */
    Pfloat          width;         /* edgewidth scale factor   */
    Pcolr           colr;          /* edge colour               */
    Plinetype_adapt adapt;         /* edgetype adaptability    */
    Plinetype_cont  cont;         /* edgetype continuity      */
    Pfloat          offset;        /* edgetype offset          */
    Plinecap        cap;           /* edgecap                   */
    Plinejoin       join;          /* edgejoin                  */
    Pfloat          limit;         /* edgemitre limit          */
} Pedge_bundle_full;

```

---

**Pedge\_mask EDGE MASK**

```

typedef struct {
    unsigned int flag:1;
    unsigned int type:1;
    unsigned int width:1;
    unsigned int colr:1;
    unsigned int adapt:1;
    unsigned int cont:1;
    unsigned int offset:1;
    unsigned int cap:1;
    unsigned int join:1;
    unsigned int limit:1;
    unsigned int :22;
} Pedge_mask;

```

---

**Pedgetype\_adapt EDGETYPE ADAPTABILITY**

```

typedef enum {
    PEDTA_EXACT = 0,
    PEDTA_ADAPT = 1
} Pedgetype_adapt;

```

---

**Pedgecap EDGECAP**

```
typedef enum {  
    PEDC_BUTT = 0,  
    PEDC_ROUND = 1,  
    PEDC_SQUARE = 2  
} Pedgecap;
```

---

**Pedgetype\_cont EDGETYPE CONTINUITY**

```
typedef enum {  
    PEDTC_CONTINUOUS = 0,  
    PEDTC_RESTART = 1  
} Pedgetype_cont;
```

---

**Pedgejoin EDGEJOIN**

```
typedef enum {  
    PEDJ_FLAT = 0,  
    PEDJ_MITRE = 1,  
    PEDJ_ROUND = 2,  
    PEDJ_BEVEL = 3  
} Pedgejoin;
```

---

**Pext\_pat\_fac EXTENDED PATTERN FACILITIES**

```
typedef struct {  
    Pint_list pattern_types; /* list of supported pattern types */  
    Pint_list image_spec_methods; /* list of supported image specification  
                                */  
                                /* methods */  
} Pext_pat_fac;
```

---

**Pfilter\_op FILTER RELATIONS**

```
typedef enum {
    PFILTER_FAILS = 0,
    PFILTER_PASSES = 1
} Pfilter_op;
```

---

**Pfloat\_array FLOAT ARRAY**

```
typedef struct {
    Pint_size      dims;           /* float array dimensions */
    Pfloat         *floats;       /* float array */
} Pfloat_array;
```

---

**Pfloat\_array\_set FLOAT ARRAY SET**

```
typedef struct {
    Pint          num_arrays;      /* number of float arrays in set */
    Pfloat_array  *floats;       /* float arrays */
} Pfloat_array_set;
```

---

**Pgcolr\_array GENERAL COLOUR ARRAY**

```
typedef struct {
    Pint          colr_type;      /* colour type */
    Pcolrv_array  colrs;         /* colour array */
} Pgcolr_array;
```

---

**Pgcolr\_array\_set GENERAL COLOUR ARRAY SET**

```
typedef struct {
    Pint          colr_type;      /* colour type */
    Pint          num_arrays;     /* number of arrays in set */
    Pcolrv_array  *colrs;        /* set of colour arrays */
} Pgcolr_array_set;
```

---

**Phighl\_facs HIGHLIGHTING FACILITIES**

```

typedef struct {
    Pint      num_pred;      /* number of predefined methods */
    Pint_list methods;       /* number of highl. methods supp. */
    Pint      max_highl_ind; /* max highl. table indices */
} Phighl_facs;

```

---

**Phlsa HUE LIGHTNESS SATURATION WITH ALPHA**

```

typedef struct {
    Pfloat hue;      /* hue */
    Pfloat lightness; /* lightness */
    Pfloat saturation; /* saturation */
    Pfloat alpha;     /* alpha */
} Phlsa;

```

---

**Phsva HUE SATURATION VALUE WITH ALPHA**

```

typedef struct {
    Pfloat hue;      /* hue */
    Pfloat saturation; /* saturation */
    Pfloat value;     /* value */
    Pfloat alpha;     /* alpha */
} Phsva;

```

---

**Pimage\_res\_facs IMAGE RESOURCE FACILITIES**

```

typedef struct {
    Pint_list image_spec_methods; /* list of supported image */
                                   /* specification methods */
    Pint      num_def_ids;        /* number of definable image resource */
                                   /* */
                                   /* identifiers */
    Pint      num_predef_ids;     /* number of predefined image resources */
                                   /* */
} Pimage_res_facs;

```

---

**\_Pin\_class\_data INPUT CLASS DATA RECORD**

```
union _Pin_class_data; /* used for defining Pset_data and
                        Pcomposite_data; */
```

---

**Pin\_class\_measure INPUT CLASS MEASURE**

```
union _Pin_class_measure; /* used for defining Pmeasure and
                           Pset_measure */
```

---

**Pinterior\_mask INTERIOR MASK**

```
typedef struct {
    unsigned int style:1;
    unsigned int style_ind:1;
    unsigned int colr:1;
    unsigned int shad_method:1;
    unsigned int :28;
} Pinterior_mask;
```

---

**Plight\_attach LIGHT SOURCE ATTACHMENT**

```
typedef struct {
    Pint    light_ws_id;           /* workstation id for view */
    Pint    light_src_ind;        /* view index */
    Pint    light_action_type;    /* view action type */
    Pint    transfer_type;        /* measure transfer type */
} Plight_attach;
```

---

**Plimit\_list LIMIT LIST**

```
typedef struct {
    Pint    num_limits;           /* number of limits */
    Plimit  *limits;             /* list of limits */
} Plimit_list;
```

---

**Plimit3\_list LIMIT 3 LIST**

```

typedef struct {
    Pint          num_limits;    /* number of limits          */
    Plimit3       *limits;      /* list of limits            */
} Plimit3_list;

```

---

**Pline\_bundle\_full POLYLINE BUNDLE FULL**

```

typedef struct {
    Pint          type;          /* linetype                  */
    Pfloat        width;        /* linewidth scale factor    */
    Pgolr         colr;         /* polyline colour           */
    Pint          shad_method;   /* polyline shading method   */
    Pcurve_approx_crit_data curve_approx_crit_data;
                                /* curve approx. criteria    */
    Plinetype_adapt adapt;      /* linetype adaptability     */
    Plinetype_cont cont;       /* linetype continuity       */
    Pfloat        offset;       /* linetype offset           */
    Plinecap      cap;          /* linecap                   */
    Plinejoin     join;         /* linejoin                  */
    Pfloat        limit;        /* linemitre limit           */
} Pline_bundle_full;

```

---

**Plinecap LINECAP**

```

typedef enum {
    PLNC_BUTT = 0,
    PLNC_ROUND = 1,
    PLNC_SQUARE = 2
} Plinecap;

```

---

**Plinejoin LINEJOIN**

```
typedef enum {
    PLNJ_FLAT = 0,
    PLNJ_MITRE = 1,
    PLNJ_ROUND = 2,
    PLNJ_BEVEL = 3
} Plinejoin;
```

---

**Plinetype\_adapt LINETYPE ADAPTABILITY**

```
typedef enum {
    PLNTA_EXACT = 0,
    PLNTA_ADAPT = 1
} Plinetype_adapt;
```

---

**Plinetype\_cont LINETYPE CONTINUITY**

```
typedef enum {
    PLNTC_CONTINUOUS = 0,
    PLNTC_RESTART = 1
} Plinetype_cont;
```

---

**Plinetype\_def\_facs LINETYPE DEFINITION FACILITIES**

```
typedef struct {
    Pint    num_definable;      /* number definable linetypes */
    Pint    num_predefined;    /* number predefined linetypes */
    Pint    max_dash_segments; /* maximum dash segments supported */
    Pfloat   offset;           /* offset to definable linetypes */
    Pint_list predef_def_linetypes /* list of predef. definable linetypes */
    */
} Plinetype_def_facs;
```

---

**Plum\_alpha\_array LUMINANCE ALPHA ARRAY**

```
typedef struct {  
    Pint_size      dims;          /* array dimensions          */  
    Plum_alpha_pair *values;      /* 2D array of luminance/alpha pairs */  
} Plum_alpha_array;
```

---

**Plum\_alpha\_array\_set LUMINANCE ALPHA ARRAY SET**

```
typedef struct {  
    Pint      num_arrays; /* number of arrays in set */  
    Plum_alpha_array *sets; /* set of 2D luminance/alpha arrays */  
} Plum_alpha_array_set;
```

---

**Plum\_alpha\_pair LUMINANCE ALPHA PAIR**

```
typedef struct {  
    Pfloat      lum_value; /* luminance_value */  
    Pfloat      alpha_value; /* alpha value */  
} Plum_alpha_pair;
```

---

**Pmarker\_desc MARKER DESCRIPTOR**

```
typedef struct {  
    Pint      number_shapes; /* number of shapes */  
    Pmarker_data *marker; /* array of shape descriptors */  
} Pmarker_desc;
```

---

**Pmarker\_type\_def\_fac** **MARKER TYPE DEFINITION FACILITIES**

```
typedef struct {
    Pint      num_definable;      /* number definable marker types */
    Pint      num_predefined;     /* number predefined marker types */
    Pfloat     offset;            /* offset to definable linetypes */
    Pint      max_allowable_pts;  /* maximum allowable points */
    Pint_list  shape_types;       /* list of available shape types */
    Pint_list  predef_marker_types /* list of predefined marker types */
                                   */
} Pmarker_type_def_fac;
```

---

**Pmeasure** **MEASURE**

```
typedef struct _Pmeasure {
    Pin_class      class;
    _Pin_class_measure *data;
} Pmeasure;
```

---

**Pmeas\_process** **MEASURE PROCESS**

```
typedef struct {
    Pin_class      dev_class;
    Pint           process_id;
} Pmeas_process;
```

---

**Pmeas\_process\_set** **MEASURE PROCESS SET**

```
typedef struct {
    Pint      set_maxsize; /* maximum set size */
    Pmeas_process process_id; /* measure process identifier */
} Pmeas_process_set;
```

---

**Pmeas\_process\_list MEASURE PROCESS LIST**

```
typedef struct _Pmeas_process_list {  
    Pint          count;          /* number of process in list */  
    Pmeas_process *measure_procs; /* list of measure processes */  
} Pmeas_process_list;
```

---

**Pmipmap\_facs MIPMAP FACILITIES**

```
typedef struct {  
    Pint          max_dims[3];    /* max dimensions mipmap base level */  
    Pboolean      equal_dims_req; /* equal mipmap dimensions required */  
    Pboolean      power_2_dims_req; /* power of 2 mipmap dimensions req. */  
} Pmipmap_facs;
```

---

**Pna\_in\_status NON-ATOMIC INPUT STATUS**

```
typedef enum {  
    PNA_IN_STATUS_NONE = 0,  
    PNA_IN_STATUS_INCOMPLETE = 1,  
    PNA_IN_STATUS_OK = 2  
} Pna_in_status;
```

---

**Pnum\_na\_in NUMBER NON-ATOMIC INPUT DEVICES**

```
typedef struct {  
    Pint          set;            /* number available set LIDs */  
    Pint          composite;      /* number available composite LIDs */  
} Pnum_na_in;
```

---

**Ppattern\_mask PATTERN MASK**

```
typedef struct {
    unsigned int pat_bundle:1;
    unsigned int pat_rep_plus:1;
    unsigned int ext_pat_rep:1;
    unsigned int :29;
} Ppattern_mask;
```

---

**Pperspect\_corr PERSPECTIVE CORRECTION**

```
typedef enum {
    PPERSP_CORR_NONE = 0,
    PPERSP_CORR_AT_VERTICES = 1,
    PPERSP_CORR_INTERIOR = 2
} Pperspect_corr;
```

---

**Ppick\_mapping\_facs PICK MAPPING FACILITIES**

```
typedef struct {
    Pint_list avail_pick_types; /* list available pick types */
    Pint_list avail_echo_types; /* list of available echo types */
} Ppick_mapping_facs;
```

---

**Ppick\_path\_list PICK PATH LIST**

```
typedef struct _Ppick_path_list {
    Pint num_paths; /* number paths in list */
    Ppick_path *paths; /* array of pick paths */
} Ppick_path_list;
```

---

**Ppick\_stat PICK STATUS**

```
typedef enum {  
    PPICK_STAT_FALSE = 0,  
    PPICK_STAT_TRUE = 1  
} Ppick_stat;
```

---

**Ppict\_stat PICTURE STATUS**

```
typedef enum {  
    PPICT_STAT_COMP = 0,  
    PPICT_STAT_INCOMP = 1  
} Ppict_stat;
```

---

**Ppolyline\_mask POLYLINE MASK**

```
typedef struct {  
    unsigned int type:1;  
    unsigned int width:1;  
    unsigned int colr:1;  
    unsigned int shad_method:1;  
    unsigned int curve_approx_crit_data:1;  
    unsigned int adapt:1;  
    unsigned int cont:1;  
    unsigned int offset:1;  
    unsigned int cap:1;  
    unsigned int join:1;  
    unsigned int limit:1;  
    unsigned int :21;  
} Ppolyline_mask;
```

---

**Ppolymarker\_mask POLYMARKER MASK**

```
typedef struct {  
    unsigned int type:1;  
    unsigned int size:1;  
    unsigned int colr:1;  
    unsigned int :29;  
} Ppolymarker_mask;
```

---

**Pposted\_ind POSTED INDICATOR**

```
typedef enum {
    PPOSTED_FALSE = 0,
    PPOSTED_TRUE = 1
} Pposted_ind;
```

---

**Ppost\_grp\_facs POSTING GROUP FACILITIES**

```
typedef struct {
    Pint      num_def_grps;      /* number of definable posting groups */
    Pint      num_predef_grps;   /* number of predefined posting groups */
    Pint_list predef_grps;       /* list of predefined posting groups */
    Pint_list backg_methods;     /* list of supported posting group */
                                /* background methods */
} Ppost_grp_facs;
```

---

**Ppost\_grp\_status POSTING GROUP STATUS**

```
typedef enum {
    PPGSTAT_INACTIVE = 0,
    PPGSTAT_ACTIVE = 1
} Ppost_grp_status;
```

---

**Pref\_type REFERENCE TYPE**

```
typedef enum {
    PREF_EXECUTE = 0,
    PREF_INSTANCE = 1
} Pref_type;
```

---

**Prefl\_mask REFLECTANCE MASK**

```
typedef struct {  
    unsigned int refl_model:1;  
    unsigned int data:1;  
    unsigned int :30;  
} Prefl_mask;
```

---

**Prgba RED GREEN BLUE WITH ALPHA**

```
typedef struct {  
    Pfloat    red;           /* red intensity          */  
    Pfloat    green;        /* green intensity        */  
    Pfloat    blue;         /* blue intensity         */  
    Pfloat    alpha;        /* alpha                  */  
} Prgba;
```

---

**Pset\_data SET DATA RECORD**

```
typedef struct _Pset_data {  
    Pin_class    dev_class;  
    Pint         num_in_set;  
    _Pin_class_data *data;  
} Pset_data;
```

---

**Pset\_fac** SET FACILITIES

```

typedef struct {
    Pint      max_measures,           /* max instances          */
    Pint      max_simul_trig,         /* max simul. trigger procs */
    Pint      max_simul_echo,         /* max simul. echo procs   */
    Pint      max_simul_ack,          /* max simul. ack. procs   */
    Pint_list loc_meas_proc_ids,      /* avail locator meas proc ids */
    Pint_list stroke_meas_proc_ids,   /* avail stroke meas proc ids */
    Pint_list val_meas_proc_ids,      /* avail valuator meas proc ids */
    Pint_list choice_meas_proc_ids,   /* avail choice meas proc ids */
    Pint_list pick_meas_proc_ids,     /* avail pick meas proc ids  */
    Pint_list string_meas_proc_ids,   /* avail string meas proc ids */
    Pint_list set_meas_proc_ids,      /* avail set meas proc ids   */
    Pint_list composite_meas_proc_ids, /* avail compos meas proc ids */
    Pint_list trig_proc_ids,          /* avail trigger proc ids    */
    Pint_list loc_echo_proc_ids,      /* avail locator echo proc ids */
    Pint_list stroke_echo_proc_ids,   /* avail stroke echo proc ids */
    Pint_list val_echo_proc_ids,      /* avail valuator echo proc ids */
    Pint_list choice_echo_proc_ids,   /* avail choice echo proc ids */
    Pint_list pick_echo_proc_ids,     /* avail pick echo proc ids  */
    Pint_list string_echo_proc_ids,   /* avail string echo proc ids */
    Pint_list set_echo_proc_ids,      /* avail set echo proc ids   */
    Pint_list comp_echo_proc_ids,     /* avail compos echo proc ids */
    Pint_list ack_proc_ids            /* avail ack. proc ids       */
} Pset_fac;

```

---

**Pset\_measure** SET MEASURE

```

typedef struct Pset_measure {
    Pin_class dev_class; /* input class of set */
    Pint      set_size;  /* size of measure set */
    _Pin_class_measure *measure_set; /* array of measures of same */
                                   /* class                  */
} Pset_measure;

```

---

**Psupport\_indication** SUPPORT INDICATION

```

typedef enum {
    PSI_NOT_SUPPORTED = 0,
    PSI_SUPPORTED = 1
} Psupport_indication;

```

---

**Ptarg\_addr TARGET ADDRESS**

```
typedef struct {
    Ptarg_type      ref_targ;      /* reference target      */
    Pint            offset;        /* offset from reference target*/
} Ptarg_addr;
```

---

**Ptarg\_data\_st TARGET DATA STATE**

```
typedef enum {
    PTARG_DATA_ST_ABSENT = 0,
    PTARG_DATA_ST_PRESENT = 1
} Ptarg_data_st;
```

---

**Ptarg\_empty\_st TARGET EMPTY**

```
typedef enum {
    PTARG_EMPTY_ST_EMPTY = 0,
    PTARG_EMPTY_ST_NOT_EMPTY = 1
} Ptarg_empty_st;
```

---

**Ptarget\_fac TARGET FACILITIES**

```
typedef struct {
    Pint      num_avail_targets; /* number of available targets */
} Ptarget_fac;
```

---

**Ptarg\_op\_list TARGET OPERATION LIST**

```
typedef struct {
    Pint      num_ops;      /* number of target operations */
    Ptarg_op  *targ_ops;    /* list of target operations   */
} Ptarg_op_list;
```

---

**Ptarg\_type TARGET TYPE**

```
typedef enum {  
    PBASE_TARG = 0,  
    PREND_TARG = 1,  
    PDISP_TARG = 2  
}  
Ptarg_type;
```

---

**Ptarg\_type\_list TARGET TYPE LIST**

```
typedef struct {  
    Pint          num_targ_types; /* number of target types */  
    Ptarg_type    *targ_types;   /* list of target types */  
}  
Ptarg_type_list;
```

---

**Ptest\_comp\_rel TEST COMPARISON RELATIONAL**

```
typedef enum {  
    PTRL_EQUAL = 0,  
    PTRL_NOT_EQUAL = 1,  
    PTRL_GREATER = 2,  
    PTRL_LESS = 3,  
    PTRL_GREATER_OR_EQUAL = 4,  
    PTRL_LESS_OR_EQUAL = 5  
}  
Ptest_comp_rel;
```

---

**Ptest\_comp\_logical TEST COMPARISON LOGICAL**

```
typedef enum {  
    PTLG_BITWISE_AND = 1,  
    PTLG_BITWISE_OR = 2,  
    PTLG_BITWISE_XOR = 3  
}  
Ptest_comp_logical;
```

---

**Ptext\_mask TEXT MASK**

```
typedef struct {  
    unsigned int font:1;  
    unsigned int precision:1;  
    unsigned int char_expan:1;  
    unsigned int char_space:1;  
    unsigned int colr:1;  
    unsigned int :27;  
}  
Ptext_mask;
```

---

**Ptexture\_binding TEXTURE BINDING**

```
typedef struct {  
    Pint    image_res_id;    /* texture image resource identifier */  
    Pint    rendering_order; /* rendering order */  
}  
Ptexture_binding;
```

---

**Ptexture\_facfs TEXTURE FACILITIES**

```
typedef struct {  
    Pint_list coord_srcs; /* list avail. coordinate sources */  
    Pint_list compos_methods; /* list avail. composition methods */  
    Pint_list min_methods; /* list avail. minification methods */  
    Pint_list mag_methods; /* list avail. magnification methods */  
    Pint_list bound_cond; /* list avail. boundary conditions */  
    Pint_list clamp_methods; /* list avail. boundary clamp methods */  
    Pint_list render_orders; /* list avail. rendering orders */  
    Pint    num_pred_inds; /* number predefined texture indices */  
}  
Ptexture_facfs;
```

---

**Ptexture\_map\_fac TEXTURE MAPPING FACILITIES**

```

typedef struct {
    Pint      max_simul;          /* max number simultaneously      */
                                   /* applicable textures             */
    Pint_list perspect_corr;      /* list of available perspective  */
                                   /* correction methods             */
    Pint_list sampling_freqs;     /* list avail. sampling frequencies */
    Pint_list opt_hints;          /* list of available resource     */
                                   /* optimization hints             */
    Ptup_util usage;              /* utilization of texture usage   */
                                   /* priorities                     */
    Pint_list image_res_types;    /* list of image resource types   */
                                   /* available for texture mapping  */
} Ptexture_map_fac;

```

---

**Ptexture\_mask TEXTURE MASK**

```

typedef struct {
    unsigned int coord_src:1;
    unsigned int coord_src_data:1;
    unsigned int orientation:1;
    unsigned int compos_method:1;
    unsigned int compos_data:1;
    unsigned int min_method:1;
    unsigned int max_method:1;
    unsigned int bound_conds:1;
    unsigned int clamp_method:1;
    unsigned int clamp_data:1;
    unsigned int depth_sampl_hint:1;
    unsigned int freq_wt_hints:1;
    unsigned int image_res_id:1;
    unsigned int rendering_order:1;
    unsigned int :18;
} Ptexture_mask;

```

---

**Ptexture\_param TEXTURE PARAMETRIZATION**

```

typedef struct {
    Pcoord_src      coord_src;          /* coordinate source and data */
    Pmatrix3        orientation;         /* orientation matrix         */
} Ptexture_param;

```

---

**Ptexture\_rep TEXTURE REPRESENTATION**

```

typedef struct {
    Ptexture_param    param;           /* texture parametrization */
    Ptexture_compos    compos;         /* texture composition */
    Ptexture_sampling  sampling;        /* texture sampling */
    Ptexture_binding   binding;        /* texture binding */
} Ptexture_rep;

```

---

**Ptexture\_rep TEXTURE RESOURCE OPTIMIZATION HEURISTICS**

```

typedef struct {
    Pint              opt_hint;         /* optimization hint */
    Pint_list         usage_priorities; /* texture usage priorities */
} Ptexture_res_opt_heur;

```

---

**Ptexture\_sampling TEXTURE SAMPLING**

```

typedef struct {
    Pint              min_method;       /* minification method */
    Pint              mag_method;       /* magnification method */
    Pint              bound_conds[3];   /* boundary conditions */
    Pclamp_method     clamp;            /* boundary clamp method & data */
    Pfloat            depth_sampl_hint; /* depth sampling hint */
    Pfloat            freq_wt_hints[3]; /* frequency weight hints */
} Ptexture_sampling;

```

---

**Ptrav\_res TRAVERSAL RESOURCE**

```

typedef struct {
    Pint              id;               /* traversal resource identifier */
    Pint              type;             /* traversal resource type */
} Ptrav_res;

```

---

**Ptrav\_res\_facs TRAVERSAL RESOURCE FACILITIES**

```
typedef struct {
    Ptrav_res_list avail_trav_res; /* list of avail. traversal resources
                                   */
} Ptrav_res_facs;
```

---

**Ptrav\_res\_list TRAVERSAL RESOURCE LIST**

```
typedef struct {
    Pint          num_trav_res; /* number of traversal resources */
    Ptrav_res     *trav_res;    /* list of traversal resources */
} Ptrav_res_list;
```

---

**Ptrav\_type TRAVERSAL TYPE**

```
typedef enum {
    PTRAV_RENDER = 0,
    PTRAV_PICK = 1
} Ptrav_type;
```

---

**Ptrig\_process TRIGGER PROCESS**

```
typedef struct {
    Ptrig_type     type;
    Pint           process_id;
} Ptrig_process;
```

---

**Ptrig\_process\_list TRIGGER PROCESS LIST**

```
typedef struct {
    Pint          count;
    Ptrig_process *procs;
} Ptrig_process_list;
```

---

**Ptrig\_type TRIGGER TYPE**

```
typedef enum {
    PTRIGGER_BREAK = 0,
    PTRIGGER_SELECT = 1,
    PTRIGGER_EVENT = 2,
    PTRIGGER_DELETE = 3
} Ptrig_type;
```

---

**Ptup\_util TEXTURE USAGE PRIORITIES UTILIZATION**

```
typedef enum {
    PTUP_UTILIZED_NO = 0,
    PTUP_UTILIZED_YES = 1
} Ptup_util;
```

---

**Pval\_facs VALUATOR FACILITIES**

```
typedef struct {
    Pint      max_simul_trig, /* max simul. trigger procs */
    Pint      max_simul_echo, /* max simul. echo procs */
    Pint      max_simul_ack, /* max simul. acknowledgement procs */
    Pint_list meas_proc_ids, /* available measure process ids */
    Pint_list trig_proc_ids, /* available trigger process ids */
    Pint_list echo_proc_ids, /* available echo process ids */
    Pint_list ack_proc_ids /* available acknowledgement process ids */
} Pval_facs;
```

---

**Pview\_attach VIEW ATTACHMENT**

```
typedef struct {
    Pint      view_ws_id; /* workstation id for view */
    Pint      view_ind; /* view index */
    Pint      view_action_type; /* view action type */
    Pint      transfer_type; /* measure transfer type */
    Pint      view_upd_method; /* view update method */
} Pview_attach;
```

---

Pview\_status **VIEW\_STATUS**

```
typedef enum {  
    PVIEW_ST_CORRESPOND = 0,  
    PVIEW_ST_DIFFERENT = 1  
} Pview_status;
```

---

Pwatch\_enable **WATCH ENABLE FLAG**

```
typedef enum {  
    PWATCH_OFF = 0,  
    PWATCH_ON = 1  
} Pwatch_enable;
```

---

Pws\_st\_tables\_highl **LENGTHS OF WORKSTATION STATE TABLES HIGHLIGHTING**

```
typedef struct {  
    Pint    highl_rep;           /* max. # of highlighting table entries */  
} Pws_st_tables_highl;
```

---

Pws\_st\_tables\_texture **LENGTHS OF WORKSTATION STATE TABLES TEXTURE**

```
typedef struct {  
    Pint    texture_rep;        /* max. # of texture table entries */  
} Pws_st_tables_texture;
```

## 12 C Full PHIGS profile macro definitions

### 12.1 Function identifiers

The error functions require a unique mapping of the Full PHIGS functions to a set of numbers. The names for these function identifiers are the same as the bound Full PHIGS names except that the sentinel character has been replaced by Pfn\_.

| Function Name Macro                             | Function Number |
|-------------------------------------------------|-----------------|
| #define Pfn_ws_type_create                      | (268)           |
| #define Pfn_ws_type_set                         | (269)           |
| #define Pfn_ws_type_get                         | (270)           |
| #define Pfn_ws_type_destroy                     | (271)           |
| #define Pfn_redraw_all_structs_from_grp         | (272)           |
| #define Pfn_redraw_all_structs_on_targ          | (273)           |
| #define Pfn_redraw_all_structs_from_grp_on_targ | (274)           |
| #define Pfn_upd_targ                            | (275)           |
| #define Pfn_define_post_grp                     | (276)           |
| #define Pfn_undefine_post_grp                   | (277)           |
| #define Pfn_set_post_grp_status                 | (278)           |
| #define Pfn_set_post_grp_priority               | (279)           |
| #define Pfn_set_post_grp_backg_style            | (280)           |
| #define Pfn_set_post_grp_backg_method           | (281)           |
| #define Pfn_set_post_grp_border_indic           | (282)           |
| #define Pfn_set_post_grp_border_ind             | (283)           |
| #define Pfn_assoc_image_res                     | (284)           |
| #define Pfn_disassoc_image_res                  | (285)           |
| #define Pfn_set_dc_clip_regions3                | (286)           |
| #define Pfn_set_dc_clip_regions                 | (287)           |
| #define Pfn_set_targ_manip_mode                 | (288)           |
| #define Pfn_set_targ_dispos                     | (289)           |
| #define Pfn_set_disp_targ                       | (290)           |
| #define Pfn_set_rend_targ                       | (291)           |
| #define Pfn_clear_targ                          | (292)           |
| #define Pfn_copy_targ                           | (293)           |
| #define Pfn_create_targ                         | (294)           |
| #define Pfn_destroy_targ                        | (295)           |
| #define Pfn_set_st_visual_rep                   | (296)           |
| #define Pfn_set_targ_st_visual_rep              | (297)           |
| #define Pfn_assoc_trav_res                      | (298)           |
| #define Pfn_disassoc_trav_res                   | (299)           |
| #define Pfn_manip_trav_res                      | (300)           |
| #define Pfn_reset_all_trav_res                  | (301)           |
| #define Pfn_ret_window_system_colr              | (302)           |
| #define Pfn_set_appl_int                        | (303)           |
| #define Pfn_set_appl_real                       | (304)           |
| #define Pfn_circle3                             | (305)           |
| #define Pfn_circle                              | (306)           |
| #define Pfn_circular_arc3                       | (307)           |

```

#define Pfn_circular_arc (308)
#define Pfn_ellipse3 (309)
#define Pfn_ellipse (310)
#define Pfn_elliptical_arc3 (311)
#define Pfn_elliptical_arc (312)
#define Pfn_fill_circle3 (313)
#define Pfn_fill_circle (314)
#define Pfn_circular_arc_close3 (315)
#define Pfn_circular_arc_close (316)
#define Pfn_fill_ellipse3 (317)
#define Pfn_fill_ellipse (318)
#define Pfn_elliptical_arc_close3 (319)
#define Pfn_elliptical_arc_close (320)
#define Pfn_set_highl_ind (321)
#define Pfn_set_linetype_adapt (322)
#define Pfn_set_linetype_cont (323)
#define Pfn_set_linetype_offset (324)
#define Pfn_set_linecap (325)
#define Pfn_set_linejoin (326)
#define Pfn_set_linemitre_limit (327)
#define Pfn_set_edgetype_adapt (328)
#define Pfn_set_edgetype_cont (329)
#define Pfn_set_edgetype_offset (330)
#define Pfn_set_edgecap (331)
#define Pfn_set_edgejoin (332)
#define Pfn_set_edgemitre_limit (333)
#define Pfn_set_highl_method (334)
#define Pfn_set_transparency (335)
#define Pfn_set_back_transparency (336)
#define Pfn_set_alpha_src_sel (337)
#define Pfn_set_alpha_data_sel_ind (338)
#define Pfn_set_active_textures (339)
#define Pfn_set_back_active_textures (340)
#define Pfn_set_texture_perspect_corr (341)
#define Pfn_set_texture_sampling_freq (342)
#define Pfn_set_texture_res_opt_heur (343)
#define Pfn_set_cond_flags (344)
#define Pfn_set_cond_flags_from_tests (345)
#define Pfn_set_line_rep_full (346)
#define Pfn_set_line_rep_mask (347)
#define Pfn_set_marker_rep_mask (348)
#define Pfn_set_text_rep_mask (349)
#define Pfn_set_int_rep_mask (350)
#define Pfn_set_edge_rep_full (351)
#define Pfn_set_edge_rep_mask (352)
#define Pfn_set_ext_pat_rep (353)
#define Pfn_set_pat_rep_mask (354)
#define Pfn_set_texture_rep (355)
#define Pfn_set_texture_rep_mask (356)
#define Pfn_set_texture_param (357)

```

```
#define Pfn_set_texture_composition (358)
#define Pfn_set_texture_sampling (359)
#define Pfn_set_texture_binding (360)
#define Pfn_set_highl_rep (361)
#define Pfn_set_transparency_mode (362)
#define Pfn_set_transparency_thresholds (363)
#define Pfn_set_refl_rep_mask (364)
#define Pfn_set_appl_filter (365)
#define Pfn_create_mipmap_texture (366)
#define Pfn_define_linetype (367)
#define Pfn_define_marker_type (368)
#define Pfn_set_view_ref_point3 (369)
#define Pfn_set_view_ref_point (370)
#define Pfn_set_view_plane_norm (371)
#define Pfn_set_view_up_vec3 (372)
#define Pfn_set_view_up_vec (373)
#define Pfn_set_view_win_limits (374)
#define Pfn_set_proj_vp3 (375)
#define Pfn_set_proj_vp (376)
#define Pfn_set_proj_type (377)
#define Pfn_set_proj_ref_point (378)
#define Pfn_set_view_plane_dist (379)
#define Pfn_set_front_plane_dist (380)
#define Pfn_set_back_plane_dist (381)
#define Pfn_set_xy_clip_indicator (382)
#define Pfn_set_front_clip_indicator (383)
#define Pfn_set_back_clip_indicator (384)
#define Pfn_upd_view_rep (385)
#define Pfn_map_dc_to_wsc (386)
#define Pfn_map_wsc_to_dc (387)
#define Pfn_map_dc_to_wc (388)
#define Pfn_open_di_struct (389)
#define Pfn_close_di_struct (390)
#define Pfn_inst_struct (391)
#define Pfn_cond_exec_struct (392)
#define Pfn_cond_inst_struct (393)
#define Pfn_cond_return (394)
#define Pfn_cond_skip_elements (395)
#define Pfn_cond_skip_to_label (396)
#define Pfn_push_st (397)
#define Pfn_pop_st (398)
#define Pfn_copy_elem_struct (399)
#define Pfn_copy_elem_range_struct (400)
#define Pfn_copy_elems_between_labels_struct (401)
#define Pfn_move_elem (402)
#define Pfn_move_elem_range (403)
#define Pfn_move_elems_between_labels (404)
#define Pfn_set_watch_on_elem_range (405)
#define Pfn_end_watch_on_elem_range (406)
#define Pfn_post_struct_to_grp (407)
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#define Pfn_unpost_structs_from_grps (408)
#define Pfn_unpost_all_structs_from_grp (409)
#define Pfn_post_di_struct (410)
#define Pfn_post_di_struct_to_grp (411)
#define Pfn_unpost_di_struct (412)
#define Pfn_renew_di_state (413)
#define Pfn_set_di_mode (414)
#define Pfn_mark_multi_pass_start (415)
#define Pfn_mark_multi_pass_compl (416)
#define Pfn_mark_pass_start (417)
#define Pfn_mark_pass_compl (418)
#define Pfn_ret_num_passes_req (419)
#define Pfn_set_set_pick_filter (420)
#define Pfn_set_composite_pick_filter (421)
#define Pfn_set_di_pick_filter (422)
#define Pfn_set_di_pick_corr_point3 (423)
#define Pfn_set_di_pick_corr_point (424)
#define Pfn_set_pick_mapping_data (425)
#define Pfn_map_dc_point_to_pick_paths (426)
#define Pfn_define_locator (427)
#define Pfn_define_stroke (428)
#define Pfn_define_valuator (429)
#define Pfn_define_choice (430)
#define Pfn_define_pick (431)
#define Pfn_define_string (432)
#define Pfn_create_set_measure (433)
#define Pfn_define_set (434)
#define Pfn_create_composite_measure (435)
#define Pfn_define_composite (436)
#define Pfn_undefine_locator (437)
#define Pfn_undefine_stroke (438)
#define Pfn_undefine_valuator (439)
#define Pfn_undefine_choice (440)
#define Pfn_undefine_pick (441)
#define Pfn_undefine_string (442)
#define Pfn_destroy_set_measure (443)
#define Pfn_undefine_set (444)
#define Pfn_destroy_composite_measure (445)
#define Pfn_undefine_composite (446)
#define Pfn_init_set3 (447)
#define Pfn_init_set (448)
#define Pfn_init_composite3 (449)
#define Pfn_init_composite (450)
#define Pfn_set_set_mode (451)
#define Pfn_set_composite_mode (452)
#define Pfn_req_set3 (453)
#define Pfn_req_set (454)
#define Pfn_req_composite3 (455)
#define Pfn_req_composite (456)
#define Pfn_sample_set3 (457)

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#define Pfn_sample_set (458)
#define Pfn_sample_composite3 (459)
#define Pfn_sample_composite (460)
#define Pfn_get_set3 (461)
#define Pfn_get_set (462)
#define Pfn_get_composite3 (463)
#define Pfn_get_composite (464)
#define Pfn_attach_lid_to_view (465)
#define Pfn_detach_lid_from_view (466)
#define Pfn_attach_lid_to_light_src (467)
#define Pfn_detach_lid_from_light_src (468)
#define Pfn_init_di_pick3 (469)
#define Pfn_init_di_pick (470)
#define Pfn_enable_di_pick (471)
#define Pfn_disable_di_pick (472)
#define Pfn_trans_di_pick_set (473)

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## 12.2 Error codes

```

/* State Errors */
#define PE_NOT_DISO (8) /* Ignoring function, func-
                        tion requires state
                        (PHOP,*,DISO,*) */

#define PE_NOT_RETAINED_STOP_ONLY (9) /* Ignoring function, func-
                        tion requires state
                        (PHOP,*,STOP,*) */

#define PE_NOT_WSOP_AND_DISO (10) /* Ignoring function, func-
                        tion requires state
                        (PHOP,WSOP,DISO,*) */

/* Workstation Errors */
#define PE_BAD_TARG_OP (65) /* Ignoring function, one of
                        the target operations is
                        not supported */

#define PE_INVALID_TRAV_RES (66) /* Ignoring function, the
                        resource is not valid */

#define PE_TRAV_RES_ASSOC_TARG (67) /* Ignoring function, the
                        traversal resource is
                        already associated with a
                        target */

#define PE_TRAV_RES_NO_DISASSOC (68) /* Ignoring function, the
                        resource cannot be disas-
                        sociated */

#define PE_INCOMPAT_TRAV_RES (69) /* Ignoring function, source
                        and destination traversal
                        resources are incompatible
                        */

```

|                                         |      |                                                                                                                                                                  |
|-----------------------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #define PE_DI_STRUCT_NOT_POSTED         | (71) | /* Ignoring function, the direct interpretation structure is not posted on the specified workstation */                                                          |
| #define PE_DI_REND_TRAV_PROC_ACTIVE     | (72) | /* Ignoring function, the direct interpretation render traversal process is already active on the specified workstation */                                       |
| #define PE_DI_REND_TRAV_PROC_NOT_ACTIVE | (73) | /* Ignoring function, the direct interpretation traversal process is not active on the specified workstation */                                                  |
| #define PE_CANNOT_CREATE_TARGET         | (74) | /* Ignoring function, an additional target could not be created */                                                                                               |
| #define PE_NUM_TARGETS_NOT_REDUCED      | (75) | /* Ignoring function, the number of targets cannot be reduced below the default number available for the respective workstation type */                          |
| #define PE_TARG_NOT_DESTROYED           | (76) | /* Ignoring function, the target could not be destroyed */                                                                                                       |
| #define PE_DISP_REND_TARG_NOT_DESTROYED | (77) | /* Ignoring function, neither the display target nor the rendering target can be destroyed */                                                                    |
| #define PE_MULTIPASS_IN_PROGRESS        | (78) | /* Ignoring function, a multi-pass operation is already in progress */                                                                                           |
| #define PE_MULTI_PASS_NOT_IN_PROGRESS   | (79) | /* Ignoring function, a multi-pass operation is not in progress */                                                                                               |
| #define PE_PASS_DEF_IN_PROGRESS         | (80) | /* Ignoring function, a pass definition is already in progress */                                                                                                |
| #define PE_PASS_DEF_NOT_IN_PROGRESS     | (81) | /* Ignoring function, a pass definition is not in progress */                                                                                                    |
| #define PE_LT_SRC_WS_NO_OUT_CAPABILITY  | (82) | /* Ignoring function, the specified light source workstation does not have output capability (i.e, the workstation category is neither OUTPUT, OUTIN, nor MO) */ |
| #define PE_POST_GRP_DEF                 | (83) | /* Ignoring function, the posting group has already been defined */                                                                                              |

|                                       |                                                                                                                                                          |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| #define PE_POST_GRP_NOT_DEF           | (84) /* Ignoring function, the posting group has not been defined */                                                                                     |
| #define PE_POST_GRP_ID_LESS_THAN_ONE  | (85) /* Ignoring function, the posting group identifier is less than one */                                                                              |
| #define PE_MAX_POST_GRP_EXCEEDED      | (86) /* Ignoring function, defining this posting group would exceed the maximum number of posting groups supported on the workstation */                 |
| #define PE_IMAGE_RES_NOT_DEF          | (87) /* Ignoring function, image resource not defined */                                                                                                 |
| #define PE_BAD_IMAGE_SPEC_METHOD      | (88) /* Ignoring function, the image resource image specification method is not supported for this operation */                                          |
| #define PE_IMAGE_RES_CAP_NOT_SUP      | (89) /* Ignoring function, image resource capability is not supported on the workstation */                                                              |
| #define PE_SPEC_IMAGE_RES_NOT_DEF     | (90) /* Ignoring function, the specified image resource has not been defined */                                                                          |
| #define PE_MAX_IMAGE_RES_EXCEEDED     | (91) /* Ignoring function, associating this image resource would exceed the maximum number of entries allowed in the workstation image resource table */ |
| #define PE_IMAGE_RES_EXCEEDS_CAP_WS   | (92) /* Ignoring function, the image resource exceeds the capabilities of the specified workstation */                                                   |
| #define PE_VW_WS_OF_CATEGORY_MI       | (93) /* Ignoring function, the specified view workstation is of category MI */                                                                           |
| #define PE_LID_WS_NOT_IN_NOR_OUTIN    | (94) /* Ignoring function, the specified LID workstation is neither of category INPUT nor of category OUTIN */                                           |
| #define PE_NEW_WS_TYPE_NOT_REALIZED   | (95) /* Warning, Not all attributes were fully realized during the creation of the new workstation type */                                               |
| #define PE_WS_TYPE_CANNOT_BE_MODIFIED | (96) /* Ignoring function, workstation type is a default type or bound to a workstation and cannot be modified */                                        |

/\* Output Attribute Errors \*/

#define PE\_NO\_STATE\_SAVED

(141) /\* Ignoring function, no state has been saved \*/

#define PE\_SPEC\_PAT\_TYPE\_NOT\_SUP

(142) /\* Ignoring function, the specified pattern type is not supported on the specified workstation \*/

#define PE\_PAT\_TYPE\_NOT\_SUP\_ON\_INQ

(143) /\* Ignoring function, pattern type of requested pattern table entry is not supported by this inquiry \*/

#define PE\_MAX\_VIEWS\_EXCEEDED

(150) /\* Ignoring function, setting this view table entry would exceed the maximum number of entries allowed \*/

#define PE\_INVALID\_LIMITS

(151) /\* Ignoring function,  $XMIN \geq XMAX$ ,  $YMIN \geq YMAX$ ,  $ZMIN > ZMAX$ ,  $UMIN \geq UMAX$  or  $VMIN \geq VMAX$  \*/

#define PE\_INVALID\_VIEWPORT

(152) /\* Ignoring function, invalid viewport:  $XMIN \geq XMAX$ ,  $YMIN \geq YMAX$ ,  $ZMIN > ZMAX$  \*/

#define PE\_INVALID\_VIEW\_CLIP\_LIM

(153) /\* Ignoring function, invalid view clipping limits:  $XMIN \geq XMAX$ ,  $YMIN \geq YMAX$ ,  $ZMIN > ZMAX$  \*/

#define PE\_VIEW\_CLIP\_LIM\_NOT\_NPC

(154) /\* Ignoring function, the view clipping limits are not within NPC range \*/

#define PE\_PROJ\_VP\_LIMITS\_NOT\_NPC

(155) /\* Ignoring function, the projection viewport limits are not within NPC range \*/

#define PE\_WS\_WIN\_LIM\_NOT\_NPC

(156) /\* Ignoring function, the workstation window limits are not within NPC range \*/

#define PE\_WS\_VP\_NOT\_IN\_DISPLAY\_SPACE

(157) /\* Ignoring function, the workstation viewport is not within display space \*/

#define PE\_INVALID\_VIEW\_PLANES

(158) /\* Ignoring function, front plane and back plane distances same and z-extent of projection viewport non-zero \*/

#define PE\_VPN\_LEN\_ZERO

(159) /\* Ignoring function, the view plane normal has length zero \*/

#define PE\_VUP\_LEN\_ZERO

(160) /\* Ignoring function, the view up vector has length zero \*/

#define PE\_VUP\_VPN\_PARALLEL (161) /\* Ignoring function, view up and view plane normal vectors parallel \*/

#define PE\_PRP\_BETW\_FRONT\_BACK (162) /\* Ignoring function, the projection reference point is between the front and back planes \*/

#define PE\_PRP\_ON\_VIEW\_PLANE (163) /\* Ignoring function, the projection referece point cannot be positioned on the view plane \*/

#define PE\_BACK\_PLN\_BEFORE\_FRONT\_PLN (164) /\* Ignoring function, the back plane is in front of the front plane \*/

#define PE\_HIGHL\_IND\_LT\_ONE (165) /\* Ignoring function, the highlighting index is less than one \*/

#define PE\_HIGHL\_METHOD\_NOT\_AVAIL (166) /\* Ignoring function, the specified highlighting method is not available on the specified workstation \*/

#define PE\_LINETYPE\_NOT\_DEFINABLE (167) /\* Ignoring function, the specified linetype does not reference a definable linetype \*/

#define PE\_MAX\_DEF\_LINETYPES\_EXCEEDED (168) /\* Ignoring function, setting this table entry would exceed the maximum number of entries allowed in the definable linetype table \*/

#define PE\_LINETYPE\_NOT\_DEFINED (169) /\* Ignoring function, the specified linetype has not been defined \*/

#define PE\_LINETYPE\_NOT\_SUP (170) /\* Warning, this linetype definition is not supported on at least one of the available workstation types \*/

#define PE\_LINETYPE\_DEF\_NOT\_AVAIL (171) /\* Ignoring function, the specified standard or implementation-defined linetype definition is not available \*/

#define PE\_MARKER\_TYPE\_NOT\_DEFINABLE (172) /\* Ignoring function, the specified marker type does not reference a definable marker type \*/

#define PE\_MAX\_DEF\_MARKER\_TYPES\_EXCEEDED (173) /\* Ignoring function, setting this table entry would exceed the maximum number of entries allowed

in the definable marker type table \*/

#define PE\_MARKER\_TYPE\_NOT\_DEFINED (174) /\* Ignoring function, the specified marker type has not been defined \*/

#define PE\_MARKER\_SHAPE\_INVALID (175) /\* Ignoring function, the marker shape descriptor is invalid \*/

#define PE\_MARKER\_SHAPE\_TYPE\_NOT\_SUP (176) /\* Ignoring function, the specified marker shape type is not supported \*/

#define PE\_MARKER\_TYPE\_DEF\_NOT\_AVAIL (177) /\* Ignoring function, the specified standard or implementation defined marker type definition is not available \*/

#define PE\_FILTER\_SEL\_INVALID (178) /\* Ignoring function, the filter selection is invalid \*/

#define PE\_FILTER\_NOT\_DEFINED (179) /\* Ignoring function, the specified application filter has not been defined \*/

/\* Input Errors \*/

#define PE\_DI\_PICK\_TRAV\_PROC\_ACTIVE (264) /\* Ignoring function, the direct interpretation pick traversal process is already active on the specified workstation \*/

#define PE\_DI\_PICK\_TRAV\_PROC\_NOT\_ACTIVE (265) /\* Ignoring function, the direct interpretation pick traversal process is not active on the specified workstation \*/

#define PE\_BAD\_PICK\_TYPE (266) /\* Ignoring function, the specified pick type is not available on the specified workstation \*/

#define PE\_LISTED\_MEAS\_PROC\_INVALID (267) /\* Ignoring function, one of the listed measure processes is invalid \*/

#define PE\_LISTED\_TRIG\_PROC\_INVALID (268) /\* Ignoring function, one of the listed trigger processes is invalid \*/

#define PE\_LISTED\_ECHO\_PROC\_INVALID (269) /\* Ignoring function, one of the listed echo processes is invalid \*/

#define PE\_LISTED\_ACK\_PROC\_INVALID (270) /\* Ignoring function, one of the listed acknowledgment processes is invalid \*/

#define PE\_LID\_NR\_IN\_USE (271) /\* Ignoring function, device number already in use \*/

```

#define PE_NR_MEAS_INVALID          (272) /* Ignoring function, number
                                         of measures is invalid */
#define PE_MEAS_ID_NOT_AVAIL        (273) /* Ignoring function, the
                                         specified measure identi-
                                         fier is not available on
                                         the specified workstation
                                         */
#define PE_MEAS_ID_IN_USE           (274) /* Ignoring function, the
                                         specified measure identi-
                                         fier is currently part of
                                         a set or composite logi-
                                         cal input device defini-
                                         tion */
#define PE_NO_PICK_MEASURE          (275) /* Ignoring function, the
                                         specified set or compos-
                                         ite device does not have a
                                         pick measure */
#define PE_LID_INAPPROP_FOR_VW_ACTION (276) /* Ignoring function, the
                                         logical input device class
                                         specified is inappropriate
                                         for the view action
                                         specified */
#define PE_LID_INAPPROP_FOR_LT_ACT  (277) /* Ignoring function, the
                                         input device class speci-
                                         fied is inappropriate for
                                         the light action speci-
                                         fied */
#define PE_LT_ACT_INAPPROP_FOR_LT_SRC (278) /* Ignoring function, the
                                         light action is inappro-
                                         priate for the light
                                         source specified */

/* Miscellaneous Errors */
#define PE_TEST_OP_INVALID          (451) /* Ignoring function, invalid
                                         test operator for test type
                                         */
#define PE_NO_WINDOW_SYSTEM         (452) /* Ignoring function, the
                                         specified workstation is
                                         not operating in a window
                                         management system envrion-
                                         ment */
#define PE_WIN_SYS_COLR_NOT_DETER   (453) /* Ignoring function, the
                                         window system colour can-
                                         not be determined */

/* Additional Output Attribute Errors */
#define PE_TEXTR_COORD_SRC_NOT_AVAIL (600) /* Ignoring function, the
                                         specified coordinate
                                         source is not available on
                                         the specified workstation
                                         */
#define PE_DATA_VALUE_IND_LESS_1    (601) /* Ignoring function, the
                                         specified data value index
                                         is less than one */

```

```

#define PE_TEXTR_COMPOS_METHOD_NOT_AVAIL          (602) /* Ignoring function, the
                                                    specified composition
                                                    method is not available on
                                                    the specified workstation
                                                    */
#define PE_TEXTR_MIN_METHOD_NOT_AVAIL             (603) /* Ignoring function, the
                                                    specified minification
                                                    method is not available on
                                                    the specified workstation
                                                    */
#define PE_TEXTR_MAG_METHOD_NOT_AVAIL             (604) /* Ignoring function, the
                                                    specified magnification
                                                    method is not available on
                                                    the specified workstation
                                                    */
#define PE_BOUND_COND_NOT_AVAIL                   (605) /* Ignoring function, the
                                                    specified boundary condi-
                                                    tion is not available on
                                                    the specified workstation
                                                    */
#define PE_BOUND_CLAMP_METHOD_NOT_AVAIL           (606) /* Ignoring function, the
                                                    specified boundary clamp
                                                    method is not available on
                                                    the specified workstation
                                                    */
#define PE_DEPTH_SAMPL_BIAS_OUT_OF_RANGE          (607) /* Ignoring function, the
                                                    specified depth sampling
                                                    bias hint is out of range
                                                    */
#define PE_TEXTR_IMAGE_RES_NOT_DEFINED            (608) /* Ignoring function, the
                                                    specified texture image
                                                    resource identifier is not
                                                    defined on the specified
                                                    workstation */
#define PE_RENDERING_ORDER_NOT_AVAIL              (612) /* Ignoring function, the
                                                    specified rendering order
                                                    is not available on the
                                                    specified workstation */

```

## 12.3 Miscellaneous

### 12.3.1 Hatch styles

```

#define PHATCH_HORIZ                               (1)
#define PHATCH_VERT                               (2)
#define PHATCH_POS_SLOPE                          (3)
#define PHATCH_NEG_SLOPE                          (4)
#define PHATCH_HORIZ_VERT_CROSS                   (5)
#define PHATCH_POS_NEG_SLOPE_CROSS                (6)

```

**12.3.2 Prompt and echo types (additional items)**

```
#define PPICK_HIGHL_PRIM (4)
#define PPICK_HIGHL_PRIM_GROUP (5)
#define PPICK_HIGHL_STRUCT_NETWORK (6)
```

**12.3.3 Colour types (additional items)**

```
#define PCOLR_RGBA (5)
#define PCOLR_CIELUVA (6)
#define PCOLR_HSVA (7)
#define PCOLR_HLSA (8)
```

**12.3.4 Direct interpretation pick prompt and echo types**

```
#define PDI_PICK_HIGHL (1)
```

**12.3.5 Pick types**

```
#define PPICK_TYPE_WS_DEP (1)
#define PPICK_TYPE_PICK_FIRST (2)
#define PPICK_TYPE_PICK_LAST (3)
#define PPICK_TYPE_PICK_CLOSEST (4)
```

**12.3.6 Target manipulation modes**

```
#define PTARG_MANIP_AUTO (1)
#define PTARG_MANIP_MANUAL (2)
```

**12.3.7 Target operation types**

```
#define PSET_REND_TARG (1)
#define PSET_DISP_TARG (2)
#define PCLEAR_TARG (3)
#define PCOPY_TARG (4)
```

**12.3.8 Traversal resource operation types**

```
#define PCLEAR_TRAV_RES (0)
#define PCOPY_TRAV_RES (1)
```

**12.3.9 Traversal resource types**

```
#define PTRAV_RES_Z_BUF (1)
#define PTRAV_RES_PAINT_BUF (2)
```

**12.3.10 View update method**

```
#define PVUM_APPLY_ALL (1)
#define PVUM_APPLY_ROTATION (2)
```

**12.3.11 View action types**

```

#define PVWA_ROT_ABOUT_U_VRC_AXIS (1)
#define PVWA_ROT_ABOUT_V_VRC_AXIS (2)
#define PVWA_ROT_ABOUT_N_VRC_AXIS (3)
#define PVWA_TRANS_U_VRC_AXIS_CLIP (4)
#define PVWA_TRANS_U_VRC_AXIS_NOCLIP (5)
#define PVWA_TRANS_V_VRC_AXIS_CLIP (6)
#define PVWA_TRANS_V_VRC_AXIS_NOCLIP (7)
#define PVWA_TRANS_N_VRC_AXIS (8)
#define PVWA_SCALE_WIN_UNIFORMLY (9)
#define PVWA_SCALE_VP_UNIFORMLY (10)
#define PVWA_SCALE_WIN_WIDTH (11)
#define PVWA_SCALE_VP_WIDTH (12)
#define PVWA_SCALE_WIN_HEIGHT (13)
#define PVWA_SCALE_VP_HEIGHT (14)
#define PVWA_TRANS_FRONT_CLIP_PLANE (15)
#define PVWA_TRANS_BACK_CLIP_PLANE (16)
#define PVWA_ROT_AROUND_VRP_ALONG_CYL_LAT (17)
#define PVWA_TRANS_EYE_FROM_VRP_OUT (18)
#define PVWA_TRANS_EYE_FROM_VRP_UP (19)
#define PVWA_ROT_EYE_FROM_VRP_UP (20)
#define PVWA_CHG_EYE_POS_WRT_VRP (21)
#define PVWA_CHG_VRP_POS_ROT_UP_WRT_PRP (22)
#define PVWA_CHG_VRP_POS_ROT_RL_WRT_PRP (23)

```

**12.3.12 Measure transfer types**

```

#define PMTT_MEASURE_CHANGE (1)
#define PMTT_EVENT_WITH_DISCARD (2)
#define PMTT_EVENT_WITH_PROPAGATION (3)

```

**12.3.13 Background methods**

```

#define PBACKGM_COLOUR_TABLE_0 (1)
#define PBACKGM_COLOUR_INDEX (2)
#define PBACKGM_COLOUR (3)
#define PBACKGM_IMAGE_RESOURCE (4)

```

**12.3.14 Image specification methods**

```

#define PIMGSM_UNCOMP_COLR_INDEX_ARRAY (1)
#define PIMGSM_UNCOMP_COLR_ARRAY (2)
#define PIMGSM_WINDOW_SYS_BITMAP (3)
#define PIMGSM_VIDEO_SIGNAL_CHAN_ID (4)
#define PIMGSM_LUMINANCE (5)
#define PIMGSM_LUMINANCE_ALPHA (6)
#define PIMGSM_MIPMAP_COLRS (7)
#define PIMGSM_MIPMAP_LUMINANCE (8)
#define PIMGSM_MIPMAP_LUMINANCE_ALPHA (9)

```

**12.3.15 Pattern types**

```
#define PPATT_COLOUR_INDEX (1)
#define PPATT_COLOUR (2)
#define PPATT_IMAGE_RESOURCE (3)
```

**12.3.16 Marker Shape Types**

```
#define PSHAPE_POLYLINE (1)
#define PSHAPE_FILL_AREA (2)
#define PSHAPE_CONVEX_FILL_AREA (3)
```

**12.3.17 Test Methods**

```
#define PTEST_ALWAYS_FAIL (0)
#define PTEST_ALWAYS_SUCCEED (1)
#define PTEST_EXTENT3 (2)
#define PTEST_EXTENT (3)
#define PTEST_BOUNDS3 (4)
#define PTEST_BOUNDS (5)
#define PTEST_NAMESET (6)
#define PTEST_APPL_INTEGER (7)
#define PTEST_APPL_REAL (8)
```

**12.3.18 Filter Types**

```
#define PFILTER_TYPE_INVIS (1)
#define PFILTER_TYPE_HIGHL (2)
#define PFILTER_TYPE_PICK (3)
#define PFILTER_TYPE_APPL (4)
```

**12.3.12 Texture sampling frequency types**

```
#define PTEXTRSF_PER_PIXEL (1)
#define PTEXTRSF_INTERP_DEP (2)
```

**12.3.13 Texture optimization hints**

```
#define PTEXTR_OPT_NO_HINT (1)
#define PTEXTR_OPT_SPEED (2)
#define PTEXTR_OPT_SPACE (3)
```

**12.3.14 Alpha sources**

```
#define PALPHASRC_TRANSPARENCY (1)
#define PALPHASRC_COLR_ASPECT (2)
#define PALPHASRC_FACET_COLR (3)
#define PALPHASRC_FACET_DATA (4)
#define PALPHASRC_VERTEX_COLR (5)
#define PALPHASRC_VERTEX_DATA (6)
```

**12.3.15 Texture coordinate sources**

```

#define PCOORDSRC_VERTEX_COORD_MC (1)
#define PCOORDSRC_VERTEX_COORD_WC (2)
#define PCOORDSRC_VERTEX_NORMAL_MC (3)
#define PCOORDSRC_VERTEX_NORMAL_WC (4)
#define PCOORDSRC_NURB_SURF_UV (5)
#define PCOORDSRC_DATA (6)
#define PCOORDSRC_REFL_SPHERE_VRC (7)
#define PCOORDSRC_REFL_SPHERE_WC (8)

```

**12.3.16 Gamma channel selectors**

```

#define PGCS_GAMMA_ONE (1)
#define PGCS_GAMMA_RED (1)
#define PGCS_GAMMA_TWO (2)
#define PGCS_GAMMA_GREEN (2)
#define PGCS_GAMMA_THREE (3)
#define PGCS_GAMMA_BLUE (3)

```

**12.3.17 Texture composition methods**

```

#define PCOMPOS_REPLACE (1)
#define PCOMPOS_MODULATE (2)
#define PCOMPOS_BLEND_ENVIRONMENT_COLOR (3)
#define PCOMPOS_DECAL (4)
#define PCOMPOS_DECAL_BACKGROUND (5)

```

**12.3.18 Minification methods**

```

#define PMINM_SINGLE_BASE (1)
#define PMINM_LINEAR_BASE (2)
#define PMINM_SINGLE_IN_MIPMAP (3)
#define PMINM_LINEAR_IN_MIPMAP (4)
#define PMINM_SINGLE_BETWEEN_MIPMAPS (5)
#define PMINM_LINEAR_BETWEEN_MIPMAPS (6)

```

**12.3.19 Magnification methods**

```

#define PMAGM_SINGLE_BASE (1)
#define PMAGM_LINEAR_BASE (2)
#define PMAGM_SINGLE_IN_MIPMAP (3)
#define PMAGM_LINEAR_IN_MIPMAP (4)
#define PMAGM_SINGLE_BETWEEN_MIPMAPS (5)
#define PMAGM_LINEAR_BETWEEN_MIPMAPS (6)

```

**12.3.20 Boundary conditions**

```

#define PBOUND_COND_CLAMP_EXPLICIT_METHOD (1)
#define PBOUND_COND_CLAMP_BORDER (2)
#define PBOUND_COND_WRAP (3)
#define PBOUND_COND_MIRROR (4)

```

### 12.3.21 Boundary clamp methods

```
#define PBOUND_CLAMP_DISCONTINUE (1)
#define PBOUND_CLAMP_COLR (2)
```

### 12.3.22 Rendering orders

```
#define PRENDORDR_PRELIGHT (1)
#define PRENDORDR_POST_LIGHT (2)
```

### 12.3.23 Transparency modes

```
#define PTRANSPMODE_NONE (1)
#define PTRANSPMODE_SCREEN_DOOR (2)
#define PTRANSPMODE_ALPHA_BLEND (3)
#define PTRANSPMODE_TWO_PASS (4)
#define PTRANSPMODE_MULTIPASS (5)
```

### 12.3.24 Light source action types

```
#define PLTA_ADJ_LT_COLR_COMP_1 (1)
#define PLTA_ADJ_LT_COLR_COMP_2 (2)
#define PLTA_ADJ_LT_COLR_COMP_3 (3)
#define PLTA_ADJ_BRIGHT (4)
#define PLTA_ROT_AROUND_X_DIR_VEC (5)
#define PLTA_ROT_AROUND_Y_DIR_VEC (6)
#define PLTA_ROT_AROUND_Z_DIR_VEC (7)
#define PLTA_TRANS_X_LT_POS (8)
#define PLTA_TRANS_Y_LT_POS (9)
#define PLTA_TRANS_Z_LT_POS (10)
#define PLTA_ADJ_CONCENTRATION_EXP (11)
#define PLTA_ADJ_LT_SPREAD_ANGLE (12)
```

## 13 C Full PHIGS profile functions

### 13.1 Control functions

---

#### WORKSTATION TYPE CREATE

```
void pws_type_create (
    Pint          ws_type,          /* workstation type */
    const Pconfig_setting *settings_list, /* array of config. settings */
    Pint          *new_ws_type      /* OUT new workstation type */
);
```

---

#### WORKSTATION TYPE SET

```
void pws_type_set (
    Pint          ws_type,          /* workstation type */
    const Pconfig_setting *settings_list /* array of config. settings */
);
```

---

#### WORKSTATION TYPE GET

```
void pws_type_get (
    Pint          ws_type,          /* workstation type */
    const char    *setting_name,    /* configuration setting name */
    Pstore        store,            /* store object for returned value */
    Pconfig_value **setting_value   /* OUT configuration setting value */
);
```

---

#### WORKSTATION TYPE DESTROY

```
void pws_type_destroy (
    Pint          ws_type          /* workstation type */
);
```

**REDRAW ALL STRUCTURES FROM POSTING GROUP**


---

```

void predraw_all_structs_from_grp (
    Pint          ws_id,          /* workstation identifier */
    Pint          grp_id,         /* posting group          */
    Pbackg_redisplay  redisplay_flag /* background redisplay flag */
);

```

---

**REDRAW ALL STRUCTURES ON TARGET**

```

void predraw_all_structs_on_targ (
    Pint          ws_id,          /* workstation identifier */
    const Ptarg_addr *targ_addr, /* target address         */
    Pctrl_flag    ctrl_flag      /* control flag            */
);

```

---

**REDRAW ALL STRUCTURES FROM POSTING GROUP ON TARGET**

```

void predraw_all_from_grp_on_targ (
    Pint          ws_id,          /* workstation identifier */
    Pint          grp_id,         /* posting group          */
    Pbackg_redisplay  redisplay_flag /* background redisplay flag */
    const Ptarg_addr *targ_addr, /* target address         */
    Pctrl_flag    ctrl_flag      /* control flag            */
);

```

---

**UPDATE TARGET**

```

void pupd_targ (
    Pint          ws_id,          /* workstation identifier */
    const Ptarg_addr *targ_addr, /* target address         */
    Pregen_flag    regen_flag    /* update regeneration flag */
);

```

---

**DEFINE POSTING GROUP**


---

```

void pdefine_post_grp (
    Pint          ws_id,          /* workstation identifier */
    Pint          grp_id,         /* posting group identifier */
    Pint          ref_grp_id,     /* reference posting group id */
    Prel_pri      rel_pri,        /* relative priority */
    Pint          def_view_ind,   /* default view index */
    Ppost_grp_status post_grp_status, /* posting group status */
    Pbackg_style  backg_style,   /* posting group backg. style */
    const Pbackg_method*backg_method, /* posting group backg. method */
    Pborder_indic border_indic,  /* posting group border indic. */
    Pint          border_ind      /* posting group border index */
);

```

---

**UNDEFINE POSTING GROUP**

```

void pundefine_post_grp (
    Pint          ws_id,          /* workstation identifier */
    Pint          grp_id         /* posting group identifier */
);

```

---

**SET POSTING GROUP STATUS**

```

void pset_post_grp_status (
    Pint          ws_id,          /* workstation identifier */
    Pint          grp_id,         /* posting group identifier */
    Ppost_grp_status post_grp_status /* posting group status */
);

```

---

**SET POSTING GROUP PRIORITY**

```

void pset_post_grp_priority (
    Pint          ws_id,          /* workstation identifier */
    Pint          grp_id,         /* posting group identifier */
    Pint          ref_grp_id,     /* reference posting group id */
    Prel_pri      rel_pri        /* relative priority */
);

```

---

**SET POSTING GROUP BACKGROUND STYLE**

```

void pset_post_grp_backg_style (
    Pint          ws_id,          /* workstation identifier */
    Pint          grp_id,         /* posting group identifier */
    Pbackg_style  backg_style     /* posting group background style */
);

```

---

**SET POSTING GROUP BACKGROUND METHOD**

```

void pset_post_grp_backg_method (
    Pint          ws_id,          /* workstation identifier */
    Pint          grp_id,         /* posting group identifier */
    const Pbackg_method *backg_method /* posting group background method */
);

```

---

**SET POSTING GROUP BORDER INDICATOR**

```

void pset_post_grp_border_indicator (
    Pint          ws_id,          /* workstation identifier */
    Pint          grp_id,         /* posting group identifier */
    Pborder_indic border_indic    /* posting group border indicator */
);

```

---

**SET POSTING GROUP BORDER INDEX**

```

void pset_post_grp_border_ind (
    Pint          ws_id,          /* workstation identifier */
    Pint          grp_id,         /* posting group identifier */
    Pint          border_ind      /* posting group border index */
);

```

---

**ASSOCIATE IMAGE RESOURCE**

```

void passoc_image_res (
    Pint          ws_id,          /* workstation identifier */
    Pint          image_res_id,   /* image resource identifier */
    const Pint_size *dims,        /* m,n dimensions */
    const Pimage_res *image_res, /* image resource */
    Paccess_flag  *access_flag    /* OUT access flag */
);

```

---

**DISASSOCIATE IMAGE RESOURCE**

```

void pdisassoc_image_res (
    Pint          ws_id,          /* workstation identifier */
    Pint          image_res_id    /* image resource identifier */
);

```

---

**SET DEVICE COORDINATE CLIP REGIONS 3**

```

void pset_dc_clip_regions3 (
    Pint          ws_id,          /* workstation identifier */
    const Plimit3_list *limit_list /* list of DC clip regions */
);

```

---

**SET DEVICE COORDINATE CLIP REGIONS**

```

void pset_dc_clip_regions (
    Pint          ws_id,          /* workstation identifier */
    const Plimit_list *limit_list /* list of DC clip regions */
);

```

---

---

**SET TARGET MANIPULATION MODE**

```

void pset_targ_manip_mode (
    Pint          ws_id,          /* workstation identifier */
    Pint          targ_manip_mode /* target manipulation mode */
);

```

---

**SET TARGET DISPOSITION**

```

void pset_targ_dispos (
    Pint          ws_id,          /* workstation identifier */
    const Ptarg_op_list *targ_ops /* target operations list */
);

```

---

**SET DISPLAY TARGET**

```

void pset_disp_targ (
    Pint          ws_id,          /* workstation identifier */
    const Ptarg_addr *targ_addr  /* target address */
);

```

---

**SET RENDERING TARGET**

```

void pset_rend_targ (
    Pint          ws_id,          /* workstation identifier */
    const Ptarg_addr *targ_addr  /* target address */
);

```

---

**CLEAR TARGET**

```

void pclear_targ (
    Pint          ws_id,          /* workstation identifier */
    const Ptarg_addr *targ_addr  /* target address */
);

```

**COPY TARGET**


---

```

void pcopy_targ (
    Pint          ws_id,          /* workstation identifier */
    const Ptarg_addr *src_targ_addr, /* source target address */
    const Ptarg_addr *dest_targ_addr /* destination target address */
);

```

---

**CREATE TARGET**


---

```

void pcreate_targ (
    Pint          ws_id,          /* workstation identifier */
    const Ptarg_addr *targ_addr    /* target address */
);

```

---

**DESTROY TARGET**


---

```

void pdestroy_targ (
    Pint          ws_id,          /* workstation identifier */
    const Ptarg_addr *targ_addr    /* target address */
);

```

---

**SET STATE OF VISUAL REPRESENTATION**


---

```

void pset_st_visual_rep (
    Pint          ws_id,          /* workstation identifier */
    Pvisual_st    visual_st       /* state of visual representation */
);

```

---

**SET TARGET STATE OF VISUAL REPRESENTATION**


---

```

void pset_targ_st_visual_rep (
    Pint          ws_id,          /* workstation identifier */
    const Ptarg_addr *targ_addr, /* target address */
    Pvisual_st    visual_st       /* state of visual representation */
);

```

---

---

**ASSOCIATE TRAVERSAL RESOURCE**

```
void passoc_trav_res (
    Pint          ws_id,          /* workstation identifier */
    Pint          res_id,         /* traversal resource identifier */
    const Ptarg_addr *targ_addr /* source target address */
);
```

---

**DISASSOCIATE TRAVERSAL RESOURCE**

```
void pdisassoc_trav_res (
    Pint          ws_id,          /* workstation identifier */
    Pint          res_id         /* traversal resource identifier */
);
```

---

**MANIPULATE TRAVERSAL RESOURCE**

```
void pmanip_trav_res (
    Pint          ws_id,          /* workstation identifier */
    Pint          res_id,         /* traversal resource identifier */
    const Ptrav_res_op *manip_data /* traversal resource operation */
);
```

---

**RESET ALL TRAVERSAL RESOURCES**

```
void preset_all_trav_res (
    Pint          ws_id          /* workstation identifier */
);
```

---

**RETRIEVE WINDOW SYSTEM COLOUR**

```

void pret_window_system_colr (
    Pint      ws_id,          /* workstation identifier      */
    const Pgcrlr *colr,       /* colour sought              */
    Pstore     store,         /* store object for returned value */
    Pdata      **winsys_colr  /* OUT window system colour    */
);

```

---

**SET APPLICATION INTEGER**

```

void pset_appl_int (
    Pint      integer_id,     /* application integer identifier */
    Pint      value           /* value of application integer   */
);

```

---

**SET APPLICATION REAL**

```

void pset_appl_real (
    Pint      real_id,        /* application real identifier    */
    Pfloat     value          /* value of application real      */
);

```

---

**13.2 Output primitive functions****CIRCLE 3**

```

void pcircle3 (
    const Ppoint3 *ctr_point, /* centre point                */
    Pfloat        radius,     /* radius                      */
    const Pvec3   ref_vecs[2] /* reference vectors            */
);

```

---

**CIRCLE**

```

void pcircle (
    const Ppoint    *ctr_point,    /* centre point    */
    Pfloat          radius         /* radius          */
);

```

---

**CIRCULAR ARC 3**

```

void pcircular_arc3 (
    const Ppoint3    *ctr_point,    /* centre point    */
    Pfloat           radius,         /* radius          */
    const Pvec3      ref_vecs[2],    /* reference vectors */
    Pfloat           start,          /* start angle     */
    Pfloat           end,            /* end angle       */
);

```

---

**CIRCULAR ARC**

```

void pcircular_arc (
    const Ppoint    *ctr_point,    /* centre point    */
    Pfloat          radius,         /* radius          */
    Pfloat          start,          /* start angle     */
    Pfloat          end,            /* end angle       */
);

```

---

**ELLIPSE 3**

```

void pellipse3 (
    const Ppoint3    *ctr_point,    /* centre point    */
    const Pvec3      *major_ref_vec, /* major axis reference vector */
    const Pvec3      *minor_ref_vec, /* minor axis reference vector */
);

```

---

**ELLIPSE**


---

```

void pellipse (
    const Ppoint    *ctr_point,      /* centre point          */
    const Pvec      *major_ref_vec,  /* major axis reference vector */
    const Pvec      *minor_ref_vec   /* minor axis reference vector */
);

```

---

**ELLIPTICAL ARC 3**

```

void pelliptical_arc3 (
    const Ppoint3    *ctr_point,      /* centre point          */
    const Pvec3      *major_ref_vec,  /* major axis reference vector */
    const Pvec3      *minor_ref_vec,  /* minor axis reference vector */
    Pfloat           start,           /* start angle           */
    Pfloat           end              /* end angle             */
);

```

---

**ELLIPTICAL ARC**

```

void pelliptical_arc (
    const Ppoint    *ctr_point,      /* centre point          */
    const Pvec      *major_ref_vec,  /* major axis reference vector */
    const Pvec      *minor_ref_vec,  /* minor axis reference vector */
    Pfloat           start,           /* start angle           */
    Pfloat           end              /* end angle             */
);

```

---

**FILL CIRCLE 3**

```

void pfill_circle3 (
    const Ppoint3    *ctr_point,      /* centre point          */
    Pfloat           radius,          /* radius                */
    const Pvec3      ref_vecs[2]     /* reference vectors      */
);

```

---

**FILL CIRCLE**


---

```

void pfill_circle (
    const Ppoint      *ctr_point,      /* centre point      */
    Pfloat            radius,          /* radius            */
);

```

---

**CIRCULAR ARC CLOSE 3**

```

void pcircular_arc_close3 (
    const Ppoint3      *ctr_point,      /* centre point      */
    Pfloat            radius,          /* radius            */
    const Pvec3        ref_vecs[2],    /* reference vectors  */
    Pfloat            start,          /* start angle       */
    Pfloat            end,            /* end angle         */
    Pclosure          type,          /* closure type      */
);

```

---

**CIRCULAR ARC CLOSE**

```

void pcircular_arc_close (
    const Ppoint      *ctr_point,      /* centre point      */
    Pfloat            radius,          /* radius            */
    Pfloat            start,          /* start angle       */
    Pfloat            end,            /* end angle         */
    Pclosure          type,          /* closure type      */
);

```

---

**FILL ELLIPSE 3**

```

void pfill_ellipse3 (
    const Ppoint3      *ctr_point,      /* centre point      */
    const Pvec3        *major_ref_vec,  /* major axis reference vector */
    const Pvec3        *minor_ref_vec,  /* minor axis reference vector */
);

```

**FILL ELLIPSE**


---

```

void pfill_ellipse (
    const Ppoint    *ctr_point,      /* centre point          */
    const Pvec      *major_ref_vec,  /* major axis reference vector */
    const Pvec      *minor_ref_vec   /* minor axis reference vector */
);

```

---

**ELLIPTICAL ARC CLOSE 3**

```

void pelliptical_arc_close3 (
    const Ppoint3    *ctr_point,      /* centre point          */
    const Pvec3      *major_ref_vec,  /* major axis reference vector */
    const Pvec3      *minor_ref_vec,  /* minor axis reference vector */
    Pfloat           start,            /* start angle           */
    Pfloat           end,              /* end angle             */
    Pclosure         type              /* closure type          */
);

```

---

**ELLIPTICAL ARC CLOSE**

```

void pelliptical_arc_close(
    const Ppoint    *ctr_point,      /* centre point          */
    const Pvec      *major_ref_vec,  /* major axis reference vector */
    const Pvec      *minor_ref_vec,  /* minor axis reference vector */
    Pfloat           start,            /* start angle           */
    Pfloat           end,              /* end angle             */
    Pclosure         type              /* closure type          */
);

```

---

### 13.3 Attribute specification functions

#### 13.3.1 Bundled attribute selection

---

##### SET HIGHLIGHTING INDEX

```
void pset_highl_ind (  
    Pint          highl_ind          /* highlighting index      */  
);
```

#### 13.3.2 Individually selected bundled attributes

---

##### SET LINETYPE ADAPTABILITY

```
void pset_linetype_adapt (  
    Plinetype_adapt    adaptability  /* linetype adaptability  */  
);
```

---

##### SET LINETYPE CONTINUITY

```
void pset_linetype_cont (  
    Plinetype_cont    continuity     /* linetype continuity    */  
);
```

---

##### SET LINETYPE OFFSET

```
void pset_linetype_offset (  
    Pfloat            offset         /* linetype offset        */  
);
```

---

##### SET LINECAP

```
void pset_linecap (  
    Plinecap          linecap        /* linecap                 */  
);
```

---

**SET LINEJOIN**

```
void pset_linejoin (
    Plinejoin      linejoin      /* linejoin          */
);
```

---

**SET LINEMITRE LIMIT**

```
void pset_linemitre_limit (
    Pfloat          limit        /* linemitre limit    */
);
```

---

**SET EDGETYPE ADAPTABILITY**

```
void pset_edgetype_adapt (
    Pedgetype_adapt adaptability /* edgetype adaptability */
);
```

---

**SET EDGETYPE CONTINUITY**

```
void pset_edgetype_cont (
    Pedgetype_cont continuity    /* edgetype continuity */
);
```

---

**SET EDGETYPE OFFSET**

```
void pset_edgetype_offset (
    Pfloat          offset      /* edgetype offset     */
);
```

---

**SET EDGECAP**

```
void pset_edgcap (
    Pedgecap      edgcap      /* edgcap*/
);
```

---

**SET EDGEJOIN**

```
void pset_edgejoin (
    Pedgejoin      edgejoin    /* edgejoin      */
);
```

---

**SET EDGEMITRE LIMIT**

```
void pset_edgemitre_limit (
    Pfloat          limit      /* edgemitre limit      */
);
```

---

**SET HIGHLIGHTING METHOD**

```
void pset_highl_method (
    const Phighl_method *method /* highlighting method */
);
```

---

**SET TRANSPARENCY**

```
void pset_transparency (
    Pfloat          transparency /* transparency      */
);
```

---

**SET BACK TRANSPARENCY**

```
void pset_back_transparency (
    Pfloat    back_transparency    /* back transparency */
);
```

---

**SET ALPHA SOURCE SELECTOR**

```
void pset_alpha_src_sel (
    const Pint_list *alpha_src_sel    /* alpha source selector list */
);
```

---

**SET ALPHA DATA SELECTION INDEX**

```
void pset_alpha_data_sel_ind (
    Pint        alpha_data_sel_ind    /* alpha data selection index */
);
```

---

**SET ACTIVE TEXTURES**

```
void pset_active_textures (
    const Pint_list *active_textures    /* list of active textures */
);
```

---

**SET BACK ACTIVE TEXTURES**

```
void pset_back_active_textures (
    const Pint_list *back_active_textures /* list of active textures */
);
```

---

**SET TEXTURE PERSPECTIVE CORRECTION**

```
void pset_texture_perspect_corr (  
    Pperspect_corr    perspect_corr    /* texture perspective correction */  
);
```

---

**SET TEXTURE SAMPLING FREQUENCY**

```
void pset_texture_sampling_freq (  
    Pint              sampling_freq      /* texture sampling frequency */  
);
```

---

**SET TEXTURE RESOURCE OPTIMIZATION HEURISTICS**

```
void pset_texture_res_opt_heur (  
    const Ptexture_res_opt_heur *heuristics /* heuristics */  
);
```

**13.3.3 Individual attributes**

---

**SET CONDITION FLAGS**

```
void pset_cond_flags (  
    const Pcond_flags *flags      /* condition flag masks */  
);
```

---

**SET CONDITION FLAGS FROM TESTS**

```
void pset_cond_flags_from_tests (  
    const Pcond_test_list *tests    /* list of condition flag tests */  
);
```

### 13.3.4 Workstation attribute table definitions

---

#### SET POLYLINE REPRESENTATION FULL

```
void pset_line_rep_full (
    Pint          ws_id,      /* workstation identifier */
    Pint          index,      /* polyline bundle index */
    const Pline_bundle_full *rep /* polyline representation full */
);
```

---

#### SET POLYLINE REPRESENTATION MASK

```
void pset_line_rep_mask (
    Pint          ws_id,      /* workstation identifier */
    Pint          index,      /* polyline bundle index */
    Ppolyline_mask mask,      /* polyline validity mask */
    const Pline_bundle_full rep /* polyline representation */
);
```

---

#### SET POLYMARKER REPRESENTATION MASK

```
void pset_marker_rep_mask (
    Pint          ws_id,      /* workstation identifier */
    Pint          index,      /* polymarker bundle index */
    Ppolymarker_mask mask,      /* polymarker validity mask */
    const Pmarker_bundle_plus rep /* polymarker representation */
);
```

---

#### SET TEXT REPRESENTATION MASK

```
void pset_text_rep_mask (
    Pint          ws_id,      /* workstation identifier */
    Pint          index,      /* text bundle index */
    Ptext_mask     mask,      /* text validity mask */
    const Ptext_bundle_plus rep /* text representation */
);
```

---

**SET INTERIOR REPRESENTATION MASK**

```

void pset_int_rep_mask (
    Pint          ws_id,    /* workstation identifier    */
    Pint          index,    /* interior bundle index    */
    Pint          mask,     /* interior validity mask    */
    const Pint_bundle_plus rep /* interior representation */
);

```

---

**SET EDGE REPRESENTATION FULL**

```

void pset_edge_rep_full (
    Pint          ws_id,    /* workstation identifier    */
    Pint          index,    /* edge bundle index        */
    const Pedge_bundle_full *rep /* edge representation full */
);

```

---

**SET EDGE REPRESENTATION MASK**

```

void pset_edge_rep_mask (
    Pint          ws_id,    /* workstation identifier    */
    Pint          index,    /* edge bundle index        */
    Pedge_mask    mask,     /* edge validity mask        */
    const Pedge_bundle_full *rep /* edge representation full */
);

```

---

**SET EXTENDED PATTERN REPRESENTATION**

```

void pset_ext_pat_rep (
    Pint          ws_id,    /* workstation identifier    */
    Pint          pat_ind,  /* pattern bundle index      */
    const Ppattern *pattern /* extended pattern representation */
);

```

**SET PATTERN REPRESENTATION MASK**

```

void pset_pat_rep_mask (
    Pint          ws_id,          /* workstation identifier */
    Pint          pat_ind,        /* pattern bundle index */
    Ppattern_mask mask,          /* pattern validity mask */
    const Ppat_rep *pat_bundle,   /* pattern representation */
    const Ppat_rep_plus *pat_rep_plus, /* pattern representation plus */
    const Ppattern *pattern       /* ext. pattern representation */
);

```

NOTE — Only the parameters indicated by the mask need be provided. Other representation parameters may reference null structures or unused representation structures;

**SET TEXTURE REPRESENTATION**

```

void pset_texture_rep (
    Pint          ws_id,          /* workstation identifier */
    Pint          index,         /* texture index */
    const Ptexture_rep *rep       /* texture representation */
);

```

**SET TEXTURE REPRESENTATION MASK**

```

void pset_texture_rep_mask (
    Pint          ws_id,          /* workstation identifier */
    Pint          index,         /* texture index */
    Ptexture_mask mask,          /* texture validity mask */
    const Ptexture_rep *rep       /* texture representation */
);

```

NOTE — Only those fields of the structures within the texture representation that are specified by the mask are referenced.

---

**SET TEXTURE PARAMETRIZATION**

```
void pset_texture_param (  
    Pint          ws_id, /* workstation identifier */  
    Pint          index, /* texture index */  
    const Ptexture_param *param /* texture parametrization */  
);
```

---

**SET TEXTURE COMPOSITION**

```
void pset_texture_composition (  
    Pint          ws_id, /* workstation identifier */  
    Pint          index, /* texture index */  
    const Ptexture_compos *compos /* texture composition */  
);
```

---

**SET TEXTURE SAMPLING**

```
void pset_texture_sampling (  
    Pint          ws_id, /* workstation identifier */  
    Pint          index, /* texture index */  
    const Ptexture_sampling *sampling /* texture sampling */  
);
```

---

**SET TEXTURE BINDING**

```
void pset_texture_binding (  
    Pint          ws_id, /* workstation identifier */  
    Pint          index, /* texture index */  
    const Ptexture_binding *binding /* texture binding */  
);
```

---

**SET HIGHLIGHTING REPRESENTATION**

```

void pset_highl_rep (
    Pint          ws_id,          /* workstation identifier */
    Pint          highl_ind,      /* highlighting bundle index */
    const Phighl_method *method  /* highlighting method */
);

```

---

**SET TRANSPARENCY MODE**

```

void pset_transparency_mode (
    Pint          ws_id,          /* workstation identifier */
    Pint          mode           /* transparency mode */
);

```

---

**SET DEPTH CUE REPRESENTATION MASK**

```

void pset_depth_cue_rep_mask (
    Pint          ws_id,          /* workstation identifier */
    Pint          index,         /* depth cue bundle index */
    Pdepth_cue_mask mask,       /* depth cue validity mask */
    const Pdepth_cue_rep *rep    /* depth cue representation */
);

```

---

**SET TRANSPARENCY THRESHOLDS**

```

void pset_transparency_thresholds (
    Pint          ws_id,          /* workstation identifier */
    const Pfloat_list *thresholds /* list of transparency thresholds */
);

```

**SET REFLECTANCE REPRESENTATION MASK**

```

void pset_refl_rep_mask (
    Pint          ws_id,      /* workstation identifier */
    Pint          index,      /* reflectance bundle index */
    Prefl_mask    mask,       /* reflectance validity mask */
    const Prefl_rep *rep,     /* reflectance representation */
);

```

**13.3.5 Workstation attribute filter definition****SET APPLICATION FILTER**

```

void pset_appl_filter (
    Pint          ws_id,      /* workstation identifier */
    Pint          filter_id,   /* application filter identifier */
    const Pfilter *filter,     /* application filter */
);

```

**13.3.6 Attribute utility functions****CREATE MIPMAP TEXTURE**

```

void pcreate_mipmap_texture (
    Pint          ws_id,      /* workstation identifier */
    Pint          src_image_res_id, /* source image resource id */
    Pint          mipmap_image_res_id, /* mipmap image resource id */
    Pint          max_levels, /* max mipmap levels */
    Pint          creation_heuristic /* mipmap creation heuristic */
);

```

**DEFINE LINETYPE**

```

void pdefine_linetype (
    Pint          linetype, /* linetype */
    Pfloat        repeat_length, /* repeat length */
    const Pfloat_list *segment_lengths /* segment length list */
);

```

**DEFINE MARKER TYPE**


---

```

void pdefine_marker_type (
    Pint          marker_type,      /* marker type          */
    const Pmarker_desc *marker      /* marker descriptor    */
);

```

**13.4 Transformation and clipping functions****13.4.1 View construction functions****SET VIEW REFERENCE POINT 3**


---

```

void pset_view_ref_point3 (
    Pint          ws_id,            /* workstation id        */
    Pint          view_ind,         /* view index            */
    const Ppoint3 *view_ref_point   /* view reference point   */
);

```

**SET VIEW REFERENCE POINT**


---

```

void pset_view_ref_point (
    Pint          ws_id,            /* workstation id        */
    Pint          view_ind,         /* view index            */
    const Ppoint *view_ref_point    /* view reference point   */
);

```

**SET VIEW PLANE NORMAL**


---

```

void pset_view_plane_norm (
    Pint          ws_id,            /* workstation id        */
    Pint          view_ind,         /* view index            */
    const Pvec3   *view_norm_vec    /* view normal vector     */
);

```

**SET VIEW UP VECTOR 3**

```

void pset_view_up_vec3 (
    Pint          ws_id,          /* workstation id          */
    Pint          view_ind,       /* view index              */
    const Pvec3   *view_up_vec   /* view up vector          */
);

```

**SET VIEW UP VECTOR**

```

void pset_view_up_vec (
    Pint          ws_id,          /* workstation id          */
    Pint          view_ind,       /* view index              */
    const Pvec    *view_up_vec   /* view up vector          */
);

```

**SET VIEW WINDOW LIMITS**

```

void pset_view_win_limits (
    Pint          ws_id,          /* workstation id          */
    Pint          view_ind,       /* view index              */
    const Plimit  *win           /* view window limits      */
);

```

**SET PROJECTION VIEWPORT 3**

```

void pset_proj_vp3 (
    Pint          ws_id,          /* workstation id          */
    Pint          view_ind,       /* view index              */
    const Plimit3 *proj_vp       /* projection viewport limits */
);

```

---

**SET PROJECTION VIEWPORT**

```

void pset_proj_vp (
    Pint          ws_id,          /* workstation id          */
    Pint          view_ind,       /* view index              */
    const Plimit  *proj_vp       /* projection viewport limits */
);

```

---

**SET PROJECTION TYPE**

```

void pset_proj_type (
    Pint          ws_id,          /* workstation id          */
    Pint          view_ind,       /* view index              */
    Pproj_type    proj_type      /* projection type          */
);

```

---

**SET PROJECTION REFERENCE POINT**

```

void pset_proj_ref_point (
    Pint          ws_id,          /* workstation id          */
    Pint          view_ind,       /* view index              */
    const Ppoint3 *proj_ref_point /* projection reference point */
);

```

---

**SET VIEW PLANE DISTANCE**

```

void pset_view_plane_dist (
    Pint          ws_id,          /* workstation id          */
    Pint          view_ind,       /* view index              */
    Pfloat        view_plane     /* view plane distance      */
);

```

---

---

**SET FRONT PLANE DISTANCE**

```
void pset_front_plane_dist (  
    Pint          ws_id,          /* workstation id          */  
    Pint          view_ind,       /* view index              */  
    Pfloat        front_plane    /* front plane distance    */  
);
```

---

**SET BACK PLANE DISTANCE**

```
void pset_back_plane_dist (  
    Pint          ws_id,          /* workstation id          */  
    Pint          view_ind,       /* view index              */  
    Pfloat        back_plane     /* back plane distance     */  
);
```

---

**SET X-Y CLIPPING INDICATOR**

```
void pset_xy_clip_indicator (  
    Pint          ws_id,          /* workstation id          */  
    Pint          view_ind,       /* view index              */  
    Pclip_ind     xy_clip        /* xy clipping indicator    */  
);
```

---

**SET FRONT CLIPPING INDICATOR**

```
void pset_front_clip_indicator (  
    Pint          ws_id,          /* workstation id          */  
    Pint          view_ind,       /* view index              */  
    Pclip_ind     front_clip     /* front clipping indicator */  
);
```

**SET BACK CLIPPING INDICATOR**


---

```

void pset_back_clip_indicator (
    Pint          ws_id,          /* workstation id          */
    Pint          view_ind,       /* view index              */
    Pclip_ind     back_clip       /* back clipping indicator  */
);

```

---

**UPDATE VIEW REPRESENTATION**

```

void pupd_view_rep (
    Pint          ws_id,          /* workstation id          */
    Pint          view_ind,       /* view index              */
    Pint          view_upd_method /* view update method      */
);

```

---

**13.4.2 Workstation utility functions****MAP DEVICE COORDINATES TO WINDOW SYSTEM COORDINATES**

```

void pmap_dc_to_wsc (
    Pint          ws_id,          /* workstation id          */
    const Ppoint_list *dc,       /* device coordinate points */
    Ppoint_list   *wsc           /* OUT window system coordinate points */
);

```

---

**MAP WINDOW SYSTEM COORDINATES TO DEVICE COORDINATES**

```

void pmap_wsc_to_dc (
    Pint          ws_id,          /* workstation id          */
    const Ppoint_list *wsc,       /* window system coordinate points */
    Ppoint_list   *dc            /* OUT device coordinate points */
);

```

---

---

**MAP DEVICE COORDINATES TO WORLD COORDINATES**

```
void pmap_dc_to_wc (
    Pint          ws_id,      /* workstation id          */
    Pint          view_ind,   /* view index              */
    const Ppoint_list *dc,    /* device coordinate points */
    Ppoint_list    *wc        /* OUT world coordinate points */
);
```

**13.5 Structure content functions**

---

**OPEN DIRECT INTERPRETATION STRUCTURE**

```
void popen_di_struct (
    void
);
```

---

**CLOSE DIRECT INTERPRETATION STRUCTURE**

```
void pclose_di_struct (
    void
);
```

---

**INSTANCE STRUCTURE**

```
void pinst_struct (
    Pint          struct_id    /* structure identifier    */
);
```

**CONDITIONAL EXECUTE STRUCTURE**


---

```

void pcond_exec_struct (
    Pint          struct_id,      /* structure identifier */
    const Ptest   *test          /* condition test */
);

```

---

**CONDITIONAL INSTANCE STRUCTURE**

```

void pcond_inst_struct (
    Pint          struct_id,      /* structure identifier */
    const Ptest   *test          /* condition test */
);

```

---

**CONDITIONAL RETURN**

```

void pcond_return (
    const Ptest   *test          /* condition test */
);

```

---

**CONDITIONAL SKIP ELEMENTS**

```

void pcond_skip_elements (
    Pint          skip_count,      /* number of elements to skip */
    const Ptest   *test          /* condition test */
);

```

---

**CONDITIONAL SKIP TO LABEL**

```

void pcond_skip_to_label (
    Pint          label,          /* label to which to skip */
    const Ptest   *test          /* condition test */
);

```

---

**PUSH STATE**


---

```

void ppush_st (
    Pint          struct_id,      /* structure identifier */
    Pref_type     ref_type       /* reference type       */
);

```

---

**POP STATE**

```

void ppop_st (
    void
);

```

---

**COPY ELEMENT FROM STRUCTURE**

```

void pcopy_elem_struct (
    Pint          struct_id,      /* structure identifier */
    Pint          elem_num       /* element number       */
);

```

---

**COPY ELEMENT RANGE FROM STRUCTURE**

```

void pcopy_elem_range_struct (
    Pint          struct_id,      /* structure identifier */
    Pint          elem_ptr_1_value, /* element position 1   */
    Pint          elem_ptr_2_value, /* element position 2   */
);

```

---

**COPY ELEMENTS BETWEEN LABELS FROM STRUCTURE**

```

void pcopy_elems_between_labels_struct (
    Pint          struct_id,      /* structure identifier */
    Pint          label1_id,      /* label identifier 1    */
    Pint          label2_id       /* label identifier 2    */
);

```

---

**MOVE ELEMENT FROM STRUCTURE**


---

```

void pmove_elem_struct (
    Pint          struct_id,          /* structure identifier */
    Pint          elem_num           /* element number */
);

```

---

**MOVE ELEMENT RANGE FROM STRUCTURE**

```

void pmove_elem_range_struct (
    Pint          struct_id,          /* structure identifier */
    Pint          elem_ptr_1_value,   /* element position 1 */
    Pint          elem_ptr_2_value    /* element position 2 */
);

```

---

**MOVE ELEMENTS BETWEEN LABELS FROM STRUCTURE**

```

void pmove_elems_between_labels_struct (
    Pint          struct_id,          /* structure identifier */
    Pint          label1_id,         /* label identifier 1 */
    Pint          label2_id         /* label identifier 2 */
);

```

---

**SET WATCH ON ELEMENT RANGE**

```

void pset_watch_on_elem_range (
    Pint          struct_id,          /* watched structure identifier */
    Pint          elem_pos1,         /* element position 1 */
    Pint          elem_pos2         /* element position 2 */
);

```

---

**END WATCH ON ELEMENT RANGE**

```

void pend_watch_on_elem_range (
    void
);

```

## 13.6 Structure display functions

---

### POST STRUCTURE TO GROUP

```
void ppost_struct_to_grp (
    Pint          ws_id,          /* workstation identifier */
    Pint          grp_id,         /* posting group identifier */
    Pint          struct_id,      /* structure identifier */
    Pfloat        pri             /* priority */
);
```

---

### UNPOST STRUCTURES FROM GROUPS

```
void punpost_structs_from_grps (
    Pint          ws_id,          /* workstation identifier */
    Pint_list     grp_ids,       /* posting group identifiers */
    Pint_list     struct_ids     /* structure identifiers */
);
```

---

### UNPOST ALL STRUCTURES FROM GROUP

```
void punpost_all_structs_from_grp (
    Pint          ws_id,          /* workstation identifier */
    Pint          grp_id         /* posting group identifier */
);
```

---

### POST DIRECT INTERPRETATION STRUCTURE

```
void ppost_di_struct (
    Pint          ws_id,          /* workstation identifier */
    Pint          struct_id       /* structure identifier */
);
```

**POST DIRECT INTERPRETATION STRUCTURE TO POSTING GROUP**


---

```

void ppost_di_struct_to_grp (
    Pint          ws_id,          /* workstation identifier */
    Pint          grp_id,        /* group identifier */
    Pint          struct_id      /* structure identifier */
);

```

---

**UNPOST DIRECT INTERPRETATION STRUCTURE**

```

void unpust_di_struct (
    Pint          ws_id          /* workstation identifier */
);

```

---

**RENEW DIRECT INTERPRETATION STATE**

```

void prenew_di_state (
    Pint          ws_id,          /* workstation identifier */
    Pint          struct_id,      /* structure identifier */
    Ptrav_type    trav_type      /* traversal type */
);

```

---

**SET DIRECT INTERPRETATION MODE**

```

void pset_di_mode (
    Pint          ws_id,          /* workstation identifier */
    Ptrav_type    trav_type,      /* traversal type */
    Pdi_mode      mode           /* direct interpretation mode */
);

```

---

**MARK MULTI-PASS START**

```

void pmark_multi_pass_start (
    Pint          ws_id          /* workstation identifier */
);

```

---

**MARK MULTI-PASS COMPLETION**

```
void pmark_multi_pass_compl (  
    Pint                ws_id          /* workstation identifier*/  
);
```

---

**MARK PASS START**

```
void pmark_pass_start (  
    Pint                ws_id          /* workstation identifier */  
);
```

---

**MARK PASS COMPLETION**

```
void pmark_pass_compl (  
    Pint                ws_id          /* workstation identifier */  
);
```

---

**RETRIEVE NUMBER OF PASSES REQUIRED**

```
void pret_num_passes_req (  
    Pint                ws_id,          /* workstation identifier */  
    Ptrav_type          trav_type,      /* traversal type */  
    Pint                *num_passes_req, /* OUT picture passes required */  
    Pboolean            *delineation_req /* OUT pass delineations required */  
);
```

## 13.7 Input functions

### 13.7.1 Pick support functions

---

#### SET SET PICK FILTER

```
void pset_set_pick_filter (
    Pint          ws_id,          /* workstation identifier */
    Pint          dev,            /* set dev. number       */
    const Pfilter *filter        /* echo switch           */
);
```

---

#### SET COMPOSITE PICK FILTER

```
void pset_composite_pick_filter (
    Pint          ws_id,          /* workstation identifier */
    Pint          dev,            /* composite dev. number  */
    const Pfilter *filter        /* echo switch           */
);
```

---

#### SET DIRECT INTERPRETATION PICK FILTER

```
void pset_di_pick_filter (
    Pint          ws_id,          /* workstation identifier */
    const Pfilter *filter        /* pick filter           */
);
```

---

#### SET DIRECT INTERPRETATION PICK CORRELATION POINT 3

```
void pset_di_pick_corr_point3 (
    Pint          ws_id,          /* workstation identifier */
    const Ppoint3 *point         /* pick correlation point */
);
```

---

**SET DIRECT INTERPRETATION PICK CORRELATION POINT**

```

void pset_di_pick_corr_point (
    Pint          ws_id,          /* workstation identifier */
    const Ppoint  *point          /* pick correlation point */
);

```

**SET PICK MAPPING DATA**

```

void pset_pick_mapping_data (
    Pint          ws_id,          /* workstation identifier */
    Pint          pick_type,      /* pick type */
    Ppath_order  order,          /* pick path order */
    const Pfilter filter,        /* pick filter */
    Pecho_switch echo,          /* echo switch */
    Pint          pet,           /* prompt and echo type */
    const Pdi_pick_data *pick_data /* pick data record */
);

```

**MAP DEVICE COORDINATE POINT TO PICK PATHS**

```

void pmap_dc_point_to_pick_paths (
    Pint          ws_id,          /* workstation identifier */
    const Ppoint  *point,        /* device coordinate point */
    Pint          max_paths,      /* max paths to return */
    Pint          depth,         /* pick path depth */
    const Ppick_path *start_path, /* starting pick path */
    Pstore        store,         /* handle to Store object */
    Pint          *err_ind,       /* OUT error indicator */
    Pin_status    *in_status,     /* OUT pick status */
    Ppick_path_list **pick       /* OUT list of pick paths */
);

```

NOTE — The memory referenced by \*pick is managed by store.

### 13.7.2 Logical input device definition functions

---

#### DEFINE LOCATOR

```
void pdefine_locator (
    Pint                ws_id,           /* workstation id */
    Pint                dev,             /* locator dev. number */
    Pint                measure_proc_id, /* locator measure proc. */
    const Ptrig_process_list *triggers, /* list of trigger proc. */
    const Pecho_process_list *echos,    /* list of echo proc. */
    const Pack_process_list *acknowledgements /* list of ack. proc. */
);
```

---

#### DEFINE STROKE

```
void pdefine_stroke (
    Pint                ws_id,           /* workstation id */
    Pint                dev,             /* stroke dev. number */
    Pint                measure_proc_id, /* stroke measure proc. */
    const Ptrig_process_list *triggers, /* list of trigger proc. */
    const Pecho_process_list *echos,    /* list of echo proc. */
    const Pack_process_list *acknowledgements /* list of ack. proc. */
);
```

---

#### DEFINE VALUATOR

```
void pdefine_valuator (
    Pint                ws_id,           /* workstation id. */
    Pint                dev,             /* valuator dev. number */
    Pint                measure_proc_id, /* valuator measure proc */
    const Ptrig_process_list *triggers, /* list of trigger proc. */
    const Pecho_process_list *echos,    /* list of echo proc. */
    const Pack_process_list *acknowledgements /* list of ack. proc. */
);
```

---

---

**DEFINE CHOICE**

```
void pdefine_choice (  
    Pint          ws_id,          /* workstation id.      */  
    Pint          dev,            /* choice dev. number  */  
    Pint          measure_proc_id, /* choice measure proc. */  
    const Ptrig_process_list *triggers, /* list of trigger proc.*/  
    const Pecho_process_list *echos,    /* list of echo proc.   */  
    const Pack_process_list *acknowledgements /* list of ack. proc.*/  
);
```

---

**DEFINE PICK**

```
void pdefine_pick (  
    Pint          ws_id,          /* workstation id.      */  
    Pint          dev,            /* pick dev. number     */  
    Pint          measure_proc_id, /* pick measure proc.   */  
    const Ptrig_process_list *triggers, /* list of trigger proc.*/  
    const Pecho_process_list *echos,    /* list of echo proc.   */  
    const Pack_process_list *acknowledgements /* list of ack. proc.   */  
);
```

---

**DEFINE STRING**

```
void pdefine_string (  
    Pint          ws_id,          /* workstation id.      */  
    Pint          dev,            /* string dev. number   */  
    Pint          measure_proc_id, /* string measure proc. */  
    const Ptrig_process_list *triggers, /* list of trigger proc.*/  
    const Pecho_process_list *echos,    /* list of echo proc.   */  
    const Pack_process_list *acknowledgements /* list of ack. proc.   */  
);
```

**CREATE SET MEASURE**


---

```

void pcreate_set_measure (
    Pint                ws_id,                /* workstation identifier */
    const Pmeas_process *base_measure_proc, /* measure process for set */
    Pint                max_measures,         /* maximum measures in set */
    Pint                *measure_proc_id      /* OUT set measure process */
                                           /* identifier */
);

```

---

**DEFINE SET**

```

void pdefine_set (
    Pint                ws_id,                /* workstation id. */
    Pint                dev,                 /* set dev. number */
    Pint                measure_proc_id,      /* set measure proc. */
    const Ptrig_process_list *triggers,      /* list of trigger proc. */
    const Pecho_process_list *echos,         /* list of echo proc. */
    const Pack_process_list *acknowledgements /* list of ack. proc. */
);

```

---

**CREATE COMPOSITE MEASURE**

```

void pcreate_composite_measure (
    Pint                ws_id,                /* workstation identifier */
    const Pmeas_process_list *measure_procs, /* list of measure proc. */
    Pint                *measure_proc_id     /* OUT composite measure */
                                           /* process identifier */
);

```

---

---

**DEFINE COMPOSITE**

```
void pdefine_composite (  
    Pint          ws_id,          /* workstation id.      */  
    Pint          dev,            /* composite dev. number*/  
    Pint          measure_proc_id, /* composite meas. proc.*/  
    const Ptrig_process_list *triggers, /* list of trigger proc.*/  
    const Pecho_process_list *echos,    /* list of echo proc.   */  
    const Pack_process_list *acknowledgements /* list of ack. proc.  */  
);
```

---

**UNDEFINE LOCATOR**

```
void pundefine_locator (  
    Pint          ws_id,          /* workstation identifier */  
    Pint          dev,            /* locator dev. number   */  
);
```

---

**UNDEFINE STROKE**

```
void pundefine_stroke (  
    Pint          ws_id,          /* workstation identifier */  
    Pint          dev,            /* stroke dev. number     */  
);
```

---

**UNDEFINE VALUATOR**

```
void pundefine_valuator (  
    Pint          ws_id,          /* workstation identifier */  
    Pint          dev,            /* locator dev. number   */  
);
```

---

**UNDEFINE CHOICE**

```
void pundefine_choice (  
    Pint          ws_id,          /* workstation identifier */  
    Pint          dev             /* choice dev. number */  
);
```

---

**UNDEFINE PICK**

```
void pundefine_pick (  
    Pint          ws_id,          /* workstation identifier */  
    Pint          dev             /* pick dev. number */  
);
```

---

**UNDEFINE STRING**

```
void pundefine_string (  
    Pint          ws_id,          /* workstation identifier */  
    Pint          dev             /* string dev. number */  
);
```

---

**DESTROY SET MEASURE**

```
void pdestroy_set_measure (  
    Pint          ws_id,          /* workstation identifier */  
    Pint          measure_proc_id /* set measure process identifier */  
);
```

---

**UNDEFINE SET**

```
void pundefine_set (  
    Pint          ws_id,          /* workstation identifier */  
    Pint          dev             /* set dev. number */  
);
```

---

**DESTROY COMPOSITE MEASURE**

```

void pdestroy_composite_measure (
    Pint          ws_id,          /* workstation identifier */
    Pint          measure_proc_id /* composite measure process id. */
);

```

---

**UNDEFINE COMPOSITE**

```

void pundefine_composite (
    Pint          ws_id,          /* workstation identifier */
    Pint          dev            /* composite dev. number */
);

```

---

**13.7.3 Initialization of input devices**

---

**INITIALIZE SET 3**

```

void pinit_set3 (
    Pint          ws_id,          /* workstation identifier */
    Pint          dev,           /* set dev. number */
    const Pset_measure *init_measure, /* initial measure */
    Pint          pet,           /* prompt and echo type */
    const Plimit3 *echo_volume, /* echo volume boundaries */
    const Pset_data *record      /* input data record */
);

```

---

**INITIALIZE SET**

```

void pinit_set (
    Pint          ws_id,          /* workstation identifier */
    Pint          dev,           /* set dev. number */
    const Pset_measure *init_measure, /* initial measure */
    Pint          pet,           /* prompt and echo type */
    const Plimit *echo_area,     /* echo area boundaries */
    const Pset_data *record      /* input data record */
);

```

**INITIALIZE COMPOSITE 3**

```

void pinit_composite3 (
    Pint          ws_id,          /* workstation identifier */
    Pint          dev,            /* composite dev. number */
    const Pcomposite_measure *init_measure, /* initial measure */
    Pint          pet,            /* prompt and echo type */
    const Plimit3 *echo_volume,   /* echo volume boundaries */
    const Pcomposite_data *record /* input data record */
);

```

**INITIALIZE COMPOSITE**

```

void pinit_composite (
    Pint          ws_id,          /* workstation identifier */
    Pint          dev,            /* composite dev. number */
    const Pcomposite_measure *init_measure, /* initial measure */
    Pint          pet,            /* prompt and echo type */
    const Plimit   *echo_area,    /* echo area boundaries */
    const Pcomposite_data *record /* input data record */
);

```

**13.7.4 Setting the mode of input devices****SET SET MODE**

```

void pset_set_mode (
    Pint          ws_id,          /* workstation identifier */
    Pint          dev,            /* set dev. number */
    Pop_mode      mode,          /* operating mode */
    Pecho_switch  echo           /* echo switch */
);

```

**SET COMPOSITE MODE**

```

void pset_composite_mode (
    Pint          ws_id,      /* workstation identifier */
    Pint          dev,        /* composite dev. number */
    Pop_mode      mode,      /* operating mode */
    Pecho_switch  echo,      /* echo switch */
);

```

**13.7.5 Request input functions****REQUEST SET 3**

```

void preq_set3 (
    Pint          ws_id,      /* workstation identifier */
    Pint          dev,        /* set dev. number */
    Pstore        store,      /* store for measure data */
    Pna_in_status *status,    /* OUT non-atomic input status */
    Pset_measure  **measure   /* OUT pointer to measure data */
);

```

NOTE — The memory referenced by \*measure is managed by store.

**REQUEST SET**

```

void preq_set (
    Pint          ws_id,      /* workstation identifier */
    Pint          dev,        /* set dev. number */
    Pstore        store,      /* store for measure data */
    Pna_in_status *status,    /* OUT non-atomic input status */
    Pset_measure  **measure   /* OUT pointer to measure data */
);

```

NOTE — The memory referenced by \*measure is managed by store.

**REQUEST COMPOSITE 3**

```

void preq_composite3 (
    Pint          ws_id,      /* workstation identifier */
    Pint          dev,        /* composite dev. number */
    Pstore        store,      /* store for measure data */
    Pna_in_status *status,    /* OUT non-atomic input status */
    Pcomposite_measure **measure /* OUT pointer to measure data */
);

```

NOTE — The memory referenced by \*measure is managed by store.

**REQUEST COMPOSITE**

```

void preq_composite (
    Pint          ws_id,      /* workstation identifier */
    Pint          dev,        /* composite dev. number */
    Pstore        store,      /* store for measure data */
    Pna_in_status *status,    /* OUT non-atomic input status */
    Pcomposite_measure **measure /* OUT pointer to measure data */
);

```

NOTE — The memory referenced by \*measure is managed by store.

**13.7.6 Sample input functions****SAMPLE SET 3**

```

void psample_set3 (
    Pint          ws_id,      /* workstation identifier */
    Pint          dev,        /* set dev. number */
    Pstore        store,      /* store for measure data */
    Pna_in_status *status,    /* OUT non-atomic input status */
    Pset_measure  **measure   /* OUT pointer to measure data */
);

```

NOTE — The memory referenced by \*measure is managed by store.

**SAMPLE SET**

```

void psample_set (
    Pint          ws_id,      /* workstation identifier */
    Pint          dev,        /* set dev. number */
    Pstore        store,      /* store for measure data */
    Pna_in_status *status,    /* OUT non-atomic input status */
    Pset_measure  **measure   /* OUT pointer to measure data */
);

```

NOTE — The memory referenced by \*measure is managed by store.

**SAMPLE COMPOSITE 3**

```

void psample_composite3 (
    Pint          ws_id,      /* workstation identifier */
    Pint          dev,        /* composite dev. number */
    Pstore        store,      /* store for measure data */
    Pna_in_status *status,    /* OUT non-atomic input status */
    Pcomposite_measure **measure /* OUT pointer to measure data */
);

```

NOTE — The memory referenced by \*measure is managed by store.

**SAMPLE COMPOSITE**

```

void psample_composite (
    Pint          ws_id,      /* workstation identifier */
    Pint          dev,        /* composite dev. number */
    Pstore        store,      /* store for measure data */
    Pna_in_status *status,    /* OUT non-atomic input status */
    Pcomposite_measure **measure /* OUT pointer to measure data */
);

```

NOTE — The memory referenced by \*measure is managed by store..

### 13.7.7 Event input functions

---

#### GET SET 3

```
void pget_set3 (
    Pstore          store,      /* store for measure data */
    Pna_in_status   *status,    /* OUT non-atomic input status */
    Pset_measure     **measure   /* OUT pointer to measure data */
);
```

NOTE — The memory referenced by \*measure is managed by store.

---

#### GET SET

```
void pget_set (
    Pstore          store,      /* store for measure data */
    Pna_in_status   *status,    /* OUT non-atomic input status */
    Pset_measure     **measure   /* OUT pointer to measure data */
);
```

NOTE — The memory referenced by \*measure is managed by store.

---

#### GET COMPOSITE 3

```
void pget_composite3 (
    Pstore          store,      /* store for measure data */
    Pna_in_status   *status,    /* OUT non-atomic input status */
    Pcomposite_measure **measure /* OUT pointer to measure data */
);
```

NOTE — The memory referenced by \*measure is managed by store

**GET COMPOSITE**

```

void pget_composite (
    Pstore          store,          /* store for measure data */
    Pna_in_status   *status,        /* OUT non-atomic input status */
    Pcomposite_measure **measure    /* OUT pointer to measure data */
);

```

NOTE — The memory referenced by \*measure is managed by store.

**13.7.8 Local input operation functions****ATTACH LOGICAL INPUT DEVICE TO VIEW**

```

void pattach_lid_to_view (
    Pint          lid_ws_id,        /* LID workstation id */
    Pin_class     dev_class,        /* LID class */
    Pint          dev,              /* LID number */
    Pint          view_ws_id,       /* view workstation id */
    Pint          view_ind,         /* view index */
    Pint          view_action_type, /* action type */
    Pint          transfer_type,    /* measure transfer type */
    Pint          view_upd_method   /* view update method */
);

```

**DETACH LOGICAL INPUT DEVICE FROM VIEW**

```

void pdetach_lid_from_view (
    Pint          lid_ws_id,        /* LID workstation id */
    Pin_class     dev_class,        /* LID class */
    Pint          dev,              /* LID number */
    Pint          view_ws_id,       /* view workstation id */
    Pint          view_ind,         /* view index */
    Pint          view_action_type, /* view action type */
    Pint          view_upd_method   /* view update method */
);

```

### 13.7.9 Local lighting functions

---

#### ATTACH LOGICAL INPUT DEVICE TO LIGHT SOURCE

```
void pattach_lid_to_light_src (
    Pint          lid_ws_id,          /* LID workstation id */
    Pin_class     dev_class,          /* LID class */
    Pint          dev,                /* LID number */
    Pint          light_ws_id,        /* light ws id */
    Pint          light_src_ind,      /* light source index */
    Pint          action,             /* light action type */
    Pint          transfer_type       /* measure transfer type */
);
```

---

#### DETACH LOGICAL INPUT DEVICE FROM LIGHT SOURCE

```
void pdetach_lid_from_light_src (
    Pint          LID_ws_id,          /* LID workstation id */
    Pin_class     dev_class,          /* LID class */
    Pint          in_num,             /* LID number */
    Pint          light_ws_id,        /* light ws id */
    Pint          light_src_ind,      /* light source index */
    Pint          action              /* light action type */
);
```

---

### 13.7.10 Direct interpretation picking functions

---

#### INITIALIZE DIRECT INTERPRETATION PICK 3

```
void pinit_di_pick3 (
    Pint          ws_id,              /* workstation identifier */
    Pint          pick_type,          /* pick type */
    Pint          max_sets,           /* max. pick sets to return */
    Pecho_switch  echo_switch,       /* echo switch */
    Pint          pet,                /* prompt and echo type */
    const Plimit3 *echo_vol,         /* echo volume */
    const Pdi_pick_data3 *pick_data, /* pick data record */
    Ppath_order   order              /* pick path order */
);
```

**INITIALIZE DIRECT INTERPRETATION PICK**

```

void pinit_di_pick (
    Pint          ws_id,          /* workstation identifier */
    Pint          pick_type,      /* pick type */
    Pint          max_sets,       /* max. pick sets to return */
    Pecho_switch  echo_switch,    /* echo switch */
    Pint          pet,            /* prompt and echo type */
    const Plimit  *echo_area,     /* echo area */
    const Pdi_pick_data *pick_data, /* pick data record */
    Ppath_order   order          /* pick path order */
);

```

**ENABLE DIRECT INTERPRETATION PICK**

```

void penable_di_pick (
    Pint          ws_id,          /* workstation identifier */
    Pint          struct_id       /* structure identifier */
);

```

**DISABLE DIRECT INTERPRETATION PICK**

```

void pdisable_di_pick (
    Pint          ws_id          /* workstation identifier */
);

```

**TRANSFER DIRECT INTERPRETATION PICK SET**

```

void ptrans_di_pick_set (
    Pint          ws_id,          /* workstation identifier */
    Pstore        store,         /* handle to Store object */
    Pin_status    *in_status,    /* OUT pick status */
    Ppick_path_list **pick       /* OUT direct interpretation
                                /* pick sets
);

```

NOTE — The memory referenced by \*pick is managed by store.

## 13.8 Inquiry functions

### 13.8.1 Inquiry functions for PHIGS description table

---

#### INQUIRE LINETYPE DEFINITION FACILITIES

```
void pinq_linetype_def_facs (
    Pstore          store,          /* handle to store object */
    Pint            *err_ind,       /* OUT error indicator */
    Plinetype_def_facs **facs      /* OUT linetype definition
                                   /* facilities */
);
```

NOTE — The memory referenced by \*facs is managed by store.

---

#### INQUIRE PREDEFINED LINETYPE DEFINITION

```
void pinq_pred_linetype_def (
    Pint            linetype,       /* linetype */
    Pint            num_elems_appl_list /* # elems in appl list */
    Pint            starting_ind,     /* starting element to return */
    Pint            *err_ind,       /* OUT error indicator */
    Pfloat          *repeat_length,  /* OUT dash cycle repeat length
                                   */
    Pfloat_list     *segment_lengths, /* OUT list of segment lengths */
    Pint            *num_elems_impl_list /* OUT # elems in impl list */
);
```

---

#### INQUIRE MARKER TYPE DEFINITION FACILITIES

```
void pinq_marker_type_def_facs (
    Pstore          store,          /* handle to store object */
    Pint            *err_ind,       /* OUT error indicator */
    Pmarker_type_def_facs **facs    /* OUT marker type definition
                                   /* facilities */
);
```

NOTE — The memory referenced by \*facs is managed by store.

**INQUIRE PREDEFINED MARKER TYPE DEFINITION**

```

void pinq_pred_marker_type_def (
    Pint          marker_type,      /* marker type          */
    Pstore        store,            /* handle to store object */
    Pint          *err_ind,         /* OUT error indicator   */
    Pmarker_desc  **marker          /* OUT predef. marker descriptors */
);

```

NOTE — The memory referenced by \*marker is managed by store..

**13.8.2 Inquiry functions for PHIGS state list****INQUIRE SET OF WORKSTATIONS TO WHICH DIRECT INTERPRETATION STRUCTURE POSTED**

```

void pinq_wss_di_struct_posted (
    Pint          num_elems_appl_list, /* # elems in appl. list */
    Pint          starting_ind,        /* starting element to return */
    Pint          *err_ind,            /* OUT error indicator       */
    Pint_list     *ws_id,              /* OUT list of ws identifiers */
    Pint          *num_elems_impl_list /* OUT # elems in impl list */
);

```

**INQUIRE WATCH ON ELEMENT RANGE**

```

void pinq_watch_elem_range (
    Pint          *err_ind,           /* OUT error indicator      */
    Poff_on       *watch_enable_flag, /* OUT watch enable flag    */
    Pint          *struct_id,         /* OUT current watched structure */
    Pint          *elem_pos1,         /* OUT element position 1    */
    Pint          *elem_pos2          /* OUT element position 2    */
);

```

**INQUIRE WATCH RANGE STATE**


---

```

void pinq_watch_range_st (
    Pint      *err_ind,          /* OUT error indicator          */
    Poff_on   *primitive_erase_req, /* OUT primitive erasures required */
    Poff_on   *primitive_redraw_req /* OUT primitive redraws required */
);

```

---

**INQUIRE NUMBER OF DEFINED LINETYPES**

```

void pinq_num_def_linetypes (
    Pint *err_ind,          /* OUT error indicator          */
    Pint *num_defined      /* OUT number defined linetypes */
);

```

---

**INQUIRE NUMBER OF DEFINED MARKER TYPES**

```

void pinq_num_def_marker_types (
    Pint *err_ind,          /* OUT error indicator          */
    Pint *num_defined      /* OUT number defined marker types */
);

```

---

**INQUIRE LINETYPE DEFINITION**

```

void pinq_linetype_def (
    Pint      linetype,          /* linetype                      */
    Pint      num_elems_appl_list, /* # elems in appl list          */
    Pint      starting_ind,      /* starting element to return    */
    Pint      *err_ind,          /* OUT error indicator           */
    Pfloat     *repeat_length,   /* OUT dash cycle repeat length */
    Pfloat_list *segment_lengths, /* OUT list of segment lengths   */
    Pint      *num_elems_impl_list /* OUT # elems in impl list     */
);

```

---

---

**INQUIRE MARKER TYPE DEFINITION**

```

void pinq_marker_type_def (
    Pint      marker_type,      /* marker type          */
    Pstore    store,           /* handle to store object */
    Pint      *err_ind,        /* OUT error indicator    */
    Pmarker_desc **marker      /* OUT list of marker descriptors */
);

```

NOTE — The memory referenced by \*marker is managed by store.

**13.8.3 Inquiry functions for workstation state list**

---

**INQUIRE LIST OF POSTING GROUPS**

```

void pinq_list_post_grps (
    Pint      ws_id,           /* workstation identifier */
    Pint      num_elems_appl_list, /* # elems in appl. list */
    Pint      starting_ind,      /* starting elem to return */
    Pint      *err_ind,          /* OUT error indicator     */
    Pint_list *grp_ids,          /* OUT list of posting groups */
    Pint      *num_elems_impl_list /* OUT # elems in impl. list */
);

```

**INQUIRE ASSOCIATED IMAGE RESOURCES**

```

void pinq_assoc_image_res (
    Pint      ws_id,           /* workstation identifier */
    Pint      num_elems_appl_list, /* # elems in appl list */
    Pint      starting_ind,      /* start index            */
    Pint      *err_ind,          /* OUT error indicator     */
    Pint_list **image_res_ids,   /* OUT list of image resource */
                                /* identifiers             */
    Pint      *num_elems_impl_list /* OUT # elems in impl list */
);

```

**INQUIRE DEVICE COORDINATE CLIP REGIONS 3**

```

void pinq_dc_clip_regions3 (
    Pint          ws_id,          /* workstation identifier */
    Pstore        store,          /* handle to Store object */
    Pint          *err_ind,       /* OUT error indicator */
    Plimit3_list  **limit_list    /* OUT list of clip regions */
);

```

NOTE — The memory referenced by \*limit\_list is managed by store.

**INQUIRE DEVICE COORDINATE CLIP REGIONS**

```

void pinq_dc_clip_regions (
    Pint          ws_id,          /* workstation identifier */
    Pstore        store,          /* handle to Store object */
    Pint          *err_ind,       /* OUT error indicator */
    Plimit_list   **limit_list    /* OUT list of clip regions */
);

```

NOTE — The memory referenced by \*limit\_list is managed by store.

**INQUIRE TARGET MANIPULATION MODE**

```

void pinq_targ_manip_mode (
    Pint          ws_id,          /* workstation identifier */
    Pint          *err_ind,       /* OUT error indicator */
    Pint          *targ_manip_mode /* OUT target manipulation mode */
);

```

**INQUIRE TARGET DISPOSITION**

```

void pinq_targ_dispos (
    Pint          ws_id,          /* workstation identifier */
    Pstore        store,          /* handle to Store object */
    Pint          *err_ind,       /* OUT error indicator */
    Ptarg_op_list **targ_ops      /* OUT target operations list */
);

```

NOTE — The memory referenced by \*targ\_ops is managed by store.

**INQUIRE DISPLAY TARGET**


---

```

void pinq_disp_targ (
    Pint          ws_id,          /* workstation identifier */
    Pint          *err_ind,       /* OUT error indicator */
    Pint          *offset         /* OUT offset from base target */
);

```

---

**INQUIRE RENDERING TARGET**

```

void pinq_rend_targ (
    Pint          ws_id,          /* workstation identifier */
    Pint          *err_ind,       /* OUT error indicator */
    Pint          *offset         /* OUT offset from base target */
);

```

---

**INQUIRE LIST OF HIGHLIGHTING INDICES**

```

void pinq_list_highl_inds (
    Pint          ws_id,          /* workstation identifier */
    Pint          num_elems_appl_list, /* # elems in appl list */
    Pint          starting_ind,      /* starting element to return */
    Pint          *err_ind,         /* OUT error indicator */
    Pint_list     *highl_inds,      /* OUT list of highl indices */
    Pint          *num_elems_impl_list /* OUT # elems in impl list */
);

```

---

**INQUIRE LIST OF DEFINED APPLICATION FILTERS**

```

void pinq_list_def_appl_filters (
    Pint          ws_id,          /* workstation id */
    Pint          num_elems_appl_list, /* num elems in appl list */
    Pint          start_ind,        /* start elem index */
    Pint          *err_ind,         /* OUT error indicator */
    Pint_list     *filter_ids,      /* OUT list of appl. filters */
    Pint          *num_elems_impl_list /* OUT num elems in impl list */
);

```

**INQUIRE LIST OF TEXTURE INDICES**

```

void pinq_list_texture_inds (
    Pint          ws_id,          /* workstation id          */
    Pint          num_elems_appl_list, /* num elems in appl list */
    Pint          start_ind,       /* start elem index        */
    Pint          *err_ind,        /* OUT error indicator     */
    Pint_list     *indices,        /* OUT list of defined texture */
                                /* indices                  */
    Pint          *num_elems_impl_list /* OUT num elems in impl list */
);

```

**INQUIRE TRANSPARENCY MODE**

```

void pinq_transparency_mode (
    Pint          ws_id,          /* workstation id          */
    Pint          *err_ind,       /* OUT error indicator     */
    Pint          *mode           /* OUT transparency mode   */
);

```

**INQUIRE TRANSPARENCY THRESHOLDS**

```

void pinq_transparency_thresholds (
    Pint          ws_id,          /* workstation id          */
    Pint          num_elems_appl_list, /* num elems in appl list */
    Pint          start_ind,       /* start elem index        */
    Pint          *err_ind,        /* OUT error indicator     */
    Pfloat_list   *thresholds,    /* OUT list of thresholds  */
    Pint          *num_elems_impl_list /* OUT num elems in impl list */
);

```

**INQUIRE DIRECT INTERPRETATION PICK CORRELATION POINT 3**

```

void pinq_di_pick_corr_point3 (
    Pint          ws_id,          /* workstation identifier   */
    Pint          *err_ind,       /* OUT error indicator      */
    Ppoint3       *point         /* OUT pick correlation point */
);

```

**INQUIRE DIRECT INTERPRETATION PICK CORRELATION POINT**

```

void pinq_di_pick_corr_point (
    Pint          ws_id,          /* workstation identifier */
    Pint          *err_ind,       /* OUT error indicator */
    Ppoint        *point         /* OUT pick correlation point */
);

```

**INQUIRE DIRECT INTERPRETATION PICK SET STATUS**

```

void pinq_di_pick_set_status (
    Pint          ws_id,          /* workstation identifier */
    Pint          *err_ind,       /* OUT error indicator */
    Ppick_stat    *pick_stat     /* OUT maximum number of pick reports reached */
);

```

**INQUIRE PICK MAPPING STATE**

```

void pinq_pick_mapping_state (
    Pint          ws_id,          /* workstation identifier */
    Pstore        store,         /* handle to Store object */
    Pint          *err_ind,       /* OUT error indicator */
    Pecho_switch  *echo,         /* OUT pick echo switch */
    Pfilter        **filter,      /* OUT pick filter */
    Pint          *pick_type,     /* OUT pick type */
    Pint          *pet,          /* OUT pick mapping prompt and echo type */
    Pdi_pick_data **pick_data,   /* OUT pick data record */
    Ppath_order   *order         /* pick path order */
);

```

NOTE — The memory referenced by \*filter, \*pick\_type, and \*pick\_data is managed by store.

---

## INQUIRE LISTS OF AVAILABLE LOGICAL INPUT DEVICES

```
void pinq_lists_avail_lids (
    Pint        ws_id,          /* workstation identifier */
    Pstore      store,          /* handle to Store object */
    Pint        *err_ind,       /* OUT error indicator */
    Pint_list   **avail_loc_dev, /* OUT list available locator LIDs */
    Pint_list   **avail_stroke_dev, /* OUT list available stroke LIDs */
    Pint_list   **avail_val_dev, /* OUT list available valuator LIDs */
    Pint_list   **avail_choice_dev, /* OUT list available choice LIDs */
    Pint_list   **avail_pick_dev, /* OUT list available pick LIDs */
    Pint_list   **avail_string_dev, /* OUT list available string LIDs */
    Pint_list   **avail_set_dev, /* OUT list available set LIDs */
    Pint_list   **avail_compos_dev /* OUT list available composite LIDs */
);
```

---

## INQUIRE POSTING GROUP

```
void pinq_post_grp (
    Pint        ws_id,          /* workstation identifier */
    Pint        grp_id,         /* posting group identifier */
    Pstore      store,          /* handle to Store object */
    Pint        *err_ind,       /* OUT error indicator */
    Pint        *view_ind,      /* OUT default view index */
    Ppost_grp_status *post_grp_status, /* OUT posting group status */
    Pbackg_style *backg_style,   /* OUT background style */
    Pbackg_method **backg_method, /* OUT background method data */
    Pborder_indic *border_indic, /* OUT border indicator */
    Pint        *border_ind     /* OUT border index */
);
```

NOTE — The memory referenced by **\*backg\_method** is managed by store.

**INQUIRE POSTED STRUCTURES FROM POSTING GROUP**

```

void pinq_posted_structs_from_post_grp (
    Pint      ws_id,          /* workstation id.          */
    Pint      num_elems_appl_list, /* # elems in appl list    */
    Pint      start_ind,       /* starting index           */
    Pint      *err_ind,        /* OUT error indicator      */
    Pint_list *struct_ids,     /* OUT list of posted struct nets */
    Pint      *num_elems_impl_list /* OUT # elems in impl list */
);

```

**INQUIRE DIRECT INTERPRETATION MODE**

```

void pinq_di_mode (
    Pint      ws_id,          /* workstation identifier    */
    Ptrav_type trav_type,     /* traversal type            */
    Pint      *err_ind,       /* OUT error indicator       */
    Pdi_mode  *mode          /* OUT direct interpretation mode */
);

```

**INQUIRE PICTURE STATUS**

```

void pinq_pict_status (
    Pint      ws_id,          /* workstation identifier    */
    Ptrav_type trav_type,     /* traversal type            */
    Pint      *err_ind,       /* OUT error indicator       */
    Ppict_stat *pict_stat     /* OUT picture status       */
);

```

**INQUIRE TARGET STATE**

```

void pinq_targ_st (
    Pint          ws_id,          /* workstation identifier */
    const Ptarg_addr *targ_addr,  /* target address */
    Pstore        store,          /* handle to Store object */
    Pint          *err_ind,        /* OUT error indicator */
    Pint          *offset,         /* OUT offset from base target */
    Ptarg_data_st *st_nr_pict,     /* OUT state of non-retained */
                                /* picture */
    Ptarg_data_st *st_ret_pict,    /* OUT state of retained */
                                /* picture */
    Pvisual_st     *visual_st,     /* OUT target state of */
                                /* visual rep. */
    Ptarg_empty_st *empty_st,      /* OUT target empty */
    Ptarg_type_list **targ_types   /* OUT target usage list */
);

```

NOTE — The memory referenced by \*targ\_types is managed by store.

**INQUIRE TRAVERSAL RESOURCES ASSOCIATED WITH TARGET**

```

void pinq_trav_res_assoc_targ (
    Pint          ws_id,          /* workstation identifier */
    const Ptarg_addr *targ_addr,  /* target address */
    Pint          num_elems_appl_list, /* # elems in appl list */
    Pint          starting_ind,       /* start index */
    Pint          *err_ind,          /* OUT error indicator */
    Pint_list     *res_ids,          /* OUT list of associated */
                                /* traversal resources */
    Pint          *num_elems_impl_list /* OUT # elems in impl list */
);

```

**INQUIRE TARGET ASSOCIATED WITH TRAVERSAL RESOURCE**

```

void pinq_targ_assoc_trav_res (
    Pint          ws_id,          /* workstation identifier */
    Pint          res_id,         /* traversal resource identifier */
    Pint          *err_ind,        /* OUT error indicator */
    Passoc_flag   *assoc_flag,     /* OUT association flag */
    Pint          *offset,         /* OUT offset from base target */
);

```

**INQUIRE IMAGE RESOURCE**

```

void pinq_image_res (
    Pint          ws_id,          /* workstation identifier */
    Pint          image_res_id,   /* image resource identifier */
    Pstore        store,         /* store */
    Pint          *err_ind,       /* OUT error indicator */
    Pint_size     *dims,         /* OUT m,n dimensions */
    Pimage_res    **image_res,   /* OUT image resource */
    Paccess_flag  *access_flag,  /* OUT access flag */
);

```

NOTE — The memory referenced by \*image\_res is managed by store.

**INQUIRE POSTED DIRECT INTERPRETATION STRUCTURE**

```

void pinq_posted_di_struct (
    Pint          ws_id,          /* workstation identifier */
    Ptrav_type    trav_type,     /* traversal type */
    Pint          *err_ind,       /* OUT error indicator */
    Pposted_ind   *posted_ind,   /* OUT posted indicator */
    Pint          *grp_id,       /* OUT posting group identifier */
);

```

**INQUIRE POLYLINE REPRESENTATION FULL**

```

void pinq_line_rep_full (
    Pint          ws_id,          /* workstation id */
    Pint          index,         /* polyline bundle index */
    Pint          *err_ind,       /* OUT error indicator */
    Pline_bundle_full *rep       /* polyline representation full */
);

```

**INQUIRE EDGE REPRESENTATION FULL**

```

void pinq_edge_rep_full (
    Pint          ws_id,          /* workstation id          */
    Pint          index,          /* edge bundle index       */
    Pint          *err_ind,        /* OUT error indicator      */
    Pedge_bundle_full *rep        /* edge representation full */
);

```

**INQUIRE EXTENDED PATTERN REPRESENTATION**

```

void pinq_ext_pat_rep (
    Pint          ws_id,          /* workstation identifier   */
    Pint          index,          /* pattern index            */
    Pinq_type     type,          /* type of returned value   */
    Pstore        store,          /* handle to store object   */
    Pint          *err_ind,        /* OUT error indicator      */
    Ppattern      **pattern       /* OUT pattern data         */
);

```

NOTE — The memory referenced by \*pattern is managed by store.

**INQUIRE VIEW STATUS**

```

void pinq_view_status (
    Pint          ws_id,          /* workstation id          */
    Pint          view_ind,       /* view index              */
    Pint          *err_ind,        /* OUT error indicator      */
    Pview_status  *view_status    /* OUT view status         */
);

```

**INQUIRE VIEW REFERENCE POINT 3**

```

void pinq_view_ref_point3 (
    Pint          ws_id,          /* workstation id          */
    Pint          view_ind,       /* view index              */
    Pint          *err_ind,        /* OUT error indicator      */
    Ppoint3       *view_ref_point /* OUT view reference point */
);

```

---

**INQUIRE VIEW REFERENCE POINT**

```
void pinq_view_ref_point (  
    Pint          ws_id,          /* workstation id          */  
    Pint          view_ind,       /* view index              */  
    Pint          *err_ind,       /* OUT error indicator     */  
    Ppoint        *view_ref_point /* OUT view reference point */  
);
```

---

**INQUIRE VIEW PLANE NORMAL**

```
void pinq_view_plane_norm (  
    Pint          ws_id,          /* workstation id          */  
    Pint          view_ind,       /* view index              */  
    Pint          *err_ind,       /* OUT error indicator     */  
    Pvec3         *view_norm_vec  /* OUT view plane normal   */  
);
```

---

**INQUIRE VIEW UP VECTOR 3**

```
void pinq_view_up_vec3 (  
    Pint          ws_id,          /* workstation id          */  
    Pint          view_ind,       /* view index              */  
    Pint          *err_ind,       /* OUT error indicator     */  
    Pvec3         *view_up_vec    /* OUT view up vector      */  
);
```

---

**INQUIRE VIEW UP VECTOR**

```
void pinq_view_up_vec (  
    Pint          ws_id,          /* workstation id          */  
    Pint          view_ind,       /* view index              */  
    Pint          *err_ind,       /* OUT error indicator     */  
    Pvec          *view_up_vec    /* OUT view up vector      */  
);
```

**INQUIRE VIEW WINDOW LIMITS**


---

```

void pinq_view_win_limits (
    Pint          ws_id,          /* workstation id          */
    Pint          view_ind,       /* view index              */
    Pint          *err_ind,       /* OUT error indicator     */
    Plimit        *win           /* OUT view window limits  */
);

```

---

**INQUIRE PROJECTION VIEWPORT 3**

```

void pinq_proj_vp3 (
    Pint          ws_id,          /* workstation id          */
    Pint          view_ind,       /* view index              */
    Pint          *err_ind,       /* OUT error indicator     */
    Plimit3       *proj_vp       /* OUT projection viewport limits */
);

```

---

**INQUIRE PROJECTION VIEWPORT**

```

void pinq_proj_vp (
    Pint          ws_id,          /* workstation id          */
    Pint          view_ind,       /* view index              */
    Pint          *err_ind,       /* OUT error indicator     */
    Plimit        *proj_vp       /* OUT projection viewport limits */
);

```

---

**INQUIRE PROJECTION TYPE**

```

void pinq_proj_type (
    Pint          ws_id,          /* workstation id          */
    Pint          view_ind,       /* view index              */
    Pint          *err_ind,       /* OUT error indicator     */
    Pproj_type    *proj_type     /* OUT projection type     */
);

```

---

**INQUIRE PROJECTION REFERENCE POINT**


---

```

void pinq_proj_ref_point (
    Pint          ws_id,          /* workstation id          */
    Pint          view_ind,       /* view index              */
    Pint          *err_ind,       /* OUT error indicator     */
    Ppoint3       *proj_ref_point /* OUT projection reference point */
);

```

---

**INQUIRE VIEW PLANE DISTANCE**

```

void pinq_view_plane_dist (
    Pint          ws_id,          /* workstation id          */
    Pint          view_ind,       /* view index              */
    Pint          *err_ind,       /* OUT error indicator     */
    Pfloat        *view_plane     /* OUT view plane distance */
);

```

---

**INQUIRE FRONT PLANE DISTANCE**

```

void pinq_front_plane_dist (
    Pint          ws_id,          /* workstation id          */
    Pint          view_ind,       /* view index              */
    Pint          *err_ind,       /* OUT error indicator     */
    Pfloat        *front_plane    /* OUT front plane distance */
);

```

---

**INQUIRE BACK PLANE DISTANCE**

```

void pinq_back_plane_dist (
    Pint          ws_id,          /* workstation id          */
    Pint          view_ind,       /* view index              */
    Pint          *err_ind,       /* OUT error indicator     */
    Pfloat        *back_plane     /* OUT back plane distance */
);

```

---

**INQUIRE X-Y CLIPPING INDICATOR**


---

```

void pinq_xy_clip_indicator (
    Pint          ws_id,          /* workstation id          */
    Pint          view_ind,       /* view index              */
    Pint          *err_ind,       /* OUT error indicator     */
    Pclip_ind     *xy_clip       /* OUT x-y clipping indicator */
);

```

---

**INQUIRE FRONT CLIPPING INDICATOR**

```

void pinq_front_clip_indicator (
    Pint          ws_id,          /* workstation id          */
    Pint          view_ind,       /* view index              */
    Pint          *err_ind,       /* OUT error indicator     */
    Pclip_ind     *front_clip    /* OUT front clipping indicator */
);

```

---

**INQUIRE BACK CLIPPING INDICATOR**

```

void pinq_back_clip_indicator (
    Pint          ws_id,          /* workstation id          */
    Pint          view_ind,       /* view index              */
    Pint          *err_ind,       /* OUT error indicator     */
    Pclip_ind     *back_clip     /* OUT back clipping indicator */
);

```

---

**INQUIRE HIGHLIGHTING REPRESENTATION**

```

void pinq_highl_rep (
    Pint          ws_id,          /* workstation identifier   */
    Pint          index,         /* highlighting index       */
    Pinq_type     type,          /* type of returned value   */
    Pstore        store,         /* handle to store object   */
    Pint          *err_ind,       /* OUT error indicator     */
    Phighl_method **method      /* OUT highlighting method data */
);

```

NOTE — The memory referenced by \*method is managed by store.

**INQUIRE TEXTURE REPRESENTATION**

```

void pinq_texture_rep (
    Pint          ws_id,          /* workstation id          */
    Pint          index,          /* texture index           */
    Pinq_type     type,           /* type of returned values */
    Pstore        store,          /* handle to Store object  */
    Pint          *err_ind,        /* OUT error indicator     */
    Ptexture_rep  **rep           /* OUT texture representation */
);

```

NOTE — The memory referenced by \*rep is managed by store.

**INQUIRE DIRECT INTERPRETATION PICK STATE 3**

```

void pinq_di_pick_st3 (
    Pint          ws_id,          /* workstation identifier   */
    Pinq_type     type,           /* type of returned value   */
    Pstore        store,          /* store for measure data   */
    Pint          *err_ind,        /* OUT error indicator      */
    Pecho_switch  *echo,          /* OUT echo switch          */
    Pfilter        **pick_filter, /* OUT di pick filter       */
    Ppoint3       *correlation_pt, /* OUT pick correlation point */
    Pint          *pick_type,      /* OUT pick type            */
    Pint          *max_sets,       /* OUT max sets to return   */
    Pin_status     *init_status,   /* OUT initial status       */
    Ppick_path_list **init_pick_sets, /* OUT initial di pick sets */
    Pint          *pet,           /* OUT prompt and echo type */
    Plimit3        *echo_vol,      /* OUT echo volume          */
    Ppick_data     **pick_data,    /* OUT input data record    */
    Ppath_order    *order         /* OUT pick path order      */
);

```

NOTE — The memory referenced by \*pick\_filter, \*pick\_type, \*init\_pick\_sets, and \*pick\_data is managed by store.

**INQUIRE DIRECT INTERPRETATION PICK STATE**

```

void pinq_di_pick_st (
    Pint          ws_id,          /* workstation identifier */
    Pint          type,           /* type of returned value */
    Pstore        store,         /* store for measure data */
    Pint          *err_ind,       /* OUT error indicator */
    Pecho_switch  *echo_switch,   /* OUT echo switch */
    Pfilter       **pick_filter,  /* OUT di pick filter */
    Ppoint        *correlation_pt, /* OUT pick correlation point */
    Pint          *pick_type,     /* OUT pick type */
    Pint          *max_sets,      /* OUT max sets to return */
    Pint          *init_status,   /* OUT initial status */
    Ppick_path_list **init_pick_sets, /* OUT initial di pick sets */
    Pint          *pet,           /* OUT prompt and echo type */
    Plimit        *echo_area,     /* OUT echo area */
    Ppick_data    **pick_data,    /* OUT input data record */
    Ppath_order   *order         /* OUT pick path order */
);

```

NOTE — The memory referenced by \*pick\_filter, \*pick\_type, \*init\_pick\_sets, and \*pick\_data is managed by store.

**INQUIRE APPLICATION FILTER**

```

void pinq_appl_filter (
    Pint          ws_id,          /* workstation identifier */
    Pint          filter_sel,     /* filter selection */
    Pstore        store,         /* handle to store object */
    Pint          *err_ind,       /* OUT error indicator */
    Pfilter       **appl_filter  /* OUT application filter */
);

```

NOTE — The memory referenced by \*appl\_filter is managed by store.

NOTE — The memory referenced by \*avail\_loc\_dev, \*avail\_stk\_dev, \*avail\_val\_dev, \*avail\_cho\_dev, \*avail\_pik\_dev, \*avail\_stg\_dev, \*avail\_set\_dev, and \*avail\_cmp\_dev is managed by store.

**INQUIRE LOGICAL INPUT DEVICE DEFINITION**

```

void pinq_lid_def (
    Pint          ws_id,          /* workstation identifier */
    Pin_class     dev_class,      /* input class            */
    Pint          device,         /* device number          */
    Pstore        store,          /* handle to Store object */
    Pint          *err_ind,       /* OUT error indicator    */
    Pint          *meas_proc,     /* OUT measure process    */
    Ptrig_process_list **trig_procs, /* OUT trigger processes */
    Pecho_process_list **echo_procs, /* OUT echo processes    */
    Pack_process_list **ack_procs  /* OUT ack. processes     */
);

```

NOTE — The memory referenced by \*trig\_procs, \*echo\_procs, and \*ack\_procs is managed by store.

**INQUIRE SET MEASURE DEFINITION**

```

void pinq_set_meas_def (
    Pint          ws_id,          /* workstation identifier */
    Pint          meas_id,        /* set measure process id */
    Pint          *err_ind,       /* OUT error indicator    */
    Pint          *max_meas,      /* OUT max measures in set */
    Pmeas_process *meas_proc     /* OUT base measure process */
);

```

**INQUIRE SET DEVICE STATE 3**

```
void pinq_set_st3 (
```

```

    Pint          ws_id,          /* workstation identifier */
    Pint          dev,            /* set device number */
    Pstore        store,          /* store for measure data */
    Pint          *err_ind,        /* OUT error indicator */
    Pop_mode      *mode,          /* OUT operating mode */
    Pecho_switch  *echo,          /* OUT echo switch */
    Pfilter        **filter,       /* OUT set pick filter */
    Pset_measure  **measure,       /* OUT initial measure */
    Pint          *pet,            /* OUT prompt and echo type */
    Plimit3        *echo_vol,      /* OUT echo volume */
    Pset_data      **set_data      /* OUT input data record */

```

```
);
```

NOTE — The memory referenced by \*filter, \*measure, and \*set\_data is managed by store.

**INQUIRE SET DEVICE STATE**

```
void pinq_set_st (
```

```

    Pint          ws_id,          /* workstation identifier */
    Pint          dev,            /* set device number */
    Pstore        store,          /* store for measure data */
    Pint          *err_ind,        /* OUT error indicator */
    Pop_mode      *mode,          /* OUT operating mode */
    Pecho_switch  *echo,          /* OUT echo switch */
    Pfilter        **filter,       /* OUT set pick filter */
    Pset_measure  **measure,       /* OUT initial measure */
    Pint          *pet,            /* OUT prompt and echo type */
    Plimit        *echo_area,     /* OUT echo area */
    Pset_data      **set_data      /* OUT input data record */

```

```
);
```

NOTE — The memory referenced by \*filter, \*measure, and \*set\_data is managed by store.

**INQUIRE COMPOSITE MEASURE DEFINITION**

```

void pinq_composite_meas_def (
    Pint          ws_id,          /* workstation identifier */
    Pint          meas_id,        /* composite measure proc id */
    Pstore        store,          /* store for measure procs */
    Pint          *err_ind,        /* OUT error indicator */
    Pmeas_process_list **meas_procs /* OUT measure processes */
);

```

NOTE — The memory referenced by \*meas\_procs is managed by store

**INQUIRE COMPOSITE DEVICE STATE 3**

```

void pinq_composite_st3 (
    Pint          ws_id,          /* workstation identifier */
    Pint          dev,            /* composite dev. number */
    Pstore        store,          /* store for measure data */
    Pint          *err_ind,        /* OUT error indicator */
    Pop_mode      *mode,          /* OUT operating mode */
    Pecho_switch  *echo,          /* OUT echo switch */
    Pfilter        **filter,       /* OUT composite pick filter */
    Pcomposite_measure **measure, /* OUT initial measure */
    Pint          *pet,            /* OUT prompt and echo type */
    Plimit3        *echo_vol,      /* OUT echo volume */
    Pcomposite_data **composite_data /* OUT input data record */
);

```

NOTE — The memory referenced by \*filter, \*measure, and \*composite\_data is managed by store.

## INQUIRE COMPOSITE DEVICE STATE

```
void pinq_composite_st (
    Pint          ws_id,          /* workstation identifier */
    Pint          dev,            /* composite dev. number */
    Pstore        store,          /* store for measure data */
    Pint          *err_ind,       /* OUT error indicator */
    Pop_mode      *mode,         /* OUT operating mode */
    Pecho_switch  *echo,         /* OUT echo switch */
    Pfilter        **filter,      /* OUT composite pick filter */
    Pcomposite_measure **measure, /* OUT initial measure */
    Pint          *pet,           /* OUT prompt and echo type */
    Plimit        *echo_area,     /* OUT echo area */
    Pcomposite_data **composite_data /* OUT input data record */
);
```

NOTE — The memory referenced by \*filter, \*measure, and \*composite\_data is managed by store.

## INQUIRE LOGICAL INPUT DEVICE ATTACHED TO VIEW

```
void pinq_lid_attached_to_view (
    Pint          ws_id,          /* workstation identifier */
    Pin_class     dev_class,      /* input class */
    Pint          dev,            /* logical input dev. number */
    Pstore        store,          /* store for list of attachment data */
    Pint          *err_ind,       /* OUT error indicator */
    Pint          *num_attached,  /* OUT num view attachments for LID */
    Pview_attach **attached      /* OUT list of view attachments for LID */
);
```

NOTE — The memory referenced by \*attached is managed by store.

---

## INQUIRE LOGICAL INPUT DEVICE ATTACHED TO LIGHT SOURCE

```
void pinq_lid_attached_to_light_src (
    Pint        ws_id,           /* workstation identifier */
    Pin_class    dev_class,       /* input class */
    Pint        dev,             /* logical input dev. number */
    Pstore       store,          /* store for list of attachment data */
    Pint        *err_ind,        /* OUT error indicator */
    Pint        *num_attached,    /* OUT num light source attachments */
    Plight_attach **attached      /* OUT list of light source
                                /* attachments for LID */
);
```

NOTE — The memory referenced by \*attached is managed by store.

### 13.8.4 Inquiry functions for workstation description table

---

## INQUIRE DEVICE COORDINATE CLIP REGIONS FACILITIES

```
void pinq_dc_clip_regions_facs(
    Pint        ws_type,         /* workstation type */
    Pstore       store,          /* handle to Store object */
    Pint        *err_ind,        /* OUT error indicator */
    Pdc_clip_facs **facs        /* OUT DC clip region facilities */
);
```

NOTE — The memory referenced by \*facs is managed by store.

---

## INQUIRE CONFIGURATION SETTING FACILITIES

```
void pinq_config_setting_facs (
    Pint        ws_type,         /* workstation type */
    Pstore       store,          /* handle to Store object */
    Pint        *err_ind,        /* OUT error indicator */
    Pconfig_setting_facs **facs, /* OUT configuration setting
                                /* facilities */
);
```

NOTE — The memory referenced by \*facs is managed by store.

---

## INQUIRE TARGET FACILITIES

```
void pinq_targ_facs (
    Pint          ws_type,          /* workstation type          */
    Pstore        store,            /* handle to Store object    */
    Pint          *err_ind,         /* OUT error indicator       */
    Ptarget_facs  *facs             /* OUT target facilities     */
);
```

NOTE — The memory referenced by \*facs is managed by store.

---

## INQUIRE DEFAULT TARGET DISPOSITION

```
void pinq_def_targ_disp (
    Pint          ws_type,          /* workstation type          */
    Pstore        store,            /* handle to Store object    */
    Pint          *err_ind,         /* OUT error indicator       */
    Ptarg_op_list **targ_ops       /* OUT list of target operations */
);
```

NOTE — The memory referenced by \*targ\_ops is managed by store.

---

## INQUIRE TRAVERSAL RESOURCE FACILITIES

```
void pinq_trav_res_facs (
    Pint          ws_type,          /* workstation type          */
    Pstore        store,            /* handle to Store object    */
    Pint          *err_ind,         /* OUT error indicator       */
    Ptrav_facs    **facs           /* OUT traversal resource facilities */
);
```

NOTE — The memory referenced by \*facs is managed by store.

---

**INQUIRE CONDITIONAL TRAVERSAL FACILITIES**

```

void pinq_cond_trav_facs (
    Pint      ws_type,          /* workstation type          */
    Pstore     store,          /* handle to Store object    */
    Pint      *err_ind,        /* OUT error indicator       */
    Pcond_trav_facs **facs,    /* OUT conditional traversal facilities */
    */
);

```

NOTE — The memory referenced by \*facs is managed by store.

---

**INQUIRE DIRECT INTERPRETATION TRAVERSAL FACILITIES**

```

void pinq_di_trav_facs (
    Pint      ws_type,          /* workstation type          */
    Pstore     store,          /* handle to Store object    */
    Pint      *err_ind,        /* OUT error indicator       */
    Pdi_trav_facs **facs,    /* OUT conditional traversal facilities */
    */
);

```

NOTE — The memory referenced by \*facs is managed by store.

---

**INQUIRE DYNAMICS OF WORKSTATION ATTRIBUTES TEXTURE**

```

void pinq_dyns_ws_attrs_texture (
    Pint      ws_type,          /* workstation type          */
    Pint      *err_ind,        /* OUT error indicator       */
    Pdyn_ws_attrs_texture *dyns /* OUT texture dynamics     */
);

```

---

**INQUIRE DYNAMICS OF POSTING GROUPS**

```

void pinq_dyns_post_grps (
    Pint      ws_type,          /* workstation type          */
    Pint      *err_ind,        /* OUT error indicator       */
    Pdyns_post_grps *dyns      /* OUT posting dynamics     */
);

```

**INQUIRE DEFAULT DIRECT INTERPRETATION PICK DATA 3**

```

void pinq_def_di_pick_data3 (
    Pint          ws_type,          /* workstation type          */
    Pstore        store,            /* store for measure data    */
    Pint          *err_ind,         /* OUT error indicator       */
    Pint_list     **pet_list,       /* OUT list prompt/echo types */
    Plimit3       *echo_vol,        /* OUT echo volume          */
    Pdi_pick_data **pick_data       /* OUT default data record   */
);

```

NOTE — The memory referenced by \*pet\_list and \*pick\_data is managed by store.

**INQUIRE DEFAULT DIRECT INTERPRETATION PICK DATA**

```

void pinq_def_di_pick_data (
    Pint          ws_type,          /* workstation type          */
    Pstore        store,            /* store for measure data    */
    Pint          *err_ind,         /* OUT error indicator       */
    Pint_list     **pet_list,       /* OUT list prompt/echo types */
    Plimit        *echo_area,       /* OUT echo area            */
    Pdi_pick_data **pick_data       /* OUT default data record   */
);

```

NOTE — The memory referenced by \*pet\_list and \*pick\_data is managed by store.

**INQUIRE POSTING GROUP FACILITIES**

```

void pinq_post_grp_facs (
    Pint          ws_type,          /* workstation type          */
    Pstore        store,            /* handle to store object    */
    Pint          *err_ind,         /* OUT error indicator       */
    Ppost_grp_facs **facs          /* OUT posting group facilities */
);

```

NOTE — The memory referenced by \*facs is managed by store.

---

**INQUIRE IMAGE RESOURCE FACILITIES**

```

void pinq_image_res_fac (
    Pint      ws_type,          /* workstation type          */
    Pstore    store,           /* handle to store object    */
    Pint      *err_ind,        /* OUT error indicator       */
    Pint_list **fac,           /* OUT image resource facilities */
);

```

NOTE — The memory referenced by \*fac is managed by store.

---

**INQUIRE LINETYPE DEFINITION SUPPORT**

```

void pinq_linetype_def_support (
    Pint      ws_type,          /* workstation type          */
    Pfloat    repeat_length,    /* repeat length             */
    const Pfloat_list *segment_lengths, /* segment lengths         */
    Pint      *err_ind,        /* error indicator           */
    Psupport_indication *supported /* support indication       */
);

```

---

**INQUIRE EXTENDED PATTERN FACILITIES**

```

void pinq_ext_pat_fac (
    Pint      ws_type,          /* workstation type          */
    Pstore    store,           /* handle to store object    */
    Pint      *err_ind,        /* OUT error indicator       */
    Pext_pat_fac **fac,        /* OUT extended pattern facilities */
);

```

NOTE — The memory referenced by \*fac is managed by store.

**INQUIRE HIGHLIGHTING FACILITIES**

```

void pinq_highl_facs (
    Pint          ws_type,          /* workstation type          */
    Pstore        store,            /* handle to Store object    */
    Pint          *err_ind,         /* OUT error indicator       */
    Phighl_facs   *facs,            /* OUT highlighting facilities */
);

```

NOTE — The memory referenced by \*facs is managed by store.

**INQUIRE ALPHA FACILITIES**

```

void pinq_alpha_facs (
    Pint          ws_type,          /* workstation type          */
    Pstore        store,            /* handle to Store object    */
    Pint          *err_ind,         /* OUT error indicator       */
    Palpha_facs   **facs           /* OUT alpha facilities      */
);

```

NOTE — The memory referenced by \*facs is managed by store.

**INQUIRE TEXTURE MAPPING FACILITIES**

```

void pinq_texture_map_facs (
    Pint          ws_type,          /* workstation type          */
    Pstore        store,            /* handle to Store object    */
    Pint          *err_ind,         /* OUT error indicator       */
    Ptexture_map_facs **texture_map_facs /* OUT texture facilities */
);

```

NOTE — The memory referenced by \*texture\_map\_facs is managed by store.

---

**INQUIRE TEXTURE FACILITIES**

```

void pinq_texture_facs (
    Pint          ws_type,          /* workstation type          */
    Pstore        store,            /* handle to Store object    */
    Pint          *err_ind,         /* OUT error indicator       */
    Ptexture_facs **texture_facs    /* OUT texture facilities    */
);

```

NOTE — The memory referenced by \*texture\_facs is managed by store.

---

**INQUIRE MIPMAP FACILITIES**

```

void pinq_mipmap_facs (
    Pint          ws_type,          /* workstation type          */
    Pint          *err_ind,         /* OUT error indicator       */
    Pmipmap_facs *facs             /* OUT mipmap facilities    */
);

```

---

**INQUIRE NUMBER OF PREDEFINED APPLICATION FILTERS**

```

void pinq_num_pred_appl_filters (
    Pint *err_ind,          /* OUT error indicator       */
    Pint *num_predefined,   /* OUT number predefined appl. filters */
);

```

---

**INQUIRE WORKSTATION STATE TABLE LENGTHS TEXTURE**

```

void pinq_ws_st_table_texture (
    Pint          ws_type,          /* workstation type          */
    Pint          *err_ind,         /* OUT error indicator       */
    Pws_st_tables_texture *lengths  /* OUT lengths of workstation */
                                   /* tables                    */
);

```

**INQUIRE WORKSTATION STATE TABLE LENGTHS HIGHLIGHTING**

```

void pinq_ws_st_table_highl (
    Pint          ws_type,      /* workstation type          */
    Pint          *err_ind,     /* OUT error indicator       */
    Pws_st_tables_highl *lengths /* OUT lengths of workstation */
                                /* tables                    */
);

```

**INQUIRE PICK MAPPING FACILITIES**

```

void pinq_pick_mapping_fac (
    Pint          ws_type,      /* workstation type          */
    Pstore        store,       /* store for pick mapping fac */
    Pint          *err_ind,     /* OUT error indicator       */
    Ppick_mapping_fac *fac     /* OUT pick mapping facilities */
);

```

**INQUIRE NUMBER OF AVAILABLE NON-ATOMIC LOGICAL INPUT DEVICES**

```

void pinq_num_avail_na_in (
    Pint          ws_type,      /* workstation type          */
    Pint          *err_ind,     /* OUT error indicator       */
    Pnum_na_in *numin          /* OUT number of non-atomic LIDs */
);

```

**INQUIRE LOCATOR FACILITIES**

```

void pinq_loc_fac (
    Pint          ws_type,      /* workstation type          */
    Pint          device,       /* locator device number     */
    Pstore        store,       /* store                     */
    Patomic_lid_fac **fac      /* OUT locator facilities    */
);

```

NOTE — The memory referenced by \*fac is managed by store.

**INQUIRE STROKE FACILITIES**

```

void pinq_stroke_facs (
    Pint          ws_type,      /* workstation type          */
    Pint          device,      /* stroke device number      */
    Pstore        store,       /* store                     */
    Pint          *err_ind,     /* OUT error indicator       */
    Patomic_lid_facs **facs    /* OUT stroke facilities     */
);

```

NOTE — The memory referenced by \*facs is managed by store.

**INQUIRE VALUATOR FACILITIES**

```

void pinq_val_facs (
    Pint          ws_type,      /* workstation type          */
    Pint          device,      /* valuator device number    */
    Pstore        store,       /* store                     */
    Pint          *err_ind,     /* OUT error indicator       */
    Patomic_lid_facs **facs    /* OUT valuator facilities   */
);

```

NOTE — The memory referenced by \*facs is managed by store.

**INQUIRE CHOICE FACILITIES**

```

void pinq_choice_facs (
    Pint          ws_type,      /* workstation type          */
    Pint          device,      /* choice device number      */
    Pstore        store,       /* store                     */
    Pint          *err_ind,     /* OUT error indicator       */
    Patomic_lid_facs **facs    /* OUT choice facilities     */
);

```

NOTE — The memory referenced by \*facs is managed by store.

**INQUIRE PICK FACILITIES**

```

void pinq_pick_facs (
    Pint          ws_type,      /* workstation type          */
    Pint          device,      /* pick device number        */
    Pstore        store,       /* store                     */
    Pint          *err_ind,     /* OUT error indicator       */
    Patomic_lid_facs **facs    /* OUT pick facilities       */
);

```

NOTE — The memory referenced by \*facs is managed by store.

**INQUIRE STRING FACILITIES**

```

void pinq_string_facs (
    Pint          ws_type,      /* workstation type          */
    Pint          device,      /* string device number      */
    Pstore        store,       /* store                     */
    Pint          *err_ind,     /* OUT error indicator       */
    Patomic_lid_facs **facs    /* OUT string facilities*/
);

```

NOTE — The memory referenced by \*facs is managed by store.

**INQUIRE SET FACILITIES**

```

void pinq_set_facs (
    Pint          ws_type,      /* workstation type          */
    Pstore        store,       /* store                     */
    Pint          *err_ind,     /* OUT error indicator       */
    Pset_facs    **facs        /* OUT set facilities       */
);

```

NOTE — The memory referenced by \*facs is managed by store.

**INQUIRE COMPOSITE FACILITIES**

```

void pinq_composite_facs (
    Pint          ws_type,          /* workstation type          */
    Pint          device,          /* composite device number   */
    Pstore        store,          /* store                     */
    Pint          *err_ind,        /* OUT error indicator       */
    Pcomposite_facs **facs        /* OUT composite facs       */
);

```

NOTE — The memory referenced by \*facs is managed by store.

**INQUIRE PREDEFINED POSTING GROUP**

```

void pinq_pred_post_grp (
    Pint          ws_type,          /* workstation type          */
    Pint          grp_id,          /* posting group identifier   */
    Pint          *err_ind,        /* OUT error indicator       */
    Pint          *view_ind,       /* OUT default view index    */
    Ppost_grp_status *post_grp_status, /* OUT posting group status */
    Pbackg_style  *backg_style,    /* OUT background style      */
    Pbackg_method *backg_method,   /* OUT background method     */
    Pborder_indic *border_indic,   /* OUT border indicator      */
    Pint          *border_ind       /* OUT border index          */
);

```

**INQUIRE PREDEFINED IMAGE RESOURCE**

```

void pinq_pred_image_res (
    Pint          ws_type,          /* workstation type          */
    Pint          image_res_id,     /* image resource identifier  */
    Pstore        store,          /* handle to store object    */
    Pint          *err_ind,        /* OUT error indicator       */
    Pint_size     *dims,          /* OUT m,n dimensions       */
    Pimage_res    **image_res,     /* OUT image resource        */
    Paccess_flag  *access_flag     /* OUT access flag          */
);

```

NOTE — The memory referenced by \*image\_res is managed by store.

---

**INQUIRE PREDEFINED ASSOCIATION OF TARGET WITH TRAVERSAL RESOURCES**

```

void pinq_pred_assoc_targ_trav_res (
    Pint          ws_type,          /* workstation type */
    const Ptarg_addr *targ_addr,    /* target address */
    Pint          num_elems_appl_list, /* # elems in appl. list */
    Pint          start_ind,        /* start element to return */
    Pint          *err_ind,         /* OUT error indicator */
    Pint_list     **res_ids,        /* OUT list of associated */
                                /* traversal resource ids */
    Pint          *num_elems_impl_list /* # elems in impl. list */
);

```

---

**INQUIRE PREDEFINED ASSOCIATION OF TRAVERSAL RESOURCE WITH TARGET**

```

void pinq_pred_assoc_trav_res_targ (
    Pint          ws_type,          /* workstation type */
    Pint          res_id,           /* traversal resource identifier */
    Pint          *err_ind,         /* OUT error indicator */
    Passoc_flag   *assoc_flag,     /* OUT association flag */
    Pint          *offset,          /* OUT offset from base target */
);

```

---

**INQUIRE MARKER TYPE DEFINITION SUPPORT**

```

void pinq_marker_type_def_support (
    Pint          ws_type,          /* workstation type */
    const Pmarker_desc *marker,    /* marker descriptor */
    Pint          *err_ind,         /* error indicator */
    Psupport_indication *supported /* support indication */
);

```

**INQUIRE PREDEFINED POLYLINE REPRESENTATION FULL**

```

void pinq_pred_line_rep_full (
    Pint          ws_type,      /* workstation type          */
    Pint          index,        /* predefined polyline bundle index */
    Pint          *err_ind,      /* OUT error indicator        */
    Pline_bundle_full *rep      /* polyline representation full */
);

```

**INQUIRE PREDEFINED EDGE REPRESENTATION FULL**

```

void pinq_pred_edge_rep_full (
    Pint          ws_type,      /* workstation type          */
    Pint          index,        /* predefined edge bundle index */
    Pint          *err_ind,      /* OUT error indicator        */
    Pedge_bundle_full *rep      /* edge representation full    */
);

```

**INQUIRE PREDEFINED EXTENDED PATTERN REPRESENTATION**

```

void pinq_pred_ext_pat_rep (
    Pint          ws_type,      /* workstation type          */
    Pint          index,        /* predefined pattern index    */
    Pstore        store,        /* handle to store object      */
    Pint          *err_ind,      /* OUT error indicator        */
    Ppattern      **pattern     /* OUT pattern data           */
);

```

NOTE — The memory referenced by \*pattern is managed by store..

**INQUIRE PREDEFINED HIGHLIGHTING REPRESENTATION**

```

void pinq_pred_highl_rep (
    Pint          ws_type,          /* workstation type          */
    Pint          index,            /* predefined highl. index   */
    Pstore        store,            /* handle to store object    */
    Pint          *err_ind,          /* OUT error indicator       */
    Phighl_method **method          /* OUT highl method data    */
);

```

NOTE — The memory referenced by \*method is managed by store.

**INQUIRE PREDEFINED TEXTURE REPRESENTATION**

```

void pinq_pred_texture_rep (
    Pint          ws_type,          /* workstation type          */
    Pint          index,            /* texture index             */
    Pstore        store,            /* handle to Store object    */
    Pint          *err_ind,          /* OUT error indicator       */
    Ptexture_rep  **rep             /* OUT texture representation */
);

```

NOTE — The memory referenced by \*rep is managed by store.

**INQUIRE PREDEFINED APPLICATION FILTER**

```

void pinq_pred_appl_filter (
    Pint          ws_type,          /* workstation identifier    */
    Pint          filter_sel,       /* filter selection          */
    Pstore        store,            /* handle to store object    */
    Pint          *err_ind,          /* OUT error indicator       */
    Pfilter       **appl_filter    /* OUT application filter    */
);

```

NOTE — The memory referenced by \*appl\_filter is managed by store.

**INQUIRE PREDEFINED SET MEASURE DEFINITION**

```

void pinq_pred_set_meas_def (
    Pint          ws_type,          /* workstation type          */
    Pint          meas_proc_id,     /* set measure proc id      */
    Pint          *err_ind,         /* OUT error indicator       */
    Pint          *max_measures,    /* OUT max measures in set  */
    Pmeas_process *meas_proc       /* OUT base measure process */
);

```

**INQUIRE PREDEFINED COMPOSITE MEASURE DEFINITION**

```

void pinq_pred_composite_meas_def (
    Pint          ws_type,          /* workstation type          */
    Pint          meas_proc_id,     /* composite measure proc id */
    Pstore        store,           /* store for measure data    */
    Pint          *err_ind,         /* OUT error indicator       */
    Pmeas_process_list **meas_procs /* OUT measure processes    */
);

```

NOTE — The memory referenced by \*meas\_procs is managed by store.

**INQUIRE DEFAULT SET DEVICE DATA3**

```

void pinq_def_set_data3 (
    Pint          ws_type,          /* workstation type          */
    Pint          device,          /* set device number         */
    Pstore        store,           /* store for measure data    */
    Pint          *err_ind,         /* OUT error indicator       */
    Pint_list     **pet_list,      /* OUT list prompt/echo types */
    Plimit3       *echo_vol,       /* OUT echo volume           */
    Pset_data     **set_data       /* OUT default data record   */
);

```

NOTE — The memory referenced by \*pet\_list and \*set\_data is managed by store.

**INQUIRE DEFAULT SET DEVICE DATA**

```

void pinq_def_set_data (
    Pint          ws_type,          /* workstation type          */
    Pint          device,          /* set device number        */
    Pstore        store,          /* store for measure data    */
    Pint          *err_ind,        /* OUT error indicator       */
    Pint_list     **pet_list,      /* OUT list prompt/echo types */
    Plimit        *echo_area,     /* OUT echo area            */
    Pset_data     **set_data      /* OUT default data record   */
);

```

NOTE — The memory referenced by \*pet\_list and \*set\_data is managed by store.

**INQUIRE DEFAULT COMPOSITE DEVICE DATA 3**

```

void pinq_def_composite_data3 (
    Pint          ws_type,          /* workstation type          */
    Pint          device,          /* composite device number   */
    Pstore        store,          /* store for measure data    */
    Pint          *err_ind,        /* OUT error indicator       */
    Pint_list     **pet_list,      /* OUT list prompt/echo types */
    Plimit3       *echo_vol,      /* OUT echo volume          */
    Pcomposite_data **composite_data /* OUT default data record   */
);

```

NOTE — The memory referenced by \*pet\_list and \*composite\_data is managed by store.

**INQUIRE DEFAULT COMPOSITE DEVICE DATA**

```

void pinq_def_composite_data (
    Pint          ws_type,          /* workstation type          */
    Pint          device,          /* composite device number   */
    Pstore        store,          /* store for measure data    */
    Pint          *err_ind,        /* OUT error indicator       */
    Pint_list     **pet_list,      /* OUT list prompt/echo types */
    Plimit        *echo_area,     /* OUT echo area            */
    Pcomposite_data **composite_data /* OUT default data record   */
);

```

NOTE — The memory referenced by \*pet\_list and \*composite\_data is managed by store.

### 13.8.5 Inquiry functions for structure state list

---

#### INQUIRE SET OF GROUPS TO WHICH POSTED

```
void pinq_grps_posted (  
    Pint        ws_id,          /* workstation identifier */  
    Pint        struct_id,      /* structure identifier   */  
    Pint        num_elems_appl_list, /* # elems in appl list */  
    Pint        start_ind,      /* starting index         */  
    Pint        *err_ind,       /* OUT error indicator    */  
    Pint_list   *grps,          /* OUT list of posting groups */  
    Pint        *num_elems_impl_list /* OUT # elems in impl list */  
);”
```

## Annex A Data types in compilation order and external functions

Pages 155 to 161

### A.1 Macro definitions

The following definition replaces the corresponding definition:

```
“
#define PE_NOT_STOP (5) /* Ignoring function, func-
tion requires state
(PHOP, *, STOP | DISO, *) */”
```

The following definitions are added numerically by error number within the specified error macro definitions categories:

```
/* State Errors */
#define PE_NOT_DISO (8) /* Ignoring function, func-
tion requires state
(PHOP, *, DISO, *) */

#define PE_NOT_RETAINED_STOP_ONLY (9) /* Ignoring function, func-
tion requires state
(PHOP, *, STOP, *) */

#define PE_NOT_WSOP_AND_DISO (10) /* Ignoring function, func-
tion requires state
(PHOP, WSOP, DISO, *) */

/* Workstation Errors */
#define PE_BAD_TARG_OP (65) /* Ignoring function, one of
the target operations is
not supported */

#define PE_INVALID_TRAV_RES (66) /* Ignoring function, the
resource is not valid */

#define PE_TRAV_RES_ASSOC_TARG (67) /* Ignoring function, the
traversal resource is
already associated with a
target */

#define PE_TRAV_RES_NO_DISASSOC (68) /* Ignoring function, the
resource cannot be disas-
sociated */

#define PE_INCOMPAT_TRAV_RES (69) /* Ignoring function, source
and destination traversal
resources are incompatible
*/

#define PE_DI_STRUCT_NOT_POSTED (71) /* Ignoring function, the
direct interpretation
structure is not posted on
the specified workstation
*/

#define PE_DI_REND_TRAV_PROC_ACTIVE (72) /* Ignoring function, the
direct interpretation ren-
der traversal process is
already active on the
specified workstation */
```

```

#define PE_DI_REND_TRAV_PROC_NOT_ACTIVE (73) /* Ignoring function, the
                                              direct interpretation tra-
                                              versal process is not
                                              active on the specified
                                              workstation */
#define PE_CANNOT_CREATE_TARGET (74) /* Ignoring function, an
                                       additional target could
                                       not be created */
#define PE_NUM_TARGETS_NOT_REDUCED (75) /* Ignoring function, the
                                           number of targets cannot
                                           be reduced below the
                                           default number available
                                           for the respective work-
                                           station type */
#define PE_TARG_NOT_DESTROYED (76) /* Ignoring function, the
                                      target could not be
                                      destroyed */
#define PE_DISP_REND_TARG_NOT_DESTROYED (77) /* Ignoring function, nei-
                                                ther the display target
                                                nor the rendering target
                                                can be destroyed */
#define PE_MULTIPASS_IN_PROGRESS (78) /* Ignoring function, a
                                         multi-pass operation is
                                         already in progress */
#define PE_MULTI_PASS_NOT_IN_PROGRESS (79) /* Ignoring function, a
                                              multi-pass operation is
                                              not in progress */
#define PE_PASS_DEF_IN_PROGRESS (80) /* Ignoring function, a pass
                                       definition is already in
                                       progress */
#define PE_PASS_DEF_NOT_IN_PROGRESS (81) /* Ignoring function, a pass
                                           definition is not in
                                           progress */
#define PE_LT_SRC_WS_NO_OUT_CAPABILITY (82) /* Ignoring function, the
                                              specified light source
                                              workstation does not have
                                              output capability (i.e,
                                              the workstation category
                                              is neither OUTPUT, OUTIN,
                                              nor M0) */
#define PE_POST_GRP_DEF (83) /* Ignoring function, the
                              posting group has already
                              been defined */
#define PE_POST_GRP_NOT_DEF (84) /* Ignoring function, the
                                   posting group has not been
                                   defined */
#define PE_POST_GRP_ID_LESS_THAN_ONE (85) /* Ignoring function, the
                                             posting group identifier
                                             is less than one */

```

#define PE\_MAX\_POST\_GRP\_EXCEEDED (86) /\* Ignoring function, defining this posting group would exceed the maximum number of posting groups supported on the workstation \*/  
 #define PE\_IMAGE\_RES\_NOT\_DEF (87) /\* Ignoring function, image resource not defined \*/  
 #define PE\_BAD\_IMAGE\_SPEC\_METHOD (88) /\* Ignoring function, the image resource image specification method is not supported for this operation \*/  
 #define PE\_IMAGE\_RES\_CAP\_NOT\_SUP (89) /\* Ignoring function, image resource capability is not supported on the workstation \*/  
 #define PE\_SPEC\_IMAGE\_RES\_NOT\_DEF (90) /\* Ignoring function, the specified image resource has not been defined \*/  
 #define PE\_MAX\_IMAGE\_RES\_EXCEEDED (91) /\* Ignoring function, associating this image resource would exceed the maximum number of entries allowed in the workstation image resource table \*/  
 #define PE\_IMAGE\_RES\_EXCEEDS\_CAP\_WS (92) /\* Ignoring function, the image resource exceeds the capabilities of the specified workstation \*/  
 #define PE\_VW\_WS\_OF\_CATEGORY\_MI (93) /\* Ignoring function, the specified view workstation is of category MI \*/  
 #define PE\_LID\_WS\_NOT\_IN\_NOR\_OUTIN (94) /\* Ignoring function, the specified LID workstation is neither of category INPUT nor of category OUTIN \*/  
 #define PE\_NEW\_WS\_TYPE\_NOT\_REALIZED (95) /\* Warning, Not all attributes were fully realized during the creation of the new workstation type \*/  
 #define PE\_WS\_TYPE\_CANNOT\_BE\_MODIFIED (96) /\* Ignoring function, workstation type is a default type or bound to a workstation and cannot be modified \*/  
 /\* Output Attribute Errors \*/  
 #define PE\_NO\_STATE\_SAVED (141) /\* Ignoring function, no state has been saved \*/

#define PE\_SPEC\_PAT\_TYPE\_NOT\_SUP (142) /\* Ignoring function, the specified pattern type is not supported on the specified workstation \*/  
 #define PE\_PAT\_TYPE\_NOT\_SUP\_ON\_INQ (143) /\* Ignoring function, pattern type of requested pattern table entry is not supported by this inquiry \*/  
 #define PE\_MAX\_VIEWS\_EXCEEDED (150) /\* Ignoring function, setting this view table entry would exceed the maximum number of entries allowed \*/  
 #define PE\_INVALID\_LIMITS (151) /\* Ignoring function,  $XMIN \geq XMAX$ ,  $YMIN \geq YMAX$ ,  $ZMIN > ZMAX$ ,  $UMIN \geq UMAX$  or  $VMIN \geq VMAX$  \*/  
 #define PE\_INVALID\_VIEWPORT (152) /\* Ignoring function, invalid viewport:  $XMIN \geq XMAX$ ,  $YMIN \geq YMAX$ ,  $ZMIN > ZMAX$  \*/  
 #define PE\_INVALID\_VIEW\_CLIP\_LIM (153) /\* Ignoring function, invalid view clipping limits:  $XMIN \geq XMAX$ ,  $YMIN \geq YMAX$ ,  $ZMIN > ZMAX$  \*/  
 #define PE\_VIEW\_CLIP\_LIM\_NOT\_NPC (154) /\* Ignoring function, the view clipping limits are not within NPC range \*/  
 #define PE\_PROJ\_VP\_LIMITS\_NOT\_NPC (155) /\* Ignoring function, the projection viewport limits are not within NPC range \*/  
 #define PE\_WS\_WIN\_LIM\_NOT\_NPC (156) /\* Ignoring function, the workstation window limits are not within NPC range \*/  
 #define PE\_WS\_VP\_NOT\_IN\_DISPLAY\_SPACE (157) /\* Ignoring function, the workstation viewport is not within display space \*/  
 #define PE\_INVALID\_VIEW\_PLANES (158) /\* Ignoring function, front plane and back plane distances same and z-extent of projection viewport non-zero \*/  
 #define PE\_VPN\_LEN\_ZERO (159) /\* Ignoring function, the view plane normal has length zero \*/  
 #define PE\_VUP\_LEN\_ZERO (160) /\* Ignoring function, the view up vector has length zero \*/  
 #define PE\_VUP\_VPN\_PARALLEL (161) /\* Ignoring function, view up and view plane normal vectors parallel \*/

|                                          |                                                                                                                                               |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| #define PE_PRP_BETW_FRONT_BACK           | (162) /* Ignoring function, the projection reference point is between the front and back planes */                                            |
| #define PE_PRP_ON_VIEW_PLANE             | (163) /* Ignoring function, the projection reference point cannot be positioned on the view plane */                                          |
| #define PE_BACK_PLN_BEFORE_FRONT_PLN     | (164) /* Ignoring function, the back plane is in front of the front plane */                                                                  |
| #define PE_HIGHL_IND_LT_ONE              | (165) /* Ignoring function, the highlighting index is less than one */                                                                        |
| #define PE_HIGHL_METHOD_NOT_AVAIL        | (166) /* Ignoring function, the specified highlighting method is not available on the specified workstation */                                |
| #define PE_LINETYPE_NOT_DEFINABLE        | (167) /* Ignoring function, the specified linetype does not reference a definable linetype */                                                 |
| #define PE_MAX_DEF_LINETYPES_EXCEEDED    | (168) /* Ignoring function, setting this table entry would exceed the maximum number of entries allowed in the definable linetype table */    |
| #define PE_LINETYPE_NOT_DEFINED          | (169) /* Ignoring function, the specified linetype has not been defined */                                                                    |
| #define PE_LINETYPE_NOT_SUP              | (170) /* Warning, this linetype definition is not supported on at least one of the available workstation types */                             |
| #define PE_LINETYPE_DEF_NOT_AVAIL        | (171) /* Ignoring function, the specified standard or implementation-defined linetype definition is not available */                          |
| #define PE_MARKER_TYPE_NOT_DEFINABLE     | (172) /* Ignoring function, the specified marker type does not reference a definable marker type */                                           |
| #define PE_MAX_DEF_MARKER_TYPES_EXCEEDED | (173) /* Ignoring function, setting this table entry would exceed the maximum number of entries allowed in the definable marker type table */ |

```

#define PE_MARKER_TYPE_NOT_DEFINED      (174) /* Ignoring function, the
                                              specified marker type has
                                              not been defined */
#define PE_MARKER_SHAPE_INVALID         (175) /* Ignoring function, the
                                              marker shape descriptor is
                                              invalid */
#define PE_MARKER_SHAPE_TYPE_NOT_SUP    (176) /* Ignoring function, the
                                              specified marker shape
                                              type is not supported */
#define PE_MARKER_TYPE_DEF_NOT_AVAIL    (177) /* Ignoring function, the
                                              specified standard or
                                              implementation defined
                                              marker type definition is
                                              not available */
#define PE_FILTER_SEL_INVALID           (178) /* Ignoring function, the
                                              filter selection is
                                              invalid */
#define PE_FILTER_NOT_DEFINED           (179) /* Ignoring function, the
                                              specified application fil-
                                              ter has not been defined
                                              */

/* Input Errors */
#define PE_DI_PICK_TRAV_PROC_ACTIVE     (264) /* Ignoring function, the
                                              direct interpretation pick
                                              traversal process is
                                              already active on the
                                              specified workstation */
#define PE_DI_PICK_TRAV_PROC_NOT_ACTIVE (265) /* Ignoring function, the
                                              direct interpretation pick
                                              traversal process is not
                                              active on the specified
                                              workstation */
#define PE_BAD_PICK_TYPE                (266) /* Ignoring function, the
                                              specified pick type is not
                                              available on the speci-
                                              fied workstation */
#define PE_LISTED_MEAS_PROC_INVALID     (267) /* Ignoring function, one of
                                              the listed measure pro-
                                              cesses is invalid */
#define PE_LISTED_TRIG_PROC_INVALID     (268) /* Ignoring function, one of
                                              the listed trigger pro-
                                              cesses is invalid */
#define PE_LISTED_ECHO_PROC_INVALID     (269) /* Ignoring function, one of
                                              the listed echo processes
                                              is invalid */
#define PE_LISTED_ACK_PROC_INVALID      (270) /* Ignoring function, one of
                                              the listed acknowledge-
                                              ment processes is invalid
                                              */
#define PE_LID_NR_IN_USE                (271) /* Ignoring function, device
                                              number already in use */
#define PE_NR_MEAS_INVALID              (272) /* Ignoring function, number
                                              of measures is invalid */

```

#define PE\_MEAS\_ID\_NOT\_AVAIL (273) /\* Ignoring function, the specified measure identifier is not available on the specified workstation \*/  
 #define PE\_MEAS\_ID\_IN\_USE (274) /\* Ignoring function, the specified measure identifier is currently part of a set or composite logical input device definition \*/  
 #define PE\_NO\_PICK\_MEASURE (275) /\* Ignoring function, the specified set or composite device does not have a pick measure \*/  
 #define PE\_LID\_INAPPROP\_FOR\_VW\_ACTION (276) /\* Ignoring function, the logical input device class specified is inappropriate for the view action specified \*/  
 #define PE\_LID\_INAPPROP\_FOR\_LT\_ACT (277) /\* Ignoring function, the input device class specified is inappropriate for the light action specified \*/  
 #define PE\_LT\_ACT\_INAPPROP\_FOR\_LT\_SRC (278) /\* Ignoring function, the light action is inappropriate for the light source specified \*/  
  
 /\* Miscellaneous Errors \*/  
 #define PE\_TEST\_OP\_INVALID (451) /\* Ignoring function, invalid test operator for test type \*/  
 #define PE\_NO\_WINDOW\_SYSTEM (452) /\* Ignoring function, the specified workstation is not operating in a window management system environment \*/  
 #define PE\_WIN\_SYS\_COLR\_NOT\_DETER (453) /\* Ignoring function, the window system colour cannot be determined \*/  
 #define PE\_TEXTR\_COORD\_SRC\_NOT\_AVAIL (600) /\* Ignoring function, the specified coordinate source is not available on the specified workstation \*/  
 #define PE\_DATA\_VALUE\_IND\_LESS\_1 (601) /\* Ignoring function, the specified data value index is less than one \*/  
 #define PE\_TEXTR\_COMPOS\_METHOD\_NOT\_AVAIL (602) /\* Ignoring function, the specified composition method is not available on

```

the specified workstation
*/
#define PE_TEXTR_MIN_METHOD_NOT_AVAIL    (603) /* Ignoring function, the
specified minification
method is not available on
the specified workstation
*/
#define PE_TEXTR_MAG_METHOD_NOT_AVAIL    (604) /* Ignoring function, the
specified magnification
method is not available on
the specified workstation
*/
#define PE_BOUND_COND_NOT_AVAIL          (605) /* Ignoring function, the
specified boundary condi-
tion is not available on
the specified workstation
*/
#define PE_BOUND_CLAMP_METHOD_NOT_AVAIL  (606) /* Ignoring function, the
specified boundary clamp
method is not available on
the specified workstation
*/
#define PE_DEPTH_SAMPL_BIAS_OUT_OF_RANGE (607) /* Ignoring function, the
specified depth sampling
bias hint is out of range
*/
#define PE_TEXTR_IMAGE_RES_NOT_DEFINED   (608) /* Ignoring function, the
specified texture image
resource identifier is not
defined on the specified
workstation */
#define PE_RENDERING_ORDER_NOT_AVAIL     (612) /* Ignoring function, the
specified rendering order
is not available on the
specified workstation */

```

Pages 161 to 164

The following definitions are added numerically by function number to the list of function name macro definitions:

```

#define Pfn_ws_type_create    (268)
#define Pfn_ws_type_set      (269)
#define Pfn_ws_type_get      (270)
#define Pfn_ws_type_destroy   (271)
#define Pfn_redraw_all_structs_from_grp (272)
#define Pfn_redraw_all_structs_on_targ (273)
#define Pfn_redraw_all_structs_from_grp_on_targ (274)
#define Pfn_upd_targ          (275)

```

```

#define Pfn_define_post_grp (276)
#define Pfn_undefine_post_grp (277)
#define Pfn_set_post_grp_status (278)
#define Pfn_set_post_grp_priority (279)
#define Pfn_set_post_grp_backg_style (280)
#define Pfn_set_post_grp_backg_method (281)
#define Pfn_set_post_grp_border_indic (282)
#define Pfn_set_post_grp_border_ind (283)
#define Pfn_assoc_image_res (284)
#define Pfn_disassoc_image_res (285)
#define Pfn_set_dc_clip_regions3 (286)
#define Pfn_set_dc_clip_regions (287)
#define Pfn_set_targ_manip_mode (288)
#define Pfn_set_targ_dispos (289)
#define Pfn_set_disp_targ (290)
#define Pfn_set_rend_targ (291)
#define Pfn_clear_targ (292)
#define Pfn_copy_targ (293)
#define Pfn_create_targ (294)
#define Pfn_destroy_targ (295)
#define Pfn_set_st_visual_rep (296)
#define Pfn_set_targ_st_visual_rep (297)
#define Pfn_assoc_trav_res (298)
#define Pfn_disassoc_trav_res (299)
#define Pfn_manip_trav_res (300)
#define Pfn_reset_all_trav_res (301)
#define Pfn_ret_window_system_colr (302)
#define Pfn_set_appl_int (303)
#define Pfn_set_appl_real (304)
#define Pfn_circle3 (305)
#define Pfn_circle (306)
#define Pfn_circular_arc3 (307)
#define Pfn_circular_arc (308)
#define Pfn_ellipse3 (309)
#define Pfn_ellipse (310)
#define Pfn_elliptical_arc3 (311)
#define Pfn_elliptical_arc (312)
#define Pfn_fill_circle3 (313)
#define Pfn_fill_circle (314)
#define Pfn_circular_arc_close3 (315)
#define Pfn_circular_arc_close (316)
#define Pfn_fill_ellipse3 (317)
#define Pfn_fill_ellipse (318)
#define Pfn_elliptical_arc_close3 (319)
#define Pfn_elliptical_arc_close (320)
#define Pfn_set_highl_ind (321)
#define Pfn_set_linetype_adapt (322)
#define Pfn_set_linetype_cont (323)
#define Pfn_set_linetype_offset (324)
#define Pfn_set_linecap (325)

```

```
#define Pfn_set_linejoin (326)
#define Pfn_set_linemitre_limit (327)
#define Pfn_set_edgetype_adapt (328)
#define Pfn_set_edgetype_cont (329)
#define Pfn_set_edgetype_offset (330)
#define Pfn_set_edgecap (331)
#define Pfn_set_edgejoin (332)
#define Pfn_set_edgemitre_limit (333)
#define Pfn_set_highl_method (334)
#define Pfn_set_transparency (335)
#define Pfn_set_back_transparency (336)
#define Pfn_set_alpha_src_sel (337)
#define Pfn_set_alpha_data_sel_ind (338)
#define Pfn_set_active_textures (339)
#define Pfn_set_back_active_textures (340)
#define Pfn_set_texture_perspect_corr (341)
#define Pfn_set_texture_sampling_freq (342)
#define Pfn_set_texture_res_opt_heur (343)
#define Pfn_set_cond_flags (344)
#define Pfn_set_cond_flags_from_tests (345)
#define Pfn_set_line_rep_full (346)
#define Pfn_set_line_rep_mask (347)
#define Pfn_set_marker_rep_mask (348)
#define Pfn_set_text_rep_mask (349)
#define Pfn_set_int_rep_mask (350)
#define Pfn_set_edge_rep_full (351)
#define Pfn_set_edge_rep_mask (352)
#define Pfn_set_ext_pat_rep (353)
#define Pfn_set_pat_rep_mask (354)
#define Pfn_set_texture_rep (355)
#define Pfn_set_texture_rep_mask (356)
#define Pfn_set_texture_param (357)
#define Pfn_set_texture_composition (358)
#define Pfn_set_texture_sampling (359)
#define Pfn_set_texture_binding (360)
#define Pfn_set_highl_rep (361)
#define Pfn_set_transparency_mode (362)
#define Pfn_set_transparency_thresholds (363)
#define Pfn_set_refl_rep_mask (364)
#define Pfn_set_appl_filter (365)
#define Pfn_create_mipmap_texture (366)
#define Pfn_define_linetype (367)
#define Pfn_define_marker_type (368)
#define Pfn_set_view_ref_point3 (369)
#define Pfn_set_view_ref_point (370)
#define Pfn_set_view_plane_norm (371)
#define Pfn_set_view_up_vec3 (372)
#define Pfn_set_view_up_vec (373)
#define Pfn_set_view_win_limits (374)
#define Pfn_set_proj_vp3 (375)
```

```

#define Pfn_set_proj_vp (376)
#define Pfn_set_proj_type (377)
#define Pfn_set_proj_ref_point (378)
#define Pfn_set_view_plane_dist (379)
#define Pfn_set_front_plane_dist (380)
#define Pfn_set_back_plane_dist (381)
#define Pfn_set_xy_clip_indicator (382)
#define Pfn_set_front_clip_indicator (383)
#define Pfn_set_back_clip_indicator (384)
#define Pfn_upd_view_rep (385)
#define Pfn_map_dc_to_wsc (386)
#define Pfn_map_wsc_to_dc (387)
#define Pfn_map_dc_to_wc (388)
#define Pfn_open_di_struct (389)
#define Pfn_close_di_struct (390)
#define Pfn_inst_struct (391)
#define Pfn_cond_exec_struct (392)
#define Pfn_cond_inst_struct (393)
#define Pfn_cond_return (394)
#define Pfn_cond_skip_elements (395)
#define Pfn_cond_skip_to_label (396)
#define Pfn_push_st (397)
#define Pfn_pop_st (398)
#define Pfn_copy_elem_struct (399)
#define Pfn_copy_elem_range_struct (400)
#define Pfn_copy_elems_between_labels_struct (401)
#define Pfn_move_elem (402)
#define Pfn_move_elem_range (403)
#define Pfn_move_elems_between_labels (404)
#define Pfn_set_watch_on_elem_range (405)
#define Pfn_end_watch_on_elem_range (406)
#define Pfn_post_struct_to_grp (407)
#define Pfn_unpost_structs_from_grps (408)
#define Pfn_unpost_all_structs_from_grp (409)
#define Pfn_post_di_struct (410)
#define Pfn_post_di_struct_to_grp (411)
#define Pfn_unpost_di_struct (412)
#define Pfn_renew_di_state (413)
#define Pfn_set_di_mode (414)
#define Pfn_mark_multi_pass_start (415)
#define Pfn_mark_multi_pass_compl (416)
#define Pfn_mark_pass_start (417)
#define Pfn_mark_pass_compl (418)
#define Pfn_ret_num_passes_req (419)
#define Pfn_set_set_pick_filter (420)
#define Pfn_set_composite_pick_filter (421)
#define Pfn_set_di_pick_filter (422)
#define Pfn_set_di_pick_corr_point3 (423)
#define Pfn_set_di_pick_corr_point (424)
#define Pfn_set_pick_mapping_data (425)

```

```

#define Pfn_map_dc_point_to_pick_paths (426)
#define Pfn_define_locator (427)
#define Pfn_define_stroke (428)
#define Pfn_define_valuator (429)
#define Pfn_define_choice (430)
#define Pfn_define_pick (431)
#define Pfn_define_string (432)
#define Pfn_create_set_measure (433)
#define Pfn_define_set (434)
#define Pfn_create_composite_measure (435)
#define Pfn_define_composite (436)
#define Pfn_undefine_locator (437)
#define Pfn_undefine_stroke (438)
#define Pfn_undefine_valuator (439)
#define Pfn_undefine_choice (440)
#define Pfn_undefine_pick (441)
#define Pfn_undefine_string (442)
#define Pfn_destroy_set_measure (443)
#define Pfn_undefine_set (444)
#define Pfn_destroy_composite_measure (445)
#define Pfn_undefine_composite (446)
#define Pfn_init_set3 (447)
#define Pfn_init_set (448)
#define Pfn_init_composite3 (449)
#define Pfn_init_composite (450)
#define Pfn_set_set_mode (451)
#define Pfn_set_composite_mode (452)
#define Pfn_req_set3 (453)
#define Pfn_req_set (454)
#define Pfn_req_composite3 (455)
#define Pfn_req_composite (456)
#define Pfn_sample_set3 (457)
#define Pfn_sample_set (458)
#define Pfn_sample_composite3 (459)
#define Pfn_sample_composite (460)
#define Pfn_get_set3 (461)
#define Pfn_get_set (462)
#define Pfn_get_composite3 (463)
#define Pfn_get_composite (464)
#define Pfn_attach_lid_to_view (465)
#define Pfn_detach_lid_from_view (466)
#define Pfn_attach_lid_to_light_src (467)
#define Pfn_detach_lid_from_light_src (468)
#define Pfn_init_di_pick3 (469)
#define Pfn_init_di_pick (470)
#define Pfn_enable_di_pick (471)
#define Pfn_disable_di_pick (472)

```

```
#define Pfn_trans_di_pick_set (473)
”
```

Page 164

The following text is appended after the definition of PLINE\_DASH\_DOT:

```
“
#define PLINE_DASH_DOT_DOT (5)
”
```

Page 165 (Page 99 of PHIGS PLUS)

The following text is appended the definition of PCOLR\_HLS:

```
“
#define PCOLR_RGBA (5)
#define PCOLR_CIELUVA (6)
#define PCOLR_HSVA (7)
#define PCOLR_HLSA (8)
”
```

Page 166

The following text is appended:

```
“
#define PHATCH_HORIZ (1)
#define PHATCH_VERT (2)
#define PHATCH_POS_SLOPE (3)
#define PHATCH_NEG_SLOPE (4)
#define PHATCH_HORIZ_VERT_CROSS (5)
#define PHATCH_POS_NEG_SLOPE_CROSS (6)

#define PPICK_HIGHL_PRIM (4)
#define PPICK_HIGHL_PRIM_GROUP (5)
#define PPICK_HIGHL_STRUCT_NETWORK (6)

#define PDI_PICK_HIGHL (1)

#define PPICK_TYPE_WS_DEP (1)
#define PPICK_TYPE_PICK_FIRST (2)
#define PPICK_TYPE_PICK_LAST (3)
#define PPICK_TYPE_PICK_CLOSEST (4)

#define PTARG_MANIP_AUTO (1)
#define PTARG_MANIP_MANUAL (2)

#define PSET_REND_TARG (1)
#define PSET_DISP_TARG (2)
#define PCLEAR_TARG (3)
#define PCOPY_TARG (4)
”
```

```

#define PCLEAR_TRAV_RES (0)
#define PCOPY_TRAV_RES (1)

#define PTRAV_RES_Z_BUF (1)
#define PTRAV_RES_PAINT_BUF (2)

#define PVUM_APPLY_ALL (1)
#define PVUM_APPLY_ORIENTATION (2)

#define PVWA_ROT_ABOUT_U_VRC_AXIS (1)
#define PVWA_ROT_ABOUT_V_VRC_AXIS (2)
#define PVWA_ROT_ABOUT_N_VRC_AXIS (3)
#define PVWA_TRANS_U_VRC_AXIS_CLIP (4)
#define PVWA_TRANS_U_VRC_AXIS_NOCLIP (5)
#define PVWA_TRANS_V_VRC_AXIS_CLIP (6)
#define PVWA_TRANS_V_VRC_AXIS_NOCLIP (7)
#define PVWA_TRANS_N_VRC_AXIS (8)
#define PVWA_SCALE_WIN_UNIFORMLY (9)
#define PVWA_SCALE_VP_UNIFORMLY (10)
#define PVWA_SCALE_WIN_WIDTH (11)
#define PVWA_SCALE_VP_WIDTH (12)
#define PVWA_SCALE_WIN_HEIGHT (13)
#define PVWA_SCALE_VP_HEIGHT (14)
#define PVWA_TRANS_FRONT_CLIP_PLANE (15)
#define PVWA_TRANS_BACK_CLIP_PLANE (16)
#define PVWA_ROT_AROUND_VRP_ALONG_CYL_LAT (17)
#define PVWA_TRANS_EYE_FROM_VRP_OUT (18)
#define PVWA_TRANS_EYE_FROM_VRP_UP (19)
#define PVWA_ROT_EYE_FROM_VRP_UP (20)
#define PVWA_CHG_EYE_POS_WRT_VRP (21)
#define PVWA_CHG_VRP_POS_ROT_UP_WRT_PRP (22)
#define PVWA_CHG_VRP_POS_ROT_RL_WRT_PRP (23)

#define PMTT_MEASURE_CHANGE (1)
#define PMTT_EVENT_WITH_DISCARD (2)
#define PMTT_EVENT_WITH_PROPAGATION (3)

#define PBACKGM_COLOUR_TABLE_0 (1)
#define PBACKGM_COLOUR_INDEX (2)
#define PBACKGM_COLOUR (3)
#define PBACKGM_IMAGE_RESOURCE (4)

#define PIMGSM_UNCOMP_COLR_INDEX_ARRAY (1)
#define PIMGSM_UNCOMP_COLR_ARRAY (2)
#define PIMGSM_WINDOW_SYS_BITMAP (3)
#define PIMGSM_VIDEO_SIGNAL_CHAN_ID (4)
#define PIMGSM_LUMINANCE (5)
#define PIMGSM_LUMINANCE_ALPHA (6)
#define PIMGSM_MIPMAP_COLRS (7)
#define PIMGSM_MIPMAP_LUMINANCE (8)
#define PIMGSM_MIPMAP_LUMINANCE_ALPHA (9)

#define PPATT_COLOUR_INDEX (1)
#define PPATT_COLOUR (2)

```

```
#define PPATT_IMAGE_RESOURCE (3)

#define PSHAPE_POLYLINE (1)
#define PSHAPE_FILL_AREA (2)
#define PSHAPE_CONVEX_FILL_AREA (3)

#define PTEST_ALWAYS_FAIL (0)
#define PTEST_ALWAYS_SUCCEED (1)
#define PTEST_EXTENT3 (2)
#define PTEST_EXTENT (3)
#define PTEST_BOUNDS3 (4)
#define PTEST_BOUNDS (5)
#define PTEST_NAMESET (6)
#define PTEST_APPL_INTEGER (7)
#define PTEST_APPL_REAL (8)

#define PFILTER_TYPE_INVIS (1)
#define PFILTER_TYPE_HIGHL (2)
#define PFILTER_TYPE_PICK (3)
#define PFILTER_TYPE_APPL (4)

#define PTEXTRSF_PER_PIXEL (1)
#define PTEXTRSF_INTERP_DEP (2)

#define PTEXTR_OPT_NO_HINT (1)
#define PTEXTR_OPT_SPEED (2)
#define PTEXTR_OPT_SPACE (3)

#define PALPHASRC_TRANSPARENCY (1)
#define PALPHASRC_COLR_ASPECT (2)
#define PALPHASRC_FACET_COLR (3)
#define PALPHASRC_FACET_DATA (4)
#define PALPHASRC_VERTEX_COLR (5)
#define PALPHASRC_VERTEX_DATA (6)

#define PCOORDSRC_VERTEX_COORD_MC (1)
#define PCOORDSRC_VERTEX_COORD_WC (2)
#define PCOORDSRC_VERTEX_NORMAL_MC (3)
#define PCOORDSRC_VERTEX_NORMAL_WC (4)
#define PCOORDSRC_NURB_SURF_UV (5)
#define PCOORDSRC_DATA (6)
#define PCOORDSRC_REFL_SPHERE_VRC (7)
#define PCOORDSRC_REFL_SPHERE_WC (8)

#define PGCS_GAMMA_ONE (1)
#define PGCS_GAMMA_RED (1)
#define PGCS_GAMMA_TWO (2)
#define PGCS_GAMMA_GREEN (2)
#define PGCS_GAMMA_THREE (3)
#define PGCS_GAMMA_BLUE (3)

#define PCOMPOS_REPLACE (1)
#define PCOMPOS_MODULATE (2)
#define PCOMPOS_BLEND_ENVIRONMENT_COLR (3)
```

```

#define PCOMPOS_DECAL (4)
#define PCOMPOS_DECAL_BACKGROUND (5)

#define PMINM_SINGLE_BASE (1)
#define PMINM_LINEAR_BASE (2)
#define PMINM_SINGLE_IN_MIPMAP (3)
#define PMINM_LINEAR_IN_MIPMAP (4)
#define PMINM_SINGLE_BETWEEN_MIPMAPS (5)
#define PMINM_LINEAR_BETWEEN_MIPMAPS (6)

#define PMAGM_SINGLE_BASE (1)
#define PMAGM_LINEAR_BASE (2)
#define PMAGM_SINGLE_IN_MIPMAP (3)
#define PMAGM_LINEAR_IN_MIPMAP (4)
#define PMAGM_SINGLE_BETWEEN_MIPMAPS (5)
#define PMAGM_LINEAR_BETWEEN_MIPMAPS (6)

#define PBOUND_COND_CLAMP_EXPLICIT_METHOD (1)
#define PBOUND_COND_CLAMP_BORDER (2)
#define PBOUND_COND_WRAP (3)
#define PBOUND_COND_MIRROR (4)

#define PBOUND_CLAMP_DISCONTINUE (1)
#define PBOUND_CLAMP_COLR (2)

#define PRENDORDR_PRELIGHT (1)
#define PRENDORDR_POST_LIGHT (2)

#define PTRANSPMODE_NONE (1)
#define PTRANSPMODE_SCREEN_DOOR (2)
#define PTRANSPMODE_ALPHA_BLEND (3)
#define PTRANSPMODE_TWO_PASS (4)
#define PTRANSPMODE_MULTIPASS (5)

#define PLTA_ADJ_LT_COLR_COMP_1 (1)
#define PLTA_ADJ_LT_COLR_COMP_2 (2)
#define PLTA_ADJ_LT_COLR_COMP_3 (3)
#define PLTA_ADJ_BRIGHT (4)
#define PLTA_ROT_AROUND_X_DIR_VEC (5)
#define PLTA_ROT_AROUND_Y_DIR_VEC (6)
#define PLTA_ROT_AROUND_Z_DIR_VEC (7)
#define PLTA_TRANS_X_LT_POS (8)
#define PLTA_TRANS_Y_LT_POS (9)
#define PLTA_TRANS_Z_LT_POS (10)
#define PLTA_ADJ_CONCENTRATION_EXP (11)
#define PLTA_ADJ_LT_SPREAD_ANGLE (12)

```

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## A.2 Types in compilation order

The following text replaces the definition of `Pint_style`:

```

“
typedef enum {
    /* start of PHIGS enumerations */
    PSTYLE_HOLLOW,
    PSTYLE_SOLID,
    PSTYLE_HATCH,
    PSTYLE_PATTERN,
    PSTYLE_EMPTY,
    /* end of PHIGS enmerations */
    /* start of Full PHIGS enumerations */
    PSTYLE_TEXTURE
    /* end of Full PHIGS enumerations */

} Pint_style;”

```

*The following text is merged into the definition of Paspect:*

```

“
typedef enum {
    /* start of PHIGS enumerations */
    ...,
    /* end of PHIGS enumerations */
    /* start of PHIGS PLUS enumerations */
    ...,
    /* end of PHIGS PLUS enumerations */
    /* start of Full PHIGS enumerations */
    PASPECT_HIGHL_METHOD
    /* end of Full PHIGS enumerations */

} Paspect;”

```

*Page 171*

*The following text replaces the text of the definition of popen\_struct\_status:*

```

“
typedef enum {
    /* start of PHIGS enumerations */
    PSTRUCT_NONE,
    PSTRUCT_OPEN,
    /* end of PHIGS enumerations */
    /* start of Full PHIGS enumerations */
    PSTRUCT_DI
    /* end of Full PHIGS enumerations */

} Popen_struct_status;”

```

The following text replaces the text of the definition of `pin_class`:

```
“
typedef enum {
    /* start of Basic PHIGS enumerations */
    PIN_NONE,
    PIN_LOC,
    PIN_STROKE,
    PIN_VAL,
    PIN_CHOICE,
    PIN_PICK,
    PIN_STRING,
    /* end of Basic PHIGS enumerations */
    /* start of Full PHIGS enumerations */
    PIN_SET,
    PIN_COMPOSITE
    /* end of Full PHIGS enumerations */

} Pin_class;”
```

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The following text is merged into the text of the definition of `pelem_type`:

```
“
typedef enum {
    /* start of PHIGS enumerations */
    ...,
    /* end of PHIGS enumerations */
    /* start of PHIGS PLUS enumerations */
    ...,
    /* end of PHIGS PLUS enumerations */
    /* start of Full PHIGS enumerations */
    PELEM_APPL_INT,
    PELEM_APPL_REAL,
    PELEM_CIRCLE3,
    PELEM_CIRCLE,
    PELEM_CIRCULAR_ARC3,
    PELEM_CIRCULAR_ARC,
    PELEM_ELLIPSE3,
    PELEM_ELLIPSE,
    PELEM_ELLIPTICAL_ARC3,
    PELEM_ELLIPTICAL_ARC,
    PELEM_FILL_CIRCLE3,
    PELEM_FILL_CIRCLE,
    PELEM_CIRCULAR_ARC_CLOSE3,
    PELEM_CIRCULAR_ARC_CLOSE,
    PELEM_FILL_ELLIPSE3,
    PELEM_FILL_ELLIPSE,
    PELEM_ELLIPTICAL_ARC_CLOSE3,
```

```

PELEM_ELLIPTICAL_ARC_CLOSE,
PELEM_HIGHL_IND,
PELEM_LINETYPE_ADAPT,
PELEM_LINETYPE_CONT,
PELEM_LINETYPE_OFFSET,
PELEM_LINECAP,
PELEM_LINEJOIN,
PELEM_LINEMITRE_LIMIT,
PELEM_EDGETYPE_ADAPT,
PELEM_EDGETYPE_CONT,
PELEM_EDGETYPE_OFFSET,
PELEM_EDGECAP,
PELEM_EDGEJOIN,
PELEM_EDGEMITRE_LIMIT,
PELEM_HIGHL_METHOD,
PELEM_TRANSPARENCY,
PELEM_BACK_TRANSPARENCY,
PELEM_ALPHA_SRC_SEL,
PELEM_ALPHA_DATA_SEL_IND,
PELEM_ACTIVE_TEXTURES,
PELEM_BACK_ACTIVE_TEXTURES,
PELEM_TEXTURE_PERSPECT_CORR,
PELEM_TEXTURE_SAMPLING_FREQ,
PELEM_TEXTURE_RES_OPT_HEUR,
PELEM_SET_COND_FLAGS,
PELEM_SET_COND_FLAGS_FROM_TESTS,
PELEM_INST_STRUCT,
PELEM_COND_EXEC_STRUCT,
PELEM_COND_INST_STRUCT,
PELEM_COND_RETURN,
PELEM_COND_SKIP_ELEMS,
PELEM_COND_SKIP_TO_LABEL,
PELEM_PUSH_ST,
PELEM_POP_ST
/* end of Full PHIGS enumerations */

```

```

} Pelem_type;”

```

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The following text is inserted after the definition of Prgb:

```

“
typedef struct {
    Pfloat    cieluv_x;        /* x coefficient          */
    Pfloat    cieluv_y;        /* y coefficient          */
    Pfloat    cieluv_y_lum;    /* y luminance           */
    Pfloat    alpha;           /* alpha                  */
} Pcieluva;

```

```

typedef struct {
    Pfloat    hue;           /* hue                      */
    Pfloat    lightness;     /* lightness                */
    Pfloat    saturation;    /* saturation                */
    Pfloat    alpha;         /* alpha                    */
} Phlsa;

typedef struct {
    Pfloat    hue;           /* hue                      */
    Pfloat    saturation;    /* saturation                */
    Pfloat    value;         /* value                    */
    Pfloat    alpha;         /* alpha                    */
} Phsva;

typedef struct {
    Pfloat    red;           /* red intensity            */
    Pfloat    green;         /* green intensity          */
    Pfloat    blue;          /* blue intensity           */
    Pfloat    alpha;         /* alpha                    */
} Prgba;”

```

The following text replaces the definition of Pcolr\_rep:

```

“
typedef union {
    /* start of Basic PHIGS union members */
    Prgb    rgb;           /* RGB colour specification */
    Pcielv  cielv;         /* CIE L*u*v* colour specification */
    Phls    hls;           /* HLS colour specification */
    Phsv    hsv;           /* HSV colour specification */
    /* end of Basic PHIGS union members */
    /* start of Full PHIGS union members */
    Prgba   rgba;          /* RGB specification with alpha */
    Pcielva cielva;        /* CIE L*u*v* colour specfication with alpha */
    Phlsa   hlsa;          /* HLS colour specificaition with alpha */
    Phsva   hsva;          /* HSV colour specification with alpha */
    /* end of Full PHIGS union members */
    Pdata   unsupp;        /* colour in an unsupported colour model */
    int     impl_dep;      /* implementation defined */
} Pcolr_rep;”

```

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The following type definitions replace the corresponding type definitions:

“

```
typedef struct {
    union Pchoice_pets {
        struct Pchoice_pet_other {
            Pint        unused;
        } pet_other; /* When no echo-specific data is required */
        struct Pchoice_pet_r1{
            Pint        imp_dep;          /* impl. dependent */
        } pet_r1; /* For PET 1 */
        struct Pchoice_pet_r2 {
            Pint        num_prompts;      /* number of prompts */
            Ppr_switch  *prompts;         /* array of prompts */
            Pint        imp_dep;          /* impl. defined */
        } pet_r2; /* For PET 2 */
        struct Pchoice_pet_r3 {
            Pint        num_strings;      /* number of choice strings */
            char        **strings;        /* array of choice strings */
            Pint        imp_dep;          /* impl. defined */
        } pet_r3; /* For PET 3 */
        struct Pchoice_pet_r4 {
            Pint        num_strings;      /* number of alternatives */
            char        **strings;        /* array of strings */
            Pint        imp_dep;          /* impl. defined */
        } pet_r4; /* For PET 4 */
        struct Pchoice_pet_r5 {
            Pint        struct_id;         /* structure identifier */
            Pint        num_pick_ids;      /* number of alternatives */
            Pint        *pick_ids;        /* array of pick identifiers */
            Pint        imp_dep;          /* impl. defined */
        } pet_r5; /* For PET 5 */
        Pint        imp_dep;          /* data for impl. defined pets */
    } pets;
    union Pchoice_measure_data {
        struct Pchoice_meas_other {
            Pint        unused;
        } meas_other; /* When no measure-specific data is required */
        Pint        imp_dep; /* data for impl. defined measure processes */
    } measure_data;
};
```

```

union Pchoice_trigger_data {
    struct Pchoice_trig_other {
        Pint        unused;
    } trig_other; /* When no trigger-specific data is required */
    Pint        imp_dep; /* data for impl. defined trigger processes */
} trigger_data;

union Pchoice_ack_data {
    struct Pchoice_ack_other {
        Pint        unused;
    } ack_other; /* When no ack.-specific data is required */
    Pint        imp_dep; /* data for impl. defined ack. processes */
} acknowledgement_data;

} Pchoice_data;

typedef struct {
    union Pchoice3_pets {
        struct Pchoice3_pet_other {
            Pint        unused;
        } pet_other; /* When no echo-specific data is required */
        struct Pchoice3_pet_r1{
            Pint        imp_dep; /* impl. dependent */
        } pet_r1; /* For PET 1 */
        struct Pchoice3_pet_r2 {
            Pint        num_prompts; /* number of prompts */
            Ppr_switch*prompts; /* array of prompts */
            Pint        imp_dep; /* impl. defined */
        } pet_r2; /* For PET 2 */
        struct Pchoice3_pet_r3{
            Pint        num_strings; /* number of choice strings */
            char        **strings; /* array of choice strings */
            Pint        imp_dep; /* impl. defined */
        } pet_r3; /* For PET 3 */
        struct Pchoice3_pet_r4 {
            Pint        num_strings; /* number of alternatives */
            char        **strings; /* array of strings */
            Pint        imp_dep; /* impl. defined */
        } pet_r4; /* For PET 4 */
        struct Pchoice3_pet_r5 {
            Pint        struct_id; /* structure identifier */
            Pint        num_pick_ids; /* number of alternatives */
            Pint        *pick_ids; /* array of pick identifiers */
            Pint        imp_dep; /* impl. defined */
        } pet_r5; /* For PET 5 */
    }
};

```

```

    Pint      imp_dep; /* data for impl. defined pets */
} pets;
union Pchoice3_measure_data {
    struct Pchoice_meas_other {
        Pint      unused;
    } meas_other; /* When no measure-specific data is required */
    Pint      imp_dep; /* data for impl. defined measure processes */
} measure_data;
union Pchoice3_trigger_data {
    struct Pchoice3_trig_other {
        Pint      unused;
    } trig_other; /* When no trigger-specific data is required */
    Pint      imp_dep; /* data for impl. defined trigger processes */
} trigger_data;
union Pchoice3_ack_data {
    struct Pchoice3_ack_other {
        Pint      unused;
    } ack_other; /* When no ack.-specific data is required */
    Pint      imp_dep; /* data for impl. defined ack. processes */
} acknowledgement_data;
} Pchoice_data3;

typedef struct {
    union Ploc_pets {
        struct Ploc_pet_other {
            Pint      unused;
        } pet_other; /* When no echo-specific data is required */
        struct Ploc_pet_r1 {
            . . . /* impl. dependent */
        } pet_r1; /* Supports standard PET 1 */
        struct Ploc_pet_r2 {
            . . . /* impl. dependent */
        } pet_r2; /* Supports standard PET 2 */
        struct Ploc_pet_r3 {
            . . . /* impl. dependent */
        } pet_r3; /* Supports standard PET 3 */
        struct Ploc_pet_r4 {
            Pline_attrline_attrs; /* polyline attributes */
            Pint      imp_dep; /* impl. dependent */
        } pet_r4; /* Supports standard PET 4 */
    };
};

```

```

struct Ploc_pet_r5 {
    Pline_fill_ctrl_flagline_fill_ctrl_flag; /*ctrl. 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;
    Pint imp_dep; /* data for impl. defined PET's */
} pet_r5; /* Supports standard PET 5 */

struct Ploc_pet_r6 {
    . . . /* impl. dependent */
} pet_r6; /* Supports standard PET 6 */
Pint imp_dep; /* data for impl. defined PET's */
} pets;

union Ploc_measure_data {
    struct Ploc_meas_other {
        Pint unused;
    } meas_other; /* When no measure-specific data is required */
    Pint imp_dep; /* data for impl. defined measure processes */
} measure_data;

union Ploc_trigger_data{
    struct Ploc_trig_other {
        Pint unused;
    } trig_other; /* When no trigger-specific data is required */
    Pint imp_dep; /* data for impl. defined trigger processes */
} trigger_data;

union Ploc_ack_data {
    struct Ploc_ack_other {
        Pint unused;
    } ack_other; /* When no ack.-specific data is required */
    Pint imp_dep; /* data for impl. defined ack. processes */
} acknowledgement_data;
} Ploc_data;

typedef struct {
    union Ploc3_pets {
        struct Ploc3_pet_other {
            Pint unused;
        } pet_other; /* When no echo-specific data is required */
    }
}

```

```

struct Ploc3_pet_r1 {
    . . . /* impl. dependent */
} pet_r1; /* Supports standard PET 1 */
struct Ploc3_pet_r2 {
    . . . /* impl. dependent */
} pet_r2; /* Supports standard PET 2 */
struct Ploc3_pet_r3 {
    . . . /* impl. dependent */
} pet_r3; /* Supports standard PET 3 */
struct Ploc3_pet_r4 {
    Pline_attrs line_attrs; /* polyline attributes */
    Pint imp_dep; /* impl. dependent */
} pet_r4; /* Supports standard PET 4 */
struct Ploc3_pet_r5 {
    Pline_fill_ctrl_flag line_fill_ctrl_flag; /* ctrl. 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;
    Pint imp_dep; /* data for impl. defined PET's */
} pet_r5; /* Supports standard PET 5 */
struct Ploc3_pet_r6 {
    . . . /* impl. dependent */
} pet_r6; /* Supports standard PET 6 */
Pint imp_dep; /* data for impl. defined PET's */
} pets;

union Ploc3_measure_data {
    struct Ploc3_meas_other {
        Pint unused;
    } meas_other; /* When no measure-specific data is required */
    Pint imp_dep; /* data for impl. defined measure processes */
} measure_data;

union Ploc3_trigger_data {
    struct Ploc3_trig_other {
        Pint unused;
    } trig_other; /* When no trigger-specific data is required */
    Pint imp_dep; /* data for impl. defined trigger processes */
} trigger_data;

```

```

union Ploc3_ack_data {
    struct Ploc3_ack_other {
        Pint        unused;
    } ack_other; /* When no ack.-specific data is required */
    Pint        imp_dep; /* data for impl. defined ack. processes */
} acknowledgement_data;

} Ploc_data3;

typedef struct {
    union Ppick_pets {
        struct Ppick_pet_other {
            Pint        unused;
        } pet_other; /* When no echo-specific data is required */
        struct Ppick_pet_r1 {
            Pint        imp_dep; /* impl. dependent */
        } pet_r1; /* For PET 1 */
        Pint        imp_dep; /* data for impl. defined pets */
        struct Ppick_pet_r2 {
            ... /* implementation dependent */
        } pet_r2; /* For PET 2 */
        struct Ppick_pet_r3 {
            ... /* implementation dependent */
        } pet_r3; /* For PET 3 */
        struct Ppick_pet_r4 {
            Pint        highl_ind; /* highlighting index */
            Pint        imp_dep; /* impl. dependent */
        } pet_r4; /* For PET 4 */
        struct Ppick_pet_r5 {
            Pint        highl_ind; /* highlighting index */
            Pint        imp_dep; /* impl. dependent */
        } pet_r5; /* For PET 5 */
        struct Ppick_pet_r6 {
            Pint        highl_ind; /* highlighting index */
            Pint        imp_dep; /* impl. dependent */
        } pet_r6; /* For PET 6 */
        Pint        imp_dep; /* implementation defined PET's */
    } pets;
    union Ppick_measure_data {
        struct Ppick_meas_other {
            Pint        unused;
        } meas_other; /* When no measure-specific data is required */
        Pint        imp_dep; /* data for impl. defined measure processes */
    } measure_data;
}

```

```

union Ppick_trigger_data {
    struct Ppick_trig_other {
        Pint        unused;
    } trig_other; /* When no trigger-specific data is required */
    Pint        imp_dep; /* data for impl. defined pick processes */
} trigger_data;

union Ppick_ack_data {
    struct Ppick_ack_other {
        Pint        unused;
    } ack_other; /* When no ack.-specific data is required */
    Pint        imp_dep; /* data for impl. defined ack. processes */
} acknowledgement_data;

} Ppick_data;

typedef struct {
    union Ppick3_pets {
        struct Ppick3_pet_other {
            Pint        unused;
        } pet_other; /* When no echo-specific data is required */
        struct Ppick3_pet_r1 {
            Pint        imp_dep; /* impl. dependent */
        } pet_r1; /* For PET 1 */
        struct Ppick3_pet_r2 {
            ... /* implementation dependent */
        } pet_r2; /* For PET 2 */
        struct Ppick3_pet_r3 {
            ... /* implementation dependent */
        } pet_r3; /* For PET 3 */
        struct Ppick3_pet_r4 {
            Pint        highl_ind; /* highlighting index */
            Pint        imp_dep; /* impl. dependent */
        } pet_r4; /* For PET 4 */
        struct Ppick3_pet_r5 {
            Pint        highl_ind; /* highlighting index */
            Pint        imp_dep; /* impl. dependent */
        } pet_r5; /* For PET 5 */
        struct Ppick3_pet_r6 {
            Pint        highl_ind; /* highlighting index */
            Pint        imp_dep; /* impl. dependent */
        } pet_r6;
        Pint        imp_dep; /* data for impl. defined pets */
    } pets; /* For PET 6 */
}

```

```

union Ppick3_measure_data {
    struct Ppick3_meas_other {
        Pint        unused;
    } meas_other; /* When no measure-specific data is required */
    Pint        imp_dep; /* data for impl. defined measure processes */
} measure_data;

union Ppick3_trigger_data {
    struct Ppick3_trig_other {
        Pint        unused;
    } trig_other; /* When no trigger-specific data is required */
    Pint        imp_dep; /* data for impl. defined pick processes */
} trigger_data;

union Ppick3_ack_data {
    struct Ppick3_ack_other {
        Pint        unused;
    } ack_other; /* When no ack.-specific data is required */
    Pint        imp_dep; /* data for impl. defined ack. processes */
} acknowledgement_data;
} Ppick_data3;

typedef struct {
    Pint        in_buf_size; /* input buffer size */
    Pint        init_pos; /* initial editing position */
    union Pstring_pets {
        struct Pstring_pet_other {
            Pint        unused;
        } pet_other; /* When no echo-specific data is required */
        struct Pstring_pet_r1 {
            Pint        imp_dep; /* impl. dependent */
        } pet_r1; /* For PET 1 */
        Pint        imp_dep; /* data for impl. defined pets */
    } pets;
    union Pstring_measure_data {
        struct Pstring_meas_other {
            Pint        unused;
        } meas_other; /* When no measure-specific data is required */
        Pint        imp_dep; /* data for impl. defined measure processes */
    } measure_data;
}

```

```

union Pstring_trigger_data {
    struct Pstring_trig_other {
        Pint        unused;
    } trig_other; /* When no trigger-specific data is required */
    Pint        imp_dep; /* data for impl. defined trigger processes */
} trigger_data;

union Pstring_ack_data {
    struct Pstring_ack_other {
        Pint        unused;
    } ack_other; /* When no ack.-specific data is required */
    Pint        imp_dep; /* data for impl. defined ack. processes */
} acknowledgement_data;
} Pstring_data;

typedef struct {
    Pint        in_buf_size; /* input buffer size */
    Pint        init_pos; /* initial editing position */
    union Pstring3_pets {
        struct Pstring_pet_other {
            Pint        unused;
        } pet_other; /* When no echo-specific data is required */
        struct Pstring3_pet_r1 {
            Pint        imp_dep; /* impl. dependent */
        } pet_r1; /* For PET 1 */
        Pint        imp_dep; /* data for impl. defined pets */
    } pets;
    union Pstring3_measure_data {
        struct Pstring3_meas_other {
            Pint        unused;
        } meas_other; /* When no measure-specific data is required */
        Pint        imp_dep; /* data for impl. defined measure processes */
    } measure_data;
    union Pstring3_trigger_data {
        struct Pstring3_trig_other {
            Pint        unused;
        } trig_other; /* When no trigger-specific data is required */
        Pint        imp_dep; /* data for impl. defined trigger processes */
    } trigger_data;
}

```

```

union Pstring3_ack_data {
    struct Pstring3_ack_other {
        Pint        unused;
    } ack_other; /* When no ack.-specific data is required */
    Pint        imp_dep; /* data for impl. defined ack. processes */
} acknowledgement_data;

} Pstring_data3;

typedef struct {
    Pint        buffer_size; /* input buffer size */
    Pint        init_pos;    /* initial editing position */
    Pfloat      x_interval;  /* x trigger interval */
    Pfloat      y_interval;  /* y trigger interval */
    Pfloat      time_interval; /* time trigger interval */
    union {
        struct Pstroke_pet_other {
            Pint        unused;
        } pet_other; /* When no echo-specific data is required */
        struct Pstroke_pet_r1 {
            Pint        imp_dep; /* impl. dependent */
        } pet_r1; /* For std PET 1 */
        struct Pstroke_pet_r2 {
            Pint        imp_dep; /* impl. dependent */
        } pet_r2; /* For std PET 2 */
        struct Pstroke_pet_r3 {
            Pmarker_attrs marker_attrs; /* marker attributes */
            Pint        imp_dep; /* impl. dependent */
        } pet_r3; /* For std PET 3 */
        struct Pstroke_pet_r4 {
            Pline_attrs line_attrs; /* line attributes */
            Pint        imp_dep; /* impl. dependent */
        } pet_r4; /* For std PET 4 */
        Pint        imp_dep; /* data for impl. defined PET's */
    } pets;
    union Pstroke_measure_data {
        struct Pstroke_meas_other {
            Pint        unused;
        } meas_other; /* When no measure-specific data is required */
        Pint        imp_dep; /* data for impl. defined measure processes */
    } measure_data;
}

```

```

union Pstroke_trigger_data {
    struct Pstroke_trig_other {
        Pint        unused;
    } trig_other; /* When no trigger-specific data is required */
    Pint        imp_dep; /* data for impl. defined trigger processes */
} trigger_data;

union Pstroke_ack_data {
    struct Pstroke_ack_other {
        Pint        unused;
    } ack_other; /* When no ack.-specific data is required */
    Pint        imp_dep; /* data for impl. defined ack. processes */
} acknowledgement_data;

} Pstroke_data;

typedef struct {
    Pint            in_buf_size; /* input buffer size */
    Pint            init_pos; /* initial editing position */
    Pfloat          x_interval; /* x trigger interval */
    Pfloat          y_interval; /* y trigger interval */
    Pfloat          z_interval; /* z trigger interval */
    Pfloat          time_interval; /* time trigger interval */
    union Pstroke3_pets {
        struct Pstroke3_pet_other {
            Pint        unused;
        } pet_other; /* When no echo-specific data is required */
        struct Pstroke3_pet_r1 {
            Pint        imp_dep; /* impl. dependent */
        } pet_r1; /* For std PET 1 */
        struct Pstroke3_pet_r2 {
            Pint        imp_dep; /* impl. dependent */
        } pet_r2; /* For std PET 2 */
        struct Pstroke3_pet_r3 {
            Pmarker_attrs marker_attrs; /* marker attributes */
            Pint        imp_dep; /* impl. dependent */
        } pet_r3; /* For std PET 3 */
        struct Pstroke3_pet_r4 {
            Pline_attrs line_attrs; /* line attributes */
            Pint        imp_dep; /* impl. dependent */
        } pet_r4; /* For std PET 4 */
        Pint        imp_dep; /* data for impl. defined PET's */
    } pets;
}

```

```

union Pstroke3_measure_data {
    struct Pstroke3_meas_other {
        Pint        unused;
    } meas_other; /* When no measure-specific data is required */
    Pint        imp_dep; /* data for impl. defined measure processes */
} measure_data;

union Pstroke3_trigger_data {
    struct Pstroke3_trig_other {
        Pint        unused;
    } trig_other; /* When no trigger-specific data is required */
    Pint        imp_dep; /* data for impl. defined trigger processes */
} trigger_data;

union Pstroke3_ack_data {
    struct Pstroke3_ack_other {
        Pint        unused;
    } ack_other; /* When no ack.-specific data is required */
    Pint        imp_dep; /* data for impl. defined ack. processes */
} acknowledgement_data;
} Pstroke_data3;

typedef struct {
    Pfloat        low;          /* Low value of valuator range */
    Pfloat        high;         /* High value of valuator range */
    union Pval_pets {
        struct Pval_pet_other {
            Pint        unused;
        } pet_other; /* When no echo-specific data is required */
        Pint        imp_dep; /* data for impl. defined pets */
    } pets;
    union Pval_measure_data {
        struct Pval_measure_other {
            Pint        unused;
        } meas_other; /* When no measure-specific data is required */
        Pint        imp_dep; /* data for impl. defined measure processes */
    } measure_data;
    union Pval_trigger_data {
        struct Pval_trig_other {
            Pint        unused;
        } trig_other; /* When no trigger-specific data is required */
        Pint        imp_dep; /* data for impl. defined trigger processes */
    } trigger_data;
}

```

```

union Pval_ack_data {
    struct Pval_ack_other {
        Pint      unused;
    } ack_other; /* When no ack.-specific data is required */
    Pint      imp_dep; /* data for impl. defined ack. processes */
} acknowledgement_data;
} Pval_data;

typedef struct {
    Pfloat      low;          /* Low value of valuator range */
    Pfloat      high;         /* High value of valuator range */
    union Pval3_pets {
        struct Pval3_pet_other {
            Pint      unused;
        } pet_other; /* When no echo-specific data is required */
        Pint      imp_dep; /* data for impl. defined pets */
    } pets;
    union Pval3_measure_data {
        struct Pval3_measure_other {
            Pint      unused;
        } meas_other; /* When no measure-specific data is required */
        Pint      imp_dep; /* data for impl. defined measure processes */
    } measure_data;
    union Pval3_trigger_data {
        struct Pval3_trig_other {
            Pint      unused;
        } trig_other; /* When no trigger-specific data is required */
        Pint      imp_dep; /* data for impl. defined trigger processes */
    } trigger_data;
    union Pval3_ack_data {
        struct Pval3_ack_other {
            Pint      unused;
        } ack_other; /* When no ack.-specific data is required */
        Pint      imp_dep; /* data for impl. defined ack. processes */
    } acknowledgement_data;
} Pval_data3;”

```

Page 194 (Page 105 Amendment 1)

The following text replaces the definition of Pcolr\_rep\_ptr:

```

“
typedef union {
    /* start of PHIGS PLUS union members */
    Prgb      *rgb;          /* pointer to RGB colour values */
    Pcielvuv  *cielvuv;      /* pointer to CIELUV pointer values */
    Phls      *hls;          /* pointer to HLS pointer values */
    Phsv      *hsv;          /* pointer to HSV pointer values */
    /* end of PHIGS PLUS union members */
    /* start of Full PHIGS union members */
    Prgba     *rgba;         /* pointer to RGBA colour values */
    Pcieluva  *cieluva;      /* pointer to CIELUVA pointer values */
    Phlsa     *hlsa;         /* pointer to HLSA pointer values */
    Phsva     *hsva;         /* pointer to HSVA pointer values */
    /* end of Full PHIGS union members */
    ...                    /* implementation defined */
} Pcolr_rep_ptr;”

```

Page 194 (Page 118 Amendment 1)

The following text replaces the definition of Ppat\_rep\_plus:

```

“
typedef struct {
    Pint      colr_type;      /* colour type                */
    Pcolrv_array colrs;       /* colour array                */
} Pgcolr_array;

typedef Pgcolr_array Ppat_rep_plus;

typedef struct {
    Pint      colr_type;      /* colour type                */
    Pint      num_arrays;     /* number of arrays in set    */
    Pcolrv_array *colrs;     /* set of colour arrays       */
} Pgcolr_array_set;
”

```

Page 194 (Page 122 Amendment 1)

The following text is inserted after the definition of Pws\_st\_tables\_plus:

```

“
typedef struct {
    Pdyn_mod      posting_status; /* posting status modification */
} Pdyns_post_grps;
”

```

```

typedef enum {
    PACCESS_REFERENCED = 0,
    PACCESS_COPIED = 1
} Paccess_flag;

typedef enum {
    P_ACK_ACCEPTANCE = 0,
    P_ACK_NONACCEPTANCE = 1
} Packnowledgement_type;

typedef struct {
    Pack_type      type;
    Pint           process_id;
} Pack_process;

typedef struct {
    Pint           count;
    Pack_process   *procs;
} Pack_process_list;

typedef enum {
    PNOTASSOCIATED = 0,
    PASSOCIATED = 1
} Passoc_flag;

typedef struct {
    Pint           max_simul_trig, /* max simul. trigger procs */
    Pint           max_simul_echo, /* max simul. echo procs */
    Pint           max_simul_ack,  /* max simul. acknowledgement procs */
    Pint_list      meas_proc_ids,  /* available measure process ids */
    Pint_list      trig_proc_ids,  /* available trigger process ids */
    Pint_list      echo_proc_ids,  /* available echo process ids */
    Pint_list      ack_proc_ids,   /* available acknowledgement */
                                /* process ids */
} Patomic_lid_facs;

typedef enum {
    PBACKG_REDISPLAY_OFF = 0,
    PBACKG_REDISPLAY_ON = 1
} Pbackg_redisplay;

```

```
typedef enum {
    PBACKG_STYLE_TRANSPARENT = 0,
    PBACKG_STYLE_OPAQUE = 1
} Pbackg_style;

typedef enum {
    PFALSE = 0,
    PTRUE = 1
} Pboolean;

typedef enum {
    PBORDER_OFF = 0,
    PBORDER_ON = 1
} Pborder_indic;

typedef enum {
    PCLIPCOND_IS_NOT_CLIPPED = 0,
    PCLIPCOND_IS_PARTIALLY_CLIPPED = 1,
    PCLIPCOND_IS_FULLY_CLIPPED = 2
} Pclip_cond;

typedef enum {
    PCLOSURE_PIE = 0,
    PCLOSURE_SEGMENT = 1
} Pclosure;

union _Pin_class_data;

typedef struct _Pset_data {
    Pin_class dev_class;
    Pint num_in_set;
    _Pin_class_data *data;
} Pset_data;
```

```

typedef struct {
    Pint      max_measures,           /* max instances */
    Pint      max_simul_trig,         /* max simul. trigger procs */
    Pint      max_simul_echo,         /* max simul. echo procs */
    Pint      max_simul_ack,          /* max simul. ack. procs */
    Pint_list loc_meas_proc_ids,      /* avail locator meas proc ids */
    Pint_list stroke_meas_proc_ids,   /* avail stroke meas proc ids */
    Pint_list val_meas_proc_ids,      /* avail valuator meas proc ids */
    Pint_list choice_meas_proc_ids,   /* avail choice meas proc ids */
    Pint_list pick_meas_proc_ids,     /* avail pick meas proc ids */
    Pint_list string_meas_proc_ids,   /* avail string meas proc ids */
    Pint_list set_meas_proc_ids,      /* avail set meas proc ids */
    Pint_list composite_meas_proc_ids, /* avail compos meas proc ids */
    Pint_list trig_proc_ids,          /* avail trigger proc ids */
    Pint_list loc_echo_proc_ids,      /* avail locator echo proc ids */
    Pint_list stroke_echo_proc_ids,   /* avail stroke echo proc ids */
    Pint_list val_echo_proc_ids,      /* avail valuator echo proc ids */
    Pint_list choice_echo_proc_ids,   /* avail choice echo proc ids */
    Pint_list pick_echo_proc_ids,     /* avail pick echo proc ids */
    Pint_list string_echo_proc_ids,   /* avail string echo proc ids */
    Pint_list set_echo_proc_ids,      /* avail set echo proc ids */
    Pint_list comp_echo_proc_ids,     /* avail compos echo proc ids */
    Pint_list ack_proc_ids            /* avail ack. proc ids */
} Pset_facs;

typedef struct _Pcomposite_individual {
    Pin_class      class;
    _Pin_class_data *data;
} Pcomposite_individual;

typedef struct {
    Pint      count;
    Pcomposite_individual *individual;
} Pcomposite_data;

```

```

typedef struct {
    Pint      max_simul_meas,      /* max simul. measure procs      */
    Pint      max_simul_trig,      /* max simul. trigger procs      */
    Pint      max_simul_echo,      /* max simul. echo procs         */
    Pint      max_simul_ack,       /* max simul. acknowledgement procs
                                   */
    Pint_list loc_meas_proc_ids,   /* avail. locator measure proc. ids
                                   */
    Pint_list stroke_meas_proc_ids, /* avail. stroke measure proc. ids
                                   */
    Pint_list val_meas_proc_ids,   /* avail. valuator measure proc. ids
                                   */
    Pint_list choice_meas_proc_ids, /* avail. choice measure proc. ids
                                   */
    Pint_list pick_meas_proc_ids,  /* avail. pick measure proc. ids */
    Pint_list string_meas_proc_ids, /* avail. string measure proc. ids
                                   */
    Pint_list set_meas_proc_ids,   /* avail. set measure proc. ids  */
    Pint_list composite_meas_proc_ids, /* avail. composite meas. proc. ids
                                   */
    Pint_list trig_proc_ids,       /* available trigger process ids */
    Pint_list loc_echo_proc_ids,   /* available locator echo proc. ids
                                   */
    Pint_list stroke_echo_proc_ids, /* available stroke echo proc. ids
                                   */
    Pint_list val_echo_proc_ids,   /* available valuator echo proc. ids
                                   */
    Pint_list choice_echo_proc_ids, /* available choice echo proc. ids
                                   */
    Pint_list pick_echo_proc_ids,  /* available pick echo proc. ids */
    Pint_list string_echo_proc_ids, /* available string echo proc. ids
                                   */
    Pint_list set_echo_proc_ids,   /* available set echo proc. ids  */
    Pint_list comp_echo_proc_ids,  /* available composite echo proc. ids
                                   */
    Pint_list ack_proc_ids         /* available ack. proc. ids      */
} Pcomposite_facs,

```

```

typedef union _Pin_class_data {
    Pint          unused;
    Ploc_data      loc;
    Ploc_data3     loc3;
    Pstroke_data   stroke;
    Pstroke_data3  stroke3;
    Pval_data      val;
    Pval_data3     val3;
    Pchoice_data   choice;
    Pchoice_data3  choice3;
    Ppick_data     pick;
    Ppick_data3    pick3;
    Pstring_data   string;
    Pstring_data3  string3;
    Pset_data      set;
    Pcomposite_data composite;
    ...           /* other classes of input data */
} Pin_class_data;

typedef enum {
    PCOMP_IN_STATUS_NONE = 0,
    PCOMP_IN_STATUS_OK = 1,
    PCOMP_IN_STATUS_INCOMPLETE = 2
} Pcomp_in_style;

typedef struct {
    Pcond_flag_mask enable_mask; /* condition flag enable mask */
    Pcond_flag_mask disable_mask; /* condition flag disable mask */
} Pcond_flags;

typedef struct {
    Ptest          test; /* test operation */
    Pcond_flags    mask; /* condition test mask */
} Pcond_flag_test;

typedef struct {
    Pint          num_tests; /* number of condition test */
    Pcond_flag_test *tests; /* list of condition flag tests */
} Pcond_test_list;

```

```

typedef struct {
    Pint        num_invis_filters; /* number of avail. invisibility filters
                                   */
    Pint        num_highl_filters; /* number of avail. highlighting filters
                                   */
    Pint        num_pick_filters; /* number of avail. pick filters      */
    Pint        num_appl_filters; /* number of avail. application filters
                                   */
    Pint        num_appl_integers; /* number of application integer
                                   /* values supported */
    Pint        num_appl_reals;    /* number of application real values
                                   /* supported */
    Pint_list   test_methods;      /* list of test methods available */
} Pcond_trav_facs;

typedef struct {
    Pint        name_size;          /* size of name */
    char        *name;              /* configuration setting name */
} Pconfig_name;

typedef struct {
    Pint        list_size;          /* number of names */
    Pconfig_name *name;             /* configuration name list */
} Pconfig_name_list;

typedef struct {
    Pint        num_supported;      /* number of simultaneously supported
                                   */
                                   /* device coordinate clip regions */
} Pconfig_setting_facs;

typedef union {
    Pint        int_value;          /* integer configuration value */
    Pfloat      real_value;         /* real configuration value */
    char        *string_value;      /* string configuration value */
} Pconfig_value;

typedef struct {
    char        *name;              /* configuration setting name */
    Pconfig_value *value;           /* configuration setting value */
} Pconfig_settings;

```

```

typedef struct {
    Pint    num_supported;    /* number of simultaneously supported */
                                /* device coordinate clip regions    */
} Pdc_clip_facs;

typedef struct {
    unsigned int mode:1;
    unsigned int ref_planes:1;
    unsigned int scale:1;
    unsigned int gcolr:1;
    unsigned int :28;
} Pdepth_cue_mask;

typedef enum {
    PDIM_INTERPRET_NONE = 0,
    PDIM_INTERPRET_STATE = 1,
    PDIM_INTERPRET_ALL = 2
} Pdi_mode;

typedef struct {
    Pint    num_trav_procs;    /* number of simultaneously posted */
                                /* traversal processes              */
    Pint    num_rend_algorithms; /* number of multi-pass algorithms */
                                /* supported for rendering          */
    Pint    num_pick_algorithms; /* number of multi-pass algorithms */
                                /* supported for picking            */
} Pdi_trav_facs;

typedef struct {
    Pin_class dev_class;    /* input class*/
    Pint      instance;    /* i = ith of class in LID def.*/
} Pecho_measure_proc;

typedef struct {
    Pint      pet;
    Pecho_measure_proc *measures_echoed;
    Pint      process_id;
} Pecho_process;

```

```

typedef struct {
    Pint          count;
    Pecho_process *procs;
} Pecho_process_list;

typedef struct {
    Pedge_flag      flag;          /* edge flag          */
    Pint            type;          /* edgetype           */
    Pfloat          width;        /* edgewidth scale factor */
    Pcolr           colr;         /* edge colour        */
    Plinetype_adapt adapt;        /* edgetype adaptability */
    Plinetype_cont  cont;         /* edgetype continuity  */
    Pfloat          offset;       /* edgetype offset      */
    Plinecap        cap;          /* edgecap            */
    Plinejoin       join;         /* edgejoin           */
    Pfloat          limit;        /* edgemitre limit     */
} Pedge_bundle_full;

typedef struct {
    unsigned int flag:1;
    unsigned int type:1;
    unsigned int width:1;
    unsigned int colr:1;
    unsigned int adapt:1;
    unsigned int cont:1;
    unsigned int offset:1;
    unsigned int cap:1;
    unsigned int join:1;
    unsigned int limit:1;
    unsigned int :22;
} Pedge_mask;

typedef enum {
    PEDTA_EXACT = 0,
    PEDTA_ADAPT = 1
} Pedgetype_adapt;

typedef enum {
    PEDC_BUTT = 0,
    PEDC_ROUND = 1,
    PEDC_SQUARE = 2
} Pedgecap;

```

```

typedef enum {
    PEDTC_CONTINUOUS = 0,
    PEDTC_RESTART = 1
} Pedgetype_cont;

typedef enum {
    PEDJ_FLAT = 0,
    PEDJ_MITRE = 1,
    PEDJ_ROUND = 2,
    PEDJ_BEVEL = 3
} Pedgejoin;

typedef struct {
    Pint_list pattern_types; /* list of supported pattern types */
    Pint_list image_spec_methods; /* list of supported image */
                                /* specification methods */
} Pext_pat_fac;

typedef enum {
    PERASE_OFF = 0,
    PERASE_ON = 1
} Perase;

typedef struct {
    Pint_list image_spec_methods; /* list of supported image */
                                /* specification methods */
    Pint num_def_ids; /* number of definable image */
                    /* resource identifiers */
    Pint num_predef_ids; /* number of predefined image */
                    /* resources */
} Pimage_res_fac;

typedef struct {
    unsigned int style:1;
    unsigned int style_ind:1;
    unsigned int colr:1;
    unsigned int shad_method:1;
    unsigned int :28;
} Pinterior_mask;

```

```
typedef struct {
    Pint          num_limits;          /* number of limits          */
    Plimit        *limits;             /* list of limits            */
} Plimit_list;

typedef struct {
    Pint          num_limits;          /* number of limits          */
    Plimit3       *limits;             /* list of limits            */
} Plimit3_list;

typedef struct {
    Pint          light_ws_id;          /* workstation id for view   */
    Pint          light_src_ind;        /* view index                */
    Pint          light_action_type;    /* view action type          */
    Pint          transfer_type;        /* measure transfer type     */
} Plight_attach;

typedef enum {
    PLNC_BUTT = 0,
    PLNC_ROUND = 1,
    PLNC_SQUARE = 2
} Plinecap;

typedef enum {
    PLNJ_FLAT = 0,
    PLNJ_MITRE = 1,
    PLNJ_ROUND = 2,
    PLNJ_BEVEL = 3
} Plinejoin;

typedef enum {
    PLNTA_EXACT = 0,
    PLNTA_ADAPT = 1
} Plinetype_adapt;

typedef enum {
    PLNTC_CONTINUOUS = 0,
    PLNTC_RESTART = 1
} Plinetype_cont;
```

```

typedef struct {
    Pint          type;          /* linetype                */
    Pfloat        width;         /* linewidth scale factor  */
    Pcolr         colr;          /* polyline colour         */
    Pint          shad_method;   /* polyline shading method */
    Pcurve_approx_crit_data
        curve_approx_crit_data; /* curve approx. criteria  */
    Plinetype_adapt adapt;       /* linetype adaptability   */
    Plinetype_cont  cont;        /* linetype continuity     */
    Pfloat          offset;      /* linetype offset         */
    Plinecap        cap;         /* linecap                 */
    Plinejoin       join;        /* linejoin                */
    Pfloat          limit;       /* linemitre limit         */
} Pline_bundle_full;

typedef struct {
    Pint      num_definable;      /* number definable linetypes */
    Pint      num_predefined;     /* number predefined linetypes */
    Pint      max_dash_segments; /* maximum dash segments supported */
    Pfloat    offset;             /* offset to definable linetypes */
    Pint_list predef_def_linetypes /* list of predef. definable linetypes */
} Plinetype_def_facs;

typedef struct {
    Pfloat      lum_value;        /* luminance_value          */
    Pfloat      alpha_value;     /* alpha value              */
} Plum_alpha_pair;

typedef struct {
    Pint_size    dims;           /* array dimensions          */
    Plum_alpha_pair *values;     /* 2D array of luminance/alpha pairs */
} Plum_alpha_array;

typedef struct {
    Pint      num_arrays;        /* number of arrays in set   */
    Plum_alpha_array *sets;      /* set of 2D luminance/alpha arrays */
} Plum_alpha_array_set;

```

```

typedef struct {
    Pint          shape_type;      /* shape type          */
    union _Pshape_data {
        Ppoint_list polyline;      /* for PSHAPE_POLYLINE */
        Ppoint_list fill_area;     /* for PSHAPE_FILL_AREA */
        Ppoint_list convex_fill_area; /* for PSHAPE_CONVEX_FILL_AREA */
        ...                      /* implementation defined */
    } shape_data;                /* marker shape data    */
} Pmarker_data;

typedef struct {
    Pint          number_shapes;    /* number of shapes     */
    Pmarker_data  *marker;         /* array of shape descriptors */
} Pmarker_desc;

typedef struct {
    Pint          num_definable;    /* number definable marker types */
    Pint          num_predefined;   /* number predefined marker types */
    Pfloat        offset;          /* offset to definable linetypes */
    Pint          max_allowable_pts; /* maximum allowable points      */
    Pint_list     shape_types;      /* list of available shape types */
    Pint_list     predef_marker_types /* list of predefined marker types */
} Pmarker_type_def_facs;

typedef union _Pin_class_measure; /* used for defining _Pmeasure */
/* and _Pset_measure             */

typedef struct _Pmeasure {
    Pin_class      class;
    _Pin_class_measure *data;
} Pmeasure;

typedef struct _Pset_measure {
    Pin_class      dev_class;      /* input class of set      */
    Pint          set_size;        /* size of measure set     */
    _Pin_class_measure *measure_set; /* array of measures of same */
    /* class                      */
} Pset_measure;

```

```

typedef struct _Pcomposite_measure {
    Pint          count;                /* number of measure components*/
    Pmeasure      *measures;           /* list of measure components */
} Pcomposite_measure;

typedef union _Pin_class_measure {
    struct {
        Pint          view_ind;
        Ppoint         loc_pos;
    } loc;
    struct {
        Pint          view_ind;
        Ppoint3        loc_pos;
    } loc3;
    struct {
        Pint          view_ind;
        Ppoint_list    points;
    } stroke;
    struct {
        Pint          view_ind;
        Ppoint_list3    points;
    } stroke3;
    Pfloat            val;
    struct {
        Pin_status     istat;
        Pint           selection;
    } choice;
    struct {
        Pin_status     istat;
        Ppick_path      *path;
    } pick;
    char              *string;
    Pset_measure       *set;
    Pcomposite_measure *composite;
    ...                /* other classes which may be added */
} Pin_class_measure;

```

```

typedef struct {
    Pin_class      dev_class;
    Pint           process_id;
} Pmeas_process;

typedef struct _Pmeas_process_list {
    Pint           count;           /* number of process in list */
    Pmeas_process *measure_procs; /* list of measure processes */
} Pmeas_process_list;

typedef struct {
    Pint           set_maxsize;     /* maximum set size */
    Pmeas_process process_id;       /* measure process identifier */
} Pmeas_process_set;

typedef enum {
    PNA_IN_STATUS_NONE = 0,
    PNA_IN_STATUS_INCOMPLETE = 1,
    PNA_IN_STATUS_OK = 2
} Pna_in_status;

typedef struct {
    Pint           set;             /* number available set LIDs */
    Pint           composite;       /* number available composite LIDs */
} Pnum_na_in;

typedef struct {
    unsigned int pat_bundle:1;
    unsigned int pat_rep_plus:1;
    unsigned int ext_pat_rep:1;
    unsigned int :29
} Ppattern_mask;

typedef struct _Ppick_path_list {
    Pint           num_paths;       /* number paths in list */
    Ppick_path     *paths;         /* array of pick paths */
} Ppick_path_list;

```

```

typedef struct {
    Pint          type;          /* pattern type */
    union _Ppattern_data {
        struct Ppat_colr_ind_array {
            Ppat_rep pat_rep;    /* pattern representation */
        } pat_colr_ind_array;
        struct Ppat_colr_array {
            Ppat_rep_plus pat_rep_plus; /* pattern representation plus */
        } pat_colr_array;
        struct Ppat_image_res {
            Pint image_res_id;    /* pattern image resource */
        } pat_image_res;
        ...                      /* implementation defined */
    } data;                      /* pattern data */
} Ppattern;

typedef enum {
    PPICK_STAT_FALSE = 0,
    PPICK_STAT_TRUE = 1
} Ppick_stat;

typedef struct {
    Pint          pick_type;
    union _Ppick_type_data {
        Pint unused;             /* workstation-dependent */
        Pfloat_size3 rect_aperture; /* 3D rectangular aperture */
        Pfloat_size3 vis_rect_aperture; /* 3D rectangular aperture
                                         /* visible primitives only */
        Ppoint_list user_aperture; /* user-specified aperture */
        . . . /* data for impl. defined pick types */
    } data;
} Ppick_type_data;

typedef enum {
    PPICT_STAT_COMP = 0,
    PPICT_STAT_INCOMP = 1
} Ppict_stat;

```

```

typedef struct {
    unsigned int type:1;
    unsigned int width:1;
    unsigned int colr:1;
    unsigned int shad_method:1;
    unsigned int curve_approx_crit_data:1;
    unsigned int adapt:1;
    unsigned int cont:1;
    unsigned int offset:1;
    unsigned int cap:1;
    unsigned int join:1;
    unsigned int limit:1;
    unsigned int :21;
} Ppolyline_mask;

typedef struct {
    unsigned int type:1;
    unsigned int size:1;
    unsigned int colr:1;
    unsigned int :29;
} Ppolymarker_mask;

typedef enum {
    PPOSTED_FALSE = 0,
    PPOSTED_TRUE = 1
} Pposted_ind;

typedef struct {
    Pint      num_def_grps; /* number of definable posting groups */
    Pint      num_predef_grps; /* number of predefined posting groups */
    Pint_list predef_grps; /* list of predefined posting groups */
    Pint_list backg_methods; /* list of supported posting group */
                                /* background methods */
} Ppost_grp_facs;

typedef enum {
    PPGSTAT_INACTIVE = 0,
    PPGSTAT_ACTIVE = 1
} Ppost_grp_status;

```

```
typedef struct {
    unsigned int refl_model:1;
    unsigned int data:1;
    unsigned int :30;
} Prefl_mask;

typedef enum {
    PREF_EXECUTE = 0,
    PREF_INSTANCE = 1
} Pref_type;

typedef enum {
    PSCALE_NOT_SCALABLE,
    PSCALE_SCALABLE
} Pscale_flag;

typedef enum {
    PSI_NOT_SUPPORTED = 0,
    PSI_SUPPORTED = 1
} Psupport_indication;

typedef enum {
    PTARG_DATA_ST_ABSENT = 0,
    PTARG_DATA_ST_PRESENT = 1
} Ptarg_data_st;

typedef enum {
    PTARG_EMPTY_ST_EMPTY = 0,
    PTARG_EMPTY_ST_NOT_EMPTY = 1
} Ptarg_empty_st;

typedef struct {
    Pint          num_avail_targets; /* number of available targets */
} Ptarget_facs;
```

```

typedef enum {
    PBASE_TARG = 0,
    PREND_TARG = 1,
    PDISP_TARG = 2
} Ptarg_type;

typedef struct {
    Pint          num_targ_types; /* number of target types */
    Ptarg_type    *targ_types;   /* list of target types */
} Ptarg_type_list;

typedef struct {
    Ptarg_type    ref_targ;      /* reference target */
    Pint          offset;        /* offset from reference target */
} Ptarg_addr;

typedef struct {
    Pint          type;          /* target operation type */
    union _Ptarget_op_data {
        struct Prend_targ {
            Ptarg_addr targ_addr; /* target address */
        } rend_targ;
        struct Pdisp_targ {
            Ptarg_addr targ_addr; /* target address */
        } disp_targ;
        struct Pclear_targ {
            Ptarg_addr targ_addr; /* target address */
        } clear_targ;
        struct Pcopy_targ {
            Ptarg_addr src_targ_addr; /* source target address */
            Ptarg_addr dest_targ_addr; /* destination target address */
        } copy_targ;
        ... /* implementation defined */
    } data; /* target operation data */
} Ptarg_op;

typedef struct {
    Pint          num_ops;      /* number of target operations */
    Ptarg_op      *targ_ops;    /* list of target operations */
} Ptarg_op_list;

```

```

typedef enum {
    PTRL_EQUAL = 0,
    PTRL_NOT_EQUAL = 1,
    PTRL_GREATER = 2,
    PTRL_LESS = 3,
    PTRL_GREATER_OR_EQUAL = 4,
    PTRL_LESS_OR_EQUAL = 5
} Ptest_comp_rel;

typedef enum {
    PTLG_BITWISE_AND = 1,
    PTLG_BITWISE_OR = 2,
    PTLG_BITWISE_XOR = 3
} Ptest_comp_logical;

typedef struct {
    unsigned int font:1;
    unsigned int precision:1;
    unsigned int char_expan:1;
    unsigned int char_space:1;
    unsigned int colr:1;
    unsigned int :27;
} Ptext_mask;

typedef struct {
    Pint          id;          /* traversal resource identifier*/
    Pint          type;        /* traversal resource type*/
} Ptrav_res;

typedef struct {
    Pint          num_trav_res; /* number of traversal resources*/
    Ptrav_res     *trav_res;   /* list of traversal resources*/
} Ptrav_res_list;

```

```
typedef struct {
    Ptrav_res_list avail_trav_res; /* list of avail trav. resources */
} Ptrav_res_fac;

typedef enum {
    PTRAV_RENDER = 0,
    PTRAV_PICK = 1
} Ptrav_type;

typedef enum {
    PTRIGGER_BREAK = 0,
    PTRIGGER_SELECT = 1,
    PTRIGGER_EVENT = 2,
    PTRIGGER_DELETE = 3
} Ptrig_type;

typedef struct {
    Ptrig_type    type;
    Pint          process_id;
} Ptrig_process;

typedef struct {
    Pint          count;
    Ptrig_process *procs;
} Ptrig_process_list;

typedef struct {
    Pint    view_ws_id; /* workstation id for view */
    Pint    view_ind;  /* view index */
    Pint    view_action_type; /* view action type */
    Pint    transfer_type; /* measure transfer type */
    Pint    view_upd_method; /* view update method */
} Pview_attach;
```

```

typedef enum {
    PVIEW_ST_CORRESPOND = 0,
    PVIEW_ST_DIFFERENT = 1
} Pview_status;

typedef enum {
    PWATCH_OFF = 0,
    PWATCH_ON = 1
} Pwatch_enable;

typedef struct {
    Pint_size      dims;          /* float array dimensions */
    Pfloat         *floats;       /* float array */
} Pfloat_array;

typedef struct {
    Pint           num_arrays;    /* number of float arrays in set */
    Pfloat_array   *floats;      /* float arrays */
} Pfloat_array_set;

typedef struct {
    Pint image_spec_method;
    union _Pimage_data {
        struct Puncomp_colr_ind_array {
            Pint *colr_ind_array; /* uncompressed array of */
                                   /* colour indices */
        } uncomp_colr_ind_array;
        struct Puncomp_colr_array {
            Pgcrlr_array *colr_array; /* uncompressed array of */
                                       /* colours */
        } uncomp_colr_array;
        struct Pwindow_sys_bitmap {
            Pint handle; /* bitmap handle */
        } window_sys_bitmap;
        struct Pvideo_sig_chan_id {
            Pint chan_id; /* video signal channel id */
        } video_sig_chan_id;
        struct Pluminance {
            Pfloat_array *lum_values; /* uncompressed array of */
                                       /* luminance values */
        } luminance;
    }

```

```

struct Pluminance_alpha {
    Plum_alpha_array *lum_values; /* uncompressed array of      */
                                /* luminance values          */
} luminance_alpha;
struct Pmipmap_colrs {
    Pgcolr_array_set *colr_arrays; /* set of uncompressed      */
                                /* colour arrays            */
} mipmap_colrs;
struct Pmipmap_luminance {
    Pfloat_array_set *lum_values; /* set of uncompressed      */
                                /* luminance arrays         */
} mipmap_luminance;
struct Pmipmap_luminance_alpha {
    Plum_alpha_array_set *lum_values; /* set of uncompressed      */
                                /* luminance/alpha arrays */
} mipmap_luminance_alpha;
int impl_def /* implementation defined methods */
} image_data;
} Pimage_res;

typedef struct {
    Pint method; /* background method */
    union Pbackg_method_data {
        struct Pcolr_table_0 {
            Pint unused; /* unused */
        } colr_table_0;
        struct Pcolr_ind {
            Pint colr_ind; /* colour index */
        } colr_ind;
        struct Pcolr {
            Pcolr_rep colr_rep; /* target address */
        } colr;
        struct Pimage_resource {
            Pint image_resource_id; /* image resource identifier */
        } image_resource;
        ... /* implementation defined */
    } data;
} Pbackg_method;

```

```

typedef struct {
    Pint          type;          /* trav. res. operation type */
    union Ptrav_res_op_data {
        struct Ptrav_res_clear {
            Pint    res_id;      /* traversal resource id. */
        } trav_res_clear;
        struct Ptrav_res_copy {
            Pint    src_res_id;  /* source traversal res. id. */
            Pint    dest_res_id; /* destination trav. res. id. */
        } trav_res_copy;
        ...                     /* implementation defined */
    } data;                     /* trav. res. operation data */
} Ptrav_res_op;

typedef struct {
    union Pdi_pick_pets {
        struct Pdi_pick_pet_other {
            Pint    unused;
        } pet_other; /* When no echo-specific data is required */
        struct Pdi_pick_pet_r1 {
            Pint    imp_dep;     /* impl. dependent */
        } pet_r1; /* For PET 1 */
        ...                     /* implementation defined PET's */
    } pets;
    union Pdi_pick_measure_data {
        struct Pdi_pick_meas_other {
            Pint    unused;
        } meas_other; /* When no measure-specific data is required */
        Pint    imp_dep; /* data for impl. defined measure processes */
    } measure_data;
    union Pdi_pick_trigger_data {
        struct Pdi_pick_trig_other {
            Pint    unused;
        } trig_other; /* When no trigger-specific data is required */
        Pint    imp_dep; /* data for impl. defined di_pick processes */
    } trigger_data;
    union Pdi_pick_ack_data {
        struct Pdi_pick_ack_other {
            Pint    unused;
        } ack_other; /* When no ack.-specific data is required */
    }

```

```

    Pint    imp_dep; /* data for impl. defined ack. processes */
} acknowledgement_data;

} Pdi_pick_data;

typedef struct {
    union Pdi_pick3_pets {
        struct Pdi_pick3_pet_other {
            Pint    unused;
        } pet_other; /* When no echo-specific data is required */
        struct Pdi_pick3_pet_r1 {
            Pint    imp_dep; /* impl. dependent */
        } pet_r1; /* For PET 1 */
        Pint    imp_dep; /* data for impl. defined pets */
    } pets;
    union Pdi_pick3_measure_data {
        struct Pdi_pick3_meas_other {
            Pint    unused;
        } meas_other; /* When no measure-specific data is required */
        Pint    imp_dep; /* data for impl. defined measure processes */
    } measure_data;
    union Pdi_pick3_trigger_data {
        struct Pdi_pick3_trig_other {
            Pint    unused;
        } trig_other; /* When no trigger-specific data is required */
        Pint    imp_dep; /* data for impl. defined di_pick processes */
    } trigger_data;
    union Pdi_pick3_ack_data {
        struct Pdi_pick3_ack_other {
            Pint    unused;
        } ack_other; /* When no ack.-specific data is required */
        Pint    imp_dep; /* data for impl. defined ack. processes */
    } acknowledgement_data;
} Pdi_pick_data3;

typedef struct {
    Pint_list  alpha_srcs; /* list available alpha sources */
    Pint_list  transp_modes; /* list transparency modes supported */
} Palpha_facs;

```

```

typedef struct {
    Pdyn_mod    texture_rep;          /* texture representation          */
} Pdyns_ws_attrs_texture;

typedef struct {
    Pint        max_dims[3];          /* max dimensions mipmap base level */
    Pboolean    equal_dims_req;       /* equal mipmap dimensions required */
    Pboolean    power_2_dims_req;     /* power of 2 mipmap dimensions req. */
} Pmipmap_facs;

typedef enum {
    PPERSP_CORR_NONE = 0,
    PPERSP_CORR_AT_VERTICES = 1,
    PPERSP_CORR_INTERIOR = 2
} Pperspect_corr;

typedef struct {
    Pint_list    avail_pick_types;    /* list available pick types        */
    Pint_list    avail_echo_types;    /* list of available echo types     */
} Ppick_mapping_facs;

typedef enum {
    PRES_HINTS_UTILIZED_NO,
    PRES_HINTS_UTILIZED_YES
} Pres_hints;

typedef struct {
    Pint        image_res_id;          /* texture image resource identifier */
    Pint        rendering_order;       /* rendering order                   */
} Ptexture_binding;

typedef struct {
    Pint        method;               /* composition method                */
    union {
        Pint        unused;           /* used by methods 1, 2, and 4      */
        struct {
            Pcolour    environ;        /* used by method 3                 */
            Pint        gamma_chan_sel; /* environment colour                */
            Pint        gamma_chan_sel; /* gamma channel selector            */
        } blend_env;
    };
}

```

```

        Pgcclr        background_clr; /* used by method 5          */
        ...           /* implementation defined                  */
    } data;

} Ptexture_compos;

typedef struct {
    Pint_list  coord_srcs;      /* list avail. coordinate sources */
    Pint_list  compos_methods; /* list avail. composition methods */
    Pint_list  min_methods;    /* list avail. minification methods */
    Pint_list  mag_methods;    /* list avail. magnification methods */
    Pint_list  bound_cond;     /* list avail. boundary conditions */
    Pint_list  clamp_methods;  /* list avail. boundary clamp methods */
    Pint_list  render_orders;  /* list avail. rendering orders */
    Pint       num_pred_inds;   /* number predefined texture indices */

} Ptexture_fac;

typedef enum {
    PTUP_UTILIZED_NO = 0,
    PTUP_UTILIZED_YES = 1
} Ptup_util;

typedef struct {
    Pint       max_simul;      /* max number simultaneously */
                                /* applicable textures        */
    Pint_list  perspect_corr; /* list of available perspective */
                                /* correction methods         */
    Pint_list  sampling_freqs; /* list avail. sampling frequencies */
    Pint_list  opt_hints;     /* list of available resource */
                                /* optimization hints         */
    Ptup_util  usage;         /* utilization of texture usage */
                                /* priorities                  */
    Pint_list  image_res_types; /* list of image resource types */
                                /* available for texture mapping */

} Ptexture_map_fac;

```

```

typedef struct {
    unsigned int coord_src:1;
    unsigned int coord_src_data:1;
    unsigned int orientation:1;
    unsigned int compos_method:1;
    unsigned int compos_data:1;
    unsigned int min_method:1;
    unsigned int max_method:1;
    unsigned int bound_conds:1;
    unsigned int clamp_method:1
    unsigned int clamp_data:1
    unsigned int depth_sampl_hint:1
    unsigned int freq_wt_hints:1
    unsigned int image_res_id:1
    unsigned int rendering_order:1
    unsigned int :18
} Ptexture_mask;

typedef struct {
    Pint          coord_src;          /* coordinate source */
    union Pcoord_src_data {          /* coordinate source data record */
        Pint      unused;             /* used by coord sources 1 - 5 */
        Pint      coord_ind;          /* used by coord source 6 */
        Pmatrix3  refl_matrix;        /* used by coord sources 7 and 8 */
        ...
    } data;
} Pcoord_src;

typedef struct {
    Pcoord_src    coord_src;          /* coordinate source and data */
    Pmatrix3      orientation;         /* orientation matrix */
} Ptexture_param;

typedef struct {
    Pint          method;             /* clamp method */
    union Pclamp_method_data {
        Pint      unused;             /* used by method 1 */
        Pgcolr    clamp_colr;         /* used by method 2 */
        ...
    } data;
} Pclamp_method;

```

```

typedef struct {
    Pint          min_method;          /* minification method          */
    Pint          mag_method;          /* magnification method          */
    Pint          bound_conds[3];       /* boundary conditions           */
    Pclamp_method clamp;               /* boundary clamp method & data */
    Pfloat        depth_sampl_hint;     /* depth sampling hint           */
    Pfloat        freq_wt_hints[3];     /* frequency weight hints        */
} Ptexture_sampling;

typedef struct {
    Ptexture_param param;              /* texture parametrization       */
    Ptexture_compos compos;            /* texture composition           */
    Ptexture_sampling sampling;        /* texture sampling              */
    Ptexture_binding binding;          /* texture binding               */
} Ptexture_rep;

typedef struct {
    Pint          opt_hint;             /* optimization hint             */
    Pint_list     usage_priorities;     /* texture usage priorities      */
} Ptexture_res_opt_heur;

typedef struct {
    Pint          max_simul_trig,       /* max simul. trigger procs      */
    Pint          max_simul_echo,       /* max simul. echo procs         */
    Pint          max_simul_ack,        /* max simul. acknowledgement procs */
    Pint_list     meas_proc_ids,        /* available measure process ids  */
    Pint_list     trig_proc_ids,        /* available trigger process ids   */
    Pint_list     echo_proc_ids,        /* available echo process ids     */
    Pint_list     ack_proc_ids,         /* available acknowledgement process ids */
} Pval_fac;

typedef struct {
    Pint          highl_rep;            /* max. # of highlighting table entries */
} Pws_st_tables_highl;

typedef struct {
    Pint          texture_rep;          /* max. # of texture table entries */
} Pws_st_tables_texture;

```

Page 195

The following text is inserted before the definition of pelem\_data:

```

“
typedef struct {
    Pint          num_pred;          /* number of predefined methods */
    Pint_list     methods;           /* number of highl. methods supp. */
    Pint          max_highl_ind;     /* max highl. table indices */
} Phighl_fac;

typedef struct {
    Pint          method;
    union _Phighl_data {
        Pint      unused;
        Pfloat    blink_rate;
        Pint      colr_ind;
        Pgcolr    colr;
        struct _Phighl_blink_colr {
            Pfloat    blink_rate;
            Pgcolr    blink_colr;
        } highl_blink_colr;
        ...        /* implementation defined methods*/
    } highl_data;
} Phighl_method;

typedef enum {
    PTRL_EQUAL = 0,
    PTRL_NOT_EQUAL = 1,
    PTRL_GREATER = 2,
    PTRL_LESS = 3,
    PTRL_GREATER_OR_EQUAL = 4,
    PTRL_LESS_OR_EQUAL = 5,
    PTLG_BITWISE_AND = 6,
    PTLG_BITWISE_OR = 7,
    PTLG_BITWISE_XOR = 8
} Ptest_comp;

typedef enum {
    PFILTER_FAILS = 0,
    PFILTER_PASSES = 1
} Pfilter_op;

```

```
typedef enum {
    PCOND_ALL_ENABLED,
    PCOND_ALL_DISABLED,
    PCOND_NOT_ALL_DISABLED,
    PCOND_NOT_ALL_ENABLED,
    PCOND_ALWAYS_PASS,
    PCOND_NEVER_PASS
} Pcond_flags_eval_op;

typedef union {
    unsigned int mask;
    struct _Pcond_flag_set {
        unsigned int flag0:1;
        unsigned int flag1:1;
        unsigned int flag2:1;
        unsigned int flag3:1;
        unsigned int flag4:1;
        unsigned int flag5:1;
        unsigned int flag6:1;
        unsigned int flag7:1;
        unsigned int flag8:1;
        unsigned int flag9:1;
        unsigned int flag10:1;
        unsigned int flag11:1;
        unsigned int flag12:1;
        unsigned int flag13:1;
        unsigned int flag14:1;
        unsigned int flag15:1;
        unsigned int flag16:1;
        unsigned int flag17:1;
        unsigned int flag18:1;
        unsigned int flag19:1;
        unsigned int flag20:1;
        unsigned int flag21:1;
        unsigned int flag22:1;
        unsigned int flag23:1;
        unsigned int flag24:1;
        unsigned int flag25:1;
        unsigned int flag26:1;
        unsigned int flag27:1;
        unsigned int flag28:1;
        unsigned int flag29:1;
        unsigned int flag30:1;
        unsigned int flag31:1;
    } flags;
} Pcond_flag_mask;
```

```

typedef struct {
    Pint          method;          /* test method          */
    union _Ptest_data {
        struct Ptest_always_fail {
            Pint          unused;
        } test_always_fail;
        struct Ptest_always_succeed {
            Pint          unused;
        } test_always_succeed;
        struct Ptest_extent_3 {
            Plimit3       rect;          /* extent rectangle    */
            Ptest_comp    relation;      /* test relation        */
            Pfloat        threshold;     /* threshold value     */
        } test_extent_3;
        struct Ptest_extent {
            Plimit        rect;          /* extent rectangle    */
            Ptest_comp    relation;      /* test relation        */
            Pfloat        threshold;     /* threshold value     */
        } test_extent;
        struct Ptest_bounds_3 {
            Ppoint_list_list3 point_lists; /* test object        */
            Pclip_cond     cond;          /* test condition      */
        } test_bounds_3;
        struct Ptest_bounds {
            Ppoint_list_list point_lists; /* test object        */
            Pclip_cond     cond;          /* test condition      */
        } test_bounds;
        struct Ptest_nameset {
            Pint          filter_type;   /* type of filter      */
            Pint          filter_id;     /* filter identifier   */
            Pfilter_op    cond;          /* test condition      */
        } test_nameset;
        struct Ptest_appl_int {
            Pint          appl_id;       /* appl. integer selector */
            Ptest_comp    comparison;    /* test comparison      */
            Pint          data;          /* appl integer data value */
        } test_appl_int;
        struct Ptest_appl_real {
            Pint          appl_id;       /* appl. real selector  */
            Ptest_comp    comparison;    /* test comparison      */
            Pfloat        data;          /* appl real data value  */
        } test_appl_real;
        struct Ptest_cond_flags {
            Pcond_flags_eval_op op;      /* condition flags eval. op. */
        } test_cond_flags;
    };
};

```

```

    struct Ptest_appl_int_as_logical {
        Pint      appl_id;      /* appl. integer selector */
        Ptest_comp_logical comparison; /* test comparison */
        Pint      data;        /* appl integer data value */
    } test_appl_int;
    ...
} test_data; /* implementation defined */
/* test data record*/

} Ptest;”

```

Pages 195 and 196

The following text is merged into the text of the definition of pelem\_data:

“

```

typedef union {
    /* start of PHIGS element data */
    ...
    /* end of PHIGS element data */
    /* start of PHIGS PLUS element data */
    ...
    /* end of PHIGS PLUS element data */
    /* start of Full PHIGS element data */
    struct Pappl_int {
        Pint      integer_id;    /* application integer identifier */
        Pint      value;        /* value for application integer */
    } appl_int;
    struct Pappl_real {
        Pint      real_id;      /* application real identifier */
        Pfloat     value;        /* value for application real */
    } appl_real;
    struct Pcircle3 {
        Ppoint3    center_point; /* center point */
        Pfloat     radius;        /* radius */
        Pvec3      ref_vecs[2];   /* reference vectors */
    } circle3;
    struct Pcircle {
        Ppoint     center_point; /* center point */
        Pfloat     radius;        /* radius */
    } circle;
    struct Pcircular_arc3 {
        Ppoint3    center_point; /* center point */
        Pfloat     radius;        /* radius */
        Pvec3      ref_vecs[2];   /* reference vectors */
        Pfloat     start;         /* start angle */
        Pfloat     end;           /* end angle */
    } circular_arc3;

```

”

```

struct Pcircular_arc {
    Ppoint          center_point; /* center point */
    Pfloat          radius;       /* radius */
    Pfloat          start;        /* start angle */
    Pfloat          end;          /* end angle */
} circular_arc;

struct Pellipse3 {
    Ppoint3         center_point; /* center point */
    Pvec3           major_ref_vec; /* major axis reference vector */
    Pvec3           minor_ref_vec; /* minor axis reference vector */
} ellipse3;

struct Pellipse {
    Ppoint          center_point; /* center point */
    Pvec            major_ref_vec; /* major axis reference vector */
    Pvec            minor_ref_vec; /* minor axis reference vector */
} ellipse;

struct Pelliptical_arc3 {
    Ppoint3         center_point; /* center point */
    Pvec3           major_ref_vec; /* major axis reference vector */
    Pvec3           minor_ref_vec; /* minor axis reference vector */
    Pfloat          start;        /* start angle */
    Pfloat          end;          /* end angle */
} elliptical_arc3;

struct Pelliptical_arc {
    Ppoint          center_point; /* center point */
    Pvec            major_ref_vec; /* major axis reference vector */
    Pvec            minor_ref_vec; /* minor axis reference vector */
    Pfloat          start;        /* start angle */
    Pfloat          end;          /* end angle */
} elliptical_arc;

struct Pfill_circle3 {
    Ppoint3         center_point; /* center point */
    Pfloat          radius;       /* radius */
    Pvec3           ref_vecs[2];  /* reference vectors */
} fill_circle3;

struct Pfill_circle {
    Ppoint          center_point; /* center point */
    Pfloat          radius;       /* radius */
} fill_circle;

struct Pcircular_arc_close3 {
    Ppoint3         center_point; /* center point */
    Pfloat          radius;       /* radius */
    Pvec3           ref_vecs[2];  /* reference vectors */
    Pfloat          start;        /* start angle */
    Pfloat          end;          /* end angle */
    Pclosure        type;        /* closure type */
} circular_arc_close3;

```

```

struct Pcircular_arc_close {
    Ppoint        center_point; /* center point */
    Pfloat        radius;       /* radius */
    Pfloat        start;        /* start angle */
    Pfloat        end;          /* end angle */
    Pclosure      type;         /* closure type */
} circular_arc_close;

struct Pfill_ellipse3 {
    Ppoint3       center_point; /* center point */
    Pvec3         major_ref_vec; /* major axis reference vector */
    Pvec3         minor_ref_vec; /* minor axis reference vector */
} fill_ellipse3;

struct Pfill_ellipse {
    Ppoint        center_point; /* center point */
    Pvec          major_ref_vec; /* major axis reference vector */
    Pvec          minor_ref_vec; /* minor axis reference vector */
} fill_ellipse;

struct Pelliptical_arc_close3 {
    Ppoint3       center_point; /* center point */
    Pvec3         major_ref_vec; /* major axis reference vector */
    Pvec3         minor_ref_vec; /* minor axis reference vector */
    Pfloat        start;        /* start angle */
    Pfloat        end;          /* end angle */
    Pclosure      type;         /* closure type */
} elliptical_arc_close3;

struct Pelliptical_arc_close {
    Ppoint        center_point; /* center point */
    Pvec          major_ref_vec; /* major axis reference vector */
    Pvec          minor_ref_vec; /* minor axis reference vector */
    Pfloat        start;        /* start angle */
    Pfloat        end;          /* end angle */
    Pclosure      type;         /* closure type */
} elliptical_arc_close;

Plinetype_adapt  linetype_adapt; /* linetype adaptability */
Plinetype_cont   linetype_cont;  /* linetype continuity */
Phighl_method    highl_method;   /* highlighting method */
Pint_list        active_textures; /* active textures */
Pint_list        back_active_textures; /* back active textures */
Pperspect_corr   perspect_corr; /* textr perspective correction */

struct Ptexture_res_opt_heur {
    Pint          opt_hint; /* optimization hint */
    Pint_list      usage_priorities; /* texture usage priorities */
} texture_res_opt_heur;

```

```

    Pint_list      alpha_src_sel; /* alpha source selector */
    struct Pcond_exec_struct {
        Pint      struct_id; /* structure identifier */
        Ptest     test; /* condition test */
    } cond_exec_struct;
    struct Pcond_inst_struct {
        Pint      struct_id; /* structure identifier */
        Ptest     test; /* condition test */
    } cond_inst_struct;
    Ptest     cond_return; /* condition test */
    struct Pcond_skip_elems {
        Pint      skip_count; /* number of elements to skip */
        Ptest     test; /* condition test */
    } cond_skip_elems;
    struct Pcond_skip_to_label {
        Pint      label; /* label to which to skip */
        Ptest     test; /* condition test */
    } cond_skip_to_label;
    /* end of Full PHIGS element data */

    } Pelem_data;”

```

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### A.3 External functions

The following text is appended:

```

/* WORKSTATION TYPE CREATE */

```

```

void pws_type_create

```

```

    Pint      ws_type, /* workstation type */
    const Pconfig_setting *settings_list, /* array of config. settings */
    Pint      *new_ws_type /* OUT new workstation type */

```

```

);

```

```

/* WORKSTATION TYPE SET */

```

```

void pws_type_set (

```

```

    Pint      ws_type, /* workstation type */
    const Pconfig_setting *settings_list /* array of config. settings */

```

```

);

```

```
/* WORKSTATION TYPE GET */
```

```
void pws_type_get (
```

```
    Pint          ws_type,          /* workstation type          */
    const char     *setting_name,    /* configuration setting name */
    Pstore         store,            /* store object for returned value */
    Pconfig_value  **setting_value   /* OUT configuration setting value */
```

```
);
```

```
/* WORKSTATION TYPE DESTROY */
```

```
void pws_type_destroy (
```

```
    Pint          ws_type          /* workstation type          */
```

```
);
```

```
/* REDRAW ALL STRUCTURES ON TARGET */
```

```
void predraw_all_structs_on_targ (
```

```
    Pint          ws_id,            /* workstation identifier     */
    const Ptarg_addr *targ_addr,    /* target address             */
    Pctrl_flag     ctrl_flag        /* control flag                */
```

```
);
```

```
/* REDRAW ALL STRUCTURES FROM POSTING GROUP */
```

```
void predraw_all_structs_from_grp (
```

```
    Pint          ws_id,            /* workstation identifier     */
    Pint          grp_id,           /* posting group              */
    Pbackg_redisplay redisplay_flag /* background redisplay flag  */
```

```
);
```

```
/* UPDATE TARGET */
```

```
void pupd_targ (
```

```
    Pint          ws_id,            /* workstation identifier     */
    const Ptarg_addr *targ_addr,    /* target address             */
    Pregen_flag    regen_flag       /* update regeneration flag    */
```

```
);
```

```
/* DEFINE POSTING GROUP */
```

```
void pdefine_post_grp (
```

```
    Pint          ws_id,          /* workstation identifier */
    Pint          grp_id,         /* posting group identifier */
    Pint          ref_grp_id,     /* reference posting group id */
    Prel_pri      rel_pri,       /* relative priority */
    Pint          def_view_ind,   /* default view index */
    Pbackg_style  backg_style,   /* posting group backg. style */
    const Pbackg_method *backg_method, /* posting group backg. method */
    Pborder_indic border_indic,  /* posting group border indic. */
    Pint          border_ind      /* posting group border index */

```

```
);
```

```
/* UNDEFINE POSTING GROUP */
```

```
void pundefine_post_grp (
```

```
    Pint          ws_id,          /* workstation identifier */
    Pint          grp_id         /* posting group identifier */

```

```
);
```

```
/* SET POSTING GROUP STATUS */
```

```
void pset_post_grp_status (
```

```
    Pint          ws_id,          /* workstation identifier */
    Pint          grp_id,         /* posting group identifier */
    Ppost_grp_status post_grp_status /* posting group status */

```

```
);
```

```
/* SET POSTING GROUP PRIORITY */
```

```
void pset_post_grp_priority (
```

```
    Pint          ws_id,          /* workstation identifier */
    Pint          grp_id,         /* posting group identifier */
    Pint          ref_grp_id,     /* reference posting group id */
    Prel_pri      rel_pri,       /* relative priority */

```

```
);
```

```
/* SET POSTING GROUP BACKGROUND STYLE */
```

```
void pset_post_grp_backg_style (
```

```
    Pint          ws_id,          /* workstation identifier */
    Pint          grp_id,         /* posting group identifier */
    Pbackg_style  backg_style    /* posting group background style */

```

```
);
```

/\* SET POSTING GROUP BACKGROUND METHOD \*/

void pset\_post\_grp\_backg\_method (

|                     |               |                             |    |
|---------------------|---------------|-----------------------------|----|
| Pint                | ws_id,        | /* workstation identifier   | */ |
| Pint                | grp_id,       | /* posting group identifier | */ |
| const Pbackg_method | *backg_method | /* posting group background | */ |
|                     |               | /* method                   | */ |

);

/\* SET POSTING GROUP BORDER INDICATOR \*/

void pset\_post\_grp\_border\_indicator (

|               |              |                                   |    |
|---------------|--------------|-----------------------------------|----|
| Pint          | ws_id,       | /* workstation identifier         | */ |
| Pint          | grp_id,      | /* posting group identifier       | */ |
| Pborder_indic | border_indic | /* posting group border indicator | */ |

);

/\* SET POSTING GROUP BORDER INDEX \*/

void pset\_post\_grp\_border\_ind (

|      |            |                               |    |
|------|------------|-------------------------------|----|
| Pint | ws_id,     | /* workstation identifier     | */ |
| Pint | grp_id,    | /* posting group identifier   | */ |
| Pint | border_ind | /* posting group border index | */ |

);

/\* ASSOCIATE IMAGE RESOURCE \*/

void passoc\_image\_res (

|                  |               |                              |    |
|------------------|---------------|------------------------------|----|
| Pint             | ws_id,        | /* workstation identifier    | */ |
| Pint             | image_res_id, | /* image resource identifier | */ |
| const Pint_size  | *dims,        | /* m,n dimensions            | */ |
| const Pimage_res | *image_res,   | /* image resource            | */ |
| Paccess_flag     | *access_flag  | /* OUT access flag           | */ |

);

/\* DISASSOCIATE IMAGE RESOURCE \*/

void pdisassoc\_image\_res (

|      |              |                              |    |
|------|--------------|------------------------------|----|
| Pint | ws_id,       | /* workstation identifier    | */ |
| Pint | image_res_id | /* image resource identifier | */ |

);

```

/* SET DEVICE COORDINATE CLIP REGIONS 3 */
void pset_dc_clip_regions3 (
    Pint          ws_id,          /* workstation identifier */
    const Plimit3_list *limit_list /* list of clip regions */
);

/* SET DEVICE COORDINATE CLIP REGIONS */
void pset_dc_clip_regions (
    Pint          ws_id,          /* workstation identifier */
    const Plimit_list *limit_list /* list of clip regions */
);

/* SET TARGET MANIPULATION MODE */
void pset_targ_manip_mode (
    Pint          ws_id,          /* workstation identifier */
    Pint          targ_manip_mode /* target manipulation mode */
);

/* SET TARGET DISPOSITION */
void pset_targ_dispos (
    Pint          ws_id,          /* workstation identifier */
    const Ptarg_op_list *targ_ops /* target operations list */
);

/* SET DISPLAY TARGET */
void pset_disp_targ (
    Pint          ws_id,          /* workstation identifier */
    const Ptarg_addr *targ_addr  /* target address */
);

/* SET RENDERING TARGET */
void pset_rend_targ (
    Pint          ws_id,          /* workstation identifier */
    const Ptarg_addr *targ_addr  /* target address */
);

```

```

/* CLEAR TARGET */
void pclear_targ (
    Pint          ws_id,          /* workstation identifier */
    const Ptarg_addr *targ_addr    /* target address */
);

/* COPY TARGET */
void pcopy_targ (
    Pint          ws_id,          /* workstation identifier */
    const Ptarg_addr *src_targ_addr, /* source target address */
    const Ptarg_addr *dest_targ_addr /* destination target address */
);

/* CREATE TARGET */
void pcreate_targ (
    Pint          ws_id,          /* workstation identifier */
    const Ptarg_addr *targ_addr    /* target address */
);

/* DESTROY TARGET */
void pdestroy_targ (
    Pint          ws_id,          /* workstation identifier */
    const Ptarg_addr *targ_addr    /* target address */
);

/* SET STATE OF VISUAL REPRESENTATION */
void pset_st_visual_rep (
    Pint          ws_id,          /* workstation identifier */
    Pvisual_st    visual_st        /* state of visual representation */
);

/* SET TARGET STATE OF VISUAL REPRESENTATION */
void pset_targ_st_visual_rep (
    Pint          ws_id,          /* workstation identifier */
    const Ptarg_addr *targ_addr,    /* target address */
    Pvisual_st    visual_st        /* state of visual representation */
);

```

```
/* ASSOCIATE TRAVERSAL RESOURCE */
```

```
void passoc_trav_res (
    Pint          ws_id,          /* workstation identifier */
    Pint          res_id,         /* traversal resource identifier */
    const Ptarg_addr *targ_addr   /* source target address */
);
```

```
/* DISASSOCIATE TRAVERSAL RESOURCE */
```

```
void pdisassoc_trav_res (
    Pint          ws_id,          /* workstation identifier */
    Pint          res_id         /* traversal resource identifier */
);
```

```
/* MANIPULATE TRAVERSAL RESOURCE */
```

```
void pmanip_trav_res (
    Pint          ws_id,          /* workstation identifier */
    Pint          res_id,         /* traversal resource identifier */
    const Ptrav_res_op *manip_data /* traversal resource operation */
);
```

```
/* RESET ALL TRAVERSAL RESOURCES */
```

```
void preset_all_trav_res (
    Pint          ws_id          /* workstation identifier */
);
```

```
/* RETRIEVE WINDOW SYSTEM COLOUR */
```

```
void pret_window_system_colr (
    Pint          ws_id,          /* workstation identifier */
    const Pgcolr *colr,          /* colour sought */
    Pstore        store,         /* store object for returned value */
    Pdata         **winsys_colr  /* OUT window system colour */
);
```

```
/* SET APPLICATION INTEGER */
```

```
void pset_appl_int (
    Pint          integer_id,     /* application integer identifier */
    Pint          value          /* value of application integer */
);
```

```

/* SET APPLICATION REAL */
void pset_appl_real (
    Pint    real_id,      /* application real identifier */
    Pfloat  value         /* value of application real */
);

/* CIRCLE 3 */
void pcircle3 (
    const Ppoint3  *center_point, /* center point */
    Pfloat         radius,         /* radius */
    const Pvec3    ref_vecs[2]    /* reference vectors */
);

/* CIRCLE */
void pcircle (
    const Ppoint  *center_point, /* center point */
    Pfloat        radius         /* radius */
);

/* CIRCULAR ARC 3 */
void pcircular_arc3 (
    const Ppoint3  *center_point, /* center point */
    Pfloat         radius,         /* radius */
    const Pvec3    ref_vecs[2],   /* reference vectors */
    Pfloat         start,         /* start angle */
    Pfloat         end            /* end angle */
);

/* CIRCULAR ARC */
void pcircular_arc (
    const Ppoint  *center_point, /* center point */
    Pfloat        radius,         /* radius */
    Pfloat        start,         /* start angle */
    Pfloat        end            /* end angle */
);

```

```
/* ELLIPSE 3 */
```

```
void pellipse3 (
```

```
    const Ppoint3    *center_point,    /* center point          */
    const Pvec3      *major_ref_vec,    /* major axis reference vector */
    const Pvec3      *minor_ref_vec    /* minor axis reference vector */

```

```
);
```

```
/* ELLIPSE */
```

```
void pellipse (
```

```
    const Ppoint    *center_point,    /* center point          */
    const Pvec       *major_ref_vec,    /* major axis reference vector */
    const Pvec       *minor_ref_vec    /* minor axis reference vector */

```

```
);
```

```
/* ELLIPTICAL ARC 3 */
```

```
void pelliptical_arc3 (
```

```
    const Ppoint3    *center_point,    /* center point          */
    const Pvec3      *major_ref_vec,    /* major axis reference vector */
    const Pvec3      *minor_ref_vec,    /* minor axis reference vector */
    Pfloat            start,            /* start angle           */
    Pfloat            end              /* end angle             */

```

```
);
```

```
/* ELLIPTICAL ARC */
```

```
void pelliptical_arc (
```

```
    const Ppoint    *center_point,    /* center point          */
    const Pvec       *major_ref_vec,    /* major axis reference vector */
    const Pvec       *minor_ref_vec,    /* minor axis reference vector */
    Pfloat            start,            /* start angle           */
    Pfloat            end              /* end angle             */

```

```
);
```

```
/* FILL CIRCLE 3 */
```

```
void pfill_circle3 (
```

```
    const Ppoint3    *center_point,    /* center point          */
    Pfloat            radius,           /* radius                */
    const Pvec3      *ref_vecs[2]      /* reference vectors     */

```

```
);
```

```

/* FILL CIRCLE */
void pfill_circle (
    const Ppoint    *center_point, /* center point */
    Pfloat          radius        /* radius */
);

/* CIRCULAR ARC CLOSE 3 */
void pcircular_arc_close3 (
    const Ppoint3    *center_point, /* center point */
    Pfloat           radius,        /* radius */
    const Pvec3      ref_vecs[2],   /* reference vectors */
    Pfloat           start,         /* start angle */
    Pfloat           end,           /* end angle */
    Pclosure         type           /* closure type */
);

/* CIRCULAR ARC CLOSE */
void pcircular_arc_close (
    const Ppoint    *center_point, /* center point */
    Pfloat          radius,        /* radius */
    Pfloat          start,         /* start angle */
    Pfloat          end,           /* end angle */
    Pclosure        type           /* closure type */
);

/* FILL ELLIPSE 3 */
void pfill_ellipse3 (
    const Ppoint3    *center_point, /* center point */
    const Pvec3      *major_ref_vec, /* major axis reference vector */
    const Pvec3      *minor_ref_vec  /* minor axis reference vector */
);

/* FILL ELLIPSE */
void pfill_ellipse (
    const Ppoint    *center_point, /* center point */
    const Pvec       *major_ref_vec, /* major axis reference vector */
    const Pvec       *minor_ref_vec  /* minor axis reference vector */
);

```

```
/* ELLIPTICAL ARC CLOSE 3 */
```

```
void pelliptical_arc_close3 (
```

```
    const Ppoint3    *center_point,      /* center point          */
    const Pvec3       *major_ref_vec,     /* major axis reference vector */
    const Pvec3       *minor_ref_vec,     /* minor axis reference vector */
    Pfloat            start,              /* start angle           */
    Pfloat            end,                /* end angle             */
    Pclosure          type                /* closure type          */

```

```
);
```

```
/* ELLIPTICAL ARC CLOSE */
```

```
void pelliptical_arc_close (
```

```
    const Ppoint      *center_point,      /* center point          */
    const Pvec         *major_ref_vec,     /* major axis reference vector */
    const Pvec         *minor_ref_vec,     /* minor axis reference vector */
    Pfloat            start,              /* start angle           */
    Pfloat            end,                /* end angle             */
    Pclosure          type                /* closure type          */

```

```
);
```

```
/* SET HIGHLIGHTING INDEX */
```

```
void pset_highl_ind (
```

```
    Pint             highl_ind            /* highlighting index    */

```

```
);
```

```
/* SET LINETYPE ADAPTABILITY */
```

```
void pset_linetype_adapt (
```

```
    Plinetype_adapt  adaptability        /* linetype adaptability */

```

```
);
```

```
/* SET LINETYPE CONTINUITY */
```

```
void pset_linetype_cont (
```

```
    Plinetype_cont   continuity          /* linetype continuity   */

```

```
);
```

```
/* SET LINETYPE OFFSET */
```

```
void pset_linetype_offset (
```

```
    Pfloat           offset              /* linetype offset       */

```

```
);
```

```

/* SET HIGHLIGHTING METHOD */
void pset_highl_method (
    const Phighl_method *method          /* highlighting method          */
);

/* SET CONDITION FLAGS */
void pset_cond_flags (
    const Pcond_flags *enable_mask,      /* condition flag enable mask */
    const Pcond_flags *disable_mask     /* condition flag disable mask */
);

/* SET CONDITION FLAGS FROM TESTS */
void pset_cond_flags_from_tests (
    const Pcond_test_list *tests         /* list of condition flag tests
                                         */
);

/* SET ACTIVE TEXTURES */
void pset_active_textures (
    const Pint_list *active_textures     /* list of active textures      */
);

/* SET BACK ACTIVE TEXTURES */
void pset_back_active_textures (
    const Pint_list *back_active_textures /* list of active textures      */
);

/* SET TEXTURE PERSPECTIVE CORRECTION */
void pset_texture_perspect_corr (
    Pperspect_corr perspect_corr         /* texture perspective correction */
);

/* SET TEXTURE SAMPLING FREQUENCY */
void pset_texture_sampling_freq (
    Pint sampling_freq                   /* texture sampling frequency    */
);

```

```
/* SET TEXTURE RESOURCE OPTIMIZATION HEURISTICS */
```

```
void pset_texture_res_opt_heur (
    Pint          opt_hint,          /* optimization hint          */
    const Pint_list *usage_priorities /* texture usage priorities    */
);
```

```
/* SET TRANSPARENCY */
```

```
void pset_transparency (
    Pfloat          transparency /* transparency                */
);
```

```
/* SET BACK TRANSPARENCY */
```

```
void pset_back_transparency (
    Pfloat          back_transparency /* back transparency           */
);
```

```
/* SET ALPHA SOURCE SELECTOR */
```

```
void pset_alpha_src_sel (
    const Pint_list *alpha_src_sel /* alpha source selector list */
);
```

```
/* SET ALPHA DATA SELECTION INDEX */
```

```
void pset_alpha_data_sel_ind (
    Pint          alpha_data_sel_ind /* alpha data selection index */
);
```

```
/* DEFINE LINETYPE */
```

```
void pdefine_linetype (
    Pint          linetype,          /* linetype                    */
    Pfloat        repeat_length,     /* repeat length                */
    const Pfloat_list *segment_lengths /* segment length list         */
);
```

```
/* DEFINE MARKER TYPE */
```

```
void pdefine_marker_type (
    Pint          marker_type, /* marker type                */
    const Pmarker_desc *marker /* marker descriptor          */
);
```

```
/* SET EXTENDED PATTERN REPRESENTATION */
```

```
void pset_ext_pat_rep (
```

```
    Pint          ws_id,          /* workstation identifier      */
    Pint          pat_ind,        /* pattern bundle index       */
    const Ppattern *pattern       /* extended pattern representation */
```

```
);
```

```
/* SET HIGHLIGHTING REPRESENTATION */
```

```
void pset_highl_rep (
```

```
    Pint          ws_id,          /* workstation identifier      */
    Pint          highl_ind,      /* highlighting bundle index    */
    const Phighl_method *method   /* highlighting method         */
```

```
);
```

```
/* SET TEXTURE REPRESENTATION */
```

```
void pset_texture_rep (
```

```
    Pint          ws_id,          /* workstation identifier      */
    Pint          index,          /* texture index              */
    const Ptexture_rep *rep       /* texture representation     */
```

```
);
```

```
/* SET TEXTURE PARAMETRIZATION */
```

```
void pset_texture_param (
```

```
    Pint          ws_id,          /* workstation identifier      */
    Pint          index,          /* texture index              */
    const Ptexture_param *param   /* texture parametrization     */
```

```
);
```

```
/* SET TEXTURE COMPOSITION */
```

```
void pset_texture_composition (
```

```
    Pint          ws_id,          /* workstation identifier      */
    Pint          index,          /* texture index              */
    const Ptexture_compos *compos /* texture composition        */
```

```
);
```

```
/* SET TEXTURE SAMPLING */
```

```
void pset_texture_sampling (
```

```
    Pint                ws_id,        /* workstation identifier    */
    Pint                index,        /* texture index            */
    const Ptexture_sampling *sampling /* texture sampling         */

```

```
);
```

```
/* SET TEXTURE BINDING */
```

```
void pset_texture_binding (
```

```
    Pint                ws_id,        /* workstation identifier    */
    Pint                index,        /* texture index            */
    const Ptexture_binding *binding  /* texture binding          */

```

```
);
```

```
/* SET TRANSPARENCY MODE */
```

```
void pset_transparency_mode (
```

```
    Pint                ws_id,        /* workstation identifier    */
    Pint                mode          /* transparency mode         */

```

```
);
```

```
/* SET TRANSPARENCY THRESHOLDS */
```

```
void pset_transparency_thresholds (
```

```
    Pint                ws_id,        /* workstation identifier    */
    const Pfloat_list *thresholds    /* list of transparency thresholds */

```

```
);
```

```
/* SET APPLICATION FILTER */
```

```
void pset_app_filter (
```

```
    Pint                ws_id,        /* workstation identifier    */
    Pint                filter_selector, /* application filter selector */
    const Pfilter       *filter       /* application filter         */

```

```
);
```

```
/* CREATE MIPMAP TEXTURE */
```

```
void pcreate_mipmap_texture (
```

```
    Pint    ws_id,          /* workstation identifier      */
    Pint    src_image_res_id, /* source image resource id    */
    Pint    mipmap_image_res_id, /* mipmap image resource id  */
    Pint    max_levels,     /* max mipmap levels          */
    Pint    creation_heuristic /* mipmap creation heuristic  */
);
```

```
/* SET VIEW REFERENCE POINT 3 */
```

```
void pset_view_ref_point3 (
```

```
    Pint    ws_id,          /* workstation id              */
    Pint    view_ind,       /* view index                  */
    const Ppoint3 *view_ref_point /* view reference point      */
);
```

```
/* SET VIEW REFERENCE POINT */
```

```
void pset_view_ref_point (
```

```
    Pint    ws_id,          /* workstation id              */
    Pint    view_ind,       /* view index                  */
    const Ppoint *view_ref_point /* view reference point      */
);
```

```
/* SET VIEW PLANE NORMAL */
```

```
void pset_view_plane_norm (
```

```
    Pint    ws_id,          /* workstation id              */
    Pint    view_ind,       /* view index                  */
    const Pvec3 *view_norm_vec /* view normal vector        */
);
```

```
/* SET VIEW UP VECTOR 3 */
```

```
void pset_view_up_vec3 (
```

```
    Pint    ws_id,          /* workstation id              */
    Pint    view_ind,       /* view index                  */
    const Pvec3 *view_up_vec /* view up vector             */
);
```