INTERNATIONAL STANDARD

ISO/IEC 9593-4

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AMENDMENT 1
1994-05-01

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

Part 4: C

AMENDMENT 1

Technologies de l'information — Infographie — Interfaces langage entre un programme d'application et son support graphique —

Partie 4: C

AMENDEMENT 1

Reference number
ISO/IEC 9593-4:1991/Amd.1:1994(E)

Contents

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 1 to International Standard ISO/IEC 9593-4:1991 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*.

Introduction

Replace the current text with the following:

Part 1 of the Programmer's Hierarchical Interactive Graphics System (PHIGS) functional description is registered as ISO/IEC 9592-1:1989. Part 1 is extended by part 4, ISO/IEC 9592-4:1991 to incorporate the effects of lighting, shading and other properties important for the display of surfaces and multidimensional data. The purpose of this part of ISO/IEC 9593 is to define a standard binding for the C computer programming language to the functionality defined in ISO/IEC 9592-1:1989 and ISO/IEC 9592-4:1991.

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

Part 4:
C

AMENDMENT 1

1 Scope

Replace the text with the following:

Part 1 of the Programmer's Hierarchical Interactive Graphics System (PHIGS), ISO/IEC 9592-1, and part 4 (PHIGS PLUS), ISO/IEC 9592-4, specify a language independent nucleus of a graphics system. For integration into a programming language, PHIGS and PHIGS PLUS are embedded in a language dependent layer obeying the particular conventions of that language. This part of ISO/IEC 9593 specifies such a language dependent layer for the C language.

2 Normative references

Add the following reference:

ISO/IEC 9592-4:1992, *Information processing systems — Computer graphics — Programmer's Hierarchical Interactive Graphics System (PHIGS) — Part 4: Plus Lumière und Surfaces, PHIGS PLUS.*

3 The C language binding of PHIGS

Change the clause heading to **The C language binding of PHIGS and PHIGS PLUS.**

3.1 Conformance

Replace the last two paragraphs with the following text:

In order to conform, an implementation of the C binding of PHIGS shall implement those functions specified in ISO/IEC 9592-1. The implementation shall make visible all of the declarations in the C binding specified in clauses 5 to 7 in this part of ISO/IEC 9593.

In order to conform, an implementation of the C binding of PHIGS PLUS shall implement those functions specified in ISO/IEC 9592-1 and also those functions specified in ISO/IEC 9592-4. The implementation shall make visible all of the declarations in the C binding specified in clauses 5 to 10 in this part of ISO/IEC 9593.

Thus, for example, 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.

3.2 Functions versus macros

No changes.

3.3 Character strings

No changes.

3.4 Function identifiers

No changes.

3.5 Registration

No changes.

3.6 Identifiers for graphical items

No changes.

3.7 Return values

No changes.

3.8 Header files

No changes.

3.9 Memory management

No changes.

3.9.1 Inquiry functions which return simple lists

No changes.

3.9.2 Inquiry functions which return complex data structures

No changes.

3.9.3 Meaning of the size of an element

No changes.

3.10 Inquiries returning structure elements

No changes.

3.11 Error handling

3.11.1 Application defined error handlers

No changes.

3.11.2 Error codes

No changes.

3.11.3 C specific PHIGS errors

Change the heading to **C binding specific errors** *and add the following binding specific errors:*

2207 `Ignoring function, two or more vertices do not contain the same type of data`
Is issued when an output primitive is created in which one or more of the vertices are specified with a particular type of data, such as normals, and other vertices are specified without the same type of data.

3.12 Storage of two-dimensional data

No changes.

3.12.1 Storage of matrices

No changes.

3.12.2 Storage of colour arrays

Change the heading to be **Storage of arrays** *and replace the text with the following:*

The entries of the `Ppat_rep` and `Px_array` data types (where x is one of `colrv`, `colrv_ctrl_point`, `ctrl_point3`, `data_ctrl_point`, `edge_flag`, `facet`, `float`, `vertex`, and `vertex3`) shall be stored such that the `(i,j)`th element in the array is given by the following expression:

```
i + j * DX
```

where:

`i = 0,..., DX-1,`
`j = 0,..., DY-1,`
`DX` = the `size_x` value of the array's `Pint_size` field, and
`DY` = the `size_y` value of the array's `Pint_size` field.

3.13 Data type descriptions

Add the clause with the following text:

The `Pedge_flag_array` data type defines an edge visibility flag for each edge of the quadrilateral mesh. The edge visibility flags are arranged in a *MXN* array of `Pedge_flag_pairs`. For each *(i,j)* `Pedge_flag_pair`, the first element speechifies the edge flag for the edge between the *i,j* and *i+1,j* vertices and the second element speechifies the edge flag for the edge between the *i,j* and *i,j+1* vertices. The first element of the *(M,j)* `Pedge_flag_pair`, where $1 \le j \le N$, and second element of the *(i, N)* `Pedge_flag_pair`, where $1 \le i \le M$, are not used.

The `Pedge_flag_triplet_list` data type consists of a list of `Pedge_flag_triplets`; one for each triangle in a triangle set. The first element of a `Pedge_flag_triplet` specifies the edge flag between the first and the second vertices of the triangle, the second element specifies the edge flag between the second and third vertices of the triangle. The third element specifies the edge flag between the third and first vertices of the triangle.

The `Px_set` data types (where x is one of `colrv`, `contour`, `edge_flag`, `float`, `vertex`, and `vertex3`) contain a list of `Px_lists`.

The `Px_set_list` data types (where x is one of `contour` and `edge_flag`) contains a list of `Px_sets`.

4 Tables

4.1 Abbreviation policy for construction of identifiers

No changes.

4.2 Table of abbreviations

Add alphabetically, to table 1, the following abbreviations:

Table 1 - Abbreviations ordered alphabetically

Word or Phrase	Abbreviation
activation	act
ambient	amb
approximation	approx
attenuation	atten
between	NULL
characteristics	chars
coefficient	coeff
concentration	conc
constant	const
compute	comp
criteria	crit
culling	cull
deactivate	deact
deactivation	deact
deviation	dev
diffuse	diff
directional	dir
distinguishing	disting
exponent	exp
geometric	geom
homogeneous	homo
isoparametric	isoparam
parametric	param
positional	pos
product	prod
properties	props
quadrilateral	quad

Table 1 - Abbreviations ordered alphabetically

Word or Phrase	Abbreviation
reflectance	refl
rendering	rend
shading	shad
specular	spec
subdivision	subd
triangle	tri
triangular	tri
trimming	trim
with	NULL

4.3 Function names

4.3.1 List ordered alphabetically by bound name

In table 2 change the column heading PHIGS Name *to* PHIGS and PHIGS PLUS Name *and merge alphabetically by bound name, the following function names:*

Table 2 - Function names ordered by bound name

C Name	PHIGS and PHIGS PLUS Name
pcell_array3_plus	CELL ARRAY 3 PLUS
pfill_area_set_data	FILL AREA SET WITH DATA
pfill_area_set3_data	FILL AREA SET 3 WITH DATA
pinq_b_spline_surf_facs	INQUIRE B-SPLINE SURFACE FACILITIES
pinq_colr_map_facs	INQUIRE COLOUR MAPPING FACILITIES
pinq_colr_map_method_facs	INQUIRE COLOUR MAPPING METHOD FACILITIES
pinq_colr_map_rep	INQUIRE COLOUR MAPPING REPRESENTATION
pinq_colr_map_st	INQUIRE COLOUR MAPPING STATE
pinq_curve_facs	INQUIRE CURVE FACILITIES
pinq_data_map_facs	INQUIRE DATA MAPPING FACILITIES
pinq_data_map_rep	INQUIRE DATA MAPPING REPRESENTATION
pinq_depth_cue_facs	INQUIRE DEPTH CUE FACILITIES
pinq_depth_cue_rep	INQUIRE DEPTH CUE REPRESENTATION
pinq_direct_colr_model_facs	INQUIRE DIRECT COLOUR MODEL FACILITIES
pinq_dyns_ws_plus	INQUIRE DYNAMICS OF WORKSTATION PLUS
pinq_edge_rep_plus	INQUIRE EDGE REPRESENTATION PLUS
pinq_int_facs_plus	INQUIRE INTERIOR FACILITIES PLUS
pinq_int_rep_plus	INQUIRE INTERIOR REPRESENTATION PLUS
pinq_light_source_facs	INQUIRE LIGHT SOURCE FACILITIES
pinq_light_source_rep	INQUIRE LIGHT SOURCE REPRESENTATION
pinq_line_facs_plus	INQUIRE POLYLINE FACILITIES PLUS
pinq_line_rep_plus	INQUIRE POLYLINE REPRESENTATION PLUS
pinq_list_colr_map_inds	INQUIRE LIST OF COLOUR MAPPING INDICES

Table 2 - Function names ordered by bound name

C Name	PHIGS and PHIGS PLUS Name
pinq_list_data_map_inds	INQUIRE LIST OF DATA MAPPING INDICES
pinq_list_depth_cue_inds	INQUIRE LIST OF DEPTH CUE INDICES
pinq_list_light_source_inds	INQUIRE LIST OF LIGHT SOURCE INDICES
pinq_list_param_surf_inds	INQUIRE LIST OF PARAMETRIC SURFACE INDICES
pinq_list_refl_inds	INQUIRE LIST OF REFLECTANCE INDICES
pinq_marker_rep_plus	INQUIRE POLYMARKER REPRESENTATION PLUS
pinq_param_surf_facs	INQUIRE PARAMETRIC SURFACE FACILITIES
pinq_param_surf_rep	INQUIRE PARAMETRIC SURFACE REPRESENTATION
pinq_pat_rep_plus	INQUIRE PATTERN REPRESENTATION PLUS
pinq_pred_colr_map_rep	INQUIRE PREDEFINED COLOUR MAPPING REPRESENTATION
pinq_pred_data_map_rep	INQUIRE PREDEFINED DATA MAPPING REPRESENTATION
pinq_pred_depth_cue_rep	INQUIRE PREDEFINED DEPTH CUE REPRESENTATION
pinq_pred_edge_rep_plus	INQUIRE PREDEFINED EDGE REPRESENTATION PLUS
pinq_pred_int_rep_plus	INQUIRE PREDEFINED INTERIOR REPRESENTATION PLUS
pinq_pred_light_source_rep	INQUIRE PREDEFINED LIGHT SOURCE REPRESENTATION
pinq_pred_line_rep_plus	INQUIRE PREDEFINED POLYLINE REPRESENTATION PLUS
pinq_pred_marker_rep_plus	INQUIRE PREDEFINED POLYMARKER REPRESENTATION PLUS
pinq_pred_param_surf_rep	INQUIRE PREDEFINED PARAMETRIC SURFACE REPRESENTATION
pinq_pred_pat_rep_plus	INQUIRE PREDEFINED PATTERN REPRESENTATION PLUS
pinq_pred_refl_rep	INQUIRE PREDEFINED REFLECTANCE REPRESENTATION
pinq_pred_text_rep_plus	INQUIRE PREDEFINED TEXT REPRESENTATION PLUS
pinq_refl_facs	INQUIRE REFLECTANCE FACILITIES
pinq_refl_rep	INQUIRE REFLECTANCE REPRESENTATION
pinq_rend_colr_model_facs	INQUIRE RENDERING COLOUR MODEL FACILITIES
pinq_text_rep_plus	INQUIRE TEXT REPRESENTATION PLUS
pinq_trim_curve_facs	INQUIRE TRIMMING CURVE FACILITIES
pinq_ws_st_table_length_plus	INQUIRE WORKSTATION STATE TABLE LENGTHS PLUS
pnon_uniform_b_spline_curve3	NON-UNIFORM B-SPLINE CURVE 3
pnon_uniform_b_spline_curve3_colr	NON-UNIFORM B-SPLINE CURVE 3 WITH COLOUR
pnon_uniform_b_spline_surf3	NON-UNIFORM B-SPLINE SURFACE 3
pnon_uniform_b_spline_surf3_data	NON-UNIFORM B-SPLINE SURFACE 3 WITH DATA
ppolyline_set3_colr	POLYLINE SET 3 WITH COLOUR
pquad_mesh_data	QUADRILATERAL MESH WITH DATA
pquad_mesh3_data	QUADRILATERAL MESH 3 WITH DATA
pset_back_data_map_ind	SET BACK DATA MAPPING INDEX
pset_back_data_map_method	SET BACK DATA MAPPING METHOD
pset_back_int_colr	SET BACK INTERIOR COLOUR
pset_back_int_ind	SET BACK INTERIOR INDEX
pset_back_int_shad_method	SET BACK INTERIOR SHADING METHOD
pset_back_int_style	SET BACK INTERIOR STYLE
pset_back_int_style_ind	SET BACK INTERIOR STYLE INDEX
pset_back_refl_ind	SET BACK REFLECTANCE INDEX
pset_back_refl_model	SET BACK REFLECTANCE MODEL
pset_back_refl_props	SET BACK REFLECTANCE PROPERTIES
pset_colr_map_ind	SET COLOUR MAPPING INDEX
pset_colr_map_rep	SET COLOUR MAPPING REPRESENTATION
pset_curve_approx_crit	SET CURVE APPROXIMATION CRITERIA