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Draft for Development

Computer graphics: Graphical Kernel System for three dimensions (GKS-3D) language bindings

Part 1. FORTRAN (ISO/DP 8806/1)

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This publication is not to be regarded as a British Standard. It is being issued in the Draft for Development series of publications and is of a provisional nature because the subject matter is in the process of ongoing development within the International Standards Committee (ISO/TC 97/SC 21 Information Retrieval, Transfer and Management for Open Systems Interconnection).

It should be applied on this provisional basis, so that information and experience of its practical application may be obtained.

A review of this Draft for Development will be carried out not later than two years after its publication. Notification of the start of the review period, with a request for the submission of comments from users of this Draft for Development will be made in an announcement in the appropriate issue of *BSI News*. Observations which it is felt should receive attention before the official call for comments will be welcomed.

According to the replies received, the responsible BSI Committee will judge whether the Draft for Development can be converted into a British Standard or what other action should be taken.

National foreword

This Part of DD 150 has been prepared under the direction of the Office and Information Standards Committee.

The primary objective of this Part of DD 150 is to give advance guidance to product and systems designers concerned with computer graphics.

This Part of DD 150 is identical with the Draft Proposal ISO/DP 8806/1 'Information processing systems—Computer graphics—Graphical Kernel System for three dimensions (GKS-3D) language bindings—Part 1: FORTRAN', issued by the International Organization for Standardization (ISO).

For ease of reproduction, the ISO text has been reproduced unchanged.

The UK is actively participating through BSI Technical Committee IST/21* in the development of the ISO Draft Proposal. The Technical Committee will review any agreed amendments or addenda to the ISO text and will, where appropriate, update the text of this Draft for Development via an amendment or revision. When the ISO draft reaches an appropriate level of agreement and stability, this Draft for Development may be converted to a British Standard.

Attention is drawn to clause 0 'Introduction' and clause 1 'Scope and Field of Application' of this document, which explain that the text of this Draft for Development is presented as changes and extensions to the FORTRAN language binding published as Draft for Development DD 114: Part 1 'FORTRAN', and is not usable without the text of DD 114: Part 1: 1986.

It is expected that further Parts will be added to DD 150 to correspond with those published for DD 114.

A Draft for Development for GKS-3D 'Functional description' has been published as DD 128.

Cross-references

International standards	Corresponding British Standards
ISO 7942-1985	BS 6390: 1985 Specification for a set of functions for computer graphics programming, the Graphical Kernel System (GKS) (Identical)
ISO/DP 8805.2	DD 128: 1986 Computer graphics: Graphical Kernel System for three dimensions (GKS-3D) functional description (ISO/DP 8805.2) (Identical)
ISO/DIS 8651/1	DD 114 Computer graphics: Graphical Kernel System (GKS) language bindings Part 1: 1986 FORTRAN (ISO/DIS 8651/1) (Identical)

ISO 1539-1980 'Programming languages—FORTRAN' is an endorsement by ISO of ANSI standard X3.9-1978. The Technical Committee has reviewed the provisions of ISO 1539, to which reference is made in the text, and has decided that they are acceptable for use in conjunction with this Part of DD 150. At present there is no related British Standard.

* Previously OIS/121.

0. Introduction

The Graphical Kernel System (GKS) is defined in ISO 7942. As explained in the scope of that document, the standard is specified in a language independent manner and is embedded in language dependent layers (language bindings) for use with particular programming languages. Those language bindings are defined in the multi-part standard ISO 8651 of which Part I is the FORTRAN language binding.

GKS is extended to GKS-3D (the Graphical Kernel System for Three Dimensions) by the document ISO 8805. In a similar way, the language bindings for GKS are extended to form language bindings for GKS-3D. The purpose of this document is that, when taken together with ISO 8651/1, it defines the FORTRAN language binding for GKS-3D.

1. Scope and Field of Application

The Graphical Kernel System for Three Dimensions (GKS-3D) specifies a language independent nucleus of a system for computer graphics in 3 dimensions. It is defined by a document (ISO 7942) specifying the Graphical Kernel System (GKS) and a document (ISO 8805) which specifies the extension of GKS to 3 dimensions.

For integration into a programming language, GKS-3D is embedded in a language binding obeying the particular conventions of that language. This document specifies such a language binding for the FORTRAN language.

The interface known as the FORTRAN language binding of the Graphical Kernel System for Three Dimensions shall be as described in clauses 3 to 20 of the FORTRAN language binding of GKS (ISO 8651/1), as modified by the corresponding clauses of this document.

If a clause or subclause number in this document is followed by the letter 'R' (for example 3.1R), the text in this document replaces that in ISO 8651/1. If a clause or subclause number in this document is followed by the letter 'C' (for example 3.2C), the text in this document consists of editing instructions to be applied to the text in ISO 8651/1, for example:

----- replace 2nd paragraph by:

followed by the replacement text. Numbers of clauses or subclauses which themselves contain subsidiary headings are not followed by a letter. If a clause or subclause in this document is empty, the effect is to leave the corresponding clause in ISO 8651/1 unchanged. The number of a new clause or subclause is also not followed by a letter.

In the context of this extension of the FORTRAN binding, allusions to GKS and Graphical Kernel System in ISO 8651/1 should be read as GKS-3D and the Graphical Kernel System for Three Dimensions respectively.

[ISO page 2]

2. References

- | | |
|----------|--|
| ISO 1539 | Programming Languages - FORTRAN |
| ISO 7942 | Information Processing Systems - Computer Graphics -
Graphical Kernel System (GKS) Functional Description |
| ISO 8805 | Information Processing Systems - Computer Graphics -
Graphical Kernel System for Three Dimensions (GKS-3D)
Function Description (in course of preparation) |

[ISO page 3]

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3. Principles

3.1 Mapping of GKS Function Names to FORTRAN Subroutine Names

3.2C Parameters

----- Insert after last paragraph

Certain inquiry functions in GKS-3D have current and requested values. For INQUIRE VIEW REPRESENTATION, either the current or the requested values may be inquired and the input value of an additional argument selects which is required.

3.3 The FORTRAN Subset

3.4 Error Handling

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4C. Generating FORTRAN Subroutine Names

----- Add to the list headed Reduce Compound Terms

ARRAY DIMENSIONS 3	D3
CLIPPING 3	CLP3
EDGE FLAG	EDFG
element OF AVAILABLE GENERALIZED DRAW PRIMITIVE 3	EGD3
EXTENT 3	3
GKS-3D WORKSTATION	W3
PATTERN REFERENCE POINTS 3	PRP3
VIEW TRANSFORMATION	VT
VIEWPORT 3	V3
WINDOW 3	W3
WORKSTATION 3	W3

----- Add to the list headed Abbreviations

EDGE	ED
EDGETYPE	EDT
EDGEWIDTH	EW
HLHSR	HR
VIEW	VW
VOLUME	VOL

5C. Data Types

----- Replace the item "const x simple_type, where
 ----- simple_type is I or R", by the following

const x simple_type where simple_type is I or R (vector of values, for example 2xR).

In non-inquiry functions where const ≥ 6 or
 in inquiry functions where const ≥ 4 ,
 a simple_type array of dimension const is used,
 otherwise separate simple_type parameters are used.

----- Replace the item "const x E" by the following

const x E

An array of INTEGER elements of dimension const is used, each element being an enumeration alternative.

----- Insert before the paragraph beginning
 ----- "The representation of CELL ARRAY,"

P3 3xREAL representing the x,y and z coordinates.

const x P3 (where const ≥ 2)

REAL arrays xa(const), ya(const), za(const). Examples of this data type are in TEXT 3, CELL ARRAY 3 and SET PATTERN REFERENCE POINTS 3.

nxP3 REAL arrays xa(n), ya(n), za(n).

L (list of 2D point lists):

L3 (list of 3D point lists):

The following description applies to both 2D and 3D point lists except that the ZA array is not present for 2D point lists. The list of point lists is as follows:

INTEGER NPL
 INTEGER IX(NPL)
 REAL XA(*),YA(*),ZA(*)

where

NPL is the number of point lists
 IX is an array of point list start indices
 XA, YA and ZA are the coordinate arrays

Each element of IX contains the starting index of a point list in the point arrays. The x coordinates of the 1st list of points are XA(1) to XA(IX(1)-1)

and the x coordinates of the i'th list of points (i=2 to NPL) are XA(IX(i-1)) to XA(IX(i)-1) (for i=2...NPL)

The following conditions hold true for a list of point lists:

IX(NPL) is 1 (one) greater than the index of the last point,
 XA, YA and ZA are dimensioned by at least IX(NPL),
 NPL ≥ 1 ,
 IX(1) ≥ 3 ,

the values in IX increase as the index into IX increases,
 $IX(i+1)-IX(i) \geq 3$ (for $i=1$ to $NPL-1$),
If any condition is not satisfied, the GKS-3D error 431 is raised.

6C. Enumeration Types

----- Add to the list of ENUMERATION type values
 ----- before the GKS functions

off/on switch for edge flag

 off, on
 INTEGER GOFF, GON
 PARAMETER (GOFF=0, GON=1)

projection type

 parallel,perspective
 INTEGER GPARG, GPERS
 PARAMETER (GPARG=0,GPERS=1)

list of GDP attributes, extended for 3 dimensions

 fill area set attribute
 edge attribute
 INTEGER GFSATT, GEDATT
 PARAMETER (GFSATT=4,GEDATT=5)

additional in the FORTRAN binding, to be used with GKS inquiry functions
 that return both Current and Requested values.

 current, requested
 INTEGER GCVRL, GRQSVL
 PARAMETER (GCVRL=0,GRQSVL=1)

----- Add after the list of names used for
 ----- error handling

INTEGER	EPL3,	EPM3,	ETX3,	EFA3,	EFAS
PARAMETER	(EPL3=109,	EPM3=110,	ETX3=111,	EFA3=112,	EFAS=113)
INTEGER	EFAS3,	ECA3,	EGDP3,	ESPRP3,	ESEDI
PARAMETER	(EFAS3=114,	ECA3=115,	EGDP3=116,	ESPRP3=117,	ESEDI=118)
INTEGER	ESEDFG,	ESEDT,	ESEWSC,	ESEDCI,	ESASF3
PARAMETER	(ESEDFG=119,	ESEDT=120,	ESEWSC=121,	ESEDCI=122,	ESASF3=123)
INTEGER	ESEDR,	ESW3,	ESV3,	ESVWI,	ESVWR
PARAMETER	(ESEDR=124,	ESW3=125,	ESV3=126,	ESVWI=127,	ESVWR=128)
INTEGER	ESVTIP,	ESHRID,	ESHRM,	ESWKW3,	ESWKV3
PARAMETER	(ESVTIP=129,	ESHRID=130,	ESHRM=131,	ESWKW3=132,	ESWKV3=133)
INTEGER	EINSG3,	ESSGT3,	EINLC3,	EINSK3,	EINV3
PARAMETER	(EINSG3=134,	ESSGT3=135,	EINLC3=136,	EINSK3=137,	EINV3=138)
INTEGER	EINCH3,	EINPK3,	EINST3,	ERQLC3,	ERQSK3
PARAMETER	(EINCH3=139,	EINPK3=140,	EINST3=141,	ERQLC3=142,	ERQSK3=143)
INTEGER	ESMLC3,	ESMSK3,	EGTLC3,	EGTSK3,	EEVWVM
PARAMETER	(ESMLC3=144,	ESMSK3=145,	EGTLC3=146,	EGTSK3=147,	EEVWVM=148)
INTEGER	EEVTM3,	EACTM3			
PARAMETER	(EEVTM3=149,	EACTM3=150)			

7. List of the GKS Functions Names and Levels7.1C List Ordered by Bound Names

-----		Merge the following with the existing	
-----		subclause in sequence	
GACTM3	AC-T-M-3	L1a	ACCUMULATE TRANSFORMATION MATRIX 3
GCA3	C-A-3	L0a	CELL ARRAY 3
GEVTM3	EV-T-M-3	L1a	EVALUATE TRANSFORMATION MATRIX 3
GEVVWM	EV-VW-M	L0a	EVALUATE VIEW MATRIX
GFA3	F-A-3	L0a	FILL AREA 3
GFAS	F-A-S	L0a	FILL AREA SET
GFAS3	F-A-S-3	L0a	FILL AREA SET 3
GGDP3	G-D-P-3	L0a	GENERALIZED DRAWING PRIMITIVE 3
GGTLC3	GT-LC-3	L0c	GET LOCATOR 3
GGTSK3	GT-SK-3	L0c	GET STROKE 3
GINCH3	IN-CH-3	L0b	INITIALISE CHOICE 3
GINLC3	IN-LC-3	L0b	INITIALISE LOCATOR 3
GINPK3	IN-PK-3	L1b	INITIALISE PICK 3
GINSG3	IN-SG-3	L2a	INSERT SEGMENT 3
GINSK3	IN-SK-3	L0b	INITIALISE STROKE 3
GINST3	IN-ST-3	L0b	INITIALISE STRING 3
GINVL3	IN-VL-3	L0b	INITIALISE VALUATOR 3
GPL3	PL-3	L0a	POLYLINE 3
GPM3	PM-3	L0a	POLYMARKER 3
GQASF3	Q-A-S-F-3	L0a	INQUIRE CURRENT ASPECT SOURCE FLAGS 3 (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES 3)
GQCH3S	Q-CH-3-S	L0b	INQUIRE CHOICE 3 DEVICE STATE
GQCLP3	Q-CLP3	L0a	INQUIRE CLIPPING 3
GQDCH3	Q-D-CH-3	L0b	INQUIRE DEFAULT CHOICE 3 DEVICE DATA
GQDLC3	Q-D-LC-3	L0b	INQUIRE DEFAULT LOCATOR 3 DEVICE DATA
GQDPK3	Q-D-PK-3	L1b	INQUIRE DEFAULT PICK 3 DEVICE DATA
GQDSK3	Q-D-SK-3	L0b	INQUIRE DEFAULT STROKE 3 DEVICE DATA
GQDST3	Q-D-ST-3	L0b	INQUIRE DEFAULT STRING 3 DEVICE DATA
GQDVL3	Q-D-VL-3	L0b	INQUIRE DEFAULT VALUATOR 3 DEVICE DATA
GQDVOL	Q-D-VOL	L0a	INQUIRE DISPLAY VOLUME SIZE
GQDW3A	Q-D-W3-A	L0a	INQUIRE DYNAMIC MODIFICATION OF WORKSTATION 3 ATTRIBUTES
GQEDCI	Q-ED-C-I	L0a	INQUIRE CURRENT EDGE COLOUR INDEX (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES 3)
GQEDF	Q-ED-F	L0a	INQUIRE EDGE FACILITIES
GQEDFG	Q-EDFG	L0a	INQUIRE CURRENT EDGE FLAG (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES 3)
GQEDI	Q-ED-I	L0a	INQUIRE CURRENT EDGE INDEX (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES 3)
GQEDR	Q-ED-R	L1a	INQUIRE EDGE REPRESENTATION
GQEDT	Q-EDT	L0a	INQUIRE CURRENT EDGETYPE (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES 3)
GQEEDI	Q-E-ED-I	L1a	INQUIRE LIST element OF EDGE INDICES

7. List of the GKS Functions Names and Levels

GQEGD3	Q-EGD3	L0a	INQUIRE LIST element OF AVAILABLE GENERALIZED DRAWING PRIMITIVES 3
GQEVWI	Q-E-VW-I	L0a	INQUIRE LIST element OF VIEW INDICES
GQEWSC	Q-EW-SC	L0a	INQUIRE CURRENT EDGEWIDTH SCALE FACTOR (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES 3)
GQGDP3	Q-G-D-P-3	L0a	INQUIRE GENERALIZED DRAWING PRIMITIVE 3
GQHRF	Q-HR-F	L1a	INQUIRE HLHSR FACILITIES
GQHRID	Q-HR-ID	L1a	INQUIRE CURRENT HLHSR IDENTIFIER
GQHRM	Q-HR-M	L1a	INQUIRE HLHSR MODE
GQLC3S	Q-LC-3-S	L0b	INQUIRE LOCATOR 3 DEVICE STATE
GQLW3	Q-L-W3	L0a	INQUIRE MAXIMUM LENGTH OF GKS-3D WORKSTATION STATE TABLES
GQNT3	Q-N-T-3	L0a	INQUIRE NORMALIZATION TRANSFORMATION 3
GQPEDR	Q-P-ED-R	L0a	INQUIRE PREDEFINED EDGE REPRESENTATION
GQPK3S	Q-PK-3-S	L1b	INQUIRE PICK 3 DEVICE STATE
GQPRP3	Q-PRP3	L0a	INQUIRE CURRENT PATTERN REFERENCE POINTS 3 (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES 3)
GQPVWR	Q-P-VW-R	L0a	INQUIRE PREDEFINED VIEW REPRESENTATION
GQPX3	Q-PX-3	L0a	INQUIRE PIXEL 3
GQPXA3	Q-PX-A-3	L0a	INQUIRE PIXEL ARRAY 3
GQPXD3	Q-PX-D3	L0a	INQUIRE PIXEL ARRAY DIMENSIONS 3
GQSGA3	Q-SG-A-3	L1a	INQUIRE SEGMENT ATTRIBUTES 3
GQSK3S	Q-SK-3-S	L0b	INQUIRE STROKE 3 DEVICE STATE
GQST3S	Q-ST-3-S	L0b	INQUIRE STRING 3 DEVICE STATE
GQTX3	Q-TX-3	L0a	INQUIRE TEXT EXTENT 3 (full FORTRAN 77 version)
GQTX3S	Q-TX-3-S	L0a	INQUIRE TEXT EXTENT 3 (FORTRAN 77 subset version)
GQVL3S	Q-VL-3-S	L0b	INQUIRE VALUATOR 3 DEVICE STATE
GQVWF	Q-VW-F	L0a	INQUIRE VIEW FACILITIES
GQVWI	Q-VW-I	L0a	INQUIRE CURRENT VIEW INDEX (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES 3)
GQVWR	Q-VW-R	L0a	INQUIRE VIEW REPRESENTATION
GQWKT3	Q-WK-T-3	L0a	INQUIRE WORKSTATION TRANSFORMATION 3
GRQLC3	RQ-LC-3	L0b	REQUEST LOCATOR 3
GRQSK3	RQ-SK-3	L0b	REQUEST STROKE 3
GSASF3	S-A-S-F-3	L0a	SET ASPECT SOURCE FLAGS 3
GSEDCI	S-ED-C-I	L0a	SET EDGE COLOUR INDEX
GSEDFG	S-EDFG	L0a	SET EDGE FLAG
GSEDI	S-ED-I	L0a	SET EDGE INDEX
GSEDR	S-ED-R	L1a	SET EDGE REPRESENTATION
GSEDT	S-EDT	L0a	SET EDGETYPE
GSEWSC	S-EW-SC	L0a	SET EDGEWIDTH SCALE FACTOR
GSHRID	S-HR-ID	L1a	SET HLHSR IDENTIFIER
GSHRM	S-HR-M	L1a	SET HLHSR MODE
GSMLC3	SM-LC-3	L0c	SAMPLE LOCATOR 3
GSMSK3	SM-SK-3	L0c	SAMPLE STROKE 3
GSPRP3	S-PRP3	L0a	SET PATTERN REFERENCE POINTS 3
GSSGT3	S-SG-T-3	L1a	SET SEGMENT TRANSFORMATION 3
GSV3	S-V3	L0a	SET VIEWPORT 3
GSVTIP	S-VT-I-P	L0a	SET VIEW TRANSFORMATION INPUT PRIORITY

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7.1C List Ordered by Bound Names

GSVWI	S-VW-I	L0a	SET VIEW INDEX
GSVWR	S-VW-R	L0a	SET VIEW REPRESENTATION
GSW3	S-W3	L0a	SET WINDOW 3
GSWKV3	S-WK-V3	L0a	SET WORKSTATION VIEWPORT 3
GSWKW3	S-WK-W3	L0a	SET WORKSTATION WINDOW 3
GTX3	TX-3	L0a	TEXT 3 (full FORTRAN 77 version)
GTX3S	TX-3-S	L0a	TEXT 3 (FORTRAN 77 subset version)

7.2C List Ordered by GKS Function Names

-----		Merge the following with the existing	
-----		subclause in sequence	
GACTM3	AC-T-M-3	L1a	ACCUMULATE TRANSFORMATION MATRIX 3
GCA3	C-A-3	L0a	CELL ARRAY 3
GEVTM3	EV-T-M-3	L1a	EVALUATE TRANSFORMATION MATRIX 3
GEVWM	EV-VW-M	L0a	EVALUATE VIEW MATRIX
GFA3	F-A-3	L0a	FILL AREA 3
GFAS	F-A-S	L0a	FILL AREA SET
GFAS3	F-A-S-3	L0a	FILL AREA SET 3
GGDP3	G-D-P-3	L0a	GENERALIZED DRAWING PRIMITIVE 3
GGTLC3	GT-LC-3	L0c	GET LOCATOR 3
GGTSK3	GT-SK-3	L0c	GET STROKE 3
GINCH3	IN-CH-3	L0b	INITIALISE CHOICE 3
GINLC3	IN-LC-3	L0b	INITIALISE LOCATOR 3
GINPK3	IN-PK-3	L1b	INITIALISE PICK 3
GINST3	IN-ST-3	L0b	INITIALISE STRING 3
GINSK3	IN-SK-3	L0b	INITIALISE STROKE 3
GINVL3	IN-VL-3	L0b	INITIALISE VALUATOR 3
GQCH3S	Q-CH-3-S	L0b	INQUIRE CHOICE 3 DEVICE STATE
GQCLP3	Q-CLP3	L0a	INQUIRE CLIPPING 3
GQASF3	Q-A-S-F-3	L0a	INQUIRE CURRENT ASPECT SOURCE FLAGS 3 (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES 3)
GQEDCI	Q-ED-C-I	L0a	INQUIRE CURRENT EDGE COLOUR INDEX (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES 3)
GQEDFG	Q-EDFG	L0a	INQUIRE CURRENT EDGE FLAG (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES 3)
GQEDI	Q-ED-I	L0a	INQUIRE CURRENT EDGE INDEX (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES 3)
GQEDT	Q-EDT	L0a	INQUIRE CURRENT EDGETYPE (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES 3)
GQEWSC	Q-EW-SC	L0a	INQUIRE CURRENT EDGEWIDTH SCALE FACTOR (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES 3)
GQHRID	Q-HR-ID	L1a	INQUIRE CURRENT HLHSR IDENTIFIER
GQPRP3	Q-PRP3	L0a	INQUIRE CURRENT PATTERN REFERENCE POINTS 3 (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES 3)
GQVWI	Q-VW-I	L0a	INQUIRE CURRENT VIEW INDEX (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES 3)
GQDCH3	Q-D-CH-3	L0b	INQUIRE DEFAULT CHOICE 3 DEVICE DATA
GQDLC3	Q-D-LC-3	L0b	INQUIRE DEFAULT LOCATOR 3 DEVICE DATA

7. List of the GKS Functions Names and Levels

GQDPK3	Q-D-PK-3	L1b	INQUIRE DEFAULT PICK 3 DEVICE DATA
GQDST3	Q-D-ST-3	L0b	INQUIRE DEFAULT STRING 3 DEVICE DATA
GQDSK3	Q-D-SK-3	L0b	INQUIRE DEFAULT STROKE 3 DEVICE DATA
GQDVL3	Q-D-VL-3	L0b	INQUIRE DEFAULT VALUATOR 3 DEVICE DATA
GQDVOL	Q-D-VOL	L0a	INQUIRE DISPLAY VOLUME SIZE
GQDW3A	Q-D-W3-A	L0a	INQUIRE DYNAMIC MODIFICATION OF WORKSTATION 3 ATTRIBUTES
GQEDF	Q-ED-F	L0a	INQUIRE EDGE FACILITIES
GQEDR	Q-ED-R	L1a	INQUIRE EDGE REPRESENTATION
GQGDP3	Q-G-D-P-3	L0a	INQUIRE GENERALIZED DRAWING PRIMITIVE 3
GQHRF	Q-HR-F	L1a	INQUIRE HLHSR FACILITIES
GQHRM	Q-HR-M	L1a	INQUIRE HLHSR MODE
GQEGD3	Q-EGD3	L0a	INQUIRE LIST element OF AVAILABLE GENERALIZED DRAWING PRIMITIVES 3
GQEEDI	Q-E-ED-I	L1a	INQUIRE LIST element OF EDGE INDICES
GQEVWI	Q-E-VW-I	L0a	INQUIRE LIST element OF VIEW INDICES
GQLC3S	Q-LC-3-S	L0b	INQUIRE LOCATOR 3 DEVICE STATE
GQLW3	Q-L-W3	L0a	INQUIRE MAXIMUM LENGTH OF GKS-3D WORKSTATION STATE TABLES
GQNT3	Q-N-T-3	L0a	INQUIRE NORMALIZATION TRANSFORMATION 3
GQPK3S	Q-PK-3-S	L1b	INQUIRE PICK 3 DEVICE STATE
GQPX3	Q-PX-3	L0a	INQUIRE PIXEL 3
GQPXA3	Q-PX-A-3	L0a	INQUIRE PIXEL ARRAY 3
GQPXD3	Q-PX-D3	L0a	INQUIRE PIXEL ARRAY DIMENSIONS 3
GQPEDR	Q-P-ED-R	L0a	INQUIRE PREDEFINED EDGE REPRESENTATION
GQPVWR	Q-P-VW-R	L0a	INQUIRE PREDEFINED VIEW REPRESENTATION
GQSGA3	Q-SG-A-3	L1a	INQUIRE SEGMENT ATTRIBUTES 3
GQST3S	Q-ST-3-S	L0b	INQUIRE STRING 3 DEVICE STATE
GQSK3S	Q-SK-3-S	L0b	INQUIRE STROKE 3 DEVICE STATE
GQTX3S	Q-TX-3-S	L0a	INQUIRE TEXT EXTENT 3 (FORTRAN 77 subset version)
GQTX3	Q-TX-3	L0a	INQUIRE TEXT EXTENT 3 (full FORTRAN 77 version)
GQVL3S	Q-VL-3-S	L0b	INQUIRE VALUATOR 3 DEVICE STATE
GQVWF	Q-VW-F	L0a	INQUIRE VIEW FACILITIES
GQVWR	Q-VW-R	L0a	INQUIRE VIEW REPRESENTATION
GQWKT3	Q-WK-T-3	L0a	INQUIRE WORKSTATION TRANSFORMATION 3
GINS3G	IN-SG-3	L2a	INSERT SEGMENT 3
GPI3	PL-3	L0a	POLYLINE 3
GPM3	PM-3	L0a	POLYMARKER 3
GRQLC3	RQ-LC-3	L0b	REQUEST LOCATOR 3
GRQSK3	RQ-SK-3	L0b	REQUEST STROKE 3
GSMLC3	SM-LC-3	L0c	SAMPLE LOCATOR 3
GSMSK3	SM-SK-3	L0c	SAMPLE STROKE 3
GSASF3	S-A-S-F-3	L0a	SET ASPECT SOURCE FLAGS 3
GSEDCI	S-ED-C-I	L0a	SET EDGE COLOUR INDEX
GSEDFG	S-EDFG	L0a	SET EDGE FLAG
GSEDI	S-ED-I	L0a	SET EDGE INDEX
GSEDR	S-ED-R	L1a	SET EDGE REPRESENTATION
GSEDT	S-EDT	L0a	SET EDGETYPE
GSEWSC	S-EW-SC	L0a	SET EDGEWIDTH SCALE FACTOR
GSHRID	S-HR-ID	L1a	SET HLHSR IDENTIFIER

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