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**Information processing systems —
Computer graphics — Graphical Kernel
System (GKS) language bindings —**

**Part 1 :
FORTRAN**

*Systèmes de traitement de l'information — Infographie — Système graphique de base (GKS)
— Interface langage —*

Partie 1 : FORTRAN

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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

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Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

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**Information processing systems —
Computer graphics — Graphical Kernel
System (GKS) language bindings —**

**Part 1 :
FORTRAN**

0 Introduction

The Graphical Kernel System (GKS), the functional description of which is given in ISO 7942, is specified in a language independent manner and needs to be embedded in language dependent layers (language bindings) for use with particular programming languages. The purpose of this part of ISO 8651 is to define a standard binding for the FORTRAN computer programming language.

1 Scope and field of application

ISO 7942 (GKS) specifies a language independent nucleus of a graphics system. For integration into a programming language, GKS is embedded in a language dependent layer obeying the particular conventions of that language. This part of ISO 8651 specifies such a language dependent layer for the FORTRAN language.

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2 References

ISO 7942, *Information Processing - Computer graphics - Graphical Kernel System (GKS) functional description*.

ISO 1539, *Programming Languages - FORTRAN*.

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3 The FORTRAN language binding of GKS

3.1 Specification

The GKS language binding interface for ISO FORTRAN 77 (ISO 1539) shall be described as in clauses 3, 4, 5, 6, 7, 8, and 9.

3.2 Mapping of GKS function names to FORTRAN subroutine names

The function names of GKS are all mapped to FORTRAN subroutine names which start with the letter G. The mapping is generally done in a one-to-one correspondence to ISO 7942. However, some inquiry functions are split into more than one subroutine in this binding, due to the number of parameters required. The remaining letters after the first one are obtained by deriving a unique acronym from the words of the function name; e.g., ACTIVATE becomes AC, WORKSTATION becomes WK. Hence, the FORTRAN subroutine name of GKS function ACTIVATE WORKSTATION is GACWK. For a list of all abbreviations, see clause 4. Names used internally which may be known outside GKS, e.g., during linking, start with some easily recognized and documented form such as GK (subroutine, function, and common block names). Therefore, no external names starting with this construct should be chosen when using GKS, in order to avoid name conflicts. Globally used GKS names may be renamed if necessary.

3.3 Parameters

In general, the order of GKS function parameters is preserved. For some subroutines, however, there are additional parameters which have been inserted in the normal parameter sequence (e.g., array length for arrays which are output parameters).

Values of input parameters are unaltered by any GKS function, by PACK DATA RECORD, or by UNPACK DATA RECORD.

In order that the application program may inquire any element of a list (member of a set), such as the set of segment names, in this binding the inquiry functions return only a single element of a list (member of a set). In addition, the total number of elements of the list (members of the set) is always returned. The elements (members) are numbered starting from 1; each invocation of the inquiry function requires the desired element (member) number as an input parameter and returns the corresponding element (member). When the list (set) is empty, a zero is returned as the number of elements (members) and the parameter representing the single element in the list is undefined.

3.4 The FORTRAN subset

The binding for FORTRAN 77 Subset is different from that for full FORTRAN 77 in order to accommodate the FORTRAN 77 Subset restrictions.

Those GKS subroutines in the full FORTRAN 77 binding that have arguments of type CHARACTER*(*) have alternative subroutine definitions that include fixed length character strings, CHARACTER*80, for the Subset.

In some cases, an additional INTEGER parameter (the number of characters) appears in the parameter list and the Subset version is distinguished by the addition of a final S, so that the two versions can coexist in the same implementation. In other cases the INTEGER parameter is

already present and the FORTRAN 77 Subset version has the same name as the full FORTRAN 77 version.

A full FORTRAN 77 implementation shall include both subroutines in the case when the names are distinct and only the full FORTRAN 77 version when the names are the same.

The enumeration values in this binding may be redefined for the Subset by replacing the PARAMETER statements with corresponding DATA statements.

3.5 Error handling

There are two error routines in every GKS system, named GERLOG and GERHND. The user may replace the latter with his own subroutine using the same name, GERHND, and calling sequence. Furthermore, this user-defined error routine may call the system-defined error logging procedure GERLOG.

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4 Generating FORTRAN subroutine names

For the binding of the GKS functions which inquire lists (sets), the word element (member) is added to the GKS function name before the subroutine name is generated from the resulting terms.

The derivation of the abbreviation for the subroutine names is performed in several steps. First, plurals are reduced to their singular form, and grammatical derivations are unified. Next, some compound terms are reduced. Finally, each remaining word is replaced by the null string or by an abbreviation.

Plurals

ATTRIBUTES	→	ATTRIBUTE	NUMBERS	→	NUMBER
DEVICES	→	DEVICE	PRIMITIVES	→	PRIMITIVE
EVENTS	→	EVENT	PRIORITIES	→	PRIORITY
FACILITIES	→	FACILITY	SEGMENTS	→	SEGMENT
FLAGS	→	FLAG	TYPES	→	TYPE
INDICES	→	INDEX	VALUES	→	VALUE
NAMES	→	NAME	WORKSTATIONS	→	WORKSTATION

Keeping Uniqueness

ACTIVE	→	ACTIVATE
DRAWING	→	DRAW
IDENTIFIER	→	IDENTIFICATION
SPACING	→	SPACE

Reduce Compound Terms:

STATE TABLES	→	TABLES
TRANSFORMATION NUMBER	→	TRANSFORMATION N
SET member	→	member
CURRENT NORMALISATION	→	CN
MAXIMUM LENGTH	→	LENGTH

Deletions

ALL	FACTOR	LIST	OF	TABLES
AND	FROM	member	ON	TO
AVAILABLE	GKSM	MODIFICATION	POINT	TYPE
CURRENT	IN	MORE	SIZE	VALUE
DATA	INDICATOR	NAME	STATES	VECTOR
DEVICE	LENGTH	NUMBER	SUPPORTED	WITH
EVENT				

Abbreviations

ACCUMULATE	→	AC	LINETYPE	→	LN
ACTIVATE	→	AC	LINEWIDTH	→	LW
ALIGNMENT	→	AL	LOCATOR	→	LC
AREA	→	A	LOGGING	→	LOG
ARRAY	→	A	LOGICAL	→	L
ASPECT	→	A	MARKER	→	MK
ASSOCIATE	→	A	MATRIX	→	M
ASSOCIATED	→	AS	MAXIMUM	→	M
ATTRIBUTE	→	A	MESSAGE	→	MSG
AWAIT	→	WAIT	MODE	→	M
BASE	→	B	NORMALIZATION	→	N
CATEGORY	→	CA	OPEN	→	OP
CELL	→	C	OPERATING	→	OP
CHARACTER	→	CH	OVERFLOW	→	OV
CHOICE	→	CH	PACK	→	P
CLASSIFICATION	→	CL	PATH	→	P
CLEAR	→	CLR	PATTERN	→	PA
CLIPPING	→	CLIP	PICK	→	PK
CLOSE	→	CL	PIXEL	→	PX
COLOUR	→	C	POLYLINE	→	PL
CONNECTION	→	C	POLYMARKER	→	PM
COPY	→	C	PRECISION	→	P
CREATE	→	CR	PREDEFINED	→	P
DEACTIVATE	→	DA	PRIMITIVE	→	P
DEFAULT	→	D	PRIORITY	→	P
DEFERRAL	→	D	QUEUE	→	Q
DELETE	→	D	READ	→	RD
DETECTABILITY	→	DTEC	RECORD	→	REC
DIMENSIONS	→	D	REDRAW	→	R
DISPLAY	→	D	REFERENCE	→	RF
DRAW	→	D	RENAME	→	REN
DYNAMIC	→	D	REPRESENTATION	→	R
element	→	E	REQUEST	→	RQ
EMERGENCY	→	E	SAMPLE	→	SM
ERROR	→	ER	SCALE	→	SC
ESCAPE	→	ESC	SEGMENT	→	SG
EVALUATE	→	EV	SELECT	→	SEL
EXPANSION	→	XP	SET	→	S
EXTENT	→	X	SIMULTANEOUS	→	SIM
FACILITY	→	F	SOURCE	→	S
FILL	→	F	SPACE	→	SP
FLAG	→	F	STATE	→	S
FONT	→	F	STRING	→	ST
GENERALISED	→	G	STROKE	→	SK
GET	→	GT	STYLE	→	S
GKS	→	KS	SURFACE	→	S
HANDLING	→	HND	TEXT	→	TX
HEIGHT	→	H	TRANSFORMATION	→	T
HIGHLIGHTING	→	HLIT	UNPACK	→	U
IDENTIFICATION	→	ID	UPDATE	→	U
INDEX	→	I	USE	→	US
INITIALISE	→	IN	VALUATOR	→	VL
INPUT	→	I	VIEWPORT	→	VP
INQUIRE	→	Q	VISIBILITY	→	VIS
INSERT	→	IN	WIDTH	→	W
INTERIOR	→	I	WINDOW	→	WN
INTERPRET	→	I	WORKSTATION	→	WK
ITEM	→	ITM	WRITE	→	W
LINE	→	LN			

5 Data types

In ISO 7942, parameters of several types are used. The following shows the correspondence between the types used in ISO 7942 and their realisation in a FORTRAN implementation.

GKS Data Type FORTRAN Data Types

I integer INTEGER

R real REAL

S string

- 1) In a full FORTRAN 77 subroutine:
 - a) INTEGER containing the number of characters returned (for output string argument only)
 - b) CHARACTER*(*) containing the string. In addition, if a character string which is an input parameter may reasonably contain no characters, then an INTEGER (≥ 0) is used to give the number of characters to be passed to the subroutine.
- 2) In a FORTRAN 77 Subset subroutine:
 - a) INTEGER containing the number of characters passed to the subroutine (for input string only, i.e. only one INTEGER needed for output).
 - b) INTEGER containing the number of characters returned (for output string argument only).
 - c) CHARACTER*80 containing the string.

P point REAL, REAL containing the X- and Y-values

N name INTEGER

- 1) Workstation Identifier, Segment Name, Pick Identifier: An implementation may restrict the range but must at least provide all non-negative integers which are available at that implementation.
NOTE - the default value for pick identifier is zero.
- 2) Workstation Type, Connection Identifier, Error File: The set of valid values is implementation dependent. The Connection Identifier and Error File may be logical unit numbers.
- 3) GDF Identifier, Escape Identifier: The set of legal values is described in ISO 7942.
- 4) Identification of GKS procedure: The range is shown under 'Enumeration Types'.

E enumeration INTEGER

NOTE - All values are mapped to the range zero to N-1, where N is the number of enumeration alternatives. Except for null values, the order of the enumeration alternatives is the same as in ISO 7942: null values always appear in the first position. If the integer value given by the application program is not in the range 0 to N-1, there is a language binding error condition (error 2000).

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

- 1) In non-inquiry functions, separate simple_type parameters are used.
NOTE - in GKS, const ≤ 4
- 2) In inquiry functions, if const ≤ 3 , separate simple_type parameters are used; if const ≥ 4 , a simple_type array of dimension const is used.

const x P (only occurs in non-inquiry functions)

Separate REAL parameters, with the X- and Y- coordinates of one point being followed by the X- and Y- coordinates of the next.

const x E (only occurrence in GKS is const = 13)

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

const 1 x const 2 x R (matrix of values, for example 2x3xR)

REAL array (const 1, const 2)

list of n values of one simple_type (for example nxI)

1) For input parameter:

- a) INTEGER (input parameter) containing length n of the list (unless the length is already present as a separate GKS parameter, in which case it is not duplicated)
- b) array of dimension n, whose elements are of the appropriate simple_type.

When the length could legally be zero within GKS, the binding indicates the array dimension by *. The implementation checks that the given length is ≥ 0 .

2) For output parameter in non-inquiry functions:

- a) INTEGER (input parameter) containing the dimension of the array
- b) INTEGER (output parameter) containing the number of elements of the array actually used.
- c) an array whose elements are of the appropriate simple_type. The input dimension being too small is a language binding error condition (error 2001).

In both cases (input or output), where the simple_type is a point, there is a REAL array for the X-coordinates and another for the Y-coordinates.

3) For inquiry functions, a single call returns a single element of the list. For a complete list of length n,

- a) INTEGER (input parameter) containing the sequence number of required list element (in the range 0...n).
- b) INTEGER (output parameter) containing the number of items in the list n.
- c) a parameter of the appropriate simple_type containing the requested element.

If the sequence number given is 0, the requested element returned is undefined, but an error is not indicated thereby; the number of items in the list n is returned. If the sequence number given is < 0 or $> n$, then error 2002 is indicated, the number of items in the list is returned, but the requested element is undefined; the exception to this is when the list size is 0, and in that case an error is not indicated thereby.

4) A complete inquired list is returned from a single call when the maximum size of the list is a small constant m:

- a) INTEGER (output parameter) containing the number of elements of the array actually used.

- b) an array of dimension m, whose elements are of the appropriate simple_type.

list of n values of a compound type (for example, nx4xR)

This only occurs in an inquiry function. A single call returns a single element of the list exactly as for the list of values of one simple_type, except that here the requested element is several FORTRAN parameters.

array of integers (for example, nxnxi)

This is described more fully below, where the representations of CELL ARRAY, PIXEL ARRAY and PATTERN ARRAY are described.

an ordered pair of different types (for example I;E)

The different types are represented in turn in the FORTRAN parameter list.

DATA RECORD

Represented as a set of scalar values and an array of type CHARACTER*80 containing the data. In addition, an INTEGER input parameter is used to dimension the array. Where the data record is an output parameter, an additional argument 'number of array elements of data record occupied' is needed. There are no scalar values except where the data record contains values which are compulsory in GKS.

Although data can be read from and written into the data record with the FORTRAN READ and WRITE statements, special utility functions are defined to pack INTEGER, REAL, and CHARACTER data into the data record and to unpack the data record to the individual data items (GPREF, GUREC). The content of the packed data records is implementation dependent, but GPREF must perform the inverse function to GUREC and vice versa.

The representation of CELL ARRAY, PIXEL ARRAY, and PATTERN allows the user of the routines requiring a cell array parameter to pass any portion of the array as an argument. Two examples should make this clear.

The user can pass an entire two-dimensional array. In this case the number of columns of the cell array is the same as the first dimension of the FORTRAN array:

```
INTEGER DIMX, DIMY, CELLS (DIMX,DIMY)
CALL GCA (X1, Y1, X2, Y2, DIMX, DIMY, 1, 1, DIMX, DIMY, CELLS)
```

(1,1)	(2,1)	(3,1)	...	(DIMX,1)
(1,2)	(2,2)	(3,2)	...	(DIMX,2)
:	:	:	...	:
(1,DIMY)	(2,DIMY)	(3,DIMY)	...	(DIMX,DIMY)

To use an arbitrary portion of an array the user passes the upper left corner of the portion as the starting address and the dimensions of the entire array for the proper treatment of addresses. The area inside the small box is the cell array being passed:

```
INTEGER STARTX, STARTY, DX, DY, DIMX, DIMY, CELLS (DIMX,DIMY)
DATA STARTX/3/, STARTY/6/, DX/2/, DY/3/
CALL GCA (X1,Y1,X2,Y2,DIMX,DIMY,STARTX,STARTY,DX,DY,CELLS)
```

(1,1)	(2,1)	(3,1)	(4,1)	...	(DIMX,1)
(1,2)	(2,2)	(3,2)	(4,2)	...	(DIMX,2)
:	:	:	:		:
:	:				:
(1,6)	(2,6)	(3,6)	(4,6)	...	(DIMX,6)
(1,7)	(2,7)	(3,7)	(4,7)	...	(DIMX,7)
(1,8)	(2,8)	(3,8)	(4,8)	...	(DIMX,8)
:	:				:
:	:	:	:		:
(1,DIMY)	(2,DIMY)	(3,DIMY)	(4,DIMY)	...	(DIMX,DIMY)

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6 Enumeration types

All the enumeration types of GKS are mapped to FORTRAN INTEGERS. The correspondence between GKS scalars and FORTRAN INTEGERS is shown below in a list of symbolic FORTRAN constants which may be included in any application program. The following section contains a method of mapping GKS enumeration types to FORTRAN variable names. In a FORTRAN 77 Subset implementation, this mapping could be accomplished by the DATA statement. Also, a numbering of all GKS functions is given for use in the error handling procedures.

Mnemonic FORTRAN names and their values for GKS ENUMERATION type values:

aspect source	bundled,	individual		
	INTEGER	GBUNDL,	GINDIV	
	PARAMETER	(GBUNDL=0, GINDIV=1)		
clear control flag	conditionally,	always		
	INTEGER	GCONDI,	GALWAY	
	PARAMETER	(GCONDI=0, GALWAY=1)		
clipping indicator	noclip,	clip		
	INTEGER	GNCLIP,	GCLIP	
	PARAMETER	(GNCLIP=0, GCLIP=1)		
colour available	monochrome,	colour		
	INTEGER	GMONOC,	GCOLOR	
	PARAMETER	(GMONOC=0, GCOLOR=1)		
coordinate switch	WC,	NDC		
	INTEGER	GWC,	GNDC	
	PARAMETER	(GWC=0, GNDC=1)		
deferral mode	ASAP,	BNIG,	BNIL,	ASTI
(see ISO 7942, subclause 4.5.3)				
	INTEGER	GASAP,	GBNIG,	GBNIL, GASTI
	PARAMETER	(GASAP=0, GBNIG=1, GBNIL=2, GASTI=3)		
detectability	undetectable,	detectable		
	INTEGER	GUNDET,	GDETEC	
	PARAMETER	(GUNDET=0, GDETEC=1)		
device coordinate units	metres,	other		
	INTEGER	GMETRE,	GOTHU	
	PARAMETER	(GMETRE=0, GOTHU=1)		
display surface empty	notempty,	empty		
	INTEGER	GNEMPT,	GEMPTY	
	PARAMETER	(GNEMPT=0, GEMPTY=1)		
dynamic modification	IRG,	IMM		
(see ISO 7942, subclause 4.5.3)				
	INTEGER	GIRG,	GIMM	
	PARAMETER	(GIRG=0, GIMM=1)		
echo switch	noecho,	echo		
	INTEGER	GNECHO,	GECHO	
	PARAMETER	(GNECHO=0, GECHO=1)		
fill area interior style	hollow,	solid,	pattern,	hatch
	INTEGER	GHOLLO,	GSOLID,	GPATTR, GHATCH
	PARAMETER	(GHOLLO=0, GSOLID=1, GPATTR=2, GHATCH=3)		
highlighting	normal,	highlighted		
	INTEGER	GNORML,	GHILIT	
	PARAMETER	(GNORML=0, GHILIT=1)		

input device status	none, INTEGER PARAMETER (	ok, GNONE, GOK=1,	nopick, GNPICK, GNPICK=2,	nochoice GNCHOI GNCHOI=2)		
input class	none, string INTEGER PARAMETER (	locator, GNCLAS, GSTRIN GNCLAS=0,	stroke, GLOCAT, GSTROK=2,	valuator, GVALUA, GCHOIC=4,	choice, GCHOIC, GPICK=5,	pick, GPICK,
implicit regeneration mode	suppressed, INTEGER PARAMETER (	allowed GSUPPD, GALLOW=1)				
level of GKS	L0a, L2a, INTEGER * PARAMETER (	L0b, L2b, GL0B, GL2B, GL0B=1, GL2B=7,	L0c, L2c, GL0C, GL2C GL0C=2, GL2C=8)	L1a, GL1A, GL1A=3,	L1b, GL1B, GL1B=4,	L1c, GL1C, GL1C=5,
new frame action necessary	no, INTEGER PARAMETER (	yes GNO, GYES=1)				
operating mode	request, INTEGER PARAMETER (	sample, GSAMPL, GSAMPL=1,	event GEVENT GEVENT=2)			
operating state value (see ISO 7942, subclause 4.11.1)	GKCL, INTEGER PARAMETER (	GKOP, GGKOP, GGKOP=1,	WSOP, GWSOP, GWSOP=2,	WSAC, GWSAC, GWSAC=3,	SGOP GSGOP GSGOP=4)	
presence of invalid values	absent, INTEGER PARAMETER (	present GABSNT, GPRSNT=1)				
regeneration flag	postpone, INTEGER PARAMETER (	perform GPOSTP, GPERFO=1)				
relative input priority	higher, INTEGER PARAMETER (	lower GHIGHR, GLOWER=1)				
simultaneous events flag	nomore, INTEGER PARAMETER (	more GNMORE, GMORE=1)				
text alignment horizontal	normal, INTEGER PARAMETER (	left, GAHNOR, GALEFT=1,	center, GACENT, GACENT=2,	right GARITE GARITE=3)		
text alignment vertical	normal, INTEGER PARAMETER (	top, GAVNOR, GATOP=1,	cap, GACAP, GACAP=2,	half, GAHALF, GAHALF=3,	base, GABASE, GABASE=4,	bottom GABOTT GABOTT=5)
text path	right, INTEGER PARAMETER (	left, GLEFT, GLEFT=1,	up, GUP, GUP=2,	down GDOWN GDOWN=3)		
text precision	string, INTEGER PARAMETER (	character, GCHARP, GCHARP=1,	stroke GSTRKP GSTRKP=2)			

type of returned values	set, INTEGER GSET, PARAMETER (GSET=0,	realized GREALI GREALI=1)				
update state	notpending, INTEGER GNPEND, PARAMETER (GNPEND=0,	pending GPEND GPEND=1)				
vector/raster/other type	vector, INTEGER GVECTR, PARAMETER (GVECTR=0,	raster, GRASTR, GRASTR=1,	other GOTHWK GOTHWK=2)			
visibility	invisible, INTEGER GINVIS, PARAMETER (GINVIS=0,	visible GVISI GVISI=1)				
workstation category (see ISO 7942, subclause 4.5.1)	OUTPUT, INTEGER GOUTPT, PARAMETER (GOUTPT=0,	INPUT, GINPUT, GINPUT=1,	OUTIN, GOUTIN, GOUTIN=2,	WISS, GWISS, GWISS=3,	MO, GMO, GMO=4,	MI GMI GMI=5)
workstation state	inactive, INTEGER GINACT, PARAMETER (GINACT=0,	active GACTIV GACTIV=1)				
list of GDP attributes	polyline attribute, INTEGER GPLATT, PARAMETER (GPLATT=0,	polymarker attribute, GPMATT, GPMATT=1,	text attribute, GTXATT, GTXATT=2,	fill area attribute GFAATT GFAATT=3)		
line type	solid, INTEGER GLSOLI, PARAMETER (GLSOLI=1,	dash, GLDASH, GLDASH=2,	dot, GLDOT, GLDOT=3,	dash-dot GLDASD GLDASD=4)		
marker type	, INTEGER GPOINT, PARAMETER (GPOINT=1,	+, GPLUS, GPLUS=2,	*, GAST, GAST=3,	o, GOMARK, GOMARK=4,	x GXMARK GXMARK=5)	

GKS functions - These names are used for error handling. The names are the same as the GKS function names except that the sentinel character G is replaced by E. The same function identification is used for both full FORTRAN 77 and FORTRAN 77 Subset.

INTEGER	EOPKS,	ECLKS,	EOPWK,	ECLWK,	EACWK
PARAMETER	(EOPKS=0,	ECLKS=1,	EOPWK=2,	ECLWK=3,	EACWK=4)
INTEGER	EDAWK,	ECLRWK,	ERSGWK,	EUWK,	ESDS
PARAMETER	(EDAWK=5,	ECLRWK=6,	ERSGWK=7,	EUWK=8,	ESDS=9)
INTEGER	EMSG,	EESC,	EPL,	EPM,	ETX
PARAMETER	(EMSG=10,	EESC=11,	EPL=12,	EPM=13,	ETX=14)
INTEGER	EFA,	ECA,	EGDP,	ESPLI,	ESLN
PARAMETER	(EFA=15,	ECA=16,	EGDP=17,	ESPLI=18,	ESLN=19)
INTEGER	ESLWSC,	ESPLCI,	ESPMI,	ESMK,	ESMKSC
PARAMETER	(ESLWSC=20,	ESPLCI=21,	ESPMI=22,	ESMK=23,	ESMKSC=24)
INTEGER	ESPMCI,	ESTXI,	ESTXFP,	ESCHXP,	ESCHSP
PARAMETER	(ESPMCI=25,	ESTXI=26,	ESTXFP=27,	ESCHXP=28,	ESCHSP=29)
INTEGER	ESTXCI,	ESCHH,	ESCHUP,	ESTXP,	ESTXAL
PARAMETER	(ESTXCI=30,	ESCHH=31,	ESCHUP=32,	ESTXP=33,	ESTXAL=34)
INTEGER	ESFAI,	ESFAIS,	ESFASI,	ESFACI,	ESPA
PARAMETER	(ESFAI=35,	ESFAIS=36,	ESFASI=37,	ESFACI=38,	ESPA=39)
INTEGER	ESPARF,	ESASF,	ESPKID,	ESPLR,	ESPMR
PARAMETER	(ESPARF=40,	ESASF=41,	ESPKID=42,	ESPLR=43,	ESPMR=44)
INTEGER	ESTXR,	ESFAR,	ESPAR,	ESCR,	ESWN
PARAMETER	(ESTXR=45,	ESFAR=46,	ESPAR=47,	ESCR=48,	ESWN=49)
INTEGER	ESVP,	ESVPIP,	ESELNT,	ESCLIP,	ESWKWN
PARAMETER	(ESVP=50,	ESVPIP=51,	ESELNT=52,	ESCLIP=53,	ESWKWN=54)
INTEGER	ESWKVP,	ECRSG,	ECLSG,	ERENSG,	EDSG
PARAMETER	(ESWKVP=55,	ECRSG=56,	ECLSG=57,	ERENSG=58,	EDSG=59)
INTEGER	EDSGWK,	EASGWK,	ECSGWK,	EINSG,	ESSGT
PARAMETER	(EDSGWK=60,	EASGWK=61,	ECSGWK=62,	EINSG=63,	ESSGT=64)
INTEGER	ESVIS,	ESHLIT,	ESSGP,	ESDTEC,	EINLC

PARAMETER (ESVIS=65, ESHLIT=66, ESSGP=67, ESDTEC=68, EINLC=69)
 INTEGER EINSK, EINVL, EINCH, EINPK, EINST
 PARAMETER (EINSK=70, EINVL=71, EINCH=72, EINPK=73, EINST=74)
 INTEGER ESLCM, ESSKM, ESVLM, ESCHM, ESPKM
 PARAMETER (ESLCM=75, ESSKM=76, ESVLM=77, ESCHM=78, ESPKM=79)
 INTEGER ESSTM, ERQLC, ERQSK, ERQVL, ERQCH
 PARAMETER (ESSTM=80, ERQLC=81, ERQSK=82, ERQVL=83, ERQCH=84)
 INTEGER ERQPK, ERQST, ESMLC, ESMSK, ESMVL
 PARAMETER (ERQPK=85, ERQST=86, ESMLC=87, ESMSK=88, ESMVL=89)
 INTEGER ESMCH, ESMPL, ESMST, EWAIT, EFLUSH
 PARAMETER (ESMCH=90, ESMPL=91, ESMST=92, EWAIT=93, EFLUSH=94)
 INTEGER EGTLC, EGTSK, EGTVL, EGTCH, EGTPK
 PARAMETER (EGTLC=95, EGTSK=96, EGTVL=97, EGTCH=98, EGTPK=99)
 INTEGER EGTST, EWITM, EGTITM, ERDITM, EIITM
 PARAMETER (EGTST=100, EWITM=101, EGTITM=102, ERDITM=103, EIITM=104)
 INTEGER EEVTM, EACTM, EPREC, EUREC
 PARAMETER (EEVTM=105, EACTM=106, EPREC=107, EUREC=108)

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7 Lists of the GKS function names

The complete list of GKS function names, their corresponding bound names, the abbreviations used, and their levels follows. Certain of these functions do not appear in the functional specification but have been created for the binding.

7.1 List ordered alphabetically by bound name

GACTM	AC-T-M	1a	ACCUMULATE TRANSFORMATION MATRIX
GACWK	AC-WK	0a	ACTIVATE WORKSTATION
GASGWK	A-SG-WK	2a	ASSOCIATE SEGMENT WITH WORKSTATION
GCA	C-A	0a	CELL ARRAY
GCLKS	CL-KS	0a	CLOSE GKS
GCLRWK	CLR-WK	0a	CLEAR WORKSTATION
GCLSG	CL-SG	1a	CLOSE SEGMENT
GCLWK	CL-WK	0a	CLOSE WORKSTATION
GCRSG	CR-SG	1a	CREATE SEGMENT
GCSGWK	C-SG-WK	2a	COPY SEGMENT TO WORKSTATION
GDAWK	DA-WK	0a	DEACTIVATE WORKSTATION
GDSG	D-SG	1a	DELETE SEGMENT
GDSGWK	D-SG-WK	1a	DELETE SEGMENT FROM WORKSTATION
GECLKS	E-CL-KS	0a	EMERGENCY CLOSE GKS
GERHND	ER-HND	0a	ERROR HANDLING
GERLOG	ER-LOG	0a	ERROR LOGGING
GESC	ESC	0a	ESCAPE
GEVTM	EV-T-M	1a	EVALUATE TRANSFORMATION MATRIX
GFA	F-A	0a	FILL AREA
GFLUSH	FLUSH	0c	FLUSH DEVICE EVENTS
GGDP	G-D-P	0a	GENERALIZED DRAWING PRIMITIVE
GGTCH	GT-CH	0c	GET CHOICE
GGTITM	GT-ITM	0a	GET ITEM TYPE FROM GKSM
GGTLC	GT-LC	0c	GET LOCATOR
GGTPK	GT-PK	1c	GET PICK
GGTSK	GT-SK	0c	GET STROKE
GGTST	GT-ST	0c	GET STRING
GGTVL	GT-VL	0c	GET VALUATOR
GIITM	I-ITM	0a	INTERPRET ITEM
GINCH	IN-CH	0b	INITIALISE CHOICE
GINLC	IN-LC	0b	INITIALISE LOCATOR
GINPK	IN-PK	1b	INITIALISE PICK
GINSG	IN-SG	2a	INSERT SEGMENT
GINSK	IN-SK	0b	INITIALISE STROKE
GINST	IN-ST	0b	INITIALISE STRING
GINVL	IN-VL	0b	INITIALISE VALUATOR
GMSG	MSG	1a	MESSAGE
GMSGs	MSG-S	1a	MESSAGE (FORTRAN 77 SUBSET)
GOPKS	OP-KS	0a	OPEN GKS
GOPWK	OP-WK	0a	OPEN WORKSTATION
GPL	PL	0a	POLYLINE
GPM	PM	0a	POLYMARKER
GPREC	P-REC	0a	PACK DATA RECORD
GQACWK	Q-AC-WK	1a	INQUIRE SET member OF ACTIVE WORKSTATIONS
GQASF	Q-A-S-F	0a	INQUIRE ASPECT SOURCE FLAGS (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQASWK	Q-AS-WK	1a	INQUIRE SET member OF ASSOCIATED WORKSTATIONS
GQCF	Q-C-F	0a	INQUIRE COLOUR FACILITIES
GQCHB	Q-CH-B	0a	INQUIRE CHARACTER BASE VECTOR (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQCHH	Q-CH-H	0a	INQUIRE CHARACTER HEIGHT (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQCHS	Q-CH-S	0b	INQUIRE CHOICE DEVICE STATE
GQCHSP	Q-CH-SP	0a	INQUIRE CHARACTER SPACING (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)

GQCHUP	Q-CH-UP	0a	INQUIRE CHARACTER UP VECTOR (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQCHW	Q-CH-W	0a	INQUIRE CHARACTER WIDTH (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQCHXP	Q-CH-XP	0a	INQUIRE CHARACTER EXPANSION FACTOR (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQCLIP	Q-CLIP	0a	INQUIRE CLIPPING
GQCNTN	Q-C-N-T-N	0a	INQUIRE CURRENT NORMALIZATION TRANSFORMATION NUMBER
GQCR	Q-C-R	0a	INQUIRE COLOUR REPRESENTATION
GQDCH	Q-D-CH	0b	INQUIRE DEFAULT CHOICE DEVICE DATA
GQDDS	Q-D-D-S	1a	INQUIRE DEFAULT DEFERRAL STATE VALUES
GQDLC	Q-D-LC	0b	INQUIRE DEFAULT LOCATOR DEVICE DATA
GQDPK	Q-D-PK	1b	INQUIRE DEFAULT PICK DEVICE DATA
GQDSGA	Q-D-SG-A	1a	INQUIRE DYNAMIC MODIFICATION OF SEGMENT ATTRIBUTES
GQDSK	Q-D-SK	0b	INQUIRE DEFAULT STROKE DEVICE DATA
GQDSP	Q-D-SP	0a	INQUIRE DISPLAY SPACE SIZE
GQDST	Q-D-ST	0b	INQUIRE DEFAULT STRING DEVICE DATA
GQDVL	Q-D-VL	0b	INQUIRE DEFAULT VALUATOR DEVICE DATA
GQDWKA	Q-D-WK-A	1a	INQUIRE DYNAMIC MODIFICATION OF WORKSTATION ATTRIBUTES
GQECI	Q-E-C-I	0a	INQUIRE LIST element OF COLOUR INDICES
GQEFAI	Q-E-F-A-I	1a	INQUIRE LIST element OF FILL AREA INDICES
GQEGDP	Q-E-G-D-P	0a	INQUIRE LIST element OF AVAILABLE GENERALIZED DRAWING PRIMITIVES
GQENTN	Q-E-N-T-N	0a	INQUIRE LIST element OF NORMALIZATION TRANSFORMATION NUMBERS
GQEPAI	Q-E-PA-I	1a	INQUIRE LIST element OF PATTERN INDICES
GQEPLI	Q-E-PL-I	1a	INQUIRE LIST element OF POLYLINE INDICES
GQEPMI	Q-E-PM-I	1a	INQUIRE LIST element OF POLYMARKER INDICES
GQETXI	Q-E-TX-I	1a	INQUIRE LIST element OF TEXT INDICES
GQEWK	Q-E-WK	0a	INQUIRE LIST element OF AVAILABLE WORKSTATION TYPES
GQFACI	Q-F-A-C-I	0a	INQUIRE FILL AREA COLOUR INDEX (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQFAF	Q-F-A-F	0a	INQUIRE FILL AREA FACILITIES
GQFAI	Q-F-A-I	0a	INQUIRE FILL AREA INDEX (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQFAIS	Q-F-A-I-S	0a	INQUIRE FILL AREA INTERIOR STYLE (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQFAR	Q-F-A-R	1a	INQUIRE FILL AREA REPRESENTATION
GQFASI	Q-F-A-S-I	0a	INQUIRE FILL AREA STYLE INDEX (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQGDP	Q-G-D-P	0a	INQUIRE GENERALIZED DRAWING PRIMITIVE
GQIQOV	Q-I-Q-OV	0c	INQUIRE INPUT QUEUE OVERFLOW
GQLCS	Q-LC-S	0b	INQUIRE LOCATOR DEVICE STATE
GQLI	Q-L-I	0b	INQUIRE NUMBER OF AVAILABLE LOGICAL INPUT DEVICES
GQLN	Q-LN	0a	INQUIRE LINETYPE (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQLVKS	Q-LV-KS	0a	INQUIRE LEVEL OF GKS
GQLWK	Q-L-WK	0a	INQUIRE MAXIMUM LENGTH OF WORKSTATION STATE TABLES
GQLWSC	Q-LW-SC	0a	INQUIRE LINewidth SCALE FACTOR (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQMK	Q-MK	0a	INQUIRE MARKER TYPE (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQMKSC	Q-MK-SC	0a	INQUIRE MARKER SIZE SCALE FACTOR (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQMNTN	Q-M-N-T-N	0a	INQUIRE MAXIMUM NORMALIZATION TRANSFORMATION NUMBER
GQNT	Q-N-T	0a	INQUIRE NORMALIZATION TRANSFORMATION
GQOPS	Q-OP-S	0a	INQUIRE OPERATING STATE VALUE
GQOPSG	Q-OP-SG	1a	INQUIRE NAME OF OPEN SEGMENT
GQOPWK	Q-OP-WK	0a	INQUIRE SET member OF OPEN WORKSTATIONS
GQPA	Q-PA	0a	INQUIRE PATTERN SIZE (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQPAF	Q-PA-F	0a	INQUIRE PATTERN FACILITIES
GQPAR	Q-PA-R	1a	INQUIRE PATTERN REPRESENTATION
GQPARF	Q-PA-RF	0a	INQUIRE PATTERN REFERENCE POINT (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQPCR	Q-P-C-R	0a	INQUIRE PREDEFINED COLOUR REPRESENTATION

GQPFAR	Q-P-F-A-R	0a	INQUIRE PREDEFINED FILL AREA REPRESENTATION
GQPKID	Q-PK-ID	1b	INQUIRE CURRENT PICK IDENTIFIER VALUE
GQPKS	Q-PK-S	1b	INQUIRE PICK DEVICE STATE
GQPLCI	Q-PL-C-I	0a	INQUIRE POLYLINE COLOUR INDEX (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQPLF	Q-PL-F	0a	INQUIRE POLYLINE FACILITIES
GQPLI	Q-PL-I	0a	INQUIRE POLYLINE INDEX (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQPLR	Q-PL-R	1a	INQUIRE POLYLINE REPRESENTATION
GQPMCI	Q-PM-C-I	0a	INQUIRE POLYMARKER COLOUR INDEX (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQPMF	Q-PM-F	0a	INQUIRE POLYMARKER FACILITIES
GQPMI	Q-PM-I	0a	INQUIRE POLYMARKER INDEX (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQPMR	Q-PM-R	1a	INQUIRE POLYMARKER REPRESENTATION
GQPPAR	Q-P-PA-R	0a	INQUIRE PREDEFINED PATTERN REPRESENTATION
GQPPLR	Q-P-PL-R	0a	INQUIRE PREDEFINED POLYLINE REPRESENTATION
GQPPMR	Q-P-PM-R	0a	INQUIRE PREDEFINED POLYMARKER REPRESENTATION
GQPTXR	Q-P-TX-R	0a	INQUIRE PREDEFINED TEXT REPRESENTATION
GQPX	Q-PX	0a	INQUIRE PIXEL
GQPXA	Q-PX-A	0a	INQUIRE PIXEL ARRAY
GQPXAD	Q-PX-A-D	0a	INQUIRE PIXEL ARRAY DIMENSIONS
GQSGA	Q-SG-A	1a	INQUIRE SEGMENT ATTRIBUTES
GQSGP	Q-SG-P	1a	INQUIRE NUMBER OF SEGMENT PRIORITIES SUPPORTED
GQSGUS	Q-SG-US	1a	INQUIRE SET member OF SEGMENT NAMES IN USE
GQSGWK	Q-SG-WK	1a	INQUIRE SET member OF SEGMENT NAMES ON WORKSTATION
GQSIM	Q-SIM	0c	INQUIRE MORE SIMULTANEOUS EVENTS
GQSKS	Q-SK-S	0b	INQUIRE STROKE DEVICE STATE
GQSTS	Q-ST-S	0b	INQUIRE STRING DEVICE STATE
GQTXAL	Q-TX-AL	0a	INQUIRE TEXT ALIGNMENT (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQTXCI	Q-TX-C-I	0a	INQUIRE TEXT COLOUR INDEX (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQTXF	Q-TX-F	0a	INQUIRE TEXT FACILITIES
GQTXFP	Q-TX-F-P	0a	INQUIRE TEXT FONT AND PRECISION (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQTXI	Q-TX-I	0a	INQUIRE TEXT INDEX (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQTXP	Q-TX-P	0a	INQUIRE TEXT PATH (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQTXR	Q-TX-R	1a	INQUIRE TEXT REPRESENTATION
GQTXX	Q-TX-X	0a	INQUIRE TEXT EXTENT
GQTXXS	Q-TX-X-S	0a	INQUIRE TEXT EXTENT (FORTRAN 77 SUBSET)
GQVLS	Q-VL-S	0b	INQUIRE VALUATOR DEVICE STATE
GQWKC	Q-WK-C	0a	INQUIRE WORKSTATION CONNECTION AND TYPE
GQWKCA	Q-WK-CA	0a	INQUIRE WORKSTATION CATEGORY
GQWKCL	Q-WK-CL	0a	INQUIRE WORKSTATION CLASSIFICATION
GQWKDU	Q-WK-D-U	0a	INQUIRE WORKSTATION DEFERRAL AND UPDATE STATES
GQWKM	Q-WK-M	1a	INQUIRE WORKSTATION MAXIMUM NUMBERS
GQWKS	Q-WK-S	0a	INQUIRE WORKSTATION STATE
GQWKT	Q-WK-T	0a	INQUIRE WORKSTATION TRANSFORMATION
GRDITM	RD-ITM	0a	READ ITEM FROM GKSM
GRENSG	REN-SG	1a	RENAME SEGMENT
GRQCH	RQ-CH	0b	REQUEST CHOICE
GRQLC	RQ-LC	0b	REQUEST LOCATOR
GRQPK	RQ-PK	1b	REQUEST PICK
GRQSK	RQ-SK	0b	REQUEST STROKE
GRQST	RQ-ST	0b	REQUEST STRING
GRQVL	RQ-VL	0b	REQUEST VALUATOR
GRSGWK	R-SG-WK	1a	REDRAW ALL SEGMENTS ON WORKSTATION
GSASF	S-A-S-F	0a	SET ASPECT SOURCE FLAGS
GSCHH	S-CH-H	0a	SET CHARACTER HEIGHT
GSCHM	S-CH-M	0b	SET CHOICE MODE
GSCHSP	S-CH-SP	0a	SET CHARACTER SPACING
GSCHUP	S-CH-UP	0a	SET CHARACTER UP VECTOR
GSCHXP	S-CH-XP	0a	SET CHARACTER EXPANSION FACTOR
GSCLIP	S-CLIP	0a	SET CLIPPING INDICATOR
GSCR	S-C-R	0a	SET COLOUR REPRESENTATION

GSDS	S-D-S	1a	SET DEFERRAL STATE
GSDTEC	S-DTEC	1b	SET DETECTABILITY
GSELNT	SEL-N-T	0a	SELECT NORMALIZATION TRANSFORMATION
GSFACI	S-F-A-C-I	0a	SET FILL AREA COLOUR INDEX
GSFAI	S-F-A-I	0a	SET FILL AREA INDEX
GSFAIS	S-F-A-I-S	0a	SET FILL AREA INTERIOR STYLE
GSFAR	S-F-A-R	1a	SET FILL AREA REPRESENTATION
GSFASI	S-F-A-S-I	0a	SET FILL AREA STYLE INDEX
GSHLIT	S-HLIT	1a	SET HIGHLIGHTING
GSLCM	S-LC-M	0b	SET LOCATOR MODE
GSLN	S-LN	0a	SET LINETYPE
GSLWSC	S-LW-SC	0a	SET LINEWIDTH SCALE FACTOR
GSMCH	SM-CH	0c	SAMPLE CHOICE
GSMK	S-MK	0a	SET MARKER TYPE
GSMKSC	S-MK-SC	0a	SET MARKER SIZE SCALE FACTOR
GSMLC	SM-LC	0c	SAMPLE LOCATOR
GSMPLK	SM-PK	1c	SAMPLE PICK
GSMKSK	SM-SK	0c	SAMPLE STROKE
GSMST	SM-ST	0c	SAMPLE STRING
GSMVL	SM-VL	0c	SAMPLE VALUATOR
GSFA	S-PA	0a	SET PATTERN SIZE
GSPAR	S-PA-R	1a	SET PATTERN REPRESENTATION
GSPARF	S-PA-RF	0a	SET PATTERN REFERENCE POINT
GSPKID	S-PK-ID	1b	SET PICK IDENTIFIER
GSPKM	S-PK-M	1b	SET PICK MODE
GSPLCI	S-PL-C-I	0a	SET POLYLINE COLOUR INDEX
GSPLI	S-PL-I	0a	SET POLYLINE INDEX
GSPLR	S-PL-R	1a	SET POLYLINE REPRESENTATION
GSPMCI	S-PM-C-I	0a	SET POLYMARKER COLOUR INDEX
GSPMI	S-PM-I	0a	SET POLYMARKER INDEX
GSPMR	S-PM-R	1a	SET POLYMARKER REPRESENTATION
GSSGP	S-SG-P	1a	SET SEGMENT PRIORITY
GSSGT	S-SG-T	1a	SET SEGMENT TRANSFORMATION
GSSKM	S-SK-M	0b	SET STROKE MODE
GSSTM	S-ST-M	0b	SET STRING MODE
GSTXAL	S-TX-AL	0a	SET TEXT ALIGNMENT
GSTXCI	S-TX-C-I	0a	SET TEXT COLOUR INDEX
GSTXFP	S-TX-F-P	0a	SET TEXT FONT AND PRECISION
GSTXI	S-TX-I	0a	SET TEXT INDEX
GSTXP	S-TX-P	0a	SET TEXT PATH
GSTXR	S-TX-R	1a	SET TEXT REPRESENTATION
GSVIS	S-VIS	1a	SET VISIBILITY
GSVLM	S-VL-M	0b	SET VALUATOR MODE
GSVP	S-VP	0a	SET VIEWPORT
GSVPIP	S-VP-I-P	0b	SET VIEWPORT INPUT PRIORITY
GSWKVP	S-WK-VP	0a	SET WORKSTATION VIEWPORT
GSWKWN	S-WK-WN	0a	SET WORKSTATION WINDOW
GSWN	S-WN	0a	SET WINDOW
GTX	TX	0a	TEXT
GTXS	TX-S	0a	TEXT (FORTRAN 77 SUBSET)
GUREC	U-REC	0a	UNPACK DATA RECORD
GUWK	U-WK	0a	UPDATE WORKSTATION
GWAIT	WAIT	0c	AWAIT EVENT
GWITM	W-ITM	0a	WRITE ITEM TO GKSM

7.2 List ordered alphabetically by GKS function name

GACTM	AC-T-M	1a	ACCUMULATE TRANSFORMATION MATRIX
GACWK	AC-WK	0a	ACTIVATE WORKSTATION
GASGWK	A-SG-WK	2a	ASSOCIATE SEGMENT WITH WORKSTATION
GWAIT	WAIT	0c	AWAIT EVENT
GCA	C-A	0a	CELL ARRAY
GCLRWK	CLR-WK	0a	CLEAR WORKSTATION
GCLKS	CL-KS	0a	CLOSE GKS
GCLSG	CL-SG	1a	CLOSE SEGMENT
GCLWK	CL-WK	0a	CLOSE WORKSTATION

GCSGWK	C-SG-WK	2a	COPY SEGMENT TO WORKSTATION
GCRSG	CR-SG	1a	CREATE SEGMENT
GDAWK	DA-WK	0a	DEACTIVATE WORKSTATION
GDSG	D-SG	1a	DELETE SEGMENT
GDSGWK	D-SG-WK	1a	DELETE SEGMENT FROM WORKSTATION
GECLKS	E-CL-KS	0a	EMERGENCY CLOSE GKS
GERHND	ER-HND	0a	ERROR HANDLING
GERLOG	ER-LOG	0a	ERROR LOGGING
GESC	ESC	0a	ESCAPE
GEVTM	EV-T-M	1a	EVALUATE TRANSFORMATION MATRIX
GFA	F-A	0a	FILL AREA
GFLUSH	FLUSH	0c	FLUSH DEVICE EVENTS
GGDP	G-D-P	0a	GENERALIZED DRAWING PRIMITIVE
GGTCH	GT-CH	0c	GET CHOICE
GGTITM	GT-ITM	0a	GET ITEM TYPE FROM GKSM
GGTLC	GT-LC	0c	GET LOCATOR
GGTPK	GT-PK	1c	GET PICK
GGTST	GT-ST	0c	GET STRING
GGTSK	GT-SK	0c	GET STROKE
GGTVL	GT-VL	0c	GET VALUATOR
GINCH	IN-CH	0b	INITIALISE CHOICE
GINLC	IN-LC	0b	INITIALISE LOCATOR
GINPK	IN-PK	1b	INITIALISE PICK
GINST	IN-ST	0b	INITIALISE STRING
GINSK	IN-SK	0b	INITIALISE STROKE
GINVL	IN-VL	0b	INITIALISE VALUATOR
GQASF	Q-A-S-F	0a	INQUIRE ASPECT SOURCE FLAGS (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQCHB	Q-CH-B	0a	INQUIRE CHARACTER BASE VECTOR (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQCHXP	Q-CH-XP	0a	INQUIRE CHARACTER EXPANSION FACTOR (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQCHH	Q-CH-H	0a	INQUIRE CHARACTER HEIGHT (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQCHSP	Q-CH-SP	0a	INQUIRE CHARACTER SPACING (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQCHUP	Q-CH-UP	0a	INQUIRE CHARACTER UP VECTOR (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQCHW	Q-CH-W	0a	INQUIRE CHARACTER WIDTH (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQCHS	Q-CH-S	0b	INQUIRE CHOICE DEVICE STATE
GQCLIP	Q-CLIP	0a	INQUIRE CLIPPING
GQCF	Q-C-F	0a	INQUIRE COLOUR FACILITIES
GQCR	Q-C-R	0a	INQUIRE COLOUR REPRESENTATION
GQCNTN	Q-C-N-T-N	0a	INQUIRE CURRENT NORMALIZATION TRANSFORMATION NUMBER
GQDCH	Q-D-CH	0b	INQUIRE DEFAULT CHOICE DEVICE DATA
GQDDS	Q-D-D-S	1a	INQUIRE DEFAULT DEFERRAL STATE VALUES
GQDLC	Q-D-LC	0b	INQUIRE DEFAULT LOCATOR DEVICE DATA
GQDPK	Q-D-PK	1b	INQUIRE DEFAULT PICK DEVICE DATA
GQDST	Q-D-ST	0b	INQUIRE DEFAULT STRING DEVICE DATA
GQDSK	Q-D-SK	0b	INQUIRE DEFAULT STROKE DEVICE DATA
GQDVL	Q-D-VL	0b	INQUIRE DEFAULT VALUATOR DEVICE DATA
GQDSP	Q-D-SP	0a	INQUIRE DISPLAY SPACE SIZE
GQDSGA	Q-D-SG-A	1a	INQUIRE DYNAMIC MODIFICATION OF SEGMENT ATTRIBUTES
GQDWKA	Q-D-WK-A	1a	INQUIRE DYNAMIC MODIFICATION OF WORKSTATION ATTRIBUTES
GQFACI	Q-F-A-C-I	0a	INQUIRE FILL AREA COLOUR INDEX (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQFAF	Q-F-A-F	0a	INQUIRE FILL AREA FACILITIES
GQFAI	Q-F-A-I	0a	INQUIRE FILL AREA INDEX (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQFAIS	Q-F-A-I-S	0a	INQUIRE FILL AREA INTERIOR STYLE (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQFAR	Q-F-A-R	1a	INQUIRE FILL AREA REPRESENTATION
GQFASI	Q-F-A-S-I	0a	INQUIRE FILL AREA STYLE INDEX (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQGDP	Q-G-D-P	0a	INQUIRE GENERALIZED DRAWING PRIMITIVE
GQIQOV	Q-I-Q-OV	0c	INQUIRE INPUT QUEUE OVERFLOW

GQLVKS	Q-LV-KS	0a	INQUIRE LEVEL OF GKS
GQLN	Q-LN	0a	INQUIRE LINETYPE (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQLWSC	Q-LW-SC	0a	INQUIRE LINEWIDTH SCALE FACTOR (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQEGDP	Q-E-G-D-P	0a	INQUIRE LIST element OF AVAILABLE GENERALIZED DRAWING PRIMITIVES
GQEWK	Q-E-WK	0a	INQUIRE LIST element OF AVAILABLE WORKSTATION TYPES
GQECI	Q-E-C-I	0a	INQUIRE LIST element OF COLOUR INDICES
GQEF AI	Q-E-F-A-I	1a	INQUIRE LIST element OF FILL AREA INDICES
GQENTN	Q-E-N-T-N	0a	INQUIRE LIST element OF NORMALIZATION TRANSFORMATION NUMBERS
GQEP AI	Q-E-PA-I	1a	INQUIRE LIST element OF PATTERN INDICES
GQEPLI	Q-E-PL-I	1a	INQUIRE LIST element OF POLYLINE INDICES
GQEP MI	Q-E-PM-I	1a	INQUIRE LIST element OF POLYMARKER INDICES
GQETXI	Q-E-TX-I	1a	INQUIRE LIST element OF TEXT INDICES
GQLCS	Q-LC-S	0b	INQUIRE LOCATOR DEVICE STATE
GQMKSC	Q-MK-SC	0a	INQUIRE MARKER SIZE SCALE FACTOR (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQMK	Q-MK	0a	INQUIRE MARKER TYPE (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQLWK	Q-L-WK	0a	INQUIRE MAXIMUM LENGTH OF WORKSTATION STATE TABLES
GQMNTN	Q-M-N-T-N	0a	INQUIRE MAXIMUM NORMALIZATION TRANSFORMATION NUMBER
GQSIM	Q-SIM	0c	INQUIRE MORE SIMULTANEOUS EVENTS
GQOPSG	Q-OP-SG	1a	INQUIRE NAME OF OPEN SEGMENT
GQNT	Q-N-T	0a	INQUIRE NORMALIZATION TRANSFORMATION
GQLI	Q-L-I	0b	INQUIRE NUMBER OF AVAILABLE LOGICAL INPUT DEVICES
GQSGP	Q-SG-P	1a	INQUIRE NUMBER OF SEGMENT PRIORITIES SUPPORTED
GQOPS	Q-OP-S	0a	INQUIRE OPERATING STATE VALUE
GQPAF	Q-PA-F	0a	INQUIRE PATTERN FACILITIES
GQPARF	Q-PA-RF	0a	INQUIRE PATTERN REFERENCE POINT (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQPAR	Q-PA-R	1a	INQUIRE PATTERN REPRESENTATION
GQPA	Q-PA	0a	INQUIRE PATTERN SIZE (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQPKS	Q-PK-S	1b	INQUIRE PICK DEVICE STATE
GQPKID	Q-PK-ID	1b	INQUIRE CURRENT PICK IDENTIFIER VALUE
GQPX	Q-PX	0a	INQUIRE PIXEL
GQPXA	Q-PX-A	0a	INQUIRE PIXEL ARRAY
GQPXAD	Q-PX-A-D	0a	INQUIRE PIXEL ARRAY DIMENSIONS
GQPLCI	Q-PL-C-I	0a	INQUIRE POLYLINE COLOUR INDEX (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQPLF	Q-PL-F	0a	INQUIRE POLYLINE FACILITIES
GQPLI	Q-PL-I	0a	INQUIRE POLYLINE INDEX (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQPLR	Q-PL-R	1a	INQUIRE POLYLINE REPRESENTATION
GQPMCI	Q-PM-C-I	0a	INQUIRE POLYMARKER COLOUR INDEX (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQPMF	Q-PM-F	0a	INQUIRE POLYMARKER FACILITIES
GQPMI	Q-PM-I	0a	INQUIRE POLYMARKER INDEX (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQPMR	Q-PM-R	1a	INQUIRE POLYMARKER REPRESENTATION
GQPCR	Q-P-C-R	0a	INQUIRE PREDEFINED COLOUR REPRESENTATION
GQPFAR	Q-P-F-A-R	0a	INQUIRE PREDEFINED FILL AREA REPRESENTATION
GQPPAR	Q-P-PA-R	0a	INQUIRE PREDEFINED PATTERN REPRESENTATION
GQPPLR	Q-P-PL-R	0a	INQUIRE PREDEFINED POLYLINE REPRESENTATION
GQPPMR	Q-P-PM-R	0a	INQUIRE PREDEFINED POLYMARKER REPRESENTATION
GQPTXR	Q-P-TX-R	0a	INQUIRE PREDEFINED TEXT REPRESENTATION
GQSGA	Q-SG-A	1a	INQUIRE SEGMENT ATTRIBUTES
GQACWK	Q-AC-WK	1a	INQUIRE SET member OF ACTIVE WORKSTATIONS
GQASWK	Q-AS-WK	1a	INQUIRE SET member OF ASSOCIATED WORKSTATIONS
GQOPWK	Q-OP-WK	0a	INQUIRE SET member OF OPEN WORKSTATIONS
GQSGUS	Q-SG-US	1a	INQUIRE SET member OF SEGMENT NAMES IN USE
GQSGWK	Q-SG-WK	1a	INQUIRE SET member OF SEGMENT NAMES ON WORKSTATION
GQSTS	Q-ST-S	0b	INQUIRE STRING DEVICE STATE
GQSKS	Q-SK-S	0b	INQUIRE STROKE DEVICE STATE

GQTXAL	Q-TX-AL	0a	INQUIRE TEXT ALIGNMENT (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQTXCI	Q-TX-C-I	0a	INQUIRE TEXT COLOUR INDEX (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQTXX	Q-TX-X	0a	INQUIRE TEXT EXTENT
GQTXXS	Q-TX-X-S	0a	INQUIRE TEXT EXTENT (FORTRAN 77 SUBSET)
GQTXF	Q-TX-F	0a	INQUIRE TEXT FACILITIES
GQTXFP	Q-TX-F-P	0a	INQUIRE TEXT FONT AND PRECISION (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQTXI	Q-TX-I	0a	INQUIRE TEXT INDEX (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQTXP	Q-TX-P	0a	INQUIRE TEXT PATH (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQTXR	Q-TX-R	1a	INQUIRE TEXT REPRESENTATION
GQVLS	Q-VL-S	0b	INQUIRE VALUATOR DEVICE STATE
GQWKCA	Q-WK-CA	0a	INQUIRE WORKSTATION CATEGORY
GQWKCL	Q-WK-CL	0a	INQUIRE WORKSTATION CLASSIFICATION
GQWKC	Q-WK-C	0a	INQUIRE WORKSTATION CONNECTION AND TYPE
GQWKDU	Q-WK-D-U	0a	INQUIRE WORKSTATION DEFERRAL AND UPDATE STATES
GQWKM	Q-WK-M	1a	INQUIRE WORKSTATION MAXIMUM NUMBERS
GQWKS	Q-WK-S	0a	INQUIRE WORKSTATION STATE
GQWKT	Q-WK-T	0a	INQUIRE WORKSTATION TRANSFORMATION
GINSG	IN-SG	2a	INSERT SEGMENT
GIITM	I-ITM	0a	INTERPRET ITEM
GMSG	MSG	1a	MESSAGE
GMSGs	MSG-S	1a	MESSAGE (FORTRAN 77 SUBSET)
GOPKS	OP-KS	0a	OPEN GKS
GOPWK	OP-WK	0a	OPEN WORKSTATION
GPREC	P-REC	0a	PACK DATA RECORD
GPL	PL	0a	POLYLINE
GPM	PM	0a	POLYMARKER
GRDITM	RD-ITM	0a	READ ITEM FROM GKSM
GRSGWK	R-SG-WK	1a	REDRAW ALL SEGMENTS ON WORKSTATION
GRENSG	REN-SG	1a	RENAME SEGMENT
GRQCH	RQ-CH	0b	REQUEST CHOICE
GRQLC	RQ-LC	0b	REQUEST LOCATOR
GRQPK	RQ-PK	1b	REQUEST PICK
GRQST	RQ-ST	0b	REQUEST STRING
GRQSK	RQ-SK	0b	REQUEST STROKE
GRQVL	RQ-VL	0b	REQUEST VALUATOR
GSMCH	SM-CH	0c	SAMPLE CHOICE
GSMLC	SM-LC	0c	SAMPLE LOCATOR
GSMPK	SM-PK	1c	SAMPLE PICK
GSMST	SM-ST	0c	SAMPLE STRING
GSMsk	SM-SK	0c	SAMPLE STROKE
GSMVL	SM-VL	0c	SAMPLE VALUATOR
GSELNT	SEL-N-T	0a	SELECT NORMALIZATION TRANSFORMATION
GSASF	S-A-S-F	0a	SET ASPECT SOURCE FLAGS
GSCHXP	S-CH-XP	0a	SET CHARACTER EXPANSION FACTOR
GSCHH	S-CH-H	0a	SET CHARACTER HEIGHT
GSCHSP	S-CH-SP	0a	SET CHARACTER SPACING
GSCHUP	S-CH-UP	0a	SET CHARACTER UP VECTOR
GSCHM	S-CH-M	0b	SET CHOICE MODE
GSCLIP	S-CLIP	0a	SET CLIPPING INDICATOR
GSCR	S-C-R	0a	SET COLOUR REPRESENTATION
GSDS	S-D-S	1a	SET DEFERRAL STATE
GSDTEC	S-DTEC	1b	SET DETECTABILITY
GSFACI	S-F-A-C-I	0a	SET FILL AREA COLOUR INDEX
GSFAI	S-F-A-I	0a	SET FILL AREA INDEX
GSFAIS	S-F-A-I-S	0a	SET FILL AREA INTERIOR STYLE
GSFAR	S-F-A-R	1a	SET FILL AREA REPRESENTATION
GSFASI	S-F-A-S-I	0a	SET FILL AREA STYLE INDEX
GSHLIT	S-HLIT	1a	SET HIGHLIGHTING
GSLN	S-LN	0a	SET LINETYPE
GSLWSC	S-LW-SC	0a	SET LINEWIDTH SCALE FACTOR
GSLCM	S-LC-M	0b	SET LOCATOR MODE
GSMKSC	S-MK-SC	0a	SET MARKER SIZE SCALE FACTOR
GSMK	S-MK	0a	SET MARKER TYPE

GSPARF	S-PA-RF	0a	SET PATTERN REFERENCE POINT
GSPAR	S-PA-R	1a	SET PATTERN REPRESENTATION
GSPA	S-PA	0a	SET PATTERN SIZE
GSPKID	S-PK-ID	1b	SET PICK IDENTIFIER
GSPKM	S-PK-M	1b	SET PICK MODE
GSPLCI	S-PL-C-I	0a	SET POLYLINE COLOUR INDEX
GSPLI	S-PL-I	0a	SET POLYLINE INDEX
GSPLR	S-PL-R	1a	SET POLYLINE REPRESENTATION
GSPMCI	S-PM-C-I	0a	SET POLYMARKER COLOUR INDEX
GSPMI	S-PM-I	0a	SET POLYMARKER INDEX
GSPMR	S-PM-R	1a	SET POLYMARKER REPRESENTATION
GSSGP	S-SG-P	1a	SET SEGMENT PRIORITY
GSSGT	S-SG-T	1a	SET SEGMENT TRANSFORMATION
GSSTM	S-ST-M	0b	SET STRING MODE
GSSKM	S-SK-M	0b	SET STROKE MODE
GSTXAL	S-TX-AL	0a	SET TEXT ALIGNMENT
GSTXCI	S-TX-C-I	0a	SET TEXT COLOUR INDEX
GSTXFP	S-TX-F-P	0a	SET TEXT FONT AND PRECISION
GSTXI	S-TX-I	0a	SET TEXT INDEX
GSTXP	S-TX-P	0a	SET TEXT PATH
GSTXR	S-TX-R	1a	SET TEXT REPRESENTATION
GSVLM	S-VL-M	0b	SET VALUATOR MODE
GSPV	S-VP	0a	SET VIEWPORT
GSPVIP	S-VP-I-P	0b	SET VIEWPORT INPUT PRIORITY
GSVIS	S-VIS	1a	SET VISIBILITY
GSWN	S-WN	0a	SET WINDOW
GSWKVP	S-WK-VP	0a	SET WORKSTATION VIEWPORT
GSWKWN	S-WK-WN	0a	SET WORKSTATION WINDOW
GTXT	TX	0a	TEXT
GTXS	TX-S	0a	TEXT (FORTRAN 77 SUBSET)
GUREC	U-REC	0a	UNPACK DATA RECORD
GUWK	U-WK	0a	UPDATE WORKSTATION
GWITM	W-ITM	0a	WRITE ITEM TO GKSM

7.3 List ordered alphabetically by bound name within level

GACWK	AC-WK	0a	ACTIVATE WORKSTATION
GCA	C-A	0a	CELL ARRAY
GCLKS	CL-KS	0a	CLOSE GKS
GCLRWK	CLR-WK	0a	CLEAR WORKSTATION
GCLWK	CL-WK	0a	CLOSE WORKSTATION
GDAWK	DA-WK	0a	DEACTIVATE WORKSTATION
GECLKS	E-CL-KS	0a	EMERGENCY CLOSE GKS
GERHND	ER-HND	0a	ERROR HANDLING
GERLOG	ER-LOG	0a	ERROR LOGGING
GESC	ESC	0a	ESCAPE
GFA	F-A	0a	FILL AREA
GGDP	G-D-P	0a	GENERALIZED DRAWING PRIMITIVE
GGTITM	GT-ITM	0a	GET ITEM TYPE FROM GKSM
GIITM	I-ITM	0a	INTERPRET ITEM
GOPKS	OP-KS	0a	OPEN GKS
GOPWK	OP-WK	0a	OPEN WORKSTATION
GPL	PL	0a	POLYLINE
GPM	PM	0a	POLYMARKER
GPREC	P-REC	0a	PACK DATA RECORD
GQASF	Q-A-S-F	0a	INQUIRE ASPECT SOURCE FLAGS (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQCF	Q-C-F	0a	INQUIRE COLOUR FACILITIES
GQCHB	Q-CH-B	0a	INQUIRE CHARACTER BASE VECTOR (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQCHH	Q-CH-H	0a	INQUIRE CHARACTER HEIGHT (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQCHSP	Q-CH-SP	0a	INQUIRE CHARACTER SPACING (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQCHUP	Q-CH-UP	0a	INQUIRE CHARACTER UP VECTOR (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQCHW	Q-CH-W	0a	INQUIRE CHARACTER WIDTH (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQCHXP	Q-CH-XP	0a	INQUIRE CHARACTER EXPANSION FACTOR (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQCLIP	Q-CLIP	0a	INQUIRE CLIPPING
GQCNTN	Q-C-N-T-N	0a	INQUIRE CURRENT NORMALIZATION TRANSFORMATION NUMBER
GQCR	Q-C-R	0a	INQUIRE COLOUR REPRESENTATION
GQDSP	Q-D-SP	0a	INQUIRE DISPLAY SPACE SIZE
GQECI	Q-E-C-I	0a	INQUIRE LIST element OF COLOUR INDICES
GQEGDP	Q-E-G-D-P	0a	INQUIRE LIST element OF AVAILABLE GENERALIZED DRAWING PRIMITIVES
GQENTN	Q-E-N-T-N	0a	INQUIRE LIST element OF NORMALIZATION TRANSFORMATION NUMBERS
GQEWK	Q-E-WK	0a	INQUIRE LIST element OF AVAILABLE WORKSTATION TYPES
GQFACI	Q-F-A-C-I	0a	INQUIRE FILL AREA COLOUR INDEX (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQFAF	Q-F-A-F	0a	INQUIRE FILL AREA FACILITIES
GQFAI	Q-F-A-I	0a	INQUIRE FILL AREA INDEX (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQFAIS	Q-F-A-I-S	0a	INQUIRE AREA INTERIOR STYLE (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQFASI	Q-F-A-S-I	0a	INQUIRE FILL AREA STYLE INDEX (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQGDP	Q-G-D-P	0a	INQUIRE GENERALIZED DRAWING PRIMITIVE
GQLN	Q-LN	0a	INQUIRE LINETYPE (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQLVKS	Q-LV-KS	0a	INQUIRE LEVEL OF GKS
GQLWK	Q-L-WK	0a	INQUIRE MAXIMUM LENGTH OF WORKSTATION STATE TABLES
GQLWSC	Q-LW-SC	0a	INQUIRE LINewidth SCALE FACTOR (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQMK	Q-MK	0a	INQUIRE MARKER TYPE (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)

GQMKSC	Q-MK-SC	0a	INQUIRE MARKER SIZE SCALE FACTOR (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQMNTN	Q-M-N-T-N	0a	INQUIRE MAXIMUM NORMALIZATION TRANSFORMATION NUMBER
GQNT	Q-N-T	0a	INQUIRE NORMALIZATION TRANSFORMATION
GQOPS	Q-OP-S	0a	INQUIRE OPERATING STATE VALUE
GQOPWK	Q-OP-WK	0a	INQUIRE SET member OF OPEN WORKSTATIONS
GQPA	Q-PA	0a	INQUIRE PATTERN SIZE (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQPAF	Q-PA-F	0a	INQUIRE PATTERN FACILITIES
GQPARF	Q-PA-RF	0a	INQUIRE PATTERN REFERENCE POINT (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQPCR	Q-P-C-R	0a	INQUIRE PREDEFINED COLOUR REPRESENTATION
GQPFAR	Q-P-F-A-R	0a	INQUIRE PREDEFINED FILL AREA REPRESENTATION
GQPLCI	Q-PL-C-I	0a	INQUIRE POLYLINE COLOUR INDEX (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQPLF	Q-PL-F	0a	INQUIRE POLYLINE FACILITIES
GQPLI	Q-PL-I	0a	INQUIRE POLYLINE INDEX (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQPMCI	Q-PM-C-I	0a	INQUIRE POLYMARKER COLOUR INDEX (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQPMF	Q-PM-F	0a	INQUIRE POLYMARKER FACILITIES
GQPMI	Q-PM-I	0a	INQUIRE POLYMARKER INDEX (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQPPAR	Q-P-PA-R	0a	INQUIRE PREDEFINED PATTERN REPRESENTATION
GQFPLR	Q-P-PL-R	0a	INQUIRE PREDEFINED POLYLINE REPRESENTATION
GQPPMR	Q-P-PM-R	0a	INQUIRE PREDEFINED POLYMARKER REPRESENTATION
GQPTXR	Q-P-TX-R	0a	INQUIRE PREDEFINED TEXT REPRESENTATION
GQPX	Q-PX	0a	INQUIRE PIXEL
GQPXA	Q-PX-A	0a	INQUIRE PIXEL ARRAY
GQPXAD	Q-PX-A-D	0a	INQUIRE PIXEL ARRAY DIMENSIONS
GQTXAL	Q-TX-AL	0a	INQUIRE TEXT ALIGNMENT (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQTXCI	Q-TX-C-I	0a	INQUIRE TEXT COLOUR INDEX (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQTXF	Q-TX-F	0a	INQUIRE TEXT FACILITIES
GQTXFP	Q-TX-F-P	0a	INQUIRE TEXT FONT AND PRECISION (INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
GQTXI	Q-TX-I	0a	INQUIRE TEXT INDEX (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQTXP	Q-TX-P	0a	INQUIRE TEXT PATH (INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
GQTXX	Q-TX-X	0a	INQUIRE TEXT EXTENT
GQTXXS	Q-TX-X-S	0a	INQUIRE TEXT EXTENT (FORTRAN 77 SUBSET)
GQWKC	Q-WK-C	0a	INQUIRE WORKSTATION CONNECTION AND TYPE
GQWKCA	Q-WK-CA	0a	INQUIRE WORKSTATION CATEGORY
GQWKCL	Q-WK-CL	0a	INQUIRE WORKSTATION CLASSIFICATION
GQWKDU	Q-WK-D-U	0a	INQUIRE WORKSTATION DEFERRAL AND UPDATE STATES
GQWKS	Q-WK-S	0a	INQUIRE WORKSTATION STATE
GQWKT	Q-WK-T	0a	INQUIRE WORKSTATION TRANSFORMATION
GRDITM	RD-ITM	0a	READ ITEM FROM GKSM
GSASF	S-A-S-F	0a	SET ASPECT SOURCE FLAGS
GSCHH	S-CH-H	0a	SET CHARACTER HEIGHT
GSCHSP	S-CH-SP	0a	SET CHARACTER SPACING
GSCHUP	S-CH-UP	0a	SET CHARACTER UP VECTOR
GSCHXP	S-CH-XP	0a	SET CHARACTER EXPANSION FACTOR
GSCLIP	S-CLIP	0a	SET CLIPPING INDICATOR
GSCR	S-C-R	0a	SET COLOUR REPRESENTATION
GSELNT	SEL-N-T	0a	SELECT NORMALIZATION TRANSFORMATION
GSFACI	S-F-A-C-I	0a	SET FILL AREA COLOUR INDEX
GSFAI	S-F-A-I	0a	SET FILL AREA INDEX
GSFAIS	S-F-A-I-S	0a	SET FILL AREA INTERIOR STYLE
GSFASI	S-F-A-S-I	0a	SET FILL AREA STYLE INDEX
GSLN	S-LN	0a	SET LINETYPE
GSLWSC	S-LW-SC	0a	SET LINEWIDTH SCALE FACTOR
GSMK	S-MK	0a	SET MARKER TYPE
GSMKSC	S-MK-SC	0a	SET MARKER SIZE SCALE FACTOR
GSPA	S-PA	0a	SET PATTERN SIZE

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GSPARF	S-PA-RF	0a	SET PATTERN REFERENCE POINT
GSPLCI	S-PL-C-I	0a	SET POLYLINE COLOUR INDEX
GSPLI	S-PL-I	0a	SET POLYLINE INDEX
GSPMCI	S-PM-C-I	0a	SET POLYMARKER COLOUR INDEX
GSPMI	S-PM-I	0a	SET POLYMARKER INDEX
GSTXAL	S-TX-AL	0a	SET TEXT ALIGNMENT
GSTXCI	S-TX-C-I	0a	SET TEXT COLOUR INDEX
GSTXFP	S-TX-F-P	0a	SET TEXT FONT AND PRECISION
GSTXI	S-TX-I	0a	SET TEXT INDEX
GSTXP	S-TX-P	0a	SET TEXT PATH
GSVP	S-VP	0a	SET VIEWPORT
GSWKVP	S-WK-VP	0a	SET WORKSTATION VIEWPORT
GSWKWN	S-WK-WN	0a	SET WORKSTATION WINDOW
GSWN	S-WN	0a	SET WINDOW
GTXT	TX	0a	TEXT
GTXS	TX-S	0a	TEXT (FORTRAN 77 SUBSET)
GUREC	U-REC	0a	UNPACK DATA RECORD
GUWK	U-WK	0a	UPDATE WORKSTATION
GWITM	W-ITM	0a	WRITE ITEM TO GKSM
GINCH	IN-CH	0b	INITIALISE CHOICE
GINLC	IN-LC	0b	INITIALISE LOCATOR
GINSK	IN-SK	0b	INITIALISE STROKE
GINST	IN-ST	0b	INITIALISE STRING
GINVL	IN-VL	0b	INITIALISE VALUATOR
GQCHS	Q-CH-S	0b	INQUIRE CHOICE DEVICE STATE
GQDCH	Q-D-CH	0b	INQUIRE DEFAULT CHOICE DEVICE DATA
GQDLC	Q-D-LC	0b	INQUIRE DEFAULT LOCATOR DEVICE DATA
GQDSK	Q-D-SK	0b	INQUIRE DEFAULT STROKE DEVICE DATA
GQDST	Q-D-ST	0b	INQUIRE DEFAULT STRING DEVICE DATA
GQDVL	Q-D-VL	0b	INQUIRE DEFAULT VALUATOR DEVICE DATA
GQLCS	Q-LC-S	0b	INQUIRE LOCATOR DEVICE STATE
GQLI	Q-L-I	0b	INQUIRE NUMBER OF AVAILABLE LOGICAL INPUT DEVICES
GQSKS	Q-SK-S	0b	INQUIRE STROKE DEVICE STATE
GQSTS	Q-ST-S	0b	INQUIRE STRING DEVICE STATE
GQVLS	Q-VL-S	0b	INQUIRE VALUATOR DEVICE STATE
GRQCH	RQ-CH	0b	REQUEST CHOICE
GRQLC	RQ-LC	0b	REQUEST LOCATOR
GRQSK	RQ-SK	0b	REQUEST STROKE
GRQST	RQ-ST	0b	REQUEST STRING
GRQVL	RQ-VL	0b	REQUEST VALUATOR
GSCHM	S-CH-M	0b	SET CHOICE MODE
GSLCM	S-LC-M	0b	SET LOCATOR MODE
GSSKM	S-SK-M	0b	SET STROKE MODE
GSSTM	S-ST-M	0b	SET STRING MODE
GSVLM	S-VL-M	0b	SET VALUATOR MODE
GSVIP	S-VP-I-P	0b	SET VIEWPORT INPUT PRIORITY
GFLUSH	FLUSH	0c	FLUSH DEVICE EVENTS
GGTCH	GT-CH	0c	GET CHOICE
GGTLC	GT-LC	0c	GET LOCATOR
GGTSK	GT-SK	0c	GET STROKE
GGTST	GT-ST	0c	GET STRING
GGTVL	GT-VL	0c	GET VALUATOR
GQIQOV	Q-I-Q-OV	0c	INQUIRE INPUT QUEUE OVERFLOW
GQSIM	Q-SIM	0c	INQUIRE MORE SIMULTANEOUS EVENTS
GSMCH	SM-CH	0c	SAMPLE CHOICE
GSMCLC	SM-LC	0c	SAMPLE LOCATOR
GSMST	SM-SK	0c	SAMPLE STROKE
GSMST	SM-ST	0c	SAMPLE STRING
GSMVL	SM-VL	0c	SAMPLE VALUATOR
GWAIT	WAIT	0c	AWAIT EVENT
GACTM	AC-T-M	1a	ACCUMULATE TRANSFORMATION MATRIX
GCLSG	CL-SG	1a	CLOSE SEGMENT
GCRSG	CR-SG	1a	CREATE SEGMENT
GDSG	D-SG	1a	DELETE SEGMENT
GDSGWK	D-SG-WK	1a	DELETE SEGMENT FROM WORKSTATION
GEVTM	EV-T-M	1a	EVALUATE TRANSFORMATION MATRIX
GMSG	MSG	1a	MESSAGE
GMSG	MSG-S	1a	MESSAGE (FORTRAN 77 SUBSET)

GQACWK	Q-AC-WK	1a	INQUIRE SET member OF ACTIVE WORKSTATIONS
GQASWK	Q-AS-WK	1a	INQUIRE SET member OF ASSOCIATED WORKSTATIONS
GQDDS	Q-D-D-S	1a	INQUIRE DEFAULT DEFERRAL STATE VALUES
GQDSGA	Q-D-SG-A	1a	INQUIRE DYNAMIC MODIFICATION OF SEGMENT ATTRIBUTES
GQDWKA	Q-D-WK-A	1a	INQUIRE DYNAMIC MODIFICATION OF WORKSTATION ATTRIBUTES
GQEFAI	Q-E-F-A-I	1a	INQUIRE LIST element OF FILL AREA INDICES
GQEPAI	Q-E-PA-I	1a	INQUIRE LIST element OF PATTERN INDICES
GQEPLI	Q-E-PL-I	1a	INQUIRE LIST element OF POLYLINE INDICES
GQEPMI	Q-E-PM-I	1a	INQUIRE LIST element OF POLYMARKER INDICES
GQETXI	Q-E-TX-I	1a	INQUIRE LIST element OF TEXT INDICES
GQFAR	Q-F-A-R	1a	INQUIRE FILL AREA REPRESENTATION
GQOPSG	Q-OP-SG	1a	INQUIRE NAME OF OPEN SEGMENT
GQPAR	Q-PA-R	1a	INQUIRE PATTERN REPRESENTATION
GQPLR	Q-PL-R	1a	INQUIRE POLYLINE REPRESENTATION
GQPMR	Q-PM-R	1a	INQUIRE POLYMARKER REPRESENTATION
GQSGA	Q-SG-A	1a	INQUIRE SEGMENT ATTRIBUTES
GQSGP	Q-SG-P	1a	INQUIRE NUMBER OF SEGMENT PRIORITIES SUPPORTED
GQSGUS	Q-SG-US	1a	INQUIRE SET member OF SEGMENT NAMES IN USE
GQSGWK	Q-SG-WK	1a	INQUIRE SET member OF SEGMENT NAMES ON WORKSTATION
GQTXR	Q-TX-R	1a	INQUIRE TEXT REPRESENTATION
GQWKM	Q-WK-M	1a	INQUIRE WORKSTATION MAXIMUM NUMBERS
GRENSG	REN-SG	1a	RENAME SEGMENT
GRSGWK	R-SG-WK	1a	REDRAW ALL SEGMENTS ON WORKSTATION
GSDS	S-D-S	1a	SET DEFERRAL STATE
GSFAR	S-F-A-R	1a	SET FILL AREA REPRESENTATION
GSHLIT	S-HLIT	1a	SET HIGHLIGHTING
GSFAR	S-PA-R	1a	SET PATTERN REPRESENTATION
GSPLR	S-PL-R	1a	SET POLYLINE REPRESENTATION
GSPMR	S-PM-R	1a	SET POLYMARKER REPRESENTATION
GSSGP	S-SG-P	1a	SET SEGMENT PRIORITY
GSSGT	S-SG-T	1a	SET SEGMENT TRANSFORMATION
GSTXR	S-TX-R	1a	SET TEXT REPRESENTATION
GSVIS	S-VIS	1a	SET VISIBILITY
GINPK	IN-PK	1b	INITIALISE PICK
GQDPK	Q-D-PK	1b	INQUIRE DEFAULT PICK DEVICE DATA
GQPKID	Q-PK-ID	1b	INQUIRE CURRENT PICK IDENTIFIER VALUE
GQPKS	Q-PK-S	1b	INQUIRE PICK DEVICE STATE
GRQPK	RQ-PK	1b	REQUEST PICK
GSDTEC	S-DTEC	1b	SET DETECTABILITY
GSPKID	S-PK-ID	1b	SET PICK IDENTIFIER
GSPKM	S-PK-M	1b	SET PICK MODE
GGTPK	GT-PK	1c	GET PICK
GSMPK	SM-PK	1c	SAMPLE PICK
GASGWK	A-SG-WK	2a	ASSOCIATE SEGMENT WITH WORKSTATION
GCSGWK	C-SG-WK	2a	COPY SEGMENT TO WORKSTATION
GINSG	IN-SG	2a	INSERT SEGMENT

8 GKS errors specific to the FORTRAN binding

Certain features of the FORTRAN language make additional errors (beyond the ones described in ISO 7942) possible. Specifically, these new errors are defined:

- 2000 Enumeration type out of range -- the INTEGER passed as a GKS enumerated type is not within the range of valid values.
- 2001 Output parameter size insufficient -- a FORTRAN array or string being passed as an output parameter is too small to contain the returned information.
- 2002 List element or set member not available -- for a non-empty list or set, a value less than zero or greater than the size of a list or set was passed as the requested list element or set member in an inquiry routine.
- 2003 Invalid data record -- the data record cannot be decoded, or there was a problem encountered when the data record was created, making the result invalid.

STANDARDSISO.COM : Click to view the full PDF of ISO 8651-1:1988

9 The GKS function interface

9.1 General principles

For each GKS function the corresponding FORTRAN SUBROUTINE declaration is given. The name of the GKS function is listed, followed by its FORTRAN name and the corresponding parameters. After that, the list of parameters is described by type and a brief identifying phrase.

For the mapping of ENUMERATION types see clause 6.

For GENERALIZED DRAWING PRIMITIVE and ESCAPE, subroutines GGDP and GESC are defined. In this binding, the GDP and ESCAPE identifiers are bound to integers. Each GDP with an identifier less than 1000 in the ISO International Register of Graphical Items and that is available in the implementation may, in addition, be accessed by a subroutine of the form GDPqrs, where qrs is a string of 4 digits representing the GDP identifier with leading zeros if necessary.¹⁾ The parameters are derived from those of GGDP as follows: N, PXA, PYA are required; PRIMID is absent; the data record is specified by parameters appropriate to the particular GDP identifier. Similarly each ESCAPE with an identifier less than 1000 in the ISO International Register of Graphics Items and that is available in the implementation may in addition be accessed by a subroutine of the form GEPqrs, where qrs represents the ESCAPE identifier. The parameters are derived from those of GESC as follows: FCTID is absent and the input and output data records are specified by parameters appropriate to the specific ESCAPE function. The type and order of the parameters representing the data record for the individual subroutines, and the corresponding data sent to PACK DATA RECORD if GGDP or GESC is used, are defined in the ISO International Register of Graphical Items. For both GDP and ESCAPE, it is possible to define each separate subroutine using GGDP and GESC.

Any unregistered GDP and ESCAPE functions that the implementation provides are accessible by the general subroutines GGDP and GESC with negative identifiers. The implementation may also allow access by subroutines named GUabc (for GDP) and GUEabc (for ESCAPE) where abc is the absolute value of the negative identifier. Parameter lists for the GUabc and GUEabc subroutines are implementation dependent.

9.2 Control functions

OPEN GKS

L0a

SUBROUTINE GOPKS (ERRFIL, BUFA)

Input Parameters:

INTEGER ERRFIL

INTEGER BUFA

error message file

amount of memory units (implementation

dependent; if -1, use implementation dependent default)

CLOSE GKS

L0a

SUBROUTINE GCLKS

1) For the purpose of this International Standard and according to the rules for the designation and operation of registration authorities in the ISO Directives, the ISO Council has designated the National Bureau of Standards (Institute of Computer Sciences and Technology), A-266 Technology Building, Gaithersburg, MD 20899, USA to act as registration authority.

OPEN WORKSTATION

L0a

SUBROUTINE GOPWK (WKID,CONID,WTYPE)

Input Parameters:

INTEGER WKID

INTEGER CONID

INTEGER WTYPE

workstation identifier

connection identifier

workstation type

CLOSE WORKSTATION

L0a

SUBROUTINE GCLWK (WKID)

Input Parameters:

INTEGER WKID

workstation identifier

ACTIVATE WORKSTATION

L0a

SUBROUTINE GACWK (WKID)

Input Parameters:

INTEGER WKID

workstation identifier

DEACTIVATE WORKSTATION

L0a

SUBROUTINE GDAWK (WKID)

Input Parameters:

INTEGER WKID

workstation identifier

CLEAR WORKSTATION

L0a

SUBROUTINE GCLRWK (WKID,COFL)

Input Parameters:

INTEGER WKID

INTEGER COFL

workstation identifier

control flag (GCONDI,GALWAY)

REDRAW ALL SEGMENTS ON WORKSTATION

L1a

SUBROUTINE GRSGWK (WKID)

Input Parameters:

INTEGER WKID

workstation identifier

UPDATE WORKSTATION

L0a

SUBROUTINE GUWK (WKID,REGFL)

Input Parameters:

INTEGER WKID
INTEGER REGFL

workstation identifier

update regeneration flag (GPOSTP,GPERFO)

SET DEFERRAL STATE

L1a

SUBROUTINE GSIDS (WKID,DEFMOD,REGMOD)

Input Parameters:

INTEGER WKID
INTEGER DEFMOD

workstation identifier

deferral mode

(GASAP,GBNIG,GBNLI,CASLI)

INTEGER REGMOD

implicit regeneration mode

(GSUPPD,GALLOW)

MESSAGE

Full FORTRAN 77 version

L1a

SUBROUTINE GMSG (WKID,MESS)

Input Parameters:

INTEGER WKID
CHARACTER*(*) MESS

workstation identifier

message

MESSAGE

FORTAN 77 Subset version

L1a

SUBROUTINE CMSG (WKID,LSTR,MESS)

Input Parameters:

INTEGER WKID
INTEGER LSTR
CHARACTER*80 MESS

workstation identifier

length of string (in characters)

message

ESCAPE

L0a

SUBROUTINE GESC (FCTID,LIDR,IDR,MLODR,LODR,ODR)

Input Parameters:

INTEGER FCTID	function identification
INTEGER LIDR	dimension of input data record array
CHARACTER*80 IDR (LIDR)	input data record
INTEGER MLODR	maximum length of output data record

Output Parameters:

INTEGER LODR	number of array elements occupied in ODR
CHARACTER*80 ODR(MLODR)	output data record

9.3 Output functions

POLYLINE

L0a

SUBROUTINE GPL (N,PXA,PYA)

Input Parameters:

INTEGER N	number of points
REAL PXA (N), PYA (N)	coordinates of points in world coordinates

POLYMARKER

L0a

SUBROUTINE GPM (N,PXA,PYA)

Input Parameters:

INTEGER N	number of points
REAL PXA (N), PYA (N)	coordinates of points in world coordinates

TEXT

L0a

Full FORTRAN 77 version

SUBROUTINE GTX (PX,PY,CHARS)

Input Parameters:

REAL PX, PY	text position in world coordinates
CHARACTER*(*) CHARS	string of characters

TEXT

L0a

FORTRAN 77 Subset version

SUBROUTINE GTXS (PX,PY,LSTR,CHARS)

Input Parameters:

REAL PX, PY

text position in world
coordinates

INTEGER LSTR

length of string (in characters)

CHARACTER*80 CHARS

string of characters

FILL AREA

L0a

SUBROUTINE GFA (N,PXA,PYA)

Input Parameters:

INTEGER N

number of points

REAL PXA (N), PYA (N)

coordinates of points in
world coordinates

CELL ARRAY

L0a

SUBROUTINE GCA (PX,PY,QX,QY,DIMX,DIMY,ISC,ISR,DX,DY,COLIA)

Input Parameters:

REAL PX, PY, QX, QY

two points (P, Q) in world coordinates

INTEGER DIMX, DIMY

the dimensions of COLIA which contains
the cell array

INTEGER ISC, ISR

indices of start column, start row

INTEGER DX, DY

number of columns, number of rows

INTEGER COLIA (DIMX,DIMY)

colour index array

GENERALIZED DRAWING PRIMITIVE

L0a

SUBROUTINE GGDP (N,PXA,PYA,PRIMID,LDR,DATREC)

Input Parameters:

INTEGER N

number of points (≥ 0)

REAL PXA (*), PYA (*)

coordinates of points in world coordinates

INTEGER PRIMID

GDP identifier

INTEGER LDR

dimension of data record array

CHARACTER*80 DATREC(LDR)

data record

9.4 Output attributes

9.4.1 Workstation independent primitive attributes

SET POLYLINE INDEX L0a

SUBROUTINE GSPLI (PLI)

Input Parameters:

INTEGER PLI polyline index

SET LINETYPE L0a

SUBROUTINE GSLN (LTYPE)

Input Parameters:

INTEGER LTYPE linetype

SET LINEWIDTH SCALE FACTOR L0a

SUBROUTINE GSLWSC (LWIDTH)

Input Parameters:

REAL LWIDTH linewidth scale factor

SET POLYLINE COLOUR INDEX L0a

SUBROUTINE GSPLCI (COLI)

Input Parameters:

INTEGER COLI polyline colour index

SET POLYMARKER INDEX L0a

SUBROUTINE GSPMI (PMI)

Input Parameters:

INTEGER PMI polymarker index

SET MARKER TYPE

L0a

SUBROUTINE GSMK (MTYPE)

Input Parameters:

INTEGER MTYPE

marker type

SET MARKER SIZE SCALE FACTOR

L0a

SUBROUTINE GSMKSC (MSZSF)

Input Parameters:

REAL MSZSF

marker size scale factor

SET POLYMARKER COLOUR INDEX

L0a

SUBROUTINE GSPMCI (COLI)

Input Parameters:

INTEGER COLI

polymarker colour index

SET TEXT INDEX

L0a

SUBROUTINE GSTXI (TXI)

Input Parameters:

INTEGER TXI

text index

SET TEXT FONT AND PRECISION

L0a

SUBROUTINE GSTXFP (FONT,PREC)

Input Parameters:

INTEGER FONT

text font

INTEGER PREC

text precision (GSTRP,GCHARP,GSTRKP)

SET CHARACTER EXPANSION FACTOR

L0a

SUBROUTINE GSCHXP (CHXP)

Input Parameters:

REAL CHXP

character expansion factor

SET CHARACTER SPACING

L0a

SUBROUTINE GSCHSP (CHSP)

Input Parameters:

REAL CHSP

character spacing

SET TEXT COLOUR INDEX

L0a

SUBROUTINE GSTXCI (COLI)

Input Parameters:

INTEGER COLI

text colour index

SET CHARACTER HEIGHT

L0a

SUBROUTINE GSCHH (CHH)

Input Parameters:

REAL CHH

character height

SET CHARACTER UP VECTOR

L0a

SUBROUTINE GSCHUP (CHUX,CHUY)

Input Parameters:

REAL CHUX, CHUY

character up vector (WC)

SET TEXT PATH

L0a

SUBROUTINE GSTXP (TXP)

Input Parameters:

INTEGER TXP

text path (GRIGHT,GLEFT,GUP,GDOWN)

SET TEXT ALIGNMENT

L0a

SUBROUTINE GSTXAL (TXALH,TXALV)

Input Parameters:

INTEGER TXALH

text alignment horizontal
(GAHNOR,GALEFT,GACENT,GARITE)

INTEGER TXALV

text alignment vertical
(GAVNOR,GATOP,GACAP,GAHALF,
GABASE,GABOTT)

SET FILL AREA INDEX

L0a

SUBROUTINE GSFAI (FAI)

Input Parameters:

INTEGER FAI

fill area index

SET FILL AREA INTERIOR STYLE

L0a

SUBROUTINE GSFAIS (INTS)

Input Parameters:

INTEGER INTS

fill area interior style
(GHOLLO,GSOLID,GPATTR,GHATCH)**SET FILL AREA STYLE INDEX**

L0a

SUBROUTINE GSFASI (STYLI)

Input Parameters:

INTEGER STYLI

fill area style index

SET FILL AREA COLOUR INDEX

L0a

SUBROUTINE GSFACI (COLI)

Input Parameters:

INTEGER COLI

fill area colour index

SET PATTERN SIZE

L0a

SUBROUTINE GSPA (SZX,SZY)

Input Parameters:

REAL SZX, SZY

pattern size

SET PATTERN REFERENCE POINT

L0a

SUBROUTINE GSPARF (RFX,RFY)

Input Parameters:

REAL RFX, RFY

pattern reference point

SET ASPECT SOURCE FLAGS

L0a

SUBROUTINE GSASF (LASF)

Input Parameters:

INTEGER LASF (13)

list of aspect source flags
(GBUNDL,GINDIV)

- 1 linetype ASF
- 2 linewidth scale factor ASF
- 3 polyline colour index ASF
- 4 marker type ASF
- 5 marker size scale factor ASF
- 6 polymarker colour index ASF
- 7 text font and precision ASF
- 8 character expansion factor ASF
- 9 character spacing ASF
- 10 text colour index ASF
- 11 fill area interior style ASF
- 12 fill area style index ASF
- 13 fill area colour index ASF

SET PICK IDENTIFIER

L1b

SUBROUTINE GSPKID (PKID)

Input Parameters:

INTEGER PKID

pick identifier

9.4.2 Workstation attributes (representations)

SET POLYLINE REPRESENTATION

L1a

SUBROUTINE GSPLR (WKID,PLI,LTYPE,LWIDTH,COLI)

Input Parameters:

INTEGER WKID

INTEGER PLI

INTEGER LTYPE

REAL LWIDTH

INTEGER COLI

workstation identifier

polyline index

linetype

linewidth scale factor

colour index

SET POLYMARKER REPRESENTATION

L1a

SUBROUTINE GSPMR (WKID,PMI,MTYPE,MSZSF,COLI)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER PMI	polymarker index
INTEGER MTYPE	marker type
REAL MSZSF	marker size scale factor
INTEGER COLI	colour index

SET TEXT REPRESENTATION

L1a

SUBROUTINE GSTXR (WKID,TXI,FONT,PREC,CHXP,CHSP,COLI)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER TXI	text index
INTEGER FONT	text font
INTEGER PREC	text precision (GSTRP,GCHARP,GSTRKP)
REAL CHXP	character expansion factor
REAL CHSP	character spacing
INTEGER COLI	colour index

SET FILL AREA REPRESENTATION

L1a

SUBROUTINE GSFAR (WKID,FAI,INTS,STYLI,COLI)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER FAI	fill area index
INTEGER INTS	interior style (GHOLLO,GSOLID,GPATTR,GHATCH)
INTEGER STYLI	style index
INTEGER COLI	colour index

SET PATTERN REPRESENTATION

L1a

SUBROUTINE GSPAR (WKID,PAI,DIMX,DIMY,ISC,ISR,DX,DY,COLIA)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER PAI	pattern index
INTEGER DIMX, DIMY	the dimensions of COLIA which contains the pattern array
INTEGER ISC, ISR	indices to start column, start row
INTEGER DX, DY	number of columns, number of rows used
INTEGER COLIA (DIMX,DIMY)	pattern array

SET COLOUR REPRESENTATION

L0a

SUBROUTINE GSCR (WKID,CI,CR,CG,CB)

Input Parameters:

INTEGER WKID

workstation identifier

INTEGER CI

colour index

REAL CR, CG, CB

colour intensities (red/green/blue)

9.5 Transformation functions

9.5.1 Normalization transformation

SET WINDOW

L0a

SUBROUTINE GSWN (TNR,XMIN,XMAX,YMIN,YMAX)

Input Parameters:

INTEGER TNR

transformation number

REAL XMIN,XMAX,YMIN,YMAX

window limits in world coordinates

SET VIEWPORT

L0a

SUBROUTINE GSVF (TNR,XMIN,XMAX,YMIN,YMAX)

Input Parameters:

INTEGER TNR

transformation number

REAL XMIN,XMAX,YMIN,YMAX

viewport limits in normalized
device coordinates

SET VIEWPORT INPUT PRIORITY

L0b

SUBROUTINE GSVPI (TNR,RTNR,RELPR)

Input Parameters:

INTEGER TNR

transformation number

INTEGER RTNR

reference transformation number

INTEGER RELPR

relative priority (GHIGHR,GLOWER)

SELECT NORMALIZATION TRANSFORMATION

L0a

SUBROUTINE GSELNT (TNR)**Input Parameters:**

INTEGER TNR

transformation number

SET CLIPPING INDICATOR

L0a

SUBROUTINE GSCLIP (CLSW)**Input Parameters:**

INTEGER CLSW

clipping indicator (GNCLIP,GCLIP)

9.5.2 Workstation transformation**SET WORKSTATION WINDOW**

L0a

SUBROUTINE GSWKWN (WKID,XMIN,XMAX,YMIN,YMAX)**Input Parameters:**

INTEGER WKID

REAL XMIN,XMAX,YMIN,YMAX

workstation identifier

workstation window limits in normalized
device coordinates**SET WORKSTATION VIEWPORT**

L0a

SUBROUTINE GSWKVP (WKID,XMIN,XMAX,YMIN,YMAX)**Input Parameters:**

INTEGER WKID

REAL XMIN,XMAX,YMIN,YMAX

workstation identifier

workstation viewport limits in
device coordinates

9.6 Segment functions

9.6.1 Segment manipulation functions

CREATE SEGMENT

L1a

SUBROUTINE GCRSG (SGNA)

Input Parameters:

INTEGER SGNA segment name

CLOSE SEGMENT

L1a

SUBROUTINE GCLSG

RENAME SEGMENT

L1a

SUBROUTINE GRENSG (OLD,NEW)

Input Parameters:

INTEGER OLD old segment name
INTEGER NEW new segment name

DELETE SEGMENT

L1a

SUBROUTINE GDSG (SGNA)

Input Parameters:

INTEGER SGNA segment name

DELETE SEGMENT FROM WORKSTATION

L1a

SUBROUTINE GDSGWK (WKID,SGNA)

Input Parameters:

INTEGER WKID workstation identifier
INTEGER SGNA segment name

ASSOCIATE SEGMENT WITH WORKSTATION

L2a

SUBROUTINE GASGWK (WKID,SGNA)

Input Parameters:

INTEGER WKID

workstation identifier

INTEGER SGNA

segment name

COPY SEGMENT TO WORKSTATION

L2a

SUBROUTINE GCSGWK (WKID,SGNA)

Input Parameters:

INTEGER WKID

workstation identifier

INTEGER SGNA

segment name

INSERT SEGMENT

L2a

SUBROUTINE GINSK (SGNA,M)

Input Parameters:

INTEGER SGNA

segment name

REAL M(2,3)

transformation matrix

(M(1,1) M(1,2) M(1,3))

(M(2,1) M(2,2) M(2,3))

9.6.2 Segment attributes**SET SEGMENT TRANSFORMATION**

L1a

SUBROUTINE GSSGT (SGNA,M)

Input Parameters:

INTEGER SGNA

segment name

REAL M(2,3)

transformation matrix

(M(1,1) M(1,2) M(1,3))

(M(2,1) M(2,2) M(2,3))

SET VISIBILITY

L1a

SUBROUTINE GSVIS (SGNA,VIS)

Input Parameters:

INTEGER SGNA

segment name

INTEGER VIS

visiblity (GINVIS,GVISI)

SET HIGHLIGHTING

L1a

SUBROUTINE GSHLIT (SGNA,HIL)

Input Parameters:

INTEGER SGNA

segment name

INTEGER HIL

highlighting (GNORML,GHLIT)

SET SEGMENT PRIORITY

L1a

SUBROUTINE GSSGP (SGNA,PRIOR)

Input Parameters:

INTEGER SGNA

segment name

REAL PRIOR

segment priority

SET DETECTABILITY

L1b

SUBROUTINE GSDTEC (SGNA,DET)

Input Parameters:

INTEGER SGNA

segment name

INTEGER DET

detectability (GUNDET,GDETEC)

9.7 Input functions

9.7.1 Initialisation of input devices

INITIALISE LOCATOR

L0b

SUBROUTINE GINLC (WKID,LCDNR,ITNR,IPX,IPY,PET,XMIN,XMAX,YMIN,
*YMAX,LDR,DATREC)

Input Parameters:

INTEGER WKID

workstation identifier

INTEGER LCDNR

locator device number

INTEGER ITNR

initial normalization transformation number

REAL IPX,IPY

initial locator position (WC)

INTEGER PET

prompt/echo type

REAL XMIN,XMAX,YMIN,YMAX

echo area in device coordinates

INTEGER LDR

dimension of data record array

CHARACTER*80 DATREC(LDR)

data record

INITIALISE STROKE

L0b

SUBROUTINE GINSK (WKID,SKDNR,TNR,N,IPXA,IPYA,PET,XMIN,XMAX,
*YMIN,YMAX,BUFLEN,LDR,DATREC)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER SKDNR	stroke device number
INTEGER TNR	initial normalization transformation number
INTEGER N	number of points in initial stroke
REAL IPXA (*), IPYA (*)	points in initial stroke (WC) (the actual arguments are dimensioned by at least MAX(1,N))
INTEGER PET	prompt/echo type
REAL XMIN,XMAX,YMIN,YMAX	echo area in device coordinates
INTEGER BUFLEN	input buffer size
INTEGER LDR	dimension of data record array
CHARACTER*80 DATREC(LDR)	data record

INITIALISE VALUATOR

L0b

SUBROUTINE GINVL (WKID,VLDNR,IVAL,PET,XMIN,XMAX,YMIN,YMAX,
*LOVAL,HIVAL,LDR,DATREC)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER VLDNR	valuator device number
REAL IVAL	initial value
INTEGER PET	prompt/echo type
REAL XMIN,XMAX,YMIN,YMAX	echo area in device coordinates
REAL LOVAL, HIVAL	minimal and maximal value
INTEGER LDR	dimension of data record array
CHARACTER*80 DATREC(LDR)	data record

INITIALISE CHOICE

L0b

SUBROUTINE GINCH (WKID,CHDNR,ISTAT,ICHNR,PET,XMIN,XMAX,YMIN,
*YMAX,LDR,DATREC)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER CHDNR	choice device number
INTEGER ISTAT	initial status (GOK,GNCHOI)
INTEGER ICHNR	initial choice number
INTEGER PET	prompt/echo type
REAL XMIN,XMAX,YMIN,YMAX	echo area in device coordinates
INTEGER LDR	dimension of data record array
CHARACTER*80 DATREC(LDR)	data record

INITIALISE PICK

L1b

SUBROUTINE GINPK (WKID,PKDNR,ISTAT,ISGNA,IPKID,PET,XMIN,XMAX,
*YMIN,YMAX,LDR,DATREC)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER PKDNR	pick device number
INTEGER ISTAT	initial status (GOK,GNPICK)
INTEGER ISGNA	initial segment name
INTEGER IPKID	initial pick identifier
INTEGER PET	prompt/echo type
REAL XMIN,XMAX,YMIN,YMAX	echo area in device coordinates
INTEGER LDR	dimension of data record array
CHARACTER*80 DATREC(LDR)	data record

INITIALISE STRING

L0b

Full FORTRAN 77 version

SUBROUTINE GINST (WKID,STDNR,LSTR,ISTR,PET,XMIN,XMAX,YMIN,
*YMAX,BUFLEN,INIPOS,LDR,DATREC)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER STDNR	string device number
INTEGER LSTR	length of the initial string (≥ 0). The number of characters actually used is the minimum of LSTR and the length of ISTR.
CHARACTER*(*) ISTR	initial string
INTEGER PET	prompt/echo type
REAL XMIN,XMAX,YMIN,YMAX	echo area in device coordinates
INTEGER BUFLN	input buffer size
INTEGER INIPOS	initial cursor position
INTEGER LDR	dimension of data record array
CHARACTER*80 DATREC(LDR)	data record

INITIALISE STRING

L0b

FORTRAN 77 Subset version

SUBROUTINE GINST (WKID,STDNR,LSTR,ISTR,PET,XMIN,XMAX,YMIN,
*YMAX,BUFLEN,INIPOS,LDR,DATREC)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER STDNR	string device number
INTEGER LSTR	length of the initial string
CHARACTER*80 ISTR	initial string
INTEGER PET	prompt/echo type
REAL XMIN,XMAX,YMIN,YMAX	echo area in device coordinates
INTEGER BUFLEN	buffer length of string
INTEGER INIPOS	initial cursor position
INTEGER LDR	dimension of data record array
CHARACTER*80 DATREC(LDR)	data record

9.7.2 Setting mode of input devices**SET LOCATOR MODE**

L0b

SUBROUTINE GSLCM (WKID,LCDNR,MODE,ESW)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER LCDNR	locator device number
INTEGER MODE	operating mode (GREQU,GSAMPL,GEVENT)
INTEGER ESW	echo switch (GNECHO,GECHO)

SET STROKE MODE

L0b

SUBROUTINE GSSKM (WKID,SKDNR,MODE,ESW)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER SKDNR	stroke device number
INTEGER MODE	operating mode (GREQU,GSAMPL,GEVENT)
INTEGER ESW	echo switch (GNECHO,GECHO)

SET VALUATOR MODE

L0b

SUBROUTINE GSVLM (WKID,VLDNR,MODE,ESW)

Input Parameters:

INTEGER WKID
INTEGER VLDNR
INTEGER MODE
INTEGER ESW

workstation identifier
valuator device number
operating mode (GREQU,GSAMPL,GEVENT)
echo switch (GNECHO,GECHO)

SET CHOICE MODE

L0b

SUBROUTINE GSCHM (WKID,CHDNR,MODE,ESW)

Input Parameters:

INTEGER WKID
INTEGER CHDNR
INTEGER MODE
INTEGER ESW

workstation identifier
choice device number
operating mode (GREQU,GSAMPL,GEVENT)
echo switch (GNECHO,GECHO)

SET PICK MODE

L1b

SUBROUTINE GSPKM (WKID,PKDNR,MODE,ESW)

Input Parameters:

INTEGER WKID
INTEGER PKDNR
INTEGER MODE
INTEGER ESW

workstation identifier
pick device number
operating mode (GREQU,GSAMPL,GEVENT)
echo switch (GNECHO,GECHO)

SET STRING MODE

L0b

SUBROUTINE GSSTM (WKID,STDNR,MODE,ESW)

Input Parameters:

INTEGER WKID
INTEGER STDNR
INTEGER MODE
INTEGER ESW

workstation identifier
string device number
operating mode (GREQU,GSAMPL,GEVENT)
echo switch (GNECHO,GECHO)

9.7.3 Request input functions**REQUEST LOCATOR**

L0b

SUBROUTINE GRQLC (WKID,LCDNR,STAT,TNR,PX,PY)

Input Parameters:INTEGER WKID
INTEGER LCDNRworkstation identifier
locator device number**Output Parameters:**INTEGER STAT
INTEGER TNR
REAL PX,PYstatus (GNONE,GOK)
normalization transformation number
locator position**REQUEST STROKE**

L0b

SUBROUTINE GRQSK (WKID,SKDNR,N,STAT,TNR,NP,PXA,PYA)

Input Parameters:INTEGER WKID
INTEGER SKDNR
INTEGER Nworkstation identifier
stroke device number
dimension of arrays for stroke points**Output Parameters:**INTEGER STAT
INTEGER TNR
INTEGER NP
REAL PXA (N), PYA (N)status (GNONE,GOK)
normalization transformation number
number of points
points in stroke (WC)**REQUEST VALUATOR**

L0b

SUBROUTINE GRQVL (WKID,VLDNR,STAT,VAL)

Input Parameters:INTEGER WKID
INTEGER VLDNRworkstation identifier
valuator device number**Output Parameters:**INTEGER STAT
REAL VALstatus (GNONE,GOK)
value

REQUEST CHOICE

L0b

SUBROUTINE GRQCH (WKID,CHDNR,STAT,CHNR)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER CHDNR	choice device number

Output Parameters:

INTEGER STAT	status (GNONE,GOK,GNCHOI)
INTEGER CHNR	choice number

REQUEST PICK

L1b

SUBROUTINE GRQPK (WKID,PKDNR,STAT,SGNA,PKID)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER PKDNR	pick device number

Output Parameters:

INTEGER STAT	status (GNONE,GOK,GNPICK)
INTEGER SGNA	segment name
INTEGER PKID	pick identifier

REQUEST STRING

L0b

Full FORTRAN 77 version

SUBROUTINE GRQST (WKID,STDNR,STAT,LOSTR,STR)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER STDNR	string device number

Output Parameters:

INTEGER STAT	status (GNONE,GOK)
INTEGER LOSTR	number of characters returned
CHARACTER*(*) STR	character string

REQUEST STRING
 FORTRAN 77 Subset version

L0b

SUBROUTINE GRQST (WKID,STDNR,STAT,LOSTR,STR)

Input Parameters:

INTEGER WKID
 INTEGER STDNR

workstation identifier
 string device number

Output Parameters:

INTEGER STAT
 INTEGER LOSTR
 CHARACTER*80 STR

status (GNONE,GOK)
 number of characters returned
 character string

9.7.4 Sample input functions

SAMPLE LOCATOR

L0c

SUBROUTINE GSMLC (WKID,LCDNR,TNR,LPX,LPY)

Input Parameters:

INTEGER WKID
 INTEGER LCDNR

workstation identifier
 locator device number

Output Parameters:

INTEGER TNR
 REAL LPX,LPY

normalization transformation number
 locator position in WC

SAMPLE STROKE

L0c

SUBROUTINE GSMSK (WKID,SKDNR,N,TNR,NP,PXA,PYA)

Input Parameters:

INTEGER WKID
 INTEGER SKDNR
 INTEGER N

workstation identifier
 stroke device number
 dimension of arrays for stroke points

Output Parameters:

INTEGER TNR
 INTEGER NP
 REAL PXA (N), PYA (N)

normalization transformation number
 number of points
 points in stroke (WC)

SAMPLE VALUATOR

L0c

SUBROUTINE GSMVL (WKID,VLDNR,VAL)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER VLDNR	valuator device number

Output Parameters:

REAL VAL	value
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SAMPLE CHOICE

L0c

SUBROUTINE GSMCH (WKID,CHDNR,STAT,CHNR)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER CHDNR	choice device number

Output Parameters:

INTEGER STAT	status (GOK,GNCHOI)
INTEGER CHNR	choice number

SAMPLE PICK

L1c

SUBROUTINE GSMPK (WKID,PKDNR,STAT,SGNA,PKID)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER PKDNR	pick device number

Output Parameters:

INTEGER STAT	status (GOK,GNPICK)
INTEGER SGNA	segment name
INTEGER PKID	pick identifier

SAMPLE STRING

L0c

Full FORTRAN 77 version

SUBROUTINE GSMST (WKID,STDNR,LOSTR,STR)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER STDNR	string device number

Output Parameters:

INTEGER LOSTR	number of characters returned
CHARACTER*(*) STR	string

SAMPLE STRING

L0c

FORTRAN 77 Subset version

SUBROUTINE GSMST (WKID,STDNR,LOSTR,STR)

Input Parameters:

INTEGER WKID

workstation identifier

INTEGER STDNR

string device number

Output Parameters:

INTEGER LOSTR

number of characters returned

CHARACTER*80 STR

string

9.7.5 Event input functions**AWAIT EVENT**

L0c

SUBROUTINE GWAIT (TOUT,WKID,ICL,IDNR)

Input Parameters:

REAL TOUT

time out (seconds)

Output Parameters:

INTEGER WKID

workstation identifier

INTEGER ICL

input class (GNCLAS,GLOCAT,GSTROK,
GVALUA,GCHOIC,GPICK,GSTRIN)

INTEGER IDNR

logical input device number

FLUSH DEVICE EVENTS

L0c

SUBROUTINE GFLUSH (WKID,ICL,IDNR)

Input Parameters:

INTEGER WKID

workstation identifier

INTEGER ICL

input class (GLOCAT,GSTROK,GVALUA,
GCHOIC,GPICK,GSTRIN)

INTEGER IDNR

logical input device number

GET LOCATOR

L0c

SUBROUTINE GGTLC (TNR,LPX,LPY)

Output Parameters:

INTEGER TNR

normalization transformation number

REAL LPX,LPY

locator position in world coordinates

GET STROKE

L0c

SUBROUTINE GGTSK (N,TNR,NP,PXA,PYA)

Input Parameters:

INTEGER N

dimension of arrays for stroke points

Output Parameters:

INTEGER TNR

normalization transformation number

INTEGER NP

number of points

REAL PXA (N), PYA (N)

points in stroke in world coordinates

GET VALUATOR

L0c

SUBROUTINE GGTVL (VAL)

Output Parameters:

REAL VAL

value

GET CHOICE

L0c

SUBROUTINE GGTCH (STAT,CHNR)

Output Parameters:

INTEGER STAT

status (GOK,GNCHOI)

INTEGER CHNR

choice number

GET PICK

L1c

SUBROUTINE GGTPK (STAT,SGNA,PKID)

Output Parameters:

INTEGER STAT

status (GOK,GNPICK)

INTEGER SGNA

segment name

INTEGER PKID

pick identifier

GET STRING

L0c

Full FORTRAN 77 version

SUBROUTINE GGTST (LOSTR,STR)

Output Parameters:

INTEGER LOSTR

number of characters returned

CHARACTER*(*) STR

string

GET STRING

L0c

FORTRAN 77 Subset version

SUBROUTINE GGTST (LOSTR,STR)

Output Parameters:

INTEGER LOSTR

number of characters returned

CHARACTER*80 STR

string

9.8 Metafile functions**WRITE ITEM TO GKSM**

L0a

SUBROUTINE GWITM (WKID,TYPE,IDRL,LDR,DATREC)

Input Parameters:

INTEGER WKID

workstation identifier

INTEGER TYPE

item type (a possible set of values
(of this parameter is described in Annex B)

INTEGER IDRL

item data record length (number of characters
in the data record array)

INTEGER LDR

dimension of data record array

CHARACTER*80 DATREC(LDR)

data record

GET ITEM TYPE FROM GKSM

L0a

SUBROUTINE GGTITM (WKID,TYPE,IDRL)

Input Parameters:

INTEGER WKID

workstation identifier

Output Parameters:

INTEGER TYPE

item type (a possible set of values
(of this parameter is described in Annex B)

INTEGER IDRL

item data record length (this may be passed
to GRDITM (MIDRL))

READ ITEM FROM GKSM

L0a

SUBROUTINE GRDITM (WKID,MIDRL,MLDR,DATREC)

Input Parameters:

INTEGER WKID
INTEGER MIDRL

workstation identifier
maximum item data record length (number of characters in the data record array).
Range is 0...IDRL. If =0, then skip the record; if < IDRL, the excess is lost;
if = IDRL, a full record is read.
(IDRL is returned by GGTITM.)
dimension of item data record

INTEGER MLDR

Output Parameters:

CHARACTER*80 DATREC(MLDR) data record

INTERPRET ITEM

L0a

SUBROUTINE GIITM (TYPE,IDRL,LDR,DATREC)

Input Parameters:

INTEGER TYPE

item type(a possible set of values
(of this parameter is described in Annex B)
item data record length (number of characters in the data record array)
dimension of data record array
data record

INTEGER IDRL

INTEGER LDR

CHARACTER*80 DATREC(LDR)

9.9 Inquiry functions

9.9.1 Inquiry function for operating state value

INQUIRE OPERATING STATE VALUE

L0a

SUBROUTINE GQOPS (OPSTA)

Output Parameters:

INTEGER OPSTA

operating state value
(GGKCL,GGKOP,GWSOP,GWSAC,GSGOP)

9.9.2 Inquiry functions for GKS description table**INQUIRE LEVEL OF GKS**

L0a

SUBROUTINE GQLVKS (ERRIND,LEVEL)

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER LEVEL

level of GKS

(GL0A, GL0B, GL0C, GL1A, GL1B, GL1C, GL2A, GL2B, GL2C)

INQUIRE LIST element OF AVAILABLE WORKSTATION TYPES

L0a

SUBROUTINE GQEWK (N,ERRIND,NUMBER,WKTYP)

Input Parameters:

INTEGER N

list element requested

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER NUMBER

number of workstation types

INTEGER WKTYP

Nth element of list of av. workstation types

INQUIRE WORKSTATION MAXIMUM NUMBERS

L1a

SUBROUTINE GQWKM (ERRIND,MXOPWK,MXACWK,MXWKAS)

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER MXOPWK

maximum number of simultaneously open workstations

INTEGER MXACWK

maximum number of simultaneously active workstaions

INTEGER MXWKAS

maximum number of workstations associated with segment

INQUIRE MAXIMUM NORMALIZATION TRANSFORMATION NUMBER

L0a

SUBROUTINE GQMNTN (ERRIND,MAXTNR)

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER MAXTNR

maximum normalization transformation number

9.9.3 Inquiry functions for GKS state list

INQUIRE SET member OF OPEN WORKSTATIONS

L0a

SUBROUTINE GQOPWK (N,ERRIND,OL,WKID)

Input Parameters:

INTEGER N	set member requested
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Output Parameters:

INTEGER ERRIND	error indicator
INTEGER OL	number of open workstations
INTEGER WKID	Nth member of set of open workstations

INQUIRE SET member OF ACTIVE WORKSTATIONS

L1a

SUBROUTINE GQACWK (N,ERRIND,OL,WKID)

Input Parameters:

INTEGER N	set member requested
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Output Parameters:

INTEGER ERRIND	error indicator
INTEGER OL	number of active workstations
INTEGER WKID	Nth member of set of active workstations

(INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)

INQUIRE POLYLINE INDEX

L0a

SUBROUTINE GQPLI (ERRIND,PLI)

Output Parameters:

INTEGER ERRIND	error indicator
INTEGER PLI	polyline index

(INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)

INQUIRE POLYMARKER INDEX

L0a

SUBROUTINE GQPMI (ERRIND,PMI)

Output Parameters:

INTEGER ERRIND	error indicator
INTEGER PMI	polymarker index

**(INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
INQUIRE TEXT INDEX**

L0a

SUBROUTINE GQTXI (ERRIND,TXI)

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER TXI

text index

**(INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
INQUIRE CHARACTER HEIGHT**

L0a

SUBROUTINE GQCHH (ERRIND,CHH)

Output Parameters:

INTEGER ERRIND

error indicator

REAL CHH

character height

**(INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
INQUIRE CHARACTER UP VECTOR**

L0a

SUBROUTINE GQCHUP (ERRIND,CHUX,CHUY)

Output Parameters:

INTEGER ERRIND

error indicator

REAL CHUX, CHUY

character up vector (WC)

**(INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
INQUIRE CHARACTER WIDTH**

L0a

SUBROUTINE GQCHW (ERRIND,CHW)

Output Parameters:

INTEGER ERRIND

error indicator

REAL CHW

character width

**(INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
INQUIRE CHARACTER BASE VECTOR**

L0a

SUBROUTINE GQCHB (ERRIND,CHBX,CHBY)

Output Parameters:

INTEGER ERRIND

error indicator

REAL CHBX,CHBY

character base vector

(INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
INQUIRE TEXT PATH

L0a

SUBROUTINE GQTXP (ERRIND, TXP)

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER TXP

text path (GRIGHT, GLEFT, GUP, GDOWN)

(INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
INQUIRE TEXT ALIGNMENT

L0a

SUBROUTINE GQTXAL (ERRIND, TXALH, TXALV)

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER TXALH

text alignment horizontal

(GAHNOR, GALEFT, GACENT, GARITE)

INTEGER TXALV

text alignment vertical

(GAVNOR, GATOP, GACAP, GAHALF,
GABASE, GABOTT)

(INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
INQUIRE FILL AREA INDEX

L0a

SUBROUTINE GQFAI (ERRIND, FAI)

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER FAI

fill area index

(INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
INQUIRE PATTERN SIZE

L0a

SUBROUTINE GQPA (ERRIND, PWX, PWY, PHX, PHY)

Output Parameters:

INTEGER ERRIND

error indicator

REAL PWX, PWY

pattern width vector

REAL PHX, PHY

pattern height vector

**(INQUIRE CURRENT PRIMITIVE ATTRIBUTE VALUES)
INQUIRE PATTERN REFERENCE POINT**

L0a

SUBROUTINE GQPARF (ERRIND,RFX,RFY)

Output Parameters:

INTEGER ERRIND

error indicator

REAL RFX, RFY

pattern reference point

INQUIRE CURRENT PICK IDENTIFIER VALUE

L1b

SUBROUTINE GQPKID (ERRIND,PKID)

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER PKID

pick identifier

**(INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
INQUIRE LINETYPE**

L0a

SUBROUTINE GQLN (ERRIND,LTYPE)

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER LTYPE

linetype

**(INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
INQUIRE LINEWIDTH SCALE FACTOR**

L0a

SUBROUTINE GQLWSC (ERRIND,LWIDTH)

Output Parameters:

INTEGER ERRIND

error indicator

REAL LWIDTH

linewidth scale factor

**(INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
INQUIRE POLYLINE COLOUR INDEX**

L0a

SUBROUTINE GQPLCI (ERRIND,COLI)

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER COLI

polyline colour index

(INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
INQUIRE MARKER TYPE

L0a

SUBROUTINE GQMK (ERRIND,MTYPE)

Output Parameters:
INTEGER ERRIND error indicator
INTEGER MTYPE marker type

(INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
INQUIRE MARKER SIZE SCALE FACTOR

L0a

SUBROUTINE GQMKSC (ERRIND,MSZSF)

Output Parameters:
INTEGER ERRIND error indicator
REAL MSZSF marker size scale factor

(INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
INQUIRE POLYMARKER COLOUR INDEX

L0a

SUBROUTINE GQPMCI (ERRIND,COLI)

Output Parameters:
INTEGER ERRIND error indicator
INTEGER COLI polymarker colour index

(INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
INQUIRE TEXT FONT AND PRECISION

L0a

SUBROUTINE GQTXFP (ERRIND,FONT,PREC)

Output Parameters:
INTEGER ERRIND error indicator
INTEGER FONT text font
INTEGER PREC text precision (GSTRP,GCHARP,GSTRKP)

(INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
INQUIRE CHARACTER EXPANSION FACTOR

L0a

SUBROUTINE GQCHXP (ERRIND,CHXP)

Output Parameters:
INTEGER ERRIND error indicator
REAL CHXP character expansion factor

**(INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
INQUIRE CHARACTER SPACING**

L0a

SUBROUTINE GQCHSP (ERRIND,CHSP)

Output Parameters:

INTEGER ERRIND

error indicator

REAL CHSP

character spacing

**(INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
INQUIRE TEXT COLOUR INDEX**

L0a

SUBROUTINE GQTXCI (ERRIND,COLI)

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER COLI

text colour index

**(INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
INQUIRE FILL AREA INTERIOR STYLE**

L0a

SUBROUTINE GQFAIS (ERRIND,INTS)

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER INTS

fill area interior style

(GHOLLO,GSOLID,GPATTR,GHATCH)

**(INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
INQUIRE FILL AREA STYLE INDEX**

L0a

SUBROUTINE GQFASI (ERRIND,STYLI)

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER STYLI

fill area style index

**(INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
INQUIRE FILL AREA COLOUR INDEX**

L0a

SUBROUTINE GQFACI (ERRIND,COLI)

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER COLI

fill area colour index

(INQUIRE CURRENT INDIVIDUAL ATTRIBUTE VALUES)
INQUIRE ASPECT SOURCE FLAGS

L0a

SUBROUTINE GQASF (ERRIND,LASF)

Output Parameters:

INTEGER ERRIND

INTEGER LASF (13)

error indicator

list of aspect source flags

(GBUNDL,GINDIV)

1 linetype ASF

2 linewidth scale factor ASF

3 polyline colour index ASF

4 marker type ASF

5 marker size scale factor ASF

6 polymarker colour index ASF

7 text font and precision ASF

8 character expansion factor ASF

9 character spacing ASF

10 text colour index ASF

11 fill area interior style ASF

12 fill area style index ASF

13 fill area colour index ASF

INQUIRE CURRENT NORMALIZATION TRANSFORMATION NUMBER

L0a

SUBROUTINE GQCNTN (ERRIND,CTNR)

Output Parameters:

INTEGER ERRIND

INTEGER CTNR

error indicator

current transformation number

INQUIRE LIST element OF NORMALIZATION TRANSFORMATION NUMBERS L0a

SUBROUTINE GQENTN (N,ERRIND,OL,TNR)

Input Parameters:

INTEGER N

list element requested

Output Parameters:

INTEGER ERRIND

INTEGER OL

INTEGER TNR

error indicator

length of list

Nth element of list of transformation
numbers, ordered by decreasing viewport input
priority

INQUIRE NORMALIZATION TRANSFORMATION

L0a

SUBROUTINE GQNT (NTNR,ERRIND,WINDOW,VIEWPT)

Input Parameters:

INTEGER NTNR

normalization transformation number

Output Parameters:

INTEGER ERRIND

error indicator

REAL WINDOW(4)

window limits in world coordinates

WXMIN, WXMAX, WYMIN, WYMAX

REAL VIEWPT(4)

viewport limits in normalized

device coordinates

VXMIN, VXMAX, VYMIN, VYMAX

INQUIRE CLIPPING

L0a

SUBROUTINE GQCLIP (ERRIND,CLSW,CLRECT)

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER CLSW

clipping indicator (GNCLIP,GCLIP)

REAL CLRECT(4)

clipping rectangle in

normalized device coordinates

CXMIN, CXMAX, CYMIN, CYMAX

INQUIRE NAME OF OPEN SEGMENT

L1a

SUBROUTINE GQOPSG (ERRIND,SGNA)

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER SGNA

name of open segment

INQUIRE SET member OF SEGMENT NAMES IN USE

L1a

SUBROUTINE GQSGUS (N,ERRIND,OL,SGNA)

Input Parameters:

INTEGER N

set member requested

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER OL

number of segment names

INTEGER SGNA

Nth member of set of segment names in use

INQUIRE MORE SIMULTANEOUS EVENTS

L0c

SUBROUTINE GQSIM (ERRIND,FLAG)

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER FLAG

more simultaneous events (GNMORE,GMORE)

9.9.4 Inquiry functions for workstation state list

INQUIRE WORKSTATION CONNECTION AND TYPE

L0a

SUBROUTINE GQWKC (WKID,ERRIND,CONID,WTYPE)

Input Parameters:

INTEGER WKID

workstation identifier

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER CONID

connection identifier

INTEGER WTYPE

workstation type

INQUIRE WORKSTATION STATE

L0a

SUBROUTINE GQWKS (WKID,ERRIND,STATE)

Input Parameters:

INTEGER WKID

workstation identifier

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER STATE

workstation state (GINACT,GACTIV)

INQUIRE WORKSTATION DEFERRAL AND UPDATE STATES

L0a

SUBROUTINE GQWKDU (WKID,ERRIND,DEFMOD,REGMOD,DEMPY,
*NFRAME)

Input Parameters:

INTEGER WKID

workstation identifier

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER DEFMOD

deferral mode

INTEGER REGMOD

(GASAP,GBNIG,GBNIL,GASTI)

implicit regeneration mode

INTEGER DEMPTY

(GSUPPD,GALLOW)

display surface empty

INTEGER NFRAME

(GNEMPT,GEMPTY)

new frame action necessary at update

(GNO,GYES)

INQUIRE LIST element OF POLYLINE INDICES

L1a

SUBROUTINE GQEPLI (WKID,N,ERRIND,OL,PLI)

Input Parameters:

INTEGER WKID

workstation identifier

INTEGER N

list element requested

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER OL

number of polyline bundle table entries

INTEGER PLI

Nth element of list of defined polyline indices

INQUIRE POLYLINE REPRESENTATION

L1a

SUBROUTINE GQPLR (WKID,PLI,TYPE,ERRIND,LTYPE,LWIDTH,COLI)

Input Parameters:

INTEGER WKID

workstation identifier

INTEGER PLI

polyline index

INTEGER TYPE

type of returned values (GSET,GREALI)

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER LTYPE

linetype

REAL LWIDTH

linewidth scale factor

INTEGER COLI

polyline colour index

INQUIRE LIST element OF POLYMARKER INDICES

L1a

SUBROUTINE GQEPMI (WKID,N,ERRIND,OL,PMI)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER N	list element requested

Output Parameters:

INTEGER ERRIND	error indicator
INTEGER OL	number of polymarker bundle table entries
INTEGER PMI	Nth element of list of defined polymarker indices

INQUIRE POLYMARKER REPRESENTATION

L1a

SUBROUTINE GQPMR (WKID,PMI,TYPE,ERRIND,MTYPE,MSZSF,COLI)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER PMI	polymarker index
INTEGER TYPE	type of returned values (GSET,GREALI)

Output Parameters:

INTEGER ERRIND	error indicator
INTEGER MTYPE	marker type
REAL MSZSF	marker size scale factor
INTEGER COLI	polymarker colour index

INQUIRE LIST element OF TEXT INDICES

L1a

SUBROUTINE GQETXI (WKID,N,ERRIND,OL,TXI)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER N	list element requested

Output Parameters:

INTEGER ERRIND	error indicator
INTEGER OL	number of text bundle table entries
INTEGER TXI	Nth element of list of defined text indices

INQUIRE TEXT REPRESENTATION

L1a

SUBROUTINE GQTXR (WKID,TXI,TYPE,ERRIND,FONT,PREC,CHXP,CHSP,
*COLI)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER TXI	text index
INTEGER TYPE	type of returned values (GSET,GREALI)

Output Parameters:

INTEGER ERRIND	error indicator
INTEGER FONT	text font
INTEGER PREC	text precision (GSTRP,GCHARP,GSTRKP)
REAL CHXP	character expansion factor
REAL CHSP	character spacing
INTEGER COLI	text colour index

INQUIRE TEXT EXTENT

L0a

Full FORTRAN 77 version

SUBROUTINE GQTXS (WKID,PX,PY,CHARS,ERRIND,CPX,CPY,
*TXEXPX,TXEXPY)

Input Parameters:

INTEGER WKID	workstation identifier
REAL PX,PY	text position in world coordinates
CHARACTER*(*) CHARS	character string

Output Parameters:

INTEGER ERRIND	error indicator
REAL CPX,CPY	concatenation point in world coordinates
REAL TXEXPX (4), TXEXPY (4)	text extent parallelogram

INQUIRE TEXT EXTENT

L0a

FORTRAN 77 Subset version

SUBROUTINE GQTXSS (WKID,PX,PY,LSTR,CHARS,ERRIND,CPX,CPY,
*TXEXPX,TXEXPY)

Input Parameters:

INTEGER WKID	workstation identifier
REAL PX,PY	text position in world coordinates
INTEGER LSTR	length of string (in characters)
CHARACTER*80 CHARS	character string

Output Parameters:

INTEGER ERRIND	error indicator
REAL CPX,CPY	concatenation point in world coordinates
REAL TXEXPX (4), TXEXPY (4)	text extent parallelogram

INQUIRE LIST element OF FILL AREA INDICES

L1a

SUBROUTINE GQFAI (WKID,N,ERRIND,OL,FAI)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER N	list element requested

Output Parameters:

INTEGER ERRIND	error indicator
INTEGER OL	number of fill area bundle table entries
INTEGER FAI	Nth element of list of defined fill area indices

INQUIRE FILL AREA REPRESENTATION

L1a

SUBROUTINE GQFAR (WKID,FAI,TYPE,ERRIND,INTS,STYLI,COLI)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER FAI	fill area index
INTEGER TYPE	type of returned values (GSET,GREALI)

Output Parameters:

INTEGER ERRIND	error indicator
INTEGER INTS	fill area interior style (GHOLLO,GSOLID,GPATTR,GHATCH)
INTEGER STYLI	fill area style index
INTEGER COLI	fill area colour index

INQUIRE LIST element OF PATTERN INDICES

L1a

SUBROUTINE GQEPAI (WKID,N,ERRIND,OL,PAI)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER N	list element requested

Output Parameters:

INTEGER ERRIND	error indicator
INTEGER OL	number of pattern table entries
INTEGER PAI	Nth element of list of pattern indices

INQUIRE PATTERN REPRESENTATION

L1a

SUBROUTINE GQPAR (WKID,PAI,TYPE,DIMX,DIMY,ERRIND,DX,DY,COLIA)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER PAI	pattern index
INTEGER TYPE	type of returned values (GSET,GREALI)
INTEGER DIMX,DIMY	maximum pattern array dimensions

Output Parameters:

INTEGER ERRIND	error indicator
INTEGER DX,DY	pattern array dimensions
INTEGER COLIA (DIMX,DIMY)	pattern array

INQUIRE LIST element OF COLOUR INDICES

L0a

SUBROUTINE GQECI (WKID,N,ERRIND,OL,COLI)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER N	list element requested

Output Parameters:

INTEGER ERRIND	error indicator
INTEGER OL	number of colour table entries
INTEGER COLI	Nth element of list of colour indices

INQUIRE COLOUR REPRESENTATION

L0a

SUBROUTINE GQCR(WKID,COLI,TYPE,ERRIND,CR,CG,CB)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER COLI	colour index
INTEGER TYPE	type of returned values (GSET,GREALI)

Output Parameters:

INTEGER ERRIND	error indicator
REAL CR,CG,CB	colour (red/green/blue intensities)

INQUIRE WORKSTATION TRANSFORMATION

L0a

SUBROUTINE GQWKT (WKID,ERRIND,TUS,RWINDO,CWINDO,
*RVIEWP,CVIEWP)

Input Parameters:

INTEGER WKID

workstation identifier

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER TUS

workstation transformation update state
(GNPEND,GPEND)

REAL RWINDO(4)

requested workstation window in NDC

REAL CWINDO(4)

RWXMIN, RWXMAX, RYMIN, RYMAX

current workstation window in NDC

REAL RVIEWP(4)

CWXMIN, CWXMAX, CYMIN, CYMAX

requested workstation viewport in DC

REAL CVIEWP(4)

RVXMIN, RVXMAX, RYMIN, RYMAX

current workstation viewport in DC

CVXMIN, CVXMAX, CYMIN, CYMAX

INQUIRE SET member OF SEGMENT NAMES ON WORKSTATION

L1a

SUBROUTINE GQSGWK (WKID,N,ERRIND,OL,SGNA)

Input Parameters:

INTEGER WKID

workstation identifier

INTEGER N

set member requested

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER OL

number of segment names

INTEGER SGNA

Nth set member of set of stored

segments for workstation

INQUIRE LOCATOR DEVICE STATE

L0b

SUBROUTINE GQLCS(WKID,LCDNR,TYPE,MLDR,ERRIND,MODE,ESW,TNR,
*IPX,IPY,PET,EAREA,LDR,DATREC)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER LCDNR	locator device number
INTEGER TYPE	type of returned values (GSET,GREALI)
INTEGER MLDR	dimension of data record array

Output Parameters:

INTEGER ERRIND	error indicator
INTEGER MODE	operating mode (GREQU,GSAMPL,GEVENT)
INTEGER ESW	echo switch (GNECHO,GECHO)
INTEGER TNR	initial normalization transformation number
REAL IPX, IPY	initial locator position in world coordinates
INTEGER PET	prompt/echo type
REAL EAREA(4)	echo area in device coordinates XMIN, XMAX, YMIN, YMAX
INTEGER LDR	number of array elements used in data record
CHARACTER*80 DATREC(MLDR)	data record

INQUIRE STROKE DEVICE STATE

L0b

SUBROUTINE GQSKS(WKID,SKDNR,TYPE,N,MLDR,ERRIND,MODE,ESW,ITNR,
*NP,IPXA,IPYA,PET,EAREA,BUFLEN,LDR,DATREC)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER SKDNR	stroke device number
INTEGER TYPE	type of returned values (GSET,GREALI)
INTEGER N	maximum number of points
INTEGER MLDR	dimension of data record array

Output Parameters:

INTEGER ERRIND	error indicator
INTEGER MODE	operating mode (GREQU,GSAMPL,GEVENT)
INTEGER ESW	echo switch (GNECHO,GECHO)
INTEGER ITNR	initial normalization transformation number
INTEGER NP	number of points
REAL IPXA(N), IPYA(N)	initial points in stroke in world coordinates
INTEGER PET	prompt/echo type
REAL EAREA(4)	echo area in device coordinates XMIN, XMAX, YMIN, YMAX
INTEGER BUFLEN	input buffer size
INTEGER LDR	number of array elements used in data record
CHARACTER*80 DATREC(MLDR)	data record

INQUIRE VALUATOR DEVICE STATE

L0b

SUBROUTINE GQVLS (WKID,VLDNR,MLDR,ERRIND,MODE,ESW,IVAL,PET,
*EAREA,LOVAL,HIVAL,LDR,DATREC)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER VLDNR	valuator device number
INTEGER MLDR	dimension of data record array

Output Parameters:

INTEGER ERRIND	error indicator
INTEGER MODE	operating mode (GREQU,GSAMPL,GEVENT)
INTEGER ESW	echo switch (GNECHO,GECHO)
REAL IVAL	initial value
INTEGER PET	prompt/echo type
REAL EAREA(4)	echo area in device coordinates XMIN, XMAX, YMIN, YMAX
REAL LOVAL, HIVAL	minimal and maximal value
INTEGER LDR	number of array elements used in data record
CHARACTER*80 DATREC(MLDR)	data record

INQUIRE CHOICE DEVICE STATE

L0b

SUBROUTINE GQCHS (WKID,CHDNR,MLDR,ERRIND,MODE,ESW,ISTAT,
*ICHNR,PET,EAREA,LDR,DATREC)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER CHDNR	choice device number
INTEGER MLDR	dimension of data record array

Output Parameters:

INTEGER ERRIND	error indicator
INTEGER MODE	operating mode (GREQU,GSAMPL,GEVENT)
INTEGER ESW	echo switch (GNECHO,GECHO)
INTEGER ISTAT	initial status (GOK,GNCHOI)
INTEGER ICHNR	initial choice number
INTEGER PET	prompt/echo type
REAL EAREA(4)	echo area in device coordinates XMIN, XMAX, YMIN, YMAX
INTEGER LDR	number of array elements used in data record
CHARACTER*80 DATREC(MLDR)	data record

INQUIRE PICK DEVICE STATE

L1b

SUBROUTINE GQPKS (WKID,PKDNR,TYPE,MLDR,ERRIND,MODE,ESW,ISTAT,
*ISGNA,IPKID,PET,EAREA,LDR,DATREC)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER PKDNR	pick device number
INTEGER TYPE	type of returned values (GSET,GREALI)
INTEGER MLDR	dimension of data record array

Output Parameters:

INTEGER ERRIND	error indicator
INTEGER MODE	operating mode (GREQU,GSAMPL,GEVENT)
INTEGER ESW	echo switch (GNECHO,GECHO)
INTEGER ISTAT	initial status (GOK,GNPICK)
INTEGER ISGNA	initial segment
INTEGER IPKID	initial pick identifier
INTEGER PET	prompt/echo type
REAL EAREA(4)	echo area in device coordinates
	XMIN, XMAX, YMIN, YMAX
INTEGER LDR	number of array elements used in data record
CHARACTER*80 DATREC(MLDR)	data record

INQUIRE STRING DEVICE STATE

L0b

Full FORTRAN 77 version

SUBROUTINE GQSTS (WKID,STDNR,MLDR,ERRIND,MODE,ESW,LOSTR,ISTR,
*PET,EAREA,BUFLEN,INIPOS,LDR,DATREC)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER STDNR	string device number
INTEGER MLDR	dimension of data record array

Output Parameters:

INTEGER ERRIND	error indicator
INTEGER MODE	operating mode (GREQU,GSAMPL,GEVENT)
INTEGER ESW	echo switch (GNECHO,GECHO)
INTEGER LOSTR	number of characters returned
CHARACTER*(*) ISTR	initial string
INTEGER PET	prompt/echo type
REAL EAREA(4)	echo area in device coordinates
	XMIN, XMAX, YMIN, YMAX
INTEGER BUFLEN	input buffer size
INTEGER INIPOS	initial cursor position
INTEGER LDR	number of array elements used in data record
CHARACTER*80 DATREC(MLDR)	data record

INQUIRE STRING DEVICE STATE
FORTRAN 77 Subset version

L0b

SUBROUTINE GQSTS (WKID,STDNR,MLDR,ERRIND,MODE,ESW,
*LOSTR,ISTR,PET,EAREA,BUFLEN,INIPOS,LDR,DATREC)

Input Parameters:

INTEGER WKID	workstation identifier
INTEGER STDNR	string device number
INTEGER MLDR	dimension of data record array

Output Parameters:

INTEGER ERRIND	error indicator
INTEGER MODE	operating mode (GREQU,GSAMPL,GEVENT)
INTEGER ESW	echo switch (GNECHO,GECHO)
INTEGER LOSTR	number of characters returned
CHARACTER*80 ISTR	initial string
INTEGER PET	prompt/echo type
REAL EAREA(4)	echo area in device coordinates
	XMIN, XMAX, YMIN, YMAX
INTEGER BUFLEN	input buffer size
INTEGER INIPOS	initial cursor position
INTEGER LDR	number of array elements used in data record
CHARACTER*80 DATREC(MLDR)	data record

9.9.5 Inquiry functions for workstation description table

INQUIRE WORKSTATION CATEGORY

L0a

SUBROUTINE GQWKCA (WTYPE,ERRIND,WKCAT)

Input Parameters:

INTEGER WTYPE	workstation type
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Output Parameters:

INTEGER ERRIND	error indicator
INTEGER WKCAT	workstation category (GOUTPT,GINPUT, GOUTIN,GWISS,GMO,GMI)

INQUIRE WORKSTATION CLASSIFICATION

L0a

SUBROUTINE GQWKCL (WTYPE,ERRIND,VRTYPE)

Input Parameters:

INTEGER WTYPE

workstation type

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER VRTYPE

vector/raster/other type
(GVECTR,GRASTR,GOTHWK)**INQUIRE DISPLAY SPACE SIZE**

L0a

SUBROUTINE GQDSP (WTYPE,ERRIND,DCUNIT,DX,DY,RX,RY)

Input Parameters:

INTEGER WTYPE

workstation type

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER DCUNIT

device coordinate units (GMETRE,GOTHU)

REAL DX,DY

display space size (DC)

INTEGER RX,RY

display space size (raster units)

INQUIRE DYNAMIC MODIFICATION OF WORKSTATION ATTRIBUTES

L1a

SUBROUTINE GQDWKA (WTYPE,ERRIND,PLBUN,PMBUN,TXBUN,FABUN,
*PAREP,COLREP,WKTR)**Input Parameters:**

INTEGER WTYPE

workstation type

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER PLBUN

polyline representation changeable
(GIRG,GIMM)

INTEGER PMBUN

polymarker representation changeable
(GIRG,GIMM)

INTEGER TXBUN

text representation changeable
(GIRG,GIMM)

INTEGER FABUN

fill area representation changeable
(GIRG,GIMM)

INTEGER PAREP

pattern representation changeable
(GIRG,GIMM)

INTEGER COLREP

colour representation changeable
(GIRG,GIMM)

INTEGER WKTR

workstation transformation changeable
(GIRG,GIMM)

INQUIRE DEFAULT DEFERRAL STATE VALUES

L1a

SUBROUTINE GQDDS (WTYPE,ERRIND,DEFMOD,REGMOD)

Input Parameters:

INTEGER WTYPE workstation type

Output Parameters:

INTEGER ERRIND error indicator

INTEGER DEFMOD default value for deferral mode
(GASAP,GBNIG,GBNIL,GASTI)INTEGER REGMOD default value for implicit regeneration mode
(GSUPPD,GALLOW)**INQUIRE POLYLINE FACILITIES**

L0a

SUBROUTINE GQPLF (WTYPE,N,ERRIND,NLT,LT,NLW,NOMLW,
*RLWMIN,RLWMAX,NPPLI)**Input Parameters:**

INTEGER WTYPE workstation type

INTEGER N list element requested

Output Parameters:

INTEGER ERRIND error indicator

INTEGER NLT number of available linetypes

INTEGER LT Nth element of list of available linetypes

INTEGER NLW number of available linewidths

REAL NOMLW nominal linewidth

REAL RLWMIN, RLWMAX range of linewidths

INTEGER NPPLI number of predefined polyline indices

INQUIRE PREDEFINED POLYLINE REPRESENTATION

L0a

SUBROUTINE GQPPLR (WTYPE,PLI,ERRIND,LTYPE,LWIDTH,COLI)

Input Parameters:

INTEGER WTYPE workstation type

INTEGER PLI predefined polyline index

Output Parameters:

INTEGER ERRIND error indicator

INTEGER LTYPE linetype

REAL LWIDTH linewidth scale factor

INTEGER COLI polyline colour index

INQUIRE POLYMARKER FACILITIES

L0a

SUBROUTINE GQPMF (WTYPE,N,ERRIND,NMT,MT,NMS,NOMMS,
*RMSMIN,RMSMAX,NPPMI)

Input Parameters:

INTEGER WTYPE
INTEGER N

workstation type
list element requested

Output Parameters:

INTEGER ERRIND
INTEGER NMT
INTEGER MT
INTEGER NMS
REAL NOMMS
REAL RMSMIN, RMSMAX
INTEGER NPPMI

error indicator
number of available marker types
Nth element of list of available marker types
number of available marker sizes
nominal marker size
range of marker sizes
number of predefined polymarker indices

INQUIRE PREDEFINED POLYMARKER REPRESENTATION

L0a

SUBROUTINE GQPPMR (WTYPE,PMI,ERRIND,MTYPE,MSZSF,COLI)

Input Parameters:

INTEGER WTYPE
INTEGER PMI

workstation type
predefined polymarker index

Output Parameters:

INTEGER ERRIND
INTEGER MTYPE
REAL MSZSF
INTEGER COLI

error indicator
marker type
marker size scale factor
polymarker colour index

INQUIRE TEXT FACILITIES

L0a

SUBROUTINE GQTXF (WTYPE,N,ERRIND,NFPP,FONT,PREC,NCHH,MINCHH,
*MAXCHH,NCHX,MINCHX,MAXCHX,NPTXI)

Input Parameters:

INTEGER WTYPE
INTEGER N

workstation type
list element requested

Output Parameters:

INTEGER ERRIND
INTEGER NFPP
INTEGER FONT
INTEGER PREC

error indicator
number of text font and precision pairs
Nth element of list of text fonts
Nth element of list of text precisions
(GSTRP,GCHARP,GSTRKP)

INTEGER NCHH
REAL MINCHH
REAL MAXCHH
INTEGER NCHX

number of available character heights
minimum character height (DC)
maximum character height (DC)
number of available character
expansion factors

REAL MINCHX
REAL MAXCHX
INTEGER NPTXI

minimum character expansion factor
maximum character expansion factor
number of predefined text indices

INQUIRE PREDEFINED TEXT REPRESENTATION

L0a

SUBROUTINE GQPTXR (WTYPE,PTXI,ERRIND,FONT,PREC,CHXP,CHSP,
*COLI)

Input Parameters:

INTEGER WTYPE
INTEGER PTXI

workstation type
predefined text index

Output Parameters:

INTEGER ERRIND
INTEGER FONT
INTEGER PREC
REAL CHXP
REAL CHSP
INTEGER COLI

error indicator
text font
text precision (GSTRP,GCHARP,GSTRKP)
character expansion factor
character spacing
text colour index

INQUIRE FILL AREA FACILITIES

L0a

SUBROUTINE GQFAF (WTYPE,NI,NH,ERRIND,NIS,IS,NHS,HS,NPFAI)

Input Parameters:

INTEGER WTYPE

workstation type

INTEGER NI

list element of interior styles requested

INTEGER NH

list element of hatch styles requested

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER NIS

number of available fill area interior styles

INTEGER IS

NIth element of list of available fill area

interior styles

(GHOLLO,GSOLID,GPATTR,GHATCH)

INTEGER NHS

number of available fill area hatch styles

INTEGER HS

NHth element of list of available

fill area hatch style indices

INTEGER NPFAI

number of predefined fill area indices

INQUIRE PREDEFINED FILL AREA REPRESENTATION

L0a

SUBROUTINE GQPFAF (WTYPE,PFAI,ERRIND,INTS,STYLI,COLI)

Input Parameters:

INTEGER WTYPE

workstation type

INTEGER PFAI

predefined fill area index

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER INTS

fill area interior style

(GHOLLO,GSOLID,GPATTR,GHATCH)

INTEGER STYLI

fill area style index

INTEGER COLI

fill area colour index

INQUIRE PATTERN FACILITIES

L0a

SUBROUTINE GQPAF (WTYPE,ERRIND,NPPAI)

Input Parameters:

INTEGER WTYPE

workstation type

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER NPPAI

number of predefined pattern indices

INQUIRE PREDEFINED PATTERN REPRESENTATION

L0a

SUBROUTINE GQPPAR (WTYPE,PPAI,DIMX,DIMY,ERRIND,DX,DY,COLIA)

Input Parameters:

INTEGER WTYPE	workstation type
INTEGER PPAI	predefined pattern index
INTEGER DIMX,DIMY	maximum pattern array dimensions

Output Parameters:

INTEGER ERRIND	error indicator
INTEGER DX,DY	pattern array dimensions
INTEGER COLIA (DIMX,DIMY)	pattern array

INQUIRE COLOUR FACILITIES

L0a

SUBROUTINE GQCF (WTYPE,ERRIND,NCOLI,COLA,NPCI)

Input Parameters:

INTEGER WTYPE	workstation type
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Output Parameters:

INTEGER ERRIND	error indicator
INTEGER NCOLI	number of colours
INTEGER COLA	colour available (GMONOC,GCOLOR)
INTEGER NPCI	number of predefined colour indices

INQUIRE PREDEFINED COLOUR REPRESENTATION

L0a

SUBROUTINE GQPCR (WTYPE,PCI,ERRIND,CR,CG,CB)

Input Parameters:

INTEGER WTYPE	workstation type
INTEGER PCI	predefined colour index

Output Parameters:

INTEGER ERRIND	error indicator
REAL CR, CG, CB	colour intensities (red/green/blue)

INQUIRE LIST element OF AVAILABLE GENERALIZED DRAWING PRIMITIVES L0a

SUBROUTINE GQEGDP (WTYPE,N,ERRIND,NGDP,GDPL)

Input Parameters:
INTEGER WTYPE
INTEGER N

workstation type
list element requested

Output Parameters:
INTEGER ERRIND
INTEGER NGDP

error indicator
number of available generalized drawing
primitives
Nth element of list of GDP identifiers

INTEGER GDPL

INQUIRE GENERALIZED DRAWING PRIMITIVE

L0a

SUBROUTINE GQGDP (WTYPE,GDP,ERRIND,NBND,BNDL)

Input Parameters:
INTEGER WTYPE
INTEGER GDP

workstation type
GDP identifier

Output Parameters:
INTEGER ERRIND
INTEGER NBND
INTEGER BNDL(4)

error indicator
number of sets of attributes used
list of sets of attributes used
(GPLATT,GPMATT,GTXTATT,GFAATT)

INQUIRE MAXIMUM LENGTH OF WORKSTATION STATE TABLES

L0a

SUBROUTINE GQLWK (WTYPE,ERRIND,MPLBTE,MPMBTE,MTXBTE,MFABTE,
*MPAI,MCOLI)

Input Parameters:
INTEGER WTYPE

workstation type

Output Parameters:
INTEGER ERRIND
INTEGER MPLBTE

error indicator
maximum number of polyline bundle
table entries

INTEGER MPMBTE

maximum number of polymarker bundle
table entries

INTEGER MTXBTE

maximum number of text bundle
table entries

INTEGER MFABTE

maximum number of fill area bundle
table entries

INTEGER MPAI
INTEGER MCOLI

maximum number of pattern indices
maximum number of colour indices

INQUIRE DEFAULT LOCATOR DEVICE DATA

L0b

SUBROUTINE GQDLC (WTYPE,DEVNO,N,MLDR,ERRIND,DPX,DPY,
*OL,PET,EAREA,LDR,DATREC)

Input Parameters:

INTEGER WTYPE	workstation type
INTEGER DEVNO	logical input device number
INTEGER N	list element requested
INTEGER MLDR	dimension of data record array

Output Parameters:

INTEGER ERRIND	error indicator
REAL DPX,DPY	default initial locator position
INTEGER OL	number of available prompt/echo types
INTEGER PET	Nth element of list of available prompt/echo types
REAL EAREA(4)	default echo area in device coordinates XMIN, XMAX, YMIN, YMAX
INTEGER LDR	number of array elements used in data record
CHARACTER*80 DATREC(MLDR)	data record

INQUIRE DEFAULT STROKE DEVICE DATA

L0b

SUBROUTINE GQDSK (WTYPE,DEVNO,N,MLDR,ERRIND,MBUFF,
*OL,PET,EAREA,BUFLEN,LDR,DATREC)

Input Parameters:

INTEGER WTYPE	workstation type
INTEGER DEVNO	logical input device number
INTEGER N	list element requested
INTEGER MLDR	dimension of data record array

Output Parameters:

INTEGER ERRIND	error indicator
INTEGER MBUFF	maximum input buffer size
INTEGER OL	number of available prompt/echo types
INTEGER PET	Nth element of list of available prompt/echo types
REAL EAREA(4)	default echo area in device coordinates XMIN, XMAX, YMIN, YMAX
INTEGER BUFLEN	buffer length for stroke
INTEGER LDR	number of array elements used in data record
CHARACTER*80 DATREC(MLDR)	data record

INQUIRE DEFAULT VALUATOR DEVICE DATA

L0b

SUBROUTINE GQDVL (WTYPE,DEVNO,N,MLDR,ERRIND,DVAL,
*OL,PET,EAREA,LOVAL,HIVAL,LDR,DATREC)

Input Parameters:

INTEGER WTYPE	workstation type
INTEGER DEVNO	logical input device number
INTEGER N	list element requested
INTEGER MLDR	dimension of data record array

Output Parameters:

INTEGER ERRIND	error indicator
REAL DVAL	default initial value
INTEGER OL	number of available prompt/echo types
INTEGER PET	Nth element of list of available prompt/echo types
REAL EAREA(4)	default echo area in device coordinates
	XMIN, XMAX, YMIN, YMAX
REAL LOVAL, HIVAL	minimal and maximal value
INTEGER LDR	number of array elements used in data record
CHARACTER*80 DATREC(MLDR)	data record

INQUIRE DEFAULT CHOICE DEVICE DATA

L0b

SUBROUTINE GQDCH (WTYPE,DEVNO,N,MLDR,ERRIND,MALT,
*OL,PET,EAREA,LDR,DATREC)

Input Parameters:

INTEGER WTYPE	workstation type
INTEGER DEVNO	logical input device number
INTEGER N	list element requested
INTEGER MLDR	dimension of data record array

Output Parameters:

INTEGER ERRIND	error indicator
INTEGER MALT	maximum number of choice alternatives
INTEGER OL	number of available prompt/echo types
INTEGER PET	Nth element of list of available prompt/echo types
REAL EAREA(4)	default echo area in device coordinates
	XMIN, XMAX, YMIN, YMAX
INTEGER LDR	number of array elements used in data record
CHARACTER*80 DATREC(MLDR)	data record

INQUIRE DEFAULT PICK DEVICE DATA

L1b

SUBROUTINE GQDPK (WTYPE,DEVNO,N,MLDR,ERRIND,
*OL,PET,EAREA,LDR,DATREC)

Input Parameters:

INTEGER WTYPE
INTEGER DEVNO
INTEGER N
INTEGER MLDR

workstation type
logical input device number
list element requested
dimension of data record array

Output Parameters:

INTEGER ERRIND
INTEGER OL
INTEGER PET

error indicator
number of available prompt/echo types
Nth element of list of available prompt/echo types

REAL EAREA(4)

default echo area in device coordinates

INTEGER LDR

XMIN, XMAX, YMIN, YMAX

CHARACTER*80 DATREC(MLDR)

number of array elements used in data record
data record

INQUIRE DEFAULT STRING DEVICE DATA

L0b

SUBROUTINE GQDST (WTYPE,DEVNO,N,MLDR,ERRIND,MBUFF,
*OL,PET,EAREA,BUFLEN,LDR,DATREC)

Input Parameters:

INTEGER WTYPE
INTEGER DEVNO
INTEGER N
INTEGER MLDR

workstation type
logical input device number
list element requested
dimension of data record array

Output Parameters:

INTEGER ERRIND
INTEGER MBUFF
INTEGER OL
INTEGER PET

error indicator
maximum string buffer size
number of available prompt/echo types
Nth element of list of available prompt/echo types

REAL EAREA(4)

default echo area in device coordinates

INTEGER BUFLEN

XMIN, XMAX, YMIN, YMAX

INTEGER LDR

buffer length of string

CHARACTER*80 DATREC(MLDR)

number of array elements used in data record
data record

9.9.6 Inquiry functions for segment state list

INQUIRE SET member OF ASSOCIATED WORKSTATIONS

L1a

SUBROUTINE GQASWK (SGNA,N,ERRIND,OL,WKID)

Input Parameters:

INTEGER SGNA	segment name
INTEGER N	set member requested

Output Parameters:

INTEGER ERRIND	error indicator
INTEGER OL	number of associated workstations
INTEGER WKID	Nth member of set of associated workstations

INQUIRE SEGMENT ATTRIBUTES

L1a

SUBROUTINE GQSGA (SGNA,ERRIND,SEGTM,VIS,HIGH,SGPR,DET)

Input Parameters:

INTEGER SGNA	segment name
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Output Parameters:

INTEGER ERRIND	error indicator
REAL SEGTM(2,3)	segment transformation matrix (SEGTM(1,1) SEGTM(1,2) SEGTM(1,3)) (SEGTM(2,1) SEGTM(2,2) SEGTM(2,3))
INTEGER VIS	visibility (GINVIS,GVISI)
INTEGER HIGH	highlighting (GNORML,GHILIT)
REAL SGPR	segment priority
INTEGER DET	detectability (GUNDET,GDETEC)

9.9.7 Pixel inquiries

INQUIRE PIXEL ARRAY DIMENSIONS

L0a

SUBROUTINE GQPXAD (WKID,PX,PY,QX,QY,ERRIND,DX,DY)

Input Parameters:

INTEGER WKID	workstation identifier
REAL PX, PY, QX, QY	upper left, lower right corners in world coordinates

Output Parameters:

INTEGER ERRIND	error indicator
INTEGER DX,DY	dimensions of pixel array

INQUIRE PIXEL ARRAY

L0a

SUBROUTINE GQ PXA (WKID,PX,PY,DIMX,DIMY,ISC,ISR,DX,DY,
*ERRIND,INVVAL,COLIA)

Input Parameters:

INTEGER WKID

workstation identifier

REAL PX, PY

upper left corner (WC)

INTEGER DIMX, DIMY

the dimensions of colour index array

INTEGER ISC, ISR

start column, start row

INTEGER DX, DY

size of requested pixel array

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER INVVAL

presence of invalid values (GABSNT,GPRSNT)

INTEGER COLIA (DIMX,DIMY)

colour index array

INQUIRE PIXEL

L0a

SUBROUTINE GQ PX (WKID,PX,PY,ERRIND,COLI)

Input Parameters:

INTEGER WKID

workstation identifier

REAL PX,PY

point in world coordinates

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER COLI

colour index

9.9.8 Inquiry function for GKS error state list**INQUIRE INPUT QUEUE OVERFLOW**

L0c

SUBROUTINE GQ IQOV(ERRIND,WKID,ICL,IDN)

Output Parameters:

INTEGER ERRIND

error indicator

INTEGER WKID

workstation identifier

INTEGER ICL

input class

(GLOCAT,GSTROK,GVALUA,GCHOIC,
GPICK,GSTRIN)

INTEGER IDN

input device number

9.10 Utility functions

EVALUATE TRANSFORMATION MATRIX

L1a

SUBROUTINE GEVTM (X0,Y0,DX,DY,PHI,FX,FY,SW,MOUT)

Input Parameters:	
REAL X0, Y0	fixed point
REAL DX, DY	shift vector
REAL PHI	rotation angle in radians
REAL FX, FY	scale factors
INTEGER SW	coordinate switch (GWC,GNDC)

Output Parameters:	
REAL MOUT(2,3)	segment transformation matrix (MOUT(1,1) MOUT(1,2) MOUT(1,3)) (MOUT(2,1) MOUT(2,2) MOUT(2,3))

ACCUMULATE TRANSFORMATION MATRIX

L1a

SUBROUTINE GACTM (MINP,X0,Y0,DX,DY,PHI,FX,FY,SW,MOUT)

Input Parameters:	
REAL MINP(2,3)	segment transformation matrix (MINP(1,1) MINP(1,2) MINP(1,3)) (MINP(2,1) MINP(2,2) MINP(2,3))
REAL X0, Y0	fixed point
REAL DX, DY	shift vector
REAL PHI	rotation angle in radians
REAL FX, FY	scale factors
INTEGER SW	coordinate switch (GWC,GNDC)

Output Parameters:	
REAL MOUT(2,3)	segment transformation matrix (MOUT(1,1) MOUT(1,2) MOUT(1,3)) (MOUT(2,1) MOUT(2,2) MOUT(2,3))

9.11 Error handling

EMERGENCY CLOSE GKS

L0a

SUBROUTINE GECLKS

ERROR HANDLING

L0a

SUBROUTINE GERHND (ERRNR,FCTID,ERRFIL)

Input Parameters:

INTEGER ERRNR

error number

INTEGER FCTID

function identification (see Section 6)

INTEGER ERRFIL

error file

ERROR LOGGING

L0a

SUBROUTINE GERLOG (ERRNR,FCTID,ERRFIL)

Input Parameters:

INTEGER ERRNR

error number

INTEGER FCTID

function identification (see Section 6)

INTEGER ERRFIL

error file

9.12 Utility functions not defined in GKS

The mechanism used for providing the error indicator of these utilities is the same as that used by the inquiry functions. The following language binding dependent errors may occur: 2001 and 2003. Note: implementation dependent errors may occur also.

PACK DATA RECORD

L0a

Full FORTRAN 77 version

SUBROUTINE GPREC(IL,IA,RL,RA,SL,LSTR,STR,MLDR,ERRIND,LDR,DATREC)

Input Parameters:

INTEGER IL

number of integer entries (≥ 0)

INTEGER IA (*)

array containing integer entries

INTEGER RL

number of real entries (≥ 0)

REAL RA (*)

array containing real entries

INTEGER SL

number of character string entries (≥ 0)

INTEGER LSTR(*)

lengths of each character string entry (≥ 0)

CHARACTER*(*) STR(*)

character string entries

INTEGER MLDR

dimension of data record array

Output Parameters:

INTEGER ERRIND

error indicator (zero if no error)

INTEGER LDR

number of array elements used in DATREC

CHARACTER*80 DATREC(MLDR)

data record

PACK DATA RECORD
 FORTRAN 77 Subset version

L0a

SUBROUTINE GPREC (IL,IA,RL,RA,SL,LSTR,STR,MLDR,ERRIND,LDR,DATREC)

Input Parameters:

INTEGER IL	number of integer entries (≥ 0)
INTEGER IA (*)	array containing integer entries
INTEGER RL	number of real entries (≥ 0)
REAL RA (*)	array containing real entries
INTEGER SL	number of character string entries (≥ 0)
INTEGER LSTR(*)	lengths of each character string entry (≥ 0)
CHARACTER*80 STR(*)	character string entries
INTEGER MLDR	dimension of data record array

Output Parameters:

INTEGER ERRIND	error indicator (zero if no error)
INTEGER LDR	number of array elements used in DATREC
CHARACTER*80 DATREC(MLDR)	data record

UNPACK DATA RECORD
 Full FORTRAN 77 version

L0a

SUBROUTINE GUREC (LDR,DATREC,IIL,IRL,ISL,ERRIND,IL,IA,RL,RA,
*SL,LSTR,STR)**Input Parameters:**

INTEGER LDR	number of array elements used in DATREC
CHARACTER*80 DATREC(LDR)	data record
INTEGER IIL	dimension of integer array
INTEGER IRL	dimension of real array
INTEGER ISL	dimension of character array

Output Parameters:

INTEGER ERRIND	error indicator (zero if no error)
INTEGER IL	number of integer entries
INTEGER IA (IIL)	array containing integer entries
INTEGER RL	number of real entries
REAL RA (IRL)	array containing real entries
INTEGER SL	number of character string entries
INTEGER LSTR(ISL)	length of each character string entry
CHARACTER*(*) STR(ISL)	character string entries