

IBM

THE  
**graPHIGS**<sup>™</sup>  
Programming Interface

*GKS—Compatibility Option  
Programmer's Pocket Reference*

SC33-8113-0

IBM



SC33-8113-00

# The Personal graPHIGS™ Programming Interface

## **Pocket Reference for the Graphical Kernel System— Compatibility Option**

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### **First Edition (March 1988)**

This edition, SC33-8113-0, applies to the IBM program product Personal graPHIGS Graphical Kernel System-Compatibility Option (GKS-CO).

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# Functions and Parameters

## Control Functions

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GWAIT - Await Event	<i>tout, wkid, icl, idnr</i>	7-57

## Metafile Functions

Call - Function	Parameters	Page
GGITM - Get Item Type from GKSM	<i>wkid, type, idrl</i>	8-2
GIITM - Interpret Item	<i>type, idrl, ldr, datrec</i>	8-3
GRDITM - Read Item from GKSM	<i>wkid, midrl, mldr, datrec</i>	8-5
GWITM - Write Item To GKSM	<i>wkid, type, idrl, ldr, datrec</i>	8-6

## Transformation Functions

Call - Function	Parameters	Page
GSCLIP - Set Clipping Indicator	<i>clsw</i>	9-2
GSELNT - Select Normalization Transformation	<i>tnr</i>	9-3
GSVP - Set Viewport	<i>tnr, xmin, xmax, ymin, ymax</i>	9-4
GSVPIP - Set Viewport Input Priority	<i>tnr, rtnr, relpri</i>	9-5
GSWKVP - Set Workstation Viewport	<i>wkid, xmin, xmax, ymin, ymax</i>	9-6
GSWKWN - Set Workstation Window	<i>wkid, xmin, xmax, ymin, ymax</i>	9-7
GSWN - Set Window	<i>tnr, xmin, xmax, ymin, ymax</i>	9-8

## Utility Functions

Call - Function	Parameters	Page
GACTM - Accumulate Transformation Matrix	<i>minp, x0, y0, dx, dy, phi, fx, fy, sw, mout</i>	10-2
GEVTM - Evaluate Transformation Matrix	<i>x0, y0, dx, dy, phi, fx, fy, sw, mout</i>	10-4
GPREC - Pack Data Record	<i>il, ia, rl, ra, sl, lstr, str, mldr, errind, ldr, datrec</i>	10-5

<b>Call - Function</b>	<b>Parameters</b>	<b>Page</b>
GPRECS - Pack Data Record (FORTRAN 77 Subset Binding)	<i>il, ia, rl, ra, sl, lstr, str, mldr, errind, ldr, datrec</i>	10-7
GUREC - Unpack Data Record	<i>ldr, datrec, iil, irl, isl, errind, il, ia, rl, ra, sl, lstr, str</i>	10-9
GURECS - Unpack Data Record (FORTRAN 77 Subset Binding)	<i>ldr, datrec, iil, irl, isl, errind, il, ia, rl, ra, sl, lstr, str</i>	10-11

## **Error Handling Functions**

<b>Call - Function</b>	<b>Parameters</b>	<b>Page</b>
GECLKS - Emergency Close GKS	none	11-2
GERHND - Error Handling	<i>errnr, fctid, errfil</i>	11-3
GERLOG - Error Logging	<i>errnr, fctid, errfil</i>	11-4

## **Inquiry Functions**

<b>Call - Function</b>	<b>Parameters</b>	<b>Page</b>
GQASF - Inquire Aspect Source Flags	<i>errind, lasf</i>	12-2
GQCHB - Inquire Character Base Vector	<i>errind, chbx, chby</i>	12-4
GQCHXP - Inquire Character Expansion Factor	<i>errind, chxp</i>	12-5
GQCHH - Inquire Character Height	<i>errind, chh</i>	12-6
GQCHSP - Inquire Character Spacing	<i>errind, chsp</i>	12-7
GQCHUP - Inquire Character Up Vector	<i>errind, chux, chuy</i>	12-8
GQCHW - Inquire Character Width	<i>errind, chw</i>	12-9

<b>Call - Function</b>	<b>Parameters</b>	<b>Page</b>
GQCHS - Inquire Choice Device State	<i>wkid, chdnr, mldr, errind, mode, esw, istat, ichnr, pet, earea, ldr, datrec</i>	12-10
GQCLIP - Inquire Clipping	<i>errind, clsw, clrect</i>	12-12
GQCF - Inquire Color Facilities	<i>wtype, errind, ncoli, cola, npc</i>	12-13
GQCR - Inquire Color Representation	<i>wkid, coli, type, errind, cr, cg, cb</i>	12-14
GQCNTN - Inquire Current Normalization Transformation Number	<i>errind, ctnr</i>	12-15
GQPKID - Inquire Current Pick Identifier	<i>errind, pkid</i>	12-16
GQDCH - Inquire Default Choice Device Data	<i>wtype, devno, n, mldr, errind, malt, ol, pet, earea, ldr, datrec</i>	12-17
GQDDS - Inquire Default Deferral State Values	<i>wtype, errind, defmod, regmod</i>	12-19
GQDLC - Inquire Default Locator Device Data	<i>wtype, devno, n, mldr, errind, dp<sub>x</sub>, dp<sub>y</sub>, ol, pet, earea, ldr, datrec</i>	12-20
GQDPK - Inquire Default Pick Device Data	<i>wtype, devno, n, mldr, errind, ol, pet, earea, ldr, datrec</i>	12-22
GQDST - Inquire Default String Device Data	<i>wtype, devno, n, mldr, errind, mbuff, ol, pet, earea, buflen, ldr, datrec</i>	12-24
GQDSK - Inquire Default Stroke Device Data	<i>wtype, devno, n, mldr, errind, dbufsk, ol, pet, earea, buflen, ldr, datrec</i>	12-26
GQDVL - Inquire Default Valuator Device Data	<i>wtype, devno, n, mldr, errind, dval, ol, pet, earea, loval, hival, ldr, datrec</i>	12-28
GQDSP - Inquire Display Space Size	<i>wtype, errind, dcunit, rx, ry, lx, ly</i>	12-30
GQDSGA - Inquire Dynamic Modification of Segment Attributes	<i>wtype, errind, sgtr, vonoff, voffon, high, sgpr, add, sgdel</i>	12-31



<b>Call - Function</b>	<b>Parameters</b>	<b>Page</b>
GQDWKA - Inquire Dynamic Modification of Workstation Attributes	<i>wtype, errind, plbun, pmbun, txbun, fabun, parep, colrep, wktr</i>	12-33
GQFACI - Inquire Fill Area Color Index	<i>errind, coli</i>	12-35
GQFAF - Inquire Fill Area Facilities	<i>wtype, ni, nh, errind, nis, is, nhs, hs, npfai</i>	12-36
GQFAI - Inquire Fill Area Index	<i>errind, fai</i>	12-38
GQFAIS - Inquire Fill Area Interior Style	<i>errind, ints</i>	12-39
GQFAR - Inquire Fill Area Representation	<i>wkid, fai, type, errind, ints, styli, coli</i>	12-40
GQFASI - Inquire Fill Area Style Index	<i>errind, styli</i>	12-42
GQGDP - Inquire Generalized Drawing Primitive	<i>wtype, gdp, errind, nbnd, bndl</i>	12-43
GQIQOV - Inquire Input Queue Overflow	<i>errind, wkid, icl, idn</i>	12-44
GQLVKS - Inquire Level of GKS	<i>errind, level</i>	12-45
GQLN - Inquire Linetype	<i>errind, ltype</i>	12-47
GQLWSC - Inquire Linewidth Scale Factor	<i>errind, lwidth</i>	12-48
GQEGDP - Inquire List of Available Generalized Drawing Primitives	<i>wtype, n, errind, ngdp, gdpl</i>	12-49
GQEWK - Inquire List of Available Workstation Types	<i>n, errind, number, wktyp</i>	12-50
GQECl - Inquire List of Color Indexes	<i>wkid, n, errind, ol, coli</i>	12-51
GQEFAl - Inquire List of Fill Area Indexes	<i>wkid, n, errind, ol, fai</i>	12-52
GQENTN - Inquire List of Normalization Transformation Numbers	<i>n, errind, ol, tnr</i>	12-53
GQEPAl - Inquire List of Pattern Indexes	<i>wkid, n, errind, ol, pai</i>	12-54

<b>Call - Function</b>	<b>Parameters</b>	<b>Page</b>
GQEPLI - Inquire List of Polyline Indexes	<i>wkid, n, errind, ol, pli</i>	12-55
GQEPMI - Inquire List of Polymarker Indexes	<i>wkid, n, errind, ol, pmi</i>	12-56
GQETXI - Inquire List of Text Indexes	<i>wkid, n, errind, ol, txi</i>	12-57
GQLCS - Inquire Locator Device State	<i>wkid, lcdnr, type, mldr, errind, mode, esw, tnr, ipx, ipy, pet, earea, ldr, datrec</i>	12-58
GQMKSC - Inquire Marker Size Scale Factor	<i>errind, mszsf</i>	12-60
GQMK - Inquire Markertype	<i>errind, mtype</i>	12-61
GQLWK - Inquire Maximum Length of Workstation State Tables	<i>wtype, errind, mplbte, mpmpte, mtxbte, mfabte, mpai, mcoli</i>	12-62
GQMNTN - Inquire Maximum Normalization Transformation Number	<i>errind, maxtnr</i>	12-63
GQSIM - Inquire More Simultaneous Events	<i>errind, flag</i>	12-64
GQOPSG - Inquire Name of Open Segment	<i>errind, sgna</i>	12-65
GQNT - Inquire Normalization Transformation	<i>ntnr, errind, window, viewpt</i>	12-66
GQLI - Inquire Number of Available Logical Input Devices	<i>wtype, errind, nlcd, nskd, nvld, nchd, npkd, nstd</i>	12-67
GQSGP - Inquire Number of Segment Priorities Supported	<i>wtype, errind, nsqp</i>	12-68
GQOPS - Inquire Operating State Value	<i>opsta</i>	12-69
GQPAF - Inquire Pattern Facilities	<i>wtype, errind, nppai</i>	12-70
GQPARF - Inquire Pattern Reference Point	<i>errind, rfx, rfy</i>	12-71

<b>Call - Function</b>	<b>Parameters</b>	<b>Page</b>
GQPAR - Inquire Pattern Representation	<i>wkid, pai, type, dimx, dimy, errind, dx, dy, colia</i>	12-72
GQPA - Inquire Pattern Size	<i>errind, pwx, pwy, phx, phy</i>	12-73
GQPKS - Inquire Pick Device State	<i>wkid, pkdnr, type, mldr, errind, mode, esw, istat, isgna, ipkid, pet, earea, ldr, datrec</i>	12-74
GQPX - Inquire Pixel	<i>wkid, px, py, errind, coli</i>	12-76
GQPXA - Inquire Pixel Array	<i>wkid, px, py, dimx, dimy, isc, isr, dx, dy, errind, inval, colia</i>	12-77
GQPXAD - Inquire Pixel Array Dimensions	<i>wkid, px, py, qx, qy, errind, n, m</i>	12-78
GQPLCI - Inquire Polyline Color Index	<i>errind, coli</i>	12-79
GQPLF - Inquire Polyline Facilities	<i>wtype, n, errind, nlt, lt, nlw, nomlw, rlwmin, rlwmax, nppli</i>	12-80
GQPLI - Inquire Polyline Index	<i>errind, pli</i>	12-81
GQPLR - Inquire Polyline Representation	<i>wkid, pli, type, errind, ltype, lwidth, coli</i>	12-82
GQPMCI - Inquire Polymarker Color Index	<i>errind, coli</i>	12-83
GQPMF - Inquire Polymarker Facilities	<i>wtype, n, errind, nmt, mt, nms, nomms, rmsmin, rmsmax, nppmi</i>	12-84
GQPMI - Inquire Polymarker Index	<i>errind, pmi</i>	12-85
GQPMR - Inquire Polymarker Representation	<i>wkid, pmi, type, errind, mtype, mszsf, coli</i>	12-86
GQPCR - Inquire Predefined Color Representation	<i>wtype, pci, errind, cr, cg, cb</i>	12-88
GQPFAR - Inquire Predefined Fill Area Representation	<i>wtype, pfai, errind, style, stylid, coli</i>	12-89

<b>Call - Function</b>	<b>Parameters</b>	<b>Page</b>
GQPPAR - Inquire Predefined Pattern Representation	<i>wtype, ppai, dimx, dimy, errind, dx, dy, parray</i>	12-90
GQPPLR - Inquire Predefined Polyline Representation	<i>wtype, pli, errind, lntype, lwidth, coli</i>	12-91
GQPPMR - Inquire Predefined Polymarker Representation	<i>wtype, pmi, errind, mktype, mksscf, coli</i>	12-92
GQPTXR - Inquire Predefined Text Representation	<i>wtype, ptxi, errind, font, prec, charxp, charsp, coli</i>	12-94
GQSGA - Inquire Segment Attributes	<i>sgna, errind, segtm, vis, high, sgpr, det</i>	12-95
GQACWK - Inquire Set of Active Workstations	<i>n, errind, ol, wkid</i>	12-96
GQASWK - Inquire Set of Associated Workstations	<i>sgna, n, errind, ol, wkid</i>	12-97
GQOPWK - Inquire Set of Open Workstations	<i>n, errind, ol, wkid</i>	12-98
GQSGUS - Inquire Set of Segment Names in Use	<i>n, errind, ol, sgna</i>	12-99
GQSGWK - Inquire Set of Segment Names on Workstation	<i>wkid, n, errind, ol, sgna</i>	12-100
GQSTS - Inquire String Device State	<i>wkid, stdnr, mldr, errind, mode, esw, lostr, istr, pet, earea, buflen, inipos, ldr, datrec</i>	12-101
GQSTSS - Inquire String Device State (FORTRAN 77 Subset Binding)	<i>wkid, stdnr, mstr, mldr, errind, mode, esw, lostr, istr, pet, earea, buflen, inipos, ldr, datrec</i>	12-103
GQSKS - Inquire Stroke Device State	<i>wkid, skdnr, type, n, mldr, errind, mode, esw, itnr, np, pxa, pya, pet, earea, buflen, ldr, datrec</i>	12-105
GQTXAL - Inquire Text Alignment	<i>errind, txalh, txalv</i>	12-107

<b>Call - Function</b>	<b>Parameters</b>	<b>Page</b>
GQTXCI - Inquire Text Color Index	<i>errind, coli</i>	12-108
GQTXX - Inquire Text Extent	<i>wkid, px, py, str, errind, cpx, cpy, txexp, txexpy</i>	12-109
GQTXXS - Inquire Text Extent (FORTRAN 77 Subset Binding)	<i>wkid, px, py, lstr, str, errind, cpx, cpy, txexp, txexpy</i>	12-110
GQTXF - Inquire Text Facilities	<i>wtype, n, errind, nfpp, font, prec, nchh, minchh, maxchh, nchx, minchx, maxchx, nptxi</i>	12-111
GQTXFP - Inquire Text Font and Precision	<i>errind, font, prec</i>	12-113
GQTXI - Inquire Text Index	<i>errind, txi</i>	12-114
GQTXP - Inquire Text Path	<i>errind, txp</i>	12-115
GQTXR - Inquire Text Representation	<i>wkid, txi, type, errind, font, prec, chxp, chsp, coli</i>	12-116
GQVLS - Inquire Valuator Device State	<i>wkid, vldnr, mldr, errind, mode, esw, ival, pet, earea, loval, hival, ldr, datrec</i>	12-118
GQWKCA - Inquire Workstation Category	<i>wtype, errind, wkcat</i>	12-120
GQWKCL - Inquire Workstation Classification	<i>wtype, errind, vrtype</i>	12-121
GQWKC - Inquire Workstation Connection and Type	<i>wkid, errind, conid, wtype</i>	12-122
GQWKDU - Inquire Workstation Deferral and Update States	<i>wkid, errind, defmod, regmod, dempty, nframe</i>	12-123
GQWKM - Inquire Workstation Maximum Numbers	<i>errind, mxopwk, mxacwk, mxwkas</i>	12-125
GQWKS - Inquire Workstation State	<i>wkid, errind, state</i>	12-126
GQWKT - Inquire Workstation Transformation	<i>wkid, errind, tus, rwindo, cwindo, rviewp, cviewp</i>	12-127

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# Enumerated Data Types

## FORTRAN Binding Enumeration Types

The following table contains the enumeration types used in the FORTRAN binding. The table contains the following information:

- The enumeration type.
- The names of the FORTRAN variables that correspond to the individual states. All of these variables are INTEGER.
- The integer value assigned to each variable and the corresponding states possible for the enumeration type.

**Note:** The following abbreviations are used in this table, indicated by an asterisk (\*) next to the enumeration type:

- ASAP - As soon as possible
- ASTI - At some time
- BNIG - Before next interaction globally
- BNIL - Before next interaction locally
- GDP - Generalized drawing primitive
- GKCL - GKS closed
- GKOP - GKS open
- NDC - Normalized device coordinates
- SGOP - Segment open
- WC - World coordinates
- WISS - Workstation independent segment storage
- WSAC - At least one workstation active
- WSOP - At least one workstation open

Enumeration Type	FORTRAN Variable	Possible States
Aspect Source Flag	GBUNDL GINDIV	0 = Bundled 1 = Individual
Attribute Control Flag	GCURNT GSPEC	0 = Current 1 = Specified
Clear Control Flag	GCONDI GALWAY	0 = Conditionally 1 = Always
Clipping Indicator	GNCLIP GCLIP	0 = No Clip 1 = Clip
Color Available	GMONOC GCOLOR	0 = Monochrome 1 = Color

<b>Enumeration Type</b>	<b>FORTTRAN Variable</b>	<b>Possible States</b>
Coordinate Switch *	GWC GNDC	0 = WC 1 = NDC
Deferral Mode *	GASAP GBNIG GBNIL GASTI	0 = ASAP 1 = BNIG 2 = BNIL 3 = ASTI
Detectability	GUNDET GDETEC	0 = Undetectable 1 = Detectable
Device Coordinate Units	GMETRE GOTHU	0 = Meters 1 = Other
Display Surface Empty	GNEMPT GEMPTY	0 = Not Empty 1 = Empty
Dynamic Modification	GIRG GIMM	0 = Implicit Regeneration 1 = Immediate
Echo Switch	GNECHO GECHO	0 = No Echo 1 = Echo
Fill Area Interior Style	GHOLLO GSOLID GPATTR GHATCH	0 = Hollow 1 = Solid 2 = Pattern 3 = Hatch
GDP Attributes *	GPLATT GPMATT GTXATT GFAATT	0 = Polyline 1 = Polymarker 2 = Text 3 = Fill Area
Highlighting	GNORML GHILIT	0 = Normal 1 = Highlighted
Initial Choice Prompt Flag	GPROFF GPRON	0 = Off 1 = On
Input Device Status	GNONE GOK GNPICK GNCHOI	0 = None 1 = OK 2 = No Pick or No Choice
Input Class	GNCLAS GLOCAT GSTROK GVALUA GCHOIC GPICK GSTRIN	0 = None 1 = Locator 2 = Stroke 3 = Valuator 4 = Choice 5 = Pick 6 = String
Implicit Regeneration Mode	GSUPPD GALLOW	0 = Suppressed 1 = Allowed

<b>Enumeration Type</b>	<b>FORTTRAN Variable</b>	<b>Possible States</b>
Level of GKS	GL0A GL0B GL0C GL1A GL1B GL1C GL2A GL2B GL2C	0 = 0a 1 = 0b 2 = 0c 3 = 1a 4 = 1b 5 = 1c 6 = 2a 7 = 2b 8 = 2c
Line Type	GLSOLI GLDASH GLDOT GLDASD	1 = Solid 2 = Dash 3 = Dot 4 = Dash-Dot
Marker Type	GPOINT GPLUS GAST GOMARK GXMARK	1 = Period (.) 2 = Plus (+) 3 = Asterisk (*) 4 = Circle (o) 5 = Cross (x)
New Frame Action Necessary	GNO GYES	0 = No 1 = Yes
Operating Mode	GREQU GSAMPL GEVENT	0 = Request 1 = Sample 2 = Event
Operating State Value *	GGKCL GGKOP GWSOP GWSAC GSGOP	0 = GKCL 1 = GKOP 2 = WSOP 3 = WSAC 4 = SGOP
Polyline/Fill Area Control Flag	GPLINE GFILLA	0 = Polyline 1 = Fill Area
Presence of Invalid Values	GABSNT GPRSNT	0 = Absent 1 = Present
Regeneration Flag	GPOSTP GPERFO	0 = Postpone 1 = Perform
Relative Input Priority	GHIGHR GLOWER	0 = Higher 1 = Lower
Simultaneous Events Flag	GNMORE GMORE	0 = No More 1 = More
Text Alignment Horizontal	GAHNOR GALEFT GACENT GARITE	0 = Normal 1 = Left 2 = Center 3 = Right



<b>Enumeration Type</b>	<b>FORTRAN Variable</b>	<b>Possible States</b>
Text Alignment Vertical	GAVNOR GATOP GACAP GAHALF GABASE GABOTT	0 = Normal 1 = Top 2 = Cap 3 = Half 4 = Base 5 = Bottom
Text Path	GRIGHT GLEFT GUP GDOWN	0 = Right 1 = Left 2 = Up 3 = Down
Text Precision	GSTRP GCHARP GSTRKP	0 = String 1 = Character 2 = Stroke
Type of Returned Value	GSET GREALI	0 = Set 1 = Realized
Update State	GNPEND GPEND	0 = Not Pending 1 = Pending
Vector/Raster/ Other Type	GVECTR GRASTR GOTHWK	0 = Vector 1 = Raster 2 = Other
Visibility	GINVIS GVISI	0 = Invisible 1 = Visible
Workstation Category *	GOUTPT GINPUT GOUTIN GWISS GMO GMI	0 = Output 1 = Input 2 = Input/Output 3 = WISS 4 = Metafile Output 5 = Metafile Input
Workstation State	GINACT GACTIV	0 = Inactive 1 = Active

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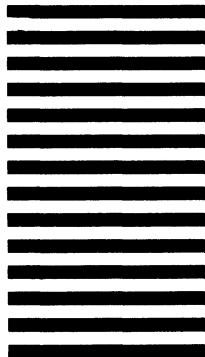
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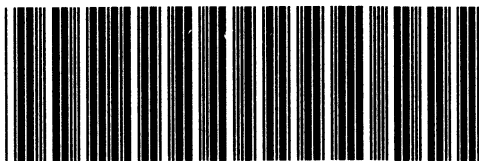
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