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GDDM-PCLK Guide

Version 1.1

IBM

*Personal
Computer
Software*

Front Cover Pattern: Electronic Sunflower

The pattern on the front cover was produced by a GDDM program. The program to produce this pattern, and many variations of the pattern, is published in:

- *GDDM Application Programming Guide*
- *GDDM Base Programming Reference*

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GDDM-PCLK Guide

Version 1.1

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*Personal
Computer
Software*

Second Edition (March 1988)

This is a new edition of the GDDM-PCLK Guide, and applies to Version 1.1 of the IBM program, GDDM™-PCLK.

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    IBM does not warrant that any other defects in the Program will be corrected or that the operation of the Program will be uninterrupted.

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Following the end of the Warranty Period, Program Services may be available until the Service Expiration Date. The License Information contains details on such availability.

If you have a question as to where you may obtain warranty service, see the Statement of Service in the License Information for this Program.

LICENSE INFORMATION

GDDM-PCLK Version 1.1 6242913

Program specifications

GDDM-PCLK, a PC program, together with the GDDM PCLKF host feature, enables a GDDM System/370 host application to link to the IBM Personal Computer or to the IBM Personal System/2™ (both referred to herein as the PC) with new or existing 3270 terminal emulators as a graphics terminal, including GDDM-emulated image. This lets users who needed both PCs for local programs and 3270 for host graphics have the choice of performing both tasks using a single PC. GDDM-PCLK not only lets users display GDDM graphics, but also plot and print on PC-attached devices.

Specified operating environment

A single license for GDDM Version 2.2 PCLKF (PCLK Feature) supports all of the GDDM-PCLK users on the same host machine.

Machine requirements:

GDDM-PCLK runs on the following IBM personal computer system units with any one of the following terminal emulators. The minimum storage size supported is 512Kb, although for some combinations of system unit, display attachment, and emulator, more storage is required.

System units

- IBM 3270 Personal Computer
- IBM 3270 Personal Computer AT
- IBM Personal Computer
- IBM Personal Computer XT™ (not XT/370)
- IBM Personal Computer AT™ (not AT/370)
- IBM Personal Computer XT™-286

- IBM Personal System/2™ Model 30
- IBM Personal System/2 Model 50
- IBM Personal System/2 Model 60
- IBM Personal System/2 Model 80

Terminal emulators

- IBM 3270 Emulation Program, Entry Level, Version 1.1
- IBM 3270 Emulation Program, Entry Level, Version 1.2

The above two terminal emulators provide dual-screen support on suitable combinations of hardware.

- IBM 3270 Emulation Program, Version 3

With the above terminal emulator on an SDLC-attached IBM personal computer, a plotter cannot be used.

- 3270 Workstation Program Version 1.1 (with necessary service-level updates).

Display attachments

- Color/Graphics Monitor Adapter (CGA) in 640x200 2-color mode.
- IBM Personal System/2 Model 30 integrated display adapter (MCGA) in 640x480 2-color mode.
- Enhanced Graphics Adapter (EGA) (64Kb) in 640x200 16-color mode.
- Enhanced Graphics Adapter (EGA) (128Kb) in 640x350 16-color mode.
- IBM Personal System/2 Display Adapter in 640x480 16-color mode.
- IBM Personal System/2 integrated display adapter (VGA) in 640x480 16-color mode.
- IBM Personal System/2 Display Adapter 8514/A in either 640x480 or 1024x768 16-color advanced function mode, with Adapter Interface code Version 1.01.

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License Information

Printers

- IBM 3852 Color Jetprinter
- IBM 4201 Proprinter™
- IBM 4201-2 Proprinter II
- IBM 4202 Proprinter XL
- IBM 4207 Proprinter X24
- IBM 4208 Proprinter XL24
- IBM 5152 Graphics Printer
- IBM 5182 Color Printer
- IBM 5201 Quietwriter™ Printer
- IBM 5202 Quietwriter III Printer

Plotters

GDDM-PCLK supports the following plotters via RS-232C attach only (that is, to an asynchronous adapter or the serial port of a serial/parallel adapter).

- IBM 6180 Color Plotter
- IBM 6182 Color Plotter
- IBM 6184 Color Plotter
- IBM 6186 Color Plotter
- IBM 7371 Color Plotter
- IBM 7372 Color Plotter
- IBM 7374 Color Plotter*
- IBM 7375 Color Plotter*

* Withdrawn from marketing

Program requirements:

Host System

Access to a host system with one of the following installed:

GDDM/MVS Version 2.2 PCLKF
(5665-356)
GDDM/VM Version 2.2 PCLKF
(5664-200)

GDDM/VMXA Version 2.2 PCLKF
(5684-007)
GDDM/VSE Version 2.2 PCLKF
(5666-328).

Software requirements

GDDM-PCLK Version 1.1 requires IBM Personal Computer DOS 2.1 or later on the IBM personal computer linked to GDDM Version 2.2 with PCLKF (PCLK Feature) on the host.

Machine requirements may dictate later levels of IBM Personal Computer DOS. See Programming Announcement 287-512, dated November 3, 1987, for GDDM Version 2.2 PCLKF.

GDDM-PCLK requires host applications executing under the control of one of the following subsystems:

System Control Program	CMS (1)	CICS/ VS(3)	IMS/ VS	TSO ACF/ VTAM
VSE		X		
MVS/370		X		X
MVS/XA		X		X
VM/SP(2)	X			
VM/XA SF	X			
VM/XA SP	X			

1. Excluding the CMS DOS environment
2. With or without HPO
3. Pseudo-conversational mode not supported.

Licensed program materials availability:
This licensed program is available without source licensed program materials. It is available in object code.

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Additional information

National Language Support is provided on the diskette at no charge.

Prerequisites

Any of GDDM/MVS Version 2.2, GDDM/VM Version 2.2, GDDM/VMXA Version 2.2, or GDDM/VSE Version 2.2, with PCLKF (PCLK Feature).

Compatibility

GDDM-PCLK Version 1.1 withdraws support for three emulators:

    IBM 3270 Emulation Program, Entry Level, Version 1.0
    IBM 3270 Emulation Program, Version 2
    IBM 3270 Workstation Program, Version 1.0.

GDDM-PCLK graphics does not support string and stroke input.

GDDM-PCLK does not provide an image cursor.

Existing GDDM applications that use the above functions may need changing.

Any mouse device that can be used to drive the usual IBM personal computer applications can be used with GDDM-PCLK.

The IBM Personal System/2 Display Adapter 8514/A requires the Adapter Interface code Version 1.01; a customer with Version 1.00 may obtain an upgrade kit Part Number 68X2300.

Limitations

Host applications connecting with GDDM-PCLK are not available under IMS/VS.

Host applications connecting with GDDM-PCLK are not available under pseudoconversational mode in CICS/VS.

GDDM-PCLK allows concurrent execution of other IBM personal computer programs *only* when used with 3270 Workstation Program, Version 1.1 (with necessary service-level updates).

Type/duration of Program

Services: Central Service is available until May 31, 1989.

Statement Of Service: Central Service for this product is available via the host GDDM PCLKF (PCLK feature) as defined by the Program Services Statement for the basic licenses of:

    GDDM/VM Version 2.2 PCLKF (5664-200)
    GDDM/MVS Version 2.2 PCLKF (5665-356)
    GDDM/VSE Version 2.2 PCLKF (5666-328)
    GDDM/VMXA Version 2.2 PCLKF (5684-007).

To invoke Central Service, contact your host system support personnel for the GDDM PCLKF basic license, who will perform the customer responsibilities.

Services available after service expiration date: Yes. Stable code will be automatically downloaded from the GDDM host.

Service is provided only to the host GDDM PCLKF (PCLK Feature) basic license on a host machine. GDDM PCLKF host libraries are updated using the Service Application Utilities (SMP, SMP/E, MSHP, or ADMSERV). Object code refreshes are automatically downloaded to GDDM-PCLK for the matching Version/Release level (this is not a delivery mechanism for upgrades).

For additional information on warranty services contact your local IBM representative or your authorized IBM supplier.

Service Registration Procedures: None.

Designated service location information: Contact your host system support personnel. Service is only provided through the procedures for the matching GDDM PCLKF basic license, specifying the host GDDM PCLKF as the program requiring service. If the host site is unable to provide support, the Central Service address, available from either the host site or the local IBM representative, should be used to report the problem.

Procedures for defect and/or non-defect assistance: Contact your host system support personnel. Problems are reported by them against the matching host GDDM PCLKF basic license, program number:

5664-200 (VM),
5665-356 (MVS),
5666-328 (VSE), or
5684-007 (VM/XA),

using the procedures for that program.

Customer responsibilities:

- Problem determination
- Problem source identification
- APAR submission
- Program currency (for example, applying mandatory updates).

Any other documentation with respect to this licensed program, including any such documentation referenced herein, is provided for information purposes only and does not extend or modify the material contained in the License Information.

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Preface

What this guide is about

This guide describes how to install and use Version 1.1 of the
GDDM-PCLK Personal Computer (PC) licensed program.

Terminology used

Throughout this guide, these conventions are used:

Disk
Means either a removable diskette, or a fixed disk, unless stated
otherwise.

Enter
Means the keyboard key labeled "Enter" or the equivalent for your
keyboard; see pages C-6 and C-8.

GDDM-PCLK
Means GDDM-PCLK Version 1.1, unless otherwise stated.

Personal Computer, or PC
Means any member of the IBM Personal Computer family, including
the Personal System/2 (PS/2™) family, unless stated otherwise.

PS/2
Means any member of the PS/2 family.

Display screens

The display screens shown in this guide are typical only; they may
vary in size and format according to the type of display in use.

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Who this guide is for

The introductory chapter of this guide is aimed at three classes of GDDM-PCLK user, namely PC users, application programmers, and system programmers. The other chapters are specifically aimed at one of these classes.

If you are a PC user, you need to be familiar with:

- Using a PC and the basic commands of the Personal Computer Disk Operating System (DOS)

- Using a PC as a host-attached terminal, through a terminal emulator.

If you are an application programmer, you need to be familiar with writing GDDM applications.

If you are a system programmer you need to be familiar with the subsystem under which the GDDM applications are to run; for example, the TSO subsystem of MVS, or the CMS subsystem of VM/SP.

How to use this guide

You can read the chapters of this guide sequentially, or just read those chapters that apply to your particular area of interest. The arrangement of the guide is detailed in the table of contents. There is a glossary and an index at the back of the guide.

You may also find the *GDDM-PCLK Version 1.1 Reference Summary* useful; it contains a summary of most of the information provided in this guide.

Hardware and software requirements for GDDM-PCLK

Hardware

GDDM-PCLK requires one of:

- IBM Personal System/2 Model 30 with either:

    - integrated display adapter (MCGA), or
    - PS/2 Display Adapter.

- IBM Personal System/2 Models 50, 60, and 80 with either:

    - integrated display adapter (VGA), or
    - PS/2 Display Adapter 8514/A.

or one of these PC system units:

- IBM Personal Computer
- IBM Personal Computer XT (not XT/370)
- IBM Personal Computer XT-286
- IBM Personal Computer AT (not AT/370).

together with one of:

- PS/2 Display Adapter
- Enhanced Graphics Adapter (EGA) (128Kb), in 640x350 pixels 16-color mode
- Enhanced Graphics Adapter (EGA) (64Kb), in 640x200 pixels 16-color mode
- Color/Graphics Monitor Adapter (CGA), in 640x200 pixels 2-color mode.

In addition, one of these PCs can be used in CGA emulation mode:

- IBM 3270 Personal Computer
- IBM 3270 Personal Computer AT.

GDDM-PCLK supports the use of:

- Personal System/2 Mouse.

Note: GDDM-PCLK also supports any mouse that can be used to drive ordinary IBM PC applications.

Software

GDDM-PCLK requires DOS Version 2.1 or later, and one of these terminal emulators:

- PC 3270 Emulation Program, Entry Level, Version 1.1[1]
- PC 3270 Emulation Program, Entry Level, Version 1.2[1]
- PC 3270 Emulation Program Version 3
- 3270 Workstation Program Version 1.1.

Note: Your copy of this last program might not contain the code necessary to support GDDM-PCLK 1.1. If this is so, your Workstation Program package should contain a note stating that if you are a GDDM-PCLK or IBM Mouse user, you must contact your local Service Coordinator to get the required Workstation Program code update.

If you are not sure whether you have the correct level of Workstation Program Version 1.1, see page C-11.

GDDM-PCLK also requires PCLKF (PCLK Feature) Version 2.2 on the host.

If you intend using a *mouse*, note that the mouse driver is included with the mouse hardware.

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[1] Provides dual-screen support on non-PS/2 hardware

Storage requirements for GDDM-PCLK

GDDM-PCLK runs in a PC session provided by the IBM Terminal Emulator. The minimum storage size required for this session depends partly on the configuration being used.

Typical storage requirements for various configurations are shown below (all values are in kilobytes):

Basic PCLK system: 182Kb.

Add for display:

	CGA	MCGA	EGA (640x200)	EGA (640x350)	VGA	8514/A
For display	+ 48	+ 76	+ 51	+ 60	+ 73	+ 14
Save/restore graphics	+ 20	+ 40	+ 65	+ 114	+ 154	+ 0

Add for printing and plotting:

Immediate plot   +16

Immediate print   +80.

In addition to the above storage requirements, more storage will be needed in the PC session for DOS, and the mouse driver or 8514/A display driver, if present.

You must also check that your computer has a minimum of:

• One 360Kb diskette drive, double sided.

Reporting problems to IBM

This section is intended for use by system-support personnel who support the host system licensed for the PCLKF feature; only they can be the focal point for any contact with the IBM Support Center.

GDDM-PCLK is one of a matched pair of programs composed of:

GDDM-PCLK   A PC-resident licensed program.

PCLKF   A host-computer-resident feature available with Version 2.2 of GDDM/MVS, GDDM/VM, GDDM/VMXA, or GDDM/VSE.

Service for GDDM-PCLK is always applied to the basic-license PCLKF host program feature, and is automatically downloaded from the host to GDDM-PCLK at the matching version/release level. This is not a mechanism for delivery of upgrades.

When a PC user reports a problem with GDDM-PCLK to you, try to solve it yourself before contacting the IBM Support Center about the basic-license PCLKF program feature. **You can quote the component identifier for PCLKF only, when you report problems to the IBM Support Center.** The PCLKF component identifier depends on which version of the GDDM licensed program you are using on your host computer:

566420003	GDDM/VM with PCLKF
566535603	GDDM/MVS with PCLKF
566632803	GDDM/VSE with PCLKF
568400703	GDDM/VMXA with PCLKF.

Quoting the component identifier helps the IBM Support Center staff to check whether the problem is known, and if so to supply the fix. Service for PCLKF is supplied by IBM on magnetic tape, and performed using:

- SMP or SMP/E in the MVS environment,
- The GDDM Service Exec ADMSERV in the VM environment, or
- MSHP in the VSE environment.

When a PC user starts GDDM-PCLK host application support (option 1 from the GDDM-PCLK Main Panel) the serviced files are automatically downloaded from the host to the PC. For details, see "Start GDDM-PCLK for GDDM application support (option 1)" on page 2-14.

If the problem is not already known, the IBM Support Center staff may ask you to submit an Authorized Program Analysis Report (APAR). For some problems, the IBM Support Center staff may ask you to investigate further. In this instance, you may need to use the GDDM-PCLK trace facility described in "Accessing the service functions" on page 4-2, or you may need to run a GDDM trace. For information on how to submit an APAR, how to invoke GDDM trace, and general points on defining problem symptoms to the IBM Support Center, refer to the *GDDM Diagnosis and Problem Determination Guide*.

The GDDM library

Introduction

GDDM General Information and brochures	GBOF-0058
GDDM General Information	GC33-0319
GDDM If you make business presentations... (brochure)	GC33-0455
GDDM If you're an engineer... (brochure)	GC33-0456
GDDM Release Guide	GC33-0320
GDDM Library Guide and Master Index	GC33-0595

General

GDDM Interactive Map Definition	SC33-0338
GDDM-REXX Guide	SC33-0478
GDDM Image View Utility	SC33-0479
GDDM-PCLK Guide	

User's guides

GDDM Guide for Users	SC33-0327
GDDM-PGF Interactive Chart Utility	SC33-0328
GDDM Image Symbol Editor	SC33-0329
GDDM-PGF Vector Symbol Editor	SC33-0330
GDDM-PCLK Reference Summary (booklet)	SX33-6067
GDDM-CSPF User's Guide	SC33-0552
GDDM Typefaces and Shading Patterns	SC33-0554

Programming

GDDM Application Programming Guide (two volumes)	SC33-0337
GDDM Base Programming Reference (two volumes)	SC33-0332
GDDM Base Programming Reference Summary (booklet)	SX33-6053
GDDM-PGF Programming Reference	SC33-0333
GDDM-PGF Programming Reference Summary (booklet)	SX33-6054
GDDM-GKS Programming Guide and Reference	SC33-0334

Systems

GDDM Installation and System Management for MVS	SC33-0321
GDDM Installation and System Management for VM	SC33-0323
GDDM Installation and System Management for VSE	SC33-0322
GDDM Performance Guide	SC33-0324
GDDM-CSPF Installation Guide	SC33-0553

Diagnosis

| GDDM Messages | SC33-0325 |
| GDDM Diagnosis and Problem Determination Guide | SC33-0326 |

Books from related libraries

In addition to the GDDM library, you may need to refer to some of these manuals:

IBM Personal Computer Hardware Reference Library

Guide to Operations
Installation and Setup

IBM Personal Computer Disk Operating System

DOS Reference

MVS

| OS/VS2 MVS Initialization and Tuning Guide | GC28-0681 |
| OS/VS2 MVS Performance Notebook | GC28-0886 |

VM

VM/SP Installation Guide	SC24-5237
VM/SP Planning Guide and Reference	SC19-6201
VM/SP Operator's Guide	SC19-6202
VM/SP System Programmer's Guide	SC19-6203
VM/VCNA General Information	GC27-0501
VM/VCNA Installation, Operation and Terminal Use	SC27-0502
VM/XA SP Planning	GC23-0378

related libraries

VM/XA SP Installation and Service	SC23-0364
VM/XA SP Administration	SC23-0353

VSE

VSE Installation Guide	SC33-0322

3274

3274 Control Unit Description and Programmer's Guide	GA23-0061
3274 Control Unit Planning, Setup and Customization Guide	GA23-2827

Emulators

Workstation program

IBM 3270 Workstation Program: User's Guide and Reference
IBM 3270 Workstation Program: Programmer's Guide

Emulation programs

IBM PC 3270 Emulation Program, Entry Level, Version 1.1
IBM PC 3270 Emulation Program, Entry Level, Version 1.2
IBM 3270 Emulation Program Version 3.00: System Planner's and User's Reference
IBM 3270 Emulation Program Version 3.00: User's Guide

Token Ring

IBM PC Local Area Network Program: User's Guide

Mouse

IBM Personal System/2 Mouse Installation and Cleaning Instructions

Summary of amendments

Changes to this guide for GDDM-PCLK Version 1.1

Additions

The *GDDM-PCLK Guide* has been updated to include references to:

- Merged alphanumeric and graphics display option that eliminates the need to hot-key

- Support for CICS under MVS and VSE

- New device support:

  - IBM Personal System/2 Model 30 MultiColor Graphics Array (MCGA)
  - IBM Personal System/2 Model 80
  - New printers:
    - 4201-1 Proprinter™ II
    - 4207 Proprinter X24
    - 4208 Proprinter XL24
    - 5202 Quietwriter™ III.
  - New plotters:
    - 6182 auto-feed color plotter
    - 6186 color plotter with cut-sheet/roll-feed.
  - IBM Personal System/2 Mouse.

- Graphic object save function to generate a PIF file

- Alphanumerics, which can now be printed, in addition to graphics and image

- An additional terminal emulator, the IBM 3270 Workstation Program Version 1.1.

New GDDM-PCLK messages have been added.

Screens have been updated where necessary.

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changes to this guide

More information has been given on keyboard key assignments, including the provision of keyboard templates for the Personal Computer AT, Personal Computer XT, and Enhanced PC keyboards.

The guide has been restructured to reflect the new merged alphanumeric and graphics facility.

New terms have been added to the Glossary.

A number of typographical and formatting improvements have been made throughout the guide.

Deletions

References to the following emulators have been removed, as they are no longer supported:

- IBM PC 3270 Emulation Program, Entry Level, Version 1.0
- IBM PC 3270 Emulation Program, Version 2
- IBM 3270 Workstation Program, Version 1.0.

Notes
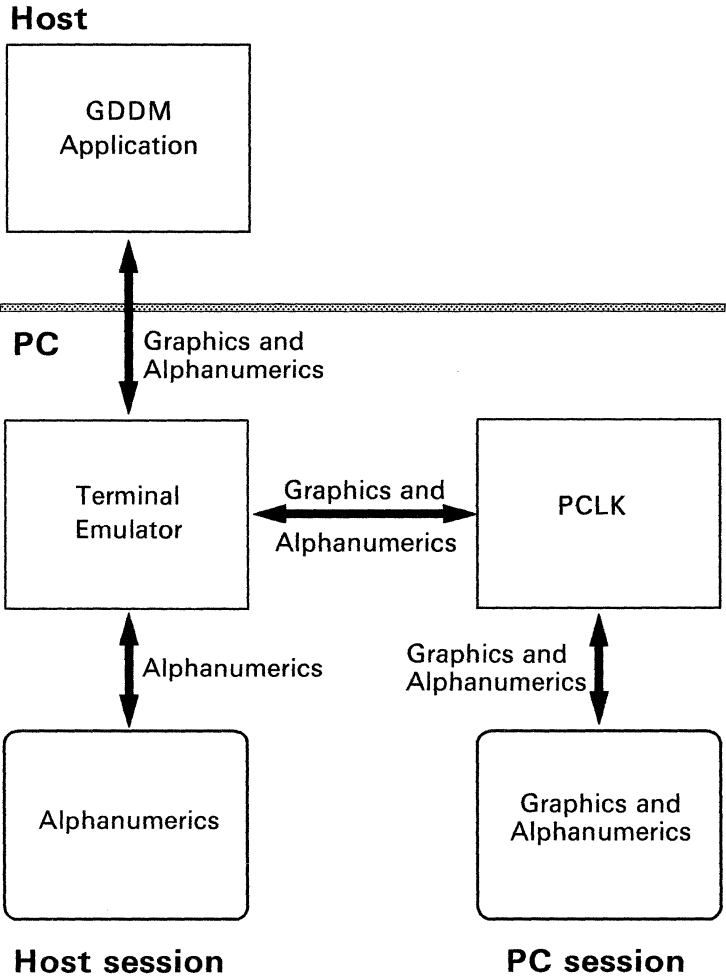
host to GDDM-PCLK relationship

Figure   1-1. GDDM-PCLK uses a terminal emulator to communicate with
              GDDM

Chapter 1. Introduction

This chapter introduces GDDM-PCLK. GDDM-PCLK is a personal computer (PC) licensed program that enables you to display graphics generated by a GDDM program running on a host computer linked to a variety of IBM personal computers equipped with graphics-display adapters, and to IBM Personal System/2™ (PS/2)™ computers, which do not need additional graphics-display adapters. Using GDDM-PCLK, you can also send host-generated graphics to a PC-attached plotter or printer.

Because images are emulated in the host using existing GDDM graphics support, this guide uses the word "graphics" to refer to graphics or images. The other word that you will come across to describe items displayed on the PC is "alphanumerics." Alphanumerics are any combination of words (for example, panels, menus, and instructions) that are displayed on your PC.

GDDM-PCLK is one of a matched pair of programs composed of:

GDDM-PCLK   A PC licensed program, running under the IBM
                Disk Operating System (DOS) Version 2.1 or later.

PCLKF   A host-computer-resident feature available with
                GDDM/MVS, GDDM/VM, GDDM/VMXA, or
                GDDM/VSE Version 2.2 or later.

For simplicity, this guide calls the part that runs on the host "GDDM".

GDDM-PCLK communicates with GDDM in the host using a 3270 *terminal emulator*. This is a separate non-GDDM product that runs concurrently with GDDM-PCLK on the PC, and makes the PC behave in a similar way to an IBM 3278 or 3279 terminal. A terminal emulator handles the two-way communication between the PC and the host, as illustrated in Figure 1-1 on page xxiv. Through a terminal emulator, you can log on to and use the facilities of a host session in the normal way. Some terminal emulators let you access

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more than one host session and others let you access more than one
DOS session. PCLK runs in one of the DOS sessions.

You switch between a host session and a DOS session by pressing a
key or combination of keys. This process is known as *hot-keying*.
(Some products call the hot-key the jump-screen key.)

The key or keys that you press to hot-key vary, depending on the
terminal emulator you are using; on some, you press Alt and Esc at
the same time to hot-key; on others, you press another key or keys.
Because of this variation, the rest of this guide just tells you to
hot-key. To find out how to hot-key on your terminal emulator, refer
to the terminal emulator itself, its documentation, or your
system-support personnel.

For general information on how keys are assigned on the Personal
Computer AT, Personal Computer XT, and Enhanced PC keyboards,
see "Keyboard support" on page C-1.

Through the terminal emulator you can run a GDDM graphics
application program (for example, a business chart program) on the
host. You can supply alphanumeric text to the program in the normal
way. For example, you can enter numeric data for a chart, and text
for axis labels and a legend. You can then request that the chart be
displayed.

GDDM-PCLK usually operates in what is called *merged* mode,
whereby the graphics and the alphanumerics are displayed together,
giving a DOS session the appearance of a host session. GDDM-PCLK
takes the host-generated graphics from the terminal emulator,
converts them into a format that is compatible with the PC, and
displays them in the DOS session. This is the usual way to work.

However, GDDM-PCLK can also operate in another mode, called
non-merged mode, and you may find this mode is quicker if you have
a lot of alphanumeric data to display. In non-merged mode, the
graphics and alphanumerics are displayed separately; you select
whether you see the graphics or the alphanumerics. Details are
given in Appendix D, "Running non-merged mode" on page D-1.

Terminology: Throughout this guide, the phrase "merged mode" implies merged alphanumerics and graphics mode, and the phrase "non-merged mode" implies non-merged alphanumerics and graphics mode.

To see your alphanumerics and graphics:

- When you have a dual-screen configuration with an IBM PC 3270 Emulation Program Entry Level emulator, you can run your host program from one screen, while GDDM-PCLK automatically displays host-generated graphics in the DOS session on the other screen, without hot-keying to it.

- When you are using a single screen only (either a single-screen PC configuration, or a dual-screen PC configuration with a terminal emulator that uses a single screen for both the host session *and* the DOS session) you enter and display alphanumerics in the host session on the screen first. You then hot-key to the DOS session on the same screen to display the merged graphics and alphanumerics.

Note that non-merged alphanumerics and graphics does not mean that you cannot see text on your *graphics* display. Any *graphics text* is displayed as part of the graphics output from an application. In addition, the GDDM User Control panels are visible as graphics text on your graphics screen.

GDDM-PCLK also supports a graphics cursor, so that you can provide graphics input from a PC, through a terminal emulator, to GDDM in the host. A typical example of graphics input is the picking and repositioning of graphics objects on the screen.

GDDM-PCLK does not support string and stroke graphics input.

Chapter 2. Using GDDM-PCLK

This chapter tells PC users how to:

- Install the GDDM-PCLK program
- Set up GDDM-PCLK for a specific PC environment
- Run GDDM-PCLK, including:
  - Plotting a file
  - Printing a file.

If things go wrong . . .

If you have any problems installing or running GDDM-PCLK — for example, you receive an unexpected message, or the appearance of the screen is not what you expected — see Appendix B, "Errors and messages" on page B-1.

Pages B-1 through B-3 tell you about two problems that can be experienced when first using GDDM-PCLK, and a list of all the messages that can be issued when using GDDM-PCLK is shown on pages B-6 through B-19.

Using GDDM-PCLK: checklist

1. Install GDDM-PCLK

2. Prepare the GDDM-PCLK environment:

   a. Set up a terminal emulator

   b. Set up a mouse

   c. Set up disk storage

   d. Set up a nickname file.

3. Run GDDM-PCLK:

   a. Start the host GDDM application

   b. Start GDDM-PCLK

   c. Set up GDDM-PCLK for your workstation

   d. Start GDDM-PCLK for GDDM application support.

Installing GDDM-PCLK: procedure

Before starting to install GDDM-PCLK, check that you have available either *two* 5.25-inch installation diskettes, or *one* 3.5-inch installation diskette.

1. Jump to a DOS session.

2. Insert the first GDDM-PCLK 5.25-inch installation diskette, or the 3.5-inch installation diskette into drive A.

3. Change the current drive to drive A if necessary.

4. Decide which drive you want GDDM-PCLK to be installed on.

5. Decide which language you want the GDDM-PCLK panels to be shown in. The national language versions and their codes are:

   /fr   French
   /cf   French (Canadian)
   /gr   German
   /it   Italian
   /sp   Spanish
   /us   U.S.-English (the default).

6. Type this command, and press ◄⎯⎦:

   `pclkinst d: /nl`

   where **d:** specifies the target disk drive, and **/nl** specifies the national language selection.

   If you do not specify a value for **nl** the GDDM-PCLK panels are displayed in U.S.-English (the default).

   For example, if you want GDDM-PCLK installed on the fixed disk, drive C, and you want the panels to be shown in Italian, type this command and press ◄⎯⎦:

   `pclkinst c: /it`

The IBM logo panel is displayed:


```
                    =========
                  =======  ======
                =====  ====  =====
              =====   =====   =====
            =====    =====    =====
```

(IBM logo)

```
                    Personal Computer

              ┌─────────────────────────┐
              │                         │
              │         GDDM-PCLK        │
              │                         │
              │        Version 1.1       │
              │                         │
              └─────────────────────────┘

              (C)  Copyright IBM Corp 1987, 1988

       Press any key to continue ...
```
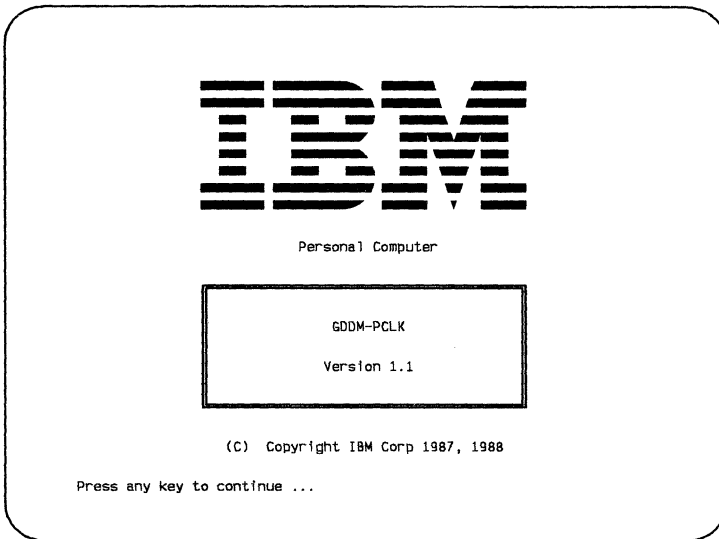
Figure   2-1. IBM logo panel

7. Press any key. The installation process creates a subdirectory
   called **PCLK11** on the disk or diskette in the specified drive, and
   installs the GDDM-PCLK program files into it. You receive the
   message:

   GQD1010 Installation in progress.
   **   Number of files left to create = n**

   where **n** is a count of the number of files that GDDM-PCLK has yet
   to install.

   If you are installing GDDM-PCLK from 5.25-inch diskettes, you
   receive this message to remind you to remove the first
   installation diskette, and replace it with the second:

   GQD1033 Remove installation diskette 1 and insert diskette 2.
   **   Press any key to continue.**

   When installation is complete, the message:

   GQD1020 Installation complete.

   is displayed.

8. Press any key to clear the message and return to DOS.

9. Remove the installation diskette or disk from the drive.

You should now have successfully installed GDDM-PCLK.

Before you run GDDM-PCLK

Setting up a terminal emulator

Before you run GDDM-PCLK to display graphics produced by your host graphics program, you must have a *terminal emulator* present on your PC. For a list of those available, see page xiii. For information on how to install it, see page C-11. Make sure you are familiar with the hot-key for your emulator.

Setting up a mouse

If you intend using a mouse, ensure that it is plugged in, and that you are familiar with its button arrangements. Ensure also that any separate mouse driver program has been loaded.

Setting up disk storage

You must ensure that there is enough disk storage available; you should have at least one 360Kb drive (double sided).

Setting up a nickname file

If a host graphics program has not been written specifically for GDDM-PCLK, you must have a file called a *nickname* file on your host system.

- Under CICS you must ask your system programmer to assemble the nickname statement in your GDDM external defaults module ADMADFC.
- Under TSO, the file must have a ddname of ADMDEFS.
- Under VM, the file must be on a currently-accessed host disk (for example, your A-disk), and it must have the file name PROFILE and the filetype ADMDEFS.

The file must contain this statement, which must always be preceded by a blank:

`ADMMNICK FAM=1,PROCOPT=((PCLK,YES))`

The nickname statement provides a processing option that tailors the host graphics program to GDDM-PCLK, without you having to change the application itself. For more details, see page 3-1.

If you intend running a plot or print program, you need the nickname statement:

`ADMMNICK FAM=0,NAME=`*appl-device-name*`,TOFAM=1,`
`        TONAME=(*,`*pc-device-name*`)`

where *appl-device-name* is the name of the plotter or printer that the host graphics program will send output data to. If you do not know what the name is, ask your system-support personnel. Some programs, for example, the GDDM-PGF Interactive Chart Utility (ICU), need to be given this name before plotting or printing can take place. Make a note of the name for future use. *pc-device-name* is either ADMPLOT for a plotter, or ADMPCPRT for a printer.

Running GDDM-PCLK

1. Log on to a host session.

2. Start a program that uses GDDM to write to your PC; for example the GDDM-PGF program, the Interactive Chart Utility (ICU).

3. When you receive the prompt:

   `ADM0873 I IF AVAILABLE, PLEASE SELECT PCLK.`
   `          OTHERWISE, PRESS 'ENTER'`

   hot-key to the DOS session.

4. Ensure that the drive you specified with the **pclkinst** command is current. Make the GDDM-PCLK directory (PCLK11) current or specify it in your directory path.

5. Type the command

pclk

and press ↵ . The IBM logo panel is displayed in the default language specified at installation time. If you want a different language, for example, German, you can specify **pclk /gr**. The panel and message files in the specified language are transferred automatically from the host when you select option 1 from the main panel; see "Start GDDM-PCLK for GDDM application support (option 1)" on page 2-14. The panels are then displayed in German for this and subsequent GDDM-PCLK sessions, until you specify otherwise. The list of available national languages, and their codes, is on page 2-2.

6. Press any key to get to the GDDM-PCLK main panel:

```
                          GDDM-PCLK  Main Panel


       To select one of the following, type a number, or use the Cursor-move
       keys and press Enter.


     ▶ 1. Start PCLK GDDM application support

       2. Plot a file stored on a PC disk

       3. Print a file stored on a PC disk

       4. Setup PCLK for your workstation




       _____
       Esc=Cancel
```
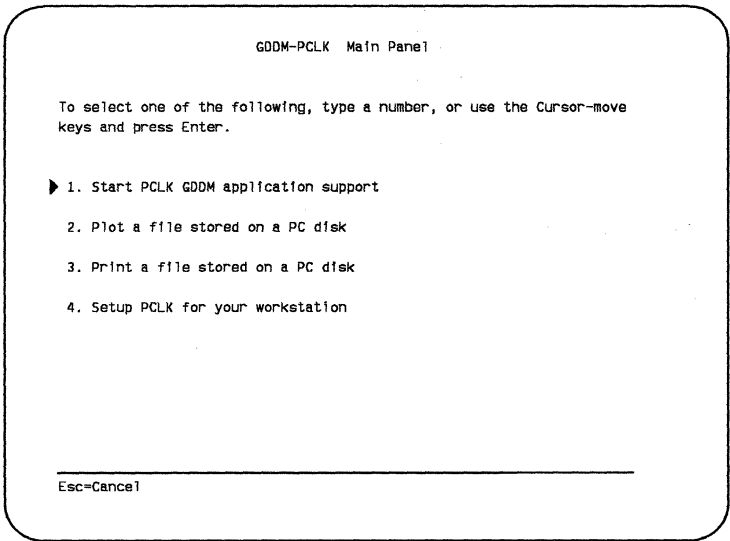
Figure   2-2. Main panel

7. The main panel gives you the options shown in Figure 2-2 on page 2-6. A pointer symbol (▶) indicates the option that is chosen when you press ◄┘ . On color screens, the option with the pointer also has a highlighted background. On monochrome screens, the option with the pointer is underscored.

You can use the cursor up (↑) and cursor down (↓) keys to move the pointer to a different option, or you can type in the number of the option you want, without pressing ◄┘ .

Restarting GDDM-PCLK: If you have already run GDDM-PCLK in this session, you can bypass the normal startup procedure just defined. Type in this command:

pclk /q

and press Enter; GDDM-PCLK resumes with option 1 selected.

GDDM-PCLK options: All the options are described in subsequent sections of this chapter. If you have not used GDDM-PCLK on your PC before, select option 4 "Setup GDDM-PCLK for your workstation," described on page 2-8 before you select any other option.

Setup GDDM-PCLK for your work station (option 4)

Option 4 provides a series of panels that enable you to define to GDDM-PCLK which plotter, printer, terminal emulator, and performance and usability options you intend to use. If you are not sure about any of this information, ask your system-support personnel.

There are three parts to the Setup Panel, and two versions of part 1 of the panel, depending on the terminal emulator you are using. If your terminal emulator gives you more than one host session, part 1 of the panel lets you select which host session you want to use, and it looks like this:

```
Setup                   GDDM-PCLK  Setup
To select an item, position the cursor against it and press the
Space Bar. Press Enter to save selections on ALL THREE parts
                                              Part 1 of 3

Plotter:                         Terminal emulator:

Attached?. . . . . . . ▶No       Host session . .   ▶E HOST1
                        Yes                          F HOST2
                                                     G HOST3
Port . . . . . . . . .  COM1                         H HOST4
                        COM2

Model number . . . . .  PCLK to query plotter
                        Use IBM model number  . . .  [    ]

Plot immediately (no prompt to defer)? . . . . . . .  No
                                                      Yes
_____

Esc=Cancel                    PgDn=Forward
```
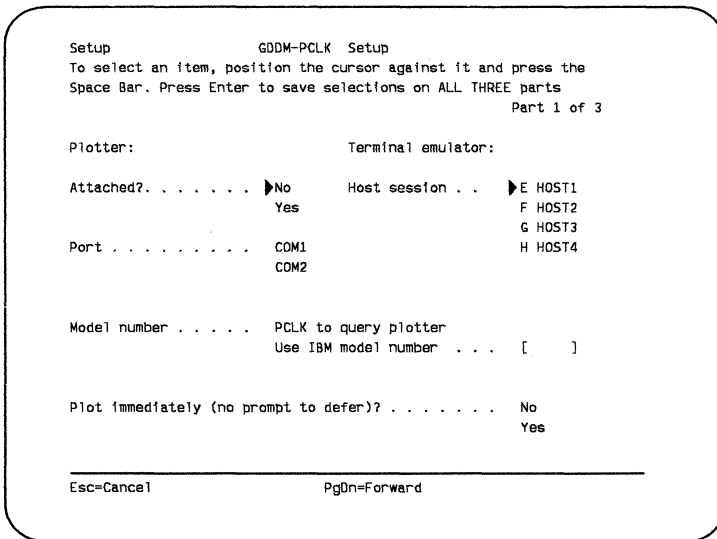
Figure 2-3. Setup panel: part 1 (with host-session selection)

If you are using a terminal emulator that lets you access only one host session, part 1 of the panel looks like this:

```
Setup                  GDDM-PCLK  Setup
To select an item, position the cursor against it and press the
Space Bar. Press Enter to save selections on ALL THREE parts
                                              Part 1 of 3


Plotter:

Attached?. . . . . . . ▶No
                        Yes

Port . . . . . . . . .  COM1
                        COM2


Model number . . . . .  PCLK to query plotter
                        Use IBM model number  . . .  [    ]


Plot immediately (no prompt to defer)? . . . . . .  No
                                                    Yes


Esc=Cancel                    PgDn=Forward
```

Figure   2-4. Setup panel: part 1 (without host-session selection)

The ▶ symbol indicates the current options. Do not press ← until you are sure that all three panels show the options that you want. Pressing ← saves the current options on the three panels.

On color screens, the cursor position is shown by a highlighted background. On monochrome screens, the option with the cursor is underscored. Use the cursor-move or tab keys to move to another option. The current options are indicated by a ▶ symbol. When you have moved to the option you want, press the space bar to make it current. For example, to tell GDDM-PCLK that you have a plotter attached to COM2, move the cursor to Yes and press the space bar. A ▶ appears against COM1. Move the cursor to COM2, so that the background of COM2 is highlighted or underscored. Press the space bar, and the ▶ moves to COM2 to show that it is now the current option.

Each question on this panel is now dealt with in turn:

Attached?
If you specify that a plotter is not attached, you cannot select a port
for it.

Port
Select either COM1 or COM2. For an explanation of these, refer to *DOS
3.30 Reference*, under the heading "DOS Device Names."

Model number
If you intend using different plotters with your PC, select PCLK to
query plotter and do not enter an IBM model number; otherwise,
enter the IBM model number of the plotter (for example, 7372). Note
that you can enter the model number for a plotter that you want to use
for deferred plotting, even if you have specified that a plotter is not
attached. This results in plot files being saved in a subdirectory with
that model number as the name.

Plot immediately (no prompt to defer)?
If you intend always to plot immediately and do not want to be
reminded about deferred plotting, select Yes for this question. But
remember that when using merged mode, it is more efficient to defer
your plotting.

If you press the PgDn key, part 2 of the panel lets you set up
GDDM-PCLK for the type of printer you are using with your PC:

```
 Setup              GDDM-PCLK  Setup
 To select an item, position the cursor against it and press the
 Space Bar. Press Enter to save selections on ALL THREE parts
                                                    Part 2 of 3
 Printer:

 Model . .  ▶None
            5182 Color Impact
            3852-1 Color Jetprinter
            3852-2 Color Jetprinter   Device name . .   LPT1
            5152 Graphics Printer                       LPT2
            4201 Proprinter                             LPT3
            4201-2 Proprinter II
            4202 Proprinter XL        Resolution  . .   Standard
            4207 Proprinter X24                         High
            4208 Proprinter XL24
            5201 Quietwriter          Form width  . .   Standard
            5202 Quietwriter III                        Wide

            Print immediately (no prompt to defer)? . .  No
                                                         Yes

 Esc=Cancel    PgUp=Backward    PgDn=Forward
```

Figure   2-5. Setup panel: part 2

You can change the options in the same way as in part 1 of the panel.
Each question on this panel is now dealt with in turn:

Model

Select **None** or a number from the list displayed.

If you do select a printer model of **None**, you cannot select a device
name, resolution, form width, or defer option for it.

Device name

Select one of **LPT1**, **LPT2**, or **LPT3**. For an explanation of these, refer to
DOS 3.30 Reference, under the heading "DOS Device Names."

Resolution

Select **High** to get a print with a maximum amount of detail. For more
information on print resolution, see page C-16. Note that printing
takes longer in high-resolution mode.

GDDM-PCLK setup

Form width

Select **Standard** if the paper size in your printer is A4 (ISO) or quarto (ANSI size A).

Select **Wide** if the paper size in your printer is wider than A4 or quarto.

Print immediately (no prompt to defer)?

This has the same effect as "plot immediately"; see page 2-10.

If you intend always to print immediately and do not want to be reminded about deferred printing, select **Yes** for this question. But remember that when using merged mode, it is more efficient to defer your printing.

If you need to, you can press the PgUp key to return to part 1 of the setup panel.

If you press the PgDn key, part 3 of the panel lets you define performance and usability options for your plotted or printed output. You can define whether you want to:

- Save the graphics you have created before you hot-key
- Merge alphanumerics and graphics
- Use the default display attributes.

```
Setup                   GDDM-PCLK  Setup
To select an item, position the cursor against it and press the
Space Bar. Press Enter to save selections on ALL THREE parts
                                        Part 3 of 3
Performance and usability options:

  Save graphics before hot-keying? . . . . . . . . ▶No
                                                    Yes


  Merged graphics and alphanumerics? . . . . . . .  No
                                                   ▶Yes


  Use 7-color and reverse-video attributes?. . . . ▶No
                                                    Yes




  ─────────────────────────────────────────────────
  Esc=Cancel     PgUp=Backward
```

Figure 2-6. Setup panel: part 3

Each question on this panel is now dealt with in turn:

Save graphics before hot-keying?

If you select **Yes** and there is enough memory available, GDDM-PCLK saves the graphics when you press Ctrl-F9 before hot-keying to the host session, and restores the graphics when you press Ctrl-F9 again after hot-keying back from the host session.

Merged graphics and alphanumerics?

By default, GDDM-PCLK runs in merged graphics and alphanumerics mode, which means that you don't have to hot-key to see your graphics. However, in this mode you are recommended to defer any plotting or printing.

If you deselect **Merged graphics and alphanumerics**, you can improve performance, and GDDM-PCLK will need less memory.

Use 7-color and reverse-video attributes?

If you select **yes**, you can use these field and character attributes:

- Color (seven)
- Reverse-video
- Underlining.

If you select **yes** and your current emulator does not support the 3270 Extended Data Stream feature, your request is ignored.

If you do not select **7-color and reverse-video attributes** you can improve performance, and GDDM-PCLK will need less memory.

When you have completed part 1, part 2, and part 3 of the Set-up panel, press ◄┘ to save the changes and return to the main panel.

If you press Esc, you quit the panel. Any changes you made to part 1, part 2, or part 3 of the panel are ignored, and you return to the main panel.

You should now have completed setting up GDDM-PCLK for your preferred methods of processing, and your particular arrangement of PC-attached plotters and printers. You are now ready to use GDDM-PCLK for GDDM application support.

Start GDDM-PCLK for GDDM application support (option 1)

When you select option 1, a link is established between your host graphics program and GDDM-PCLK.

If you are running in merged mode, this message may be displayed:

GQD0305 To complete installation for merged graphics and
         alphanumerics, start a GDDM application on the host.

If this message is displayed, press Ctrl-F9 to deselect GDDM-PCLK and hot-key to your host session and start an application that uses GDDM. This causes file requests by GDDM-PCLK to be transferred automatically by GDDM. Otherwise, the alphanumerics from the host session are displayed.

If you are running in non-merged mode, the message:

GQD0010 PCLK ready. Press "Ctrl-F3" to cancel.

is displayed in the DOS session. The message appears only briefly when GDDM has asked you to select GDDM-PCLK.

The bottom line of the screen is called the *operator information area (OIA)*.

When running in merged mode, the OIA for the host session is displayed in this line.

Note: For the IBM 3270 Emulation Program Version 3 it is only possible to display the input inhibited indicator, ✖ .

When running in non-merged mode, a horizontal line is drawn across the bottom of the screen to show that the screen is ready to display graphics. The only symbol that may be displayed in the OIA is a white cross to indicate that GDDM-PCLK is busy.

If GDDM-PCLK has just been installed, or you specified a language other than the default, or service has been applied to PCLKF in the host, you receive the prompt:

GQD0030 File transfer in progress. Please wait.
         Number of bytes transferred so far = n
         (filename)

Files that GDDM-PCLK requires are automatically transferred from
the host to your PC. (For details of a problem that can occur if you
are running GDDM-PCLK on a low-density diskette, see "If your
diskette fills up during automatic transfer" on page B-2.) The n in the
message is a count of the bytes transferred by the automatic transfer.
The **filename** is the name of the file being transferred. When the
transfer is complete, the message:

```
GQD0430  PCLK update process complete
           - press any key to exit PCLK, then restart PCLK.
```

may be displayed. If it is, press any key to return to DOS, type the
pclk command again, and press ◄┘ . The main panel is
redisplayed. Select option 1 again.

The message:

```
GQD0431  PCLK update process complete -
           press any key to cancel PCLK, then restart system.
```

may also be displayed. If it is, you must restart both the emulator and
GDDM-PCLK.

Any graphics displayed by your host graphics program at this time
also appears on the screen.

If you are using a single screen only (either a single-screen PC
configuration, or a dual-screen PC configuration with a terminal
emulator that lets you use just a single screen for both the host
session **and** the DOS session), press Ctrl-F9 to deselect GDDM-PCLK,
so that the screen can be used by the host session. The prompt:

```
GQD0020 Either "hot-key" to host session,
          or press Ctrl-F9 to resume PCLK.
```

is displayed.

On all configurations, hot-key back to your graphics program in the
host. You have started GDDM-PCLK for GDDM application support,
and so any graphics generated by the application are passed to
GDDM-PCLK for displaying, plotting, or printing in the DOS session.

There is an example of using a GDDM application at
Appendix A, "Running the ICU from a PC" on page A-1.

Plotting and printing graphics from a GDDM program

When a host program sends a graphics file to your PC for plotting or printing, and you selected **No** in response to the question

`Plot/print immediately (no prompt to defer)?`

in the Setup panel 1 (plotting) or 2 (printing), this panel is displayed:

```
                    GDDM-PCLK  Plotter/Printer Output




     To select an item, position the cursor against it and press the
     Space Bar.  Press Enter to proceed.


     Output mode. . . . . . . . .  ▶ Plot/print immediately
                                     Store data on PC disk


     Filename . . . . . . . . . . .  [        ]


     Replace an existing file
     with the same name . . . . . .   Yes
                                      No




     ─────────────────────────────────────────────────────────────
     Esc=Cancel
```

Figure   2-7. Plotter/printer output panel

You can select either to plot or print immediately, or to defer the actual plotting or printing to another time. You can get better performance if you select deferred plotting or printing; see pages 2-11 and 2-12. A ▶ symbol points to the current option.

Immediate plotting or printing: If you select immediate plotting or printing, the graphics are immediately sent to your PC-attached plotter or printer. Your plotter or printer must be switched on, and you must have previously set up GDDM-PCLK for your plotter or printer, using option 4 from the main panel, described in "Setup GDDM-PCLK for your work station (option 4)" on page 2-8; otherwise you will receive an error message.

If these conditions are met, you receive this message if you are plotting:

GQD0519   Plotting in progress. Press "Esc" to cancel.

or, if printing:

GQD0518   Data transfer in progress. Please wait.
          Number of bytes transferred so far = n

followed by:

GQD0507   Printing in progress. Press "Esc" to cancel.

While the graphics are being plotted or printed, you can hot-key back to the host session if you want to. However, the plotting or printing is suspended until you hot-key back to GDDM-PCLK. On some devices, the suspension does not occur until the device has processed the plot/print data stream in its internal storage buffer.

If you want to cancel a plot or print, press Esc in the DOS session.

Another way to cancel a plot is to press the GDDM-PCLK equivalent of the Clear key in the DOS session. On some devices, the plotting does not stop until the plotter has processed the plot data stream in its internal storage buffer; this may also apply when using some printers.

Deferred plotting or printing: If you decide to defer the plot or print, you must enter a unique file name, or specify that an existing file is to be overwritten. The data is stored in a file of that name in a subdirectory **nnnn**, where **nnnn** is the device; for example, 5182.

While the plot or print data is being stored, you receive the message:

GQD0518   Data transfer in progress. Please wait.
          Number of bytes transferred so far = n

If you specify an existing file name, but do not specify that it is to be overwritten, the message:

File already exists

is displayed on the panel.

GDDM-PCLK-supplied control keys

The GDDM-PCLK control keys are assigned as follows:

Ctrl-F1	t	Alpha cursor style [1]
Ctrl-F2	t	Alpha cursor/graphics cursor move [1] [2] [3]
Ctrl-F3		Exit GDDM application support
Ctrl-F4		Erase graphics and redraw alpha [1] [4]
Ctrl-F5		PA3 to host to redraw screen
Ctrl-F6		Not defined
Ctrl-F7	t	Graphic cursor style [3]
Ctrl-F8	t	Graphic cursor speed [2] [3]
Ctrl-F9		Suspend PCLK for hot-key
Ctrl-F10		Not defined

[1] Only effective in merged graphics mode
[2] Not effective when a mouse is installed
[3] Only effective when the graphic cursor is displayed
[4] With some emulators, GDDM-PCLK cannot control when graphics
    are erased, and so they may not be erased when required.
    Therefore, the F4 control-key function is provided to let the user
    decide when to erase graphics.
t "Toggle-action" key.

GDDM-PCLK-supplied host keys

When using the IBM 3270 Workstation Program Version 1.1, correctly
configured for the GDDM-PCLK system extension (see page C-12), the
GDDM-PCLK key assignments match those of the host session.

When using the IBM 3270 Emulation Program, Entry Level, and the
IBM 3270 Emulation Program Version 3, it is **not** possible for
GDDM-PCLK to match the key assignments to those of the host
session. The GDDM-PCLK default is shown on the keyboard
templates supplied with your GDDM-PCLK program package and as
listed in Appendix C, "Reference information" on page C-1.

GDDM User Control functions

You can activate GDDM User Control functions when running a GDDM application with GDDM-PCLK. User Control is described in the *GDDM Guide for Users*; refer to "Introduction to GDDM's User Control."

If User Control is normally activated by a PF key on your system, you can activate it in the DOS session when using GDDM-PCLK to view graphics, by means of the GDDM-PCLK equivalent of the PF key. In this case, the User Control panels appear at the bottom of the graphics display.

Under GDDM-PCLK the User Control graphics functions such as sizing, scrolling, and zooming in or out, are available.

GDDM-PCLK plotting and printing, as already described, are available in the DOS session.

Creating PIF files

Activating User Control also lets you create, by means of the output panel, picture interchange format (PIF) files.

Note: GDDM-PCLK cannot read, display, or print PIF files.

To create PIF files while GDDM User Control is active:

1. Select option 4 (Output) from the User Control Graphics panel displayed on your host screen.
2. When the Output panel is displayed, leave all the input fields unchanged and press PF5 (save PIF).
3. When the file transfer panel appears (see Figure 2-8 on page 2-20), type in the path name, the file name, and select the overwrite option as required. Press ↵ .
4. You then see this message displayed:

   ```
   GQD0030  File transfer in progress. Please wait.
            Number of bytes transferred so far = n
            (C:\PCLK11\PIF\PIF00001.PIF)
   ```

   where n is a running count of the number of bytes transferred.
5. Press PF3 to return to the User Control graphics panel.

If you see messages that say the selection is invalid, check that you have this nickname statement in your nickname file (remember to precede it with a blank character):
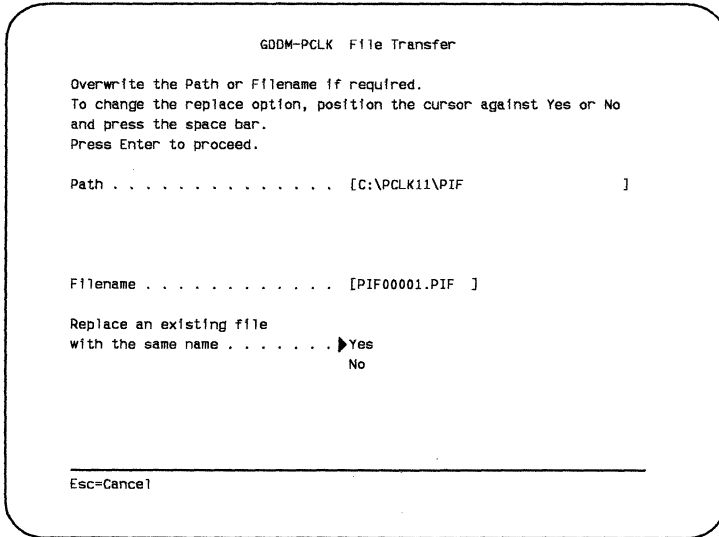
ADMMNICK FAM=1,PROCOPT=((CTLSAVE,YES))

```
                      GDDM-PCLK   File Transfer

      Overwrite the Path or Filename if required.
      To change the replace option, position the cursor against Yes or No
      and press the space bar.
      Press Enter to proceed.

      Path . . . . . . . . . . . . . .   [C:\PCLK11\PIF                    ]




      Filename . . . . . . . . . . . .   [PIF00001.PIF ]

      Replace an existing file
      with the same name . . . . . . . ▶Yes
                                         No




      ─────────────────────────────────────────────────────
      Esc=Cancel
```

Figure   2-8. PIF file transfer

Using interactive graphics applications

With interactive applications, GDDM-PCLK gives you a choice of two graphics cursors; a small cross or a larger cross-hair. You move the graphics cursor with the cursor-move keys, or a mouse if you have one. The small cross is the default. Except when you are using a PS/2 mouse, there are two cursor speeds available; fast and slow. Fast is the default. You can control the appearance and speed of the cursor as follows:

Ctrl-F7   Switches the cursor between the small cross and the cross-hair

Ctrl-F8   Switches the cursor speed between fast and slow

Shift   When pressed and held down while you move the cursor, gives you the opposite of the current cursor speed.

For an example of using an interactive graphics application, see "Using the graphics cursor to move chart notes" on page A-3.

Using a mouse to move the cursor

If you have a mouse, you can use it to move the graphics cursor in interactive GDDM applications. Important points to note are:

• You can use the mouse buttons as a *choice* device

• Do not attach the mouse to the port configured for the plotter.

As with cursor-movement keys, you can change the appearance of the graphics cursor by using the Ctrl-F7 shift keys.

Plot a file stored on a PC disk (option 2)

Set up plotter
Make sure that your PC plotter is attached, switched on, and ready to plot.

Note: You are recommended to defer any plotting when using GDDM-PCLK in merged mode.

If you intend using a PC-attached plotter (see page 3-2), ask your system-support personnel to ensure that it is set with these characteristics:

4800 baud (data transmission rate)
No parity
1 stop bit
8-bit word length.

To plot or delete a stored file on your PC-attached plotter (for
information on storing your plot files, see page 2-17), select option 2
from the main panel. This panel is displayed, showing a list of
deferred files:

```
                GDDM-PCLK   Plot or delete a file

    To select files position the cursor against the filename and press
    the Space Bar. Press Enter to plot ALL the selected files or F1 to
    delete ALL the selected files.
                                                Part 1 of 1


            Filename:  Date:     Time:         Plotter:  6180
            ---------  -----     -----
            IRSFILE    12/21/87   6:30p
            RESULTS1   01/27/88  11:45a
            SALES1QR   02/10/88   6:30p
            1986FIGS   03/17/88   2:17p
            PROFITS1   03/28/88   2:24p




    Esc=Cancel                          F1=Delete
```

Figure   2-9. Plot or delete panel

The panel shows only those deferred files that were created for the
plotter that is currently attached and switched on. If the list of
deferred files exceeds one page, you can use the PgDn (page down)
and PgUp (page up) keys to scroll vertically through them.

If you try to access this panel without having set up GDDM-PCLK for
your plotter (using option 4 from the main panel), or if you have no
deferred files for the plotter, this panel is not displayed, and
GDDM-PCLK issues an error message. Go back to the main menu
panel, select option 4, and set up GDDM-PCLK for your plotter.

Use this panel either to select files for plotting, or to select them for
deleting. To select a file, position the cursor against it, and press the
space bar. You cannot select files for plotting, and files for deleting,
at the same time.

To plot the selected files, press ◄─┘ . While each file is being plotted, you receive the message:

GQD00506 Plotting spooled file. Press "Esc" to cancel.
Number of bytes of remaining data = n

where **n** is a countdown of the remaining bytes of the file being plotted. Wait until the graphics are plotted, or press Esc to cancel the plot. On some devices, the plotting does not stop until the plotter has processed the plot data stream in its internal storage buffer.

To delete the selected files, press F1. The message:

Press Enter to confirm deletion of selected files.

appears on the panel. Either press ◄─┘ to confirm the deletion, or any other key to cancel it.

GDDM-PCLK supports these plotters, connected to the PC through an RS-232C interface:

- IBM 6180
- IBM 6182
- IBM 6184
- IBM 6186
- IBM 7371
- IBM 7372
- IBM 7374*
- IBM 7375*

Print a file stored on a PC disk (option 3)

Set up printer
Make sure that your PC printer is attached, switched on, and ready to print.

Note: You are recommended to defer any printing when using GDDM-PCLK in merged mode.

_____

* Withdrawn from marketing.

To print the stored file on your PC-attached printer, (for information
on storing your print files, see page 2-17), select option 3 from the
main panel. This panel is displayed, showing a list of deferred files:
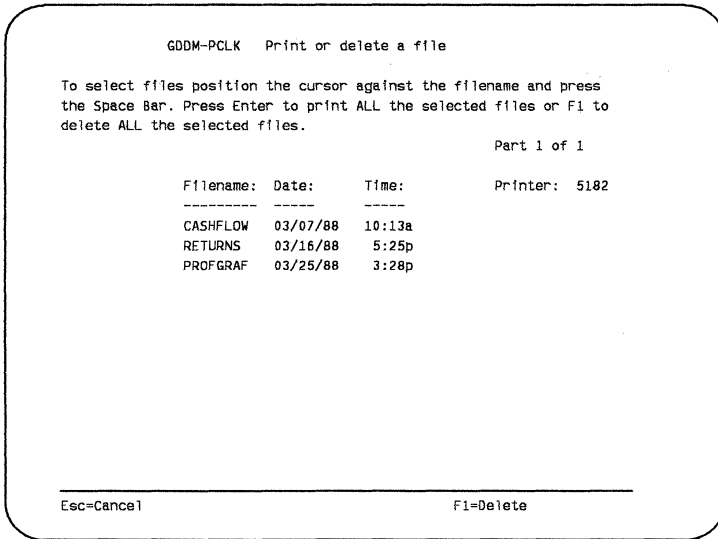
```
      GDDM-PCLK    Print or delete a file

  To select files position the cursor against the filename and press
  the Space Bar. Press Enter to print ALL the selected files or F1 to
  delete ALL the selected files.
                                          Part 1 of 1

      Filename:   Date:      Time:          Printer:  5182
      ---------   -----      -----
      CASHFLOW    03/07/88   10:13a
      RETURNS     03/16/88    5:25p
      PROFGRAF    03/25/88    3:28p




  Esc=Cancel                        F1=Delete
```

Figure   2-10. Print or delete panel

The panel shows only those deferred files that were created for the
printer that is specified on the Setup panel. If the list of deferred files
exceeds one page, you can use the PgDn (Page down) and PgUp
(Page up) keys to scroll vertically through them.

If you try to access this panel without having set up GDDM-PCLK for
your printer (using option 4 from the main panel), or if you have no
deferred files for the printer, the panel is not displayed, and
GDDM-PCLK issues an error message. Go back to the main menu
panel, select option 4, and set up GDDM-PCLK for your printer.

You use this panel either to select files for printing, or to select them
for deleting. To select a file, position the cursor against its name, and
press the space bar. You cannot select files for printing, and files for
deleting, at the same time.

To print the selected files, press ◄┘ , and wait until the graphics are printed. While each file is being printed, you receive the message:

GQD00507 Printing in progress. Press "Esc" to cancel.

Wait while the graphics are printed, or press the Esc key to cancel the print.

To delete the selected files, press F1. The message:

Press Enter to confirm deletion of selected files.

appears on the panel. Either press ◄┘ to confirm the deletion, or any other key to cancel it.

Chapter 3. Application programming

This chapter tells application programmers how to customize GDDM applications for GDDM-PCLK.

GDDM-PCLK processing option

PCLK

You make GDDM-PCLK available to users by means of a processing option, either on a DSOPEN call:

```
DECLARE NAME(1) CHARACTER(8);
DECLARE PROCOPT_LIST(2) FIXED BINARY(31):

PROCOPT_LIST(1) = 33; /* GDDM-PCLK available    */
PROCOPT_LIST(2) = 1;  /* 1=yes, 0=no (default) */

CALL DSOPEN(0, 1, '*', 2, PROCOPT_LIST, 0, NAME);

CALL DSUSE(1,0);
```

or in a nickname statement (remember to precede it with a blank character):

```
ADMMNICK FAM=1,PROCOPT=((PCLK,YES))
```

The DSOPEN call is fully described in the *GDDM Base Programming Reference*. Some examples of the use of processing options and nicknames are given in *GDDM Application Programming Guide, Volume 1*.

GDDM default value

IOBFSZ

When using the distributed function terminal (DFT) mode with the IBM 3270 Workstation Program Version 1.1 (with necessary service-level updates), you are recommended to change the GDDM default IOBFSZ to set the Input/Output buffer size to 3478 to improve performance:

```
ADMMDFT IOBFSZ=3478
```

Plotting

If you have an existing program that opens a plotter, you can make it use your PC-attached plotter instead, by putting a nickname statement in your nicknames file; see "Setting up a nickname file" on page 2-4. For example, for a program containing a DSOPEN for a plotter with a name of **PLOTTER** specified in its name list, the nickname statement is:

```
ADMMNICK FAM=0,NAME=PLOTTER,TOFAM=1,TONAME=(*,ADMPLOT)
```

Your GDDM program can explicitly send graphics to a single PC-attached plotter from the supported range. Your program accesses the plotter using the same DSOPEN name-list entry method as with existing GDDM plotter support. In namelist(2) of DSOPEN, you specify the name **ADMPLOT** or **PLOTTERn**, where **n** = 0 for the 6180, 1 for the 7371, 2 for the 6182 or 7372, 4 for the 6184 or 7374, and 5 for the 7375 plotters.

Here is a simple example using **ADMPLOT**:

```
DECLARE PROC_LIST(1) FIXED BINARY(31);
DECLARE N_LIST(2)    CHARACTER(8);

N_LIST(1) = '*';
N_LIST(2) = 'ADMPLOT';

CALL DSOPEN(99, 1, '*', 0, PROC_LIST, 2, N_LIST);

CALL DSUSE(1,99);
```

A PC user running your program is given the option of plotting graphics immediately (immediate plotting), or later (deferred plotting). This is described in the section "Plotting and printing graphics from a GDDM program" on page 2-16. The deferred plotting option will not be shown if the prompt has been suppressed. For details, see page 2-10.

For immediate plotting, picture complexity is almost unlimited. For deferred plotting, picture complexity is limited by the amount of disk space available at the time of plotting. Your application program cannot query the amount of disk space available. The user has no control over the size and position of deferred plots when they are eventually plotted, because the operator-defined plot area has then been overridden by the plot size and position specified by the GDDM application when the plot file was generated.

GDDM supplies these device tokens for PC-attached plotters:

Token	Device
LPC6180	6180
LPC6182	6182
LPC6184	6184
LPC6186	6186
LPC7371	7371
LPC7372	7372
LPC7374	7374
LPC7375	7375.

Printing

If you have an existing program that opens a printer, you can make it use your PC-attached printer instead, by putting a nickname statement in your nickname file. For example, for a program containing a DSOPEN for a printer with a name of **PCPRINT** specified in its name list, the nickname statement is:

```
ADMMNICK FAM=0,NAME=PCPRINT,TOFAM=1,TONAME=(*,ADMPCPRT)
```

Another way is for your GDDM program to send graphics to a single PC-attached printer from the supported range. The program addresses the printer as a family-one auxiliary device with a device-name of ADMPCPRT.

```
DECLARE PROC_LIST(1) FIXED BINARY(31);
DECLARE N_LIST(2)    CHARACTER(8);

N_LIST(1) = '*';
N_LIST(2) = 'ADMPCPRT';

CALL DSOPEN(97, 1, '*', 0, PROC_LIST, 2, N_LIST);

CALL DSUSE (1,97);
```

A PC user running your program is prompted to hot-key to the PC session, where a panel gives the option of printing graphics immediately (immediate printing), or later (deferred printing). The deferred printing option will not be shown if the prompt has been suppressed. For details, see page 2-12.

The amount of disk space available at the time of printing limits the complexity of pictures. Your application program cannot query the amount of available disk space.

GDDM supplies these device tokens for PC-attached printers:

Token	Device
LPC3852	3852 Color Jetprinter
LPC4201	4201 Proprinter™
LPC4202	4202 Proprinter XL
LPC42012	4201 Proprinter-II
LPC4207	4207 Proprinter X24
LPC4208	4208 Proprinter XL24
LPC5152	5152 Graphics Printer (mono)
LPC5182	5182 Color Printer
LPC5201	5201 Quietwriter™
LPC5202	5202 Quietwriter-III.

™ Trademark of IBM Corporation.

These print-control options have no effect with GDDM-PCLK:

Heading indicator
Number of copies
Page depth
Maximum number of FSLOG characters per line
Alphanumeric device type.

If any of the above are specified with non-default values, GDDM
issues a warning message when the program is run.

GDDM alphanumerics (ASxxxx and MSxxxx calls) are supported by
PC printers, with these field and character attributes:

- Color
- Outlining
- Reverse video
- Transparency
- Underscore.

Color mix mode OR is not supported on printers. If you specify it, you
receive a warning message. However, if you use mix mode OR with
a black background, colors will mix and be visible, but this result
cannot be ensured.

Display adapter device tokens

GDDM supplies these device tokens for PC display adapters:

Token	Display adapter
LPCM	CGA, 2-color, 640x200 pixels
LPCC1	EGA, 16-color, 640x200 pixels
LPCC2	EGA, 16-color, 640x350 pixels
LPCC3	IBM Personal System/2 Display Adapter, 16-color, 640x480 pixels
	IBM Personal System/2 VGA, 16-color, 640x480 pixels
LPCC4	IBM Personal System/2 Display Adapter 8514/A, 16-color advanced function, 1024x768 pixels
LPCC5	IBM Personal System/2 MCGA, 2-color, 640x480 pixels.

Querying device characteristics with the FSQURY call

The FSQURY call returns device information for the GDDM-PCLK
display. In the first parameter of FSQURY, a code specifies the type
of information required. Only these code values apply to
GDDM-PCLK:

0   The characteristics of the device
1   The partition characteristics of the device
2   The graphics characteristics of the device
3   The characteristics of attached plotters.

The information is returned in an array in the last parameter. In
addition to the information listed under the description of FSQURY in
the *GDDM Base Programming Reference, Volume 1*, this information
is returned:

code = 0   The alphanumeric characteristics of the device are
           derived from the terminal emulator.

           Element 15 of the array (exceptional device) returns the
           following values, depending on the current device:

           0   Display
           3   Plotter
           4   Printer.

code = 1   GDDM-PCLK does not support real partitions.

code = 2   For displays, GDDM-PCLK returns:

           1. Output class
              a. If running in merged mode, output class = 3
                 (alphanumerics and graphics overlayed)
              b. If running in non-merged mode, output class = 4
                 (alphanumerics and graphics separated).
           2. Graphics class = 1 (interactive).

           Other graphics characteristics are determined according
           to display adapter and screen combinations.

The colors available with the EGA, VGA, and 8514/A are:

Number	Color	Number	Color
0	Green		
1	Blue	9	Dark blue
2	Red	10	Orange
3	Pink (magenta)	11	Purple
4	Green	12	Dark green
5	Turquoise (cyan)	13	Dark turquoise
6	Yellow	14	Mustard
7	White	15	Gray
8	Black	16	Brown

code = 2   For printers or plotters, this information is returned:

1. Output class = 2 (graphics only)
2. Graphics class = 0 (output only)
3. Maximum horizontal size of the graphics field in pixels
4. Maximum vertical size of the graphics field in pixels
5. Number of pixels per meter horizontally
6. Number of pixels per meter vertically
7. Default cell-size width for graphics in pixels
8. Default cell-size height for graphics in pixels
9. Number of available colors, including background.

Note: Items 3 through 9 above depend on the device characteristics.

10. Reserved
11. Choice device = −1 (none)
12. Locator device = −1 (none)
13. Pick device = −1 (none)
14. String device = −1 (none)
15. Stroke device = −1 (none)
16. Reserved
17. Mouse buttons available = 0
18. Graphics cursor = −1 (none)
19. Foreground mix
        Plotters = 22 (transparent, overpaint, underpaint)
        Printers = 22 (transparent, overpaint, underpaint)
20. Background mix = 18 (transparent, overpaint)

21. Mix combination = 1 (background mix only if foreground mix is overpaint).
22. Alphanumerics and graphics interaction:
    1   alphanumeric fields erase graphics at the same screen position. The application may need to resend the graphics after alphanumeric fields have been changed.
    2   alphanumeric fields do not erase graphics at the same screen position.

code = 3   Auxiliary plotter information is returned, as described in the *GDDM Base Programming Reference, Volume 1*.

Chapter 4. System-support information

This chapter tells system-support personnel for the basic-license PCLKF host program feature how to:

- Find out the level of GDDM-PCLK code

- Access the GDDM-PCLK Service Functions panel

- Ensure that changes to the host default image symbol set are reflected in GDDM-PCLK.

Finding the level of GDDM-PCLK code

If a PC user has a problem running GDDM-PCLK, the PC user must report it to the system-support personnel for the basic-license PCLKF host program feature. The system-support personnel can then call the IBM Support Center, quoting the component identifier for PCLKF (see "Reporting problems to IBM" on page xvi).

Note: The PC user *cannot* report the problem directly to the IBM Support Center staff.

The system-support personnel may need to know the level of GDDM-PCLK code on the PC. A PC user can find this out by entering the command:

`pclklev`

in the **\PCLK11** subdirectory. GDDM-PCLK displays a list of the files that comprise GDDM-PCLK, with level numbers that system-support personnel for the basic-license PCLKF host program feature can quote to the IBM Support Center staff. The level numbers tell them if any service has been applied.

Accessing the service functions

The IBM Support Center staff may ask system-support personnel for
the basic-license PCLKF host program feature to run a GDDM-PCLK
trace. Access GDDM-PCLK trace from option 5 "Service functions"
on the GDDM-PCLK Main Panel. To make option 5 appear, run
GDDM-PCLK by entering the command:

pclk /s

where **/s** stands for service. The Main Panel, with option 5
displayed, appears:

```
                        GDDM-PCLK   Main Panel


      To select one of the following, type a number, or use the Cursor-move
      keys and press Enter.


   ▶ 1. Start GDDM-PCLK GDDM application support

     2. Plot a file stored on a PC disk

     3. Print a file stored on a PC disk

     4. Setup GDDM-PCLK for your workstation

     5. Service Functions



     ─────────────────────────────────────────────────────────────

     Esc=Cancel
```
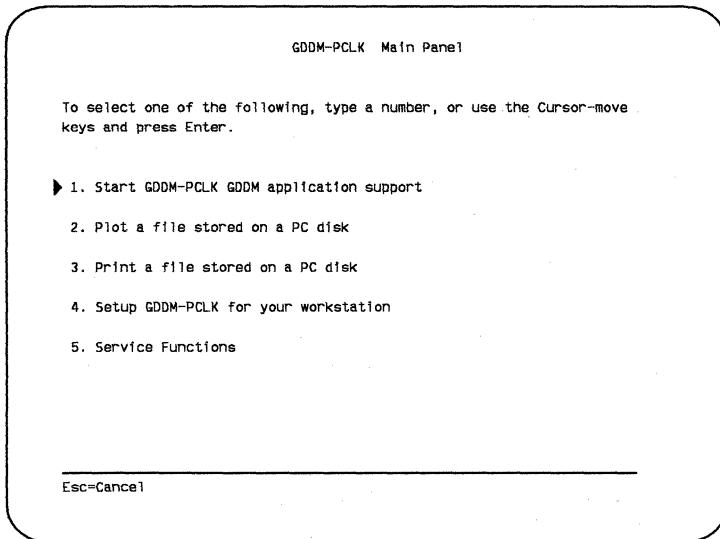
Figure   4-1. Main Panel with option 5 — service functions

Choose option 5, and the service functions panel is displayed:

```
                    GDDM-PCLK  Service Functions

     To select an item, position the cursor against it and press the
     Space Bar. Press Enter to save the changes and return to the
     Main Panel.

     Trace. . . . . . .   Off
                        ▶ On

     Output . . . . . .   File (\pclk11\pclk.trc)
                          Mono Screen
                        ▶ Mono Screen & File

     Transmission
     Buffer . . . . . . ▶ No
                          Yes

     Trace Points . . .  01    04 ▶ 07    10    13 ▶ 16    19    22
                         02    05   08    11 ▶ 14    17    20    23
                         03    06 ▶ 09    12    15    18    21    24


     Esc=Cancel
```

Figure   4-2. Service functions panel (on dual-screen PC)

You use this panel to activate the GDDM-PCLK trace facility. If you
have a PC with a single screen, you are only given the option of
sending the trace output to a file. If you have a dual-screen PC, you
can send the trace output to a file, or to the mono screen only, or to
both of these. The created file resides in the **PCLK11** subdirectory.

You can choose to trace the data stream that is sent, through the
transmission buffer, to and from the host.

Trace points 01 through 24 represent the component parts of
GDDM-PCLK, so you can restrict the trace to specific components.
The IBM Support Center staff will tell the system-support personnel
for the basic-license PCLKF host program feature which trace points
to select.

When you have completed the panel, press ◀━┘ to save the changes,
and return to the Main Panel. Then perform the operation that was
causing the problem.

Here is an example trace listing, where transmission buffer and trace
point 01 were chosen:

```
         PCLK TRACE           started at 12:30:25 on 02/29/1988

     Selected Trace Points are:
     TB 01

  01 HOPEN
  01 XHGI Parameters are:
               03000000  00                      *.....         *
  01 XHGI Reply is:
               03000000  00                      *.....         *
  01 HQDPS
  01 XHGI Parameters are:
               04000000  0020                    *.....         *
  01 XHGI Reply is:
               04005809  0020                    *..X..         *
  01 HINIT
  01 XHGI Parameters are:
               0200665F                          *..f_          *
  01 HQMODE
  01 XHGI Parameters are:
               1300665F  00202020  20202020  20475144  *..f_.    GQD*
               58583130  00                      *XX10.         *
```

Figure 4-3. Trace output

The IBM Support Center staff will either tell the system-support
personnel for the basic-license PCLKF host program feature how to
analyze the listing, or ask that a print be sent to them.

National-use characters

When GDDM-PCLK is installed on a PC, it downloads the default
image symbol set that it uses to display mode-1 graphics text. For
more information on mode-1 graphics, refer to the *GDDM Base
Programming Reference* manual.

You can edit the default image symbol set in the host, using the
GDDM Image Symbol Editor, to put in any national-use characters
that you have in your language. However, if you do this, the changes
are only reflected in GDDM-PCLK if they are made before
GDDM-PCLK is installed on the PC. If GDDM-PCLK has already been
installed on the PC, the PC user must delete the PC version of the
symbol set. When GDDM-PCLK is next run, the new default image
symbol set is automatically downloaded from the host. The PC
version of the symbol set is in the GDDM-PCLK directory on the PC,
and has a filename of the format **GQD*n*X*m*.SYM**, where *n* and *m* depend
on the PC you are using.

Vector symbol sets

The vector symbol set provided with GDDM is ADMDVECP.

It is used by GDDM-PCLK, when printing alphanumerics; to draw the alphanumeric characters that the application has specified in ASxxxx calls or MSxxxx (mapping) GDDM calls.

You can generate your own vector symbol sets by editing the ADMDVECP sample set using the GDDM-PGF Vector Symbol Editor. You may want to do this, for example, to add national-use characters in different positions from code page 00037, which is the code page for this set. However, if possible, you should use the new country-extended code page (CECP) facilities provided by GDDM 2.2 to get access to the national-use characters.

For more information on CECPs, refer to the *GDDM Typefaces and Shading Patterns* manual.

The vector symbol sets must contain lines only; that is, no shaded area characters, and no proportional spacing.

If the vector symbol set is not valid, you can get the message:

GQD0521 Printer Vector Symbol Set is not acceptable.

from GDDM-PCLK when you try to print.

To load a new symbol set, the default symbol set GQDVSS.SYM must be erased from the \PCLK11 subdirectory to enable GDDM-PCLK to automatically download the new one (ADMDVECP ADMSYMBL) from the host. GDDM-PCLK renames the new vector symbol set to GQDVSS.SYM.

Appendix A. Running the ICU from a PC

This appendix tells you how to run a GDDM application with GDDM-PCLK, using the GDDM-PGF Interactive Chart Utility (ICU) as an example.

The ICU is a GDDM-PGF menu-driven program that allows business charts to be created interactively by people with little or no computer experience. It is fully described in the *GDDM-PGF Interactive Chart Utility* manual. If you are not familiar with the ICU you should read that manual before using the ICU with GDDM-PCLK.

Running the ICU with GDDM-PCLK

There are two ways in which the ICU can be run with GDDM-PCLK:

1. In merged alphanumerics and graphics mode; described in this appendix.

2. In non-merged alphanumerics and graphics mode; described on page D-4.

Running the ICU in merged mode

For an initial experiment to display an ICU chart using GDDM-PCLK, do the following:

1. Start the ICU in the host session. Standard ways are:

    Under CICS, type **ADMC** and press Enter.

    Under TSO, type **CALL** 'data-set-name(**ADMCHART**)' and press Enter. The data-set-name identifies the data set that holds the ICU on your host computer.

    Under VM, type **ADMCHART** and press Enter.

    However, check with your system-support personnel to see if there is a method of starting the ICU that is specific to your host computer.

2. Where the panel asks you to "Type in the number or letter of the choice you want," type in 2.2 and press Enter. This takes you directly to the data manipulation panel 2.2, without you having to complete the intervening panel.

3. Without moving the cursor, type **SAMPLE**, and press Enter. This loads some sample data, as shown in Figure A-1.

```
  2.2                        DATA MANIPULATION
ADM1008 I SAMPLE DATA PROVIDED
                Data Group Names -------> HONG;KONG    MIAMI
                Data Group (Z) Values --> 1            2

                *** X Values    X Labels    Y1          Y2          Y3
                001 1           JAN         5           8           .
                002 2           FEB         4           8           .
                003 3           MAR         3           8.5         .
                004 4           APR         4           9           .
                005 5           MAY         4.8         9           .
                006 6           JUN         5           9           .
                X   .           .           .           .           .
                X   .           .           .           .           .
                X   .           .           .           .           .
                X   .           .           .           .           .
                X   .           .           .           .           .
                X   .           .           .           .           .
Commands: D (Delete) R (Repeat) FIT (Least Squares Fit) S (Select) X (Exclude)
          / (Scroll Here) M (Move) A (After) B (Before) I (Insert)
          See Help for More

PF: 1=Help 2=Save/Load 3=End 4=Print 5=Display 7=Up 8=Down 10=Left 11=Right
    12=Home
```

Figure   A-1. ICU data manipulation panel

4. Press PF5 (for details of the key combination that emulates PF5, see pages C-6 and C-8) to display the chart.

   If you receive the message:

   ADM0275 W GRAPHICS CANNOT BE SHOWN, REASON CODE n

   either the GDDM-PCLK processing option has not been specified to GDDM (see page 3-1), or you pressed Enter instead of selecting GDDM-PCLK, when you first started the ICU. (The value of **n** depends on your terminal emulator.) You will have to come out of the ICU, add the GDDM-PCLK processing option to your nickname file if necessary, and then start again at step 1 on page A-1.

5. The chart looks like this:

DAILY HOURS OF SUN

PF: 1=Help 2=Save/Load 3=End 4=Print 11=Edit 12=Home
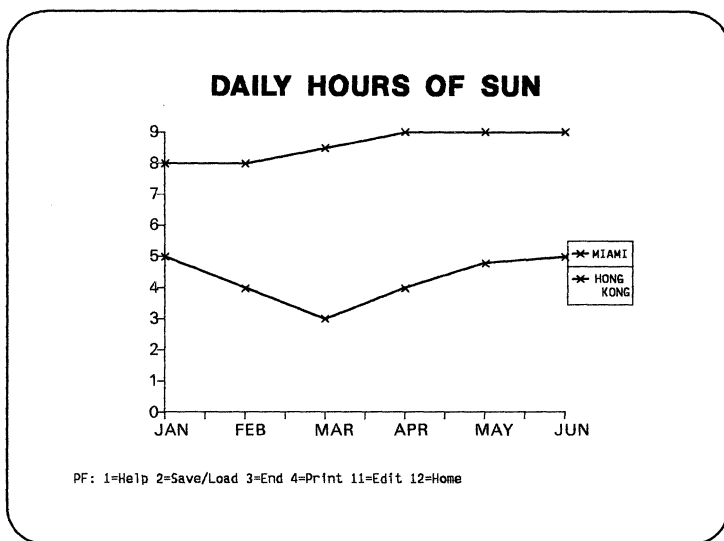
Figure   A-2. "Daily hours of sun" chart

6. When you have finished viewing the chart, press PF3 (see pages
   C-6 and C-8) to return to the ICU data manipulation panel. At this
   point, if you have finished, exit from the ICU in the normal way,
   then hot-key back to the DOS session and press Esc to end
   GDDM-PCLK.

Using the graphics cursor to move chart notes

This subsection gives an example of using an interactive graphics
application with GDDM-PCLK. The ICU lets you put notes on your
chart, and change the height, width, position, or angle of orientation
of the notes.

If you exited from the ICU at step 6 above, repeat the first three steps
in "Running the ICU in merged mode" on page A-1 to get the sample
data again.

Go through the following tasks to put a chart note on the "Daily hours of sun" chart, and then to position it:

1. From the ICU data manipulation panel (2.2), press PF12 (see pages C-6 and C-8) to take you back to the ICU home panel.

2. Type in 3 and press Enter to take you to the ICU chart notes panel.

3. Move the cursor to the right of 001 and under Note Text, and enter the word "note" as shown in Figure A-3.

```
 3                        CHART NOTES
  Type in the Notes you want under Note Text , one Note per line.
  Use PF11 (Edit) to change the size or position or angle of a note.
  Use PF8 or the P and T commands to change other properties.


  Commands Note Text
     ***
     001 note
     002
     003
     004
     005
     006
     007
     008

Commands: I (Insert) D (Delete) R (Repeat) M (Move) A (After) B (Before)
          / (Scroll here) S (select) X (Exclude) P (Position)
          T (Text Attributes)

PF: 1=Help 2=Save/Load 3=End 4=Print 5=Display 6=Show Attributes 7=Up 8=Down
    11=Edit 12=Home
```

Figure A-3. ICU chart notes panel

4. Press PF11 (see pages C-6 and C-8) to edit the chart.

5. The chart is displayed, with a dotted border, your note, and a graphics cursor in the form of a small cross, as shown in Figure A-4 on page A-5.

```
ADM1121 I YOU CAN EDIT CHARTNOTES AND SUBCHARTS
ADM1125 I PRESS PF7-PF11 TO SELECT THE FUNCTION YOU WANT
```
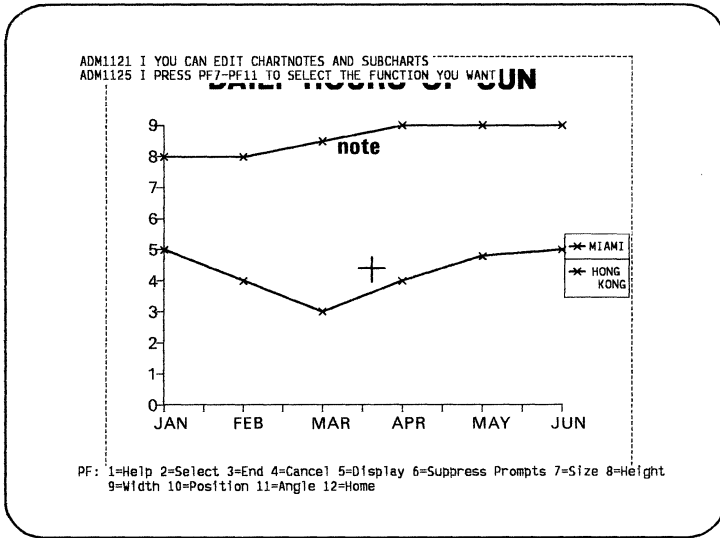
Figure   A-4. ICU chart with note and graphics cursor

6. Using the cursor-move keys or the mouse, move the graphics cursor until it overlaps part of the chart note. You can reduce the speed of cursor movement by using a cursor-move key with the Shift key held down, or by pressing Ctrl-F8.

7. Press PF2 (see pages C-6 and C-8); a dotted border appears around the chart note.

8. Move the graphics cursor to a new position for the chart note.

9. Press PF2. The chart is redisplayed, with the chart note in the new position.

10. When you have finished viewing the chart, press PF3 to tell the ICU that you have finished the edit.

11. If you have finished with GDDM-PCLK, exit from the ICU in the normal way, then hot-key back to the DOS session and press Esc to end GDDM-PCLK.

Plotting and printing with the ICU

To send an ICU-generated plot to a PC-attached plotter, put this nickname in your nickname file (see "Setting up a nickname file" on page 2-4):

```
ADMMNICK FAM=0,NAME=PCPLOT,TOFAM=1,TONAME=(*,ADMPLOT)
```

When the ICU requests a plotter name in the Printer/Plotter output panel, type in **PCPLOT**.

To send an ICU-generated print to a PC-attached printer, put this nickname in your nickname file:

```
ADMMNICK FAM=0,NAME=PCPRINT,TOFAM=1,TONAME=(*,ADMPCPRT)
```

When the ICU requests a printer name in the Printer/Plotter output panel, type in **PCPRINT**.

Appendix B. Errors and messages

This appendix begins by describing two possible problems you might have with GDDM-PCLK, and how to recover from them. It continues with lists of messages that you might receive from:

- GDDM in the host, when using GDDM-PCLK. Host GDDM messages, including those from the GDDM-PGF Interactive Chart Utility, usually begin with the letters ADM. The host messages that apply to GDDM-PCLK start on page B-6. There is a complete list of GDDM messages in the *GDDM Messages* manual.
- GDDM-PCLK in the DOS session. GDDM-PCLK messages begin with the letters GQD; they start on page B-9.

If you receive a message that starts with letters other than those defined in this guide or the *GDDM Messages* manual, tell your system-support personnel.

Two common errors

If your graphics don't look right

If your application deletes text that has been drawn on top of graphics, a black rectangle may be left where the text was originally drawn. To correct this, you must direct the application to redraw the graphics:

- For many programs, you can use the Clear key

- For some terminal emulators, you can press Ctrl-F5.

Sometimes the display of graphics may be incorrect with one or more of the following symptoms:

- The graphics screen is corrupted by random pixels or blocks of color.
- The graphics are white and shown only as regularly spaced vertical slices.
- The colors are not correct.

Explanation

When using an emulator such as Version 1.1 of the PC 3270 Entry Level Emulator, you have hot-keyed to the host session without first pressing Ctrl-F9. The PC screen must be clear of graphics before you hot-key to the host session; pressing Ctrl-F9 clears the graphics.

Recovery

1. Hot-key to the PC session if you are not already there.

2. Press Ctrl-F9 to clear the graphics.

3. Hot-key to the host session.

4. Redisplay the graphics from the host program.

   For many programs, pressing the Clear key causes a refresh of the graphics on the screen.

Another way is to stay in the PC session and use the GDDM-PCLK-supplied host key equivalents:

1. Hot-key to the PC session if you are not already there.

2. Press Ctrl-F9 to clear the graphics.

3. Press Ctrl-F9 to return to the graphics.

4. Stay in the PC session, and redisplay the graphics from the host program. Use the GDDM-PCLK-supplied host key equivalents as required by the host program. For many programs, when you press the Alt and F2 keys (Clear) the host program redisplays the graphics.

If your diskette fills up during automatic transfer

The automatic download process does not delete the old version of GDDM-PCLK until the new one has been downloaded. This does not affect a high-density diskette, but it can cause a low-density diskette to become full before the process is complete, in which instance you receive the message:

GQD0410 Disk full.

Recovery

Release as much space as possible, for example by deleting unwanted plot or print files. You can do this using either the GDDM-PCLK panels or DOS commands. Then start GDDM-PCLK again. If your diskette still fills up, you can:

1. Copy the file **pclk.exe** from the **\PCLK11** subdirectory to another drive.

2. Delete **pclk.exe** from the **\PCLK11** subdirectory.

3. With the drive that contains the **\PCLK11** subdirectory as the default drive, run **pclk.exe** in the other drive.

4. Choose option 1 from the GDDM-PCLK main panel. A new version of **pclk.exe** is automatically downloaded from the host to the **\PCLK11** subdirectory.

5. Delete the copy that you made in step 1, above.

Messages

GDDM-PCLK messages start on page B-9.

GDDM host messages

Message format

Each GDDM host message is preceded by a seven-character identifier and a one-character severity code, separated from the identifier and the message text by blanks. For example:

ADM0002 E GDDM IS ALREADY INITIALIZED

The identifier has two components:

- Three characters, usually ADM, that identify the message as originating from GDDM.

- A four-digit serial number.

The severity code is one of the following:

I Informational message
W Warning
E Error
S Severe error
U Unrecoverable error.

The meanings of these are:

Informational The message gives you information; you do not usually have to do anything.

Warning There is a problem or potential problem; you may have to do something.

Error Something has gone wrong; you will probably have to do something.

Severe Something has gone seriously wrong; you will have to do something, possibly with help from your system-support personnel.

Unrecoverable Something catastrophic has happened to GDDM, or the system or subsystem under which GDDM is running. Tell your system-support personnel.

Structure of message information

The messages are listed here in numeric order; however, not all numbers have been used and, therefore, the list is not continuous.

Parts of some messages only appear in specific circumstances, and are known as "message inserts." For example:

ADM0205 E   FIELD POSITION IS INVALID{, DEFINITION n}

where {, **DEFINITION n**} is the message insert.

Some messages can show more than one insert; they are all shown within left and right braces, and separated from each other by vertical lines. For example:

ADM0705 E   {KEY|LABEL|HEADING} LENGTH (= n) IS INVALID

where the insert can be **KEY**, **LABEL**, or **HEADING**.

For each message, information is provided under the following headings:

Explanation: Why the message was issued and a description of any fields in the text.

System action: What GDDM does, if anything, about the situation to which the message draws attention.

Programmer response or **User response**: Instructions for the programmer or PC user. If you are a PC user and you receive a message for which this guide gives a programmer response, tell your host system-support personnel.

Conventions used for message variables

Some messages display text or numbers that vary according to the circumstances giving rise to the message; these are known as "message variables." The conventions used to indicate the type of the variable are:

a   alphanumeric text
n   numbers, in decimal (integer or real)
x   numbers, in hexadecimal.

However, if there is more than one insert of a particular type, a number is added to the above letters. For example:

ADM0086 E   INVALID PROCESSING OPTION VALUE n1 FOR CODE n2

where **n1** is the first numeric value (in decimal), and **n2** is the second.

Host messages

ADM0087 E   **QUERY ERROR: TOKEN 'a',HDR X'llllttqq' OFF X'xx' REASON n**
Explanation: On trying to open a device, GDDM found that the query
reply data, either received from the physical device or contained within
the device tokens, was not valid. This error can occur on an explicit
DSOPEN or FSOPEN call, or on any call that causes a default primary
device to be opened.

TOKEN is the device-token used by GDDM (after any nickname
processing).

HDR is the first four bytes (the header) of the particular query reply
found to be in error. It contains:
llll   length of structured field
tt   structured field type (should be X'81' = query reply)
qq   query reply type (q-code).
OFF is, generally, the offset at which the error was detected within the
particular query reply.

REASON defines the cause of the error. The following values of **n** apply
to GDDM-PCLK only. For other values, refer to the *GDDM Messages*
manual.

27   An Anomaly Implementation query reply (**qq** = X'9D') for the
             GDDM-PCLK (query reply byte 5 = X'02') indicates that the
             default symbol set is not available but no Graphic Symbol Sets
             query reply (**qq** = X'B6') was received from the physical device.
             GDDM requires a Graphic Symbol Sets query reply so that it can
             send a default symbol set with the correct graphic cell size for
             the device.

             OFF is the offset of the image set availability flag.

28   An Anomaly Implementation query reply (**qq** = X'9D') has a
             device-dependent parameter length that is less than the
             minimum expected.

             OFF is the offset of the device-dependent parameter length field.

29   An Anomaly Implementation query reply (**qq** = X'9D') for the
             GDDM-PCLK (query reply byte 5 = X'02') was specified through
             a device-token. It contains a File Request self-defining
             parameter or indicates that the default symbol set is not
             available. It must not contain either of these.

             OFF is the offset of the type of the self-defining parameter, or of
             the image set availability flag.

System action: The call is ignored.
Programmer response: Determine whether the query reply came from
the physical device (device-token was an asterisk (*), or was defaulted
and the device is queriable), or from GDDM's device definition tables.
In the former case, check that the device is correctly configured, and
correctly defined to the subsystem; in the latter case, check that
GDDM's device definition tables were not wrongly modified.

ADM0275 W **GRAPHICS {(IMAGE)} CANNOT BE SHOWN. REASON CODE n**

Explanation: A page containing graphics, or image, if this is indicated
by the message, is being sent to a GDDM-PCLK-supported PC where
GDDM-PCLK is available, but the PC user has not started PCLK GDDM
application support. Reason code **n** depends on the terminal emulator
you are using.

System action: The construction of the graphics picture, or image, if
this is indicated by the message, is suppressed, and the area of the
display where the graphics or image should appear remains blank.

User response: On a PC with the GDDM-PCLK program available,
either:

- The GDDM-PCLK procopt has not been specified to GDDM, either in
  an application program (see "GDDM-PCLK processing option" on
  page 3-1), or by a nickname file (see "Before you run GDDM-PCLK"
  on page 2-4), or
- You pressed the Enter key, instead of hot-keying to the PC session
  and starting the GDDM-PCLK program, when message **ADM0873**
  was displayed (see below).

ADM0303 E **{SYMBOL SET|GENERATED MAPGROUP|SAVED PICTURE|CHART
FORMAT|CHART DATA|TUTORIAL PAGE|SAVED IMAGE|SAVED
PROJECTION|PCFILE}' a ' HAS AN INVALID FIRST RECORD**

Explanation: The specified function required the GDDM file **a** to be
read; the first record in the file is not valid for the indicated type of file.

System action: The call is ignored.

User response: The file may have been wrongly overwritten (for
example, by an attempt to renumber or sequence the file). Tell your
system-support personnel. They should correct or recreate the file,
after which you can run your application program again.

ADM0307 E **FILE 'a' NOT FOUND**

Explanation: The specified function required the GDDM file **a** to be read
from auxiliary storage, but the file cannot be found on auxiliary storage.
If this message occurs on a DSOPEN call for a PC device, it means that
the files required to use the PC device have not been installed.

System action: The call is ignored.

User response: Ask your system-support personnel if PCLKF is
installed on the host computer. If it is, ask them to create or install the
required file, and run the application program again.

ADM0320 E **UNABLE TO OPEN 'a'. FILE MISSING OR INVALID**

Explanation: An error occurred during an attempt to open the GDDM
file **a**. If this message occurs on a DSOPEN call for the PC device, it
means that the files required to use a PC device have not been
installed.

System action: The file operation is not performed.

User response: Ask your system-support personnel if PCLKF is
installed on the host computer. If it is, ask them to create or install the
required file, and run the application program again.

ADM0873 I   **IF AVAILABLE, PLEASE SELECT PCLK. OTHERWISE, PRESS "ENTER"**
Explanation: A device is being used that does not usually support host graphics. However, if the GDDM-PCLK program is available and selected, the device will support host graphics.
System action: If PCLK GDDM application support is started, the PC is used as a graphic display device, and the host graphics can be displayed. If the Enter key is pressed instead, the device is used as a non-graphic display device, and the host graphics are suppressed.
User response: If you intend displaying host-generated graphics on a GDDM-PCLK-supported device, hot-key to the PC session, and start PCLK GDDM application support. Otherwise, press Enter.

ADM0874 I   **PLEASE SELECT PCLK**
Explanation: GDDM-PCLK is waiting to display host-generated graphics.
System action: None.
User response: Hot-key to the PC session. The graphics are displayed if the GDDM-PCLK program is running on the PC, and PCLK GDDM application support is started.

ADM0875 E   **UNABLE TO SEND FILE OR SYMBOL SET TO PC**
Explanation: An error occurred when GDDM was sending a file or symbol set to the PC. For example, the PC may not be able to write the file or symbol set to PC disk, either because there is not enough PC disk space, or because the disk has a write-protect tab.
System action: The sending of the file or symbol set stops.
User response: You may need to hot-key to the PC session to see if the GDDM-PCLK program has issued an error message. If it has, look up the explanation and response. Otherwise, tell your system-support personnel.

ADM0876 E   **PC ERROR. REQUIRED PC FILE IS MISSING**
Explanation: A file required by the GDDM-PCLK program is not available on the PC.
System action: The call in the application program that requires the file is ignored.
User response: Start your application program again. The missing files are automatically downloaded to your PC. If the problem persists, check the installation of the PC and the GDDM-PCLK program.

ADM0877 E   **PC SPOOLED OUTPUT TERMINATED**
Explanation: Spooled printer or plotter output was terminated because of a PC disk error, or because the PC disk became full.
System action: The call is ignored.
User response: Check the condition of your PC disk. If necessary, release some space. Try the spool request again.

ADM0878 E   **PC PRINTING CANCELED**
Explanation: You have canceled an immediate print by pressing the Escape key on your host-connected PC.
System action: The call is ignored. The printer and adapter are reset.
User response: Before continuing to print, check that the paper is correctly aligned to the top of a page.

GDDM-PCLK messages

Message format

Each GDDM-PCLK message is preceded by a seven-character identifier comprising the three characters GQD and a four-digit serial number.

The messages are listed here in numeric order; however, not all numbers have been used and, therefore, the list is not continuous.

GQD0010   **PCLK ready. Press "Ctrl-F3" to cancel.**
Explanation: GDDM-PCLK is ready for GDDM application support.
System action: GDDM-PCLK waits for GDDM data to be received from the host.
User response: If you have not started your host GDDM application, press Ctrl-F9 and hot-key to the host session to start it.

GQD0020   **Either "hot-key" to host session, or press Ctrl-F9 to resume PCLK.**
Explanation: GDDM-PCLK processing is suspended.
System action: GDDM-PCLK waits for Ctrl-F9 to be pressed.
User response: If you want to go to the host session, use the hot-key for your terminal emulator. If you want GDDM-PCLK to resume processing, press Ctrl-F9.

GQD0030   **File transfer in progress. Please wait. Number of bytes transferred so far = n**
Explanation: An automatic file transfer is in progress.
System action: GDDM-PCLK is automatically transferring file(s) to the PC.
User response: Wait for the file transfer to finish.

GQD0100   **Initialization failed - DOS memory allocation error.**
Explanation: An error occurred when requesting or releasing storage from DOS.
System action: Processing terminates.
User response: Re-IPL DOS.

GQD0110   **Initialization failed - not enough memory.**
Explanation: There is not enough memory to run GDDM-PCLK.
System action: Processing terminates.
User response: Reconfigure your PC to make more storage available when GDDM-PCLK is started.

GDDM-PCLK messages

GQD0120 **Initialization failed - disk operation error.**
Explanation: A disk operation error occurred.
System action: Processing terminates.
User response: If the current drive is a diskette drive, check that the diskette is correctly inserted, without a write-protect tab. If possible, retry using a different diskette or disk drive. If the problem persists, suspect a hardware fault and tell your hardware-support personnel.

GQD0130 **Initialization failed - cannot access PCLK files.**
Explanation: GDDM-PCLK cannot read its data files from a subdirectory called \PCLK11 on the current drive.
System action: Processing terminates.
User response: Change the current drive to the drive with GDDM-PCLK installed on it. If necessary rerun the GDDM-PCLK install program to recreate the GDDM-PCLK data files.

GQD0140 **Initialization failed - no graphics display available.**
Explanation: There is no graphics display or display adapter installed that GDDM-PCLK can use.
System action: Processing terminates.
User response: Install a graphics display or display adapter that is supported by GDDM-PCLK.

GQD0150 **Initialization failed - symbol set not found.**
Explanation: GDDM-PCLK cannot access a symbol set.
System action: Processing terminates.
User response: Start your host GDDM application so that a symbol set may be transferred from the host automatically. If the problem persists, tell your system-support personnel.

GQD0155 **Initialization failed - invalid symbol set.**
Explanation: The symbol set in the \PCLK11 subdirectory has an invalid format.
System action: Processing terminates.
User response: Erase the symbol set from the \PCLK11 subdirectory (file has a file extension of 'SYM'). Run your host GDDM application so that a valid symbol set can be transferred from the host automatically. If the problem persists, tell your system-support personnel.

GQD0160 **Initialization failed - display driver not found.**
Explanation: GDDM-PCLK cannot access a display driver.
System action: Processing terminates.
User response: Start your host GDDM application so that a display driver can be transferred from the host automatically.

GQD0165 **Initialization failed - invalid display driver.**
Explanation: Either the display driver in the \PCLK11 subdirectory has an invalid format, or the resident display driver does not match the display adapter installed.
System action: Processing terminates.
User response: If you have a resident display driver, ensure that you have loaded the correct one for your display adapter. If you have no resident display driver, erase the display driver from the \PCLK11 subdirectory (file has a file name of 'GQDXX..'). Run your host GDDM

application so that a valid display driver can be transferred from the
host automatically.

GQD0170 **Initialization failed - cannot communicate with a terminal emulator.**
Explanation: GDDM-PCLK cannot establish communication with a
terminal emulator.
System action: Processing terminates.
User response: Ensure that a terminal emulator supported by
GDDM-PCLK is resident before starting GDDM-PCLK. If you are using
the IBM 3270 Workstation Program Version 1.1 (with necessary
service-level updates), check that you have enabled the COPY option on
the 3270 Workstation Program Configuration Panels. If you are using
the IBM PC3270 Emulation Program Version 3, check that you loaded
PSCAPI before starting the Emulation Program, and that you have
enabled the Application Programming Interface (API) option on the
Emulation Program Configuration panels.

GQD0171 **PCLK system extension is not available.**
Explanation: The GDDM-PCLK system extension is not available,
because either the version of the 3270 Workstation Program is
back-level or because the system extension was not loaded when the
3270 Workstation Program was loaded.
System action: GDDM-PCLK runs with degraded performance, and the
position of host function keys may not match those in the host session.
User response: Install the 3270 Workstation Program Version 1.1 (with
necessary service-level updates). Configure it so that the GDDM-PCLK
system extension is loaded.

GQD0175 **Incorrect level of GDDM**
Explanation: GDDM-PCLK cannot run with the level of GDDM accessed
on the host.
System action: GDDM-PCLK returns to the main panel.
User response: Verify that a level of GDDM that supports GDDM-PCLK
is available and accessed by the host application.

GQD0300 **Host session currently selected does not exist. Press any key to go to
Setup to choose a new host session.**
Explanation: The host session that you previously selected in the
GDDM-PCLK Setup facility is no longer active. You must select a new
host session.
System action: When a key is pressed, the GDDM-PCLK Setup facility is
entered.
User response: Select a new host session from the Setup panel.

GQD0301 **PCLK is already running in another PC session.**
Explanation: Only one PC session can run GDDM-PCLK for GDDM
application support at any one time.
System action: GDDM-PCLK returns to the main panel.
User response: Jump to the other PC session, and terminate the
GDDM-PCLK that is running there. Return to this PC session, and select
the option: 'Start PCLK GDDM application support'.

GDDM-PCLK messages

GQD0302   **Cannot display the host alphanumerics - host session presentation space is too large.**
Explanation: GDDM-PCLK cannot display the alphanumerics for the host session selected, as the presentation space has too many rows, or columns, or both.
System action: Processing continues, without displaying the host alphanumerics.
User response: Either continue to run GDDM-PCLK without the host alphanumerics displayed, or terminate GDDM-PCLK and reconfigure the terminal emulator to use a smaller presentation space.

GQD0303   **7-color and reverse-video will not be used - not available from the terminal emulator.**
Explanation: GDDM-PCLK cannot display the alphanumerics using 7-color and reverse-video as GDDM-PCLK cannot get them from the terminal emulator.
System action: Processing continues, displaying the alphanumerics using standard attributes.
User response: Either change the GDDM-PCLK Setup option for '7-color and reverse-video' or if possible reconfigure the terminal emulator so that it uses the 3270 Extended Data Stream feature.

GQD0304   **Cannot display the host alphanumerics - 8514/A Adapter Interface Code is back-level.**
Explanation: GDDM-PCLK cannot display the host alphanumerics because the 8514/A Adapter Interface Code loaded does not support the required functions.
System action: Processing continues, without displaying the host alphanumerics.
User response: Install 8514/A Adapter Interface Code version 1.01 or later.

GQD0305   **To complete installation for merged graphics and alphanumerics, start a GDDM application on the host.**
Explanation: GDDM-PCLK cannot display the host alphanumerics in the PC session because some files that GDDM-PCLK requires have not yet been received from GDDM PCLKF on the host.
System action: Processing continues, without displaying the host alphanumerics. When the files have been received, the host alphanumerics can be displayed.
User response: Hot-key to the host session and start a GDDM application, so that the required files can be automatically transferred.

GQD0306   **Not enough memory to save graphics before hot-keying.**
Explanation: When Ctrl-F9 is pressed before a hot-key, it is not possible to save the graphics as there is not enough memory available.
System action: Graphics are not restored on return from a hot-key.
User response: To restore the graphics, press PA3 (see pages C-6 and C-8) to indicate to your GDDM application that it must reshow the picture.

GQD0400 **Datastream error.**
Explanation: GDDM-PCLK detected an error in the data sent by the GDDM host component.
System action: GDDM-PCLK returns to the main panel.
User response: Retry the application. If the problem persists, tell your system-support personnel.

GQD0410 **Disk full.**
Explanation: The disk in the current drive is full.
System action: Processing may terminate.
User response: If necessary, clear some space on the current disk and restart GDDM-PCLK.

GQD0420 **Contact with host lost.**
Explanation: GDDM-PCLK can no longer communicate with the GDDM host component.
System action: Processing terminates.
User response: Hot-key to the host session and check that your host and host application are both still active, and restart GDDM-PCLK.

GQD0430 **PCLK update process complete - press any key to exit PCLK, then restart PCLK.**
Explanation: An automatic update to GDDM-PCLK occurred. To use the new version, you must terminate the current version and restart PCLK.
System action: Processing terminates.
User response: Press any key to terminate GDDM-PCLK, and then restart GDDM-PCLK.

GQD0431 **PCLK update process complete - press any key to cancel PCLK, then restart system.**
Explanation: An automatic update to GDDM-PCLK occurred. The update included a new version of the GDDM-PCLK system extension. To use the new version, you must restart the IBM 3270 Workstation Program.
System action: Processing terminates.
User response: Press any key; GDDM-PCLK terminates and you can then restart the system.

GQD0501 **Not enough free storage to print file.**
Explanation: GDDM-PCLK cannot find enough free storage to print the file requested.
System action: Processing terminates.
User response: Reconfigure your PC to make more storage available when GDDM-PCLK is started.

GQD0503 **No plotter/printer selected on Setup panel.**
Explanation: You have not selected which plotter or printer is attached to your PC on the GDDM-PCLK Setup panel.
System action: When a key is pressed, GDDM-PCLK returns to the main panel so that you can choose the Setup option.
User response: Choose the Setup option and select the plotter or printer that is attached to your PC.

GDDM-PCLK messages

GQD0504   **Plotter/printer is inoperative. Possibly powered off. Press "1" to retry. Press "Esc" to cancel.**
Explanation: GDDM-PCLK cannot communicate with the plotter or printer.
System action: GDDM-PCLK waits for either "1" or Esc to be pressed.
User response: Check that the plotter or printer is correctly connected to the PC, that it is switched on and ready for use. For plotters, check also that the paper-feeding rollers are down, that the baud-rate switches are set to 4800 baud, and that the switches are set for no parity checking, 1 stop bit, and 8-bit word length. Either press "1" to retry the plot or print, or press Esc to cancel it.

GQD0505   **File operation error.**
Explanation: An error occurred when GDDM-PCLK was operating on a file in the current drive.
System action: Processing may terminate.
User response: Check that you entered a valid file name for the file. If the current drive is a diskette drive, check that the diskette is correctly inserted, without a write-protect tab. If possible, retry using a different diskette or drive. If the problem persists, suspect a hardware fault, and tell your hardware-support personnel.

GQD0506   **Plotting spooled file. Press "Esc" to cancel. Number of bytes of remaining data = n**
Explanation: GDDM-PCLK is plotting a spooled file. The amount of data left to plot is indicated.
System action: Plotting continues.
User response: Wait for the plot to finish. To cancel the plot, press Esc. The plotting may take some time to stop because of the buffering of plotter data.

GQD0507   **Printing in progress. Press "Esc" to cancel.**
Explanation: GDDM-PCLK is printing a file.
System action: Printing continues.
User response: Wait for the print to finish, or if you want to cancel the print, press Esc.

GQD0508   **No plotter/printer files found.**
Explanation: There are no files on the current disk suitable for plotting or printing on the device currently selected on the GDDM-PCLK Setup panel.
System action: When a key is pressed, GDDM-PCLK returns to the main panel.
User response: Check that the plotter or printer selected on the GDDM-PCLK Setup panel is correct. If you have already spooled a plot/print file, and you used an explicit GDDM device token, check that this is the correct token for the plotter or printer.

GQD0509 **Not enough free storage to list plotter/printer files.**
Explanation: GDDM-PCLK cannot find enough free storage to list all the plotter or printer files for you to make a selection from.
System action: When a key is pressed, GDDM-PCLK returns to the main panel.
User response: If possible, reconfigure your PC to make more storage available when GDDM-PCLK is started. If you cannot do this, you must erase some plotter or printer files before rerunning GDDM-PCLK. The files are stored in the subdirectory \PCLK11\nnnn where nnnn is the device.

GQD0510 **Printer driver and/or bitmap driver not found.**
Explanation: GDDM-PCLK cannot find the two driver files required to perform a spooled print.
System action: When a key is pressed, GDDM-PCLK returns to the main panel.
User response: You should start GDDM-PCLK with a host GDDM application, to allow the printer drivers to be transferred automatically from the host.

GQD0511 **Printer requires paper. Press "1" to retry. Press "Esc" to cancel.**
Explanation: GDDM-PCLK cannot print, because the printer requires paper.
System action: GDDM-PCLK waits for either "1" or Esc to be pressed.
User response: Either load paper in the printer and press "1," or press Esc.

GQD0512 **Printer is not ready. Press "1" to retry. Press "Esc" to cancel.**
Explanation: GDDM-PCLK cannot print, because the printer is not ready.
System action: GDDM-PCLK waits for either "1" or Esc to be pressed.
User response: Check that the printer is correctly connected to the PC, and that it is ready, then press "1." Press Esc if you want to cancel the print.

GQD0513 **Printer is not available.**
Explanation: GDDM-PCLK cannot print, because the printer is not available.
System action: GDDM-PCLK cancels the printing.
User response: Check that the printer is correctly connected to the port you specified on the GDDM-PCLK Setup panel. Check that the printer is switched on and ready for use. If the problem persists, suspect a hardware problem, and tell your hardware-support personnel.

GQD0514 **Not enough storage for immediate print.**
Explanation: GDDM-PCLK cannot find enough free storage to perform an immediate print.
System action: GDDM-PCLK processing continues.
User response: Either choose the printing option to store the print data for later (deferred) printing, or exit GDDM-PCLK, make more storage available, and restart GDDM-PCLK.

GDDM-PCLK messages

GQD0515   **Plotter is not ready. Check that paper-feeding rollers are down. Press "1" to retry. Press "Esc" to cancel.**
Explanation: GDDM-PCLK cannot plot as the plotter is not ready.
System action: GDDM-PCLK waits for either "1" or Esc to be pressed.
User response: Check that the plotter is correctly connected to the PC, and that it is ready, then press "1." Press Esc if you want to cancel the plot.

GQD0516   **Plotter/printer is inoperative.**
Explanation: GDDM-PCLK cannot plot or print as the plotter or printer is not switched on, is not ready, or is not responding correctly.
System action: GDDM-PCLK cancels the plotting or printing.
User response: Check that the plotter or printer is correctly connected to the PC, that it is switched on, and that it is ready for use. For plotters, check also that the paper-feeding rollers are down, that the baud-rate switches are set to 4800 baud, and that the switches are set for no parity checking, 1 stop bit, and 8-bit word length.

GQD0517   **Change plotter paper and press any key.**
Explanation: GDDM-PCLK is waiting for you to change the plotter paper.
System action: GDDM-PCLK waits until any key is pressed.
User response: Change the plotter paper, then press any key.

GQD0518   **Data transfer in progress. Please wait. Number of bytes transferred so far = n**
Explanation: Plotter or printer data is being transferred from the host.
System action: The data required for plotting or printing is transferred.
User response: Wait for the data transfer to finish.

GQD0519   **Plotting in progress. Press "Esc" to cancel.**
Explanation: GDDM-PCLK is plotting a file.
System action: Plotting continues.
User response: Wait for the plot to finish, or if you want to cancel the plot, press Esc.

GQD0520   **Printer vector symbol set not found.**
Explanation: GDDM-PCLK requires a vector symbol set (VSS) (file name ADMDVECP) to exist in the \PCLK11 subdirectory. It was not found.
System action: Printing terminates.
User response: Run a host GDDM Application on your PC using GDDM-PCLK. This causes the VSS to be automatically transferred to the \PCLK11 subdirectory.

GQD0521   **Printer vector symbol set is not acceptable.**
Explanation: GDDM-PCLK loaded the printer vector symbol set (VSS) and found it to be in an unacceptable format.

GDDM host sends the default sample VSS (ADMDVECP) to GDDM-PCLK for use when printing alphanumerics. If the sample VSS has been changed, or substituted by another, the new sample set may not be acceptable to GDDM-PCLK. The restrictions on the symbol set are as follows:
- Must be a vector symbol set
- Must be type 3 (containing GDF orders)
- Must be flagged as having line orders only
- Must not contain areas
- Must not be proportionally spaced.

For details of the VSS format, refer to the *GDDM Base Programming Reference* manual.
System action: Printing terminates.
User response: To replace the VSS in the \PCLK11 subdirectory you must first delete it using the normal PC DOS DELETE command. Then ensure that the sample VSS is suitable and run GDDM with GDDM-PCLK to cause the VSS to be transferred to the PC.

GQD0600   **Please select PCLK**
Explanation: GDDM in the host has sent data to GDDM-PCLK. For GDDM-PCLK to be able to process the data, the GDDM-PCLK PC session must be selected.
System action: GDDM-PCLK waits for the PC session to be selected.
User response: Hot-key to the GDDM-PCLK PC session.

GQD0610   **PCLK system extension initialization complete. Press any key to continue.**
Explanation: Initialization of the GDDM-PCLK system extension has completed without error.
System action: GDDM-PCLK waits for any key to be pressed.
User response: Press any key.

GQD0620   **Error detected by PCLK system extension. Refer to the PCLK Guide for more information on code n.**
Explanation: The GDDM-PCLK system extension detected an error that prevents GDDM-PCLK operating correctly.
System action: GDDM-PCLK waits for any key to be pressed.
User response: Retry the application. If the problem persists, tell your system-support personnel. For information on code **n**, consult your system-support personnel, or refer to *IBM 3270 Workstation Program: Programmer's Guide*.

GQD0900   **PCLK internal error.**
Explanation: GDDM-PCLK has detected an error in its processing.
System action: Processing terminates.
User response: Retry the application. If the problem persists, tell your system-support personnel.

Appendix B. Errors and messages   **B-17**

GDDM-PCLK messages

GQD1010   **Installation in progress. Number of files left to create = n**
Explanation: The GDDM-PCLK installation program is running. The number of files that GDDM-PCLK has yet to install is indicated.
System action: Processing continues.
User response: Wait for the installation program to finish.

GQD1020   **Installation complete.**
Explanation: The GDDM-PCLK installation program completed successfully.
System action: The installation program terminates.
User response: You may now use GDDM-PCLK.

GQD1030   **Cannot find the national language file for the language specified.**
Explanation: The GDDM-PCLK installation program searched the current directory but did not find a national-language file to match the language you specified. The file name is GQDNLAxx.PAN, where xx is the two-character code that you used to specify the national language.
System action: The installation program terminates.
User response: Check that you specified the national language correctly. Check that the national language file is on the current disk. If it is not, you or your system-support personnel should transfer it from the host.

GQD1031   **Invalid or no drive specified.**
Explanation: You did not specify which drive to install GDDM-PCLK on.
System action: The installation program terminates.
User response: Specify the target drive as a parameter to the install program.

GQD1032   **PCLK is already installed on the target drive. Press "1" to replace. Press "Esc" to cancel.**
Explanation: The installation program found a \PCLK11 subdirectory already existing on the target drive.
System action: The installation program waits for either "1" or Esc to be pressed.
User response: If you want to proceed with the installation, press "1"; otherwise press Esc.

GQD1033   **Remove installation diskette 1 and insert diskette 2. Press any key to continue.**
Explanation: The GDDM-PCLK installation program requires diskette 2 to be loaded.
System action: The installation program waits for you to install diskette 2 and press any key. It then continues with installing GDDM-PCLK.
User response: Remove GDDM-PCLK installation diskette 1 from your diskette drive, and replace it with GDDM-PCLK installation diskette 2. Press any key; the GDDM-PCLK installation program continues.

GQD1034 **Cannot find PCLK installation data file.**
Explanation: The GDDM-PCLK installation program cannot find the
GDDM-PCLK installation file PCLKINST.DAT in the current directory.
System action: The installation program terminates.
User response: Check that when you are asked to insert installation
diskette 2, you insert the correct diskette. You must insert diskette 2 in
the same drive that you inserted diskette 1.

Appendix C. Reference information

Keyboard support

GDDM-PCLK supports these keyboards:

- Personal Computer AT (not AT/370)
- Personal Computer XT (not XT/370)
- Enhanced PC keyboard
- 3270 PC (when using the IBM 3270 Workstation Program Version 1.1, with the GDDM-PCLK system extension only; see page C-12).

Keyboard layouts

The layouts of the first three keyboards are shown on pages C-3, C-4, and C-5.

When using the IBM 3270 Workstation Program Version 1.1, correctly configured for the GDDM-PCLK system extension the GDDM-PCLK key assignments match those of the host session.

When using the IBM 3270 Emulation Program, Entry Level, and the IBM 3270 Emulation Program Version 3, it is **not** possible for GDDM-PCLK to match the key assignments to those of the host session.

The remapping of the keyboard key legends for GDDM-PCLK is shown in tabular form on pages C-6 through C-9. Use the figures below to identify your keyboard, and then select the relevant keyboard template from the set of three provided with your GDDM-PCLK Program Package.

Keyboard templates

The keyboard template highlights which keys you need to press to
run GDDM-PCLK on your particular keyboard. Several keys have
more than one function, and this is shown on the templates by means
of this convention:

Blue tint   Press and hold the Alt key first
Green tint   Press and hold the Ctrl key first
Red tint   Press and hold the Shift key first
Black text   Normal key action.

Figure   C-1. Personal Computer AT keyboard (U.S.)

Personal Computer XT keyboard
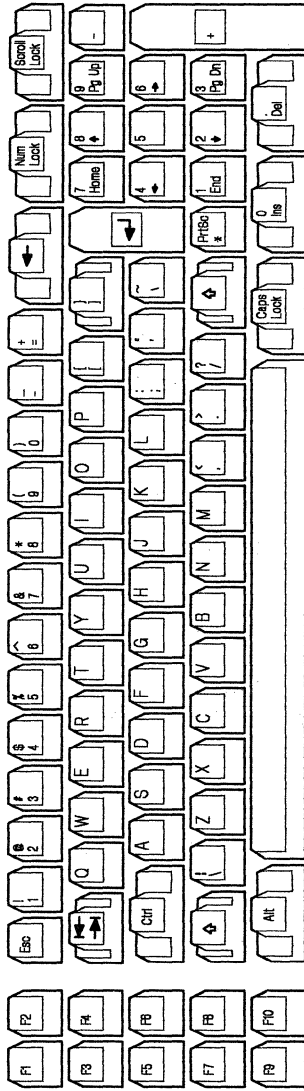
Figure   C-2. Personal Computer XT keyboard (U.S.)
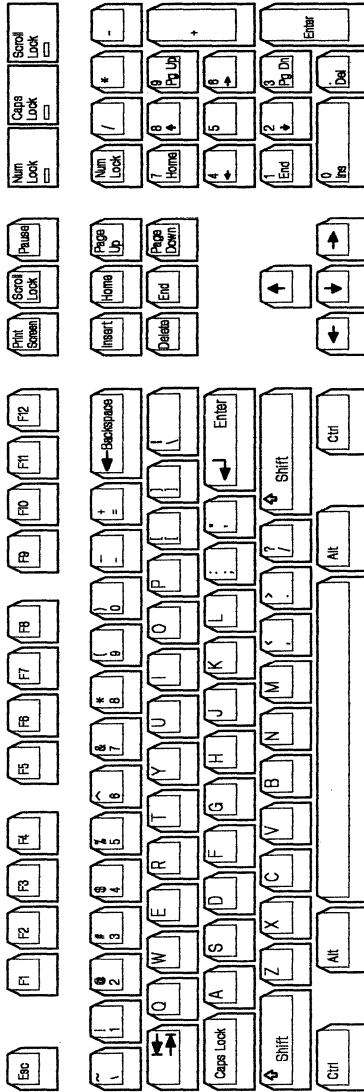
Figure C-3. Enhanced PC keyboard (U.S.)

Keyboard mapping

Because it is not possible to set all the required keys to match the emulators' key settings, the GDDM-PCLK keys are assigned as follows:

Personal Computer AT and XT keyboards

3270 function	PCLK key
ATTENTION	alt-F1
BACKSPACE	←
BACKTAB	shift-Tab
CLEAR	alt-F2
CURSOR DOWN	CurDown
CURSOR LEFT	CurLeft
CURSOR RIGHT	CurRight
CURSOR SEL	alt-F3
CURSOR UP	CurUp
DELETE [2]	Del
DEV CANCEL	alt-F4
DUP	alt-F8
ENTER	Pad+ and Pad*
ERASE EOF	alt-F6
ERASE INPUT	alt-F5
FAST CURS L [1]	ctrl-CurLeft
FAST CURS R [1]	ctrl-CurRght
FLD MARK	alt-F9
HOME	Home
IDENTIFY [2]	Ctrl-Backspace
INSERT [2]	Ins
NEW LINE	←┘
PA1	PgUp
PA2	Pad−
PA3 [1] [2]	PgDn
PF1	F1
PF2	F2
PF3	F3
PF4	F4
PF5	F5
PF6	F6
PF7	F7
PF8	F8
PF9	F9
PF10	F10
PF11	shift-F1
PF12	shift-F2
PF13	shift-F3

3270 function	PCLK key
PF14	shift-F4
PF15	shift-F5
PF16	shift-F6
PF17	shift-F7
PF18	shift-F8
PF19	shift-F9
PF20	shift-F10
PF21	N/A
PF22	N/A
PF23	N/A
PF24	N/A
PRINT [2]	alt-F7
RESET	alt-F10
SYS REQ	ctrl-pad*
TAB	Tab
TEST [2]	ctrl-End

Notes

N/A	not applicable
alt	alternate case
ctrl	control case
shift	shift case
pad	numeric key-pad
[1]	function not available from the IBM PC 3270 Emulation Program, Entry Level, Version 1.1 or 1.2.
[2]	function not available from the IBM 3270 Emulation Program Version 3.

keyboard mapping

Enhanced PC keyboards

3270 function	PCLK key
ATTENTION	Esc
BACKSPACE	←
BACKTAB	shift-Tab
CLEAR	alt-PgDn
CURSOR DOWN	CurDown and pad-CurDown
CURSOR LEFT	CurLeft and pad-CurLeft
CURSOR RIGHT	CurRight and pad-CurRight
CURSOR SEL	alt-F9
CURSOR UP	CurUp and alt-pad-CurUp
DELETE [2]	Del
DEV CANCEL [2]	alt-F11
DUP	ctrl-Ins
ENTER	Enter
ERASE EOF	End
ERASE INPUT	alt-End
FAST CURS L [1]	alt-CurLeft and alt-pad-CurLeft
FAST CURS R [1]	alt-CurRght and alt-pad-CurRght
FLD MARK	ctrl-Home
HOME	Home
IDENTIFY [2]	ctrl-PrtScn
INSERT [2]	Ins
NEW LINE	←┘
PA1	PgUp
PA2	PgDn
PA3 [1] [2]	ctrl-PgUp [1]
PF1	F1
PF2	F2
PF3	F3
PF4	F4
PF5	F5
PF6	F6
PF7	F7
PF8	F8
PF9	F9
PF10	F10
PF11	F11
PF12	F12
PF13	shift-F1
PF14	shift-F2
PF15	shift-F3

3270 function	PCLK key
PF16	shift-F4
PF17	shift-F5
PF18	shift-F6
PF19	shift-F7
PF20	shift-F8
PF21	shift-F9
PF22	shift-F10
PF23	shift-F11
PF24	shift-F12
PRINT [2]	alt-F7
RESET	alt-F12
SYS REQ	alt-PgUp
TAB	Tab
TEST [2]	ctrl-End

Notes

alt	alternate case
ctrl	control case
pad	numeric key-pad
shift	shift case
[1]	function not available from the IBM PC 3270 Emulation Program, Entry Level, Version 1.1 or 1.2.
[2]	function not available from the IBM 3270 Emulation Program Version 3.

Keyboard Remap Utility (PCLKKEYS.EXE)

A key-assignment utility is provided with GDDM-PCLK to enable you
to reassign keys from the default layout. To run the utility, make the
\PCLK11 subdirectory current, and type

PCLKKEYS

The standard GDDM-PCLK logo panel is displayed: press any key to
continue.

The reassignment utility main panel is displayed. This has a table
showing the current assignments for your keyboard, from which you
can select the assignment you want to change. You can only
reassign to keys that do not currently have a function assigned to
them. If you want to reassign to a key that is already assigned, you
must make that key unassigned first. To unassign a key, use the
cursor-up (↑) and cursor-down (↓) keys to select the assignment, and
press F2.

To change a key assignment, use the cursor-up and cursor-down keys
to select the assignment that you want to change, then press ←.
The list of keys to which it is possible to assign that function is then
displayed. Use the cursor-up and cursor-down keys to select the key
you want that function to be assigned to. If you do not want that
function to be assigned to any key, select **unassigned**. Press ← to
confirm your selection, or press Esc to leave the current assignment
unchanged. The utility then returns to the main panel.

If you want to restore the standard GDDM-PCLK assignments, press
F5 when the remap utility main panel is displayed.

When you have done all the reassignments, press F3 to save your
changes and exit, or press Esc to quit the key-assignment utility
without making any changes.

Emulator installation

This section describes options that you can select when installing the supported emulators, which are:

- IBM 3270 Workstation Program 1.1 (with necessary service-level updates)
- IBM PC 3270 Emulation Program (Version 3)
- IBM PC 3270 Emulation Program, Entry Level, Version 1.1 or 1.2.

Alphanumerics and graphics can be merged when using GDDM-PCLK with all emulators, but 3270 Workstation Program Version 1.1 provides the best performance.

IBM 3270 Workstation Program Version 1.1

Check that you have Version 1.1 of the Workstation Program, with necessary service-level updates.

If you do **not** have the necessary level, you will find there is not enough space in the Name of System Extension field on Panel 1.1 for the input value shown below. If this is so, you must contact your local Service Coordinator to get the Workstation Program code update needed.

You must provide the following input values for the panel fields specified — the program default values are valid for the remaining fields.

Home panel
Check that you have enabled the COPY option.

Panel field	Input value	Comment
Copy	Yes	

This results in Panel 1.1 being shown.

Panel 1.1 (see below)

Panel field	Input value	Comment
NAME	C:\PCLK11\PX.EXE	Name of system extension[1]
STORAGE	16	Storage required for system extension
DOS	No	System extension uses DOS functions
DEFAULT DRIVE	C[1]	Default disk drive for this system extension[1]

[1] The drive specified here must be the same drive that contains the GDDM-PCLK program.

```
Panel 1.1          USER-SUPPLIED SYSTEM EXTENSION OPTIONS

Move the cursor under the desired option.            1182K Allocated
Press PF2 to scroll through and select options,      1122K Free
or type the required information.
NAME OF SYSTEM EXTENSION
                C:\PCLK11\PX.EXE_____

STORAGE      16_K           Storage required for system extension

DOS          No             System extension uses DOS functions

DEFAULT DRIVE  C            Default disk drive for this system extension

DEFAULT DIRECTORY USED BY SYSTEM EXTENSION
      A:_____
      B:_____
      C:_____
      D:_____
      E:_____
      F:_____

PF1=Help   PgDn=Next   PgUp=Prev   Home=Home   End=Last   Esc=Quit
```

Figure   C-4. Workstation Program configuration panel 1.1

Panel 3

Panel field	Input value	Comment
Storage	nnn[1]	

[1] Define a PC session with enough storage to run GDDM-PCLK; for typical storage requirements, see page xv.

For more detailed information on the installation process, refer to the *IBM 3270 Workstation Program: User's Guide and Reference.*

IBM 3270 Emulation Program (Version 3)

Check that you loaded PSCAPI before starting the emulation program, and check that you have enabled the Application Programming Interface (API) option on the Emulation Configuration panels.

For details, refer to *IBM 3270 Emulation Program Version 3.00: User's Guide.*

IBM PC3270 Emulation Program, Entry Level, Versions 1.1 and 1.2

For details, refer to:

- *IBM PC3270 Emulation Program, Entry Level, Version 1.1.*

- *IBM PC3270 Emulation Program, Entry Level, Version 1.2.*

Token Ring

GDDM-PCLK can be used with the Token Ring adapter and the IBM Local Area Network (LAN) Program.

Important points to note are:

- GDDM-PCLK is not a multiuser program; that is, there can only be one user for each installed version of GDDM-PCLK.

- Other network users who want to use GDDM-PCLK must install a version in its own sub-directory.

- In LAN gateway mode, it is recommended that all users have their own copy of the emulator program. It can be stored on a shared disk; it need not be on a separate disk.

For more detailed information, refer to *IBM PC Local Area Network Program: User's Guide.*

Screen sizes

When using the Workstation Program 1.1, the screen sizes supported by GDDM-PCLK on the various display adapters are:

Figure C-5. Display adapter screen sizes	
Display adapter	**Screen size (row x column)**
CGA, EGA 64Kb	24x80
EGA 128Kb+	24x80, 32x80
VGA, MCGA	24x80, 32x80, 43x80
8514/A + 8503, 8512 or 8513	24x80, 32x80, 43x80
8514/A + 8514	24x80, 32x80, 43x80, 27x132

8514/A — driver load

When using the 8514/A, enter this command within the PC session:

`\HDIPCDOS\HDILOAD`

This loads the display driver for the 8514/A. Add this command to your DOS session AUTOEXEC.BAT file.

To run in merged graphics mode, HDILOAD must be at level 1.01 or later.

Character attributes

For display adapters other than the 8514/A 8-plane, the color blue is not supported for alphanumerics; cyan is used instead.

On two-color devices, highlighting is usually done by showing a particular field at double-intensity. However, when using a CGA or MCGA in 2-color mode, highlighted fields are shown in reverse video.

The transparency attribute is not supported; non-null characters are displayed as opaque, and nulls are displayed as transparent. Field attributes are displayed with the same transparency as the character that follows it. Under some conditions, this can result in the graphics showing through.

The blink attribute is not supported. Characters with this attribute are displayed with normal highlighting, that is, double-intensity.

Programmable symbol sets are not supported; characters are displayed using the base character set.

Interaction of text and graphics

If your application deletes text that has been drawn on top of graphics, a black rectangle may be left where the text was originally drawn. To correct this, you must direct the application to redraw the graphics:

- For many programs, you can use the Clear key

- For some terminal emulators, you can press Ctrl-F5.

Code pages

If the code page is changed between starting the emulator and starting GDDM-PCLK, incorrect characters may be displayed in alphanumeric fields.

Unattended plotting and printing

This can be done (with hardware that supports form-feed) by selecting **Yes** in response to the question

`Plot/Print immediately (no prompt to defer)?`

on the setup panel part 1 (plotting) or 2 (printing).

Printer paper widths and resolutions

Figure	C-6. Printer paper widths and print resolutions			
	Paper size (characters)		**Print resolution (pixels per inch)**	
Printer	**Standard**	**Wide**	**Std (x/y)**	**High (x/y)**
5182	80	132	84/84	84/84
3852-1	80	80	84/84	84/84
3852-2	80	80	100/96	100/96
5152	80	80	120/72	120/72
4201	80	80	240/72	120/72
4201-2	80	80	240/72	120/72
4202	80	136	240/72	120/72
4207	80	80	120/72	360/180
4208	80	136	120/72	360/180
5201	80	132	120/120	240/240
5202	80	132	120/120	240/240

Appendix D. Running non-merged mode

GDDM-PCLK can also be run in non-merged mode; that is, the alphanumerics and graphics are displayed separately. This can lead to a useful improvement in performance when doing work that is mainly alphanumeric.

Note: To avoid possible graphics text formatting problems, when using a CGA or EGA, the maximum alphanumeric screen size for the host session should be 80 columns by 24 rows.

Procedure

When you select non-merged graphics mode, you have to hot-key between the graphics in the PC session and the alphanumerics in the host session.

However, if you just want to display non-merged graphics, select option 1 "Start PCLK GDDM application support."

Displaying non-merged alphanumerics and graphics

GDDM-PCLK-supplied control keys

The GDDM-PCLK control keys are assigned as follows:

Ctrl-F1		Not applicable
Ctrl-F2		Not applicable
Ctrl-F3		Exit GDDM application support
Ctrl-F4		Not applicable
Ctrl-F5		Not applicable
Ctrl-F6		Not defined
Ctrl-F7	t	Graphic cursor style
Ctrl-F8	t	Graphic cursor speed[1]
Ctrl-F9		Suspend GDDM-PCLK for hot-key
Ctrl-F10		Not defined.

[1] Not applicable when mouse is installed
t "Toggle-action" key.

When you have started GDDM-PCLK for GDDM application support, and hot-keyed back to the host, what you do next depends on the hardware/software configuration you are using:

- **On a dual-screen PC with an IBM PC 3270 Emulation Program Entry Level emulator**, pressing the Alt and R keys at the same time in the host session resumes the DOS session without you having to hot-key back to it. The resumed DOS session is active *concurrently* with the host session. Host-generated graphics are automatically displayed on the color display. You need to hot-key only to start or end GDDM-PCLK, or to switch access between the host session and the DOS session — to perform interactive graphics, for example.

  (Pressing the Alt and S keys at the same time in the host session suspends the DOS session.)

- **On a dual-screen PC** with a terminal emulator that lets you use the one screen for the host session and another screen for the DOS session, but does not let you run an active DOS session concurrently with the host session:

  1. When your host program displays graphics, the prompt:

     `ADM0874 I  PLEASE SELECT PCLK`

     is displayed.

  2. Hot-key to GDDM-PCLK in the DOS session to view the graphics on the DOS screen.

  3. When you have finished viewing the graphics, hot-key back to your host program. The graphics continue to be displayed on the DOS screen.

  The sequence of actions is illustrated below.

Hot-key

```
┌─────────────────────┐          ▓          ┌─────────────────────┐
│                     │         ▓▓▓         │                     │
│                     │                     │                     │
│   Alphanumerics     │◄───────────────────►│      Graphics       │
│                     │                     │                     │
│                     │                     │                     │
└─────────────────────┘                     └─────────────────────┘
```
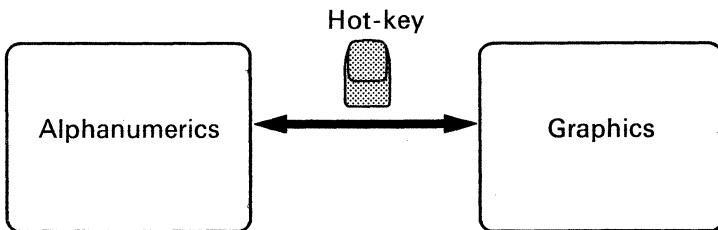
Figure   D-1. Hot-key action

- **On a single-screen PC:**

  1. When your host program displays graphics, the prompt:

     `ADM0874 I PLEASE SELECT PCLK`

     is displayed.

  2. Hot-key to the DOS session. The prompt:

     `GQD0020 Either "hot-key" to host session,`
     `        or press Ctrl-F9 to resume PCLK.`

     is displayed.

  3. Press Ctrl-F9 to resume GDDM-PCLK. The graphics are displayed.

  4. When you have finished viewing the graphics, press Ctrl-F9 to deselect GDDM-PCLK. The prompt:

     `GQD0020 Either "hot-key" to host session,`
     `        or press Ctrl-F9 to resume PCLK.`

     is displayed again. Hot-key back to your host program.

All you have to remember is that the hot-key gets you in and out of DOS, and Ctrl-F9 gets you in and out of GDDM-PCLK. The sequence of actions is shown below.
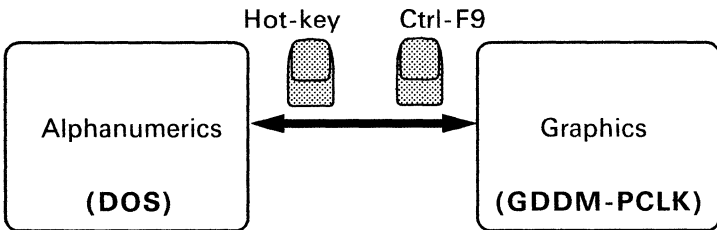
Figure   D-2. Ctrl-F9 action

On any configuration, when graphics are being sent from the host to the PC, a white ✗ symbol appears near the bottom-left-hand corner of the OIA. When you are in the DOS session, you should wait until the white ✗ disappears before you press Ctrl-F9 or hot-key, to make sure that you receive all the graphics.

If you press Ctrl-F9 to deselect GDDM-PCLK, and there is enough storage available, GDDM-PCLK keeps the graphics for you. If you press Ctrl-F9 to reselect GDDM-PCLK, the stored graphics are redisplayed.

It is good practice to end your host graphics program before you end GDDM-PCLK, in case your host program still has graphics to display.

Switching off the display of graphics

A GDDM application that displays graphics without you explicitly requesting it may be difficult to use with a single screen in non-merged mode, because of the frequent need to hot-key to GDDM-PCLK to process the graphics. To avoid this problem, you can switch graphics off by pressing F11 from the graphics panel (accessed by pressing F5 from the User Control main menu). This stops the transmission and display of graphics, unless you are using an interactive graphics application that needs graphics input before it can continue.

Press F11 again to switch the graphics back on. Graphics are transmitted and displayed immediately. When running in non-merged mode, and GDDM-PCLK is busy, only a white cross is shown at the left-hand side of the OIA.

Running the ICU in non-merged mode

To display an ICU chart using GDDM-PCLK, do the following:

1. Start the ICU in the host session. Standard ways are:

   Under CICS, type **ADMC** and press Enter.

   Under TSO, type **CALL** 'data-set-name(**ADMCHART**)' and press Enter. The data-set-name identifies the data set that holds the ICU on your host computer.

   Under VM, type **ADMCHART** and press Enter.

   However, check with your system-support personnel if there is a method of starting the ICU that is specific to your host computer.

2. Before the ICU displays its home panel, you receive the prompt:

   `ADM0873 I IF AVAILABLE, PLEASE SELECT PCLK.`
   `         OTHERWISE, PRESS 'ENTER'`

   a. Do not press Enter. (If you did not receive the above prompt, either you made a mistake in your nickname file or you do not have a nickname file. Exit from the ICU, ensure that you have a suitable nickname file, and start again.)

   b. To select GDDM-PCLK, hot-key to the DOS session, and make sure that the GDDM-PCLK directory is current. Enter the command **pclk** and start GDDM-PCLK for GDDM application support, as described in "Running GDDM-PCLK" on page 2-5.

   c. If you are using only a single screen, press Ctrl-F9 to deselect GDDM-PCLK. The prompt:

   `GQD0020 Either "hot-key" to host session,`
   `         or press Ctrl-F9 to resume GDDM-PCLK.`

   is displayed.

   d. Hot-key back to the host; you see the ICU home panel.

3. Where the panel asks you to "Type in the number or letter of the choice you want" type in 2.2, and press Enter. This takes you directly to the data-manipulation panel 2.2, without you having to complete the intervening panel.

4. Without moving the cursor, type in the word **SAMPLE**, and press Enter. This loads some sample data, as shown in Figure D-3 on page D-6.

```
  2.2                         DATA MANIPULATION
ADM1008 I SAMPLE DATA PROVIDED
                  Data Group Names -------> HONG;KONG    MIAMI
                  Data Group (Z) Values --> 1            2

           *** X Values     X Labels    Y1          Y2          Y3
           001 1            JAN         5           8           .
           002 2            FEB         4           8           .
           003 3            MAR         3           8.5         .
           004 4            APR         4           9           .
           005 5            MAY         4.8         9           .
           006 6            JUN         5           9           .
           X   .            .           .           .           .
           X   .            .           .           .           .
           X   .            .           .           .           .
           X   .            .           .           .           .
           X   .            .           .           .           .
           X   .            .           .           .           .
Commands: D (Delete) R (Repeat) FIT (Least Squares Fit) S (Select) X (Exclude)
          / (Scroll Here) M (Move) A (After) B (Before) I (Insert)
          See Help for More

PF: 1=Help 2=Save/Load 3=End 4=Print 5=Display 7=Up 8=Down 10=Left 11=Right
    12=Home
```

Figure   D-3. ICU data-manipulation panel (non-merged)

5. Press PF5 to display the chart.

   If you receive the message

   ADM0275 W GRAPHICS CANNOT BE SHOWN, REASON CODE n

   you pressed Enter, instead of selecting GDDM-PCLK, when you
   first started the ICU. (The value of n depends on your terminal
   emulator.) You will have to come out of the ICU and start again at
   step 1 on page D-4.

   If you do not receive the above message, do the following to
   display the graphics:

   • If you are using both screens of a dual-screen PC, and DOS is
     active concurrently with the host session, as described on
     page D-2, the chart is displayed on the DOS screen
     automatically, so you do not have to do anything.

   • On other configurations, the ICU is suspended and the
     prompt:

     ADM0874 I PLEASE SELECT PCLK

     is displayed.

     a. Hot-key to the DOS session. The ICU is suspended.

b. If you pressed Ctrl-F9 when you last exited GDDM-PCLK, the prompt:

**GQD0020 Either "hot-key" to host session,
        or press Ctrl-F9 to resume GDDM-PCLK.**

is displayed when you return to the DOS session.

c. Press Ctrl-F9 to select GDDM-PCLK. The chart is displayed on the DOS screen.

6. The chart looks like this:
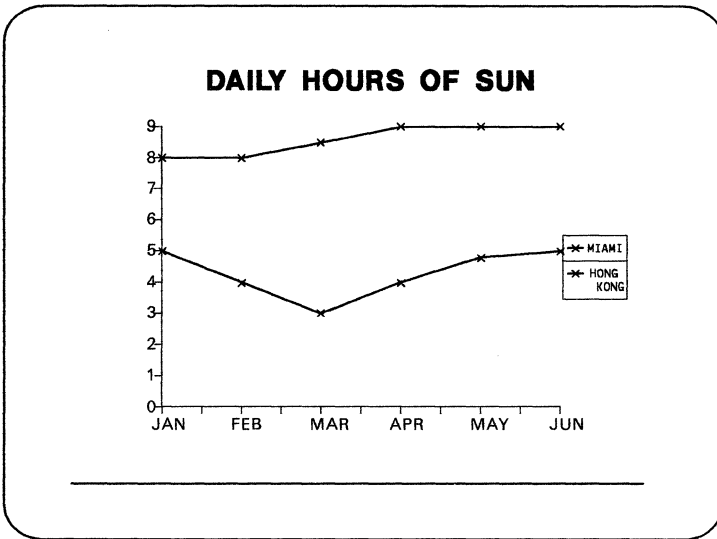
Figure   D-4. "Daily hours of sun" chart (non-merged)

When you have finished viewing the chart:

- If you are using both screens of a dual-screen PC, and DOS is active concurrently with the host session, you do not have to do anything, as you are still in the host session.

- On other configurations:

  - If you are using both screens of a dual-screen PC, hot-key back to the host session to see the PF-key information at the bottom of the chart-display screen.

- If you are using a single screen, press Ctrl-F9 to deselect GDDM-PCLK and clear the graphics from the screen. The prompt:

  ```
  GQD0020 Either "hot-key" to host session,
          or press Ctrl-F9 to resume GDDM-PCLK.
  ```

  is displayed again. Hot-key back to the host session to see the PF-key information at the bottom of the chart-display screen.

7. Press PF3 to return to the ICU data manipulation panel. At this point, if you have finished, exit from the ICU in the normal way, then hot-key back to the DOS session and press Esc to end GDDM-PCLK.

Using the graphics cursor to move chart notes

This subsection gives an example of using an interactive graphics application with GDDM-PCLK. The ICU lets you put notes on your chart, and interactively change the height, width, position, or angle of orientation of the notes.

If you exited from the ICU at the end of the last section, repeat the first four steps in "Running the ICU in non-merged mode" on page D-4 to get the sample data again.

Go through the following tasks to put a chart note on the "Daily hours of sun" chart, and then to position it:

1. From the ICU data-manipulation panel (2.2), press PF12 to take you back to the ICU home panel.

2. Type in 3 and press Enter to take you to the ICU Chart Notes panel.

3. Move the cursor to the right of 001 and under Note Text, and enter the word "note" as shown in Figure D-5 on page D-9.

```
3                           CHART NOTES
Type in the Notes you want under Note Text , one Note per line.
Use PF11 (Edit) to change the size or position or angle of a note.
Use PF8 or the P and T commands to change other properties.


Commands Note Text
       ***
       001 note
       002
       003
       004
       005
       006
       007
       008

Commands: I (Insert) D (Delete) R (Repeat) M (Move) A (After) B (Before)
          / (Scroll here) S (select) X (Exclude) P (Position)
          T (Text Attributes)

PF: 1=Help 2=Save/Load 3=End 4=Print 5=Display 6=Show Attributes 7=Up 8=Down
    11=Edit 12=Home
```

Figure   D-5. ICU Chart Notes panel (non-merged)

4. Press PF11 to edit the chart.

5. *On any PC configuration*, you must hot-key to the DOS session and select GDDM-PCLK before you can perform interactive graphics. The chart is displayed with a dotted border, your note, and a graphics cursor in the form of a small cross, as shown in Figure D-6 on page D-10.
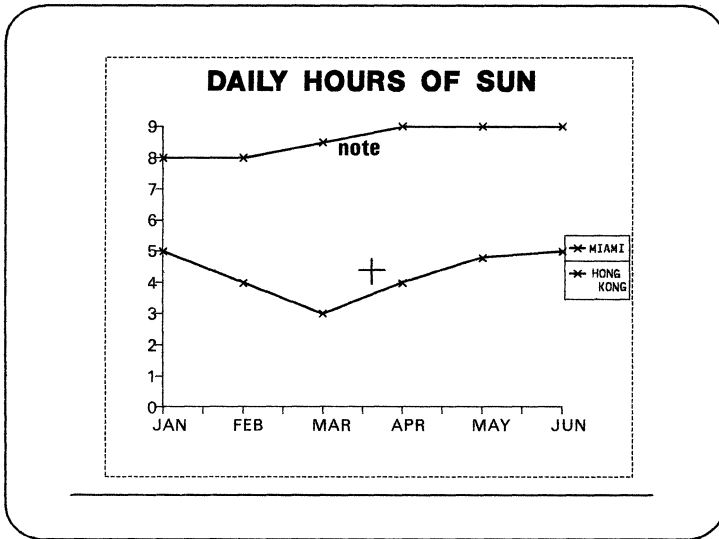
Figure   D-6. ICU chart with note and graphics cursor (non-merged)

6. Using the cursor-move keys or the mouse, move the graphics cursor until it overlaps part of the chart note. You can reduce the speed of cursor movement by using a cursor-move key with the Shift key held down, or by pressing Ctrl-F8.

7. Press PF2 (see pages C-6 and C-8); a dotted border appears around the chart note.

8. Move the graphics cursor to a new position for the chart note.

9. Press PF2. The chart is redisplayed, with the chart note in the new position.

10. When you have finished viewing the chart, press PF3 (see pages C-6 and C-8) to tell the ICU that you have finished the edit. If you are using a single screen, press Ctrl-F9 to clear the graphics.

11. Hot-key back to the host session to see the alphanumerics − in this case, the Chart Notes panel.

12. If you do not want to do anything else with GDDM-PCLK, exit from the ICU in the normal way, then hot-key back to the DOS session and press Esc to end GDDM-PCLK.

Plotting and printing with the ICU

To send an ICU-generated plot to a PC-attached plotter, put this nickname in your nickname file:

```
ADMMNICK FAM=0,NAME=PCPLOT,TOFAM=1,TONAME=(*,ADMPLOT)
```

When the ICU requests a plotter name in the Printer/Plotter output panel, type in **PCPLOT**.

To send an ICU-generated print to a PC-attached printer, put this nickname in your nickname file:

```
ADMMNICK FAM=0,NAME=PCPRINT,TOFAM=1,TONAME=(*,ADMPCPRT)
```

When the ICU requests a printer name in the Printer/Plotter output panel, type in **PCPRINT**.

Glossary

This glossary defines various terms used in the documentation of GDDM and GDDM-PCLK. The full GDDM glossary is contained in the *GDDM Base Programming Reference* manual.

The glossary includes terms and definitions from the IBM *Dictionary of Computing*, SC20-1699.

A

alphanumeric cursor. A physical indicator on a display surface that can be moved from one hardware cell to another. (Contrast with **graphics cursor**.)

alphanumeric text. Letters of the alphabet, numbers, and other characters such as punctuation marks, held in the host computer as a code for each character. Alphanumeric input/output devices hold a definition of the appearance of the character represented by each code. Alphanumeric text is of fixed device-dependent size. (Contrast with **graphics text**.)

ANSI. American National Standards Institute.

API. Application programming interface.

application program. A program that is written by or for a user and that applies to a user's work, for example, a charting application program.

B

background color. The initial color of the display medium, which is usually black on a display, and white on a printer. Contrast with **foreground color**.

C

CECP. Country-extended code page.

CGA. Color graphics adapter.

character. A letter, digit, or other symbol.

chart. In GDDM, usually means business chart (for example, a **bar chart**).

choice device. A logical input device that enables the application program to identify keys pressed by the terminal operator.

CMS. Conversational Monitor System. A time-sharing subsystem that runs under VM/SP.

configuration. The arrangement of a computer system or network as defined by the nature, number, and chief characteristics of its functional units. More specifically, the term configuration may refer to a hardware or software configuration.

control unit terminal (CUT). An operational mode that allows one logical terminal session. Contrast with **distributed function terminal**.

country-extended code page (CECP). An eight-bit code page that has a 93-character set on its nationally standardized code points but is extended to the multilingual character set for the national languages of some European countries.

cursor. A physical indicator that can be moved around a display surface. See **alphanumeric cursor** and **graphics cursor**.

cursor-movement keys. The arrow keys that can move the screen cursor. Also known as compass keys.

CUT. Control unit terminal.

D

data set. The major unit of data storage and retrieval, consisting of a collection of data in one of several prescribed arrangements and described by control information to which the system has access.

default value. A value chosen by GDDM when no value is explicitly specified by the user. For example, the default line type is a solid line.

device family. In GDDM, a device classification that governs the general way in which I/O is to be processed. See also **processing option**. For example:

• Family 1: 3270 display or printer
• Family 2: queued printer
• Family 3: system printer (alphanumerics only)
• Family 4: composed-page printer.

device token. In GDDM, an 8-byte code giving entry to a table of pre-established device hardware characteristics that are required when the device is opened (initialized).

DFT. Distributed function terminal.

directory. A list or collection of personal-computer files that are often related by subject or purpose, for example, a directory of spooled files for printing. The directory is contained on a diskette or a fixed disk.

Disk Operating System (DOS). The IBM Personal Computer program that interacts with the processor in the system unit and the fixed-disk or diskette drives of the PC to control the flow of data.

diskette. A flexible magnetic disk, permanently enclosed in a semi-rigid protective jacket and containing a program or used for storing data, that can be removed from its drive. (Contrast with **fixed disk**.)

diskette drive. A device in the system unit of a personal computer that stores information in, and retrieves information from, removable diskettes. (Contrast with **fixed-disk drive**.)

display adapter. When used with a Personal Computer, it is a board in the Personal Computer (often called an adapter card) that modifies a display device to operate in a particular way. See also **display driver**.

display device. Any output unit that gives a visual representation of data. For example, a screen or printer. More commonly, the term is used to mean a screen and not a printer.

display driver. A PC-resident program that provides a common interface to a **display adapter**. A program running in the PC can use this interface to control the adapter without needing to know the specific hardware design of the adapter.

display terminal. An input/output unit by which a user communicates with a data-processing system or subsystem. Usually includes a keyboard and always provides a visual presentation of data. For example, an IBM 3179-G display. See also **terminal**.

distributed function terminal (DFT). In PC terms, an operational mode that allows multiple concurrent logical terminal sessions. Contrast with **control unit terminal**.

DOS. **Disk Operating System**.

DOS session. That session when you communicate with a PC application running on your personal computer. (Contrast with **host session**.)

download. To transfer data from a processing unit (the host) to an attached device, such as a PC. See also **terminal emulator**.

E

EGA. Extended graphics adapter.

emulator. A combination of programming techniques and special machine features that enable a computing system to run programs written for a different system.

F

field. An area on the screen or the printed or plotted page.

file. A collection of data. This data can be programs, text, numbers, pictures, or charts. Files are stored in the host computer, on personal computer diskettes, or on a personal computer fixed disk.

fixed disk. A non-removable storage disk that is housed in a drive in the system unit of a personal computer and is used for the mass storage and retrieval of data. Also known as **hard disk**. (Contrast with **diskette**.)

fixed-disk drive. A device that stores information on, and retrieves information from, a non-removable storage disk. (Contrast with **diskette drive**.)

foreground color. The color of characters within a window on a display. Contrast with **background color.**

G

GDDM. A series of IBM licensed programs, running in a host computer, that manage communications between application programs and display devices, printers, and plotters for graphics applications.

GDDM-PGF. GDDM-Presentation Graphics Facility. A member of the GDDM series of licensed programs. It is concerned with business graphics, rather than general graphics.

Graphical Data Display Manager. See **GDDM.**

graphics. A picture defined in terms of graphics primitives and graphics attributes.

graphics cursor. A physical indicator that can be moved (often with a joystick, mouse, or stylus) to any position on a display surface. (Contrast with **alphanumerics cursor.**)

graphics data stream. The data stream that produces graphics on a screen, printer, or plotter.

graphics text. Letters of the alphabet, numbers, and other characters such as punctuation marks, held in the host computer as a definition of the appearance of each character in terms of graphics lines, and sometimes areas. Graphics devices draw the lines, and fill the areas as appropriate, to present the text. Graphics text can be any size, subject to the limitations of the graphics device. (Contrast with **alphanumeric text.**)

H

hard disk. See **fixed disk.**

host computer. The primary or controlling computer in a multiple-computer installation.

host session. That session when you communicate directly with an application program in the host computer. (Contrast with **DOS session.**)

hot key. A key or combination of keys that you press to alternate between access to the host session and access to the DOS session.

I

ICU. Interactive Chart Utility.

Interactive Chart Utility (ICU). A GDDM-PGF menu-driven program that allows business charts to be created interactively by people with little or no computer experience.

interactive graphics. In GDDM, those graphics that can be moved or manipulated by a user at a terminal.

ISO. International Organization for Standardization.

K

Kb. Kilobyte; 1024 bytes.

L

LAN. Local Area Network.

LAN gateway. A functional unit that connects a local area network with another network using different protocols.

Local Area Network (LAN). A data network located on the user's premises in which serial transmission is used for direct data communication among data stations.

logging on. The procedure by which you are linked to a multiple-user host computer system. The procedure usually requires a user identification and a password.

M

MCGA. Multicolor graphics array.

menu. A displayed list of logically-grouped functions from which the operator can make a selection. Sometimes called a menu panel.

menu-driven. Describes a program that is driven by operator response to one or more displayed menus.

mouse. A hand-held device (the IBM 5277 Mouse) that is moved around a locator pad to position the graphics cursor on the screen.

MVS. IBM Multiple Virtual Storage. A system under which GDDM can be used.

N

name-list. A means of identifying which physical device is to be opened by a GDDM program. It can be used as a parameter of the DSOPEN call, or in a **nickname**.

nickname. In GDDM, a quick and easy means of referring to a device, the characteristics and identity of which have been predefined.

O

OIA. Operator information area.

OS/2. Operating System/2.

operator information area (OIA). The line nearest to the bottom of a screen that displays information about the status of the work station, the host session, and the PC session.

P

panel. A predefined display that defines the locations and characteristics of alphanumeric fields on a display terminal. When the panel offers the operator a selection of alternatives it may be called a menu panel. Synonymous with **frame**.

partitioned data set (PDS). A data set in direct access storage that is divided into partitions, called members, each of which can contain a program, part of a program, or data. Synonymous with **program library**.

PDS. In MVS, a partitioned data set.

PGF. Presentation Graphics Facility.

pick. The action of the operator in selecting part of a graphics display by placing the graphics cursor over it.

Picture interchange format (PIF). In graphics systems, the type of file, containing picture data, that can be transferred between GDDM (the host) and a 3270-PC/G or 3270-PC/GX work station.

PIF. In GDDM terms, picture interchange format.

plotter. An output device that uses pens to draw its output on paper or transparency foils.

Presentation Graphics Facility. See **GDDM-PGF**.

processing option. Describes how a device's I/O is to be processed. It is a device-family-dependent and subsystem-dependent option that is specified when the device is opened (initialized). An example is the choice between CMS attention-handling protocols.

procopt. Processing option.

program library. (1) A collection of available computer programs and routines. (2) An organized collection of computer programs. (3) Synonym for **partitioned data set**.

PS/2. Personal System/2.

S

scrolling. In computer graphics, moving a display image vertically or horizontally in a manner such that new data appears at one edge as existing data disappears at the opposite edge.

SDLC. Synchronous Data Link Control.

SMP. System Modification Program.

SMP/E. System Modification Program Extended.

symbol set. A collection of symbols, usually, but not necessarily, forming a font.

T

terminal. A device, usually equipped with a keyboard and a display unit, capable of sending and receiving information over a link. See also **display terminal**.

terminal emulator. A program that enables a device such as a personal computer to enter and receive data from a computer system as if it were a particular type of attached terminal. See also **download**.

toggle. To switch between two modes. In GDDM-PCLK, the user can toggle between the host session and the DOS session by pressing one or more keys.

Token Ring. A feature of the **Local Area Network** program that enables unidirectional data transmission between stations by means of a token-passing procedure over one transmission medium such that the data transmitted returns to the sending station.

TSO. Time-sharing option. A subsystem of OS/VS under which GDDM can be used.

V

VGA. Video graphics array.

VM/SP CMS. IBM Virtual Machine/System Product Conversational Monitor System. A system under which GDDM can be used.

VM/XA. IBM Virtual Machine/Extended Architecture. A system under which GDDM can be used.

VSE. IBM Virtual Storage Extended. A system under which GDDM can be used.

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G D D M™

GDDM-PCLK Version 1.1 6242913

Warranty
Media – 3-month warranty.   Program – 3-month warranty.

Program services
Available after warranty: yes.   Charges apply: no.
See "Additional information" below.

Service expiry date
31st May, 1989.   No program warranty or program services are available after this date.

Systems requirements

Software required:
Personal Computer DOS 2.1 or later; One of these emulators:
IBM 3270 Emulation Program, Entry Level, Version 1.1
IBM 3270 Emulation Program, Entry Level, Version 1.2
IBM 3270 Emulation Program, Version 3
3270 Workstation Program, Version 1.1 (with necessary service-level updates)

Hardware required:
System Units – one of 3270 PC, 3270 PC AT, PC/XT™, PC/AT™, PC/XT-286, IBM Personal System/2™ Models 30, 50, 60, and 80.
Minimum storage – 512Kb.
Display adapters – one of CGA in 640x200, pixel, 2-color mode,
IBM Personal System/2 Model 30 MCGA in 640x480 pixel, 2-color mode,
EGA adapter: (64K) in 640x200 16-color mode, (128K) in 640x350 pixel, 16-color mode,
IBM Personal System/2 Display Adapter in 640x480 pixel, 16-color mode,
IBM Personal System/2 Models 50, 60, and 80 (VGA) in 640x480 pixel, 16-color mode,
IBM Personal System/2 Display Adapter 8514/A in 640x480 pixel, 16-color mode, or in
1024x768 pixel, 16-color advanced-function mode.

Carefully review your hardware and software system requirements with an IBM representative, your IBM Authorized Dealer, or any other IBM-approved Supplier before obtaining a license for this program.

Software included:
Two 5.25-inch diskettes two-sided, one 3.5-inch diskette two-sided.

Additional information:
GDDM-PCLK requires connectivity with one of the IBM host programs GDDM/MVS (5665-356), GDDM/VM (5664-200), GDDM/VMXA (5684-007), or GDDM/VSE (5666-328), which must have the PCLK Feature (PCLKF).
Program Services for GDDM-PCLK are only available through the host PCLKF.

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