

# **HP GlancePlus User's Manual**

## **(for MPE/iX Systems)**



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## Printing History

Updates are new editions or complete revisions of the manual.

A software code may be printed before the date; this indicates the version level of the software product at the time the manual was issued. Many product updates and fixes do not require manual changes and, conversely, manual corrections may be done without accompanying product changes. Therefore, do not expect a one-to-one correspondence between product updates and manual updates.

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## Conventions

Capitalization	Capitalized first letters signify HP GlancePlus commands, screen names, screen sections, function keys, company names, and product names.
Computer Font	Computer font represents screen text, including prompts and messages that appear on the screen, and characters or words that you are prompted to enter on the screen.
<i>Italics</i>	Italics are used to emphasize words, phrases, or characters in the text, or in syntax strings, to indicate variables.
UPPERCASE	Words in all uppercase (capitals) represent program fields and system commands that should be entered exactly as shown.
 or 	Depending on your keyboard, one or the other represents the terminal key used to execute a command.

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### Notice

MPE/iX, Multiprogramming Executive with Integrated POSIX, is the latest in a series of forward-compatible operating systems for the HP 3000 line of Hewlett-Packard computers.

MPE/iX is a superset of its direct predecessor MPE XL, and all programs written for MPE XL will run under MPE/iX without change. Also, you can continue to use MPE XL system documentation, although it may not refer to features added to the operating system to support POSIX (for example, hierarchical directories).

You may encounter references to MPE V, the operating system for HP 3000s that are not based on the PA-RISC architecture. MPE V software can be run on PA-RISC HP 3000s (series 900) in *compatibility mode*.

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## Introduction

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HP GlancePlus for MPE/iX is an online diagnostic tool that you can use to monitor system activity and troubleshoot system performance problems.

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### What HP GlancePlus Can Do For You

*HP GlancePlus is easy to install, easy to run, and easy to use.* You don't have to spend time on complicated set-up procedures or training. Anyone can use HP GlancePlus effectively from day one.

*HP GlancePlus is powerful.* It gives you a complete picture, highlighting processes that are starved for resources and those using resources.

*HP GlancePlus gives you expert assistance.* It uses a comprehensive set of rules developed by performance specialists to alert you whenever a possible performance problem arises.

*HP GlancePlus is flexible.* You can customize the software to display and highlight the data that is most important to you and your system. You won't have to wade through unnecessary data when dealing with a problem. For example, you can easily set thresholds so the Global activity screen displays only processes that exceed your defined limits.

*HP GlancePlus provides data at the level of detail you need.* You can go from displaying simple, graphical global data, to displaying technical data, to displaying detailed process data. By letting you "zoom in" on the data you need, you won't be overwhelmed with too much or too little data at one time.

*HP GlancePlus provides an extensive online help facility developed by performance experts.* Any help you might need to use the product is right at your fingertips.

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## How You Can Use HP GlancePlus

You can use HP GlancePlus:

- As a diagnostic tool to identify immediate performance problems.

You can easily find out who or what is slowing your system and identify particular programs or applications that are CPU or I/O “hogs”.

- As a monitoring tool to learn about your system.

By routinely checking system activity you can document typical performance levels and characterize typical system loads. This can make it much easier to identify unusual performance or potential problems. Having this knowledge of typical system performance can even help you avoid potential problems with your systems.

---

## Will You Need Other Performance Tools?

HP GlancePlus is only one member of a family of performance products offered by Hewlett-Packard. If you need to go beyond *immediate* performance monitoring, you may wish to consider other members of this family:

- HP GlancePlus Pak for MPE/iX combines GlancePlus with the ability to log data for analysis by programs on the HP 3000 or by spreadsheet packages on a personal computer.
- HP LaserRX/MPE logs data similar to HP GlancePlus Pak for MPE/iX but also contains a powerful performance data analysis tool. It organizes and categorizes raw performance data into easy-to-use Microsoft® Windows™-based graphs and charts that can be displayed on a PC. You use a highly efficient hierarchical approach to analysis, looking at data from the global to detail level.
- HP RXForecast/MPE forecasts future resource utilization based on actual past history. This tool helps you plan future resource requirements and can help you avoid periods of insufficient resources. (It requires HP LaserRX/MPE as a companion program.)
- HP SPT/XL helps you optimize native mode programs.

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## How to Use This Manual

This manual will help you get maximum value from HP GlancePlus. Depending on your needs and previous experience, you can consult the following chapters for specific information:

- Chapter 2 for information on installing HP GlancePlus.
- Chapter 3 for information on the general features of the program.
- Chapter 4 for additional information on commands.
- Chapter 5 to learn about the statistics appearing on each screen.
- Chapter 6 to find out about the Expert facility.
- Chapter 7 for information on customizing HP GlancePlus.

The appendixes contain additional information, such as expanded definitions of wait reasons.

HP GlancePlus also provides online help information as discussed in chapter 3. This online help information is context sensitive and can be accessed using the “H” command.



## Installation

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### System Requirements

HP GlancePlus for MPE/iX can be used on any HP 3000 Precision Architecture system using the MPE/XL operating system, version 2.1 (or later), or the MPE/iX operating system.

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### Terminal and PC Requirements

HP GlancePlus runs on the following terminals and personal computers:

- HP Vectra personal computer (running HP-compatible terminal-emulation software).
- HP 150 personal computer.
- HP 700/9*x* family.
- HP 239*x* family.
- HP 262*x* family.

---

## Installing HP GlancePlus

Installing GlancePlus is a simple process. It involves placing the appropriate files in a group with the necessary capabilities.

### Group Capabilities

HP GlancePlus should be placed in a group that allows all system users easy access to the program. Normally this group is PUB.SYS.

The group must have the following capabilities:

- Interactive access (IA).
- Process handling (PH).
- Extra data segments (DS).
- Privileged mode (PM).

### Group Access

A user must have read, lock, and execute access to the GlancePlus files before running it. Since GlancePlus is usually installed in PUB.SYS, all users typically would have the required access.

### Installing the Program

Usually, HP GlancePlus is installed automatically through the MPE/iX AUTOINST process.

To customize the use of GlancePlus, activate the GlancePlus UDC (user-defined command) file as follows:

- Move the user-defined command GLANCE from the GLANUDCX file to the desired UDC file and activate it.

*or*

- Activate the HP GlancePlus UDC file and type the following:

```
:SETCATALOG GLANUDCX
```

## Getting Started

---

### Overview

This chapter shows you how easy it is to use the HP GlancePlus program. You will learn how to run the program, display a screen, move to other screens, get help, print screens, exit the program, and use the single-letter commands to invoke GlancePlus's various tasks.

---

### Running HP GlancePlus for MPE/iX

To execute the program,

- Type:  
:GLANCEXL.PUB.SYS
- If you have activated the HP GlancePlus UDC file, type:  
:GLANCE

When you become familiar with GlancePlus, you may want to customize the GlancePlus startup procedure. Chapter 7 contains information on customizing the GlancePlus startup procedure.

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## Exiting HP GlancePlus

To exit the program at any time:

- Press **(E)** or **(F8)** from any screen except an online help screen.

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## More Than a Look—The HP GlancePlus Global Screen

The Global screen (figure 3-1) is the first screen that appears when you start GlancePlus. This screen gives you much information in an easy-to-read display. It provides a global, systemwide summary of how resources are being used by active processes.

The screenshot shows the HP GlancePlus Global screen. At the top, it displays 'HPB1787 B.04.00 HP GlancePlus 16:21:56 Global'. Below this is a summary of system resources: CPU (52% current, 66% avg, 89% high), Disc (6, 14, 29), and Mem (100%, 100%, 100%). The main part of the screen is a table of active processes with columns for JSNo, Dev, Logon, Pin, Program, Pri, CPU%, Disc, Trn, Resp, and Wait. At the bottom, there are several softkey buttons: Global, Select, Print, MPE Command, Time Adjust, Refresh Screen, Help, and Exit Glance.

JSNo	Dev	Logon	Pin	Program	Pri	CPU%	Disc	Trn	Resp	Wait
S20	216	TWYLA.EVAL	160	MNTMENU	C152	1.8%	0.1	11	0.2	TERM
S39	131	DEBRA.EVAL	208	MNTMENU	C152	1.3%	0.5	6	0.3	TERM
S45	310	BECKY.EVAL	221	MNTMENU	C152	1.6%	0.1	11	0.1	TERM
S52	124	BETHANNE.EVAL	233	MNTMENU	C152	1.0%	0.4	6	0.3	TERM
S60	220	EARL.EVAL	234	MNTMENU	C152	1.4%	0.4	12	0.2	TERM
S83	315	FRANCES.EVAL	60	MNTMENU	C152	1.6%	0.0	25	0.1	TERM
S119	101	AL.ACCTG	173	APPR01	C152	5.7%	0.7	15	0.5	TERM
S15	311	SALLIE.EVAL	321	MNTMENU	C152	1.2%	0.0	11	0.4	TERM
S75	227	VAN.ACCTG	212	APPR01	C152	3.1%	0.0	11	0.3	TERM
S49	304	DEBBIE.EVAL	264	MNTMENU	C152	1.6%	0.0	14	0.1	TERM
S138	121	FRIEDA.EVAL	75	MNTMENU	C152	2.2%	0.7	12	0.6	TERM
S142	225	HARBISON.EVAL	262	MNTMENU	C152	3.1%	0.1	20	0.2	TERM
S55	221	JANIE.EVAL	257	MNTMENU	C152	2.8%	1.6	9	1.0	TERM
S29	110	VICKY.EVAL	291	MNTMENU	C152	1.1%	0.0	8	0.2	TERM
S169	330	JOE.TELESUP	136	GLANCEXL	B100	2.6%	0.0	0	0.0	

Figure 3-1. The Global Screen

You can access other GlancePlus screens using the softkeys (dedicated function keys) or single-letter commands described later in this chapter.

### 3-2 Getting Started

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## Reading the Screen Display

Although all GlancePlus screens appear similar, they carry different information about system resources. Each screen is divided into four sections—Banner Line, Global Bars, Detail Display, and Function Keys. The Banner Line and Global Bars present the same information on every screen, whereas the Detail Display section differs from screen to screen.

### Banner Line

The Banner Line at the top of the screen contains information on the version of the product, product name, current time (hour:minute:second), and screen identifier (figure 3-2). The screen identifier may contain information pertinent to the particular screen, such as the particular job number in the Job screen.

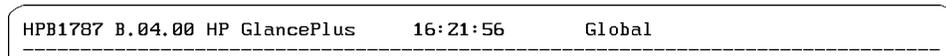


Figure 3-2. The Banner Line

### Global Bars

Three Global Bars appear directly below the Banner Line (figure 3-3). These bars, and the percentages listed to the right of them, show the system's use of three resources: CPU, Disc, and Memory. The bars are present on every screen to help you keep track of the overall “global” picture. The letters superimposed on each bar specify *how* that portion of the resource is being used.

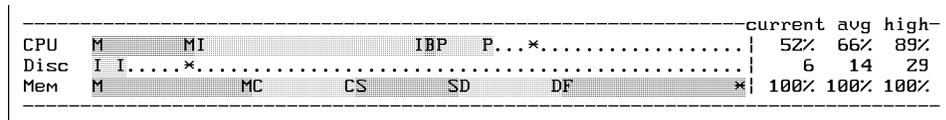
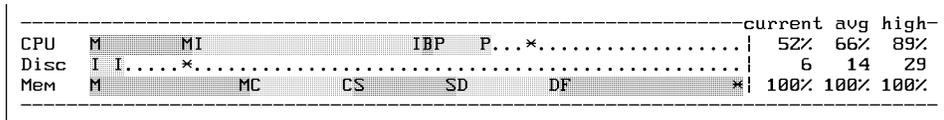


Figure 3-3. Global Bars

## CPU Bar



The CPU bar shows how much of the central processing unit's time was spent on various activities during the last interval. The current, average, and highest percentages are displayed numerically to the right of the bar. The length of the bar indicates the percentage of CPU time used or time that could be used if pending disc I/Os were satisfied during the current interval. Paused for disc is not included in these numbers since the CPU is inactive during this time because of pending disc transfers. (Scale: 0 to 100 percent.)

The components of the CPU bar are as follows:

- M MPE/iX functions such as memory management, interrupt handling, and deciding which process uses the CPU
- S System processes such as data communication monitors and spoolers
- I Interactive (session) processes
- B Batch (job) processes
- P Paused for disc (no CPU is used but Disc I/O is occurring)
- \* Average usage of this resource during this execution of GlancePlus (not including Paused for Disc).

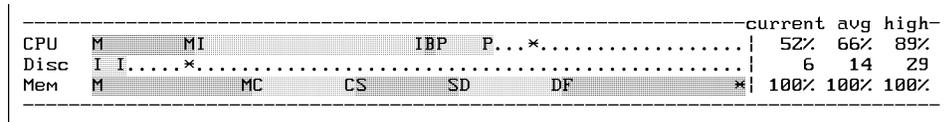
---

**Note** The CPU bar may be configured to show activity by queue, which changes the above components. Chapter 7 contains information on customizing the GlancePlus global bars.

---

## 3-4 Getting Started

## Disc Bar

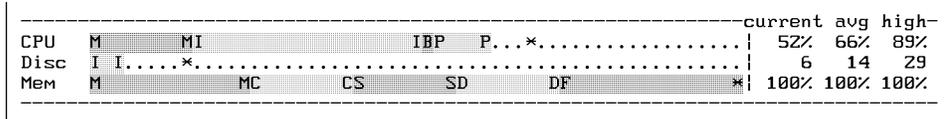


The Disc bar shows the rate of disc transfers that occurred on the system during the last interval. The current, average, and highest number of transfers per second are shown numerically to the right of the bar. The length of the bar indicates the total number of transfers per second occurring currently. (Scale: 0 to 100 physical transfers per second.)

The components of the Disc bar are as follows:

- M Memory management transfers (swapping)
- S System process transfers (data communication monitors and spoolers)
- I Interactive (session) process transfers
- B Batch (job) process transfers
- \* Average usage of this resource during this execution of GlancePlus.

## Memory Bar



This bar represents the amount of main Memory in current use as a percentage. The current, average, and highest percentages of main Memory use are displayed to the right of the bar. The length of the bar indicates the total amount of main Memory that is currently being used.

---

**Note** It is *normal* for main Memory to be full even when there is little activity on the system.

---

Components of the Memory bar show how much Memory is being used for different purposes. The Memory bar components are as follows:

- M Resident MPE (operating system code and data are not swappable)
- C Code (both native and compatibility-mode programs and libraries)
- S Stacks (both native and compatibility-mode program data stacks)
- D Data objects (certain system data structures and compatibility-mode data segments)
- F Files (data files such as TurboIMAGE data sets, KSAM key and data files, and normal MPE files)
- \* Average usage of this resource during this execution of GlancePlus.

A particular category will not be displayed if there is insufficient Memory usage to occupy one character space on the screen.

## 3-6 Getting Started

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**Note** The Memory bar may be configured to show fault rates, which changes the above components. Chapter 7 contains information on customizing the GlancePlus global bars.

---

### Percentage Columns

The percentage columns at the right of the global bars (figure 3-3) show current, average, and highest use of each system resource. Current value represents use for the current interval. Average is the mean value of all usage data collected since the present monitoring session began. High value shows the single highest usage amount of that resource during the monitoring session.

If you reset the statistics to zero with the Zero Averages command (**Z**), the current value will still represent current usage for each interval, but subsequent average and high values will represent data collected since the resetting.

---

**Note** Upon entry to GlancePlus, the first global screen will show GLANCEXL using a high percentage of CPU. This is normal since the program must take two data samples within a few seconds of each other in order to display the first Global screen. At the default 30-second interval, CPU usage is typically low and should cause no problems on your system. CPU overhead used by GlancePlus is proportional to the frequency of screen update and the number of processes on the system. You can cause excessive CPU overhead by pressing a key every few seconds.

---

## Detail Display

The information presented in the detail display portion of the screen below the global bars depends on the type of screen (figure 3-4).

JSNo	Dev	Logon	Pin	Program	Pri	CPU%	Disc	Trn	Resp	Wait
S20	216	TUYLA.EVAL	160	MNTMENU	C152	1.8%	0.1	11	0.2	TERM
S39	131	DEBRA.EVAL	208	MNTMENU	C152	1.3%	0.5	6	0.3	TERM
S45	310	BECKY.EVAL	221	MNTMENU	C152	1.6%	0.1	11	0.1	TERM
S52	124	BETHANNE.EVAL	233	MNTMENU	C152	1.0%	0.4	6	0.3	TERM
S60	220	EARL.EVAL	234	MNTMENU	C152	1.4%	0.4	12	0.2	TERM
S83	315	FRANCES.EVAL	60	MNTMENU	C152	1.6%	0.0	25	0.1	TERM
S119	101	AL.ACCTG	173	APPR01	C152	5.7%	0.7	15	0.5	TERM
S15	311	SALLIE.EVAL	321	MNTMENU	C152	1.2%	0.0	11	0.4	TERM
S75	227	VAN.ACCTG	212	APPR01	C152	3.1%	0.0	11	0.3	TERM
S49	304	DEBBIE.EVAL	264	MNTMENU	C152	1.6%	0.0	14	0.1	TERM
S138	121	FRIEDA.EVAL	75	MNTMENU	C152	2.2%	0.7	12	0.6	TERM
S142	225	HARBISON.EVAL	262	MNTMENU	C152	3.1%	0.1	20	0.2	TERM
S55	221	JANIE.EVAL	257	MNTMENU	C152	2.8%	1.6	9	1.0	TERM
S29	110	UICKY.EVAL	291	MNTMENU	C152	1.1%	0.0	8	0.2	TERM
S169	330	JOE.TELESUP	136	GLANCEXL	B100	2.6%	0.0	0	0.0	

Figure 3-4. An Example of a Detail Display

Some screens show a summary of processes, such as the Global, Job/Session, and Filter screens. Interesting applications are scrolled down as new entries are added to the top of the listing to keep the latest information just below the Global bars. The process information for the most current interval is displayed at the top of the detail area immediately below the global bars. You can use terminal memory to scroll back to process data from previous intervals.

Other screens show statistics for an individual resource or individual process. These screens refresh the detail display at every interval. Examples of this type of screen include the CPU, Disc, Memory, and Process screens.

The Filter Select and Set Option Values screens help you set parameters. Their detail display is a table of value settings followed by a prompt you can use to change a value. Every time you change a value, a new, adjusted table of values is displayed below the previous one until you terminate the dialogue by pressing **Return**.

## 3-8 Getting Started

On many systems, it could take several screens full of data to display all currently-running processes. Evaluating that much information could be confusing. To avoid this, GlancePlus lets you limit the processes displayed to those that are *interesting* to you—processes that surpass predetermined threshold-usage values. Interesting processes either use a major portion of the system's resources or must wait exceptionally long to use them, and are the processes most likely to reflect an existing or potential problem. The procedure for setting process thresholds is described at the end of this chapter.

The Global screen is the starting point for most performance analysis activity. Other GlancePlus screens are discussed individually in chapter 5.

---

## HP GlancePlus Function Keys and Commands

To make it easy to select screens or functions, GlancePlus displays a row of function-key labels across the bottom of each screen. These labels, also called **softkeys**, correspond to function keys **F1** through **F8** on your terminal keyboard.



**Figure 3-5. HP GlancePlus Function Keys**

You can also access all of GlancePlus's functionality using the single-letter commands shown in tables 3-1 and 3-2 (see pages 3-10 and 3-11).

To avoid confusion, function keys perform the same actions on all GlancePlus screens. To maintain this consistency, some screens or functions can be selected only by using their single-letter commands. The command abbreviations, such as **C** for CPU screen and **D** for Disc screen, are intuitive and easy to remember. For a quick reminder, simply enter **H** or press the Help softkey, then press **C** at the next prompt to indicate you want a quick list of the available commands. Additional information about commands is presented in chapter 4.

**Table 3-1. Commands to Access Screens**

Command Name	Command Character	Function Key	Action
CPU Detail	(C)		Displays CPU Detail screen.
Disc Detail	(D)		Displays Disc Detail screen.
Filter	(F)		Displays Filter screen.
Global	(G)	(F1)	Displays Global screen.
Help	(H)	(F7)	Enters Help facility.
Select Job	(J)		Selects particular job to be displayed in detail on the Job/Session screen.
Memory Detail	(M)		Displays Memory Detail screen.
Xpert Overview	(O)		Displays Expert Overview of system bottlenecks. <i>Note:</i> The (X) key is the command character for the Xpert Analysis command.
Select Process	(P)		Selects particular process to be displayed in detail on the Process screen.
Select Session	(S)		Selects particular session to be displayed in detail on the Job/Session screen.
Workload	(W)		Displays Workload screen.
Select	(#)	(F2)	Selects job/session/process to monitor.
Previous Display	(<)		Displays screen that was last active before entering current display.
Next Logical Display	(>)		Displays next logical screen, that is, the top resource consumer. <i>See</i> chapter 4.

**3-10 Getting Started**

**Table 3-2. Commands to Access Program Activities**

Command Name	Command Character	Function Key	Action
All Processes	(A)		Displays detail data for <i>all</i> processes or applications rather than only <i>interesting</i> processes or applications.
Exit Glance	(E)	(F8)	Terminates program.
Print	(L)	(F3)	Toggles continuous printing on or off for the line printer (LP).
Change Queue	(Q)		Changes queue or priority of a given job, session, or process.
Refresh Screen	(R)	(F6)	Clears and displays an updated screen.
Time Adjust	(T) or (I)	(F5)	Changes refresh time or interval.
Users	(U)		Lists users of a file.
Set Option Values	(V)		Displays current option values and allows you to change them.
Xpert Analysis	(X)		Displays Expert Analysis.
Zero Averages	(Z)		Resets averages to zero and recomputes them beginning with the current interval.
MPE Command	(;) )	(F4)	Allows you to enter an MPE command.
	(Ctrl)+(Y)		Terminates command display.
	(Ctrl)+(S)		Stops scrolling of screen display.
	(Ctrl)+(Q)		Resumes scrolling of screen display.
Update Display	(Enter) or (Space Bar)		Updates display immediately.

## Online Expert Assistance for Understanding Performance Data

Now that you're familiar with the Global screen and have an idea of how to display performance statistics, you may wonder how you can get help understanding what the data means? All you need to do is use the Expert facility in GlancePlus.

It provides expert assistance online by a comprehensive set of rules developed by performance experts to alert you whenever a possible performance problem arises.

You can set an option to get expert assistance continuously or only when you request it using by typing the X command. Refer to chapter 6 for details on the Expert facility.

HPB1787 B.04.00 HP GlancePlus 14:44:46 Global												
-----current avg high-----												
CPU	M	MS	SI	*	I	.....				87%	54%	91%
Disc	MSI	*	.....							12	9	31
Mem	M	MC	CS	SD	DF	*				100%	100%	100%
-----												
JSNo	Dev	Logon	Pin	Program	Pri	CPU%	Disc	Trn	Resp	Wait		
<b>XPERT: CPU IS HIGH!</b>												
S203	134	SHARON.EVAL	182	MNTMENU	C152	2.8%	0.0	18	0.2	TERM		
S211	310	BECKY.EVAL	81	MNTMENU	C152	1.8%	0.0	16	0.4	TERM		
S209	23	COLLECT.EVAL	212	REVALINQ	C152	3.5%	0.6	14	0.4	TERM		
S230	314	MARYANN.EVAL	291	MNTMENU	C152	2.1%	0.1	14	0.3	TERM		
S288	215	VIRGINIA.EVAL	228	MNTMENU	C152	2.1%	0.1	16	0.1	TERM		
S208	227	VAN.ACCTG	288	APPR01	C152	0.3%	0.0	2	6.0	TERM		
S293	332	JOE.TELESUP	240	GLANCEXL	B100	3.6%	0.0	4	0.6			
S295	334	DUP013.DIALUP	312	CI	DIED	0.7%	0.2	0	0.0			
S295	334	DUP013.DIALUP	237	LOGON	DIED	1.8%	0.0	2	2.5			
S295	334	DUP013.DIALUP	48	RESMNT	DIED	0.6%	0.5	2	0.4			
S295	334	DUP013.DIALUP	103	REVALINQ	DIED	0.9%	0.2	4	0.0			
S297	333	DUP041.DIALUP	239	TTSSON	C166	6.3%	0.2	4	5.4	CPU		
S298	225	HARBISON.EVAL	144	CI	C152	2.8%	0.1	0	0.0	SON		
S298	225	HARBISON.EVAL	261	LOGCHK	C152	5.6%	0.7	0	0.0	TERM		
-----												
Global	Select	Print	MPE	Time	Refresh	Help	Exit					
			Command	Adjust	Screen		Glance					

Figure 3-6. An Example of the Expert Facility

---

## Help Facility (H)

You can access the GlancePlus Help facility in three ways. Enter the **H** command character, press the **Help** softkey, or enter a question mark (?). A prompt will ask if you want to see a list of available commands, access help specific to the current screen, or access general help.

If you request a list of commands or help specific to the current screen, you will be returned to GlancePlus when you finish that topic and press **Return**.

Select general help if you want to get help on more than one topic. A menu will be displayed, followed by a greater than (>) prompt. Then, you can enter any of the following:

- Any menu item. For example, you can enter XPERT to find out about the GlancePlus Expert facility.
- A menu item and a key word. For example, you can enter PROCESS,STATE to produce a listing of the codes that may appear in the process STATE bar.
- **Menu** to display the Help facility menu.
- **Help** to display the Help facility instructions.
- **Exit** or **E** to terminate the Help Facility.

If you access Help and the softkey feature of GlancePlus is enabled, a base set of softkeys will be loaded. These base keys will allow you to move directly to Help menus for the four most popular screens, or to access additional general Help commands. You can access the following:

- **F1** Global screen Help.
- **F2** Job screen Help.
- **F3** Session screen Help.
- **F4** Process screen Help.
- **F5** GlancePlus commands.
- **F6** Main Help menu.
- **F7** Help (on Help).
- **F8** Exit Help and return to GlancePlus processing.

If you press **Return** while in the Help Menu, Help displays information up to the next key word or command. For example, after you enter SESSION, Help displays the overall format of the Session screen and a list of key words associated with it (CPU, DISC, TOTALS, PROCESS). If you press **Return**, Help displays the CPU topic for Session. If you press **Return** again (after the prompt), Help displays the Disc information for Session and so on. (This is similar to turning pages in a manual.)

---

## Printing a Screen

The Print facility provides a default formal designator for the print command—the file is GLANCELP. The default device class is LP. Once enabled, the Print facility prints each screen as it is updated.

To print, press:

```
Print *
```

The softkey changes to:

```
Print *  
Enabled
```

And the following message appears:

```
Printing is now enabled
```

When printing is enabled, a hard copy will be printed *each time* the screen updates and will *continue* to be printed if you select a new screen.

To disable the Print Facility, press:

```
Print *  
Enabled
```

The following message appears:

```
Printing is now disabled
```

The spool file is released to print.

### 3-14 Getting Started

To change the default device,

- Use the MPE (:) command to enter a file equation:

```
:FILE GLANCELP;DEV=[device]
```

The default option, CCTL, will print one screen per page.

To save paper by printing contiguously,

- Add the NOCCTL option to the file equation:

```
:FILE GLANCELP;DEV=LP;NOCCTL
```

---

## Setting Process Thresholds

Once you are familiar with GlancePlus, you may want to customize the Global screen to focus attention on the data most important to you and your system environment. For example, if a 4-second response time is acceptable and a 5-second response time is unacceptable, you would want to see processes receiving 5-second or longer response times highlighted on the Global screen. Processes exceeding a given level or threshold, as in the example above, are called *interesting*.

A process can be interesting for these reasons:

- It uses a large amount of system resources.
- It must wait an exceptionally long time to use a system resource.
- It is newly created.
- It was terminated during the last interval.

These interesting processes are displayed on the Global screen. Some of these interesting processes might be highlighted. Highlighting is used to indicate a process that exceeds some higher threshold value. For example, you may want all processes exceeding 1% of the CPU displayed and processes using more than 10% of the CPU highlighted. On color monitors, highlighting is in color; otherwise, highlighted items are underlined.

The power of GlancePlus lies in its ability to focus your attention on the pertinent data. A good rule of thumb is to set your process thresholds so that

the number of interesting processes does not exceed the capacity of a single screen for an interval. You also want to set them appropriate to your system environment.

Use the Set Option Values (V) command to set process thresholds. Figure 3-6 shows the display resulting from the Set Option Values (V) command. The values in the left-hand and center columns are thresholds that determine which processes are interesting.

```

                                Current Threshold Values
                                -----
System ID = HP3000 SERIES 93Z
APPL Defn = GLANCNFG.PUB.SYS                                (8 Applications defined)

MinCPU   = 1.0%      waitIMPEDE= 50.0%    XPERT    = CONTINUE/demand
CPU      = 10.0%     waitCPU    = 50.0%    XLEVEL   = LOW/high
DISC     = 10/sec    waitDISC  = 50.0%
RESP     = 5 sec     waitMEM   = 50.0%    FILEDISP = simple/DETAIL
TRANS    = 10/min
NEW      = YES/no
DIED     = YES/no

                                DISPCPU   = INTER-BATCH/queue
                                DISPMEMORY= CONTENTS/faults

CHANGE (keyword=newvalue)>

```

**Figure 3-7. Setting Process Thresholds**

In this example, GlancePlus displays any process that uses more than 1.0% of the CPU during the current interval, and will display *and* highlight any process that uses more than 10% CPU, more than 10 physical disc transfers per second, receives an average response time larger than 5 seconds, performs more than 10 terminal transactions (that is pressing **Return** or **Enter**) per minute, is newly created, or dies (terminates) during the current interval. The center column of thresholds causes GlancePlus to display and highlight any process that waited longer than 50% of the interval time for impedes, CPU, disc, or memory.

To change a threshold, type in its keyword followed by a space or an equal sign and the new value. To save keystrokes, you need only type in enough characters to make the keyword unique. Typing either **C 8** or **CPU 8** would set the CPU threshold to 8%. For keywords with two value choices, such as **NEW = YES/no**, simply typing the keyword (such as **NEW** or **N**) will toggle the value to the other choice. The capitalized value is the current selection.

### 3-16 Getting Started

Different situations will require different thresholds, and every system is unique. It is worthwhile taking time to become familiar with the Process Thresholds Definition screen and to determine which thresholds provide you with the best information on your system. Once you have determined the optimal settings for your thresholds, you can have GlancePlus default to your custom values every time you run it (see chapter 7).



## Commands: Additional Information

---

### Overview

This chapter provides additional information to help you understand how certain HP GlancePlus commands function.

### Selecting Jobs, Sessions, and Processes (>, J, S, P, #)

There are three methods to select the job, session, or process you want to monitor.

The first method uses the Next Logical Display command character (>) to zoom in, with a single keystroke, on the process that consumed the *most* resource during the last interval. You *cannot* use it to select a job or session. For example, if you are displaying the Global or CPU Detail screen, this command will take you to the Process screen of the highest CPU consumer. If you are displaying the Filter screen, you will go to the Process screen of the highest CPU consumer in the group of processes you are monitoring. If you are displaying the Disc Detail screen, you will go to the Process Screen of the highest Disc Consumer. It provides you with a guided-analysis capability that lets you quickly pinpoint and analyze the top resource consumer.

A second method uses the J, S, or P command character to select the job, session, or process to monitor. For example, if you enter an S, GlancePlus will prompt you for a session number. When you enter a valid session number, the Session screen will be displayed with information about the requested session. These three commands—J, S, and P—are mnemonic and require a single keystroke.

A third method uses the **Select** softkey or the # command character. Once the appropriate identifier and its number are entered, the screen changes to show the details of a single job, session, or process. Batch jobs and sessions are identified by the letter J or S followed by their job or session number

(*Jnnnn* or *Snnnn*). Processes are identified by the letter **P** followed by a process identification number or PIN (*Pnnn*). This method has the advantage of being available through a softkey. It also gives you the capability to select operating system processes (those not attached to a job or session) by entering **SYS** when prompted for a job, session, or process number.

If no process matching the selection criteria can be found, the user is returned to the Global screen. For example, if you are monitoring a batch job that terminates, GlancePlus returns to the Global screen automatically.

### **MPE Command (:)**

Use this command to enter a single command to be executed by MPE. This includes MPE, UDC, RUN, and implied RUN commands. The HP GlancePlus screen is suspended until the command completes and you press **Return** or **Enter**.

---

#### **Hint**

You can issue subsequent commands after a single command is completed by simply entering a colon (:) in response to the prompt: **Press RETURN to continue (or Enter a GLANCE command):**.

---

### **Refresh Screen (R)**

Use this command to clear the current display and redraw it with updated information for the current interval. It is useful for solving the problem of a corrupted display by refreshing the display completely.

### **All Processes (A)**

Use this command to produce a one-time screen display that lists *all* processes or applications, not just those that are *interesting*. It can be used with the Global, Job/Session, Workload, and Filter screens. Following the All Processes display, the screen returns to its previous method of displaying only interesting processes.

## **4-2 Commands: Additional Information**

## Change Queue (Q)

Use this command, if you have sufficient capability, to change the queue of a specific process or of all the processes associated with a specific job or session. A user with system manager (SM) capability can also change a process, or all the processes belonging to a job or session, to or from the B subqueue (BS). At the **Enter new queue ...** prompt, an SM user can enter a specific number to set the priority at any number between 100 and 255, or enter B to set the priority at 100.

The system manager can limit the use of this command to certain user capabilities by modifying the GlancePlus configuration file. See chapter 7 for information about customizing GlancePlus.

The priority of a process (or process-related job/session) in a circular queue is placed initially at the base of the chosen queue and will vary within the queue limits. The priority of a process in a linear queue remains constant. Furthermore, a linear queue process will not relinquish the CPU for processes with lower priorities unless it must wait for another resource.

---

**Caution**      Misuse of this command can degrade system operating efficiency significantly.

---

## List Users of a File (U)

Use this command to check the current file users on the system. Press U to initiate an on-screen request for the FILE.GROUP.ACCOUNT information for a particular MPE file. Based on that information, all users of the specified file are listed by process identification number (PIN), user logon, job or session number, and logical device number (Ldev). For example, this can be used to identify all users of a program file you want to replace.

---

**Note**            MPE message files are not supported because of the special type of control blocks that govern access to them.

---

## **Zero Averages (Z)**

Use this command to reset the averages for CPU, Disc, and Memory to zero and recompute them beginning with the current interval values. These averages are shown on the screen in the column labeled **avg** and as an asterisk (\*) in the horizontal bars.

## **Previous Display (<)**

Use this command to return immediately to the display that was last active before you entered the current display. For example, if you examine a job on the Job screen then move to the Process screen for an in-depth look at a specific process, you can use the Previous Display (<) command to return to the Job screen.

## **Next Logical Display (>)**

Use this command to move to the next logical display based on your current display. As discussed earlier in this chapter, the Next Display command provides a guided analysis capability you can use to zoom from the Global, CPU Detail, Disc Detail, or Filter screen to the Process Detail screen of the *top consumer* of resources. You can also use it to zoom from the Workload screen to the Filter screen to examine the group of application programs that consumed the most CPU during the last interval. The Next Display command is only valid when issued while one of the screens mentioned above is the current screen.

## **Ninety-second Timeout on Command Prompts**

Some commands issue a prompt and wait for your response. Examples are the Set Option Values command and the MPE command. A ninety-second timeout is in effect for *all* GlancePlus prompts to insure that you do not get an excessive number of interesting processes due to a large time interval when the next screen is displayed. If you do not respond to a prompt in 90 seconds, GlancePlus will move you to the next screen or prompt.

There are two exceptions. When you are in the Help subsystem or in the midst of executing an MPE command, GlancePlus does not have control of the terminal. Therefore, it cannot initiate a time out. It is recommended that you limit your time in these areas to a few minutes.

### **4-4 Commands: Additional Information**

## Screen Metrics and Statistics

---

HP GlancePlus for MPE/iX provides different levels of performance analysis. You can use the statistics on the Global screen to monitor systemwide activity, or you can refer to the detailed data screens to focus on specific areas of system usage.

This chapter describes the metrics and statistics presented on the detailed data screens. The discussion for each screen focuses on the Screen Elements display—the detailed data area of the screen. The Screen Elements display differs for every GlancePlus screen.

The Banner line, and Global bars are the same for every detailed data screen and are discussed in chapter 3.

The following detailed data screens are described in this chapter.

- Global screen.
- Job/Session screen.
- Process screen.
- Filter screen.
- Workload screen.
- CPU Detail screen.
- Disc Detail screen.
- Memory Detail screen.

## Global Screen

This screen summarizes activity systemwide and lists all processes that exceed the usage thresholds for the system (figure 5-1). The Global screen is the first screen to appear when you start GlancePlus, unless you have specified an INFO string in the RUN command to call up another screen (see chapter 7).

This Global screen is the usual starting point for a review of system activity and performance. The information on this screen will tell you if a resource is used excessively or a process is monopolizing available resources.

HPB1787 B.04.00 HP GlancePlus 14:44:46 Global										
								current	avg	high
CPU	M	MS	SI	*	I	.....		87%	54%	91%
Disc	MSI	*	.....					12	9	31
Mem	M	MC	CS	SD	DF	*		100%	100%	100%
JSNo	Dev	Logon	Pin	Program	Pri	CPU%	Disc	Trn	Resp	Wait
XPERT: CPU IS HIGH!										
S203	134	SHARON.EVAL	182	MNTMENU	C152	2.8%	0.0	18	0.2	TERM
S211	310	BECKY.EVAL	81	MNTMENU	C152	1.8%	0.0	16	0.4	TERM
S209	23	COLLECT.EVAL	212	REVALINQ	C152	3.5%	0.6	14	0.4	TERM
S230	314	MARYANN.EVAL	291	MNTMENU	C152	2.1%	0.1	14	0.3	TERM
S288	215	VIRGINIA.EVAL	228	MNTMENU	C152	2.1%	0.1	16	0.1	TERM
S208	227	VAN.ACCTG	288	APPR01	C152	0.3%	0.0	2	5.0	TERM
S293	332	JOE.TELESUP	240	GLANCEXL	B100	3.6%	0.0	4	0.6	
S295	334	DUP013.DIALUP	312	CI	DIED	0.7%	0.2	0	0.0	
S295	334	DUP013.DIALUP	237	LOGON	DIED	1.8%	0.0	2	2.5	
S295	334	DUP013.DIALUP	48	RESMNT	DIED	0.6%	0.5	2	0.4	
S295	334	DUP013.DIALUP	103	REVALINQ	DIED	0.9%	0.2	4	0.0	
S297	333	DUP041.DIALUP	239	TTSSON	C166	6.3%	0.2	4	5.4	CPU
S298	225	HARBISON.EVAL	144	CT	C152	2.8%	0.1	0	0.0	SON
S298	225	HARBISON.EVAL	261	LOGCHK	C152	5.6%	0.7	0	0.0	TERM

Global	Select	Print	MPE Command	Time Adjust	Refresh Screen	Help	Exit Glance
--------	--------	-------	----------------	----------------	-------------------	------	----------------

Figure 5-1. Global Screen

## Interesting Processes

Only processes that you define as *interesting* are displayed on the Global screen. This allows you to concentrate on processes most likely to affect performance. A process can be interesting if it exceeds a user-defined threshold value, it was just created, or it was terminated during the last interval.

## 5-2 Screen Metrics and Statistics

Interesting processes are scrolled down as new entries are added. This keeps the latest information at the top of the list below the Global bars. You can scroll the terminal display to examine previous processes and intervals again. A blank line separates each group of process information from the group that was displayed during the previous time interval.

JSNo	Dev	Logon	Pin	Program	Pri	CPU%	Disc	Trn	Resp	Wait
<b>XPERT: CPU IS HIGH</b>										
S203	134	SHARON.EVAL	182	MNTMENU	C152	2.8%	0.0	<b>18</b>	0.2	TERM
S211	310	BECKY.EVAL	81	MNTMENU	C152	1.8%	0.0	<b>16</b>	0.4	TERM
S209	23	COLLECT.EVAL	212	REVALINQ	C152	3.5%	0.6	<b>14</b>	0.4	TERM
S230	314	MARYANN.EVAL	291	MNTMENU	C152	2.1%	0.1	<b>14</b>	0.3	TERM
S288	215	VIRGINIA.EVAL	228	MNTMENU	C152	2.1%	0.1	<b>16</b>	0.1	TERM
S208	227	VAN.ACCTG	288	APPR01	C152	0.3%	0.0	2	<b>6.0</b>	TERM
S293	332	JOE.TELESUP	240	GLANCEXL	B100	3.6%	0.0	4	0.6	
S295	334	DUP013.DIALUP	312	CI	<b>DIED</b>	0.7%	0.2	0	0.0	
S295	334	DUP013.DIALUP	237	LOGON	<b>DIED</b>	1.8%	0.0	2	2.5	
S295	334	DUP013.DIALUP	48	RESMNT	<b>DIED</b>	0.6%	0.5	2	0.4	
S295	334	DUP013.DIALUP	103	REVALINQ	<b>DIED</b>	0.9%	0.2	4	0.0	
S297	333	DUP041.DIALUP	239	TTSSON	C166	6.3%	0.2	4	<b>5.4</b>	<b>CPU</b>
S298	225	HARBISON.EVAL	144*	CI	C152	2.8%	0.1	0	0.0	SON
S298	225	HARBISON.EVAL	261*	LOGCHK	C152	5.6%	0.7	0	0.0	TERM

**Figure 5-2. Global Screen—Interesting Processes**

Some interesting processes will have highlighted fields to indicate an event that might require closer attention. These appear in a different color or are underlined on your screen, depending on the type of monitor (see figure 5-2 for examples of highlighted processes).

You can use the Set Option Values (V) command to change the threshold values of events to cause a process to become interesting or have one of its fields highlighted. You can also change the threshold values before entering GlancePlus by setting the appropriate job control words (JCWs). See chapter 7 for more information on customizing GlancePlus.

## Interesting Process Components

Each interesting process occupies a single line on the Global screen. The components of interesting processes and any applicable reasons for highlighting are as follows:

<b>JSNO</b>	JSNO is the job number ( <i>#Jnnnn</i> ), session number ( <i>#Snnnn</i> ) or process identification number ( <i>#Pnnn</i> ) for the process.
<b>DEV</b>	DEV is the logical device number for a job or session. If the job or session is a system process, DEV is displayed as SYS.
<b>LOGON</b>	LOGON is the first 22 characters of the logon string (jobsessionname,user.account).
<b>PIN</b>	PIN is the process identification number for the process.
<b>PROGRAM</b>	<p>PROGRAM refers to the name of the program being run. If the program is the MPE/iX Command Interpreter (CI), then this field displays a colon (:) followed by the first characters of the last CI command issued. However, depending on your assigned capabilities, the following might apply:</p> <ul style="list-style-type: none"><li>■ SM (System Manager) capability will show the last CI command for all users systemwide.</li><li>■ AM (Account Manager) capability will show the last CI command for all users within that account.</li><li>■ A user with neither SM nor AM capabilities will be shown only his or her last CI command. All other Command Interpreters will show CI as the program name.</li></ul> <p>The program name of a new process is highlighted, and an asterisk (*) is located between the PIN and PROGRAM columns.</p> <p>A terminating process is represented by the word DIED, highlighted in the priority (PRI) field.</p>
<b>PRI</b>	PRI is the execution queue ( <i>where: A=AS, B=BS, C=CS, D=DS, E=ES</i> ) followed by the current execution priority number of the process (1-255). If a process has just terminated, this field will contain the word <b>DIED</b> .

## 5-4 Screen Metrics and Statistics

<b>CPU%</b>	<p>CPU% is the percentage of the central processing unit used by this process during the last interval.</p> <p>The CPU field is highlighted if the process exceeds the CPU threshold. The default is 10 percent of the CPU.</p>
<b>DISC</b>	<p>DISC is the disc transfer rate (transfers per second) for this process during the last interval.</p> <p>The DISC field is highlighted if the process exceeds the disc transfer threshold. The default is 10 disc transfers per second.</p>
<b>TRN</b>	<p>TRN is the rate per minute at which the <b>Return</b> or <b>Enter</b> key was pressed during the last interval. Transactions with think times less than 0.2 second are not counted since they probably represent hardware status replies. The number of transactions is 0 for most batch jobs because generally they do not read from terminals.</p> <p>The TRN field is highlighted if the process exceeds the terminal transaction threshold. The default is 10 transactions per minute.</p>
<b>RESP</b>	<p>RESP is the average time from when the <b>Return</b> or <b>Enter</b> key is pressed until the computer is ready to accept more input. This includes the time for the process to do all the work requested by the user, write out all the characters in response to the request, and issue the next read to the terminal. This number is 0.0 if there were no transactions during the last interval.</p> <p>The RESP field is highlighted if the response time exceeds the response time threshold. The default is 5.0 seconds.</p>
<b>WAIT</b>	<p>WAIT is the reason a process was waiting at the end of the last interval.</p> <p>For a list of WAIT reasons, see table 5-1 and appendix B, “Wait Reasons—Expanded Definitions.”</p>

**Table 5-1. Wait Reasons**

<b>Wait</b>	<b>Definition</b>
BREK	Waiting to be resumed from a program BREAK.
CONS	Waiting for reply to a console request.
CPU	Waiting for CPU resources.
DBMS	Waiting for SQL monitor.
DISC	Waiting for disc I/O.
FATH	Waiting for father.
IMP	Waiting impeded.
I/O	Waiting for nondisc, nonterminal read I/O.
MEM	Waiting for memory swap.
MISC	Waiting for miscellaneous reason.
MSG	Waiting for user or system message.
OTHR	Waiting for other unknown reasons.
PAUS	Waiting for requested time period to expire.
RIN	Waiting for shared resource, such as a file lock.
SEM	Waiting for software semaphore.
SIR	Waiting for critical system resource.
SON	Waiting for son.
TERM	Waiting for terminal read to complete.

**5-6 Screen Metrics and Statistics**

## Job/Session Screen

If you select a specific job or session (using the #, J, or S commands), the Job/Session screen appears containing information about how the job or session is utilizing system resources. The job or session number is displayed in the Banner Line as part of the screen identifier. You may also select all system processes that do not belong to any job or session by using the # command and specifying SYS at the prompt. In this case, **System Processes** will display as the screen identifier. The Job/Session screen can be used to track the resource usage of several programs that execute in a job without having to change screens. It is shown below.

The detailed data area of the display is divided into two parts:

- Job/Session Bars and Summary Fields.
- Interesting Processes.

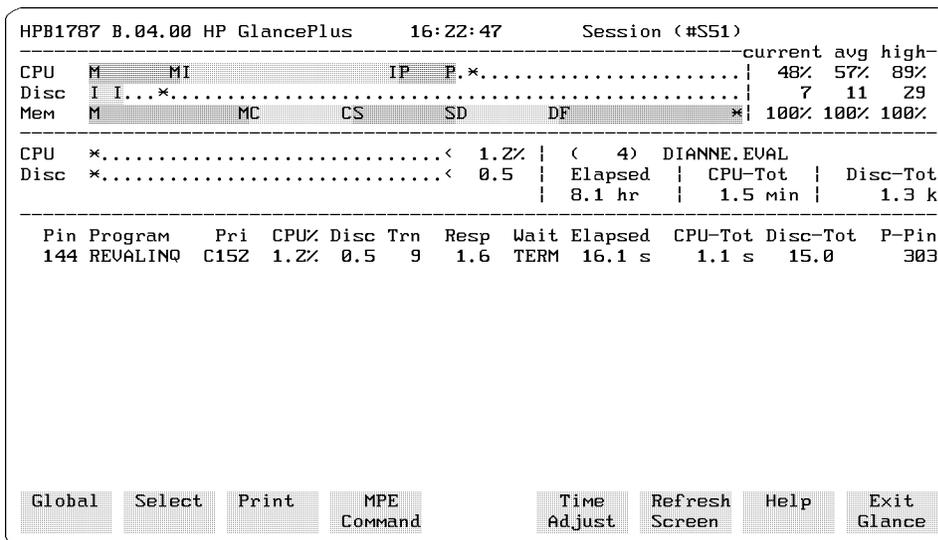


Figure 5-3. Job/Session Screen

## Job/Session Bars and Summary Fields

CPU	*.....<	1.2%	( 4)	DIANNE.EVAL		
Disc	*.....<	0.5	Elapsed	CPU-Tot	Disc-Tot	
			8.1 hr	1.5 min	1.3 k	

The Job/Session Bars appear below the Global bars (CPU, Disc, and Memory) and show additional information about how the selected job or session is using CPU and Disc resources.

The Job/Session Bars and Summary Fields contain the following information:

**CPU** This CPU bar shows the percentage of central processing unit time used by the job or session during the last interval. The codes in this bar correspond to the codes used in the Global CPU bar (see CPU Bars under “Reading the Screen Display” in chapter 3). The number at the right of the bar is the percentage of time the CPU is busy (not counting idle and paused-for-disc time).

An asterisk (\*) represents the average usage of this resource during this execution of HP GlancePlus. You can use the Z command to reset the averages to zero and recompute them beginning with the current interval values.

**DISC** This bar shows the job or session’s disc transfer rate (transfers per second) during the interval. The codes in this bar correspond to the codes used in the Global Disc bar (see “Disc” under “Global Screen” earlier in this chapter). The overall transfer rate appears at the right of the bar.

An asterisk (\*) represents the average usage of this resource during this execution of HP GlancePlus. You can use the Z command to reset the averages to zero and recompute them beginning with the current interval values.

<b>COUNT</b>	The count (in parentheses) is the number of processes associated with the current job or session. There are four processes shown in the previous example.
<b>LOGON</b>	LOGON is the logon string (jobsessionname,user.account). The logon string in the previous example is "DIANNE.EVAL".
<b>ELAPSED</b>	ELAPSED is the total clock time during which a job or session has been logged on.
<b>CPU-TOT</b>	CPU-TOT is the total amount of processor time used during the life of the job or session (see note).
<b>DISC-TOT</b>	DISC-TOT is the total number of physical Disc transfers completed during the life of the job or session (see note). A number followed by the letter K represents thousands of transfers; a number followed by the letter M represents millions of transfers.

---

**Note**

Disc totals are not collected until either HP GlancePlus or another performance tool enables the MPE measurement facility to collect process data. This means that the DISC-TOT value will not include physical transfers that were completed by a process before the MPE measurement facility was enabled.

Upon entry to the Job/Session screen, CPU-TOT and DISC-TOT values represent CPU and disc totals for the processes, associated with the job or session, that are still alive. To prevent these values from decrementing as processes terminate, HP GlancePlus maintains counters for the job or session as long as it is monitored in the Job/Session screen. These counters are lost as soon as you enter another screen or select a different job or session.

---

## Interesting Processes

Interesting processes related to the job or session you select appear below the Job/Session Bars and Summary Fields. In addition, you can use the SYS option of the Select command to display all system processes not related to a job or session.

Pin	Program	Pri	CPU%	Disc	Trn	Resp	Wait	Elapsed	CPU-Tot	Disc-Tot	P-Pin
144	REVALINQ	C152	1.2%	0.5	9	1.6	TERM	16.1 s	1.1 s	15.0	303

**Figure 5-4. Job/Session Screen—Interesting Processes**

**Interesting Job or Session Processes** Processes belonging to this Job (#Jnnnn) or Session (#Snnnn) are considered interesting here for the same reasons as in the Global screen (see “Interesting Processes” under “Global Screen” earlier in this chapter). Any job or session process that is not waiting for another process (father-, son-, or message-waited) will also be displayed.

For example, the screen will display the command interpreter (CI) process for a job or session at the top of the Interesting Processes section of the screen. If a son process starts running, both processes will be displayed *while* both are running. If the CI process must wait for the son process to complete, the CI will disappear from the screen during the wait interval, but it will return when the wait period ends.

This allows you to see the most interesting part of a job or session without having to manually track the process numbers as they are created and terminated.

You can see *all processes* belonging to the job or session by entering the A command.

**Interesting System Processes** Use the Select command's SYS option to display only system processes that do not belong to a specific job or session. Since there are usually many of these processes left in different waiting states, system processes will only be displayed if they are "interesting" (see "Interesting Processes" under "Global Screen" earlier in this chapter).

You can see *all system processes* by entering the A command.

## Interesting Process Components

Each process related to the job or session is displayed in a single line.

The following components make up a line of interesting process data:

<b>PIN</b>	PIN is the process identification number for the process.
<b>PROGRAM</b>	PROGRAM refers to the name of the program being run. If the program is the MPE Command Interpreter (CI), then this field displays a colon (:) followed by the first characters of the last CI command issued.
<b>PRI</b>	PRI is the execution queue ( <i>where</i> : A=AS, B=BS, C=CS, D=DS, E=ES) followed by the absolute execution priority number of the process (1-255). If a process has just terminated, then this field will contain the word <b>DIED</b> .
<b>CPU%</b>	CPU% is the percentage of the central processing unit used by this process during the last interval.
<b>DISC</b>	DISC is the disc transfer rate (transfers per second) for this process during the last interval.

TRN	TRN is the rate at which the <b>Return</b> or <b>Enter</b> key was pressed during the last interval. A rate is displayed to maintain independence from the time interval; thus, one <i>transaction</i> in a 30-second interval equates to a <i>rate</i> of 2 transactions per minute. The number of transactions is 0 for most batch jobs because generally they do not read from terminals.
RESP	RESP is the average time (in seconds) between when the <b>Return</b> or <b>Enter</b> key was pressed and the computer was ready to accept more input. This number is 0.0 if there were no transactions during the last interval.
WAIT	WAIT is the reason a process was waiting at the end of the last interval. See table 5-1 for definitions of wait reasons and appendix B, “Wait Reasons—Expanded Definitions.” More detailed Wait reasons are defined for the Process screen (see appendix C).
ELAPSED	ELAPSED is the length of time a process was alive.
CPU-TOT	CPU-TOT is the amount of CPU time used during the life of the process.
DISC-TOT	DISC-TOT is the total number of physical disc transfers completed during the life of the process. A number followed by the letter K represents thousands of transfers; a number followed by the letter M represents millions of transfers.
P-PIN	PIN is the process identification number for the parent (or father) of this process.

---

**Note** Disc totals are not collected until either HP GlancePlus or another performance tool enables the MPE measurement facility to collect process data. This means that the DISC-TOT value will not include physical transfers that were completed by a process before the MPE measurement facility was enabled.

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## Process Screen

If you select a specific process (using the #, P, or > commands), the Process screen appears containing information about that process. The Banner Line includes the PIN number and job or session number for the process as part of the screen identifier. The detailed data area of the display is divided into five parts:

- Process Bars.
- Process Summary Fields.
- Process States.
- Miscellaneous Process Information.
- Process Screen Function Keys.

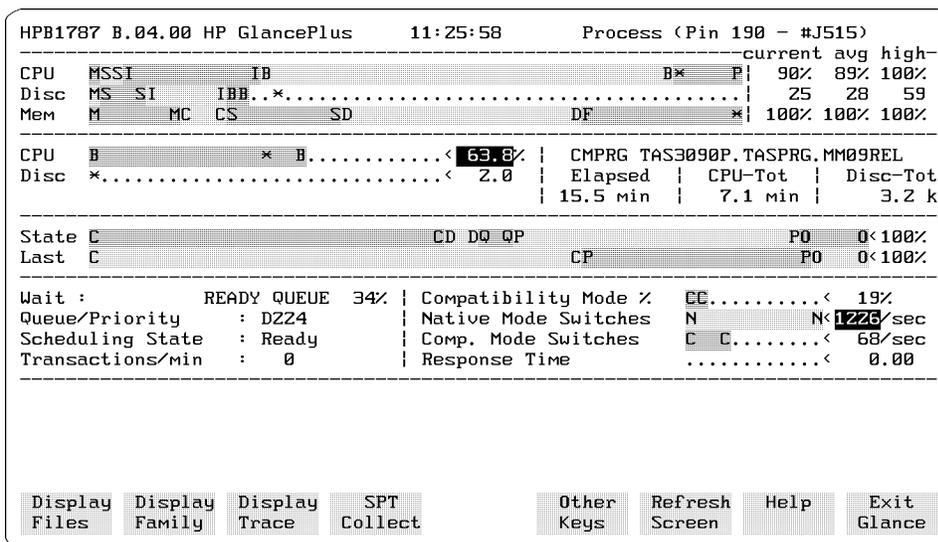
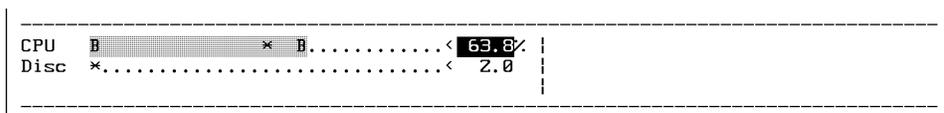


Figure 5-5. Process Screen

## Process Bars

The Process Bars show how the selected process is using CPU and disc resources.



**Figure 5-6. Process Screen—Process Bars**

The Process bar has the following components:

- |             |   |
|-------------|---|
| <b>CPU</b>  | The CPU bar shows the percentage of central processing unit time used by the process during the last interval. The codes on this bar correspond to the codes used in the Global CPU bar (see CPU Bars under “Reading the Screen Display” in chapter 3). The number at the right of the bar is the percentage of time the CPU is busy (not counting idle time or paused-for-disc time). [Scale: 0% to 100% of total time busy.]<br><br>An asterisk (*) represents the average usage of this resource over time—since the program started or since the last Z (“zero”) command. |
| <b>DISC</b> | The Disc bar shows the disc transfer rate (transfers per second) by the process during the current interval. The codes on this bar correspond to the codes used in the Global Disc bar (see Disc Bars under “Reading the Screen Display” in chapter 3). [Scale: 0 to 100 disc transfers per second.]<br><br>An asterisk (*) represents the average usage of this resource over time—since the program started or since the last Z (“zero”) command.   |

## Process Summary Fields

The Process Summary Fields at the right of the screen provide additional information about the process.

TAS3090P.TASPRG.MM09REL		
Elapsed	CPU-Tot	Disc-Tot
15.5 min	7.1 min	3.2 k

**Figure 5-7. Process Screen—Process Summary Fields**

The Process Summary Fields are as follows:

<b>PROGRAM TYPE</b>	The type of program is displayed as <b>NMPRG</b> (native mode), <b>CMPRG</b> (compatibility mode or <b>PROG</b> code in <b>LISTF</b> ), or <b>OCTed</b> (one or more SOMs have been run through the Object Code Translator).
<b>PROGRAM</b>	The fully qualified program name is displayed as <b>FILE.GROUP.ACCOUNT</b> .
<b>ELAPSED</b>	<b>ELAPSED</b> shows the total clock time that the process has been running.
<b>CPU-TOT</b>	<b>CPU-TOT</b> shows the total amount of processor time used during the life of the process.
<b>DISC-TOT</b>	<b>DISC-TOT</b> shows the total number of physical disc transfers completed during the life of the process. A number followed by the letter <b>K</b> represents thousands of transfers; a number followed by the letter <b>M</b> represents millions of transfers.

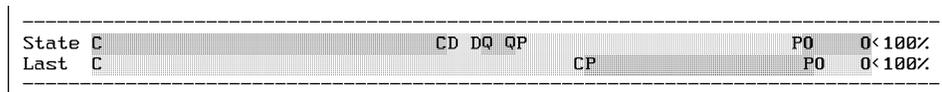
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**Note** Disc totals are not collected until either HP GlancePlus or another performance tool enables the MPE measurement facility to collect process data. This means that the **DISC-TOT** value will not include physical transfers that were completed by a process before the MPE measurement facility was enabled.

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## Process State Bars

The bars show the process's states during its lifetime and the last interval.



**Figure 5-8. Process Screen—Process State Bars**

### STATE (Components of Response Time)

The STATE or Elapsed Time Process State bar shows the components of response time for the process over its lifetime (running time). The number at the right represents what percentage of the total time the process requested service (it was not waiting on terminal reads). Usually, this number will be 100% for a batch job since batch jobs typically do not interact with a terminal. For interactive processes, however, this number is typically well below 100%, and is a good indicator of how much of the time the process is requesting service from the computer.

The components of the State bar are shown below. For each component listed, the process state was as follows:

- C** Using the CPU.
- M** Waiting for memory resources.
- D** Blocked, waiting for a disc I/O transfer.
- I** Blocked, waiting for a non-disc I/O transfer (this includes waiting for terminal writes but not terminal reads. Remember, the State bar represents the portion of time the process is asking for service).
- Q** Impeded by a synchronizing mechanism including the following wait reasons: DBMS, RIN, SEM, SIR, and IMPEDE wait times.
- P** Preempted, waiting for the CPU.
- F** Waiting on a process in the family tree including the following wait reasons: father, son, and message wait times.
- O** Waiting for some other reason. Wait reasons in this category include: TIMER, PORT, JUNK, MAIL, CONSOLE, PAUSE, TERMINAL, MISCELLANEOUS, and BREAK wait times.

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### LAST (Components of Response Time)

The LAST or Last Interval Process State bar represents components of response time for the process over the last interval. The number at the right represents the percentage of time the process was asking for service (not waiting for input from a terminal) during the most recent time interval. The codes for the Last bar are similar to those for the State bar except they only represent the time for the last interval. A comparison of the LAST bar to the STATE bar shows if the last interval was typical relative to the life of the process.

### Miscellaneous Process Information

Below the State and Last Interval bars the screen shows additional information for the process being monitored.

Wait :	READY QUEUE	34%	Compatibility Mode %	CC.....<	19%
Queue/Priority	: DZZ4		Native Mode Switches	N.....N<	1226/sec
Scheduling State	: Ready		Comp. Mode Switches	C.....<	68/sec
Transactions/min	: 0		Response Time	.....<	0.00

Figure 5-9. Process Screen—Miscellaneous Process Information

Additional information includes the following:

- Wait** Upon first entering the Process screen, this field indicates why a process is currently waiting (if the process is active, it will be blank). For every succeeding interval, it shows both the percentage and wait reason for the highest percentage wait reason during that interval. While the STATE and LAST bars group wait reasons for better representation, the Wait field uses the detailed reasons in appendix C to increase its ability to pinpoint a process slowdown.
- Queue Priority** This field shows the execution queue (*where*: A=AS; B=BS; C=CS; D=DS; E=ES) and the absolute priority number (1-255) for the process at the time it was displayed. The priority will display a zero if the process has just terminated.

<b>Scheduling State</b>	This field shows the state this process is in according to the MPE/iX Dispatcher. Valid states are: Executing, Ready, Short Wait, Long Wait, and Null.
<b>Executing</b>	The process is using the CPU.
<b>Ready</b>	The process is waiting its turn for the CPU.
<b>Short Wait</b>	The process is waiting for disc I/O, such as a code page fault or file page fault.
<b>Long Wait</b>	The process is waiting for other I/O activities such as a terminal read or terminal write. SIR, RIN, Parent Wait, and other semaphore-type waits fall under this category.
<b>Null</b>	Appears only if a process is being created or is dying.
<b>Transactions/min</b>	This field shows the rate of terminal transactions (transactions per minute) completed during the last interval.
<b>Compatibility Mode</b>	This field shows the percentage of CPU time the process spent in Compatibility Mode during the last interval.
<b>Native Mode Switches</b>	This field shows the rate of Native Mode switches completed (switches per second from Native Mode to Compatibility Mode) during the last interval. [Bar Scale: 0 to 200 switches per second. The number to the right of the bar shows the actual switch rate per second up to a maximum of 9,999.]
<b>Comp. Mode Switches</b>	This field shows the rate of Compatibility Mode switches completed (switches per second from Compatibility Mode to Native Mode) during the last interval. [Bar Scale: 0 to 200 switches per second. The number to the right of the bar shows the actual switch rate per second up to a maximum of 9,999.]
<b>Response Time</b>	This field shows the average response time for the process during the last interval. If no terminal transactions were completed, the response time value is zero. [Scale: 0.00 to 60.00 seconds.]

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## Process Screen Function Keys

When you display the Process screen, the softkeys at the bottom of the screen change to functions related to the process being viewed. By pressing these softkeys you can display the information described below.

If you choose not to use softkeys, you can access GlancePlus functions using the subcommands described with the specific functions.



**Figure 5-10. Process Screen—Screen Function Keys**

## Setting Option Values (V)

The process-specific functions can be customized using the V command to set the following configuration parameters:

- File (Simple or Detailed)

This option controls the information displayed for open files. See the Display Files option below for more information.

- Prockeys (Demand or Continuous)

This option controls how information on the three process-specific functions (Display Files, Display Family, and Display Trace) are displayed.

- Demand

When Demand is selected, the functions are treated as requests to display the appropriate information once. For example, if Prockeys=Demand and the Display Files function is selected from the Process screen, the open file information is displayed once, but will not be redisplayed when the screen is refreshed.

□ Continuous

When Continuous is selected, the functions are treated as switches enabling or disabling the continuous display of information. For example, if `Prockeys=Continuous` and the Display Files function key is selected from the Process screen, the open file information is displayed, and redisplayed automatically each time the screen is refreshed.

When a continuous-mode display is enabled, the Process State bars and Miscellaneous Process Information sections of the detail display are suppressed to leave more room for the display just enabled. When that display is disabled, the Process State bars and Miscellaneous Process Information are again included in the detail display.

---

**Hint**

If you wish to see successive displays on the monitor for comparison, set `Prockeys = Demand`, and press the Display Files function key at the prompt `Press RETURN to continue (or enter a GLANCE command):`. This is useful particularly for tracking the progress of the file pointer in the file display. It has the additional benefit of not updating the rest of the process information; this can be very handy over a slow data communications link.

---

**Display  
Files**

Press the Display Files function key to see a list of open files for the process being viewed. To display this data without using the function keys, press “1”. (The “1” subcommand is only valid during the Process screen display.)

The Display Files function appears in two formats depending on how the File parameter is configured: `File=simple` or `File=detailed`. This parameter is set using the Set Option Values (V) command. The following formats occur:

### Simple File Display

If the File parameter is configured `File=simple`, the Simple File Display format occurs,

*where:*

**Filename** The file name comprised of the first eight characters of the formal designator for the file.

**xxx%** This field, following the file name, indicates the progress of the record pointer as compared with the end-of-file pointer. A sample display might be:

DB01 /32% DB02 /45%

### Detailed File Display

If the File parameter is configured `File=detailed`, the Detailed File Display format occurs, as shown in figure 5-11.

Open Files for Process Z1Z are:										
File	Group	Account	Type	Rec-Ptr	EOF	Domain	Access	Share	Opens	
APPR01	.OBJ3	.ACCTG	NMPRG	659	789	PERM	LOAD M	SEM	3	
AMRXL	.PUB	.ACCTG	NMXL	8821	8937	PERM	LOAD M	SEM	13	
UPDATES	.PUB	.ACCTG		447	447	PERM	APEN	SHR	1	
APPRSCRN	.PUB	.ACCTG	UFAST	879	1705	PERM	IN	SHR	3	
APPRMAST	.....			92						
APPRMAST	.PUB	.ACCTG	KSAM	163590	165500	PERM	UPDT	SHR, L	52	
APPRMASK	.PUB	.ACCTG	KSAMK	18	148226	PERM	UPDT	SHR	52	
NBMASTER	.....			96						
NBMASTER	.PUB	.ACCTG	KSAM	988	3645	PERM	IN	SHR, L	52	
NBMASTEK	.PUB	.ACCTG	KSAMK	74	2770	PERM	IN	SHR	52	
NBRATES	.....			0						
NBRATES	.PUB	.ACCTG	KSAM	255	1737	PERM	IN	SHR, L	3	
NBRKEYS	.PUB	.ACCTG	KSAMK	42	1282	PERM	IN	SHR	3	
AZ64X	.....			2330						
AUDIT	.LOG	.ACCTG		32529	32529	PERM	APEN	SHR	3	
VERRMSG	.PUB	.SYS		1414	1766	PERM	IN		35	

Press RETURN to continue (or enter a GLANCE command):

Display	Display	Display	SPT	Other	Refresh	Help	Exit
Files	Family	Trace	Collect	Keys	Screen		Glance

Figure 5-11. File Display Screen—Detailed Display

*where:*

**File.Group.Account** is the formal designator for the file.

*and*

<b>File</b>	The file name or, if unnamed, a question mark (?).
<b>Group</b>	The group name or, if unnamed, a series of dots (.....).
<b>Account</b>	The account name or, if unnamed, a series of dots (.....).
<b>Type</b>	File code mnemonic (as in LISTF,1 command) <i>or</i> File code number (user-defined file code) <i>or</i> One of the following specially defined mnemonics:  RXRAW LaserRX raw log file (file code 1135). RXEXT LaserRX extracted log file (file code 1136). ROOT TurboIMAGE data base root file (file code -400). DSET TurboIMAGE data base data set (file code -401). DBREM TurboIMAGE remote data base (file code -402). DBILR TurboIMAGE ILR file (file code -404). PRIV Any other negative file code.  <i>or</i> if the file code is zero:  KSAM Foptions file type = 1 RIO Foptions file type = 2 KSAMX Foptions file type = 3 CIR Foptions file type = 4 SPOOL Foptions file type = 5 MSG Foptions file type = 6
<b>Rec-Pointer</b>	The current record pointer for the file. (This usually points to the last record accessed by the process.)
<b>End-of-File</b>	The current end-of-file value (disc files only).
<b>Domain</b>	The designation of the file's condition. It may be:  NEW File is newly created, Foptions Domain = 0. PERM File is permanent, Foptions Domain = 1. TERM File is temporary, Foptions Domain = 2. OLD File is old permanent or temporary, Foptions Domain = 3.

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If the file is a system-defined file, the Domain lists one of the following designations:

**\$stdlist** System-defined file, Foptions designator = 1.  
**\$newpass** System-defined file, Foptions designator = 2.  
**\$oldpass** System-defined file, Foptions designator = 3.  
**\$stdin** System-defined file, Foptions designator = 4.  
**\$stdinx** System-defined file, Foptions designator = 5.  
**\$null** System-defined file, Foptions designator = 6.  
**???????** System-defined file, Foptions designator = 7.

**Access** The way a file is opened by the process—the type of access, as follows:

**IN** File is opened for READ access, Aoptions  
Access = 0.  
**OUT** File is opened for WRITE access, Aoptions  
Access = 1.  
**KEEP** File is opened for WRITE-SAVE access, Aoptions  
Access = 2.  
**APEN** File is opened for APPEND access, Aoptions  
Access = 3.  
**I/O** File is opened for READ/WRITE access, Aoptions  
Access = 4.  
**UPDT** File is opened for UPDATE access, Aoptions  
Access = 5.  
**XEQ** File is opened for EXECUTE access, Aoptions  
Access = 6.  
**LOAD** File is opened for EXECUTE-READ, Aoptions  
Access = 7.  
**M** File is opened for MAPPED-FILE access

**Share** The way the file is shared by this process:

**EXC** File is open for EXCLUSIVE access, Aoptions  
Excl = 1.  
**SEM** File is open for READ-SHARE (SEMI EXCLUSIVE)  
access, Aoptions Excl = 2.  
**SHR** File is open for SHARE access, Aoptions Excl = 3.  
**,L** File is open with Dynamic Locking, Aoptions  
Lock = 1.

**Opens**                    The number of times the file has been opened.

TurboIMAGE data sets will have their record pointers and end of files expressed as TurboIMAGE record numbers instead of MPE file blocks of media records.

See the MPE Intrinsic Manual under the FOPEN intrinsic for a detailed description of Foptions and Aoptions parameters.

**Display  
Family**

Press the Display Family function key to see the family tree for the process currently being viewed. To display the tree without using the function keys, press **2**. (The “2” subcommand is valid only during the Process screen display.)

If available, the parent process identification number (PIN) is shown, followed by any and all children of the process. For each PIN displayed, the program being executed by the respective process is also presented.

**Display  
Trace**

Pressing the Display Trace function key provides an HP Debug Procedure trace of the process being monitored. To display the trace without using the function keys, press **3**. (The “3” subcommand is valid only during the Process screen display.)

The first time you use the Display Trace key, a 5- to 30-second delay occurs. This is normal. Note, however, that a user will not be able to execute this command without System Manager (SM) capability.

Consult the *MPE XL System Debug Reference Manual* for detailed information on how to read a trace.

**SPT**  
**Collect**

This function key allows you to use the HP SPT (Software Performance Tuner) product to create and run a program under HP GlancePlus for collecting metrics on the process currently running. To display this process without using function keys, press **F4**. (The “4” subcommand is valid only during the Process screen display.)

This command is optional and will operate only if the HP SPT product was installed.

The data SPT collects about a process is placed in the default log file SPTLOG. The default time for collecting process metrics via SPT is 5 minutes, but can be changed by using the job control word GLANCESPTTIME. Collection times between 1 and 60 minutes can be selected when using SPT from within GlancePlus. The file SPTOUT is used for STDLIST messages created from the SPT process running under HP GlancePlus.

If desired, you can terminate a SPT process created by GlancePlus, by using the MPE command (: ) and issuing the command SETVAR SPT\_STOP TRUE. The existence of the SPT\_STOP variable will cause the SPT process to terminate in 15 to 30 seconds.

After creating and activating the SPT program, GlancePlus resumes normal operation and its screens can be accessed.

---

**Note** HP GlancePlus limits SPT data collection to one active process at a time.

---

---

## Filter Selection Menu Variables

HP GlancePlus lets you define any collection of programs, applications, or users as a group and view them on the Filter Display screen. It combines the ability to subset the Global screen's interesting processes to a group you wish to see with the Job/Session screen's feature of summarizing their activity. You can press the Filter command key (**F**) to see the current filter values. You will be prompted to change them, or you can accept the current values by pressing **RETURN**.

Also, you can select whether to display information by program, user, or predefined application, and whether it must match one or all of those selections to become a part of the filter group. You can select whether it should display all processes matching your specifications or only those that exceed threshold values. MPE wildcard attributes are accepted for the Program name and User logon.

To change a current filter's value, type the key word for the filter (shown in uppercase on the screen), then type the new value for that filter.

---

### Hints

- HP GlancePlus can recognize a key word by the minimum number of characters needed to identify it uniquely. In this case, since each key word *is* unique in the Filter Selection menu, the program can recognize a key word by the first letter of its name.
- Multiple filter commands can be entered by separating the individual commands with semicolons (;).
- Commands that have only two states—such as YES/no—can be entered without a value to change to the opposite state. For example, if “use THRESHOLD values = YES/no” is YES, it can be changed to NO by entering the THRESHOLD command.
- To remove a program name or user logon selection, enter the key word without a value.

An example of a filter selection menu is shown below.

```
Filter Selection Criteria
(keyword are UPPERCASE)
-----

use THRESHOLD values = YES/no

MATCH criteria = all/ANY
PROGRAM name   =
USER logon     =
APPL Defn File = PARM.SCOPE.SYS      (16 Applications defined)
  1 OTHER          2 Networking      3 Corp Utility
  4 EDC            5 MM/3000         6 DBS
  7 Batchnet      8 Obsolete Sess   9 Netbase
 10 Procurement   11 Fred              12 Prodsys
 13 Partsid       14 Queries & Reporti 15 Promis
 16 System Support

CHANGE (keyword=newvalue)>
```

**Figure 5-12. Filter Screen Selection Dialogue**

You can choose from the following variables:

- use THRESHOLD values**      **YES/no**    Select **Yes** and GlancePlus will use the threshold values to display only interesting processes. Select **No** to display all processes (interesting or not) that match the filter criteria.
- MATCH criteria**        **all/ANY**    Select **all** if a process must match *all* of the criteria or **ANY** if it must only match *any one* selection criterion.
- PROGRAM name**        Select any valid MPE program name, which may include wildcards. For example, **GLANCEXL** will list all current users of the HP GlancePlus program.
- USER logon**            Select any valid MPE logon value, which may include wildcards. For example, **@.XYZ** will list all users currently logged on to the XYZ account.

**APPL Defn File** If an application definition file appears on the display with application index numbers and names below it (see figure 5-12), you may immediately select applications to be displayed. Select one or more applications by entering their index numbers separated by spaces or commas. You may also use the “+” or “-” to add or subtract applications from the selected list. When you select an application, both its number and name are highlighted. For example, entering **2 5** in response to the **CHANGE** prompt in figure 5-12 would result in selecting (and highlighting) the **Networking** and **MM/3000** applications. Entering **+6 12** in response to the next prompt would add **DBS** and **Prodsys** to the selected applications.

If no applications appear on the display or you wish to specify a different application definition file, enter **APPL filename** in response to the **CHANGE** prompt. If the file contains valid application definitions, then the display will show the application index numbers and names from that file. Creating a file with application definitions provides a rapid and simple means to select groups of programs or users to view in the Filter Display and Workload Screens.

GlancePlus looks for application definitions in the configuration file **GLANCNFG** when it is initiated. If found, **GLANCNFG** is used as the default application definition file. If no application definitions are found there, GlancePlus next looks for them in the **PARM.SCOPE.SYS** file. This is the file used by HP Performance Collection Software, which is part of both the HP LaserRX/MPE and HP GlancePlus Pak products. If no application definitions are found in either place, then GlancePlus initiates with no default application definition file, and the **APPL Defn File** field is blank.

To find out how to construct an application file, see appendix D.

## Filter Display Screen

The Filter Display screen provides both systemwide information, and information that matches the programs, users, and applications you selected.

The Filter Display screen has five components:

- Program Banner Line.
- Global Bars.
- Filter Bars.
- Summary Fields.
- Filter Processes.

The Program Banner Line and Global Bars are the same on all HP GlancePlus screens and contain the same information.

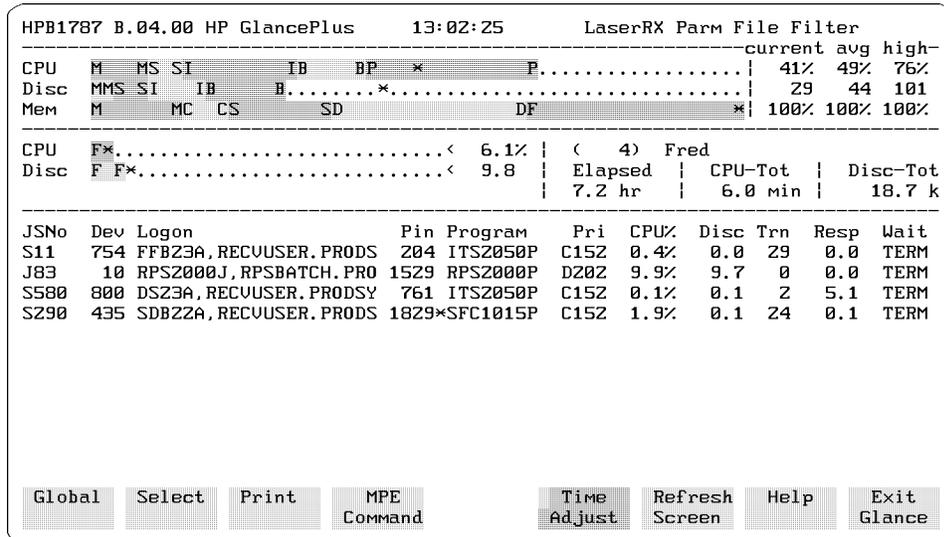
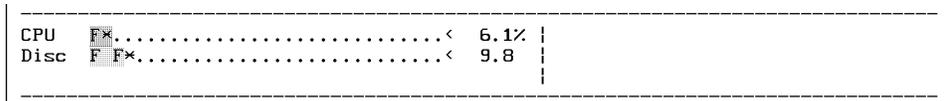


Figure 5-13. Filter Screen

## Filter Bars



### CPU Bar

The CPU bar represents the usage of CPU resources for all processes filtered during the last interval. The “F” code on this bar corresponds to the Filter Display screen and may indicate jobs, sessions, or system processes that match the filter criteria you selected.

The asterisk (\*) indicates the average usage of CPU resources by the filtered processes for the total time monitored, but only since the last Z command, if one was entered. See chapter 4 for information about screen commands.

### Disc Bar

The disc bar shows the combined rate of disc transfers for all processes filtered during the last interval. The “F” code indicates the job, session, and system processes that match the filter criteria you selected.

The asterisk (\*) on this bar indicates the average rate of disc transfer for the filtered processes over the total time monitored, but only since the last Z command, if one was entered. See chapter 4 for information about screen commands.

## Summary Fields

```
-----  
| ( 4) Fred |  
| Elapsed | CPU-Tot | Disc-Tot |  
| 7.2 hr  | 6.0 min | 18.7 k  |  
-----
```

The summary fields for the user-defined filter appear at the right of the CPU and disc bars. These fields contain the following information:

<b>Count</b>	This number (in parentheses) is the total number of processes displayed. There are four processes in the example above.
<b>Filter Value</b>	This value identifies the filter. It may be a program name, user logon, application name, or application number list. The example above identifies an application called "Fred".
<b>Elapsed</b>	This field shows the total time that the filter processes are known to have been running.
<b>CPU-TOT</b>	This field shows the total CPU time used by filtered processes during the time they were running.
<b>DISC-TOT</b>	This field shows the total number of disc transfers completed by all filtered processes during the time they were running.

## Filter Processes

JSNo	Dev	Logon	Pin	Program	Pri	CPU%	Disc	Trn	Resp	Wait
S11	754	FFBZ3A, RECVUSER. PRODS	204	ITSZ050P	C15Z	0.4%	0.0	29	0.0	TERM
J83	10	RPSZ000J, RPSBATCH. PRO	1529	RPSZ000P	D20Z	9.9%	9.7	0	0.0	TERM
S500	800	DSZ3A, RECVUSER. PRODSY	761	ITSZ050P	C15Z	0.1%	0.1	2	5.1	TERM
S290	435	SDBZZA, RECVUSER. PRODS	1829*	SFC1015P	C15Z	1.9%	0.1	24	0.1	TERM

The lower section of the Filter Display screen provides details about processes that match the filter criteria. These fields contain the following information.

<b>JSNO</b>	This field contains the job number ( <i>#Jnnn</i> ) or session number ( <i>#Snnn</i> ), or if the process is a system process, the PIN or process identification number ( <i>#Pnnnn</i> ), as appropriate.
<b>DEV</b>	This field contains the logon device number ( <b>SYS</b> indicates a system process).
<b>LOGON</b>	This field contains the user logon string.
<b>PIN</b>	This field contains the process identification number. System processes will have the same PIN listed here and under <b>JSNO</b> .
<b>PROGRAM</b>	This field contains the program's name, or if the program is the MPE Command Interpreter (CI), then the field will display a colon (:) followed by the first characters of the last CI command issued.
<b>PRI</b>	This field will contain the execution queue and priority number (or if terminated, the word <b>DIED</b> ).
<b>CPU%</b>	This field indicates the percentage of time the CPU was used during the last interval.

<b>DISC</b>	This field indicates the rate of physical disc transfers (number per second) during the last interval.
<b>TRN</b>	This field indicates the rate of terminal transactions (number per minute) during the last interval.
<b>RESP</b>	This field indicates the terminal response time (in seconds) during the last interval.
<b>WAIT</b>	This field indicates the current resource for which the process is waiting.

## Workload Screen

The Workload screen summarizes activity for user-defined collections of processes called applications. You can use it to view information on resource usage and transactions for groups of specific processes. Application definitions are specified in a configuration file (for more information, see appendix D).

The detail area of the display is divided into two parts:

- Interesting Applications.
- Top CPU Consumer and Top Disc Consumer.

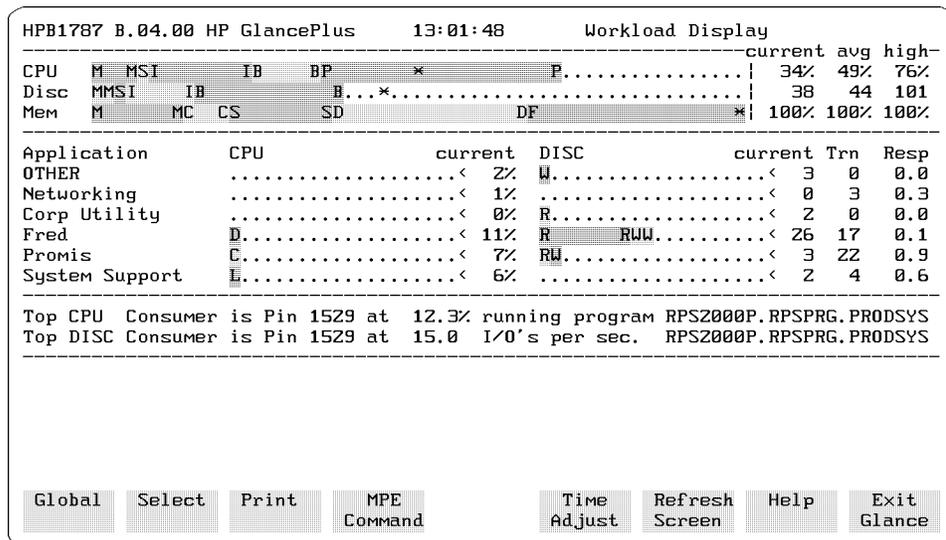


Figure 5-14. Workload Screen

### Interesting Applications

The Workload screen displays only applications that use CPU during the interval to allow you to concentrate on applications currently affecting performance. Interesting applications scroll down as new entries are added to the top of the listing thus keeping the latest information just below the Global bars. You can scroll the terminal display to examine previous applications and intervals again. You can also press the **(A)** key to see a one-time display of all applications.

#### 5-34 Screen Metrics and Statistics

Some interesting applications will have fields highlighted to indicate an event that might require closer attention. On colored monitors, these highlights are in color, on monochrome monitors they are underlined.

Since applications represent groups of processes, the thresholds for CPU usage, disc transfers, and transaction rate are set higher than they are for single processes. These values are set by highlight specifications in the GlancePlus configuration file GLANCNFG. Since response time is an average for all processes in the application, the response time threshold value used for single processes is also used for applications. See chapter 7 for more information on customizing GlancePlus.

### Interesting Application Fields

The application bars and fields appear below the Global bars and present information about how the applications are using CPU and Disc resources and information on their transaction rates and response times.

The Application bars and fields contain the following information:

<b>Application Name</b>	This is the name of the application as specified in the application definitions (see appendix D).
<b>CPU</b>	This CPU bar shows the percentage of central processing unit time used by the application during the last interval.

The bar contains the following codes:

- L - Linear queue (AS or BS).
- C - CS queue.
- D - DS queue.
- E - ES queue.

The number at the right of the bar is the percentage of time the application used the CPU during the last interval. A bar *will not* be displayed if the percentage of CPU used was not high enough to occupy one character space on the bar.

<b>DISC</b>	<p>This bar shows the application's disc transfer rate (transfers/second) during the interval.</p> <p>The bar contains the following codes:</p> <ul style="list-style-type: none"> <li>■ R - Disc reads.</li> <li>■ W - Disc writes.</li> </ul> <p>The number at the right of the bar is the application's disc transfer rate during the interval.</p>
<b>TRM</b>	<p>This field indicates the rate of terminal transactions (number/minute) during the last interval.</p>
<b>RESP</b>	<p>This field indicates the average terminal response time (seconds) during the last interval.</p>

## Top CPU and Disc Consumer

GlancePlus names the processes that are consuming the most CPU resources and the most Disc resources on the two lines following the application bars and summary fields.

The top CPU consumer is identified by its PIN (process identification number), the percentage of CPU it used during the last interval, and the program name or MPE/iX Command Interpreter (CI) command last issued. If an MPE/iX system process is the top consumer, it is identified by the program name or by the text: `running program on behalf of MPE/iX`.

The top Disc consumer is identified in the same way as the top CPU consumer except that the rate of disc transfers (transfers/second) for the process during the last interval is displayed instead of CPU percentage. If no disc activity occurred during the interval, the Top Disc Consumer line will not appear on the screen.

---

**Note** If you do not have System Manager (SM) capability, you will see the letters `CI` instead of the command string text when the program is a Command Interpreter.

---

## CPU Detail Screen

If you choose the C command for the CPU Detail screen, you can view metrics that are specific to CPU usage. In addition to the Program Banner Line and Global Bars, this screen will show CPU usage by the dispatcher, memory manager, system, and batch processes, as well as the time spent in various states such as paused, idle, or in a queue. The detailed data section of the display has four components:

- Type of Utilization.
- Queue Distribution.
- Miscellaneous Performance Metrics.
- Top CPU Consumer.

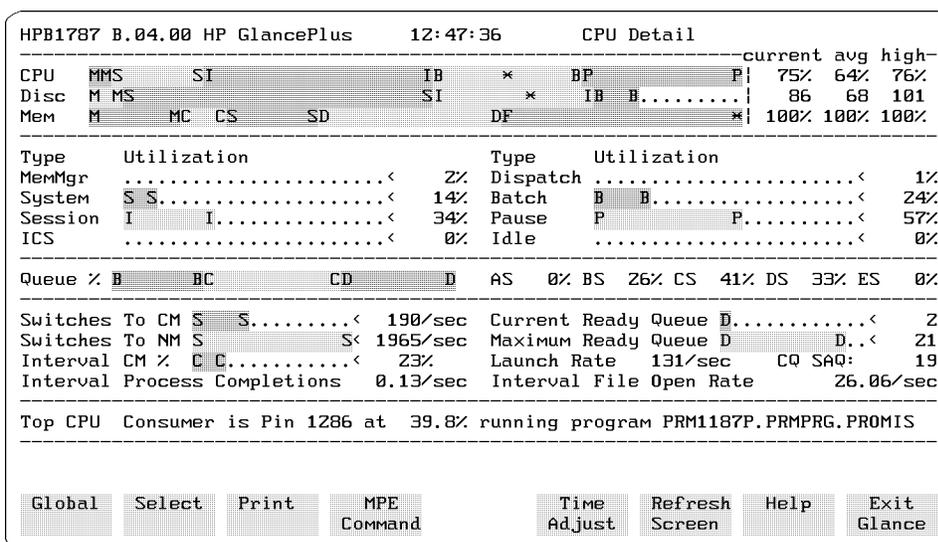


Figure 5-15. CPU Detail Screen

## Type of Utilization

This uppermost section of the detail area lists the percentage of total time used for different system resources and system purposes.

Type	Utilization	Type	Utilization		
MemMgr	.....<	2%	Dispatch	.....<	1%
System	SS.....<	14%	Batch	BB.....<	24%
Session	II.....<	34%	Pause	PP.....<	57%
ICS	.....<	0%	Idle	.....<	0%

**Figure 5-16. CPU Detail Screen—Type of Utilization**

These system resources and system purposes include the following:

- MemMgr** This line shows the time during the current interval that the CPU was processing certain Memory Manager activities, such as fetches and swap ins.

If memory manager CPU utilization is consistently higher than 8%, the system might be experiencing a main memory bottleneck.
- System** This line shows the time during the current interval that the CPU spent on system processes such as NS services, spoolers, and the Loader.
- Session** The Session line shows the time the CPU spent on interactive processes during the current interval.

If more than 70% of the CPU time was spent, consistently, on interactive processes, the system might be experiencing a CPU bottleneck condition.
- ICS** The Interrupt Control Stack (ICS) line shows the time spent on interrupt activity during the current interval. The ICS value is derived by subtracting the sum of all other CPU states during the interval from 100%.
- Dispatch** This line shows the time the CPU spent on MPE/iX Dispatcher activity.
- Batch** This line shows the time the CPU spent processing batch jobs during the current interval.

**Pause** This line shows the time the CPU was paused for the disc during the current interval.

If more than 25% of the time is spent, consistently, in a paused condition, the system might be experiencing a disc bottleneck condition.

**Idle** This line shows the time the CPU was idle during the current interval.

### Queue Distribution

The Queue % line shows the active CPU cycles consumed during the current interval distributed by queue. The percentage for each queue is shown at the right.

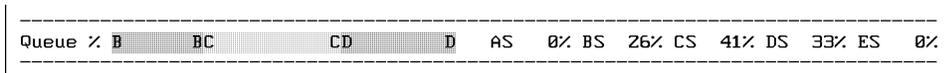


Figure 5-17. CPU Detail Screen—Queue Distribution

### Miscellaneous Performance Metrics

The bottom section of the CPU Detail screen shows various Global CPU performance metrics measured during the current interval.

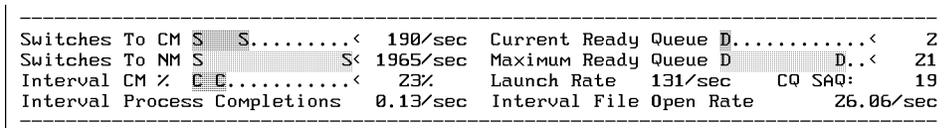


Figure 5-18. CPU Detail Screen—Miscellaneous Metrics

- Switches to CM** This shows the rate of switching from Native Mode to Compatibility Mode. [Bar Scale: 0 to 500 switches per second. The number to the right of the bar shows the actual switch rate per second up to a maximum of 9,999.]
- Switches to NM** This shows the rate of switching from Compatibility Mode to Native Mode. [Bar Scale: 0 to 500 switches per second. The number to the right of the bar shows the actual switch rate per second up to a maximum of 9,999.]

---

**Note** Excessive switching may indicate CPU saturation. While switching rates depend on machine size, you combine the rates for the two modes and use table 5-2 as a guideline for determining whether excessive switching is occurring. If it is, you should consider a Native Mode migration.

---

**Table 5-2. Guidelines for Switches to CM or NM**

<b>Machine Model</b>	<b>Threshold Rate (switches/second)</b>
S/920	approx 75
S/925	approx 120
S/922	approx 150
S/932	approx 225
S/935	approx 270
S/950	approx 300
S/955,917,927,937,947	approx 440
S/948,949	approx 500
S/960	approx 630
S/958	approx 650
S/957	approx 720
S/980-100,967	approx 1000
S/977	approx 1170
S/980-200	approx 1500
S/980-300	approx 1830

<b>Interval CM %</b>	This shows the percentage of time the CPU was in Compatibility Mode between switches.
<b>Interval Process Completions</b>	This shows the rate of process completions for the current interval (number of processes completed per second).  This provides information about the workload characteristics of the machine. A high rate of process completions, for instance, may indicate a CPU bottleneck due to excessive or improper process handling. A sustained rate greater than 0.50 may be considered excessive.
<b>Current Ready Queue</b>	This shows the number of processes waiting for the CPU. [Scale: 0 to 25 processes.]
<b>Maximum Ready Queue</b>	This shows the maximum number of processes waiting for the CPU since GlancePlus was started or since the MPE/iX Measurement Interface was enabled. [Scale: 0 to 25 processes.]
<b>Launch Rate</b>	This shows the rate of launches during the current time interval (number of launches per second). A launch occurs every time the MPE/iX Dispatcher gives a process control of the CPU.
<b>CQ SAQ</b>	This is the System Average Quantum (SAQ) for the C queue (CQ). This value represents the current time limit (in milliseconds) during which a process in C queue can retain use of the CPU. The SAQ value, which is recalculated continuously by the dispatcher, must be a value between the minimum (MIN) and maximum (MAX) parameters of the current CQ setting.
<b>Interval File Open Rate</b>	This is the rate that files are being opened during the current interval (number of files opened per second). The File Open Rate can be used to judge the workload characteristics of the system. A sustained rate greater than 35 files opened per second might indicate a CPU bottleneck condition or, possibly, poor application design.

## Top CPU Consumer

In a single line near the bottom of the CPU Detail screen, GlancePlus names the process that is consuming the most CPU resources.

```
-----  
Top CPU Consumer is Pin 1286 at 39.8% running program PRM1187P.PRMPRG.PROMIS  
-----
```

**Figure 5-19. CPU Detail Screen—Top CPU Consumer**

The percentage represents the amount of CPU resource that the process used during the last interval. The screen lists either the program name or the MPE/iX Command Interpreter (CI) command last issued. If an MPE/iX system process is the top consumer, it is identified by the program name or by the text “running program on behalf of MPE/iX.” If you wish to analyze that process in more detail, you can use the > command to take you to the Process screen for that process identification number (PIN).

---

**Note** If you do not have System Manager (SM) capability, you will see the letters “CI” instead of the command string text.

---

## Disc Detail Screen

Press the D command to see activity for the system disc drives as shown on the Disc Detail screen. This screen lists performance information for each drive currently active.

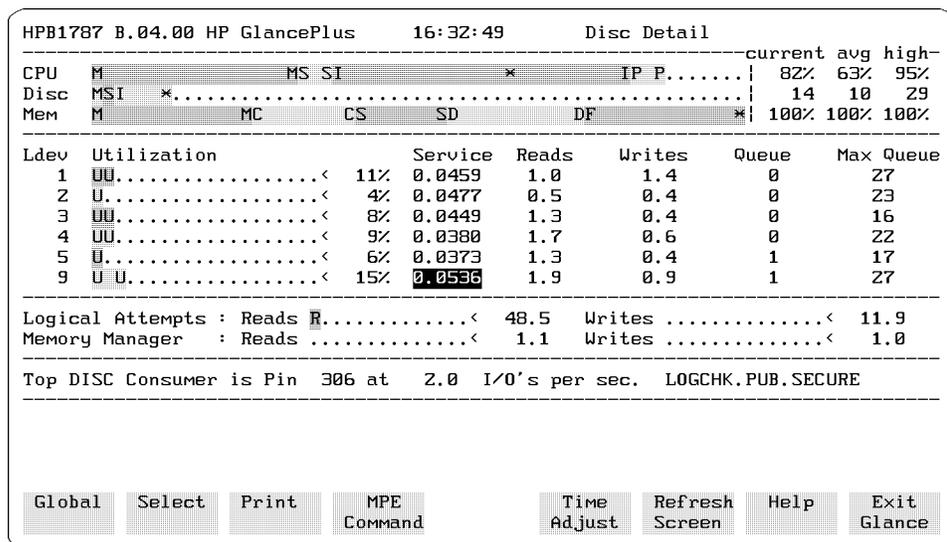


Figure 5-20. Disc Detail Screen

The detailed data area of the display is divided into three parts:

- Individual Disc Utilization.
- Summary Disc Utilization.
- Top Disc Consumer.

## Individual Disc Utilization

The individual disc utilization section of the screen displays one line for each disc drive. Information is shown on the logical device number (Ldev), percentage of utilization for the current interval, the average service time (Service), physical read and write rates, current queue depth, and maximum queue depth.

Ldev	Utilization	Service	Reads	Writes	Queue	Max Queue
1	UU.....< 11%	0.0459	1.0	1.4	0	27
2	U.....< 4%	0.0477	0.5	0.4	0	23
3	UU.....< 8%	0.0449	1.3	0.4	0	16
4	UU.....< 9%	0.0380	1.7	0.6	0	22
5	U.....< 6%	0.0373	1.3	0.4	1	17
9	UU.....< 15%	0.0536	1.9	0.9	1	27

**Figure 5-21. Disc Detail Screen—Individual Disc Utilization**

- Utilization** The utilization for each disc drive refers to the percentage of time during the current interval that the drive was in use servicing reads and writes. It is computed by dividing the disc's service time for the interval by the interval's elapsed time. [Scale: 0% to 100% utilization.]
- Service** The average service time for each physical I/O appears in the Service field. Represented in seconds, this metric is derived by dividing the disc service time by the total number of physical reads and writes for the current interval. For example, "0.0520" indicates an average service time of 52 milliseconds for that drive for the current interval.
- Reads** The number of physical reads per second for the disc during the current interval appears to the right of the Service field.
- Writes** The column showing the number of physical writes per second for the disc during the current interval appears to the right of the Reads column.
- Queue** The Queue column lists the number of processes in queue for this disc during the current time interval.
- Max Queue** The Maximum Queue column shows the largest number of processes in queue for this disc since GlancePlus or the measurement interface was started.

## Summary Disc Utilization

The Summary Disc Utilization section shows the rate of logical reads and writes per second, and the global memory manager reads and writes per second. These rates are for the current interval. [Logical Attempt Bar scale: 500 I/Os per second. Memory Manager scale: 100 I/Os per second.]

## Top Disc Consumer

The bottom section of the Disc Detail screen lists the highest disc consumer for the current interval, identified by its process identification number (PIN), the program name, and the physical I/O rate for that PIN. If no disc activity occurred during the interval, the Top Disc Consumer line will not appear on the screen. If you wish to analyze that process in more detail, you can use the > command to take you to the Process screen for that PIN.

```
-----  
Logical Attempts : Reads 48.5 Writes .....< 11.9  
Memory Manager  : Reads .....< 1.1 Writes .....< 1.0  
-----  
Top DISC Consumer is Pin 306 at 2.0 I/O's per sec. LOGCHK.PUB,SECURE  
-----
```

Figure 5-22. Disc Detail Screen—Summary and Top Disc Consumer

# Memory Detail Screen

The Memory Detail screen displays metrics that show physical memory activity by the system during the current interval. The detailed data area of the display is divided into two parts:

- Fault Types.
- Miscellaneous.

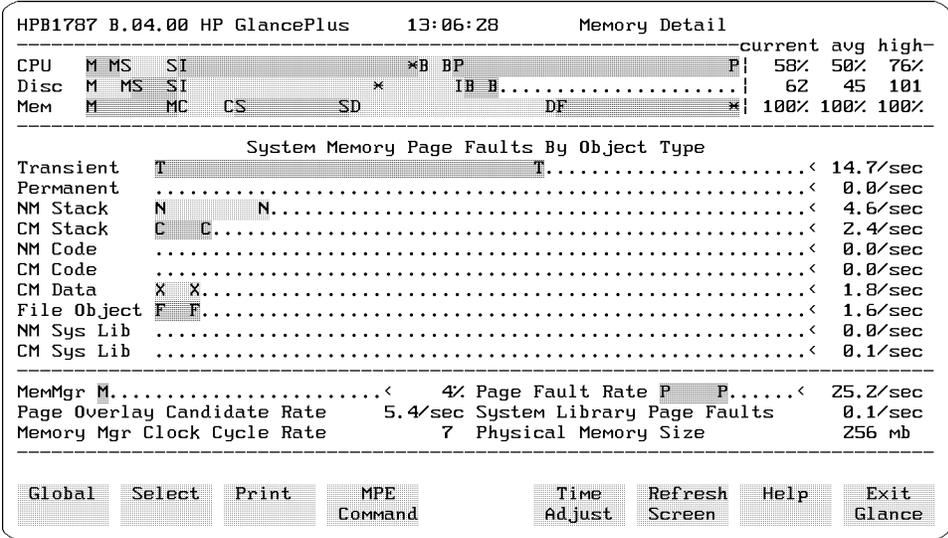


Figure 5-23. Memory Detail Screen

## Fault Types

The Fault Types section presents several metrics for memory faults (faults per second). [Scale: 0 to 50 faults per second.]

System Memory Page Faults By Object Type		
Transient	T	14.7/sec
Permanent		0.0/sec
NM Stack	N	4.6/sec
CM Stack	C	2.4/sec
NM Code		0.0/sec
CM Code		0.0/sec
CM Data	X	1.8/sec
File Object	F	1.6/sec
NM Sys Lib		0.0/sec
CM Sys Lib		0.1/sec

**Figure 5-24. Memory Detail Screen—Fault Types**

The Fault Types are as follows:

Transient	Unspecified transient data objects.
Permanent	Unspecified permanent data objects.
NM Stack	Native Mode process stacks.
CM Stack	Compatibility Mode process stacks.
NM Code	Native Mode code.
CM Code	Compatibility Mode code (program files).
CM Data	Compatibility Mode data segment.
File Object	File Objects.
NM System Library	Native Mode system library.
CM System Library	Compatibility Mode system library.

## Miscellaneous

The Miscellaneous section presents several system memory performance metrics that could be used to indicate potential memory bottlenecks. A bottleneck occurs when a memory resource has reached its capacity limit and might slow system throughput or response time.

MemMgr  M.....<	4%	Page Fault Rate  P.....<	25.2/sec
Page Overlay Candidate Rate	5.4/sec	System Library Page Faults	0.1/sec
Memory Mgr Clock Cycle Rate	7	Physical Memory Size	256 mb

**Figure 5-25. Memory Detail Screen—Miscellaneous Metrics**

- MemMgr**                      Memory Manager utilization during the current time interval is shown on the bar and by percentage to the right of this field. Sustained utilization of 8% or greater may indicate a potential memory bottleneck.
- Page Overlay Candidate Rate**                      This metric, depicted as the number of potential free pages per second, shows the Memory Manager activity on the making of physical memory pages as Overlay candidates (potential free pages). A sustained rate greater than 35 free pages per second may indicate a memory bottleneck.

<b>Memory Mgr Clock Cycle Rate</b>	<p>The bottom line of the Memory Detail screen shows the memory manager clock cycle rate.</p> <p>The clock cycle rate is computed by dividing the number of times the memory manager has cycled through memory by the elapsed time GlancePlus has been running. Unlike the other metrics on the screen, this one is relative to the run time of GlancePlus rather than the current interval. This avoids the misrepresentation of reporting one clock cycle over four thirty-second intervals as a rate of 120 per second during one interval and 0 per second during the other three. It also means that you should be careful to let GlancePlus run a few minutes before drawing any conclusions from this metric.</p> <p>A memory manager clock cycle rate of more than 25 per hour over ten minutes or more may indicate possible memory pressure.</p>
<b>Page Fault Rate</b>	<p>This field shows the sum of the Global System Page Fault types. The sum is expressed in page faults per second. A fault rate greater than 30 faults per second sustained over several intervals may indicate a potential bottleneck.</p>
<b>System Library Page Faults</b>	<p>This metric shows the total Native Mode and Compatibility Mode system library faults. A sustained rate of greater than 2 faults per second may indicate a memory bottleneck condition.</p>
<b>Physical Memory Size</b>	<p>This metric indicates the size of the machine's physical memory (in megabytes).</p>

## The Expert Facility

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To use a performance management tool effectively, you must be able to obtain proper measures of your system's performance, then separate the important from the unimportant information. HP GlancePlus for MPE/iX helps you do this in several ways.

- **Indicators.** HP GlancePlus uses indicators that are carefully chosen and arranged to make the product easier to use. Where several indicators might be used to represent a system resource, only those that are clear, reliable, and easy to interpret are used. Indicators that require an in-depth knowledge of the operating system or are unique to a particular operating system's technique are not used, if better alternatives are available. Reducing the number of redundant indicators makes it easier to notice when one exceeds its normal ranges.
- **Filtering.** Intelligent filtering of data helps you focus on what is important. For example, by showing only interesting processes, it is easier to identify problems than it would be if you had to scan through every process on the system. GlancePlus's ability to identify interesting processes—those that are starved for a resource or those that are using resources excessively—make it possible to see the forest without examining every tree.
- **Highlighting.** Highlighting draws your attention to important indicators. Highlights might indicate *why* a process is interesting. For example, If a process was starved for a resource, the WAIT field is highlighted and the name of the resource needed is displayed.

Highlighting can also identify an indicator that exceeds a level that experts consider normal. For example, if you are displaying the CPU display and the number of compatibility-mode switches is abnormally high for this size of system, this field is highlighted in the display. GlancePlus's highlighting provides an "expert in your pocket" that can tell you when your system is out of line.

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**Note** Highlighting works on all supported terminals and terminal emulators, but it works best on color terminals. Color highlights can provide additional information—red indicates more severe situations than blue or green. Terminals without color capability use underlining or inverse video to highlight an item. Highlighting is not available on the printer output.

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- **Guidelines.** GlancePlus provides guidelines to help you understand and use the data presented. Usually, all you have to do is type **H** or press **F7** to access online Help. Help can give you a list of commands and explain your current display, in general terms. Help can also give you more detailed information.

After entering the general Help section, you can ask for details about each metric on your screen. The advice of many HP 3000 performance specialists has been gathered and used to provide guidelines for understanding performance data. By asking for **GUIDELINES** you can access this knowledge base for information on what is considered “normal” for your system and how to tell when your system might be experiencing problems. This information is always at your fingertips when you need it.

- **Expert Facility.** GlancePlus’s Expert Facility helps you examine all the pertinent system performance indicators quickly and obtain a diagnosis. It can even recommend specific actions that might improve your system’s performance. This facility is a true expert system utilizing advanced techniques that enable this program to make the same decisions as might be made by a human expert in HP 3000 computer system performance.

## 6-2 The Expert Facility

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## Invoking The Expert Facility

You can use the Expert facility in several ways:

- It is always active and can guide you when fields are highlighted on a specific GlancePlus display.
- You can type **X** from any screen to request the Expert facility to diagnose your system. This diagnosis considers all available information, not just the information displayed on the screen.
- You can enable the Expert facility to operate continuously. In continuous mode, the Expert facility examines your system each time the display is updated. If it notices any performance problems it will add a single-line summary to the screen indicating the area of the problem and its severity. The Expert facility will also notify you of any problems, regardless of the screen you are viewing—the only exceptions are the Help, Option Values, and MPE Command screens.

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## What Does The Expert Facility Do?

The data displayed on each GlancePlus screen is examined by the Expert facility, and any indicators that exceed the normal range for the size of system are highlighted. Since the highlighting feature adds negligible overhead, it is permanently enabled.

A global system analysis is performed based on data obtained from a single sample. This can be a response to an on-demand request (you pressed the **X** key), or might occur automatically following each screen update, if the Expert facility is in continuous mode. During global analysis, all pertinent systemwide performance indicators are passed through a set of rules. These rules were developed by top performance specialists working on the HP 3000. The rules were further refined through use on a variety of systems of all sizes and configurations. The response to these rules establishes the degree of probability that any particular performance situation (called a symptom) could be true.

If the analysis is performed on demand, any symptom that has a high enough probability of being true is listed along with the reasons (rules) why it is probably the case, as in the following example:

XPert Status: 75% CHANCE OF GLOBAL CPU BOTTLENECK  
Reason: INTERACTIVE > 90.00 (96.4)

This says that “most experts would agree that the system is experiencing a problem when interactive users consume more than 90% of the CPU.” Currently, interactive use is 96.4%. Since the probability is only 75% (not 100%), some additional situations are not true. (In this case, the number of processes currently starved for the CPU might not be high enough to declare a real emergency.)

Summarization of expert analysis is available when the Expert facility is used in continuous mode. When this is enabled, global analysis is performed after each screen update, but messages are not given *unless* there is a problem. When one or more problems are detected, a single-line summary is added to the current display screen. In generating this one-line summary, each symptom is counted as *one or more* types of problems (CPU, DISC, MEMORY, LOCKS, Compatibility Mode, Switch Rate, or Response Time).

The probabilities for all symptoms of a given type are added to arrive at the state of the resource. If the state of the resource is low enough, the resource is considered normal, if higher, it is evaluated as MODERATE, HIGH, or VERY HIGH. The continuous-mode Expert facility display is a single line showing any problem areas and their states. For example,

XPert: |CPU IS VERY HIGH| |SWITCHES ARE HIGH|

In addition to generating one-line displays, the Expert facility also retains a summary of how often each type of problem occurred in each state. By typing 0 (for Overall Summary), you can generate a summary report showing the totals since the Expert facility was put into continuous mode.

Xpert Summary: Out of the last 327 seconds (5.4 Minutes)				
	OK	MODERATE	HIGH	VERY HIGH
CPU	306 ( 94%)	10 ( 3%)	0 ( 0%)	11 ( 3%)
DISC	327 (100%)	0 ( 0%)	0 ( 0%)	0 ( 0%)
MEMORY	283 ( 87%)	44 ( 13%)	0 ( 0%)	0 ( 0%)
LOCKS	327 (100%)	0 ( 0%)	0 ( 0%)	0 ( 0%)
CM	327 (100%)	0 ( 0%)	0 ( 0%)	0 ( 0%)
SWITCH	327 (100%)	0 ( 0%)	0 ( 0%)	0 ( 0%)
RESPONSE	327 (100%)	0 ( 0%)	0 ( 0%)	0 ( 0%)

Figure 6-1. Xpert Overview Screen

## 6-4 The Expert Facility

High level analysis can be performed only if the Expert facility is enabled for high level—use the V command: XLEVEL=HIGH. After a global analysis in which a problem type was not normal, the processes that executed during the last interval are examined. If an action can be suggested that might improve the situation, the action is listed as follows:

```
XPERT: Status 75% CHANCE OF GLOBAL CPU BOTTLENECK.  
Reason: INTERACTIVE > 90.00 (96.4)  
Action: QZAP pin 122 (PASXL) for MEL.EELKEMA from "C" to "D" queue.
```

Actions will not be instituted automatically since you may or may not agree with the suggestions.

If the Expert facility is enabled for high level analysis, you can request additional information when you request an expert diagnosis using the X command. Following the initial display, you can type X again to display the process data analysis. This analysis often includes the process or processes that are probably causing the problems as well as those that are suffering from the problems. For example,

Enter the X command:

```
XPERT: Status 75% CHANCE OF GLOBAL CPU BOTTLENECK.  
Reason: INTERACTIVE > 90.00 (96.4)  
Action: QZAP pin 122 (PASXL) for MEL.EELKEMA from "C" to "D" queue.
```

Press **RETURN** to continue, then press **X** for more details, or **0** for an overview summary. Press **X** again:

```
-----CPU ANALYSIS-----
Low priority processes ("D","E") are being starved for CPU.
If you want the lower priority processes to run, consider lowering the
priority of the CPU consumers listed below.
Action: QZAP pin 1ZZ (PASXL) for MEL.EELKEMA from "C" to "D" queue.

CPU is heavily used by high priority processes ("C" queue and above).
The following processes are using a large amount of CPU time. ■
  JSNO  Dev Logon      Pin Program Pri  CPU Disc Trn Resp Wait
S1009   46 MEL.EELKEMA   1ZZ PASXL  C   91.9% 0.0  0  0.0  8%

The following processes were starved for CPU time: ■
  JSNO  Dev Logon      Pin Program Pri  CPU Disc Trn Resp Wait
JZ435   10 PAYROLL.ACCTNG  140 PRNTCHK D    0.0% 0.0  0  0.0 100%
```

Even if no action is recommended, it can be helpful to display the high level analysis. The analysis might indicate why no action should be taken at this time. You might discover that even though your system CPU is 100% busy due to interactive users and a CPU bottleneck is indicated, no action is recommended since no process is starving for the CPU. Continued use of the expert high level analysis can teach you some of the subtleties of managing performance. You may not always agree with the suggested actions, but the information can help you understand your system better.

There is one level of analysis available beyond the high level discussed above. If after viewing the high level analysis, you still want more information, you can respond by pressing **X** again. This will give you the “Dump Everything” level analysis.

Usually, high level analysis is only done on areas of system performance that the Expert facility determined to be a problem. Processes will not be examined for disc problems unless there was an overall disc problem indicated. In the “Dump Everything” level analysis, every possible type of problem is examined to determine even a remote possibility that a process is causing a problem. This can be useful if you are interested in potential database-locking problems on your system, but the problems are not affecting enough of the system to be considered serious.

## 6-6 The Expert Facility

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## Recommendations For Using The Expert Facility

Using the Expert facility will add a small amount of overhead to the GlancePlus program. On most systems this additional overhead is about 0.2% CPU; it should not cause any problems. On systems with many processes, the GlancePlus overhead might be higher. In this case, you can eliminate almost all the Expert facility's additional overhead by using the **V** command to set **XLEVEL=LOW** instead of **HIGH**. The high level analysis and suggested actions will not be available to you with this setting. You can use **XLEVEL=LOW** as a default and change it to **HIGH** only when you need more detailed information. See chapter 7 for details on how to select the default settings for GlancePlus. With **XLEVEL=LOW** and **XPERT=DEMAND**, the Expert facility adds no additional overhead. Press **(X)** to request an on-demand global analysis at any time.

Since the overhead of the Expert facility on most systems is negligible, you can safely let it run in continuous mode. You may use **XLEVEL=LOW** and **XPERT=CONTINUOUS** to report any global problems and to accumulate the overview summary information (for the **O** command). Using **XLEVEL=HIGH** should not add significant overhead on most systems. (You can see the overhead by using GlancePlus to monitor itself under various settings on your system).

---

### Hint

The frequency of screen updates is one factor that affects GlancePlus's overhead most directly. If you set the update interval to its lowest setting (5 seconds), or press **(Return)** or **(Enter)** repeatedly to generate rapid updates, the CPU overhead can become very high. If you want to collect long-term summary information, set a longer update interval (60-90 seconds) to lower the GlancePlus overhead substantially.

However in some cases, setting the update interval to longer than *90 seconds* might not reduce the GlancePlus overhead. To keep process information from "backing up" in the measurement interface, information should be extracted every 60-90 seconds. Failure to do so can result in missing and inaccurate data. To avoid this problem if you select an update interval longer than 90-seconds, GlancePlus extracts the process data automatically once a minute to prevent backups.

---

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## Changing The Expert Facility's Rules

A situation might occur on your system that the Expert facility considers unusual but is normal for your system. Or, conversely, you might have a situation that the Expert facility does not detect, but one that you would like to add to its list of symptoms. In such cases, see chapter 7 for information on changing the GlancePlus default configuration. Make changes to the Expert facility carefully, since by doing so, you are assuming the role of an expert.

## Customizing HP GlancePlus

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As discussed in chapter 3, GlancePlus allows you to customize the startup procedure.

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### Customizing Startup

HP GlancePlus for MPE/iX provides the following two startup parameters when you run the program.

#### Refresh Time

Once you execute HP GlancePlus, the screens are refreshed (updated) every 30 seconds, by default.

You can specify a different refresh time when you execute the program by using the ;PARM= option of the MPE RUN command. With this parameter you can specify the number of seconds (5–3600) between screen updates.

#### Selecting the Initial Screen

GlancePlus displays the Global screen at startup, by default. You can direct it to start with the Job/Session, Process, CPU Detail, Disc Detail, Memory Detail, or Workload screen by specifying the appropriate GlancePlus command in the ;INFO= option of the MPE RUN command. To select a job, session, or process to monitor, you must follow the command abbreviation for that screen with a valid number.

The following examples specify a refresh time of 60 seconds and the monitoring of job number 312:

- Type: `:RUN GLANCEXL.PUB.SYS;INFO="J312";PARM=60`
- If you activated the HP GlancePlus UDC file, type: `:GLANCE J312,60`

The following examples specify that startup should proceed directly to the Workload screen:

- Type: `:RUN GLANCEXL.PUB.SYS;INFO="W"`
- If you activated the HP GlancePlus UDC file, type: `:GLANCE W`

---

## Customizing GlancePlus Global Bars

As discussed in chapter 3, the Global CPU bar and the Global Memory bar can be configured differently. This will change the abbreviations and their corresponding components in those bars.

For example, you can reconfigure the components of the Global CPU bar to show activity by queue and the components of the Global Memory bar to show fault rates, as discussed below.

### Global CPU Bar

Reconfiguring Global CPU Bar to show activity by queue is useful when you use a batch job to initiate processes that interact with terminal users. The normal “interactive/batch” representation would show these terminal users as “batch” since they were initiated as a batch job—this would not be as useful as a queue representation. A queue representation might also be useful on a system where interactive sessions and batch jobs routinely execute in queues other than the normal CS queue for sessions and DS and ES queues for batch.

The CPU bar has the following components:

DISPCPU = QUEUE

**Code Meaning**

- M MPE processing (memory management, interrupts, ICS, etc.).
- A Processes running in the A subqueue (system priority).
- B Processes running in the B subqueue (high priority).
- C Processes running in the C subqueue (normally interactive).
- D Processes running in the D subqueue (normally batch priority).
- E Processes running in the E subqueue (normally background).
- P Paused for disc (no CPU used but disc I/O is occurring).
- Blank* CPU was idle (and no disc I/O was occurring).

### **Global Memory Bar**

Configuring the Global Memory bar to show page-fault rates rather than contents might be useful on a system where memory is a bottleneck and page faults are used as key indicators to alert you of a problem.

The Memory bar has the following components:

DISPMEMORY=FAULTS (*Page fault rate for different object types*)

**Code Meaning**

- T Transient objects (program heaps, etc.).
- P Permanent objects (not normally faulted).
- S Data Stacks (NM + CM).
- C Code (NM + CM).
- D Data objects.
- F Files.
- L Library code (NM + CM).

---

## Customizing Configuration

HP GlancePlus for MPE/iX comes ready to use. Although it is configured with a selection of carefully tested defaults, you might want to change those settings in certain situations. For example, if the interesting process thresholds cause too many or too few processes to display on the Global screen, you might want to adjust the thresholds to match the activity on your system.

You can change GlancePlus parameters in several ways. Some ways are local to a particular execution of GlancePlus, such as using the **V** (Option Values) command to change interesting process thresholds. Other ways carry forward from one execution to another within the same job or session.

You can set job control words (JCWs) to have GlancePlus *remember* settings within the same job or session. You can also set a JCW using the **V** command to allow you to run GlancePlus again from the same job or session using those values. You can also set JCWs external to GlancePlus—for example, GLANCE user-defined commands (UDCs) can start GlancePlus with specific values each time the UDC is used.

You can set the default GlancePlus parameter values for the entire system by changing the GLANCNFG configuration file. If a file named GLANCNFG already exists in the same group and account as the GLANCEXL program, it will be examined for default parameters. You will be allowed to set some parameters *only* via the GLANCNFG file (parameters such as controlling which users may execute the QZAP command).

The GLANCNFG file contains additional information, such as the global rules for the Expert facility and, sometimes, the definitions for user-defined applications used by the Filter and Workload screens. (If you also own the HP LaserRX/MPE or HP GlancePlus Pak programs, application definitions will probably be found in the PARM.SCOPE.SYS file.) See the HP Performance Collection Software manual for more details.

Since you can set parameters in several ways, it is important to understand what happens if you use more than one way. The hierarchy for setting parameter values is usually:

- Program Defaults            *which can be overridden by . . .*
- GLANCNFG File            *which can be overridden (in most cases) by . . .*
- Job Control Words        *which can be overridden by . . .*
- Value Command Changes

The following table lists the changeable parameters, their default values, and the key words used to set them. Detailed descriptions of these parameters follow the table:

**Table 7-1. Changeable Default Parameters**

**Interesting Process Thresholds:**

<b>Values Command</b>	<b>Job Control Word</b>	<b>GLANCNFG File Keyword</b>	<b>Default Value</b>
MinCPU	GLANCEMINCPU	THRESHOLD MINCPU	1 Percent
CPU	GLANCECPU	THRESHOLD CPU	10 Percent
DISC	GLANCEDISC	THRESHOLD DISC	10 IOs/Second
RESP	GLANCERESPONSE	THRESHOLD RESP	5 Seconds
TRANS	GLANCETRANS	THRESHOLD TRANS	10 Trans/Min
NEW	GLANCENEW	THRESHOLD NONEW	YES (show)
DIED	GLANCEDIED	THRESHOLD DIED	YES (show)
WAITIMPEDE	GLANCEWAITIMP	WAIT IMPEDE	50 Percent
WAITCPU	GLANCEWAITCPU	WAIT CPU	50 Percent
WAITDISC	GLANCEWAITDISC	WAIT DISC	50 Percent
WAITMEM	GLANCEWAITMEM	WAIT MEMORY	50 Percent

**Display Control Parameters:**

<b>Values Command</b>	<b>Job Control Word</b>	<b>GLANCNFG File Keyword</b>	<b>Default Value</b>
FILEDISP	GLANCEFILEDISP	FILEDETAIL	DETAIL
PROCKEYS	GLANCEPROCKEYS	PROCKEYS	DEMAND
DISPCPU	GLANCEDISPCPU	DISPLAY CPU=	INTER-BATCH
DISPMEMORY	GLANCEDISPMEM	DISPLAY MEMORY=	CONTENTS
<i>n/a</i>	GLANCECLEARSCREEN	CLEARSCREEN ON/OFF	OFF

**Expert Facility:**

<b>Values Command</b>	<b>Job Control Word</b>	<b>GLANCNFG File Keyword</b>	<b>Default Value</b>
XPERT	GLANCEXPERT	XPERT	DEMAND
XLEVEL	GLANCEXLEVEL	XLEVEL	LOW

**Additional Parameters:**

<b>Values Command</b>	<b>Job Control Word</b>	<b>GLANCNFG File Keyword</b>	<b>Default Value</b>
<i>n/a</i>	<i>n/a</i>	XPERT	ANY
<i>n/a</i>	<i>n/a</i>	QZAP	SM
<i>n/a</i>	<i>n/a</i>	QZAPSYS	NONE
I, T, <b>f5</b>	GLANCETIME	REFRESH	30 Seconds

---

## Interesting Process Thresholds

Interesting process thresholds, set on the Global and Filter screens, allow you to select processes to be displayed and fields to be highlighted.

The **MINIMUM CPU** parameter determines the minimum amount of CPU time a process must consume in order to be displayed.

```
DEFAULT:    1 percent
GLANCNFG:   THRESHOLD MINCPU=percent
JCW:        SETJCW GLANCEMINCPU=percent
VALUES:     MinCPU=percent
```

The **CPU** parameter determines how much CPU time a process must consume to be displayed with its CPU field highlighted.

```
DEFAULT:    10 percent
GLANCNFG:   THRESHOLD CPU=percent
JCW:        SETJCW GLANCECPU=percent
VALUES:     CPU=percent
```

The **DISC** parameter determines what disc IO rate a process must perform in order to be displayed with its DISC field highlighted.

```
DEFAULT:    10 IOs/second
GLANCNFG:   THRESHOLD DISC=percent
JCW:        SETJCW GLANCEDISC=iopersec
VALUES:     DISC=iopersec
```

The **RESPONSE TIME** parameter determines what terminal-response time a process must exceed in order to be displayed with its response-time field highlighted.

DEFAULT: 5 seconds  
GLANCNFG: THRESHOLD RESP=seconds  
JCW: SETJCW GLANCERESP=seconds  
VALUES: RESP=seconds

The **TRANSACTIONS** parameter determines the terminal-transaction rate that a process must exceed in order to be displayed with its transaction-rate field highlighted.

DEFAULT: 10 transactions/minute  
GLANCNFG: THRESHOLD TRANS=transpermin  
JCW: SETJCW GLANCETRANS=transpermin  
VALUES: TRANS=transpermin

The **NEW** (or **NONEW**) parameter determines whether or not processes that are newly created are displayed with their names highlighted.

DEFAULT: (*New processes are displayed and highlighted.*)  
GLANCNFG: THRESHOLD NONEW (*Specifies to not highlight new processes.*)  
JCW: SETJCW GLANCENEW=1 (*Specifies to not highlight new processes.*)  
SETJCW GLANCENEW=0 (*Specifies to highlight new processes.*)  
VALUES: NEW=YES or NEW=NO (*YES means to highlight new processes.*)

The **DIED** (or **NODIED**) parameter determines whether or not processes that terminate are displayed with the process priority field highlighted as **DIED**.

**DEFAULT:**     *(Terminated processes are displayed and highlighted.)*  
**GLANCNFG:**   **THRESHOLD NODIED** *(Specifies to not highlight processes that died.)*  
**JCW:**         **SETJCW GLANCEDIED=1** *(Specifies to not highlight processes that died.)*  
                  **SETJCW GLANCEDIED=0** *(Specifies to highlight processes that died.)*  
**VALUES:**     **DIED=YES** or **DIED=NO** *(YES means to highlight processes that died.)*

The **WAIT ON IMPEDE** parameter determines when a process should be displayed and its **WAIT** field highlighted due to excessive waiting on software locks, latches, and other synchronization events.

**DEFAULT:**     **50 percent**  
**GLANCNFG:**   **WAIT IMPEDE=percent**  
**JCW:**         **SETJCW GLANCEWAITIMP=percent**  
**VALUES:**     **WAITIMPEDE=percent**

The **WAIT ON CPU** parameter determines when a process should be displayed and its **WAIT** field highlighted due to excessive waiting on access to the CPU.

**DEFAULT:**     **50 percent**  
**GLANCNFG:**   **WAIT CPU=percent**  
**JCW:**         **SETJCW GLANCEWAITCPU=percent**  
**VALUES:**     **WAITCPU=percent**

The **WAIT ON DISC** parameter determines when a process should be displayed and its **WAIT** field highlighted due to excessive waiting on data transfers to or from disc drives.

DEFAULT: 50 percent  
GLANCNFG: WAIT DISC=percent  
JCW: SETJCW GLANCEWAITDISC=percent  
VALUES: WAITDISC=percent

The **WAIT ON MEMORY** parameter determines when a process should be displayed and its **WAIT** field highlighted due to excessive waiting on main memory resources.

DEFAULT: 50 percent  
GLANCNFG: WAIT MEMORY=percent  
JCW: SETJCW GLANCEMEM=percent  
VALUES: WAITMEM=percent

---

## Display Control Parameters

Display control parameters control the actions of various GlancePlus display screens.

The **FILE DETAIL DISPLAY** parameter determines whether the display of files opened by a process on the **PROCESS** screen is in *detailed* (one open file per line) or *simple* (four files per line) format.

DEFAULT:     **DETAIL**  
GLANCNFG:   **FILEDISP SIMPLE or FILEDISP DETAIL**  
JCW:         **SETJCW GLANCEFILEDISP=0 (for detailed) or**  
              **SETJCW GLANCEFILEDISP=1 (for simple)**  
VALUES:      **FILEDISP=SIMPLE or FILEDISP=DETAIL**

The **PROCESS KEYS** parameter determines whether or not the **OPEN FILES** and **PROCESS FAMILY** commands show only one display on the Process screen each time they are requested (on demand) or toggle between no display and continuous display (continuous).

DEFAULT:     **DEMAND**  
GLANCNFG:   **PROCKEYS DEMAND or PROCKEYS CONTINUE**  
JCW:         **SETJCW GLANCEPROCKEYS=0 (for demand) or**  
              **SETJCW GLANCEPROCKEYS=1 (for continue)**  
VALUES:      **PROCKEYS=CONTINUE or PROCKEYS=DEMAND**

The **CLEAR SCREEN** parameter determines whether old display data is always erased before a new display begins (**CLEARSCREEN ON**) or whether some screens scroll previous process data down allowing the current data to be compared against previous data.

DEFAULT:     **OFF**  
GLANCNFG:   **CLEARSCREEN ON** *or* **CLEARSCREEN OFF**  
JCW:         **SETJCW GLANCECLEARSCREEN=0** (*for off*) *or*  
              **SETJCW GLANCECLEARSCREEN=1** (*for on*)  
VALUES:      (*This parameter cannot be changed using the VALUES command.*)

The **DISPLAY CPU** parameter determines what type of display is used for the GLOBAL CPU bar at the top of each screen. **INTER-BATCH** divides the CPU bar by the type of processes using it (**SYSTEM**, **INTERACTIVE**, and **BATCH**), while **QUEUE** divides the CPU bar based on the priority of the processes (**A**, **B**, **C**, **D**, **E**).

DEFAULT:     **INTER-BATCH**  
GLANCNFG:   **DISPLAY CPU=INTERBATCH** *or* **DISPLAY CPU=QUEUE**  
JCW:         **SETJCW GLANCEDISPCPU=0** (*for inter-batch*) *or*  
              **SETJCW GLANCEDOSPCPU=1** (*for queue*)  
VALUES:      **DISPCPU=INTER-BATCH** *or*  
              **DISPCPU=QUEUE**

The **DISPLAY MEMORY** parameter determines what type of display is used for the GLOBAL MEMORY bar at the top of each screen. **CONTENTS** displays how much of main memory is occupied by different types of objects. **FAULTS** shows the rate at which different objects are being requested to be brought into main memory (faulted into memory).

DEFAULT:     **CONTENTS**  
GLANCNFG:   **DISPLAY MEMORY=CONTENTS** *or*  
              **DISPLAY MEMORY=FAULTS**  
JCW:         **SETJCW GLANCEDISPMEM=0** (*for contents*) *or*  
              **SETJCW GLANCEDISPMEM=1** (*for faults*)  
VALUES:      **DISPMEMORY=CONTENTS** *or*  
              **DISPMEMORY=FAULTS**

## 7-12 Customizing HP GlancePlus

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## The Expert Parameters

The Expert parameters control the operation of the Expert Facility.

The **EXPERT MODE** parameter controls whether the Expert facility examines the system automatically every time the display is updated (continuous mode) or is available only after typing the **X** command (on demand).

DEFAULT:     **DEMAND**  
GLANCNFG:    **XPERT DEMAND** *or* **XPERT CONTINUOUS**  
JCW:           **SETJCW GLANCEXPERT=0** (*for demand*) *or*  
               **SETJCW GLANCEXPERT=1** (*for continuous*)  
VALUES:       **XPERT CONTINUE** *or* **XPERT DEMAND**

The **EXPERT LEVEL** parameter controls whether the Expert facility is working at a low level of detail (no process) or at high detail (including processes) and slightly higher overhead. See chapter 6 on the Expert facility for information on how to set this parameter.

DEFAULT:     **LOW**  
GLANCNFG:    **XLEVEL LOW** *or* **XLEVEL HIGH**  
JCW:           **SETJCW GLANCELEVEL=1** (*for low*) *or*  
               **SETJCW GLANCELEVEL=2** (*for high*)  
VALUES:       **XLEVEL=LOW** *or* **HIGH**

---

## Additional Parameters

The **EXPERT USERS** parameter can control which users are allowed to use the Expert facility (who can execute **X** commands or utilize continuous mode).

- DEFAULT:** **ANY** (*Any user may use the Expert facility.*)
- GLANCNFG:** **XPERT SM, OP, AM, ANY** (*or any combination to allow users with SM, OP, AM capabilities or ANY user to use the Expert facility.*)  
**XPERT NONE** (*Prevents all users from accessing the Expert facility.*)
- JCW:** (*This capability is not accessible through Job Control Words.*)
- VALUES:** (*This capability is not accessible through any GlancePlus commands.*)

The **QZAP** parameter is only allowed in the GLANCNFG file. It can control which users are allowed to execute the QZAP command to change the priority of a process, job, or session.

- DEFAULT:** **SM** (*Only system managers may execute the QZAP command.*)
- GLANCNFG:** **QZAP SM** (*Only system managers may execute the QZAP command.*)  
**QZAP OP** (*System operators—or users with OP capability—may execute the QZAP command but not into or out of the B or linear queues.*)  
**QZAP NONE** (*No user may execute the QZAP command.*)

The **QZAPSYS** parameter is only allowed in the GLANCNFG file. It controls which users are allowed to execute the QZAP command against system processes. Combinations of **OP** and **SM** are allowed in this parameter. Care must be taken when adjusting system process priorities since this might degrade performance, cause errors, or even hang or crash the system.

- DEFAULT:** **NONE** (*No user may QZAP a system process.*)
- GLANCNFG:** **QZAPSYS SM and/or OP** (*To allow users with SM and/or OP caps.*)

The **REFRESH TIME** parameter determines how many seconds between automatic updates of the GlancePlus display.

DEFAULT: 30 seconds

GLANCNFG: REFRESH seconds

JCW: SETJCW GLANCETIME=seconds

VALUES: *Not used. Use the I (Interval) or T (Time) command, or press*  
**f5**.

---

## GlancePlus Configuration File: Security

The GlancePlus configuration file enables certain capabilities and contains vital global configuration options. Because of this, a user is not allowed to use file equations to utilize an alternate configuration file.

If GlancePlus is installed in the PUB.SYS group and the default access is still in effect, any user who can log on in the PUB.SYS group has the capability to change the configuration file. You may want to restrict write and append access to MANAGER.SYS via the ALTSEC command to further protect the file from unauthorized modification.

---

## Configuring the Expert Facility

Many parts of the GlancePlus Expert facility can be customized by editing the GLANCNFG file. Be careful when making changes because they will affect the Expert facility's recommendations when you use it. Two main areas of the Expert facility can be configured: The highlighting of key metrics on GlancePlus screens, and the performance recommendations made by the X command.

## Highlighting Metrics

You can change the points where the Expert facility highlights metrics on GlancePlus screens by adding one or more lines to the GLANCNFG file. These added lines should have the following syntax:

```
HIGHLIGHT hitem=newvalue
```

where *hitem* is one of the items shown in the following table, and *newvalue* is the desired value for that item. The *hitem* field must be entered exactly as shown—uppercase and underscore characters are required.

**Table 7-2. GlancePlus Highlighting Characteristics**

Hitem	Default	Description
CPU_CM	20	CPU usage in compatibility mode (percentage of total).
CPU_SW_CM	500	Switches from compatibility mode to native mode (switches/second).
CPU_SW_NM	500	Switches from native mode to compatibility mode (switches/second).
CPU_PROC	1	
CPU_FOPEN	5	Rate of file opens (opens/second).
CPU_DISPQ	10	Number of processes in the dispatcher queue.
DISC_UTIL	80	Individual disc drive usage (percentage of total).
DISC_SERV	0.0500	Service time for an individual disc (seconds).
MEM_CPU	8	CPU usage managing main memory (percentage of total).
MEM_PFAULTS	30	Memory page faults (faults/second).
MEM_CLOCK	25	Memory clock cycles.
MEM_LIBFAULT	2	Memory page faults on library code (faults/second).
PROC_CPUSEC	3600	Time of total CPU usage by a process (seconds).
PROC_CM	80	CPU usage in compatibility mode by a process (percentage of total).
PROC_SWCM	100	Switches from compatibility mode to native mode by a process (switches/second).
PROC_SWNM	100	Switches from native mode to compatibility mode by a process (switches/second).

**Table 7-2. GlancePlus Highlighting Characteristics (continued)**

<b>Hitem</b>	<b>Default</b>	<b>Description</b>
APPL_CPU	20	CPU usage by an application (percentage of total).
APPL_DISC	50	Disk I/O rate by an application (IOs/second).
APPL_TRANS	120	Transaction rate by an application (transactions per minute).

## **Performance Recommendations**

The second area in which the Expert facility can be customized consists of the rules by which Expert facility accesses a system's overall performance—also known as low level analysis.

The Expert facility defines a set of symptoms wherein each symptom represents a particular performance situation. A set of rules define the conditions that increase the probability that a particular symptom is true. (Computer scientists might recognize the use of *fuzzy logic*, a technique in which a condition doesn't have to be clearly true or false, but might be "a little bit true" or "very much true.") Basically, the rules consist of comparisons between two items with an accompanying probability value. If the rule is true, the probability that the symptom is also true increases by the rule's probability value.

Items are formed either by using constants or by selecting them from a list of available performance indicators supplied by GlancePlus at each interval. Items may also be combined into user-defined variables. The syntax for this section of the GLANCNFG file is described below. For an example of the CPU bottleneck rules, see below or examine the GLANCNFG file.

```
VAR A = TOTAL CPU - BATCH CPU "INTERACTIVE"
```

```
SYMPTOM "GLOBAL CPU BOTTLENECK" TYPE=CPU
```

```
RULE VAR A > 70 PROBABILITY 25
```

```
RULE VAR A > 80 PROBABILITY 25
```

```
RULE VAR A > 90 PROBABILITY 25
```

```
RULE CPU QUEUE > 3 PROBABILITY 75
```

To define a user **variable**, express the following:

```
VAR [A ... Z]= itemid [+,-,*,/]itemid mnemonic
```

Twenty-six variables can be defined (VAR A through VAR Z). The definition of one variable may include another item but only if that variable has a lesser name alphabetically. For example, VAR B can include VAR A, but not VAR C. The mnemonic is the name used to represent this variable when the Expert facility prints out reasons to the user.

To define a **symptom**, express the following:

```
SYMPTOM symptom name TYPE=symptomtype
```

*where symptomtype* can be one of the following: CPU, DISC, MEMORY, IMPEDE, SWITCH, CM, RESPONSE, or OTHER.

One or more rules defining when the symptom occurs should follow each symptom. The syntax for defining a rule is:

```
RULE itemid comparison itemid PROBABILITY percent
```

*where itemid* can be a constant, a user variable, or one of the GlancePlus performance indicator mnemonics.

Comparison is > (*greater than*)  
< (*lesser than*)  
>= (*greater than or equal to*)  
<= (*lesser than or equal to*)

Percent is a value from -100 to 100.

You may define as many as 50 symptoms and 100 rules at one time. GlancePlus performance indicators are defined below.

**Table 7-3. GlancePlus Performance Indicators**

<b>Indicator</b>	<b>Description</b>
TOTAL CPU	Total CPU usage in the interval (percentage of available).
SYSTEM CPU	CPU usage by system processes (percentage of total).
SESSION CPU	CPU usage by interactive session processes (percentage of total).
BATCH CPU	CPU usage by batch job processes (percentage of total).
MEM MGR CPU	CPU usage to manage main memory (percentage of total).
DISPATCH CPU	CPU usage used in dispatching processes (percentage of total).
OTHER CPU	CPU usage for other reasons (percentage of total).
CPU PAUSED	Time CPU was idle but disc IO occurred (percentage of total).
IDLE CPU	Time CPU was idle and disc IO did not occur (percentage of total).
PHYS DISC	Total physical disc IO rate (IOs/second).
SYSTEM DISC	Physical disc IO rate by system processes (IOs/second).
SESSION DISC	Physical disc IO rate by interactive sessions processes (IOs/second).
BATCH DISC	Physical disc IO rate by batch job processes (IOs/second).
MEM MGR DISC	Physical disc IO rate to manage main memory (IOs/second).
LOGICAL DISC	Logical disc IO rate (IOs/second).
DISC UTIL	Average usage of all disc drives (percentage).
TRANSACT/MIN	Rate of terminal transactions completed (transactions/minute).
FIRST RESP	Average time to first terminal response (seconds).
RESPONSE	Average time to terminal prompt (seconds).

**Table 7-3. GlancePlus Performance Indicators (continued)**

<b>Indicator</b>	<b>Description</b>
PEAK LOGL IO	Logical disc IO rate for busiest disc drive (IOs/second).
PEAK PHYS IO	Physical disc IO rate for busiest disc drive (IOs/second).
PEAK MEM IO	Physical disc IO rate for memory manager on busiest disc drive (IOs/second).
PEAK UTIL	Usage of busiest disc drive on system (percentage of total).
CPU QUEUE	Average number of processes using or waiting for CPU.
DISC QUEUE	Average number of processes waiting on disc I/O.
MEMORY QUEUE	Average number of processes waiting on main memory.
IMPEDE QUEUE	Average number of processes waiting on locks, impedes, etc.
CM CPU	Average time spent in compatibility mode (percentage).
NM CPU	Average time spent in native mode (percentage).
CM SWITCHES	Rate of switches from native mode to compatibility mode (switches/second).
NM SWITCHES	Rate of switches from compatibility mode to native mode (switches/second).
TOTAL MIPS	Relative processor speed (millions of internal clock cycles per second).

## Multiprocessor Systems

---

In addition to single-processor systems, MPE now supports multiprocessor systems—systems that have more than one processor (CPU) board. To determine if you have a multiprocessor system, examine the banner line of the GlancePlus Global screen. If more than one processor is configured, the total number of configured processors will be displayed in the area to the right of the word “Global.” If this area is blank, your system has only one processor configured.

The following is an overview of how GlancePlus presents CPU metrics on a multiprocessor system.

Global CPU bars and their associated percentages are presented relative to *all* processors on the system. Any process CPU metric is presented relative to a *single* processor. For example, if a two-processor system has only one active process that constantly consumes CPU, then the Interesting Process section of the Global screen will show 100% CPU for that process. The Global CPU bar will display 50% (100% divided by the number of processors). If that same system had two processes constantly consuming the CPU, then each process would show 100% CPU and the Global CPU bar would display 100% (100% plus 100%, divided by the number of processors).

Screens that represent *groups* of processes (the Job, Session, Filter, and Workload screens) present their data as follows: CPU bars and their associated percentages are displayed relative to *all* processors. CPU-seconds are displayed relative to a *single* processor. For example, a Job screen showing a job with one process constantly using the CPU would display the JOB CPU bar at 50% (just like the Global bar). The CPU total-seconds would increment at the same rate as clock time. The process in this display would still show CPU usage at 100% since it is displayed relative to a single processor.

These choices of design for presenting CPU usage represent tradeoffs. It is useful to present process CPU usage relative to a single processor since

other MPE sources such as the system log files, the `REPORT` command, the `SHOWME` command, and log-off statistics also present CPU usage relative to a single processor. It is advantageous to represent CPU-seconds on the Job, Session, and Filter screens relative to a single processor so they can be compared properly to other MPE sources. In addition, it is useful to scale the CPU bars between 0 and 100% of the total processing power of the system, or relative to *all* processors. By doing this, 100% means that the total CPU power of the system is utilized completely, regardless of the number of processors utilized.

The tradeoff for these advantages is the need to be able to understand that it is reasonable for a two-processor system to have a Global CPU bar showing 100% usage and two processes in the interesting process section each using 100% (of a single processor). The user must understand the difference between Global CPU bar and individual process presentations. Once this is understood, the user need not consider the number of CPUs in use to easily understand how CPU-intensive each process is and how much total processing power is in use.

# B

## Wait Reasons—Expanded Definitions

---

A process will be suspended if it cannot access a resource or it must wait for another event to be completed. Although a process's wait reason can pass through many different states between refresh intervals, HP GlancePlus reports the state at the instant the process is displayed.

The following WAIT reasons occur for MPE/iX:

BREK	IMP	PAUS
CONS	I/O	RIN
CPU	MEM	SEM
DBMS	MISC	SIR
DISC	MSG	SON
FATH	OTHR	TERM

The specific WAIT REASONS can be defined as follows:

- BREK** The process is waiting to be resumed from a BREAK. For instance, if a user who is running a program presses the **Break** key and receives the colon (:) prompt, that process will show up in a BREK wait.
- CONS** The process is waiting for a reply from the console operator. A typical example would be a STORE with an outstanding tape request at the console.

- CPU** The process is waiting to use the central processing unit. On busy systems, higher priority processes can consume all of the available CPU resources while lower priority processes must wait. The PRI column displays the queue and priority number of a process. On extremely busy systems, a low priority batch job (high PRI number) can remain in a CPU wait state while all available CPU resources are consumed by higher priority processes (lower PRI number).
- DBMS** When SQL applications are running with multiple users, the database monitor process (DBMON) will stay in the DBMS wait state during periods of inactivity. *This wait state is unique to MPE/iX SQL applications.*
- When TurboIMAGE applications request a lock, the process will be semaphore waited (SEM).
- DISC** The process is waiting for the completion of a read to a file or write to a file. This does not include memory manager I/O, which is accounted for in the MEM wait category. On MPE/iX systems, main memory is used to buffer I/O requests; this greatly reduces the amount of time a process waits on DISC.
- FATH** The son process is waiting for its father to reawaken it. When one process creates a second process, the first process is referred to as the *father* and the second process as the *son*. The father process has the capability of starting and stopping the son process.
- IMP** The process is impeded. This wait state is used for a variety of reasons.
- On MPE/iX systems, processes using databases make use of the DBMS wait state.
- I/O** The process is waiting for the completion of nondisc I/O, such as from magnetic tape. Disc I/O (DISC) and terminal I/O (TERM) have separate wait states and are not included in this category.

## **B-2 Wait Reasons—Expanded Definitions**

MEM	<p>The process is waiting for library code, program code, data, or any combination of the three to be brought into memory. Since it would be wasteful for a large process to fully occupy main memory, the process is broken up into smaller pieces, referred to as pages. As these segments or pages of memory are needed, they are brought into main memory from disc and the process must memory (MEM) wait.</p> <p>It is normal to find a process in this state occasionally. Finding a single process in memory wait state repeatedly, however, can be caused by poor locality—the process’s logic is forcing it to continually branch to other segments or pages. Finding multiple processes in this state can indicate a lack of main memory. As the demand for memory outstrips the supply, the operating system must use a process’s main memory for other, higher priority processes.</p>
MISC	<p>The process is waiting for an unspecified wait state and is accumulated under this general category. HP GlancePlus reports seldom-used wait states in this category.</p>
MSG	<p>The process is waiting to receive a message. To synchronize internal operations, some operating system processes communicate by sending internal messages to one another. MPE message file waits, RECEIVEMAIL intrinsic waits, and interprocess communication (IPC) waits are examples of user-generated message wait state.</p>
OTHR	<p>The process is waiting for an unspecified wait state called OTHR, which excludes all of the other wait states. OTHR appears as an (O) in the wait reasons and the wait-state bar in the Process display.</p>
PAUS	<p>The application program calls the PAUSE intrinsic, which delays the program for a user-specified length of time. The program is currently waiting for this time to elapse before continuing.</p>
RIN	<p>Specific resources can be shared by a set of processes. MPE provides users with a RIN (resource identification number) facility to prevent two processes from using a shared resource at the same time. When one process locks a specific RIN, a second process wanting to lock the same RIN will wait. A RIN wait applies to both global and local RINs. RINs are also used to lock MPE/iX files.</p>

- SEM The process is waiting for a software semaphore or flag other than those specified by SIR and RIN wait categories.
- SIR To maintain consistency, certain operating system functions are performed serially by a single process. To enforce this access pattern, a software resource called a SIR is obtained before the critical function is performed. SIRs are internally-used MPE resources and are not available to users directly.
- SON The father process is waiting to be reawakened by its son process. When one process creates a second process, the first process is referred to as the *father* and the second as the *son*. The father process has the capability of starting the son and continuing to process, or starting the son and waiting until it is reawakened by the son.
- TERM The process is waiting for the completion of a terminal read.

#### **B-4 Wait Reasons—Expanded Definitions**

## Detailed WAIT Reasons

---

**Table C-1. Detailed WAIT Reasons**

Reason	Description	Reason	Description
<b>NM Code</b>	NM Code Fault.	<b>PortWait</b>	Port Wait.
<b>NM Stack</b>	NM Stack Fault.	<b>MailWait</b>	Mail Wait.
<b>NM Trans</b>	NM Trans Fault.	<b>JunkWait</b>	Junk Wait.
<b>FPgFault</b>	File Page Fault.	<b>Message</b>	Message Wait.
<b>CM Code</b>	CM Code Fault.	<b>Impeded</b>	Impeded.
<b>CM Stack</b>	CM Stack Fault.	<b>Break</b>	Wait for Break.
<b>CM Trans</b>	CM Trans Fault.	<b>Queue</b>	Wait for Queue.
<b>TermRead</b>	Terminal Read Wait.	<b>Mem Mgmt</b>	Wait for Memory Management.
<b>TermWrit</b>	Terminal Write Wait.	<b>PortMake</b>	Port Blocked Make Present.
<b>Disc IO</b>	Disc I/O Wait.	<b>Blocked</b>	Wait for Blocked File.
<b>Other IO</b>	Other I/O Wait.	<b>Unblocked</b>	Wait for Unblocked File.
<b>Preemptd</b>	Preempted (CPU).	<b>Stor Mgr</b>	Wait for Storage Manager.
<b>SIR Wait</b>	SIR.	<b>DebugMsg</b>	Wait for Debug Message to User.
<b>RIN Wait</b>	RIN Wait.	<b>IO Config</b>	Wait for I/O Configuration.
<b>MemMgrPF</b>	Memory Manager Prefetch.	<b>PFPReply</b>	Wait for port facility process (PFP) Reply.
<b>QuantExp</b>	Quantum Expired.	<b>DB Mon</b>	Wait for data base (DB) Monitor.
<b>Paused</b>	Timer Wait.	<b>DiscFill</b>	Wait for Disc Fill Operation.
<b>Father</b>	Wait for Parent.	<b>HL IO</b>	Wait for High Level I/O.
<b>CtrlBlck</b>	Control Block Wait.	<b>FSTermIO</b>	Wait for File System Terminal I/O.
<b>Son</b>	Wait for Child.	<b>MemMgrPW</b>	Memory Manager Post Wait.
<b>DataComm</b>	Data Comm Wait.	<b>SignalTmr</b>	Signal Timer Wait.
<b>Console</b>	RIT (Console Reply) Wait.	<b>Other</b>	Other Wait Reason.
<b>Dspatchr</b>	Wait for Dispatcher (Disp Work).		



## Application Definition Files

---

The GlancePlus Workload screen and appropriate Filter commands allow you to utilize user-defined applications. These are the same definitions as those used by the HP LaserRX/MPE and GlancePlus Pak for MPE/iX products.

You can use any one of the following as an application definition file:

- GlancePlus configuration file (`GLANCNFG.PUB.SYS`).
- LaserRX or GlancePlus Pak Parm file (`PARM.SCOPE.SYS`).
- Any other file that contains valid application definitions.

GlancePlus scans the `GLANCNFG` file, automatically, every time it is executed. If application definitions are not found, it attempts to open `PARM.SCOPE.SYS`. If you want to use a file other than the ones GlancePlus opens, select it by using the `APPL` keyword in the Filter or Value command. If no applications are defined in the `GLANCNFG` file, you may file equate `PARM.SCOPE.SYS` to an application definition file of your choice before starting GlancePlus. Then it will begin with the desired application definitions.

Read access is usually required before a user is allowed to read a file containing application definitions. Since the default access for **ANY** user to `PARM.SCOPE.SYS` is “execute only,” GlancePlus will be able to read it as long as it has execute access. Note that read access is required for GlancePlus to read `GLANCNFG`.

---

## Application Definition Syntax

The following information describes the syntax used to define an application and gives several examples of application definitions.

APPLICATION { *application name* }

FILE= [ *filename* ]

INTERACTIVE= [ *filename* ]

BATCH= [ *filename* ]

USER= [ *job/session name*, ] { *username.acctname* } [ , *groupname* ]

QUEUE [ *execution priority* ]

OR

*where:*

The *application name* parameter identifies an application that groups multiple program files together and reports on their combined activities. The *application name* is a string of up to 20 characters identifying that application.

One or more *application definitions* should follow the APPLICATION command. An application definition consists of combinations of FILE, INTERACTIVE, BATCH, USER, or QUEUE parameters.

The OR parameter is used to separate multiple definitions for the same application.

All application definitions apply to the last APPLICATION command entered.

The parameters for application definitions fall into three categories:

File name:	<b>FILE</b> <b>INTERACTIVE</b> <b>BATCH</b>
User logon:	<b>USER</b>
Execution priority:	<b>QUEUE</b>

If a parameter from a category is used in an application definition, a process will not belong to that application unless a match for that category is made.

If no parameters in a category are used in an application definition, then a process does not have to match that category.

For example, there can be any number of **FILE** and **USER** parameters following an **APPLICATION** directive, but if there is no **QUEUE** parameter, a process could belong to any queue and still belong to the application. It *would* have to match at least one of the **FILE** parameters *and* one of the **USER** parameters.

Or, as another example, if an application consisted of **USER** and **QUEUE** parameters but had no **FILE**, **INTERACTIVE**, or **BATCH** parameters, then any program file name could belong to the application as long as the user logon *and* execution queue matched one of the **USER** and **QUEUE** specifications.

Use the **OR** parameter when you want more than one application definition to apply to the same application.

You can define up to 15 applications on MPE V and 31 applications on MPE/iX. GlancePlus predefines an application called **OTHER** that collects all processes not defined by **APPLICATION** directives in the application definition file.

If a process file is included in more than one application, it is logged in the first application in which it is defined.

```
APPLICATION=Order Processing
FILE=@.0.FICPROD,@.0.PAPRPROD,@.0.SUPPLIES
```

```
APPLICATION=Office Products
FILE=@.FURNITUR.0.FICPROD,@.ELECTRON.0.FICPROD
```

Since @.@.OFICPROD is included in Order Processing, any programs in @.FURNITUR.OFICPROD or @.ELECTRON.OFICPROD will be logged in the Order Processing application, not in Office Products. However, if the order of the applications is reversed, any programs in the groups FURNITUR and ELECTRON in the OFICPROD account will be logged in the Office Products application, not in Order Processing.

By default, no user applications are defined.

---

**Note**

Since any process on the system can belong to only one application, no process will be counted in more than one application. The application definition file is processed in the order entered, and the first match of a program name, user logon, and queue will define the application to which a particular process belongs.

---

**FILE**

The FILE=*filename* parameter specifies which program files belong to an application. It includes all interactive or batch executions of these programs and applies to the last APPLICATION directive issued. An error is generated if no APPLICATION directive is found.

The *filename* can be any of the following:

- A simple, fully qualified MPE file name. For example,

EDITOR.PUB.SYS

- A generic file name. For example,

V00D00#. @. @

- A partially-qualified file name. For example,

SPOOK5

In this case, all groups and all accounts are assumed (SPOOK5.@.@).

Multiple file names can be entered on the same line, separated by commas, or in separate FILE parameters.

**D-4 Application Definition Files**

## **INTERACTIVE**

The INTERACTIVE=*filename* parameter acts the same as the FILE parameter except it signifies that only interactive executions of the program (sessions) are included in the application class.

## **BATCH**

The BATCH=*filename* parameter acts the same as the FILE parameter except it signifies that only batch executions of a program (jobs) are included in the application class.

## **USER**

The USER=[*job/sessionname*,]{*username.acctname*}[*,group*] parameter identifies the job or session, user, account, and group to be included in the application class.

- *job/session name*,

The job/session name is an optional part of a user logon that can be used for identification. If this parameter is included, it must be terminated by a comma. If this parameter is not supplied, all job/session names are matched.

- *username*

The username specifies the name of the user as defined by the MPE accounting structure.

- *acctname*

The accountname specifies the name of the logon account as defined by the MPE accounting structure.

- *group*

The groupname specifies the logon group of a particular job or session. It is optional, but if it is included, it must be preceded immediately by a comma. If this parameter is not supplied, all logon group names are matched.

---

**Note** Since commas are allowed within the parameter string in the `USER` parameter, they cannot be used to separate one logon string from another. You must use another character (such as a space) to separate parameters or use a separate `USER` line for each logon.

---

## QUEUE

Usually, the execution priority of a process is `CS`, `DS`, or `ES`. Special accounts can log on or run programs with `;PRI=BS`, whereas privileged mode and system processes can place themselves in the `AS` or linear queues. (Linear queue can be any priority you want, but it is not subject to the normal priority adjustments of the MPE dispatcher.)

You can restrict processes in an application to those belonging to selected execution priority queues using the `QUEUE [L,A,B,C,D,E] ...` parameter. More than one queue can be indicated. The following example specifies any process running in either the `DS` or `ES` queue:

```
QUEUE=D,E
```

---

**Note** The `AS` and `BS` queues are special cases of the linear execution queue. If you specify `QUEUE=L` then processes executing as `AS` or `BS` priority are included. Specifying `QUEUE=A,B` is not the same as specifying `QUEUE=L` since the linear queue can be outside the range of the `A` and `B` queues.

---

A process with process-handling capabilities can change its execution queue as it runs. A process's execution priority can be altered also by an external tool, such as `HP GlancePlus`.

The process execution queue is sampled at the end of each 1-minute sample interval. If the process has changed queue, it can change applications. All activity for a process during the 1-minute sample interval is assumed to have occurred in the new queue and as such is attributed to the application that matches the process at the *end* of each 1-minute sample interval.

## D-6 Application Definition Files

## OR

Use the OR parameter to allow more than one application definition to apply to the same application. Within a single application definition, a process must match at least one of each category of parameters. Parameters separated by the OR parameter are treated as independent definitions. If a process matches the conditions for any definition, it will belong to the application, as in the following example:

```
APPLICATION=CONSOLE
USER=OPERATOR.SYS
OR
USER=MANAGER.SYS
FILE=STORE.PUB.SYS,SYSDUMP.PUB.SYS
```

This defines an application (CONSOLE) that consists of any programs run by the user OPERATOR.SYS plus two programs (STORE.PUB.SYS and SYSDUMP.PUB.SYS), *if* they are executed by the user MANAGER.SYS.

---

## Sample Application Definition

The following is an example of how an application can be defined:

```
APPLICATION=Program Development
INTERACTIVE=EDITOR.PUB.SYS, QEDIT.@.@, VOODOO#, TDP
USER=@.TEST @.@,TESTGROUP LABTEST,@.@
```

```
APPLICATION=Other Editors
FILE=EDITOR.PUB.SYS, QEDIT.@.@, VOODOO#, TDP
APPLICATION=Compilers
FILE=COBOL@.PUB.SYS,FORTRAN.PUB.SYS,FTN@.PUB.SYS
FILE=PASCAL.PUB.SYS, SPL.PUB.SYS, RPG.PUB.SYS
```

```
APPLICATION=HP Products
FILE=@.PUB.SYS
```

The following is an example of how programs would be logged using the preceding application definition file:

<b>Program</b>	<b>User Logon</b>	<b>Application</b>
EDITOR.PUB.SYS	GERRY.TEST	Program Development
EDITOR.PUB.SYS	SAM.SNEED	Other Editors
HPSLATE.PUB.SYS	SAM.SNEED	HP Products
PASCAL.PUB.SYS	GERRY.TEST	Compilers
EDITOR.UTIL.SYS	GERRY.TEST	OTHER

If the HP Products application in the previous example was defined first, the first four examples would belong to it.

# Index

---

## A

aaa[#] key, 3-10, 4-1  
aaa[**C**] key, 3-10, 3-15, 4-2, 5-4, 5-11, 5-25  
aaa[**<**] key, 3-10, 4-4  
aaa[**>**] key, 3-10, 4-1, 4-4  
aaa[**?**] key, 3-13  
aa[**A**] key, 3-10, 4-2  
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