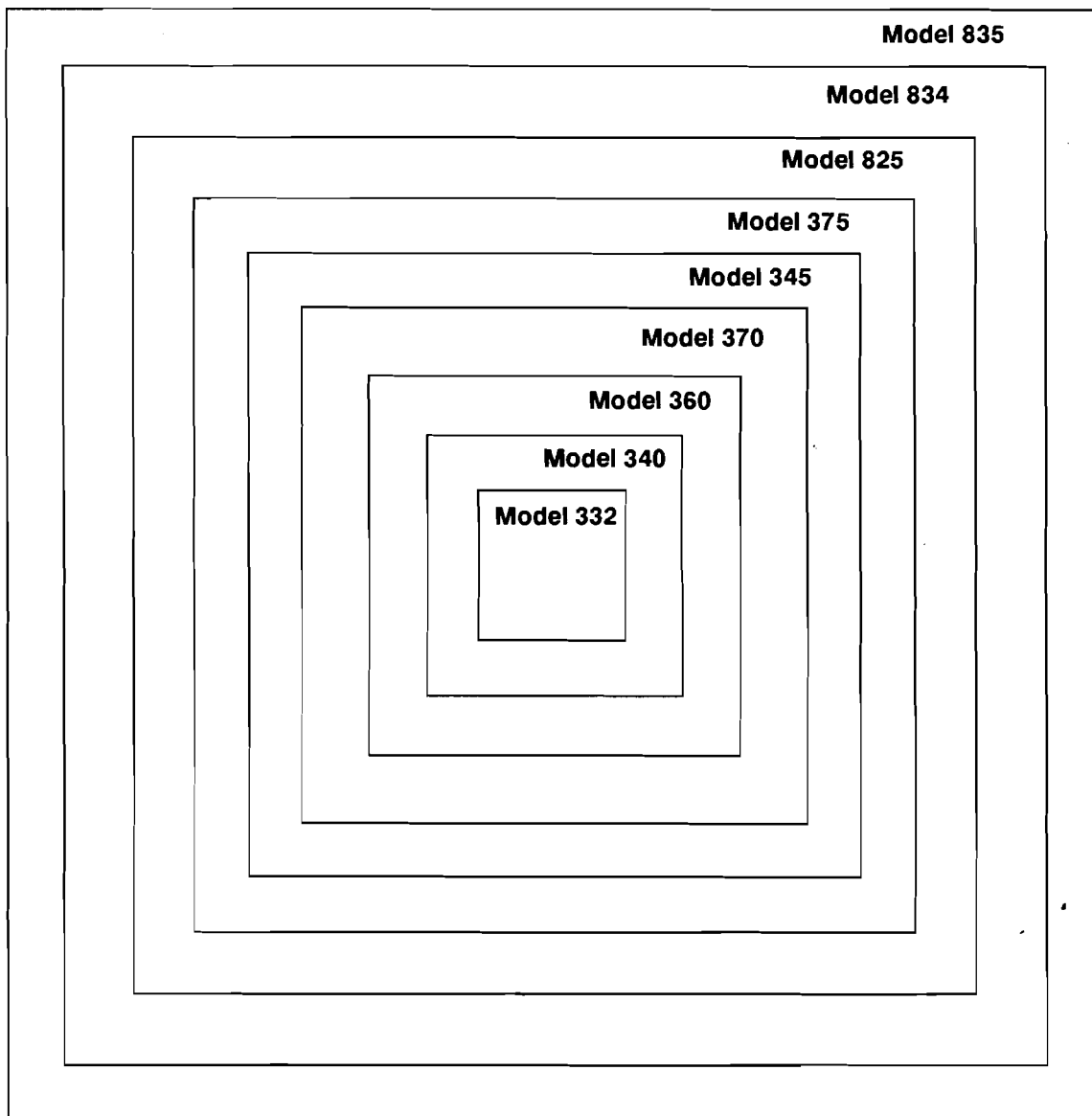
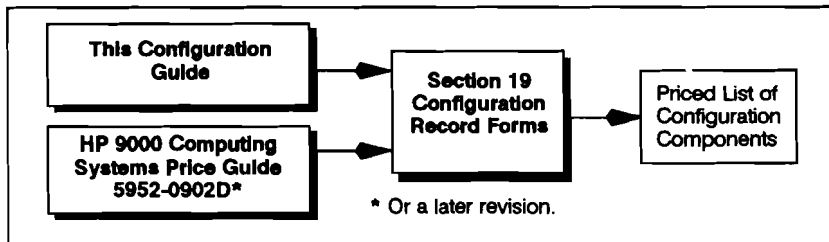

HP 9000 Workstations

Configuration Guide

**Effective
January 1, 1990**



About This Guide



HP 9000 Workstation Configuration Tools

Purpose

This HP 9000 Workstations Configuration Guide is designed to help the user to understand Workstation configurations and complete a comprehensive, accurate, priced pre-purchase list of system components to satisfy specific application requirements. It is used with the HP 9000 Pricing Guide and copies of the Workstations Configuration Record forms in Section 19, as shown in the diagram above.

Organization

For overall organization, see the facing Quick Reference Index page. The Configuration Topics and Components Index is designed to speed direct access to needed configuration information. An overview provides basic familiarization with HP 9000 Workstation uses, processor families and performance, workstation bundles, software, and available peripheral devices.

The Suggested Configuration Procedure section provides specific, structured configuration guidance, complete with examples. The remaining sections (Software, Communications, SPU's and Bundles, and Peripherals) support the procedure section. Section 19 of this guide contains blank Configuration Record forms which can be duplicated on a copier for use with the Suggested Configuration Procedure.

New Products in This Guide

Model 332C MAX/M MAX Instrument Controllers.

Model 345 and 375 2-D and 3-D Workstations and Model 375 SPU.

HP Model 834 2-D and 3-D Graphics Superworkstation

HP Model 635SV Server

HP B1600A HP OpenMail.

HP C1511A and C1512A Digital Data Storage Tape Drives.

HP C1700A and C1701A optical disk products.

HP C2200A and C2203A HP-IB disks.

HP C2201A and C2204A HP-FL disks.

HP C2212A and C2213A SCSI disks.

HP D2300A Accelerated X-Window Display Server PC software.

HP C2301A - C2304A 700/X X-Window Graphics Terminals.

HP C1602A PaintJet/XL Printer.

HP 2562C Industrial Printer.

HP 3082B Industrial Touch Terminal.

HP MAP 3.0 communications products.

Products Not Included

Model 310, 318, 319, 320, 330, and 350 and related products, which have been superseded by the Model 332, 340, 360, 370, 345, and 375 products, have been omitted from this guide. Users needing reference information on those products should keep the HP 9000 Series 300 Configuration Guide dated November 1, 1988, HP Literature Stock Number 5952-6342.

Other Information

Other important information on HP 9000 Series 300 systems and Model 825 and 835 Superworkstations and related products is provided in the following publications:

- HP 9000 Series 300 Computer Systems data sheet, 5952-6344*.
- HP 9000 2-D Graphics Subsystems data sheet, 5953-3793*.
- HP 9000 3-D Graphics Subsystems data sheet, 5953-3794*.
- HP 9000 Instrument Controllers data sheet, 5953-3795*.
- HP 9000 Computer Systems Price Guide, 5952-0902D, 12/89*.
- HP AdvanceNet Specification Guide, 5956-4144, 7/89*.
- HP-UX Software Catalog, 5952-7010*.

* Or a later revision.

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Quick Reference Index



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2. Suggested Configuration Procedure

3. Applications Software

4. Other Software

5. Inter-System Communications

6. Series 300 System Processor Units (SPUs)

7. 2-D Workstations and AI Development Systems

8. 3-D Workstations

9. Instrument Controllers

10. Network Servers

11. Series 300 Interfacing and Accessories

12. Series 800 Interfacing

13. User Communications (Monitors, Terminals, HP-HIL Devices, and Bar Code Readers)

14. Mass Storage (Magnetic and Optical Disks)

15. Software Installation and Backup (Cartridge and Mag Tapes)

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Overview

Introduction

Workstations are powerful computers, usually consisting of the components shown in Figure 1-1, below. Each workstation is typically dedicated to interactive use by one person for such applications as:

- Computer-aided mechanical, electronic, or software design and engineering.
- Development and animation of 3-dimensional images for design, research, or motion picture production.
- Automatic control of laboratory or production test instruments.
- Desktop publishing.
- Development of artificial intelligence applications.

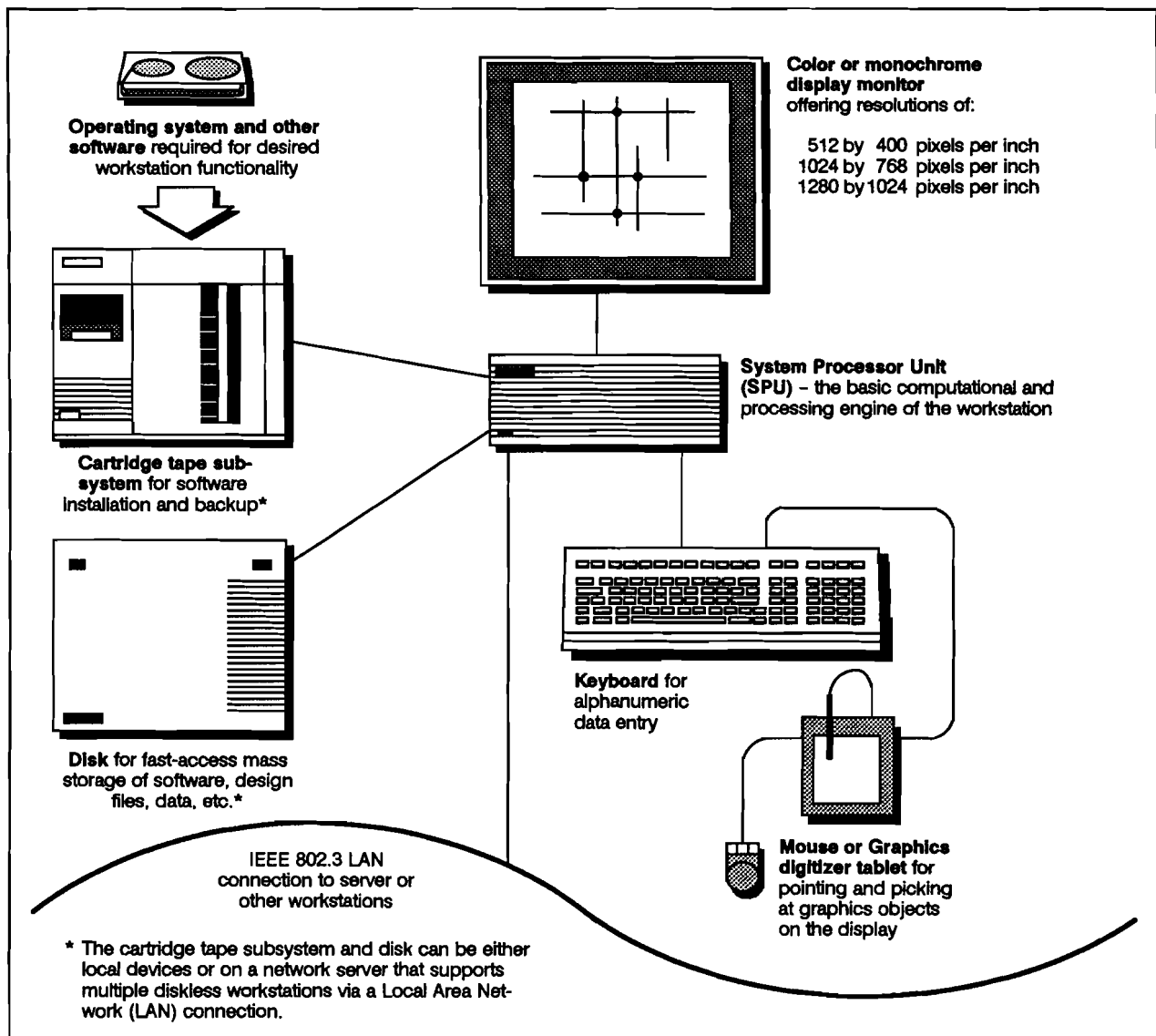


Figure 1-1. Workstation Components

The HP 9000 Workstation Product Line

Processor Families

HP 9000 Workstation System Processor Units (SPUs) are based on two different processor families. The highest performance Model 825, 834, and 835 (Series 800) Superworkstations use Hewlett-Packard's RISC-based HP Precision Architecture processors. The lower-priced Model 332, 340, 345, 360, 370, and 375 workstations use the Motorola MC68030 32-bit Microprocessor and MC68882 Floating Point Coprocessor, clocked at 16.7, 25, 33, or 50 MHz.

Workstation responsiveness as perceived by the user is related to the SPU's integer and floating point processing speeds. See comparison in Figure 1-2.

RAM capacity for multiple resident applications (to minimize the need for disk accesses), available I/O slots for peripheral device connections, and included interfaces are compared in Figure 1-3, next page.

It is important to note here that the Models 340, 345, and 834 do not offer I/O expandability; Model 345 has no available I/O slot and Models 340 and 834 have only one available I/O slot, which can be used for a disk interface or other purpose. For that reason, a workstation based on the Model 340, 345, or 834 should be selected only if it is not expected to require I/O expansion.

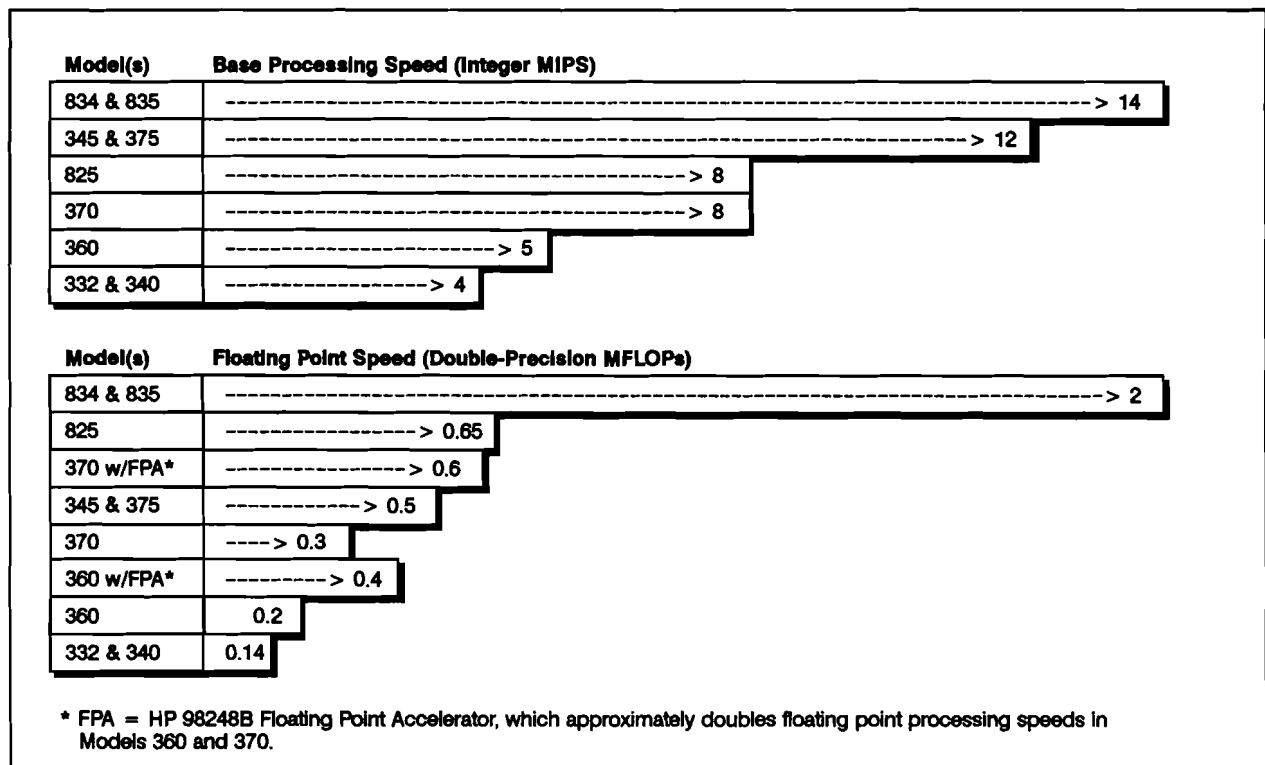


Figure 1-2. HP 9000 Workstations Processor Speed Comparison

Model(s)	RAM Capacity (MB): Base	Maximum
825 & 835	8	> 96
370 & 834	8	> 48†
375	8	> 32
345	8 - 16	
340 & 360	4	> 16
332	1-8	

Model(s)	Available I/O Slots: Base	With Expander(s)
835	4	> 12
825	4	> 11
360 & 370	1	> 23
375	1	> 23
340 & 834	1 Expansion is not available with Model 340 or 834.	
345	0	
332	1	> 20
R/332	4	> 18

Model(s)	Included Interfaces
825/34/35	HP-IB Disk, LAN, HP-HIL, & Audio Beeper
375	SCSI*, Std HP-IB, LAN, HP-HIL, RS-232, Centronics, & Audio Beeper
370	HP-IB Disk‡, Std HP-IB, LAN, HP-HIL, RS-232, & Audio Beeper
340 & 360	Std HP-IB, LAN, HP-HIL, RS-232, & Audio Beeper
345	Std HP-IB, LAN, HP-HIL, RS-232, Centronics & Audio Beeper
332	Std HP-IB, HP-HIL, RS-232, & Audio Beeper

† 48 MB is maximum for ECC memory; maximum parity memory in Model 370 is 32 MB.

* HP-IB Disk interface is available instead of SCSI Disk interface.

‡ SCSI Disk interface is available instead of HP-IB Disk interface.

Figure 1-3. Other HP 9000 Processor Comparisons

Display Subsystem Choices and Workstation Bundles

Display subsystem selection in HP 9000 systems is simplified by workstation bundles that combine the SPU with an operating system, a video or display controller interface, and a color or monochrome monitor. Figure 1-4, next page, shows how bundle model numbers indicate the type of display provided in the bundles.

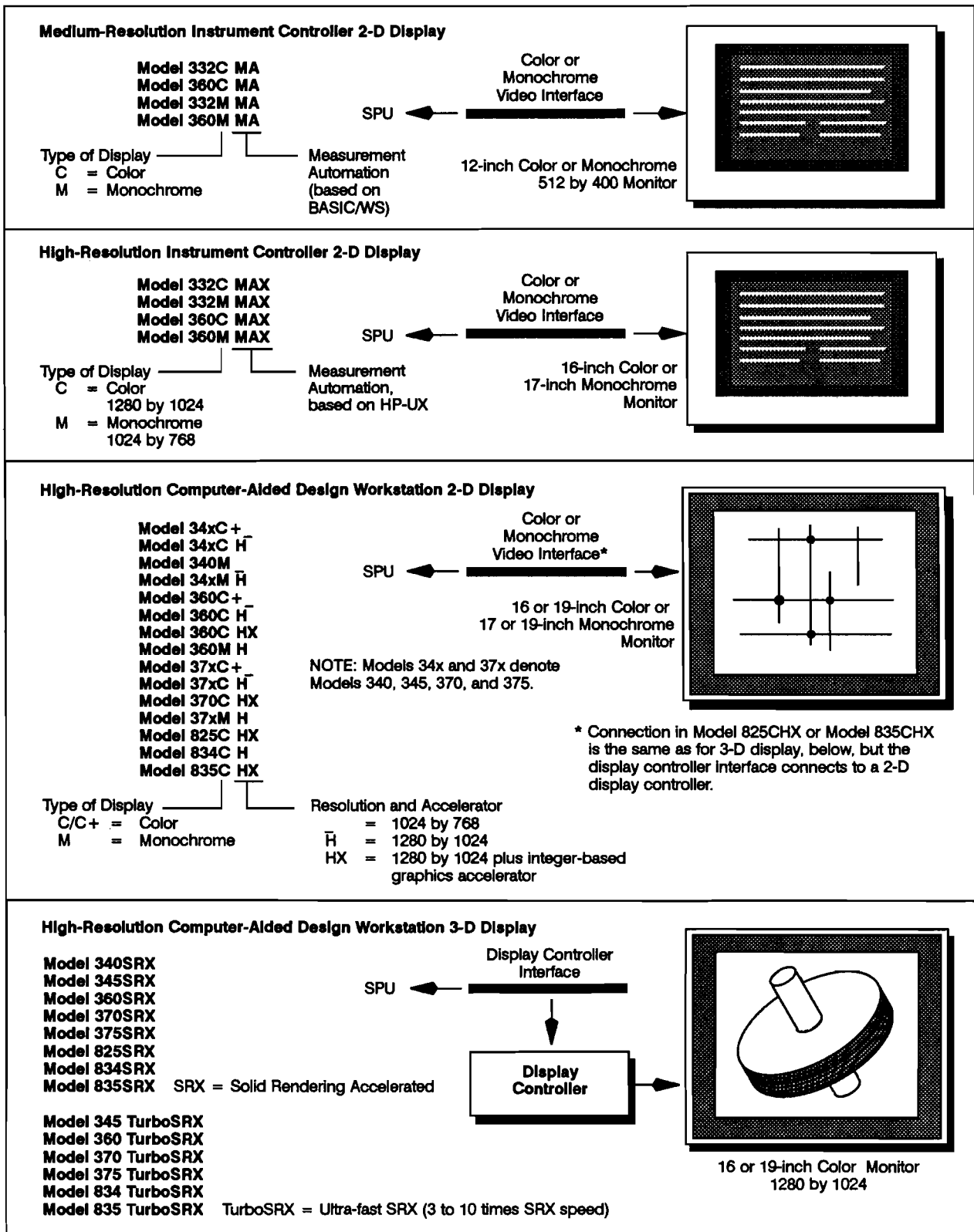


Figure 1-4. Workstation Display - HP 9000 Workstation Bundle Model Numbers Summary

AI Development Systems

AI Development Systems, not listed in Figure 1-4, are systems based on the Model 370 System Processor Unit. They are available in two versions — the Model 370AIC (Artificial Intelligence, Color) and the Model 370 AIM (Artificial Intelligence, Monochrome), both of which provide a Common LISP II program development environment. With respect to display, the Model 370AIC is identical to the Model 370CH 2-D color workstation and the Model 370 AIM is identical to the Model 370MH 2-D monochrome workstation.

System Processor Units

Model 332, 360, 370, and 375 processors are offered as a basic System Processor Unit (SPU) without software, display, or keyboard for customers who wish to tailor a configuration to meet requirements not specifically supported by the available bundles.

Diskless Workstations and Network Servers

Cost per workstation seat can be significantly reduced and coordination of workgroup activities improved by configuring a workgroup as a set of Series 300 diskless workstations connected via a LAN to a supporting network server, as shown in Figure 1-5.

This is supported by built-in LAN interfaces and operating system and communications software licenses included in the diskless workstations. The Network Server provides software installation and disk storage for the diskless workstations. This greatly reduces hardware costs, since a Network Server with one or two 304 or 571 MB disks can support up to 35 workstations. Moreover, the network server does not have to be totally dedicated to the server function, but can itself be one of the seats in the workgroup. Two preconfigured Series 300 Network Servers are available, the Model 15NS, which is based on the Model 340 processor, and the Model 25NS, which is based on the Model 370 processor. Other platforms that can be configured as network servers include the Models 330, 340, 350, 360, 370, 375, 635SV, 825, 835, 850, and 855.

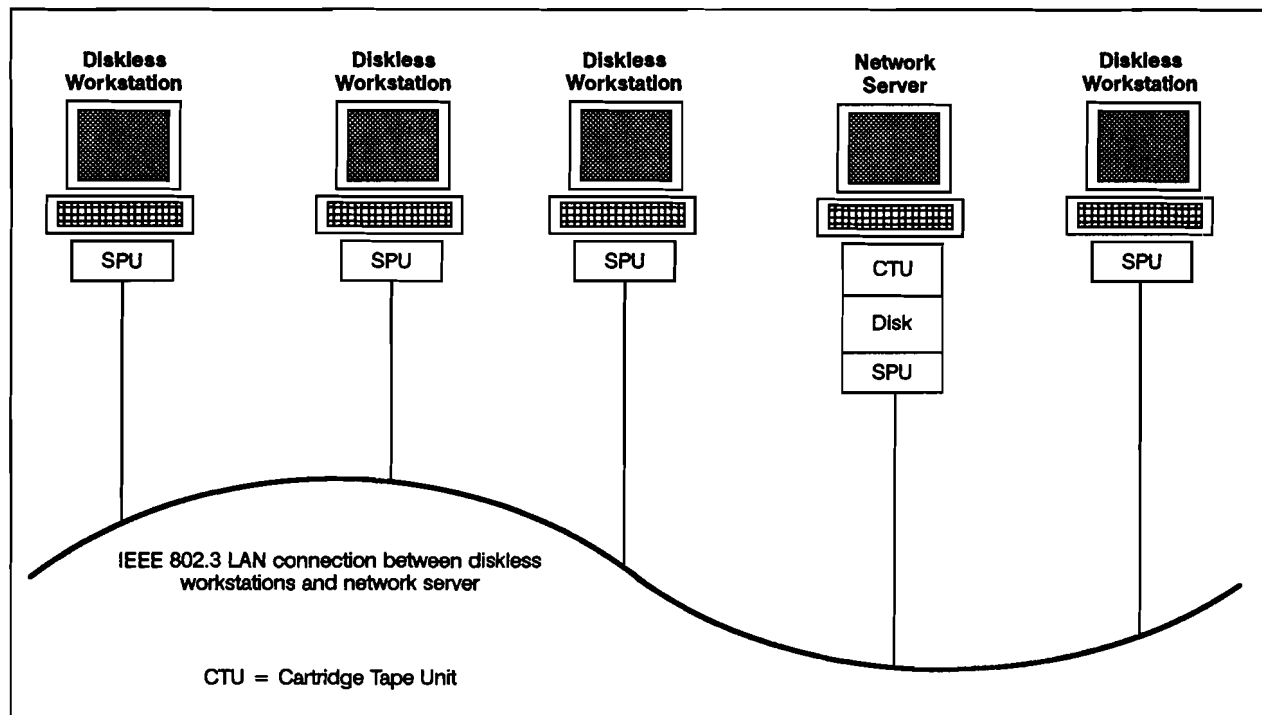


Figure 1-5. Diskless Workstations and Network Server

Software for HP 9000 Workstations

As shown in Figure 1-6, below, the software for HP 9000 Workstations consists principally of the HP-UX operating system, the X Window System, and the application packages, communications software, database management software and application development software that the operating system and the X Window system make accessible to the user. On the Series 300 only, bundles and systems for instrument control or other simple applications can instead be equipped with single-user, single-task BASIC/WS or Pascal/WS language operating systems.

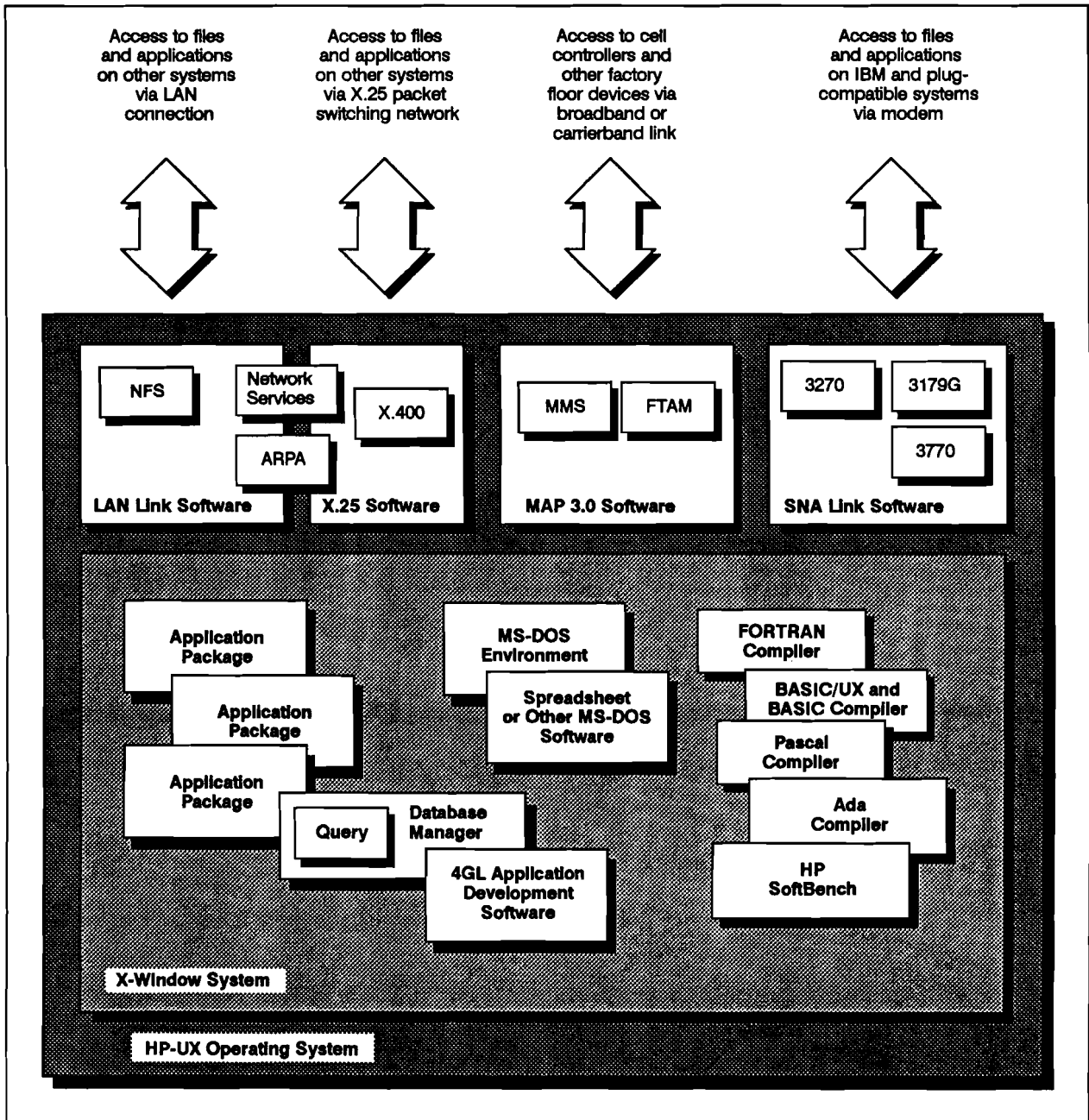


Figure 1-6. Software for HP 9000 Workstations

How Fundamental Operating Software is Made Available for Series 300 Systems

For Workstations: Series 300 Workstation bundles include a 2-user license to use the HP-UX Application Execution Environment (AXE), the Programming Environment (PE), the LAN Link Software, Network Services/ARPA (NS/ARPA), the Network File System (NFS), and the X Window System (X11). One copy of the software (on option-specified media) and documentation must be purchased for installation.

For Instrument Controllers: Model 332CMA and MMA, 360CMA and MMA, and R/332 instrument controllers include a license to use and software media and documentation for the single-user, single-task HP BASIC/WS language system. The Model 332CMA and MMA and 360CMA and MMA instrument controllers include the same software licenses as workstation bundles plus a license to use BASIC/UX and the media and documentation for all licensed software.

For System Processor Units: The license to use, software, and media are purchased individually since no software is included in Series 300 SPUs.

How Fundamental Operating Software is Made Available for Series 800 Systems

For Model 825/835 Superworkstations: Model 825/835 Superworkstations include a 16-user license to use, the software on option-specified media, and documentation for HP-UX, the LAN Link Software, ARPA/BSD Networking Software, and the X Window application access system (X11).

For Model 834 Superworkstations and Model 635SV Servers: Model 834 Superworkstations and Model 635SV Servers include a 2-user license to use HP-UX. One copy of the software (on option-specified media) and documentation must be purchased for installation.

How Additional Software is Made Available for HP 9000 Workstations

Additional software is purchased separately from the bundle. This may involve the individual purchase of a license and the software and documentation, which may be separate products. For detailed information on software product structure and available software media, refer to the HP 9000 Pricing Guide, literature stock number 5953-3791D, or a later revision. If media options are listed with the software, one of the media options must be specified in order to obtain the software, since the software is encoded on the media.

Network Communications Software

Network communications software available for HP 9000 Workstations includes:

- **LAN communication software**, including support for ARPA/BSD networking, Network File System (NFS), and Network Services for communication with other HP systems. As noted above, licenses to use some of these are included with workstation bundles.

- **X.25 communication software** for ARPA, Network Services, and/or X.400 communications via public or private packet switching networks.

- **SNA communication software** for communication with IBM or plug-compatible systems via point-to-point modem.

- **MAP 3.0 communication software** for communication between Model 825/835 Superworkstations and factory floor devices.

Application Software

A wide variety of application software is available for Series 300 systems and Model 825/835 Superworkstations. A comprehensive listing is provided in the HP-UX software catalog, HP literature stock number 5952-7010 or a later revision. To provide examples of the type of information needed for a complete configuration, the following application software products are covered in more extensive detail in this configuration guide.

- **ME Series 10 Mechanical Engineering**, 2-D Design and Drafting System and related variation design and data management modules.
- **ME Series 30 Mechanical Engineering**, 2-D Design and Drafting System with integrated solid modeling and related variation design and data management modules.
- **FrameMaker Software** for WYSIWYG electronic development of documents, including text processing and development and manipulation of integrated graphics.

Database Management Software

HP 9000 Workstations can support two different types of databases, as follows:

- **HP Real-Time Database**, a small-capacity memory-based database designed to be accessed and updated quickly.
- **HP ALLBASE/SQL**, a disk-based, relational database with capacity essentially determined by the amount of disk memory provided for it.

Application Development Software

HP-UX based HP 9000 Workstation bundles include license to use a program development environment with a C compiler, an assembler, and a symbolic debugger. The software media and documentation must be purchased separately. HP 9000 Workstations also support the following additional application development software products:

- **HP ALLBASE/4GL Developer Pack**, a fourth-generation language designed for development of screen-based applications for transaction processing or data processing.
- **FORTRAN 77/HP-UX Compiler** for programming applications in FORTRAN in the HP-UX operating environment.
- **Pascal/HP-UX Compiler** for programming applications in Pascal in the HP-UX operating environment.
- **Cobol/HP-UX Compiler or Developer Pack** for programming applications in Cobol in the HP-UX operating environment.
- **HP-UX Ada Development System** for programming applications in Ada in the HP-UX operating environment *in Series 300 systems only*.
- **BASIC/WS**, a *Series 300-only* BASIC language programming system for the development and execution of single-user, single-task applications for instrument control or similar uses. (Also functions as a simple operating system.)
- **Pascal/WS**, a *Series 300-only* Pascal language programming system for the development and execution of single-user, single-task applications for instrument control or similar uses. (Also functions as a simple operating system.)
- **BASIC/UX** for programming applications in BASIC in the HP-UX operating environment *in Series 300 systems only*.
- **BASIC Compiler** for programming compiled applications in BASIC in the BASIC/WS or HP-UX operating environment *in Series 300 systems only*.
- **HP Common LISP II Development Environment** for programming applications in Common LISP II in the HP-UX operating environment.
- **HP SoftBench** is a windows-oriented program development environment. It includes a program editor, program builder for coordination of compilations of source programs, program debugger, static analyzer for determining program structure cross-reference information, and a development manager for all files related to a software project, including version control.

MS-DOS Environment Software

- **DOS Coprocessor**, a DIO Accessory board plus software package that supports a wide variety of MS-DOS applications on Series 300 Systems.
- **SoftPC**, a synthetic hardware emulation software package that supports a wide variety of MS-DOS applications on Series 300 Systems and Model 825/835 Superworkstations.

Peripheral Devices for HP 9000 Workstations

Disks

- **Flexible disks** – 3.5-inch (1.42 MB) or 5.25-inch (0.5 MB) for BASIC/WS or Pascal/WS based operating system or access to software for the MS-DOS environment.
- **10/20/40 MB hard disk, with or without 3.5-inch flexible disk**, for BASIC/WS or Pascal/WS based operating system.
- **80/107/152/162/304/323/331/571/663/670 MB hard disk** for HP-UX in Series 300 system.
- **304/331/571/670/1340 MB hard disk** for HP-UX in Model 825/835 Superworkstation.
- **Up to 5.3 GB (8 x 670 MB hard disks)** can be connected via a single interface where large capacity is needed.
- **20 GB Rewritable Optical Disk Library System** (*Series 300 only*).
- **650 MB Rewritable Optical Disk Drive** (*Series 300 only*).

Tape Units

- **Cartridge Tape Subsystems**
 - Autochanger Cartridge Tape Subsystem (536 MB capacity - 8 cartridges x 67 MB).
 - 16-Track Cartridge Tape Subsystem (67 MB capacity).
 - 32-Track Cartridge Tape Subsystem (133 MB capacity).
- **Digital Data Storage Tape Drive**
 - 1.3 GB per 4 mm tape cassette.
 - 20 second average access to any part of the 1.3 GB tape cassette.
 - 183 KB/sec transfer rate.
- **Magnetic Tape Units**
 - Autoloading 1600 cpi (40 MB).
 - Autoloading 6250/1600 cpi (140/40 MB).
 - Autoloading CPR/6250/1600 cpi with data compression (CPR)(280-420/140/40 MB).

Printers

- **Inkjet Printers**
 - Monochrome, 120-240 cps, draft quality to letter quality.
 - Color, 167 cps, near letter quality.
- **Dot-Matrix Serial Impact Printers**
 - Non-Asian, 40-480 cps, draft quality to letter quality.
 - Asian, 40-330 cps, draft quality to letter quality.
- **Laser Printers** - 8-20 ppm, single sheet or duplex.
- **Line Printers**
 - Non-Asian, 300-900 cps (1200 cps in Model 825/835 Super-workstation), draft quality.
 - Asian, 270-330 cps, draft quality.

Plotters

- **Pen (Multicolor) Plotters**
 - A-Size, 8 pens, 15.7 ips.
 - B-Size, 6 pens, 15.7 ips.
 - B-Size, 8 pens, 31.5 ips with auto sheet feed.
 - D-Size, 8 pens, 15.7/32 ips.
 - E-Size, 8 pens, 24/32 ips.
 - E-Size, 8 pens, 24 ips with auto roll feed.
- **Electrostatic (monochrome) Plotters**
 - D-Size, 0.67 ips across full width.
 - E-Size, 0.86 ips across full width.

Graphics Input Devices

- **Button box.**
- **Control dials box.**
- **Mouse**
 - Two-button.
 - Three-button.
 - Two-button, interfaced via quadrature port.
- **Rotary control knob.**
- **Tablets and Digitizers**
 - 11 by 11-inch size, one-button.
 - A-size, three-button.
 - B-size, three-button.
- **Trackball.**

Bar Code Readers

- **HP-HIL Reader.**
- **RS-232C Readers**
 - Programmable.
 - Non-programmable.

CRT Display Terminals

- **Alpha w/basic term0 command set.**
- **Alpha w/WYSE30 and basic term0 command sets.**
- **Alpha w/VT100 and basic term0 command sets.**
- **Monochrome graphics** (512 by 400) plus alpha w/basic term0 command set.
- **Industrial touch terminal** with monochrome ISA graphics plus alpha w/VT100 and basic term0 command sets.
- **Color graphics** (512 by 400) plus alpha w/basic term0 command set.
- **Color graphics** in NEMA12 enclosure.
- **X Window graphics** with choice of 14 to 20-inch color monitor and 17-inch monochrome monitor.

NOTES:

[illegible]

Suggested Configuration Procedure

The Application Drives the Configuration

Workstation configuration is driven by the application, especially the applications software, as outlined in Figure 2-1, below. If the application involves support of diskless workstations or X Window PCs or terminals by a network server, it dictates the provision of communications software and communications links. Since a particular applications software package may run on only one operating system, that application dictates the choice of operating system.

Regardless of the application, a cartridge or magnetic tape unit must be provided for installation and backup of the software and user-generated design and data files and databases.

Enough RAM must be provided to support all software modules that have to be resident in order to provide adequate responsiveness.

Enough disk capacity must be provided to hold all the software on the system, plus swap space for virtual memory operations,

plus space for design and data files and databases. A network-server must provide enough swap space to support the virtual memory operations of all of the diskless workstations it supports.

The other requirements outlined in Figure 2-1 also depend on the application. For example, the application package may require a particular type of graphics input device. The fact that the application drives the configuration is reflected in the order of performance of the suggested configuration procedure.

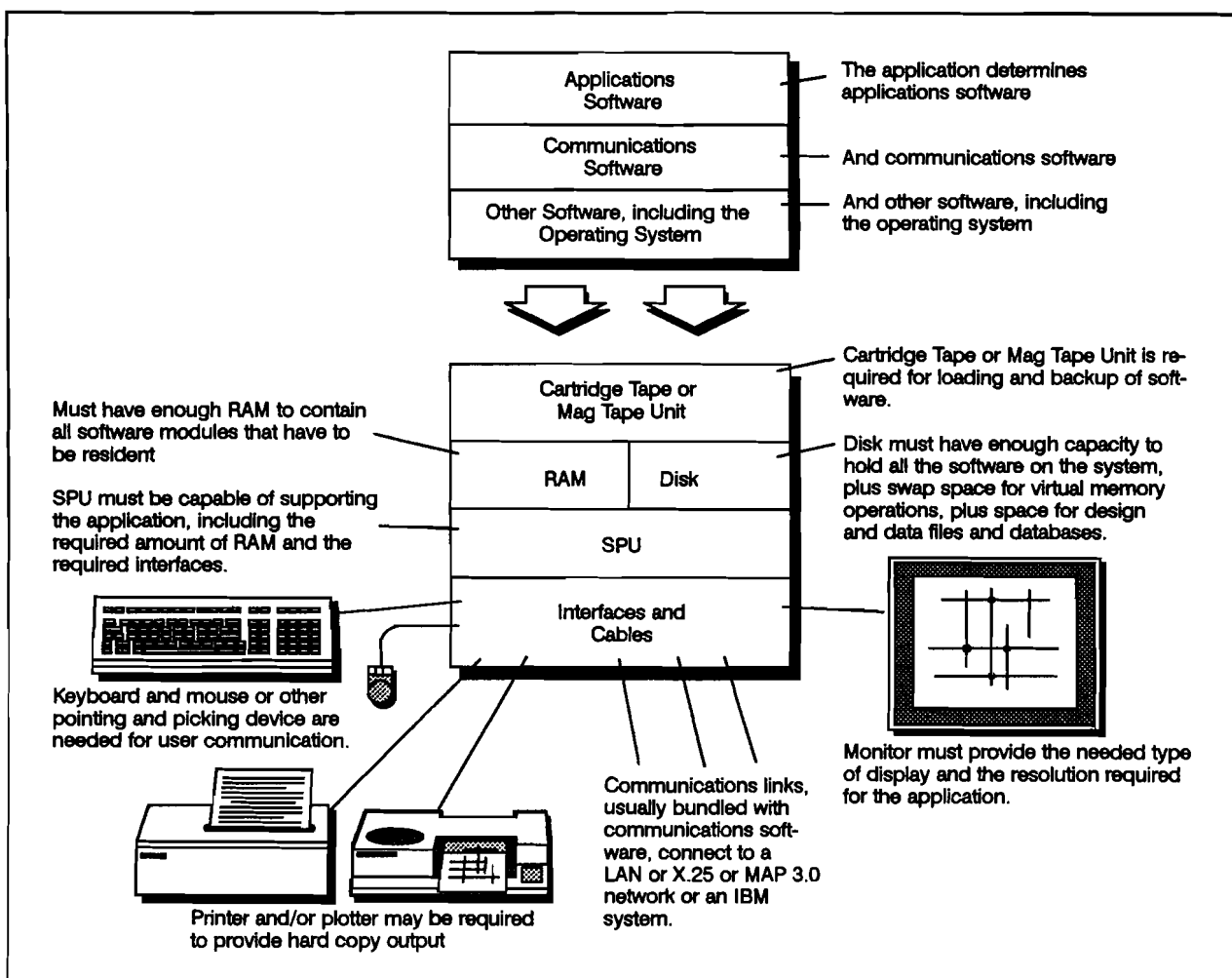


Figure 2-1. Configuration Relationships

The Configuration Record Packet

This configuration guide is designed to be used with the Configuration Record Section, pages 19-1 through 19-16. The Configuration Record is designed to be copied for use in summarizing the application-driven model discussed on the previous page. It consists of the following sections:

- A configuration summary for preparing a superficial overview of an individual network server or workstation (page 19-2).
- A configuration list (pages 19-3 through 19-6), as follows:
 - A first page and a follow-on page for entry of software and communications components information, including product number, quantity, name/description, requirements for RAM, Disk, and Swap Space, and price. The follow-on page can be copied multiply as needed for a complete listing of software and communications aspects of the configuration.
 - A first page and a follow-on page for entry of SPU and peripherals information, including product number, quantity, name/description, and price. The follow-on page can be copied multiply as needed for a complete listing of hardware aspects of the configuration.
- Backplane/Interface Use Records for keeping track of interface and backplane space availability as the configuration is selected (pages 19-7 through 19-16).

During the configuration procedure outlined here, please have a copy of the required pages from section 19 available for entering your configuration information as you determine it. Before actually starting your configuration, you should glance through the Configuration Record to familiarize yourself with it.

1. Establish the Overall Design

Before getting bogged down in the details of your configuration, you may find it helpful to use page 19-2 of the Configuration Record to outline the overall design. See example on the next page. The Configuration Summary can help keep you on track as you go through your configuration.

2. List the Configuration

Starting with the outline in your Configuration Summary, go through the various pertinent sections of this guide to determine the products and options that must be specified to flesh out the outline and provide all needed functions. Enter the appropriate product and option numbers, names, descriptions, and prices into the Configuration List record. Pages 2-4 through 2-6 provide a complete configuration list of the system outlined in the facing Configuration Summary example. The product and option numbers and descriptions come from later sections in this guide. Price information comes from the HP 9000 Computer Systems Price Guide or the HP Corporate Price List, except for non-HP hardware or software, in which instance price information is obtained from the other manufacturer(s).

a. Enter Software and Communications Information

The software and communications listings on pages 3 through 6 of the configuration record are like those in the examples on pages 2-4 through 2-6. Software and communications software are unique in imposing specific capacity requirements for RAM, Disk, and Swap Space (SwSP) on the system. The tables provide for item-by-item entry of the appropriate capacity information from *Requirements* subsections in the software and inter-system communications sections in this guide. The *Requirements* subsections also list any other items that are required for use of the software, such as a mouse or a spooling console (terminal). Of course, hardware items would be entered in later pages of the configuration record.

Configuration Summary Example

System for: WILD WIDGETS, INC., LONG BEACH, CA
(customer's name and location)

Application: MECHANICAL DESIGN
(type of application, such as mechanical design, PC design, desktop publishing, etc.)

Application Software Package(s): ME SERIES 10 COMPUTER-AIDED DESIGN SYSTEM (HP)

(name and supplier of software package(s) to be used to implement application)

Diskless Workstation?: / Network Server? ☒ No. of Seats Served? 4
(check one and for network server indicate number of seats served)

Monitor(s) Required: MONOCHROME, 19-INCH, 1280 BY 1024
(indicate color or monochrome and required resolution of each)

Peripherals Required:

Display Terminal(s): 700/92 ALPHANUMERIC (SPOOLING CONSOLE)

(indicate type and required specifications)

Graphics Image Control Device(s): MOUSE, 2-BUTTON

(indicate type and required specifications)

Printer(s): LASER PRINTER, 8 PPM

(indicate type and required specifications)

Plotter(s): LOW-PRICED, E-SIZE

(indicate type and required specifications)

Disk(s): 500 MB FIXED DISK & 20 GB OPTICAL DISK LIBRARY SYSTEM FOR ARCHIVING

(indicate type and required specifications)

Tape Unit(s): CARTRIDGE TAPE SUBSYSTEM

(indicate type and required specifications)

Suggested Configuration
Procedure, continued

Software and Communications, including License Products and Media Options, as applicable

Product, Option, or Part Number	Qty	Name/Description	Requirements (MB)			Price
			RAM	Disk	SwSP	
B1310A	1	ME10 DESIGN & DRAFTING PACKAGE		10	96	\$ 0
OPT. AEQ	1	1/4-INCH CARTRIDGE TAPE FOR SERIES 300				600
OPT. 0AJ	1	FIRST TIME BUY				2,000
OPT. 0A8	1	64-USER LICENSE				10,000
OPT. 001	1	BASE PRODUCT LICENSE				9,000
OPT. 002	1	DELETE DATA MANAGEMENT CLIENT				-1,500
OPT. 1B1	5	OVERLAY FOR "B"-SIZE TABLET				0
B1300A	1	DATA MANAGEMENT SERVER	8	2	15	3,500
OPT. AEQ	1	1/4-INCH CARTRIDGE TAPE FOR SERIES 300				600
		INITIAL DISK SPACE FOR DESIGN DATA (100		20		N/A
		DRAWINGS X 0.2				
98594L	1	HP-UX LICENSE TO USE:				BUNDLED
		AXE (2 USERS)		40		WITH N/W
		PE		65		SERVER
		NS	0.35	4.5		
		ARPA	0.35	4.5		
		NFS	0.5	3		
		X-WINDOWS		16		
98594A	1	MEDIA AND DOCUMENTATION FOR 98594L				
98794A	1	PROGRAMMER'S DOCUMENTATION SET				
98595L	1	HP-UX AXE, 16-USER LICENSE*				\$ 520
OPT. 003	1	CREDIT FOR UPGRADE FROM 2-USER LICENSE				-150
		* SPOOLING CONSOLE ON NETWORK SERVER				
		FORCES PURCHASE OF 16-USER LICENSE.				
Totals			9.2	165	111	\$ 24,570



Software and Communications, continued

Product, Option, or Part Number	Qty	Name/Description	Requirements (MB)			Price
			RAM	Disk	SwSP	
Totals Forward			9.2	165	111	\$ 24,570
79725L	1	SQL/300 DEVELOPMENT ENV. USE LICENSE	3	23		3,425
79725B	1	MEDIA & DOCUMENTATION FOR 79725L				0
OPT. 022	1	1/4-INCH CARTRIDGE TAPE MEDIA				255
	1	LAN/9000 SERIES 300 LINK				BUNDLED
						WITH N/W
50952L	1	NS/ARPA 300 USE LICENSE				SERVER
50952C	1	MEDIA AND DOCUMENTATION FOR 50952L				
50969L	1	NFS/300 USE LICENSE				
50969A	1	MEDIA AND DOCUMENTATION FOR 50969L				
92227E	4	16-METER THINLAN CABLE				\$ 156
92227P	1	PAIR OF 50 OHM THINLAN TERMINATIONS				23
Totals			12.2	188	111	\$ 28,429

2. List the Configuration, continued

b. Add Up Requirements for RAM, Disk Capacity, and Swap Space

The totals for RAM and Disk at the bottom of the Communications Example on the previous page give directly the amount of RAM and Disk memory capacity that are required for the network server being configured. The Swap Space (SwSP) does not add up directly. Different software products may use swap space at different times. The swap space allocated on the network server's disk must be sufficient to simultaneously support the *total* swap space requirement for the network server and all four of the diskless workstations it supports. In this case, total swap space adds up to 111 MB (four workstations x 24 MB plus 15 MB for the data management server).

c. Enter Network Server and Peripherals Information

The totals for RAM and Disk make it possible to select the appropriate amount of RAM and Disk memory. The determination of the swap space requirement determines the selection of the network server's swap space configuration option. With the guidance in the appropriate network server and peripherals sections, you can now select the appropriate products and options to complete your configuration. As you do so, you should also note your use of backplane space and interfaces in the appropriate worksheets on pages 9-7 through 9-15 of the configuration record to make certain you order additional interfaces as needed, and to be assured of having ordered cables for connection of peripheral devices.

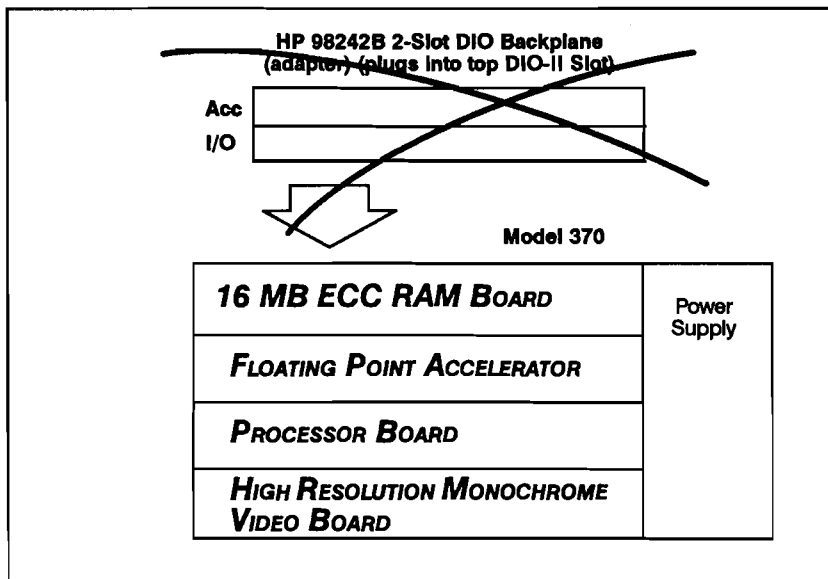
Suggested Configuration
Procedure, continued

SPUs, Workstations, Network Servers, and Peripherals, options and accessories

Product, Option, or Part Number	Qty	Name/Description	Price
Total Forward			\$ 28,429
98566F	1	MODEL 25NS DESIGN AUTOMATION NETWORK SERVER	56,300
OPT. 017	1	THINLAN OUTPUT	0
OPT. 1AR	1	PRELOAD HP-UX WITH 150 MB SWAP SPACE	0
OPT. 316	1	SUBSTITUTE 16 MB ECC RAM FOR 8 MB ECC RAM	12,350
OPT. 548	1	PROVIDES "MH" GRAPHICS DISPLAY SUBSYSTEM	2,400
98248B	1	FLOATING POINT ACCELERATOR	3,605
C1001W	1	700/92 ALPHANUMERIC SPOOLING CONSOLE	895
40242G	1	5 METER RS-232C CABLE	77
7937H	1	571 MB WINCHESTER DISK	BUNDLED WITH N/W SERVER
C1700A	1	HP SERIES 6300 MODEL 20GB/A OPTICAL DISK LIBRARY S/S	\$ 39,750
35401A	1	AUTOCHANGER CARTRIDGE TAPE SUBSYSTEM	BUNDLED WITH N/W SERVER
33440A	1	LASERJET SERIES II PRINTER	2,695
		15 METER RS-232C CABLE IS INCLUDED WITH 98642A MULTIPLEXER	
7576A	1	DRAFTPRO EXL PLOTTER	6,495
		15 METER RS-232C CABLE IS INCLUDED WITH 98642A MULTIPLEXER	
98642A	1	4-PORT MULTIPLEXER	630
98265A	1	SCSI INTERFACE	1,135
Total			\$ 154,761

SPU Backplane Example (Configuration Record Page 19-10)

Please use this page, and extenders pages 19-12 and 19-13 if needed, to keep track of your Model 370 configuration as you select it. Enter DIO accessory, I/O, and DIO-II or DIO system cards by product number in the appropriate backplane diagram as items are selected. Identify multiple multiplexer interfaces as 98642A -1, -2, -3, etc., HP-IB interfaces as 98624A-G1, -G2 and 98625B -D1, -D2, and SCSI interfaces as 98658A-D1, -D2, for keying with multi-device interface use records on page 19-14.



HP-HIL Interface Record

Device P/N and Name
46084A ID MODULE
46021A KEYBOARD
46060A 2-BUTTON MOUSE

RS-232C Interface Record

Device P/N	Cable P/N
C1001A	40242G

Std HP-IB Interface Record

[illegible]

High-Speed HP-IB Disk Interface Record*

[illegible]

Option 011 SCSI Single-Ended Disk Interface Record*

[illegible]

*** Cross out the High-Speed HP-IB Disk Interface record if Option 011 is ordered or the Option 011 Disk Interface Record if Option 011 is not ordered.**

3. Record Backplane and Interface Use to Check Slot and Interface Availability, continued

Expander Example (Configuration Record Page 19-12)

Model 360/370/375 Expanders Backplane Use Records

Please use this page and the next page as needed to keep track of your Model 360/370/375 configuration as you select it. Cross out expanders that are not used. A maximum of two of the expanders shown on this page is permitted per Model 360/370/375 SPU.

HP 98577A VME Expander		
VME C.1		Pwr Sup
VME C.1		
VME C.1		
VME C.1		
Controller		

HP 98568A 8-Slot DIO Expander		
Acc		Power Supply
I/O		
Acc		
I/O		
Acc		
I/O		
Acc		
I/O		

HP 98570A 6-slot DIO-II/DIO Expander		
Acc		Power Supply
I/O	98642A 4-PORT MPXER	
Acc		
I/O	98265A SCSI INTERFACE	
DIO-II		
DIO-II SYSTEM INTERFACE BOARD WITH HIGH-SPEED HP-IB I/F		

HP 98568A Option 132 8-Slot DIO Expander		
Acc		Power Supply
I/O		
Acc		
I/O		
Acc		
I/O		
Acc		
I/O		

HP 98570A Option 004 4-slot DIO-II Expander		
DIO-II		Power Supply
DIO-II		
DIO-II		
DIO-II		

HP 98570A 6-slot DIO-II/DIO Expander		
Acc		Power Supply
I/O		
Acc		
I/O		

HP 98570A Option 004 4-slot DIO-II Expander		
DIO-II		Power Supply
DIO-II		

3. Record Backplane and Interface Use to Check Slot and Interface Availability, continued

Interface Use Example (Configuration Record Page 19-14)

Multiplexer/HP-IB/SCSI Interface Use Records

Please use this page to keep track of your configuration. As each multiplexer, HP-IB, and/or SCSI DIO I/O interface is selected for the configuration, place a check by its title and enter the product numbers of each of the devices it interfaces and the cable used for connection of that device. (Device and cable product numbers are given in the workstations configuration guide.) In this way, you will be able to continuously keep track of how many more devices can be connected by the interfaces you've selected, and thereby determine if and when you have to select the next interface.

98642A Multiplexer No. 1

Device P/N	Cable P/N
0	
1 33440A	INCLUDED
2 7576A	INCLUDED
3	

98642A Multiplexer No. 2

Device P/N	Cable P/N
0	
1	
2	
3	

98642A Multiplexer No. 3

Device P/N	Cable P/N
0	
1	
2	
3	

98642A Multiplexer No. 4

Device P/N	Cable P/N
0	
1	
2	
3	

98625B High-Speed HP-IB Disk Interface D1

Device P/N	Cable P/N

98625B High-Speed HP-IB Disk Interface D2

Device P/N	Cable P/N

98658A SCSI Single-Ended Disk Interface D1

Device P/N	Cable P/N
C1700A	Incl. w/interface
2nd req'd addr.	
3rd req'd addr.	

98658A SCSI Single-Ended Disk Interface D2

Device P/N	Cable P/N
	Incl. w/interface

98624A HP-IB Interface G1

Device P/N	Cable P/N

98624A HP-IB Interface G2

Device P/N	Cable P/N

98624A HP-IB Interface G3

Device P/N	Cable P/N

[illegible]

Introduction

This section contains configuration information on three Hewlett-Packard application packages, as listed below. These packages are provided to show examples of the type of application package information that is needed to obtain a complete, accurate system configuration. Such information should be available from the Hewlett-Packard entity offering the application package or from the third-party supplier that offers it.

Contents

Mechanical Engineering Series 10 Design and Drafting System	3-2
Mechanical Engineering Series 30 Modelling, Design, and Drafting System	3-7
FrameMaker Technical Publishing System	3-12

Mechanical Engineering Series 10 Design and Drafting System

Description

Hewlett-Packard's Mechanical Engineering Series 10 (ME Series 10) is a versatile 2-D design and drafting system that typically consists of the components shown in Figure 3-1, below. When supported by a network server, ME Series 10 can be accessed from multiple diskless workstations, which also take advantage of the printer and plotter shown in Figure 3-1. It combines sophisticated tools for support of initial design with additional capabilities for quickly generating design variations and management of design data files. The user interface for interactive design is based on a graphics tablet overlay, but a 2-button or 3-button mouse can be used instead for pointing and picking. For details on the features and capabilities of the ME Series 10 system and related capabilities, refer to the ME Series 10 data sheet, the Variation Design Module data sheet, the Data Management System data sheet, and the ME 10v View System data sheet, HP Literature Stock Numbers 5953-4392, 5954-8059, 5954-8060, and 5954-8058, or later revisions.

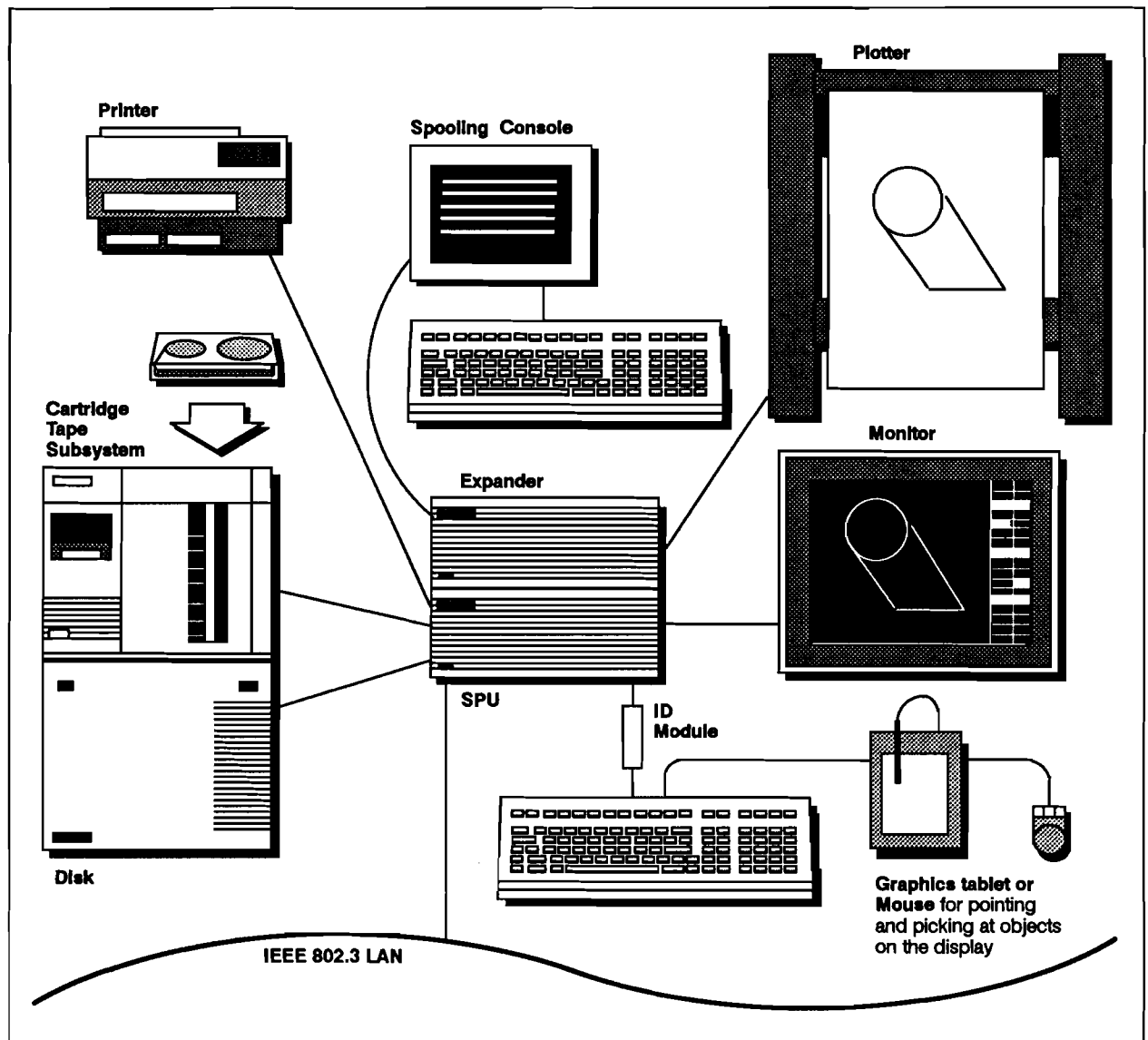


Figure 3-1. ME Series 10 Standalone Disk-based Workstation or Network Server

ME Series 10 Workgroup Clusters

Diskless workstations receive the HP-UX operating system, ME Series 10 Design and Drafting System, Design Variation Module, ME 10v View System, and Data Management Client module via their LAN connection with the Network Server. See Figure 3-2. As design data is generated, the Data Management Server saves it in a common HP SQL/300 relational database, from which it can be accessed and modified at any of the design workstations. Drawing information may be accessed, but not modified, by manufacturing people at view access stations. The Data Management Client modules in the diskless workstations access the design database via the LAN and the Data Management Server in the network server.

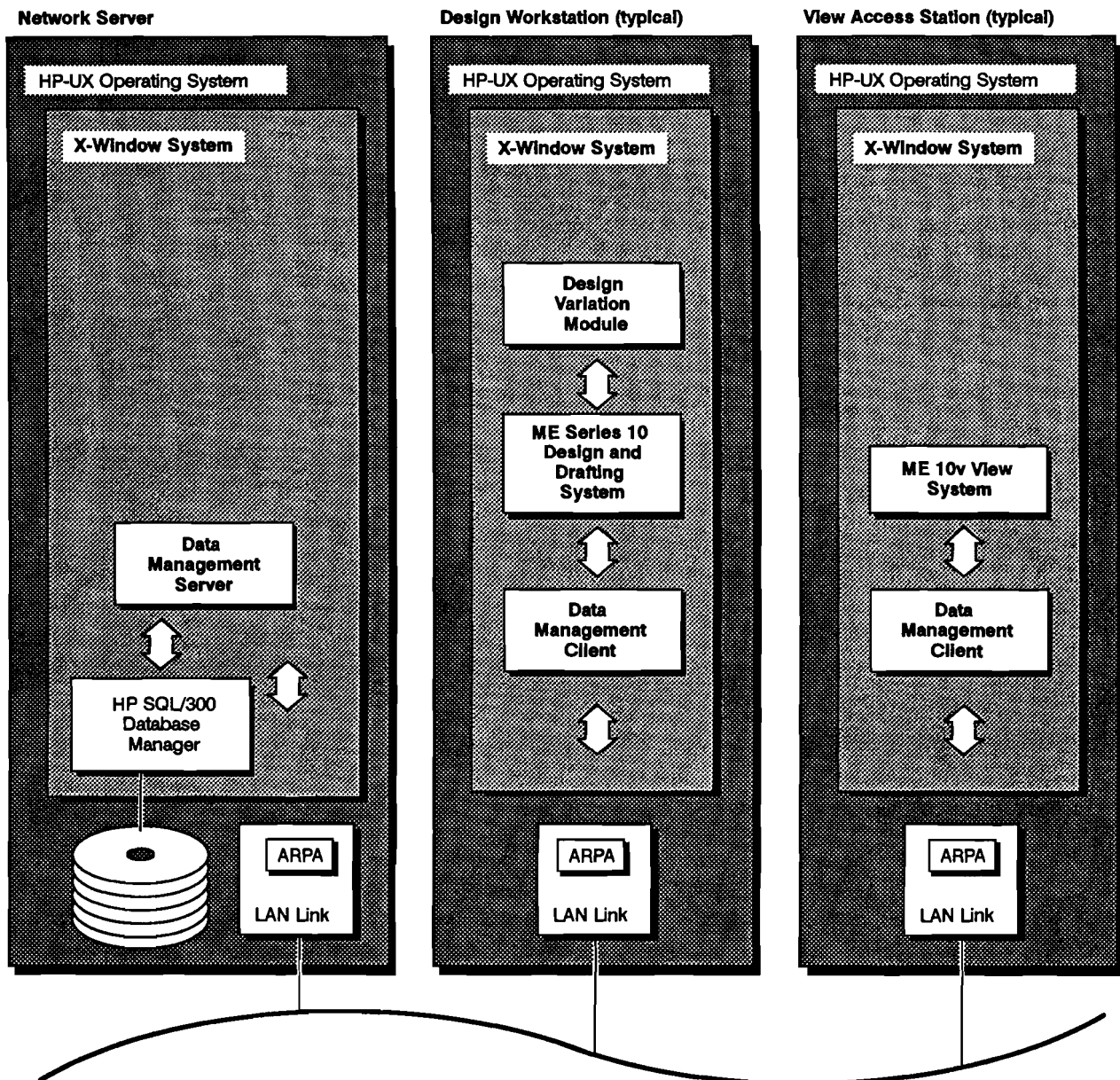


Figure 3-2. ME Series 10 Workgroup Cluster Relationships

Mechanical Engineering Series 10 Design and Drafting System, continued

Product Summary

Product/ Opt. No.	Description
B1310A*	Mechanical Engineering Series 10 Design and Drafting System. The option 001 Base Product License includes: A. The following software on customer-specified media (must order option AEQ or 100): 1. Basic ME Series 10 Design and Drafting System. 2. Variation Design Module. 3. ME Data Management Client Module (when one ME Data Management Server is purchased per network). B. One set of manuals.
Opt. AEQ	Software on 1/4-inch cartridge tape for use in Series 300 Workstation (excludes option 100).
Opt. 0AJ	First-time buy (must be ordered the first time option 001 is ordered).
Opt. 0A8	64-user license for X-window multiuse. For one workstation to be client for many X-window server stations.
Opt. 0B1	Adds one set of manuals.
Opt. 001	Base Product License (requires concurrent or prior purchase of option 0AJ, 020, or 022 or 98365A or 98366A product).
Opt. 002	Deletes Data Management Client Module (requires concurrent purchase of option 001, 020, or 022).
Opt. 003	Adds Data Management Client Module (requires prior purchase of option 001, 020, or 022).
Opt. 004	Deletes Variation Design Module (requires concurrent purchase of option 001, 020, or 022).
Opt. 005	Adds Variation Design Module (requires prior purchase of option 001, 020, or 022).
Opt. 020	Upgrade from 98365A or 98366A to B1310A.
Opt. 022	Upgrade from 98363A or 98364A ME Series 5 to B1310A.
Opt. 1B0	Overlay for ANSI A/ISO A4 Tablet. An overlay option must be ordered with each option 001, 020, or 022; multiple overlay options may be ordered with option 0A8.
Opt. 1B1	Overlay for ANSI B/ISO A3 Tablet. An overlay option must be ordered with each option 001, 020, or 022; multiple overlay options may be ordered with option 0A8.
Opt. 100	No media for existing customer who has received the latest revision through Software Materials Update (excludes option AEQ).
B1300A*	ME Data Management Server (also requires 79725L HP SQL/300)
Opt. AEQ	Software on 1/4-inch cartridge tape for use in Series 300 Workstation.
B1311A*	ME 10v View System for read-only access to ME Series 2-D drawings (loading, viewing, measuring, and plotting) Requires option 001 Base Product License.
Opt. AEQ	Software on 1/4-inch cartridge tape for use in Series 300 Workstation.
Opt. 0A8	64-user license for X-window multiuse. For one workstation to be client for many X-window server stations.
Opt. 0B1	Adds one set of manuals.
Opt. 001	Base Product License.
Opt. 002	Deletes Data Management Client Module (requires concurrent purchase of option 001).
Opt. 003	Adds Data Management Client Module (requires prior purchase of option 001).

* This product is available in different national versions, as summarized below.

<i>German</i>	<i>Spanish</i>	<i>French</i>	<i>Japanese</i>	<i>Swedish</i>	<i>Finnish</i>	<i>Italian</i>
B1310AD	B1310AE	B1310AF	B1310AJ	B1310AS	B1310AX	B1310AZ
B1300AD	not available	B1300AF	B1300AJ	not available	not available	B1300AZ
B1311AD	not available	not available	B1311AJ	not available	not available	not available

Operational Requirements

Description	Requirements					
For Network Server:						
Supported Models:	15NS and 25NS					
Operating System:	HP-UX, included in 15NS and 25NS					
RAM & Disk Space for ME Series 10 and Related Software:	RAM	Unit	x No. =	Total SwSP	Disk	
Swap space for each of first 6 design workstations:		24 MB	x ____ =	____ MB		
Swap space for each of 7 through nth design workstations:		12 MB	x ____ =	____ MB		
Swap space per view access station:		12 MB	x ____ =	____ MB		
Swap space per Data Management Client:		5 MB	x ____ =	____ MB		
ME Series 10 Design and Drafting System					10 MB	
Data Management Server	8 MB*			15 MB	2 MB	
Initialization space per Database:		16 MB	x ____ =		____ MB	
Average Disk Space per Drawing		0.2 MB	x ____ =		____ MB	
Supported Printers for hard copy output:	See printer output section (section 16).					
Supported Plotters for hard copy output:	See graphics input/output section (section 17).					
Supported Graphics Display Subsystems:	C+ and CH (Network Server options 549 and 550)					
Other Requirements:	HP 46084A HP-HIL ID Module and HP 46060A or B Two or three-button Mouse or HP 45911A, 46087B, or 46088B A or B-Size Digitizer Tablet and HP 700/9x Terminal as spooling console					
For Diskless View Access Station:						
Supported Models:	340C+, 340CH, 340CHX, 340SRX, 360C+, 360CH, 360CHX, 360SRX, 360 TurboSRX, 370C+, 370CH, 370CHX, 370 SRX, and 370 TurboSRX.					
Operating System:	HP-UX, downloaded from network server.					
RAM Space for ME 10v View System	8 MB*					
Other Requirements:	HP 46084A HP-HIL ID Module and HP 46060A or B Two or three-button Mouse					
For Diskless Design Workstation:						
Supported Models:	340C+, 340CH, 340CHX, 340SRX, 360C+, 360CH, 360CHX, 360SRX, 360 TurboSRX, 370C+, 370CH, 370CHX, 370 SRX, and 370 TurboSRX.					
Operating System:	HP-UX, downloaded from network server.					
RAM Space for ME Series 10 Design and Drafting System:	8 MB*					
Other Requirements:	HP 46084A HP-HIL ID Module and HP 46060A or B Two or three-button Mouse or HP 45911A, 46087B or 46088B A or B-Size Digitizer Tablet					

* Including HP-UX and X-Windows (and HP SQL/300 supporting the Data Management Server).

Mechanical Engineering Series 10
Design and Drafting System, continued

Operational Requirements, continued

Description	Requirements			
For Standalone, Disk-Based Series 300 Design Workstation:				
Supported Models:	340C + , 340CH, 340CHX, 340SRX, 360C + , 360CH, 360CHX, 360SRX, 360 TurboSRX, 370C + , 370CH, 370CHX, 370SRX and 370 TurboSRX			
Operating System:	HP-UX, license-to-use included in workstation.			
RAM & Disk Space for ME Series 10 and Related Software:	RAM	SwSP	Disk	
ME Series 10 Design and Drafting System	8 MB*	24 MB	10 MB	
Average Disk Space per Drawing			0.2 MB	
Supported Printers for hard copy output:	See printer output section (section 16).			
Supported Plotters for hard copy output:	See graphics input/output section (section 17).			
Other Requirements:	HP 46084A HP-HIL ID Module and HP 46060A or B Two or three-button Mouse or HP 45911A, 46087B, or 46088B A or B-Size Digitizer Tablet and HP 700/9x Terminal as spooling console			

* Including HP-UX and X-Windows.

Mechanical Engineering Series 30 Modelling, Design and Drafting System

Description

Hewlett-Packard's Mechanical Engineering Series 30 (ME Series 30) is a versatile system that integrates solid modeling into a 2-D design and drafting capability. The ME Series 30 system typically consists of the components shown in Figure 3-3, below. When supported by a network server, ME Series 30 can be accessed from multiple workstations, which also take advantage of the printer and plotter shown in Figure 3-3. It combines sophisticated tools for support of initial design with additional capabilities for quickly generating design variations and management of design data files. For details on the features and capabilities of the ME Series 30 system and related capabilities, refer to the ME Series 30 data sheet, the Variation Design Module data sheet, the Data Management System data sheet, and the ME 10v View System data sheet, HP Literature Stock Numbers 5953-4393, 5954-8059, 5954-8060, and 5954-8058, or later revisions.

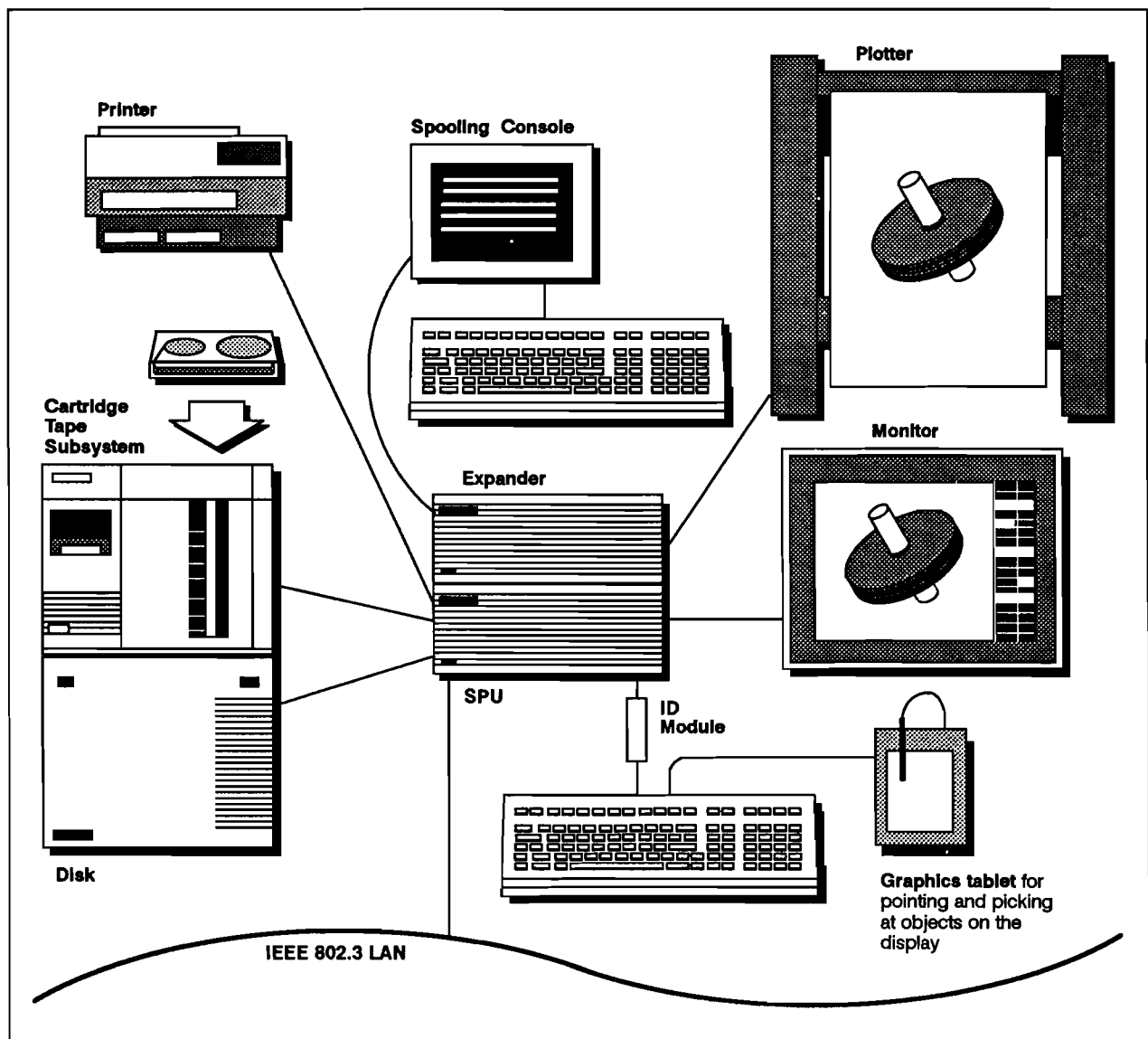


Figure 3-3. ME Series 30 Standalone Disk-based Workstation or Network Server

ME Series 30 Workgroup Clusters

Design workstations receive the HP-UX operating system, ME Series 30 Modelling, Design, and Drafting System, Design Variation Module, ME 10v View System, and Data Management Client module via their LAN connection with the Network Server. See Figure 3-4. As design data is generated, the Data Management Server saves it in a common HP SQL/300 relational database, from which it can be accessed and modified at any of the design workstations. Drawing information may be accessed, but not modified, by manufacturing people at view access stations. The Data Management Client modules in the diskless workstations access the design database via the LAN and the Data Management Server in the network server.

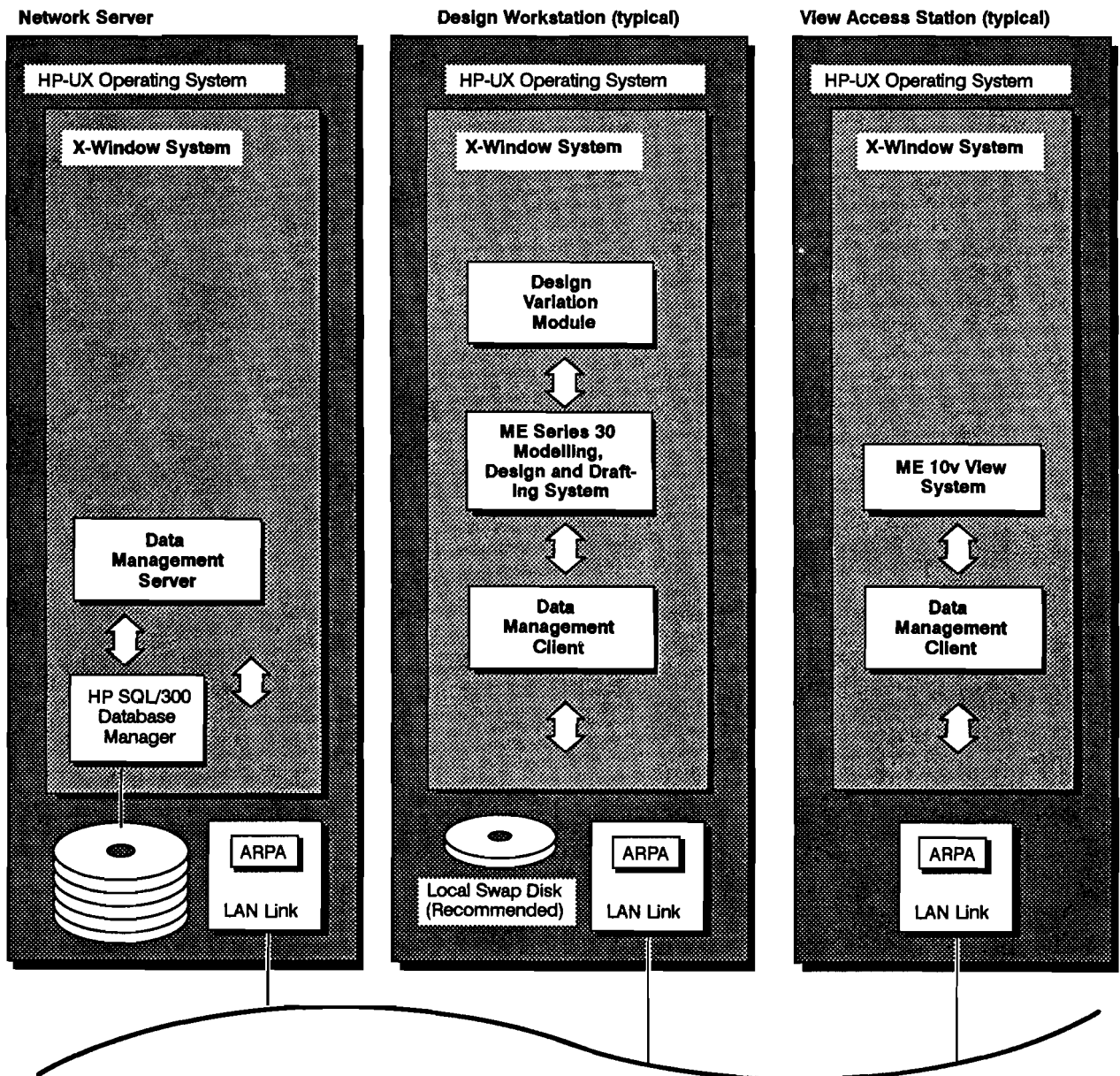


Figure 3-4. ME Series 30 Workgroup Cluster Relationships

Product Summary

Product/ Opt. No.	Description
B1330A*	Mechanical Engineering Series 30 Modelling, Design, and Drafting System. The option 001 Base Product License includes: A. The following software on customer-specified media (must order option AEQ or AER or 100): 1. Basic ME Series 30 Modelling, Design, and Drafting System. 2. Variation Design Module. 3. ME Data Management Client Module (when one ME Data Management Server is purchased per network). B. One set of manuals.
Opt. AEQ	Software on 1/4-inch cartridge tape for use in Series 300 Workstation (excludes option AER).
Opt. AER	Software on 1/4-inch cartridge tape for use in Model 825/835 Superworkstation (excludes option AEQ).
Opt. 0AJ	First-time buy (must be ordered the first time option 001 is ordered).
Opt. 0A8	64-user license for X-window multiuse. For one workstation to be client for many X-window server stations. Requires B1330A option 001 or 021.
Opt. 0B1	Adds one set of manuals.
Opt. 001	Base Product License (requires concurrent or prior purchase of option 0AJ or 021 or 74836A or 74839A product).
Opt. 002	Deletes Data Management Client Module (requires concurrent purchase of option 001 or 021).
Opt. 003	Adds Data Management Client Module (requires prior purchase of option 001 or 021 or B1331A).
Opt. 004	Deletes Variation Design Module (requires concurrent purchase of option 001 or 021).
Opt. 005	Adds Variation Design Module (requires prior purchase of option 001 or 021 or B1331A).
Opt. 021	Upgrade from 74836A to B1330A.
Opt. 030	Provides 3-D data translation to APT-AC format (requires prior purchase of option 001 or 021 or B1331A).
Opt. 031	Provides 3-D data translation to COMPACT II format (requires prior purchase of option 001 or 021 or B1331A).
Opt. 032	Provides 3-D data translation to GNC format (requires prior purchase of option 001 or 021 or B1331A).
Opt. 033	Provides 3-D data translation to ANSYS format (requires prior purchase of option 001 or 021 or B1331A).
Opt. 034	Provides 3-D data translation to FEMGEN format (requires prior purchase of option 001 or 021 or B1331A).
Opt. 035	Provides 3-D data translation to PATRAN format (requires prior purchase of option 001 or 021 or B1331A).
Opt. 036	Provides 3-D data translation to SUPERTAB format (requires prior purchase of option 001 or 021 or B1331A).
Opt. 037	Provides 3-D data translation to IGES format (requires prior purchase of option 001 or 021 or B1331A).
Opt. 038	Provides 3-D data translation to VDA-FS format (requires prior purchase of option 001 or 021 or B1331A).
Opt. 1B0	Overlay for ANSI A/ISO A4 Tablet. An overlay option must be ordered with each option 001 or 021; multiple overlay options may be ordered with option 0A8.
Opt. 1B1	Overlay for ANSI B/ISO A3 Tablet. An overlay option must be ordered with each option 001 or 021; multiple overlay options may be ordered with option 0A8.
Opt. 100	No media for existing customer who has received the latest revision through Software Materials Update.
B1331A*	Upgrade from ME Series 10 to ME Series 30, as described above.
Opt. AEQ	Software on 1/4-inch cartridge tape for use in Series 300 Workstation (excludes option AER).
Opt. AER	Software on 1/4-inch cartridge tape for use in Model 825/835 Superworkstation (excludes option AEQ).
Opt. 0AJ	First-time buy (must be ordered the first time option 001 is ordered).
Opt. 001	Base Product License (requires concurrent or prior purchase of B1331A option 0AJ or B1330A option 0AJ).

* This product is available in different national versions, as summarized below.

<i>German</i>	<i>French</i>	<i>Japanese</i>	<i>Swedish</i>	<i>Italian</i>
B1330AD	B1330AF	B1330AJ	B1330AS	B1330AZ
B1331AD	B1331AF	B1331AJ	B1331AS	B1331AZ

Mechanical Engineering Series 30 Modelling, Design and Drafting System, continued

Product Summary, continued

Product/ Opt. No.	Description
B1331A*	Upgrade from ME Series 10 to ME Series 30, continued
Opt. 1B0	Overlay for ANSI A/ISO A4 Tablet. An overlay option must be ordered with each option 001.
Opt. 1B1	Overlay for ANSI B/ISO A3 Tablet. An overlay option must be ordered with each option 001.
B1300A*	ME Data Management Server (also requires 79725L HP SQL/300 or 92460A HP ALLBASE/SQL)
Opt. AEQ	Software on 1/4-inch cartridge tape for use in Series 300 Workstation (excludes option AER).
Opt. AER	Software on 1/4-inch cartridge tape for use in Model 825/835 Superworkstation (excludes option AEQ).
B1311A*	ME10v View System for read-only access to ME Series 2-D drawings (loading, viewing, measuring, and plotting) Requires option 001 Base Product License.
Opt. AEQ	Software on 1/4-inch cartridge tape for use in Series 300 Workstation (excludes option AER).
Opt. AER	Software on 1/4-inch cartridge tape for use in Model 825/835 Superworkstation (excludes option AEQ).
Opt. 0A8	64-user license for X-window multiuse. For one workstation to be client for many X-window server stations.
Opt. 0B1	Adds one set of manuals.
Opt. 001	Base product license.
Opt. 002	Deletes Data Management Client Module (requires concurrent purchase of option 001).
Opt. 003	Adds Data Management Client Module (requires prior purchase of option 001).

* This product is available in different national versions, as summarized below.

<i>German</i>	<i>French</i>	<i>Japanese</i>	<i>Italian</i>
B1300AD	B1300AF	B1300AJ	B1300AZ
B1311AD	not available	B1311AJ	not available

Operational Requirements

Description	Requirements					
For Series 300 Network Server:						
Supported Models:	15NS and 25NS					
Operating System:	HP-UX, included in 15NS and 25NS					
RAM & Disk Space for ME Series 30 and Related Software:	RAM	Unit	x No. =	Total SwSP	Disk	
Swap space per design workstation:		40 MB	x ____ =	____ MB		
Swap space per view access station:		12 MB	x ____ =	____ MB		
Swap space per Data Management Client:		5 MB	x ____ =	____ MB		
ME Series 30 Design and Drafting System					15 MB	
Data Management Server	8 MB*			15 MB	2 MB	
Initialization Space per Database		16 MB	x ____ =		____ MB	
Average Disk Space per Drawing		0.2 MB	x ____ =		____ MB	
Supported Printers for hard copy output:	See printer output section (section 16).					
Supported Plotters for hard copy output:	See graphics input/output section (section 17).					

* Including HP-UX and X-Windows (and SQL/300 supporting the Data Management Server).

Operational Requirements, continued

Description	Requirements			
For Series 300 Network Server, continued:				
Supported Graphics Display Subsystems:	C+ and CH (Network Server options 549 and 550)			
Other Requirements:	HP 46084A HP-HIL ID Module and HP 45911A, 46087B, or 46088B A or B-Size Digitizer Tablet and HP 700/9x Terminal as spooling console			
For Series 300 Diskless View Access Station:				
Supported Models:	340C+, 340CH, 340CHX, 340SRX, 360C+, 360CH, 360CHX, 360SRX, 360 TurboSRX, 370C+, 370CH, 370CHX, 370 SRX, and 370 TurboSRX.			
Operating System:	HP-UX, downloaded from network server.			
RAM Space for ME 10v View System	8 MB*			
Other Requirements:	HP 46084A HP-HIL ID Module and HP 46060A or B Two or three-button Mouse			
For Series 300 Design Workstation with Local Swapping Disk:				
Supported Models:	340C+, 340CH, 340CHX, 340SRX†, 360C+, 360CH, 360CHX, 360SRX†, 360 TurboSRX†, 370C+, 370CH, 370CHX, 370 SRX†, and 370 TurboSRX†.			
Operating System:	HP-UX, downloaded from network server			
RAM & Disk Space for ME Series 30 Software:	RAM	SwSP	Disk	
ME Series 30 Design, and Drafting System	16 MB*	40 MB		
Local Swapping Disk:			40 MB	
Other Requirements:	HP 46084A HP-HIL ID Module and HP 45911A, 46087B, or 46088B A or B-Size Digitizer Tablet			
For Standalone, Disk-Based Series 300 Design Workstation or Model 825/835 Superworkstation:				
Supported Models:	340C+, 340CH, 340CHX, 340SRX†, 360C+, 360CH, 360CHX, 360SRX†, 360 TurboSRX†, 370C+, 370CH, 370CHX, 370 SRX†, 370 TurboSRX†, 825CHX, 825SRX†, 835CHX, 835SRX†, and 835 TurboSRX†			
Operating System:	HP-UX, license-to-use included in workstation.			
RAM & Disk Space for ME Series 30 Software :	RAM	SwSP	Disk	
ME Series 30 Design, and Drafting System	16 MB*	40 MB	15 MB	
Average Disk Space per Drawing			0.2 MB	
Supported Printers for hard copy output:	See printer output section (section 16).			
Supported Plotters for hard copy output:	See graphics input/output section (section 17).			
Other Requirements:	HP 46084A HP-HIL ID Module and HP 45911A, 46087B, or 46088B A or B-Size Digitizer Tablet and HP 700/9x Terminal as spooling console			

† This model provides hardware-support for ultra-fast solid modelling.

* Including HP-UX and X-Windows.

FrameMaker Technical Publishing System

Description

FrameMaker is a document publishing system that typically consists of the components shown in Figure 3-5, below. When supported by a network server, FrameMaker can be accessed from multiple diskless workstations, which also take advantage of the printer shown in Figure 3-5. FrameMaker combines a complete text processor with a graphics toolbox for creating and manipulating technical graphics on a "What you see is what you get" page display, aided by easy-to-use page and document design formats. International FrameMaker supports spell checking, fonts, and hyphenation in U.S. English, U.K. English, Parisian French, Dutch, and German. Related FrameViewer software provides for view-only access to hypertext and document files. Filters are available for importing text and graphics from other systems. For details on the features and capabilities of the FrameMaker Technical Publishing System, refer to the FrameMaker data sheet, HP Literature Stock Number 5954-6641, or a later revision.

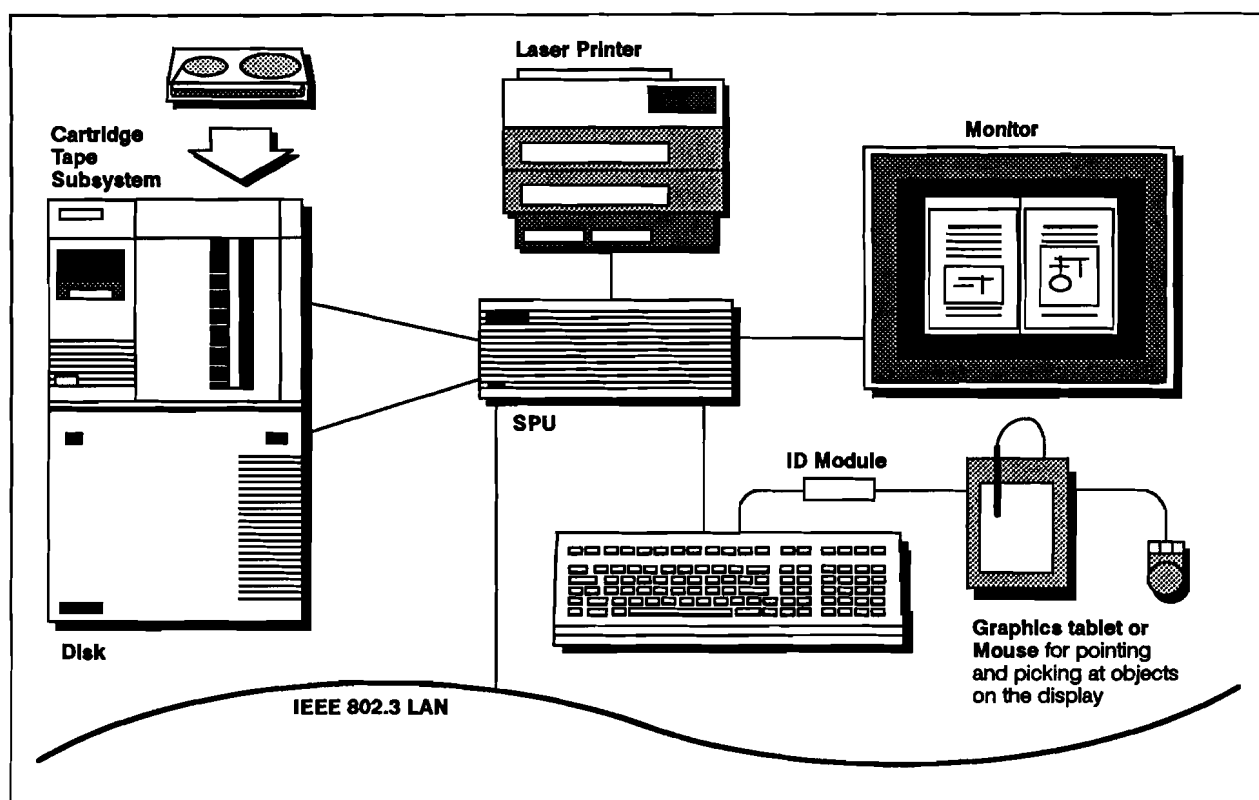


Figure 3-5. FrameMaker Standalone Disk-based Workstation or Network Server

FrameMaker Workgroup Clusters

Diskless workstations may receive the HP-UX operating system and the FrameMaker System or FrameViewer via their LAN connection with the Network Server. See Figure 3-6, next page. Alternatively, diskless workstations to which only HP-UX and X Windows software is sent may function as X Servers to access up to five copies of the FrameMaker and/or FrameViewer software on the network server, which functions as an X client. The limit of five copies on the network server is set by the maximum of seven addressable HP-HIL devices – each copy requires its own ID module and an HP-HIL address and the keyboard and mouse or tablet each also use one address. Documents are saved in the HP-UX file system, from which they can be accessed at the network server or any of the publication design workstations or view access stations.

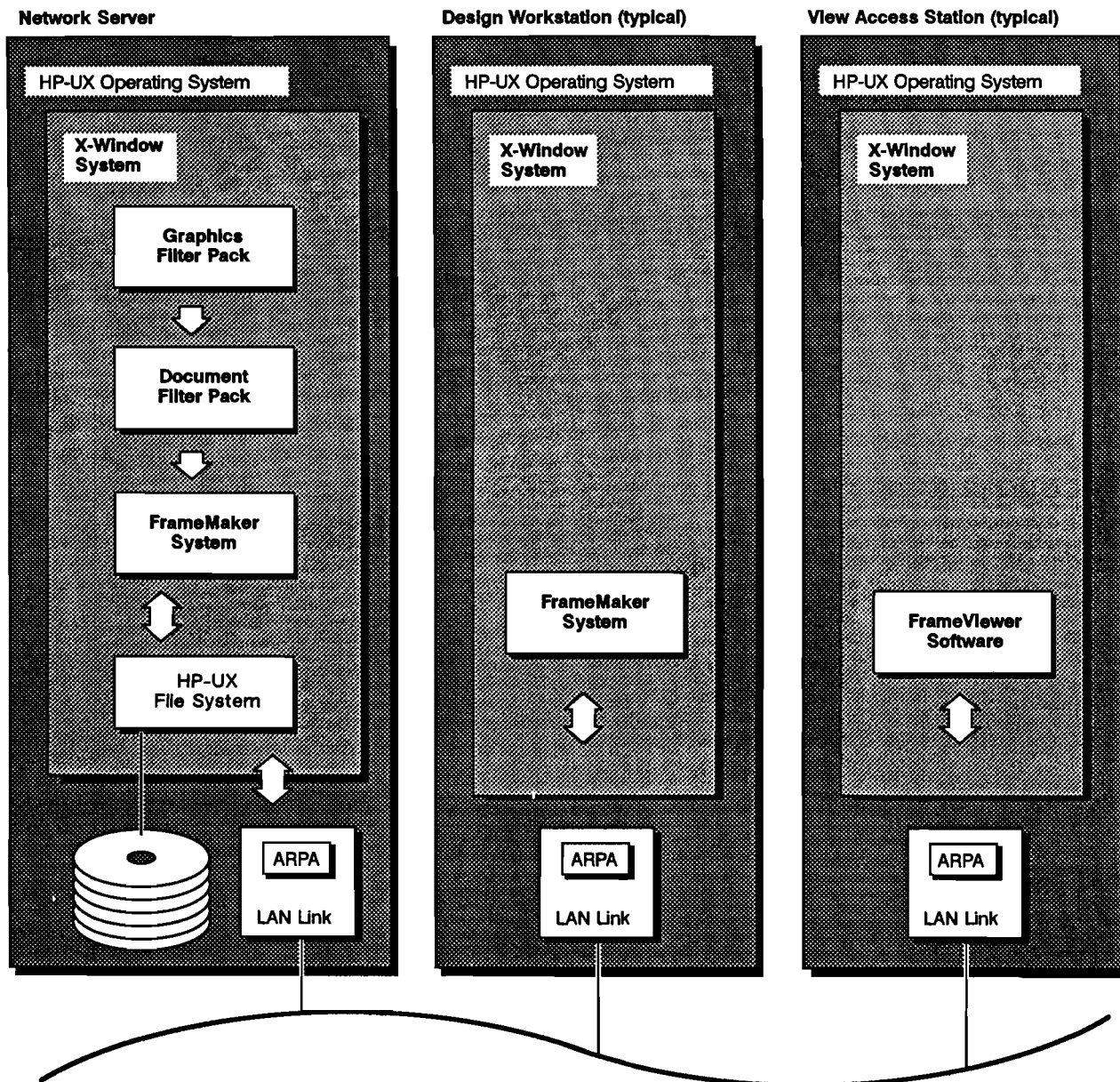


Figure 3-6. FrameMaker Workgroup Cluster Relationships with FrameMaker/FrameViewer Software Active on the Diskless Workstations

FrameMaker Technical Publishing System, continued

Product Summary

Product/ Opt. No.	Description
74350A	FrameMaker Technical Publishing System (must order option 002 and 022)
Opt. 002	Software on 1/4-inch cartridge tape and installation guide (ordered by itself for demo only).
Opt. 022	License-to-Use on HP 9000 Series 300 System with User's Manual and Reference Manual (requires prior or concurrent purchase of option 002).
74350R	Right to Copy FrameMaker Technical Publishing System (Includes User's and Reference Manuals - must order option 002).
Opt. 0B0	Deletes manuals.
Opt. 002	Right to make one copy of 74350A software for use on HP 9000 Series 300 system.
74351A	International FrameMaker Technical Publishing System (must order option 002 or 002 and 022 and option ABA, ABF, or ABD)
Opt. ABA	Manuals in English (excludes options ABD and ABF).
Opt. ABD	Manuals in German (excludes options ABA and ABF).
Opt. ABF	Manuals in French (excludes options ABA and ABD).
Opt. 002	Software on 1/4-inch cartridge tape and installation guide (ordered by itself for demo only).
Opt. 022	License-to-Use on on HP 9000 Series 300 System with User's Manual and Reference Manual (requires prior or concurrent purchase of option 002).
74351R	Right to Copy International FrameMaker Technical Publishing System (Includes User's and Reference Manuals - must order option ABA, ABF, or ABD and option 002).
Opt. ABA	Manuals in English (excludes options ABD and ABF).
Opt. ABD	Manuals in German (excludes options ABA and ABF).
Opt. ABF	Manuals in French (excludes options ABA and ABD).
Opt. 0B0	Deletes manuals.
Opt. 002	Right to make one copy of 74351A software for use on HP 9000 Series 300 system.
74352A	FrameViewer (requires 74350A or 74351A - must order option 002)
Opt. 002	Software on 1/4-inch cartridge tape, license-to-use on HP 9000 Series 300 system, and manual addendum.
74352R	Right to Copy FrameViewer (must order option 002).
Opt. 002	Right to make one copy of 74352A software for use on Series 300 system.
74353A	FrameMaker Graphics FilterPak for Importing HPGL, IGES, or MacDraw Images (requires 74350A or 74351A - must order option 002)
Opt. 002	Software on 1/4-inch cartridge tape, site license-to-use on HP 9000 Series 300 system, and reference manual.
74354A	FrameMaker Document FilterPak for Importing DCA, Interleaf, Microsoft Word, Multimate, Wang, WordMARC, WordPerfect, WordStar, and troff documents (requires 74350A or 74351A - must order option 002)
Opt. 002	Software on 1/4-inch cartridge tape, site license-to-use on HP 9000 Series 300 system, and reference manual.
Manuals (the following manuals are available for Frame products; additional manuals are available from DMK)	
FrameMaker Installation Guide (74350-90601)	FrameMaker User's Manual (English 74350-90602) (German 74351-90602) (French 74351-90601)
FrameMaker Reference Manual (74350-90603)	
FrameViewer Manual (74352-90601)	Graphics FilterPak Reference Manual (74353-90601)
Document FilterPak Reference Manual (74354-90601)	

Operational Requirements

Description		Requirements					
For Network Server or Disk-Based System:							
Supported Models:	15NS and 25NS or disk-based 340, 360, or 370 2-D workstation.						
Operating System:	HP-UX, included in 15NS and 25NS						
RAM and Disk Space for Frame Software :	Per Unit	x No. =	RAM	SwSP	Per Page	x No. =	Disk
Swap space per design workstation:				10 MB		x ____ =	____ MB
Swap space per view access station:				10 MB		x ____ =	____ MB
FrameMaker per design workstation:	4 MB	x ____ =	____ MB				13 MB
FrameViewer per view access station:	4 MB	x ____ =	____ MB				13 MB
Document storage (maximum) per page:					0.2 MB	x ____ =	____ MB
Supported Printers for hard copy output:	HP LaserJet or LaserJet Series IID with 2 MB, Z font cartridge, and K font cartridge (for math) and Apple LaserWriter IINT (Postscript only).						
Supported 1280 by 1024 pixel Monitors:	HP 98752A (CH), 98788A (MH), and 98789A all provide full page display.						
Supported 1024 by 768 pixel Monitors:	HP 98785A (C+), 98751A, 98786A all provide partial page display with scroll.						
Other Requirements:	HP 46084A HP-HIL ID Module for each executing copy of FrameMaker or FrameViewer (max. of 5 per server) and HP 46060B or A Three or two-button Mouse or HP 46087B or 46088B A or B-Size Digitizer Tablet with 46089B 4-button Cursor						
For Diskless Design or View Access Workstation with Active Frame Software:							
Supported Models for full-page display:	340CH, 340CHX, 340MH, 360CH, 360CHX, 360MH, 370CH, 370CHX, and 370MH						
Supported Models for partial-page display with scroll:	340C+, 340M, 360C+, 370C+,						
Operating System:	HP-UX, downloaded from network server						
RAM Space for Frame Software:	Per User	x No. =	RAM				
FrameMaker:	4 MB	x ____ =	____ MB				
FrameViewer:	4 MB	x ____ =	____ MB				
Other Requirements:	HP 46084A HP-HIL ID Module for each executing copy of FrameMaker or FrameViewer and HP 46060B or A Three or two-button Mouse or HP 46087B or 46088B A or B-Size Digitizer Tablet with 46089B 4-button Cursor						



Introduction

This section contains configuration information on software other than that used for applications and communications.

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HP BASIC/WS Language System

Description

The HP BASIC/WS Language System is a single-task, single-user operating system with a built-in BASIC Interpreter for Series 300 systems. It supports an available BASIC compiler. Thus it may execute interpreted or compiled programs. Its available CSUB utilities support execution of subprograms compiled in standalone Pascal or MC68000 assembly language that have been prepared in the HP Pascal/WS environment. BASIC/WS programming is also supported in the multi-user HP-UX environment by the BASIC/UX product. See the BASIC Language System data sheet (5954-9833 or a later revision) for details on the HP BASIC/WS Language System.

Product Summary

Product/ Opt. No.	Description
For Series 300 System Processor Unit	
98616A	RAM-based HP BASIC/WS 5.1, including: A. Software on option 042, 044, or 045 media, which must be specified. B. License-to-Use HP BASIC/WS. C. BASIC 5.0/5.1 Manual Kit.
Opt. 001	Upgrade from a previous BASIC Language system.
Opt. 042	Software on 5.25-inch flexible disks (excludes options 044 and 045).
Opt. 044	Software on single-sided 3.5-inch flexible disks (excludes options 042 and 045).
Opt. 045	Software on double-sided 3.5-inch flexible disks (excludes options 042 and 044).
Opt. 618	Adds BASIC 5.X Compiler (supplied on both 5.25-inch and 3.5-inch flexible disks).
98616M	Right-to-Reproduce one copy of 98616A software for VEUs, SRM users, or end users (includes manuals).
Opt. 100	Deletes manuals.
98616R	Right-to-Reproduce one copy of 98616A software for resellers (includes manuals).
Opt. 100	Deletes manuals.
CSUB	98616-11240 Compiled Subprogram (CSUB) Utilities on 5.25-inch flexible disk.
CSUB	98616-11440 Compiled Subprogram (CSUB) Utilities on 3.5-inch single-sided flexible disk.
CSUB	98616-11540 Compiled Subprogram (CSUB) Utilities on 3.5-inch double-sided flexible disk.
98618A	BASIC 5.X Compiler: A. Software on option 042, 044, or 045 media, which must be specified. B. BASIC 5.X Manual Kit.
Opt. 042	Software on 5.25-inch flexible disks (excludes options 044 and 045).
Opt. 044	Software on single-sided 3.5-inch flexible disks (excludes options 042 and 045).
Opt. 045	Software on double-sided 3.5-inch flexible disks (excludes options 042 and 044).
For Model 332CMA, 332MMA, 332/R, 360MMA, and 360CMA Instrument Controllers	
98616A	RAM-based HP BASIC/WS is bundled with the instrument controller.

Operational Requirements

Description	Requirements		
For Any Series 300 System			
RAM and Disk Space for BASIC/WS	RAM	Disk	
RAM-based BASIC/WS	790 KB	687 KB	Fully-configured system; not all binaries are required.
BASIC Compiler		193 KB	
Recommended Initial Space for User's Applications	0.5 MB	10 MB	Sizes of BASIC applicatons vary widely.
System Console:	Not necessary. If used, the default console is the first found of: • Plug-in, bit-mapped display (CRTB binary is loaded and switch-configurable card is set to internal address space. • 98546A compatibility video interface (if interface is present and CRTA binary is loaded). • Plug-in, bit-mapped display (CRTB binary is loaded and switch-configurable card is set to external address space). The default graphics "CRT" device is the same as the alpha device if the alpha display has graphics capability. If the alpha display is the 98546A with its graphics card removed, the default graphics is chosen as above. Output is possible from only one display at a time. The alpha content of the prior alpha display is lost when switching. Display color maps are reset to their defaults when switching graphics displays (with PLOTTER IS), and the next display is erased if GINIT has been performed since the next display was last addressed. HP BASIC/WS can switch between the default bit-mapped display and the 98546A interface with a CONTROL statement.		
Other Requirements:	HP 9122C or 9127A Flexible Disk drive for software loading and backup.		
Supported Printers for hard copy output:	HP 2225A, 2227A/B 2228A, 2235B/D (HP-IB), 2276A, 256xB Opt. 200, 2934A Opt. 046, 33440A, 33447A, and 3630A Opt. 002.		
Supported Plotters for hard copy output:	HP 7440A Opt. 002, 7475A Opt. 002, 7550A (HP-IB), 7570A with 17570A, 7575A with 17570A, 7576A with 17570A, 7595A (HP-IB), and 7596A (HP-IB).		
Supported HP-HIL Devices:	HP M1309A, 35723A, 45911A, 46021A, 46060A/B, 46081A, 46083A, 46085A, 46086A, 46087B, 46088B, 46089B, 46094A, and 46095A		
Supported Video (Display Monitor) Interfaces:	HP 98542A, 98543A, 98544B, 98546A, 98547A, 98548A, 98549A, and 98550A. NOTE: 98556A Accelerator is NOT supported.		
Supported Disks:	HP 7936H, 7937H, 7957B, 7958B, 7959B, 7962B, 7963B, 9122C, 9127A, 9153C, 9262B, and 9263B.		
Supported Magnetic Tapes:	HP 35401A (excluding autochange feature), 9144A, and 9145A.		

HP Pascal/WS Language System

Description

The HP Pascal/WS Language System is a single-task, single-user operating system with Pascal programming and execution capability for Series 300 systems. See the HP 9000 Series 200 and 300 Pascal 3.2 Language System data sheet (5954-9874 or a later revision) for specifications of the HP Pascal/WS Language System and the Pascal System Internals Documentation data sheet (5953-9534 or a later revision) for a description of the manual set available for system programmers.

Product Summary

Product/ Opt. No.	Description
For Series 300 System Processor Unit	
98617A	HP Pascal/WS 3.2, including: A. Software on option 042, 044, or 045 media, which must be specified. B. License-to-Use HP Pascal /WS. C. Pascal 3.21 Manual Kit.
Opt. 001	Upgrade from a previous Pascal Language system.
Opt. 042	Software on 5.25-inch flexible disks (excludes options 044 and 045).
Opt. 044	Software on single-sided 3.5-inch flexible disks (excludes options 042 and 045).
Opt. 045	Software on double-sided 3.5-inch flexible disks (excludes options 042 and 044).
98617M	Right-to-Reproduce one copy of 98617A software for VEU's, SRM users, or end users (includes manuals).
Opt. 100	Deletes manuals.
98617R	Right-to-Reproduce one copy of 98616A software for resellers (includes manuals).
Opt. 100	Deletes manuals.
98617E	Right-to-Execute HP Pascal/WS 3.21 software for resellers.
Opt. 090	Adds right-to-execute additional 99 copies of HP Pascal/WS.
	98617-87901 Pascal 3.21 Documentation Kit (order from HP's Direct Marketing Division).

Operational Requirements

Description	Requirements		
For Any Series 300 System			
RAM and Disk Space for Pascal/WS	RAM	Disk	
Pascal/WS	n/s	n/s	
Recommended Initial Space for User's Applications	n/s	n/s	
System Console:	Not necessary. If used, the one alpha console is chosen according to the ordering of the display modules in "INIT_LIB" (user specified). There is no supported method for switching alpha displays after system startup. "External" bit-mapped displays are never chosen. The use of the 98267A as an alpha display interface is not supported by Hewlett-Packard. Graphics output may be sent to one display at a time. Display color maps are reset to their defaults when switching graphics displays, but the next display contents are preserved if the DISPLAY_INIT has control bit 7 set to 1.		
Other Requirements:	HP 9122C or 9127A Flexible Disk drive for software loading and backup.		
Supported Printers for hard copy output:	HP 2225A, 2227B 2235B/D (HP-IB), 256xB Opt. 200, 2934A Opt. 046, 33440A, and 33447A		
Supported Plotters for hard copy output:	HP 7440A Opt. 002, 7475A Opt. 002, 7550A (HP-IB), 7570A with 17570A, 7575A with 17570A, 7576A with 17570A, 7595A (HP-IB), and 7596A (HP-IB).		
Supported HP-HIL Devices:	HP M1309A, 35723A, 45911A, 46021A, 46060A/B, 46081A, and 46083A, 46087B, 46088B, 46089B, 46094A, and 46095A		
Supported Video (Display Monitor) Interfaces:	HP 98542A, 98543A, 98544B, 98546A, 98547A, 98548A, 98549A, and 98550A. NOTE: 98556A Accelerator is NOT supported.		
Supported Disks:	HP 7936H, 7937H, 7957B, 7958B, 7959B, 7962B, 7963B, 9122C, 9127A, 9153C, 9262B, and 9263B.		
Supported Magnetic Tapes:	HP 35401A (excluding autochange feature), 9144A, and 9145A.		

n/s = not specified

HP-UX Operating System

Description

The HP-UX operating system is a multi-user, multiprogramming operating system. It provides the maximum operating system capabilities that are available for HP 9000 Series 300 systems and is the only operating system supported in Series 800 Superworkstations and the Model 635SV Server. HP-UX capabilities include support for an extensive array of programming languages, subsystems, and applications, as discussed in the remainder of this section and in the next (Inter-System Communications) section. See the HP 9000 HP-UX Operating System Technical Supplement (5952-6341 or a later revision) for a description of the HP-UX and related software.

HP-UX Licensing, License Upgrades, and Media and Documentation

The base license for Series 300 Workstations is a two-user license to use the HP-UX Application Execution Environment (AXE). The bit-mapped console of a workstation or a terminal connected to a System Processor Unit counts as one user. Local LAN interfaces that speak "telnet" or "rlogin" also count as a user. Workstations that are limited to one bit-mapped console and one LAN interface completely use the two-user license. A workstation or network server or other Series 300 system that requires more than one direct-connected or modem-connected terminal, such as a network server supporting ME Series 10 (which requires a spooling console), exceeds the two-user license; its license must be upgraded to a 16-user license. The Model 635SV Server and Model 834 Superworkstation include a 2-user license to use the entire HP-UX operating system. This licenses concurrent use of two terminals or the bit-mapped console and one additional terminal. The other Series 800 Superworkstations include a 16-user license to use HP-UX. The licensed software can be made available for installation in licensed systems by:

1. Purchasing the corresponding media and documentation
2. Copying the licensed software to the licensed system.
3. Installing the licensed software from a previously-purchased media and documentation product.

NOTE: The system license must match the software revision being installed; an HP-UX Release 7.0 license is required to license installation and use of the HP-UX Release 7.0 software.

Product Summary

Product/ Opt. No.	Description
For Series 300 System Processor Units	
98515L	2-User License-to-Use HP-UX Release 7.0 Application Execution Environment (AXE), as listed below. A. HP-UX Kernel. B. Essential Commands. C. X Windows, Version 11. D. OSF/ Motif™ User Interface. E. HP Windows/9000. F. Starbase Graphics Library. G. Personal Applications Manager (PAM).
98515B	Media and AXE Documentation for 98515L. <i>Requires option 022 and prior or concurrent purchase of 98515L or 98594L.</i>
Opt. 022	Software on 1/4-inch cartridge tape.
98595L	16-User License-to-Use HP-UX Release 7.0 Application Execution Environment (AXE), as listed under 98515L.
Opt. 003	2-User to 16-User Upgrade. Requires prior purchase of 98515L or 98594L.
98595B	Media and AXE Documentation for 98595L. <i>Requires option 022 and prior or concurrent purchase of 98515L or 98594L.</i>
Opt. 022	Software on 1/4-inch cartridge tape.
98596L	32-User License-to-Use HP-UX Release 7.0 Application Execution Environment (AXE), as listed under 98515L.
Opt. 003	16-User to 32-User Upgrade. Requires prior purchase of 98595L.
98596B	Media and AXE Documentation for 98596L. <i>Requires option 022 and prior or concurrent purchase of 98515L or 98594L.</i>
Opt. 022	Software on 1/4-inch cartridge tape.

™ OSF/Motif is a trademark of the Open Software Foundation.

Product Summary, continued

Product/ Opt. No.	Description
For Series 300 System Processor Units, continued	
98597L	License-to-Use HP-UX Release 7.0 Programming Environment, as listed below. Requires 98515L, 98595L, or 96596L. A. Programming Commands. B. C Compiler. C. MC680x0 Assembler. D. Symbolic Debugger. E. X11 Programming Libraries. F. OSF/Motif™ User Interface. G. RS-232C Communications. H. Device I/O Library. I. Starbase Graphics Library.
98597C	Media and Programming Environment Documentation for 98597L. Requires option 022 and prior or concurrent purchase of 98597L or 98594L.
Opt. 022	Software on 1/4-inch cartridge tape.
98896-87904	HP-UX Programmer's Documentation Set. Provides programmer's information on HP-UX, networking, windows, and graphics.
98594L	2-User License-to-Use HP-UX Release 7.0 Software Bundle, as listed below. A. 98515L Application Execution Environment (AXE) – see list on previous page. B. 98597L Programming Environment (PE) – see list above. C. B1012A Network Services/300 (NS/300). D. B1014A ARPA Services/9000 on the Series 300 (ARPA/300). E. B1013A Network File System Services/300 (NFS/300). F. 98896-87901 General Usage Documentation Set. Contains beginner's guides and the "roadmap" to all other documentation, which briefly describes the contents of each manual.
98594A	Media and 98896-87903 System Administration Documentation Set for 98594L. The System Administration Documentation Set contains installation information for HP-UX and networking and peripherals. 98594A requires option 022 and prior or concurrent purchase of 98594L. 98896-87904 Programmer's Documentation Set is ordered separately.
Opt. 022	Software on 1/4-inch cartridge tape.
98896-87902	Series 300 Advanced General Usage Documentation Set. Provides editing and shells information for advanced general users.
98896-87905	Complete Series 300 HP-UX Documentation Set. Provides all documents in the 98896-87901, -87902, -87903, and -87904 documentation sets.
For Models 370AIC, 370AIM, 15NS, and 25NS	
98594L	2-User License-to-Use HP-UX Release 7.0 Software Bundle is included with the respective models.
98594A	Media and Documentation for 98594L is included with the respective models.
98794A	HP-UX Programmer's Documentation Set is included with the respective models.
For Models 332CMAX, 332MMAX, 360CMAX, and 360MMAX	
98594L	2-User License-to-Use HP-UX Release 7.0 Software Bundle is included with the respective models.
98594A	Media and Documentation for 98594L is included with the respective models.
For Models 3xxC+, 3xxCH, 3xxCHX, 340M, 3xxMH, 3xxSRX, and 3xx TurboSRX	
98594L	2-User License-to-Use HP-UX Release 7.0 Software Bundle is included with the respective models.
For Model 635SV	
92508L	2-User License-to-Use HP-UX Release 7.0 is included with Model 635SV Network Server.
92508A	Media and Documentation for 92508L. Requires option AA0 and prior or concurrent purchase of 92466L.
Opt. AA0	Software on 1/4-inch cartridge tape.
B1155A	License-to-Use X Window System, Media, and Documentation are included with the Model 635SV.
50981A	License-to-Use ARPA Services/800, Media, and Documentation are included with the Model 635SV.
50970A	License-to-Use Network File System (NFS) Services/800, Media, and Documentation are included with the Model 635SV.

HP-UX Operating System, continued

Product Summary, continued

Product/ Opt. No.	Description
For Models 825CHX, 835CHX, 825SRX, 835SRX, 835 TurboSRX, and 835 TurboSRX Animation Superworkstation	
98452L	16-User License-to-Use HP-UX Release 7.0 is included with the respective models.
98452B	Media and System Administration Documentation Set for 98452B are included with the respective models.
B1155A	License-to-Use X Window System, Media, and Documentation are included with the respective models.
50981A	License-to-Use ARPA Services/800, Media, and Documentation are included with the respective models.
92445A	License-to-Use Starbase Graphics Library, Media, and Documentation are included with the Superworkstations.
91787A	License-to-Use Network Services/9000, Media, and Documentation are included with the Superworkstations.
For Models 834CH, 834SRX, and 834 TurboSRX	
92466L	2-User License-to-Use HP-UX Release 7.0 is included with Model 834 Superworkstations.
92466A	Media and Documentation for 92466L. <i>Requires option AA0 or AA1 and prior or concurrent purchase of 92466L.</i>
Opt. AA0	Software on 1/4-inch cartridge tape.
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape.
HP-UX Documentation for Series 600 and 800	
92536A	Series 800 HP-UX General Usage Set, included in 92452A and 92466A.
92537A	Series 800 HP-UX Advanced General Usage Set.
92538A	Series 800 HP-UX System Administration Set, included in 92466A.
92539A	Series 800 HP-UX Programmer's Documentation Set.

Operational Requirements

Description		Requirements			
For Series 300 System					
RAM and Disk Space for HP-UX	Unit	x No. =	RAM	Disk	
Application Execution Environment			2.8 MB	40 MB	
Programming Environment			0.9 MB	65 MB	
X Windows Base, including first window			0.6 MB*	16 MB	
X Windows, per additional window	0.35 MB*	x No. =	___ MB		

* Plus RAM requirements of the local application being accessed via X Windows.

Operational Requirements, continued

Description	Requirements
For Series 300 System, continued	
System Console:	One alpha console is required. The default alpha console is the first found of: • A built-in, HP 98626A, 98628A (not supported by boot ROM), 98642A (port 1), or 98644A RS-232C serial interface with the "remote" switch or jumper on or installed. If more than one is present, the one with the lowest select code is used. • "Internal" bit-mapped display. Plug-in video interfaces set to "external" addresses are always ignored. • HP 98546A compatibility interface, if present. • A built-in, HP 98626A, 98628A, 98642A (port 1), or 98644A RS-232C serial interface with the "remote" switch or jumper off or not installed. If more than one is present, the one with the lowest select code is used. A terminal is presumed to be connected to the selected interface. The default configuration is 9600 bps, 8 bits/char, no parity, 1 stop bit, Xon/Xoff flow control. This may be changed by editing <i>/etc/inittab</i> after HP-UX installation. The system console in HP-UX is used for displaying boot ROM messages and for entering commands during system installation. After HP-UX is installed and running, it uses the console only when in the single-user state or for displaying certain serious error messages; it otherwise functions as an ordinary user terminal. The Series 300 boot ROM, HP-UX install process, and several system administration tools presently assume that a 24 line by 80 character HP <i>term0</i> command set compatible device is being used as the console. For a terminals-only HP-UX system, the lowest-priced supported console is the HP 700/92 (product number C1001A/G/W). There is no supported method for enabling an ignored (non-console) 98546A as an alpha device. Both <i>Starbase</i> and <i>DGL</i> can address any installed graphics display. If a plug-in video interface is designated the console, a kernel process known as the ITE (Internal Terminal Emulator) is attached to it. The ITE provides a sufficient subset of <i>term0</i> simulation on any supported bit-mapped or HP 98546A memory mapped video interface. Only one copy of the ITE process can be active, although the X-Windows system may be dispatched to multiple bit-mapped displays. Only one HP-HIL interface is available on Series 300 systems.
Other Requirements:	Cartridge Tape Subsystem for software installation and backup and disk with at least 150 MB capacity.
Supported Printers for hard copy output:	See Printer Output section (Section 16).
Supported Plotters for hard copy output:	See Graphics Input/Output section (Section 17).
Supported HP-HIL Devices:	See User Communications section (Section 13).
Supported Display Subsystems & Terminals:	See User Communications section (Section 13).
Supported Disks:	See Mass Storage section (Section 14).
Supported Magnetic Tapes:	See Software Installation and Backup section (Section 15).

Operational Requirements, continued

Description		Requirements		
For Model 825/834/835 Superworkstation				
RAM and Disk Space for HP-UX	RAM	SwSP	Disk	
HP-UX Base	8 MB	24 MB	76 MB	
Additional for LAN Link, NFS, and ARPA			13 MB	
Additional for X Windows			8 MB	
Additional for Starbase Graphics			9 MB	
System Console:	One alpha console is required, as follows: ● Keyboard connected to the HP-HIL interface of the display controller and the Superworkstation's bit-mapped display. OR ● HP 700/92 (C1001A/G/W) Terminal or HP 2392A Option S12 (discontinued) Terminal, connected to the system via port 1 of the 98196A Multiplexer Interface.			
Other Requirements:	Magnetic Tape Unit or Cartridge Tape Subsystem for software installation and back-up and disk with at least 304 MB capacity.			
Supported Printers for hard copy output:	See Printer Output section (Section 16).			
Supported Plotters for hard copy output:	See Graphics Input/Output section (Section 17).			
Supported HP-HIL Devices:	See User Communications section (Section 13).			
Supported Display Subsystems & Terminals:	See User Communications section (Section 13).			
Supported Disks:	See Mass Storage section (Section 14).			
Supported Magnetic Tapes:	See Software Installation and Backup section (Section 15).			
For Model 635SV Server Supporting Series 300 Diskless Workstations				
RAM and Disk Space for HP-UX	RAM	SwSP	Disk	
HP-UX with 5 diskless Series 300s	16 MB	96 MB	192 MB	
Per 5 additional diskless Series 300s		+ 60 MB		
Additional for LAN Link, NFS, and ARPA			13 MB	
Additional for X Windows			8 MB	
Additional for Starbase Graphics			9 MB	
System Console:	One alpha console is required, as follows: ● HP 700/92 (C1001A/G/W) Terminal or HP 2392A Option S12 (discontinued) Terminal, connected to the system via port 1 of the 98196A Multiplexer Interface.			
Other Requirements:	Magnetic Tape Unit or Cartridge Tape Subsystem for software installation and back-up and disk with at least 304 MB capacity.			
Supported Printers for hard copy output:	See Printer Output section (Section 16).			
Supported Plotters for hard copy output:	See Graphics Input/Output section (Section 17).			
Supported HP-HIL Devices:	See User Communications section (Section 13).			
Supported Display Subsystems & Terminals:	See User Communications section (Section 13).			
Supported Disks:	See Mass Storage section (Section 14).			
Supported Magnetic Tapes:	See Software Installation and Backup section (Section 15).			

Database Management

A Choice of Two Database Management Systems

The HP Real-Time Database

For Computer Integrated Manufacturing and other uses requiring ultra-fast data capture and retrieval by factory floor cell controllers, Series 300 Systems and 825/834/835 Superworkstations can be provided with the HP Real-Time Database (Figure 4-1, below). The HP Real-Time Database is memory-based to provide fast, deterministic response that avoids the extra delays inherent in disk-based data bases.

Relational Database

Series 300 Systems can be provided with the disk-based HP SQL/300 Development Environment and Model 825/835 Superworkstations can be provided with HP ALLBASE/SQL (Figure 4-2, next page). HP SQL/300 and HP ALLBASE/SQL are both relational access database management systems. Interactive and ad hoc query access for users on Series 300 and 825/834/835 is provided by HP ALLBASE/QUERY, and ALLBASE/4GL can be used for development and execution of transaction processing applications. Both SQL/300 and ALLBASE/SQL provide a standard (ANSI) SQL interface. HP ALLBASE/NET can be used for remote data-

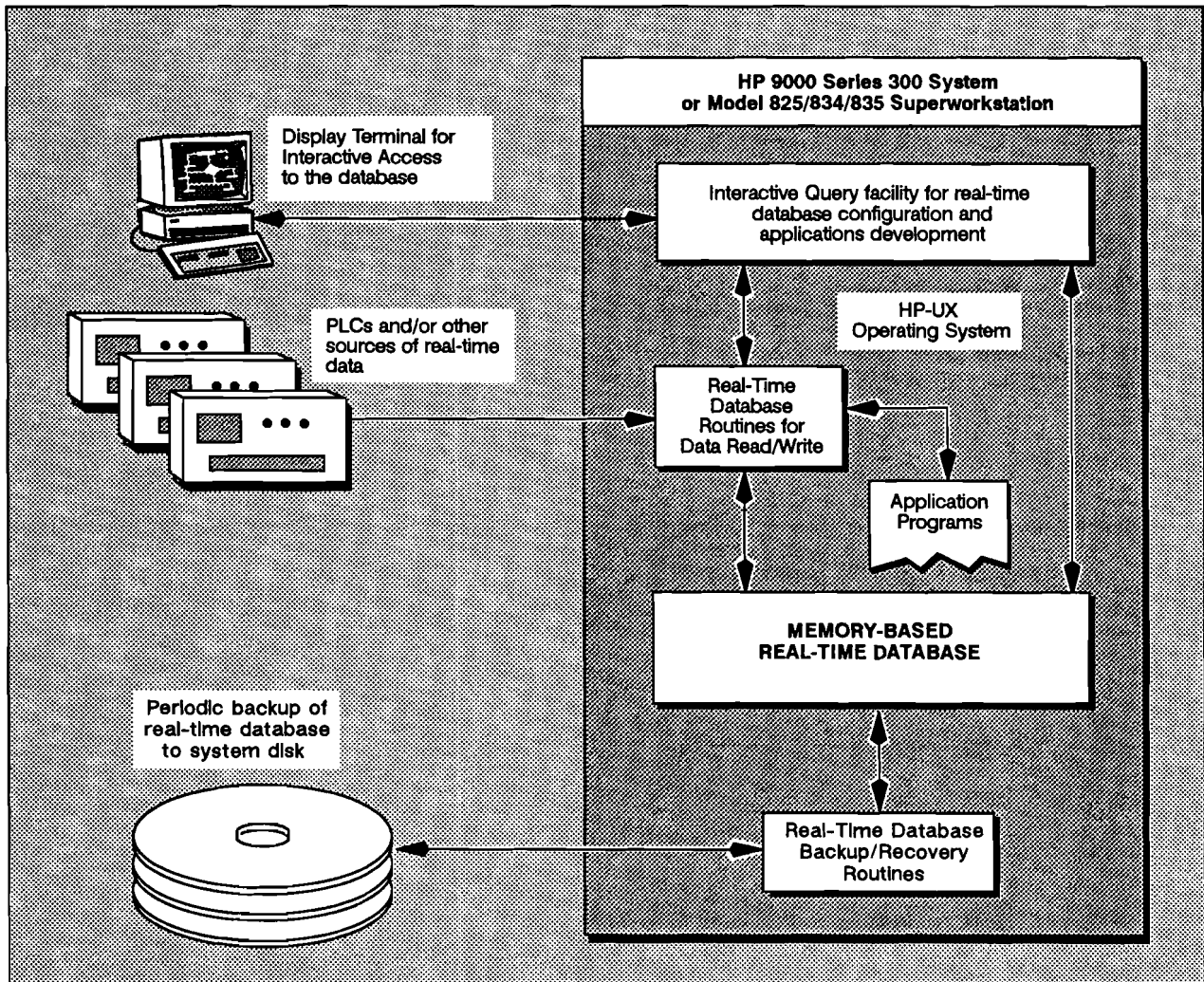


Figure 4-1. The HP Real-Time Database in Series 300 Systems and Model 825/834/835 Superworkstations

Database Management, continued

base access in a Client-Server mode (Figure 4-3, next page). Because they are disk-based, both SQL/300 and HP ALLBASE/SQL are disk-based, they can provide considerably greater capacity than the HP Real-Time Database.

Relational Database Peripheral Requirements

The peripheral devices required for relational data base support are shown in Figure 4-2, below. For guidance on interfacing and selecting terminals, disks, magnetic tape units and cartridge tape subsystems, and printers, respectively, see sections 13, 14, 15, and 16 in this guide.

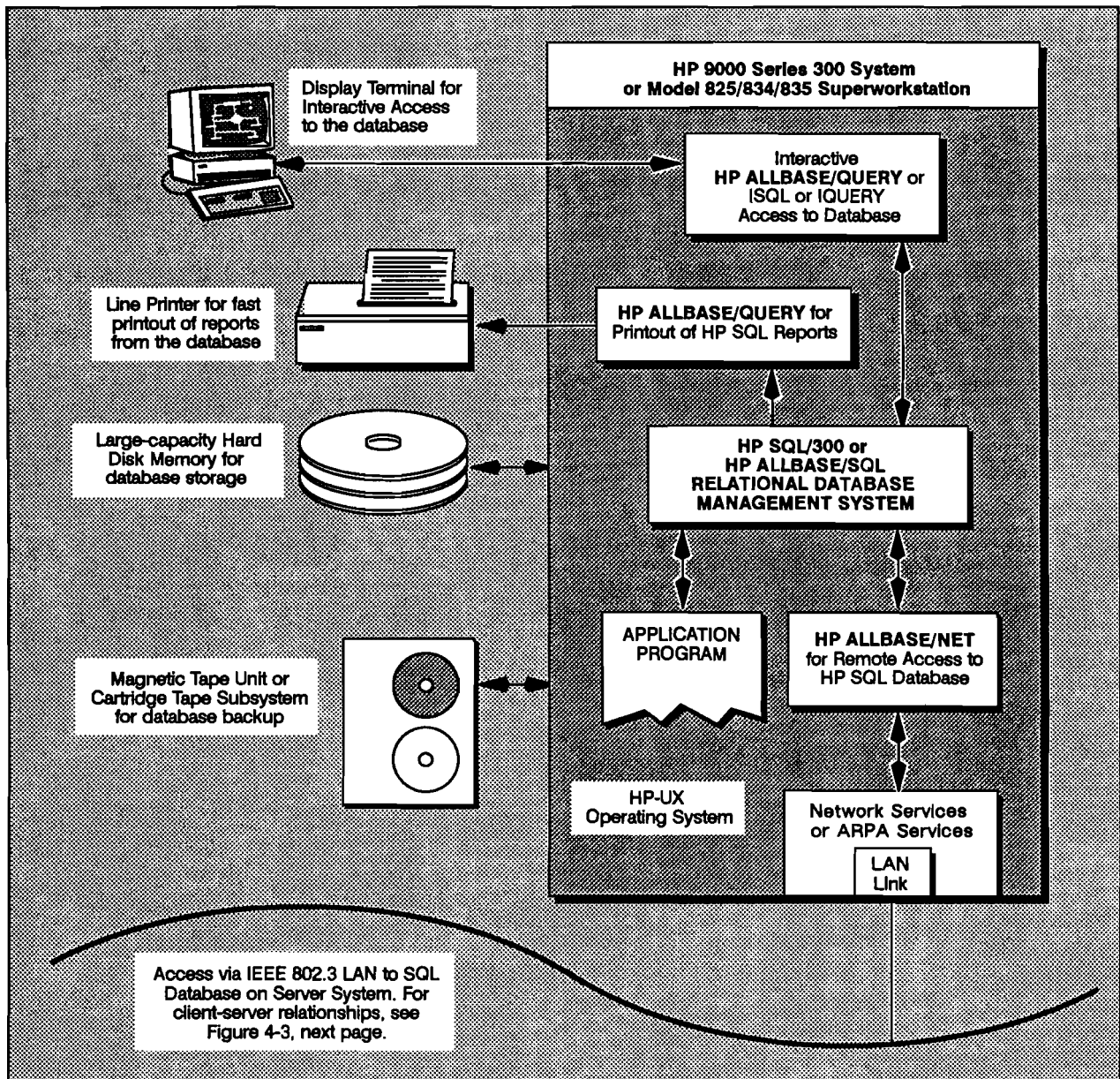


Figure 4-2. The Relational Database in Series 300 Systems and Model 825/834/835 Superworkstations

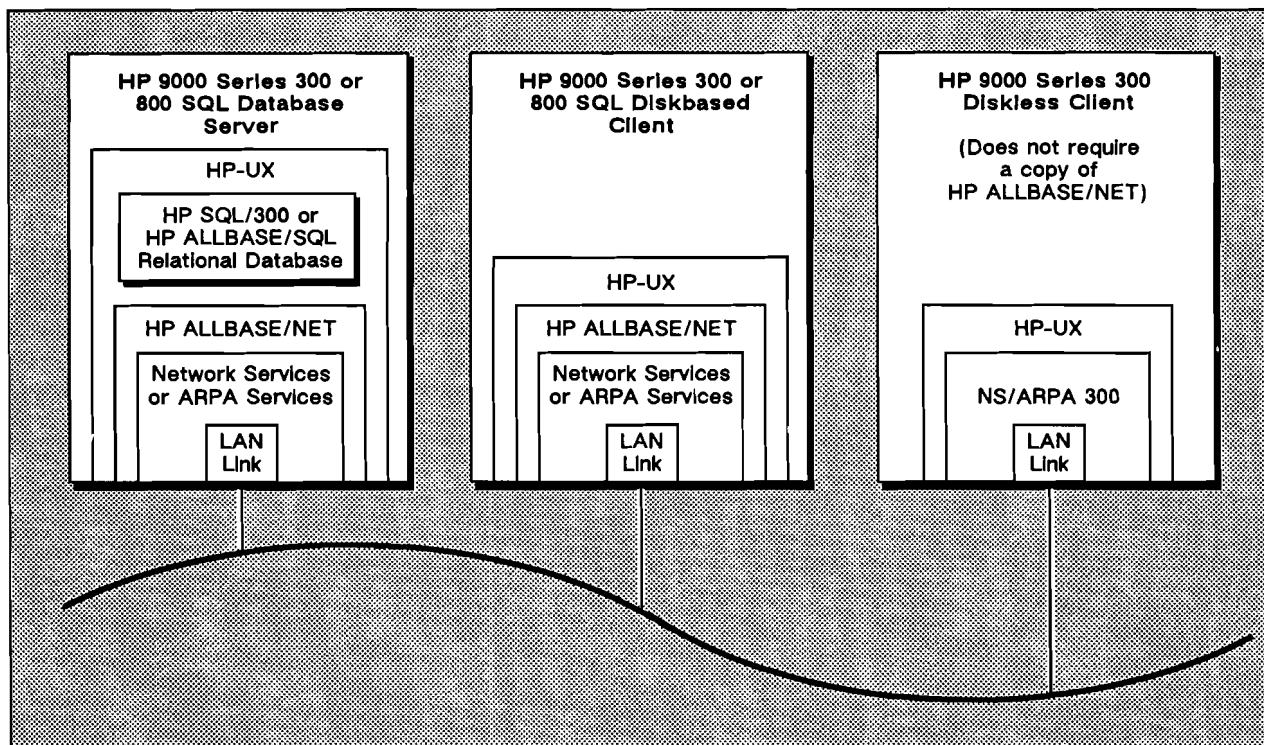


Figure 4-3. HP ALLBASE/NET Access to SQL Database on Server from HP 9000 Client Systems

Product Summary

Product/ Opt. No.	Description
Real-Time Database	
92572A	Real-Time Database, including: A. Software on option AA0 or AA1 media, which must be specified. <i>Must also specify model option AEM or AEQ.</i> B. License-to-Use Real-Time Database. C. Manuals, including self-paced tutorial.
Opt. AA0	Software on 1/4-inch cartridge tape.
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape.
Opt. AEM	Real-Time Database for use on Model 825/835 Superworkstation.
Opt. AEQ	Real-Time Database for use on Series 300 SPU and workstation.
92572R	Right-to-Copy 92572A Real-Time Database software to one system, including: A. Right-to-copy and use Real-Time Database onto one system. <i>Must specify model option AEM or AEQ.</i> B. Manuals, including self-paced tutorial.
Opt. AEM	Right-to-Copy Real-Time Database software to one Model 825/835 Superworkstation.
Opt. AEQ	Right-to-Copy Real-Time Database software to one Series 300 SPU or workstation.
92572E	Right-to-Execute 92572A Real-Time Database software on one system. <i>Must specify model option AEM or AEQ.</i>
Opt. AEM	Right-to-Execute Real-Time Database software on one Model 825/835 Superworkstation.
Opt. AEQ	Right-to-Execute Real-Time Database software on one Series 300 SPU or workstation.

Database Management, continued

Product Summary, continued

Product/ Opt. No.	Description
Relational Database Products for Series 300	
79725L	HP SQL/300 Development Environment License to Use. Requires Media and Documentation: A. SQL Relational Database. B. Language preprocessors for C, FORTRAN, and Pascal programs.
79725B	Media and Documentation for 79725L. Requires option 022 and prior or concurrent purchase of 79725L.
Opt. 022	Software on 1/4-inch cartridge tape.
Opt. 100	Deletes manuals.
98883L	HP SQL/300 Runtime License to Use; language preprocessors are not included. Requires Media and Documentation.
98883B	Media and Documentation for 98883L. Requires option 022 and prior or concurrent purchase of 98883L.
Opt. 022	Software on 1/4-inch cartridge tape.
Opt. 100	Deletes manuals.
79727L	HP ALLBASE/QUERY License to Use on Model 332 or 340. Requires Media and Documentation.
79727B	Media and Documentation for 79727L. Requires option 022 and prior or concurrent purchase of 79727L.
Opt. 022	Software on 1/4-inch cartridge tape.
Opt. 100	Deletes manuals.
79728L	HP ALLBASE/QUERY License to Use on Model 360 or 370. Requires Media and Documentation.
79728B	Media and Documentation for 79728L. Requires option 022 and prior or concurrent purchase of 79728L.
Opt. 022	Software on 1/4-inch cartridge tape.
Opt. 100	Deletes manuals.
98884L	HP ALLBASE/NET. Requires One of User License Options 0AN through 0A5 and Media and Documentation.
Opt. 0AN	1-User License.
Opt. 0AL	1 to 8-User License.
Opt. 0AM	1 to 16-User License.
Opt. 0AO	1 to 32-User License.
Opt. 0A2	1 to 64-User License.
Opt. 0A5	Unlimited User License.
98884B	Media and Documentation for 98884L. Software supplied on 1/4-inch, 16-channel tape cartridge. Requires prior or concurrent purchase of 98884L.
Opt. 100	Deletes manuals.
Relational Database Products for Model 825/834/835 Superworkstations or Model 635SV Network Server	
92460A	HP ALLBASE/SQL with manuals and license-to-use on one system. Must specify media option AA0 or AA1.
Opt. AA0	Software on 1/4-inch cartridge tape.
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape.
92460R	Right-to-Copy 92460A HP ALLBASE/SQL Software to one system (includes manuals).
Opt. 0B0	Deletes manuals.
92534A	HP ALLBASE/QUERY with manuals and license-to-use on one system. Must specify media option AA0 or AA1.
Opt. AA0	Software on 1/4-inch cartridge tape.
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape.
92534R	Right-to-Copy 92534A HP ALLBASE/QUERY Software to one system (includes manuals).
Opt. 0B0	Deletes manuals.



Product Summary, continued

Product/ Opt. No.	Description
Relational Database Products for Model 825/834/835 Superworkstations or Model 635SV Network Server, continued	
92634A	HP ALLBASE/NET with manuals. Must specify one of User License options 0AN through 0A5 and media option AA0 or AA1.
Opt. AA0	Software on 1/4-inch cartridge tape.
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape.
Opt. 0AN Opt. 0AL Opt. 0AM Opt. 0AO Opt. 0A2 Opt. 0A5	1-User License. 1 to 8-User License. 1 to 16-User License. 1 to 32-User License. 1 to 64-User License. Unlimited User License.
Opt. 0B0	Deletes manuals.

Operational Requirements

Description	Requirements						
For Real-Time Database In Series 300 System or Model 825/834/835 Superworkstation							
RAM and Disk Space for Real-Time Database:	RAM	Disk					
Base Requirement	8 MB	1.5 MB					
Query Access	0.5 MB						
Recommended Initial Space for Database	2 MB						
Operating System	HP-UX						
For Relational Database In Series 300 System							
RAM and Disk Space for Relational Database:	Unit	x No. =	RAM	Unit	x No. =	Disk	
HP SQL/300 Base Requirement			3 MB			3 MB	
HP ALLBASE/QUERY Access Per User	1 MB	x ____ =	____ MB	1 MB	x ____ =	____ MB	
Recommended Initial Space for Database						20 MB	
Operating System	HP-UX						
Other Requirements	Terminals for interactive access to database; see Section 13. Printer(s) for hard copy output of report; see Section 16.						
For Relational Database In Model 825/834/835 Superworkstation or Model 635SV Network Server							
RAM and Disk Space for Relational Database:	Unit	x No. =	RAM	Unit	x No. =	Disk	
HP ALLBASE/SQL Base Requirement			3 MB			3 MB	
HP ALLBASE/QUERY Access Per User	1 MB	x ____ =	____ MB	1 MB	x ____ =	____ MB	
Recommended Initial Space for Database						30 MB	
Operating System	HP-UX						
Other Requirements	Terminals for interactive access to database; see Section 13. Printer(s) for hard copy output of report; see Section 16.						

Disk Mirroring

Description

Disk mirroring with DataPair/800 software offers Model 825/835 Superworkstation users with special concern for data protection and high availability of software a means of configuring part or all of their disk storage capacity in mirrored pairs. See Figure 4-4. Maintaining two identical copies of software and data on two separate disks doubles the assurance of availability. Any type of data or software can be mirrored, including the boot and swap disks. Disks can have mirrored and unmirrored sections. Unmirrored disk capacity is available to the system as ordinary disk storage capacity. Due to the restricted configuration of Model 834CH and 834SRX Superworkstations, those superworkstations cannot support disk mirroring.

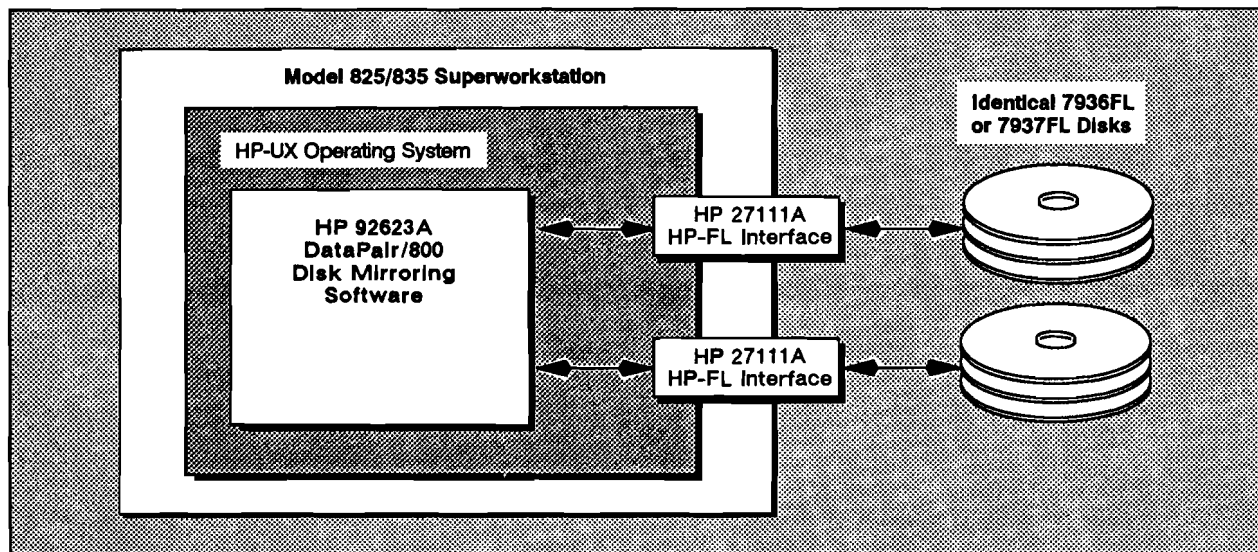


Figure 4-4. DataPair/800 in Model 825/835 Superworkstations

Product Summary

Product/ Opt. No.	Description
HP DataPair/800 Software for Model 825/835 Superworkstation	
92623A	DataPair/800 with License to Use on one Model 825/835 Superworkstation. Requires option AA0 or AA1.
Opt. AA0	Software on 1/4-inch cartridge tape.
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape.
92623R	Right-to-Copy 92623A DataPair/800 software to one additional Model 825/835 Superworkstation.

Operational Requirements

Description	Requirements
For HP DataPair/800 in Model 825/835 Superworkstation operating under HP-UX	
RAM Space for HP DataPair/800:	0.5 MB
Disk Space for HP DataPair/800:	0.3 MB
Supported Disks:	HP 7936FL, 7937FL (or 19521FL, 19522FL, or 19524FL packages of 7937FL Disks).
Disk Matching:	Both disks of a pair must be the same model (both HP 7936FL or both 7937FL).
Interfacing:	Each "half" of the disk pair must connect via its own HP 27111A HP-FL interface.

Application Development

Three Types of Application Development are Available

HP 9000 Systems support three different types of application development, as follows:

- Fast interactive development of screen-based applications in HP-UX based systems using HP ALLBASE/4GL, a fourth-generation language.
- High-level development and testing of cell controller-to-factory floor device communications in Model 825/835 Superworkstations only, using the Device Interface System.
- Conventional program development, using editor, compilers, debugger, etc., which is facilitated by HP SoftBench.

Using HP ALLBASE/4GL

The HP ALLBASE/4GL Developer Pack provides a dictionary, screen painter, logic commands, and report layout facilities for interactive development of screen-based applications for transaction processing or data processing. (See Figure 4-5.) These applications typically interact with HP SQL/300, HP ALLBASE/SQL, or other data bases. An external program interface, with full parameter passing, affords access to existing packages or computationally-intensive code or other code written in conventional program languages. An HP ALLBASE/4GL run-time environment is available for execute-only support of completed HP ALLBASE/4GL applications on target systems.

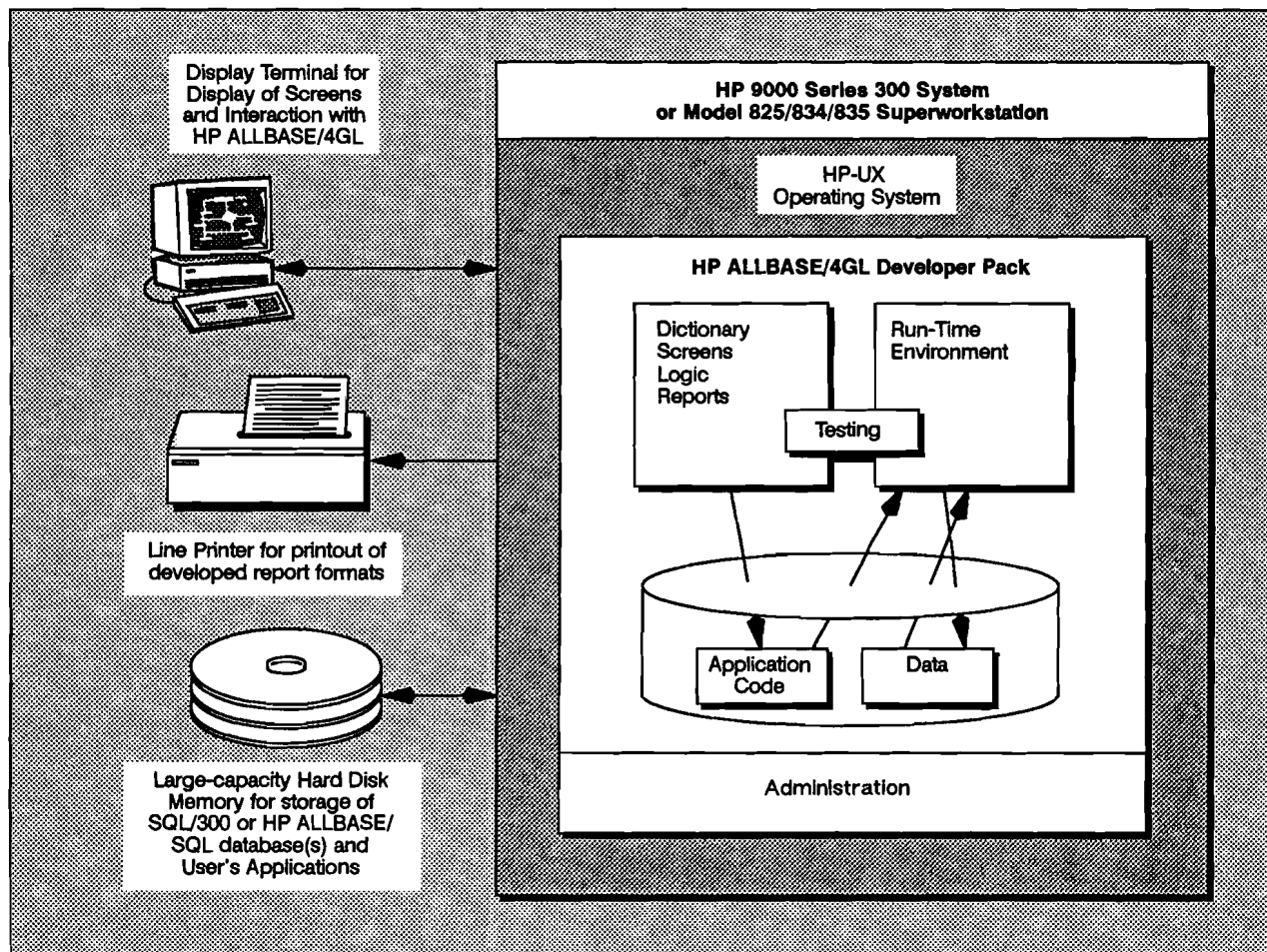


Figure 4-5. HP ALLBASE/4GL in Series 300 Systems and Series 800 Superworkstations

Using the Device Interface System

In Series 800 Superworkstations, the Device Interface System (DIS) supports high-level development of interface subroutines for RS-232C communication between factory floor cell controllers and programmable controllers, robots, vision systems, and other factory floor devices. See Figure 4-6, below.

Development

The DIS shifts the focus of development from detailed coding in C or FORTRAN to specification of protocol. Operating in the world of state transition diagrams, an environment familiar to designers of interfaces, the user simply

describes the "state" table of the communication, using a C-like Protocol Specification Language. The DIS automatically converts this description into a Protocol Interface run time package that includes prepackaged Action Routines which perform most of the protocol interface functions. This library of Action Routines covers the majority of interface requirements; in many cases, the user will not have to develop any new interface code. Overall, this approach reduces device interface development times to one half or one fourth those required without the DIS.

Testing

The protocol description is used by the DIS to automatically generate a suite of tests for the inter-

face. In addition, the DIS automatically creates a documentation of the tests and the operations performed by the interface module. The complete suite of tests is displayed to the user, who can edit them or add other tests, again using a high-level Test Generation Language. An interactive trace facility supports the setting of break points, tracing of test execution, and comparison of actual files to "should be" files. Facilities are included for simulating data communication errors and for simulating the device for which the interface is being written.

Hardware Interface

The DIS currently supports the HP 98196A Multiplexer in Series 800 Superworkstations.

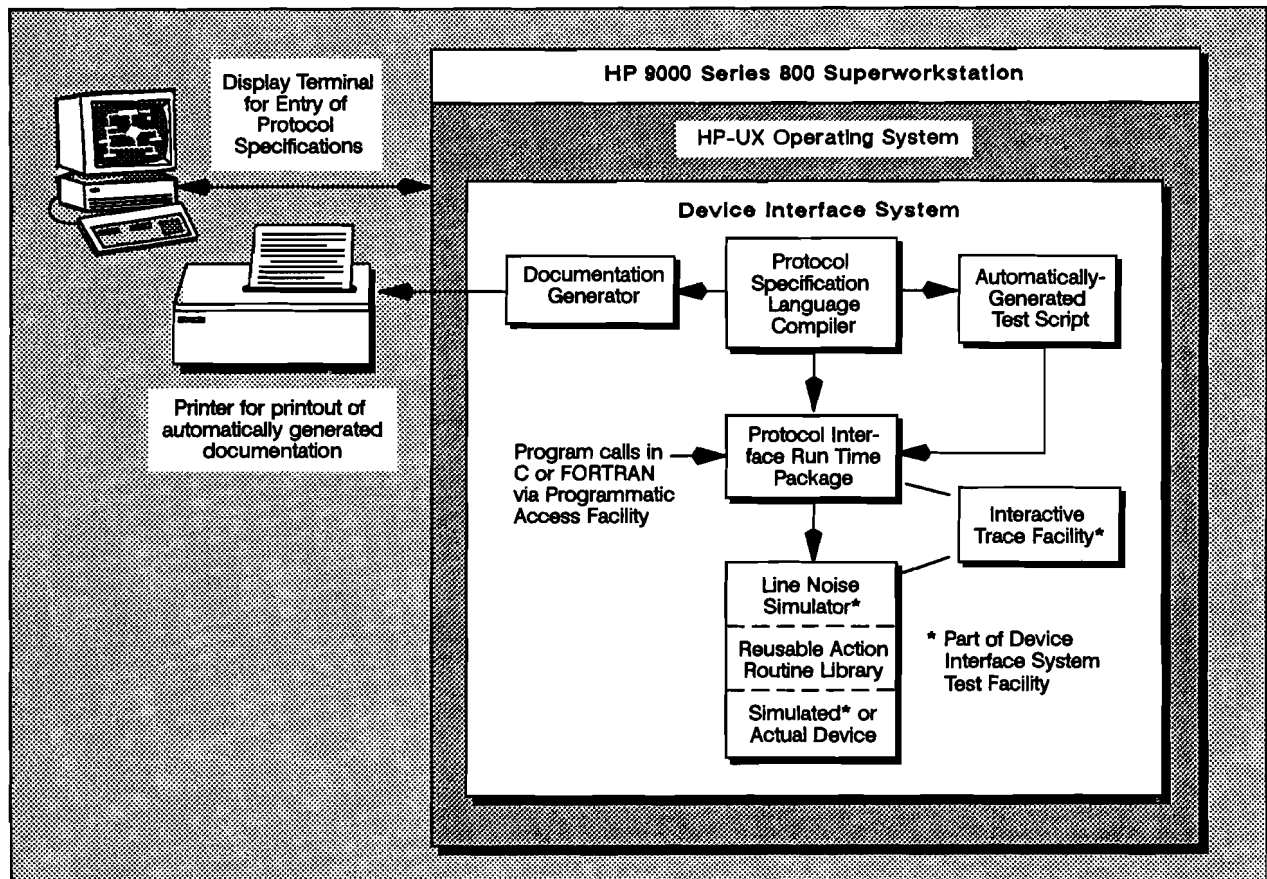


Figure 4-6. Device Interface Systems in Series 800 Superworkstations

Conventional Program Development

The basic requirements for conventional program development are illustrated in Figure 4-7, which also generally outlines the conventional program development process.

Step 1 - Entry of Program Code

A bit-mapped X-Windows display or a terminal is required by each concurrent user for calling up the appropriate program development software from the disk and for

entry, or commanding the entry, of the source program, which may be accomplished via the vi Editor.

Step 2 - Compilation of the Program

Upon initial completion of the program, it must be compiled, assembled, or interpreted to provide an executable program in object (machine) code form. The compilation process often involves printout of a hard copy program listing, which requires some type of system printer, preferably a fast line printer to conserve programmer's time.

Step 3 - Loading and Test Execution

The object program output of the compiler must be tested to confirm that it functions as intended by the programmer. If it does, the program development process can skip directly to step 5, routinely executing the program. However, if there are defects in the program, or if the program takes too much time to execute, some of the other intermediate steps will also have to be taken.

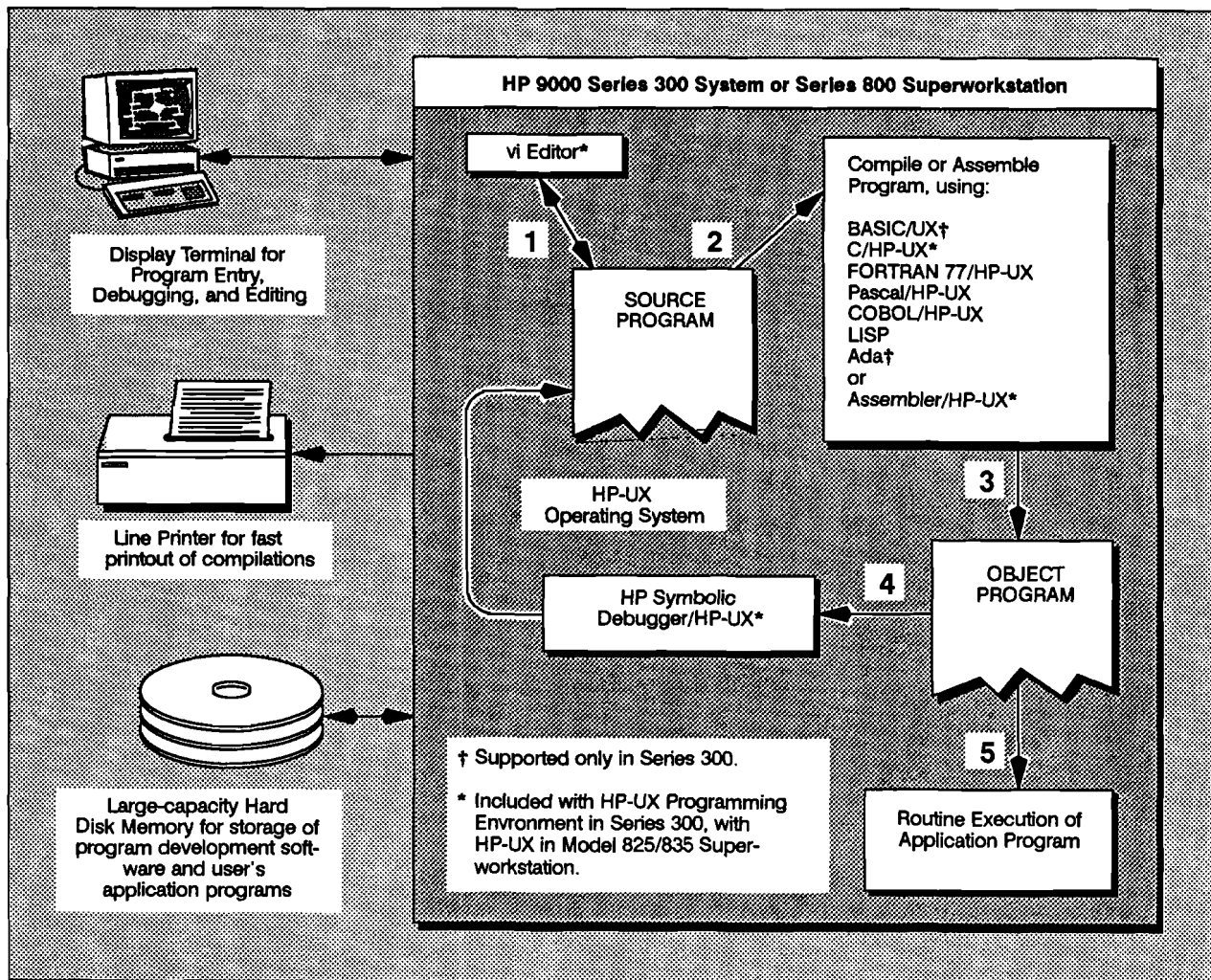


Figure 4-7. Conventional Program Development in Series 300 Systems and Series 800 Superworkstations

Step 4 - Debugging the Program

Program defects need to be isolated and corrected, a process that is aided by the Symbolic Debugger/HP-UX, which is included with the HP-UX Programming Environment in Series 300, with the HP-UX operating system in Model 825/834/835 Superworkstations. Symbolic Debugger/HP-UX is window-oriented and can support multiple panes for viewing source statements and assembly instructions at the same time. It provides controlled execution that facilitates program fault isolation. With corrections made to the source code, it can be recompiled and retested. Symbolic Debugger/HP-UX provides complete support for programs written in C, FORTRAN, Pascal, and Assembly language.

Step 5 - Routine Execution

After debugging and compilation of an error-free program that runs as fast as it needs to, the program development process ends with routine execution of a successful application program.

HP SoftBench

Conventional program development under HP-UX is greatly facilitated in the HP SoftBench window-oriented program development environment for C, FORTRAN, and Pascal. HP SoftBench provides these integrated program development tools:

- Program Editor, an easy-to-use, window-based, language-sensitive editor.
- Program Builder for coordination of compilations of source files.
- Program Debugger, based on the Symbolic Debugger/HP-UX, with a mouse/menu interface added.
- Static Analyzer for determining program structure cross reference information, which facilitates maintenance and re-use of program code.
- Development Manager for all files related to a software project, including version control.
- Mail for easy communication among members of the development team.

HP SoftBench integrates these tools and the compilers they use. It also provides distributed computing services, communication among the tools, OSF/Motif™ appearance and behavior across all tools, and an integrated on-line help facility.

HP Encapsulator

HP Encapsulator affords users the means of extending and customizing the HP SoftBench environment. HP Encapsulator establishes communication between the standard HP SoftBench tools and user-added tools. Tools with a command-line interface can be added to SoftBench with no changes to source code.

Single-User Programming Systems

Two different single-user programming systems are available for Series 300 systems. These are the BASIC/WS system, which supports "Rocky Mountain" BASIC interpretive programming and execution and the Pascal/WS system. These are relatively small, single-user systems with keyboard and monitor that can use flexible disks to perform the functions of software installation and backup.

These systems are also discussed on pages 4-2 through 4-5.

Programming in "Rocky Mountain" BASIC and HP Pascal is supported in the HP-UX multi-user environment by BASIC/UX and the BASIC 5.1 Compiler and by an HP-UX Pascal Compiler.

Product Summary

Product/ Opt. No.	Description
HP ALLBASE/4GL Products for Series 300 Systems	
92471A	HP ALLBASE/4GL Developer Pack for use on Model 332 or 340. Requires option 022.
Opt. 022	Software on 1/4-inch cartridge tape.
98112A	HP ALLBASE/4GL Developer Pack for use on Model 360 or 370. Requires option 022.
Opt. 022	Software on 1/4-inch cartridge tape.
92470A	HP ALLBASE/4GL Run-Time Environment for use on Model 332 or 340. Requires option 022.
Opt. 022	Software on 1/4-inch cartridge tape.
98118A	HP ALLBASE/4GL Run-Time Environment for use on Model 360 or 370. Requires option 022.
Opt. 022	Software on 1/4-inch cartridge tape.
HP ALLBASE/4GL Products for Series 800 Superworkstations	
35305A	HP ALLBASE/4GL Developer Pack. Requires option AA0 or AA1.
Opt. AA0	Software on 1/4-inch cartridge tape.
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape.
36362A	HP ALLBASE/4GL Developer Pack, HP ALLBASE/SQL, and HP ALLBASE/QUERY. Requires option AA0 or AA1.
Opt. AA0	Software on 1/4-inch cartridge tape.
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape.
35306A	HP ALLBASE/4GL Run-Time Environment. Requires option AA0 or AA1.
Opt. AA0	Software on 1/4-inch cartridge tape.
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape.
Device Interface System Products for Model 825/835 Superworkstations	
92580A	Device Interface System with license to use on one system. Requires options AEM and AA0 or AA1.
Opt. AEM	Use on 825/835 System.
Opt. AA0	Software on 1/4-inch cartridge tape.
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape.
92580R	Right-to-Copy 92580A software to one additional system. Requires option AEM.
Opt. AEM	Use on 825/835 System.
92580E	Right-to-Execute 92580A run-time package on one additional system. Requires option AEM.
Opt. AEM	Use on 825/835 System.
BASIC Language Software for Series 300 Systems	
98796L	BASIC/UX License-to-Use. Media and Documentation must be available for software installation. NOTE: 98796L is included in Models 332CMAX, 332MMAX, 360CMAX, and 360MMAX. 98768A Includes: A. BASIC Development Environment. B. BASIC Compiler. C. CSUB Development Utilities.
98796A	Media and Documentation for 98796L. Requires prior or concurrent purchase of 98796L and option 022. NOTE: 98796A is included in Models 332CMAX, 332MMAX, 360CMAX, and 360MMAX.
Opt. 022	Software on 1/4-inch cartridge tape.

Application Development, continued

Product Summary, continued

Product/ Opt. No.	Description
BASIC Language Software for Series 300 Systems, continued	
97066L	HP-UX Technical BASIC License-to-Use. Includes Interpreter and Run-Time Environment. Media and Documentation must be available for software installation.
97066B	Media and Documentation for 97066L. Requires prior or concurrent purchase of 97066L and option 022.
Opt. 022	Software on 1/4-inch cartridge tape.
98616A	RAM-based HP BASIC/WS 5.1 (see page 4-2).
98618A	BASIC 5X Compiler for use with BASIC/WS (see page 4-2).
Ada Software for Series 300 Systems	
98860L	HP Ada/300 Development System License-to-Use. Requires Media and Documentation.
98860A	Media and Documentation for 98860L. Requires prior or concurrent purchase of 98860L and option 022.
Opt. 022	Software on 1/4-inch cartridge tape.
COBOL Development Products for Series 300 Systems	
35322A	COBOL/HP-UX Developer Package for Models 332 and 340, including: A. COBOL/HP-UX Compiler. B. ANIMATOR Debugging Tool. C. FORMS-2 Screen Generator. D. COBOL/HP-UX Run-Time System. E. Manual Set. F. Software on 1/4-inch, 16-channel cartridge tape.
35338A	COBOL/HP-UX Developer Package, as above, but for Models 360 and 370.
Opt. 0C7	Upgrade from use on Model 310, 320, 330, 332, or 340 System.
35334A	COBOL/HP-UX Compiler for Models 332 and 340, including: A. COBOL/HP-UX Compiler. B. COBOL/HP-UX Run-Time System. C. Manual Set. D. Software on 1/4-inch cartridge tape.
35339A	COBOL/HP-UX Compiler, as above, but for Models 360 and 370.
Opt. 0C7	Upgrade from use on Model 310, 320, 330, 332, or 340 System.
35323A	COBOL/HP-UX Run-Time System for Models 332 and 340, including: A. COBOL/HP-UX Run-Time System. B. Software on 1/4-inch cartridge tape.
35340A	COBOL/HP-UX Run-Time System, as above, but for Models 360 and 370.
Opt. 0C7	Upgrade from use on Model 310, 320, 330, 332, or 340 System.
Other Software Development Products for Series 300 Systems	
98688L	HP Common LISP II Development Environment License-to-Use. Requires Media and Documentation. NOTE: 98688L is included in Models 370AIC and 370AIM.
98688B	Media and Documentation for 98688L. Requires prior or concurrent purchase of 98688L and option 022. NOTE: 98688L is included in Models 370AIC and 370AIM.
Opt. 022	Software on 1/4-inch cartridge tape.
98689L	HP Common LISP II Application Environment License-to-Use. Requires Media and Documentation.
98689B	Media and Documentation for 98689L. Requires prior or concurrent purchase of 98689L and option 022.
Opt. 022	Software on 1/4-inch cartridge tape.

Product Summary, continued

Product/ Opt. No.	Description
98598L	HP-UX FORTRAN 77 Compiler License-to-Use. <i>Requires Media and Documentation.</i>
98598B	Media and Documentation for 98598L. <i>Requires prior or concurrent purchase of 98598L and option 022.</i>
Opt. 022	Software on 1/4-inch cartridge tape.
98599L	HP-UX Pascal Compiler License-to-Use. <i>Requires Media and Documentation.</i>
98599B	Media and Documentation for 98599L. <i>Requires prior or concurrent purchase of 98599L and option 022.</i>
Opt. 022	Software on 1/4-inch cartridge tape.
COBOL Development Products for Series 800 Superworkstations	
35328A	COBOL/HP-UX Developer Package. <i>Requires option AA0 or AA1 and includes:</i> A. COBOL/HP-UX Compiler. B. ANIMATOR Debugging Tool. C. FORMS-2 Screen Generator. D. COBOL/HP-UX Run-Time System. E. Manual Set.
Opt. AA0	Software on 1/4-inch cartridge tape.
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape.
35335A	COBOL/HP-UX Compiler. <i>Requires option AA0 or AA1 and includes:</i> A. COBOL/HP-UX Compiler. B. COBOL/HP-UX Run-Time System. C. Manual Set.
Opt. AA0	Software on 1/4-inch cartridge tape.
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape.
35323A	COBOL/HP-UX Run-Time System. <i>Requires option AA0 or AA1.</i>
Opt. AA0	Software on 1/4-inch cartridge tape.
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape.
Other Software Development Products for Series 800 Superworkstations	
92447A	Development Pack consisting of FORTRAN 77, Pascal, and Starbase and DGL/AGP Graphics Libraries. <i>Requires option AA0 or AA1.</i>
Opt. AA0	Software on 1/4-inch cartridge tape.
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape.
98443A	FORTTRAN 77/HP-UX Compiler with License-to-Use on one system. <i>Requires option AA0 or AA1.</i>
Opt. AA0	Software on 1/4-inch cartridge tape.
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape.
98443R	Right-to-Copy 92443A FORTRAN 77/HP-UX Compiler to one additional system.
98444A	Pascal/HP-UX Compiler with License-to-Use on one system. <i>Requires option AA0 or AA1.</i>
Opt. AA0	Software on 1/4-inch cartridge tape.
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape.
98444R	Right-to-Copy 92444A Pascal/HP-UX Compiler to one additional system.
92640A	LISP/800 Development System. <i>Requires option AA0 or AA1.</i>
Opt. AA0	Software on 1/4-inch cartridge tape.
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape.
92640R	Right-to-Copy 92640A LISP/800 Development System to one additional system.

Application Development, continued

Product Summary, continued

Product/ Opt. No.	Description
92641A	LISP/800 Application Environment. <i>Requires option AA0 or AA1.</i>
Opt. AA0	Software on 1/4-inch cartridge tape.
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape.
92641R	Right-to-Copy 92640A LISP/800 Application Environment to one additional system.
Other Software Development Products for Model 825/834/835 Superworkstations, continued	
28671A	Real-Time Interface Developer's Kit with License-to-Use on one system. <i>The Real-Time Interface is NOT included. Requires options AEM and AA0 or AA1.</i>
Opt. AEM	Use on 825/834/835 System.
Opt. AA0	Software on 1/4-inch cartridge tape.
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape.
28671R	Right-to-Copy 28671A Real-Time Interface Developer's Kit to one additional system. <i>Requires option AEM.</i>
Opt. AEM	Use on 825/834/835 System.
HP SoftBench and HP Encapsulator for Series 300 Systems	
B1621A	License-to-Use HP SoftBench/300. <i>Requires one of options 0AN, 0A9, 0AG, or 0AA and includes:</i> A. Program Editor. D. Static Analyzer. G. Tool Integration Platform. B. Program Builder. E. Development Manager. C. Program Debugger. F. Mail.
Opt. 0AN	1-Seat License.
Opt. 0A9	10-Seat License.
Opt. 0AG	25-Seat License.
Opt. 0AA	50-Seat License.
B1622A	Media and Manuals for B1621A. <i>Requires prior or concurrent purchase of B1621A. Requires option AA0.</i>
Opt. AA0	Software on 1/4-inch cartridge tape.
B1629A	HP SoftBench Documentation Kit.
B1625A	License-to-Use HP Encapsulator/300.
B1626A	Media and Manuals for B1625A. <i>Requires prior or concurrent purchase of B1625A. Requires option AA0.</i>
Opt. AA0	Software on 1/4-inch cartridge tape.
HP SoftBench and HP Encapsulator for Model 825/834/835 Superworkstations	
B1623A	License-to-Use HP SoftBench/800. <i>Requires one of options 0AN, 0A9, 0AG, or 0AA and includes:</i> A. Program Editor. D. Static Analyzer. G. Tool Integration Platform. B. Program Builder. E. Development Manager. C. Program Debugger. F. Mail.
Opt. 0AN	1-Seat License.
Opt. 0A9	10-Seat License.
Opt. 0AG	25-Seat License.
Opt. 0AA	50-Seat License.
B1624A	Media and Manuals for B1623A. <i>Requires prior or concurrent purchase of B1623A. Requires either option AA0 or AA1.</i>
Opt. AA0	Software on 1/4-inch cartridge tape.
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape.
B1629A	HP SoftBench Documentation Kit.

Product Summary, continued

Product/ Opt. No.	Description
B1627A	License-to-Use HP Encapsulator/800.
B1628A	Media and Manuals for B1627A. Requires prior or concurrent purchase of B1627A. Requires either option AA0 or AA1.
Opt. AA0	Software on 1/4-inch cartridge tape.
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape.

Operational Requirements

Description	Requirements					
For HP ALLBASE/4GL in Series 300 System operating under HP-UX						
RAM and Disk Space for HP ALLBASE/4GL:	RAM	SwSP	Disk			
Developer Pack:	3 MB	8 MB	8 MB			
Run-Time Environment:	2 MB		4 MB			
Recommended Space for Applications:			1 MB			
Other Requirements:	Monitor and keyboard or any <i>term0</i> terminal listed in Section 13 and any of the printers listed in Section 16.					
For HP ALLBASE/4GL in Model 825/834/835 Superworkstation operating under HP-UX						
RAM and Disk Space for HP ALLBASE/4GL:	RAM	SwSP	Disk			
Developer Pack:	3 MB	8 MB	12 MB			
Run-Time Environment:	2 MB		5 MB			
Recommended Space for Applications:			1 MB			
Other Requirements:	Monitor and keyboard or any <i>term0</i> terminal listed in Section 13 and any of the printers listed in Section 16.					
For Device Interface System in Model 825/834/835 Superworkstation operating under HP-UX						
RAM & Disk Space for Device Interface System:	Unit	x No. =	RAM	Disk		
For Application Development:			2 MB	5 MB		
Run Time (Base):			0.27 MB			
Run Time (Per Port):	0.35 MB	x ____ =	____ MB			
Recommended Space for Applications:				1 MB		
Other Requirements	98196A 6-Channel Multiplexer, monitor and keyboard or any RS-232C terminal listed in Section 13 and any of the printers listed in Section 16.					
For Ada Program Development in Series 300 System operating under HP-UX						
RAM & Disk Space for Ada/300:	RAM	SwSP	Unit	x No. =	Disk	
Base Requirement:	8 MB*	30 MB			46 MB	
Per User:			40 MB	x ____ =	____ MB	
Other Requirements	Monitor and keyboard or any RS-232C terminal listed in Section 13 and any of the printers listed in Section 16.					

* Including HP-UX, X-Windows, and NFS.

Operational Requirements, continued

Description		Requirements				
For BASIC Language Program Development in Series 300 System operating under HP-UX						
RAM & Disk Space for BASIC/UX Software:	Unit	x No. =	RAM	SwSP	Disk	
Base Requirement:			2.5 MB	10 MB	4.5 MB	Requires only AXE
Per User†:	2.5 MB	x ____ =	____ MB			
CSUB Creation Facility and Utilities:					1.3 MB	Requires AXE & PE
Other Requirements	Monitor & keyboard or any RS-232C terminal listed in Section 13 and any of the printers listed in Section 16.					
For COBOL Program Development in Series 300 System operating under HP-UX						
RAM and Disk Space for COBOL/HP-UX:	Unit	x No. =	RAM	SwSP	Disk	
Developer Package:			n/s	n/s	n/s	
Per User:	n/s	x ____ =	n/s			
Run-Time Environment:			n/s		n/s	
Other Requirements:	Monitor and keyboard or any RS-232C terminal listed in Section 13 and any of the printers listed in Section 16.					
For COBOL Program Development in Model 825/834/835 Superworkstation operating under HP-UX						
RAM and Disk Space for COBOL/HP-UX:	Unit	x No. =	RAM	SwSP	Disk	
Developer Package:			n/s	n/s	n/s	
Per User:	n/s	x ____ =	n/s			
Run-Time Environment:			n/s		n/s	
Other Requirements:	Monitor and keyboard or any RS-232C terminal listed in Section 13 and any of the printers listed in Section 16.					
For Common LISP II Program Development in Series 300 System operating under HP-UX						
Supported Models:	Any Series 300, except Model 310.					
Recommended Models:	Model 360 or 370.					
RAM and Disk Space for Common LISP II:	RAM	SwSP	Disk			
Development Environment:	16 MB*	30 MB	100 MB			
Application Environment:	16 MB†	30 MB	66 MB			
Recommended Space for Applications:			100 MB			
Other Requirements:	Color or Monochrome Monitor with 1024 by 768 or 1280 by 1024 resolution, interfaced by 98548A, 98549A, or 98550A video board for developing window-based applications or any RS-232C terminal listed in Section 13.					

† Max. of 4 users in Model 370, 3 users in Model 360.

* Recommended, including HP-UX Application Execution and Programming Environments and NS-ARPA.

† Recommended, including HP-UX Application Execution Environment.

n/s = not specified

Operational Requirements, continued

Description		Requirements				
For FORTRAN 77 Program Development in Series 300 System operating under HP-UX						
RAM & Disk Space for FORTRAN 77/HP-UX:	Unit	x No. =	RAM	SwSP	Disk	
Base Requirement:			4 MB	4 MB	2.7 MB	
Per User:	1 MB	x ____ =	____ MB			
Other Requirements:	Monitor and keyboard or any RS-232C terminal listed in Section 13 and any of the printers listed in Section 16.					
For FORTRAN 77 Program Development in Model 825/834/835 Superworkstation operating under HP-UX						
RAM & Disk Space for FORTRAN 77/HP-UX:	Unit	x No. =	RAM	SwSP	Disk	
Base Requirement:			n/s	n/s	n/s	
Per User:	n/s	x ____ =	n/s			
Other Requirements:	Monitor and keyboard or any RS-232C terminal listed in Section 13 and any of the printers listed in Section 16.					
For Pascal Program Development in Series 300 System operating under HP-UX						
RAM and Disk Space for Pascal/HP-UX:	Unit	x No. =	RAM	SwSP	Disk	
Base Requirement:			n/s	n/s	n/s	
Per User:	n/s	x ____ =	n/s			
Other Requirements:	Monitor and keyboard or any RS-232C terminal listed in Section 13 and any of the printers listed in Section 16.					
For Pascal Program Development in Model 825/834/835 Superworkstation operating under HP-UX						
RAM and Disk Space for Pascal/HP-UX:	Unit	x No. =	RAM	SwSP	Disk	
Base Requirement:			n/s	n/s	n/s	
Per User:	n/s	x ____ =	n/s			
Other Requirements:	Monitor and keyboard or any RS-232C terminal listed in Section 13 and any of the printers listed in Section 16.					
For Common LISP II Program Development in Model 825/834/835 Superworkstation operating under HP-UX						
RAM and Disk Space for Common LISP II:	Unit	x No. =	RAM	SwSP	Disk	
Development Environment:			16 MB	40 MB	100 MB	
Per User:	____ MB	x ____ =	____ MB			
Application Environment:			8 MB†	30 MB	50 MB	
Recommended Space for Applications:					100 MB	
Other Requirements:	Color Monitor with 1024 by 768 or 1280 by 1024 resolution, interfaced via A1017A display controller interface and A1020H Display Controller for developing window-based applications, or any RS-232C terminal listed in Section 13.					

n/s = not specified

Operational Requirements, continued

Description		Requirements			
For HP SoftBench in Standalone Disk-Based System operating under HP-UX					
Recommended Series 300 Models:	340, 360, 370 (C + /CH/CHX/M/MH/SRX/TurboSRX)				
Recommended Series 800 Models:	825, 835, (CHX/SRX/TurboSRX) NOTE A				
Display Resolution:	768 by 1024, mininum, 1024 by 1280 preferred				
RAM and Disk Space Requirements:	RAM	SwSP	Disk		
HP SoftBench for Series 300:	12 MB*		5 MB		
HP SoftBench for Series 800:	16 MB*		4.5 MB		
HP Encapsulator for Series 300 or 800:			1 MB		
Swap Space for Series 300:		40 MB*			
Swap Space for Series 800:		50 MB*			
Software Requirements:	HP-UX 7.0, including programming environment, X Windows, Version 11 with OSF Motif™, and LAN/9000 Link.				
Other Requirements:	46060A 2-button mouse.				
For HP SoftBench in Series 300 Single-User Diskless Workstation operating under HP-UX					
Recommended Models:	340, 360, 370 (C + /CH/CHX/M/MH/SRX/TurboSRX)				
Display Resolution:	768 by 1024, mininum, 1024 by 1280 preferred				
RAM Space for HP SoftBench:	12 MB*				
Software Requirements:	HP-UX 7.0, including programming environment, X Windows, Version 11 with OSF Motif™, LAN/9000 Link, ARPA Services, and NFS.				
Other Requirements:	46060A 2-button mouse.				
For HP SoftBench in Diskless Cluster Server					
Recommended Models:	25NS, NOTE A				
RAM and Disk Space Requirements:	RAM	Unit	x No. =	SwSP	Disk
HP SoftBench for Series 300:	16 MB*				5 MB
HP SoftBench for Series 800:	32 MB*				4.5 MB
HP Encapsulator for Series 300 or 800:					1 MB
Swap Space per Diskless Workstation:		40 MB*	x ____ =	____ MB	
Swap Space for Series 300 Server:				40 MB*	
Swap Space for Series 800 Server:				50 MB*	
Software Requirements:	HP-UX 7.0, including programming environment, X Windows, Version 11 with OSF Motif™, LAN/9000 Link, ARPA Services, and NFS.				

NOTE A: Model 834 Superworkstations and Model 635SV Servers have not been tested with SoftBench, but are expected to support it without reservation when testing is completed.

* Includes requirements for HP-UX and X-Windows in addition to HP SoftBench.

PC Emulation

Two Ways to Support MS-DOS Applications in HP 9000 Systems

Users can support MS-DOS applications on both HP 9000 Series 300 systems and Series 800 Superworkstations operating under HP-UX. Series 300 systems support both a DOS Coprocessor (a DIO Accessory card with related DOS Coprocessor emulation software) and SoftPC® Synthetic Hardware (MS-DOS system emulation software). Series 800 Superworkstations and the Model 635SV Network Server support SoftPC. HP 9000 systems can thus provide access to an MS-DOS environment that can run the thousands of applications that are available for the IBM PC family. This can include access from an X-Window display server via LAN to an X Client workstation containing the PC Emulation software. Peripheral devices connect via the host system/Superworkstation's interfaces, as shown in Figure 4-8. For more information, see the HP-UX/DOS Integration Products General Information Manual, 5952-6345 or a later revision.

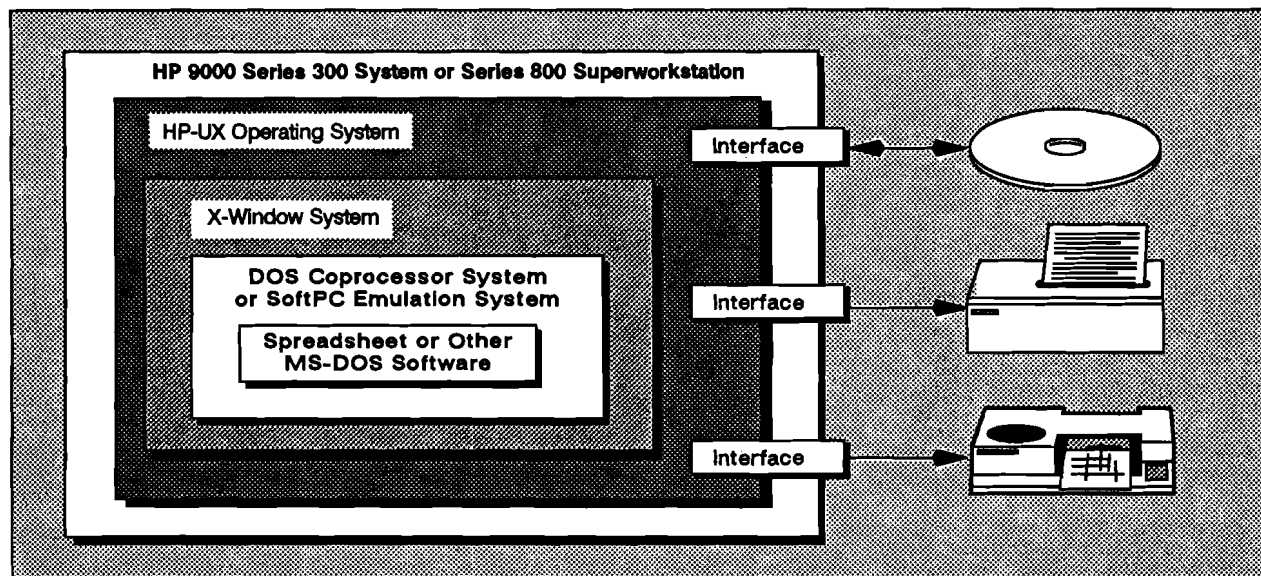


Figure 4-8. PC Emulation in HP 9000 Series 300 Systems or Series 800 Superworkstations

Product Summary

Product/ Opt. No.	Description
PC Emulation Products for Series 300 Systems	
98286A	DOS Coprocessor (DIO Accessory) Board. Requires 98531A DOS Coprocessor Software and Documentation.
98531A	DOS Coprocessor Software and Documentation for 98286A DOS Coprocessor. Requires option 022.
Opt. 022	Software on 1/4-inch cartridge tape.
98286D	DOS Coprocessor Diskless Node Kit. A. 98286A DOS Coprocessor Board. B. License-to-Use 98531A DOS Coprocessor Software. C. Manuals.
Opt. 100	Deletes manuals.
98286S	DOS Coprocessor System. Requires option 022. A. 98286A DOS Coprocessor Board. B. 98531A DOS Coprocessor Software, including manuals.
Opt. 022	Software on 1/4-inch cartridge tape.
D1387A	Numeric Coprocessor for 98286A DOS Coprocessor Board.

PC Emulation continued

Product Summary, continued

Product/ Opt. No.	Description
PC Emulation Products for Series 300 Systems, continued	
98870L	License-to-Use SoftPC PC Emulation Software. <i>SoftPC Software and Documentation must be available for installation.</i>
98870A	SoftPC Rev. 1.3 Software (on 1/4-inch cartridge tape) and Documentation for 98870L. <i>Requires prior or concurrent purchase of 98870L. and HP-UX 6.2 or 6.5.</i>
98870B	SoftPC Rev. 2.0 Software (on 1/4-inch cartridge tape) and Documentation for 98870L. <i>Requires prior or concurrent purchase of 98870L. and HP-UX 6.5.</i>
PC Emulation Products for Model 825/835 Superworkstations	
98876A	SoftPC PC Emulation Software, including License-to-Use on one system and Documentation. <i>Requires option AA0 or AA1.</i>
Opt. AA0	Software on 1/4-inch cartridge tape.
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape.
98876R	Right-to-Copy 98876A SoftPC PC Emulation Software to one additional system (includes manuals).
Opt. 0B0	Deletes manuals.

Operational Requirements

Description	Requirements		
PC Emulation System operating under HP-UX			
Supported in:	Models 332, 340, 360, and 370.		
Backplane slot (DOS Coprocessor only):	One DIO Accessory or I/O slot; in Model 340, will require option 006; in Model 360 or 370, will require a 98242A/B DIO Backplane or a 98568A Option 132 or 98570A Expander.		
RAM and Disk Space:	RAM	Disk	
DOS Coprocessor software:	8 MB†	5 MB	
Base Memory for Emulated PC	0.6 MB		
Video Interfaces that support CGA, HCG, and EGA* PC Display Emulation:	Model 332 built-in monochrome video interface*, HP 98542A*, 98543A*, 98544B, 98545A, 98547A, 98548A*, 98549A, 98550A, 98720A*, and 98730A.		
Supported Flexible Disks:	HP 9122C 3.5-Inch Flexible Disk as 720 KB or 1.44 MB drive A or B or 9127A 5.25-inch Flexible Disk as 360 KB drive A.		
Mouse Support:	HP 46060A or B two- or three-button mouse can automatically emulate the Micro-Soft mouse.		
Recommended Printers for MS-DOS Use:	HP 2225D RS-232C ThinkJet, 2227B HP-IB QuietJet, 2276A RS-232C DeskJet, and 33440A LaserJet.		
Recommended Plotters for MS-DOS Use:	Any of the plotters listed in Graphics Input/Output section 18.		

† 8 MB is total RAM required by the system, including that required by HP-UX and X Windows.

* Model 332 Monochrome video interface and HP 98542A, 98543A, 98548A, and 98720A do not support EGA Emulation.

Operational Requirements, continued

Description	Requirements		
SoftPC Emulation System operating under HP-UX			
Supported in:	All Series 300, except the Model 310, and Series 800 Superworkstations.		
RAM and Disk Space:	RAM	Disk	
X-Windows version of SoftPC software:	8 MB†	5 MB	
Terminal version of SoftPC software:	8 MB†	4.5 MB	
Both versions of SoftPC software:	8 MB†	7 MB	
Base Memory for Emulated PC	0.6 MB		
Video Interfaces that support CGA, HCG, and EGA* PC Display Emulation:	HP 98542A*, 98543A*, 98544B, 98545A, 98547A, 98548A*, 98549A, 98550A, 98720A*, 98730A, and A1020H.		
Supported Flexible Disks:	HP 9122C 3.5-inch Flexible Disk as 720 KB or 1.44 MB drive A or B or HP 9127A 5.25-inch Flexible Disk as 360 KB drive A; Slave PC software provided with SoftPC supports file migration from PCs to HP 9000s via RS-232C interface, eliminating a requirement for an HP 9127A Disk for use in file transfer.		
Supported Terminals:	HP 2392A°, 2393A, 2397A, 700/44 (C1007A/G/W), 700/92 (C1001A/G/W), and 700/94 (C1002A/G/W) have been tested and are supported; though not tested or supported, other HP terminals should also work.		
Mouse Support:	HP 46060A or B two- or three-button mouse can automatically emulate the Micro-Soft mouse.		
Recommended Printers for MS-DOS Use:	HP 2225D RS-232C ThinkJet, 2227B HP-IB QuietJet, 2276A RS-232C DeskJet, and 33440A LaserJet.		
Recommended Plotters for MS-DOS Use:	Any of the plotters listed in Graphics Input/Output section (Section 17).		

† 8 MB is total RAM required by the system, including that required by HP-UX and X Windows.

* HP 98542A, 98543A, 98548A, and 98720A do not support EGA Emulation.

° Discontinued product listed here for reference only.

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Inter-System Communications

Introduction

This section contains configuration information on the facilities that are available for inter-system communications in Series 300 systems, Series 600 Servers, and Series 800 Superworkstations.

Contents

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MAP 3.0 Communications	5-18

Local Area Network Communications

LAN Support

For Series 300

Interface. Models 340, 345, 360, 370, and 375 include a Local Area Network (LAN) interface for communication with other systems in a Local Area Network. The 98171A LAN/300 Link can be used to also equip the Model 332 with the basic hardware needed for LAN communication. In all cases, the interfaces offer a choice of ThinMAU, ThickMAU, and Twisted Pair MAU connections. The ThinMAU is the preferred type of connection to diskless workstations, as shown in Figure 5-1, below, but ThickMAU or Twisted Pair MAU can be used instead of ThinMAU.

Software. Series 300 HP-UX Workstation bundles include ARPA/Berkeley, NFS, HP Network Services, and LAN Link software licenses. The network servers include the 98594A media and documentation for this software, which can be used to support diskless workstations. For standalone workstations, the 98594A media and documentation must be purchased separately to be available for installation of the licensed software. For capabilities of this software, see Table 5-1, next page.

For Model 825/834/835 Superworkstations and Model 635SV Network Server

Interface. Model 825/834/835 Superworkstations and the Model 635SV Network Server include a 91786B LAN/9000 Series 825/834/835 Link, which incorporates the hardware interface and OSI model layers 2 through 5. ThinMAU and ThickMAU options are available.

Software. Model 825/834/835 Superworkstations and the Model 635SV Network Server include ARPA/BSD networking software, license to use, media, and documentation. For the capabilities of this software and other available LAN software, see Table 5-1, next page.

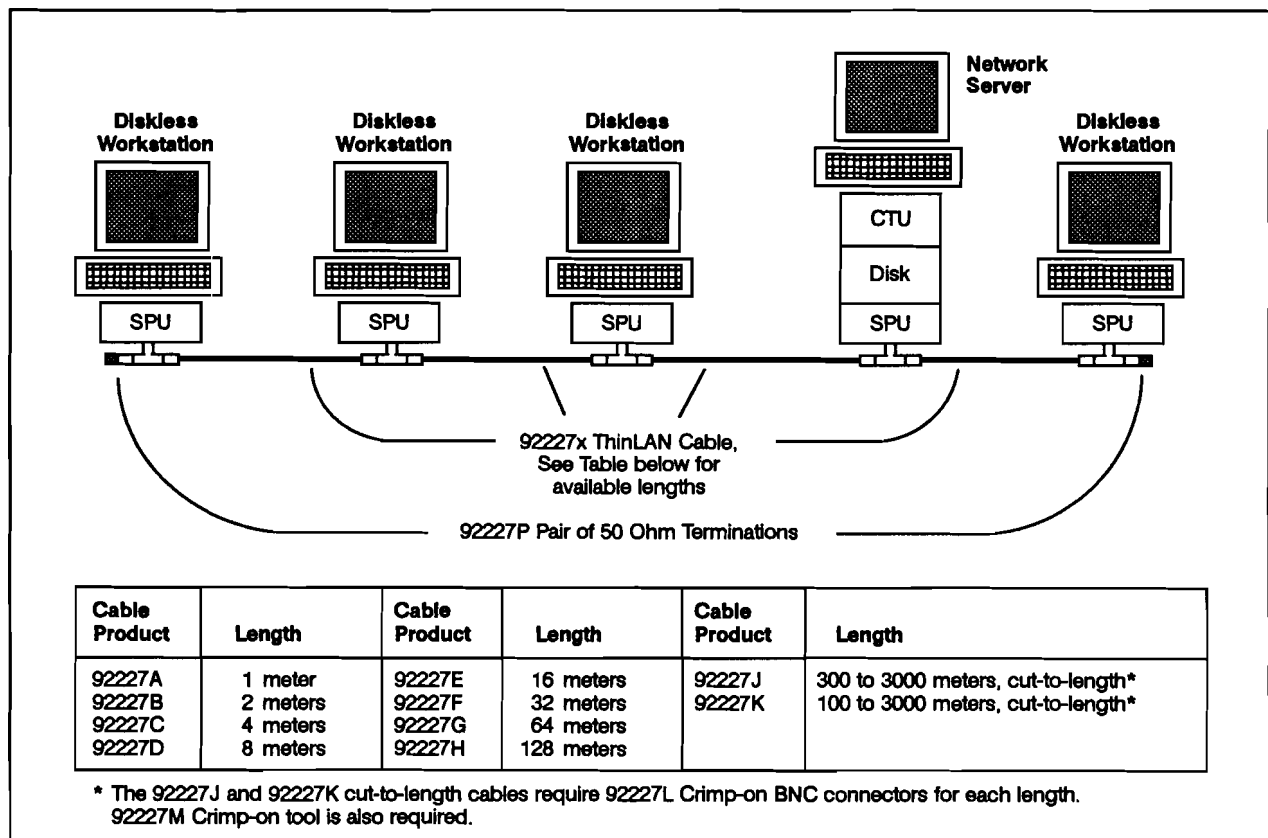


Figure 5-1. ThinLAN Connection of Diskless Workstations to Network Server

Table 5-1. LAN-Based Communications Packages for HP 9000 Workstations

Communications Packages	Capabilities	Supports Communication with
LAN Link Level		
LAN/9000 Series 300 and 800 Links	Interface with ThinMAU, ThickMAU, or Twisted Pair MAU and lower-level software collectively supporting OSI Model layers 1 - 5.	All of the systems listed below when also supported by appropriate higher-level Communications Package.
Network Services		
Network Services/300 (also requires LAN/9000 Series 300 Link, listed above) Network Services/9000 Series 800 (also requires LAN/9000 Series 800 Link, listed above)	Network File Transfer Remote File Access Resource Sharing with other HP-UX based systems Inter-process Communications Base support for OSI levels 2 through 6 (NS/ARPA 300 only) Link level access to data link layer (NS/ARPA 300 only)	HP 1000 A-Series System with NS-ARPA/1000 software HP 3000 System with Network Services/3000-V or 3000-XL software HP 9000 Series 300 System with NS/ARPA Services 300 software HP 9000 Series 800 System with NS/9000 Series 800 software HP 9000 Series 500 System with NS Services Series 500 software DEC VAX/VMS System with HP 50950A Network Services for DEC VAX/VMS (Network file transfer Only)
ARPA Services		
ARPA Services/9000 on Series 300 (also requires LAN/9000 Series 300 Link, listed above) ARPA Services/800 (also requires LAN/9000 Series 800 Link, listed above)	File Transfer Protocol (FTP) (ARPA) TELNET Virtual Terminal Capability (ARPA) Simple Mail Transfer (ARPA) Remote Copy (BSD 4.2) Remote Login (BSD 4.2) Remote Who (BSD 4.2) Remote Uptime (BSD 4.2) Remote Shell (BSD 4.2) Sendmail (BSD 4.2) Berkeley Sockets (Interprocess Communication) (BSD 4.2)	HP 1000 A-Series System with NS-ARPA/1000 or ARPA/1000 software (FTP and TELNET only). HP 9000 Series 300 System with HP-UX 5.1 or later and NS/ARPA Services/300 software HP 9000 Series 800 System with ARPA Services/800 software DEC VAX/VMS System with HP 50950A Network Services for DEC VAX/VMS (ARPA Telnet Only) DEC VAX 7xx/BSD UNIX 4.2/4.3 System with BSD 4.2/4.3 networking DEC VAX 7xx/VMS 5.0 System w/Wollongong's WIN/VX Rel. 2.2 (ARPA services only) IBM PC-AT or HP Vectra with MS-DOS or PC-DOS 3.xx and ARPA Services/Vectra and ARPA ThinLAN Link/Vectra (Supports FTP and TELNET only) SUN 68010 or 68020 computer with SUN Release 3.5 and 4.0 operating system and SUN ARPA
Network File System		
Network File System Services/300 (also requires LAN/9000 Series 300 Link, listed above) Network File System Services/800 (also requires Series 800 Link, listed above)	Network File Sharing Remote Procedure Call External Data Report (XDR) Yellow Pages (YP) Virtual Home Environment (VHE)	HP 9000 Series 300 System with HP-UX 6.0 or later and Network File System Services/300 HP 9000 Series 800 System with Network File System Services/800 DEC VAX 7xx-8xxx/VMS 4.0 System with Wollongong's WIN/TCP 3.0 and WIN/NFS 1.1 IBM PC-AT or HP Vectra with MS-DOS or PC-DOS 3.xx and Sun Microsystems PC NFS 1.0 or 2.0 SUN 2/xxx or 3/xxx system with SUN Release 3.x and 4.0 operating system and SUN NFS

LAN Connection Choices

Attachment Unit Interface (AUI) to Backbone LAN (ThickLAN connection)

Option 015 in Models 340, 360, and 370, the 98171A option 740 LAN/300 Link interface for Model 332, and Option 004 in Model 825/834/835 Superworkstations provide for AUI ThickLAN connection; AUI connection is jumper-selectable in Models 345 and 375. In Models 635SV/825/834/835, option 004 includes a 30241A Medium Attachment Unit (ThickMAU) and a 92254A 6 meter AUI cable). The AUI ThickLAN connection offers the greatest versatility because it can be used for connection to:

1. Backbone LAN (ThickLAN) cabling via a 92254E 6 meter or longer AUI cable and a 30241A Medium Attachment Unit (MAU), which must be separately purchased for Series 300 systems. This supports LAN cable length up to 500 meters and 100 nodes.
2. ThinLAN cabling via a separately purchased 28641A ThinMAU attachment unit or (from backbone LAN) a 4-connection 28645A ThinLAN Hub. ThinLAN cable length can be up to 185 meters and 30 nodes.
3. StarLAN twisted pair cabling via a separately purchased 28664A Twisted Pair Medium Attachment Unit to a 12-connection 28663A StarLAN 10 Hub. StarLAN 10 cable length can be up to 100 meters.

ThinMAU Interface to ThinLAN

Option 017 in Models 340, 360, and 370, jumper selection in Models 345 and 375, the standard 98171A LAN/300 Link interface for Model 332, and Option 003 in Models 635SV/825/834/855 provide for ThinMAU connection. This offers the greatest implementation simplicity, since all that the user needs to do is to connect ThinLAN cables to each arm of a BNC "T" and connect terminations to each far end of the network. See Figure 5-1, page 5-2.

Product Summary

Product/ Opt. No.	Description
LAN Communications Products for Series 300 SPU's and Workstations	
98171A	LAN/300 Link with ThinMAU. Requires one DIO I/O slot and NS/300, NFS/300, or ARPA/300 software. NOTE: The 98171A is required for LAN communication with Model 332 or R/332 or to connect to a second LAN from Model 360, 370, or 375. One LAN/300 Link is included in Model 340, 345, 360, 370, and 375 SPU's and Workstations.
Opt. 1AW	Deletes software and documentation.
Opt. 740	Provides ThickMAU assembly instead of ThinMAU assembly and BNC "T" connector (excludes option 840).
Opt. 840	Provides Twisted Pair MAU instead of ThinMAU and BNC "T" connector (excludes option 740).
B1012A	Network Services/300 License-to-Use. Requires Media and Documentation.*
Opt. AA0	1/4-inch Cartridge Tape Media and Documentation for B1012A. Requires prior or concurrent purchase of B1012A.
B1013A	Network File System Services/300 License-to-Use. Requires Media and Documentation.*
Opt. AA0	1/4-inch Cartridge Tape Media and Documentation for B1013A. Requires prior or concurrent purchase of B1013A.
B1014A	ARPA Services/9000 on the Series 300, License-to-Use. Requires Media and Documentation.*
Opt. AA0	1/4-inch Cartridge Tape Media and Documentation for B1014A. Requires prior or concurrent purchase of B1014A.

* NOTE: HP-UX based Model 332, 340, 345, 360, 370, and 375 workstations, instrument controllers, and network servers include 98549L License-to-Use HP-UX that also includes Network Services/300, Network File System Services/300, and ARPA Services/300. Of these, workstations not supported by a Network Server will also require that the 98594A media product be available for installation.

Product Summary, continued

Product/ Opt. No.	Description
LAN Communications Products for Model 635SV Network Server and Model 825/834/835 Superworkstations	
91786B	LAN/9000 Series 800 Link with interface and software on 1/4-inch cartridge tape. Requires one CIO slot. NOTE: One 91786B is included with Model 635SV Network Server or Model 825/834/835 Superworkstation. It needs to be ordered separately only for connection to a second LAN.
Opt. AA1	Substitutes software on 1/2-inch, 1600 cpi magnetic tape for software on 1/4-inch cartridge tape.
91787A	Network Services/9000 Series 800 with software on 1/4-inch cartridge tape. Requires LAN/9000 Series 800 Link. NOTE: The 91787A software is included with Model 825 and 835 Superworkstations. It does not have to be ordered separately.
Opt. AA1	Substitutes software on 1/2-inch, 1600 cpi magnetic tape for software on 1/4-inch cartridge tape.
50981A	ARPA Services/800. Requires option AA0 or AA1 and LAN/9000 Series 800 Link. NOTE: The 50981A software is included with Model 635SV Network Servers and Model 825 and 835 Superworkstations. It does not have to be ordered separately for those models.
Opt. AA0	Software on 1/4-inch cartridge tape (excludes option AA1).
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape (excludes option AA0).

Operational Requirements

Description	Requirements		
For LAN Communication in Series 300 System operating under HP-UX			
Per 98171A LAN/300 Link	One DIO I/O Slot.		
RAM and Disk Space:	RAM	Disk	
LAN/300 Link	0.3 MB	3 MB	
ARPA Services/300	0.3 MB	4.5 MB	
Network Services/300	0.3 MB	4.5 MB	
NFS Services/300	0.5 MB	3 MB	
For LAN Communication in Model 635SV Network Server or 825/834/835 Superworkstation operating under HP-UX			
Per 91786B LAN/9000 Series 800 Link	One CIO Slot.		
RAM and Disk Space:	RAM	Disk	
LAN/9000 Series 800 Link	1 MB	4.6 MB	
NS/9000 Series 800	1 MB	1.8 MB	
ARPA Services/800	1 MB	2.9 MB	
NFS Services/800	0.5 MB	5.3 MB	

Additional Information

For specifications on LAN hardware and software

See the "HP AdvanceNet Specification Guide," HP Literature Stock Number 5956-4144 or a later revision, available from HP Field Offices.

For a LAN Primer

Purchase "Making the LAN Connection," HP Part Number 5957-4624, from Hewlett-Packard's Direct Marketing Division, telephone 800-538-8787.

For LAN Installation Guidance

Purchase "LAN Cable and Accessories Installation Manual," HP Part Number 5955-7680, from Hewlett-Packard's Direct Marketing Division, telephone 800-538-8787.

X.25 Communications

Description

X.25 Communication for Series 300 systems and Model 825/835 Superworkstations is illustrated in Figure 5-2, below. Higher-level communication is supported by Network Services, ARPA Services, (and X.400 software in Model 825/835 Superworkstations). The capabilities are summarized in Table 5-2, next page. Communication to remote terminals connected via an HP 2334A Plus or 2335A X.25 Multiplexer is also supported and programmatic access to the X.25 packet layer is provided.

Configuration Choices

HP 9000 systems with X.25 Link can be configured as a DTE (Data Terminal Equipment) to transmit via a public or private X.25 network, as shown in Figure 5-2. Data rates up to 64 Kbps are achievable on Model 825/835 Superworkstations; up to 19.2 Kbps on the Series 300. The X.25 Link can also be configured as a DCE (Data Circuit terminating Equipment) to run over direct, hardwired lines. (A modem or modem eliminator is then required between the two computers; no clock signals are available on the X.25 interface.)

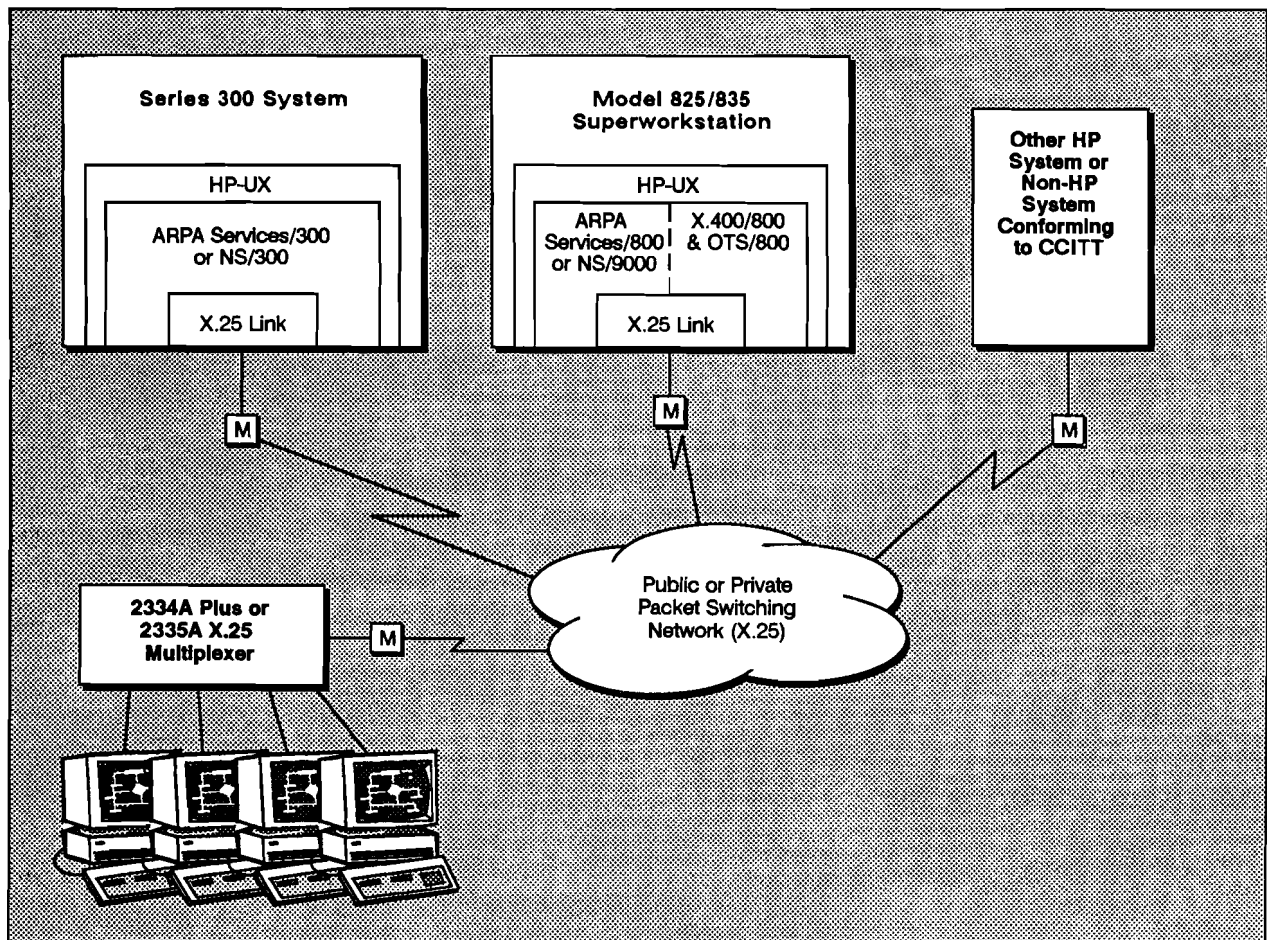


Figure 5-2. X.25 Communications for Series 300 Systems and Model 825/835 Superworkstations

Table 5-2. X.25-Based Communications Packages for HP 9000 Workstations

Communications Packages	Capabilities	Supports Communication with
Link Level		
X.25/ 300 Link X.25/800 Link	Connection to Public or Private Packet Switching Network (X.25)	All of the systems listed below when also supported by appropriate higher-level Communications Package.
Network Services		
Network Services/300 (also requires X.25/300 Link, listed above)	Network File Transfer	HP 3000 System with Network Services/3000-V software
Network Services/9000 Series 800 (also requires X.25/800 Link, listed above)	Resource Sharing with other HP-UX based systems	HP 9000 Series 300 System with NS/ARPA Services/300 software
	Inter-process Communications	HP 9000 Model 825/835 Superworkstation with NS/9000 Series 800 software
ARPA Services		
ARPA Services/9000 on Series 300 (also requires X.25/300 Link, listed above)	File Transfer Protocol (FTP) (ARPA)	HP 9000 Series 300 System with HP-UX 6.5 or later and NS/ARPA Services/300 software
ARPA Services/800 (also requires X.25/800 Link, listed above)	TELNET Virtual Terminal Capability (ARPA)	HP 9000 Model 825/835 Superworkstation with ARPA Services/800 software
	Simple Mail Transfer (ARPA)	SUN computer with SunLink X.25, Release 5.0
	Remote Copy (BSD 4.2)	
	Remote Login (BSD 4.2)	
	Remote Shell (BSD 4.2)	
	Sendmail (BSD 4.2)	
	Berkeley Sockets (Interprocess Communications) (BSD 4.2)	
X.400 Electronic Mail		
X.400/800 (also requires OTS Transport Services/800, below)	Standards-based electronic mail	Any system that complies with the X.400 standard.
OTS Transport Services/800 (also requires X.25/800 Link, listed above)	Provides OSI Model Layers 4 and 5 for transport between the X.25/800 Link and the X.400/800 communications package.	Not applicable

X.25 Communications, continued

Product Summary

Product/ Opt. No.	Description
X.25 Communications Products for Series 300 SPU's and Workstations	
36941A	X.25/300 Link Interface and Software on 1/4-inch cartridge tape.
Opt. 1AW	Deletes software for an additional X.25/300 Link to be used on the same system.
B1012A	Network Services/300 License-to-Use. Requires Media and Documentation.*
Opt. AA0	Media and Documentation for B1012A. <i>Requires option 022 and prior or concurrent purchase of B1012A.</i>
Opt. 022	Software on 1/4-inch cartridge tape.
B1014A	ARPA Services/9000 on the Series 300 License-to-Use. Requires Media and Documentation.*
Opt. AA0	Media and Documentation for B1014A. <i>Requires option 022 and prior or concurrent purchase of B1014A.</i>
Opt. 022	Software on 1/4-inch cartridge tape.
X.25 Communications Products for Model 825/835 Superworkstations	
36940A	X.25/800 Link Interface and Software. Requires option AA0 or AA1 and option 1AT or 1AU.
Opt. AA0	Software on 1/4-inch cartridge tape (excludes option AA1).
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape (excludes option AA0).
Opt. 1AT	5 meter RS-232C cable for line speeds to 19.2 kbps (excludes option 1AU).
Opt. 1AU	5 meter V.35 cable for line speeds to 64 kbps (excludes option 1AT).
Opt. 1AW	Deletes software for an additional X.25/800 Link to be used on the same system.
91787A	Network Services/9000 Series 800 with software on 1/4-inch cartridge tape. Requires X.25/800 Link. NOTE: The 91787A software is included with Model 825 and 835 Superworkstations. It does not have to be ordered separately.
Opt. AA1	Substitutes software on 1/2-inch, 1600 cpi magnetic tape for software on 1/4-inch cartridge tape.
50981A	ARPA Services/800. Requires option AA0 or AA1 and X.25/800 Link. NOTE: The 50981A software is included with Model 825 and 835 Superworkstations. It does not have to be ordered separately.
Opt. AA0	Software on 1/4-inch cartridge tape (excludes option AA1).
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape (excludes option AA0).
32034A	X.400/800 Message Transfer Agent (MTA) Software. Requires option AA0 or AA1 and OTS Transport Services/800.
Opt. AA0	Software on 1/4-inch cartridge tape (excludes option AA1).
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape (excludes option AA0).
32034R	Right-to-Copy 32034A X.400/800 MTA Software to one additional system.
Opt. 0B0	Deletes manuals.
32071A	OTS Transport Services/800 Software. Requires option AA0 or AA1, X.25/800 Link, and concurrent purchase of X.400/800.
Opt. AA0	Software on 1/4-inch cartridge tape (excludes option AA1).
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape (excludes option AA0).
32071R	Right-to-Copy 32071A OTS Transport Services/800 Software to one additional system.
Opt. 0B0	Deletes manuals.

* NOTE: HP-UX based Model 332, 340, 360, and 370 workstations, instrument controllers, and network servers include 98549L License-to-Use HP-UX that also includes Network Services/300 and ARPA Services/300. Of these, workstations not supported by a Network Server will also require that the 98594A media product be available for installation.



Operational Requirements

Description		Requirements				
For X.25 Communication in Series 300 System operating under HP-UX						
Per 36941A X.25/300 Link		One DIO I/O Slot.				
RAM and Disk Space:		Per Link	x No. =	RAM	Disk	
X.25/300 Link		0.05 MB	x ____ =	____ MB	2.4 MB	
ARPA Services/300*				0.25 MB	4.5 MB	
Network Services/300*				0.25 MB	4.5 MB	
For X.25 Communication in Model 825/835 Superworkstation operating under HP-UX						
Per 36940A X.25/800 Link		One CTB slot and the adjacent CIO Slot.				
RAM and Disk Space:		Per Link	x No. =	RAM	Disk	
X.25/800 Link		0.7 MB	x ____ =	____ MB	2.4 MB	
NS/9000 Series 800*				1 MB	1.8 MB	
ARPA Services/800*				1 MB	2.9 MB	
X.400/800				2 MB	6 MB	
OTS Transport Services/800					2 MB	

* If not already counted in the Local Area Network Communications section.

Additional Information

For data sheets on the X.25 and related higher-level communications software products, see the "HP AdvanceNet Specification Guide," HP Literature Stock Number 5956-4144 or a later revision, which is available from HP Field Offices.

HP OpenMail Electronic Mail Communications

Description

The principal connections available for HP OpenMail communication to/from HP 9000 Series 300 systems and Series 800 Superworkstations and Series 600 Servers are shown in Figure 5-3, below. LAN, X.25, and RS-232C links are supported. HP OpenMail uses the Sendmail transport system on top of standard ARPA and Berkeley Services, which is prerequisite. HP OpenMail is fully integrated with HP DeskManager, HP's mailing service on MPE, which enables HP-UX and MPE users to transparently exchange information and gives HP-UX users full access to gateways supported by HP DeskManager, such as PROFs, DISOSS, and HP Telex. In addition, Model 825/835 Superworkstations and Series 600 Servers can also use HP's X.400/800 Message Transfer Agent (see Figure 5-2, page 5-6) to communicate via X.25 with users on other X.400 compatible mailing systems in a multivendor environment. See Table 5-3, next page, for capabilities.

Additional Information

For detailed information on HP OpenMail, see the HP OpenMail data sheet, HP Literature Stock Number 5959-9611.

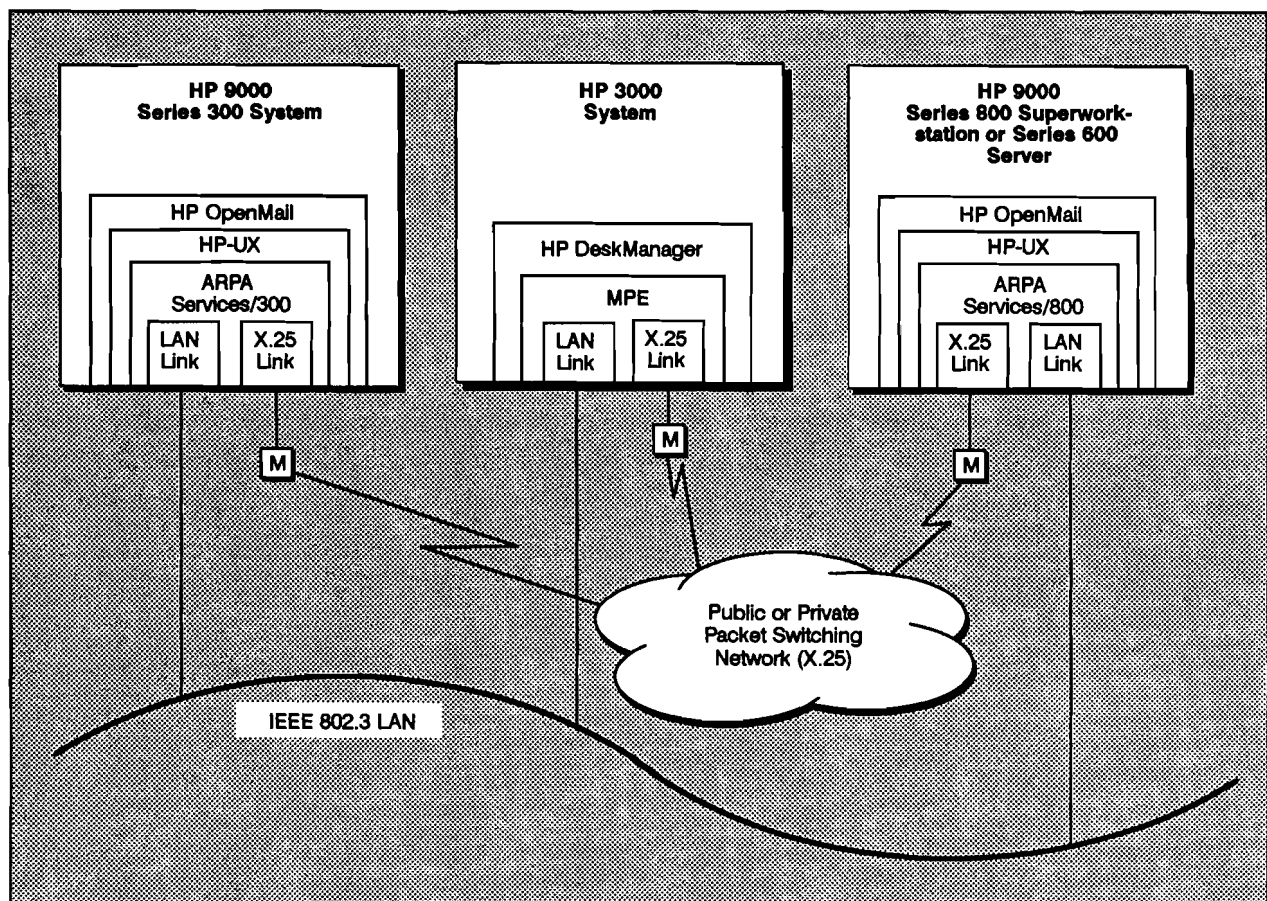


Figure 5-3. HP OpenMail Communications for Series 300 Systems and Series 800 Superworkstations

Table 5-3. HP OpenMail Communications for HP 9000 Workstations

Communications Packages	Capabilities	Supports Communication with
Link Level		
LAN/9000 Series 300 and 800 Links	Interface with ThinMAU, ThickMAU or Twisted Pair MAU and lower-level software collectively supporting OSI Model layers 1 - 5.	All of the systems listed below, except X.400/800 when also supported by appropriate higher-level Communications Package.
X.25/300 Link X.25/800 Link	Connection to Public or Private Packet Switching Network (X.25)	All of the systems listed below when also supported by appropriate higher-level Communications Package.
ARPA Services		
ARPA Services/9000 on Series 300 (also requires LAN/9000 Series 300 Link or X.25/300 Link, listed above) ARPA Services/800 (also requires LAN/9000 Series 800 Link or X.25/800 Link, listed above)	Sendmail (BSD 4.2)	HP 9000 Series 300 System with HP-UX 6.5 or later and ARPA Services/300 software HP 9000 Model 825/835 Superworkstation with ARPA Services/800 software
X.400 Electronic Mail		
HP OpenMail (also requires ARPA Services and LAN or X.25 Link, listed above)	All services required by AdvanceMail on MS-DOS PCs AdvanceMail user interface for terminal users or users of Macintosh PCs running terminal emulators Editor for message creation Confirmation of receipt of messages Non-delivery notification Private and urgent mail Ability to attach HP-UX files to messages	HP 9000 Series 300 system with HP-UX 7.0 or later with HP OpenMail. HP 9000 Series 800 system with HP-UX 3.1 or later with HP OpenMail HP 3000 System with HP DeskManager running on MPE
X.400/800 Message Transfer Agent (also requires OTS Transport Services/800, below)	Standards-based electronic mail	Any system that complies with the X.400 standard.
OTS Transport Services/800 (also requires X.25/800 Link, listed above)	Provides OSI Model Layers 4 and 5 for transport between the X.25/800 Link and the X.400/800 communications package.	X.25-connected systems only.

HP OpenMail Electronic Mail Communications, continued

Product Summary

Product/ Opt. No.	Description
LAN Link Products for HP OpenMail	
98171A	LAN/300 Link with ThinMAU. Requires one DIO I/O slot and Network Services/ARPA software. NOTE: The 98171A is required for LAN communication with Model 332 or R/332 or to connect to a second LAN from Model 360 or 370. One LAN/300 Link is included in Model 340, 360, and 370 SPU's and Workstations.
Opt. 1AW	Deletes software and documentation.
Opt. 740	Provides ThickMAU assembly instead of ThinMAU assembly and BNC "T" connector (excludes option 840).
Opt. 840	Provides Twisted Pair MAU instead of ThinMAU and BNC "T" connector (excludes option 740).
91786B	LAN/9000 Series 800 Link with interface and software on 1/4-inch cartridge tape. Requires one CIO slot. NOTE: One 91786B is included with Model 635SV Network Server or Model 825/834/835 Superworkstation. It needs to be ordered separately only for connection to a second LAN.
Opt. AA1	Substitutes software on 1/2-inch, 1600 cpi magnetic tape for software on 1/4-inch cartridge tape.
X.25 Link Products for HP OpenMail	
36941A	X.25/300 Link Interface and Software on 1/4-inch cartridge tape.
Opt. 1AW	Deletes software for an additional X.25/300 Link to be used on the same system.
36940A	X.25/800 Link Interface and Software. Requires option AA0 or AA1 and option 1AT or 1AU.
Opt. AA0	Software on 1/4-inch cartridge tape (excludes option AA1).
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape (excludes option AA0).
Opt. 1AT	5 meter RS-232C cable for line speeds to 19.2 kbps (excludes option 1AU).
Opt. 1AU	5 meter V.35 cable for line speeds to 64 kbps (excludes option 1AT).
Opt. 1AW	Deletes software for an additional X.25/800 Link to be used on the same system.
ARPA Services Products for HP OpenMail	
B1014A	ARPA Services/9000 on the Series 300 License-to-Use. Requires Media and Documentation.*
Opt. AA0	Media and Documentation for B1014A. Requires option 022 and prior or concurrent purchase of B1014A.
Opt. 022	Software on 1/4-inch cartridge tape.
50981A	ARPA Services/800. Requires option AA0 or AA1 and X.25/800 Link. NOTE: The 50981A software is included with Model 825 and 835 Superworkstations. It does not have to be ordered separately.
Opt. AA0	Software on 1/4-inch cartridge tape (excludes option AA1).
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape (excludes option AA0).
HP OpenMail	
B1600A	HP OpenMail Requires media option AA0 or AA1, one of processor options AE5 through AE9, and Language Support product B1602A (next page) with appropriate options.
Opt. AA0	Software on 1/4-inch cartridge tape (excludes option AA1).
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape (excludes option AA0).
Opt. AE5	HP OpenMail for Model 825 Superworkstation (excludes options AE7 through AE9)
Opt. AE7	HP OpenMail for Model 635SV Server or Model 834/835 Superworkstation (excludes options AE5, AE8, and AE9)
Opt. AE8	HP OpenMail for Series 300 Models 332 and 340 (excludes options AE5, AE7, and AE9)
Opt. AE9	HP OpenMail for Series 300 Models 360 and 370 (excludes options AE5, AE7, and AE8)

* NOTE: HP-UX based Model 332, 340, 360, and 370 workstations, instrument controllers, and network servers include 98549L License-to-Use HP-UX that also includes Network Services/300 and ARPA Services/300. Of these, workstations not supported by a Network Server will also require that the 98594A media product be available for installation.

Product Summary, continued

Product/ Opt. No.	Description
HP OpenMail, continued	
B1602A	Language Support Product (provides all message catalogs, help and system screens to run the HP OpenMail product in the specified language. <i>Requires media option AA0 or AA1 and one of language options ABA through ABF.</i>)
Opt. AA0	Software on 1/4-inch cartridge tape (excludes option AA1).
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape (excludes option AA0).
Opt. ABA	HP OpenMail English language support (excludes options ABD and ABF).
Opt. ABD	HP OpenMail German language support (excludes options ABA and ABF).
Opt. ABF	HP OpenMail French language support (excludes options ABA and ABD).
X.400/800 Message Transfer Agent Software for Multivendor X.400 Communication (Series 800 via X.25 only).	
32034A	X.400/800 Message Transfer Agent Software. <i>Requires option AA0 or AA1 and OTS Transport Services/800.</i>
Opt. AA0	Software on 1/4-inch cartridge tape (excludes option AA1).
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape (excludes option AA0).
32071A	OTS Transport Services/800 Software. <i>Requires option AA0 or AA1, X.25/800 Link, and concurrent purchase of X.400/800.</i>
Opt. AA0	Software on 1/4-inch cartridge tape (excludes option AA1).
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape (excludes option AA0).

Operational Requirements

Description	Requirements		
For HP OpenMail Communication in Series 300 System operating under HP-UX			
Other Communications Products:	LAN/300 Link or X.25/300 Link and ARPA Services/9000 on Series 300		
RAM and Disk Space:	RAM	Disk	
HP OpenMail*	n/s	n/s	
For HP OpenMail and Related X.400 Communication In Series 600 Server or 800 Superworkstation operating under HP-UX			
Other Communications Products:	LAN/800 Link or X.25/800 Link and ARPA Services/800		
RAM and Disk Space:	RAM	Disk	
HP OpenMail*	n/s	n/s	
X.400/800†	2 MB	6 MB	
OTS Transport Services/800†		2 MB	

* Requirements for LAN or X.25 Link and ARPA software are in the respective Local Area Network and X.25 sections, pages 5-5 and 5-9.

† Requires X.25 Link; not supported via LAN.

n/s = not specified

Communication with IBM Systems

Description

IBM Communication connections available for Series 300 systems and Model 825/835 Superworkstations are shown in Figure 5-4, below. Communication may be direct or via LAN connection to a gateway system. The capabilities are summarized in the Product Summary, next two pages.

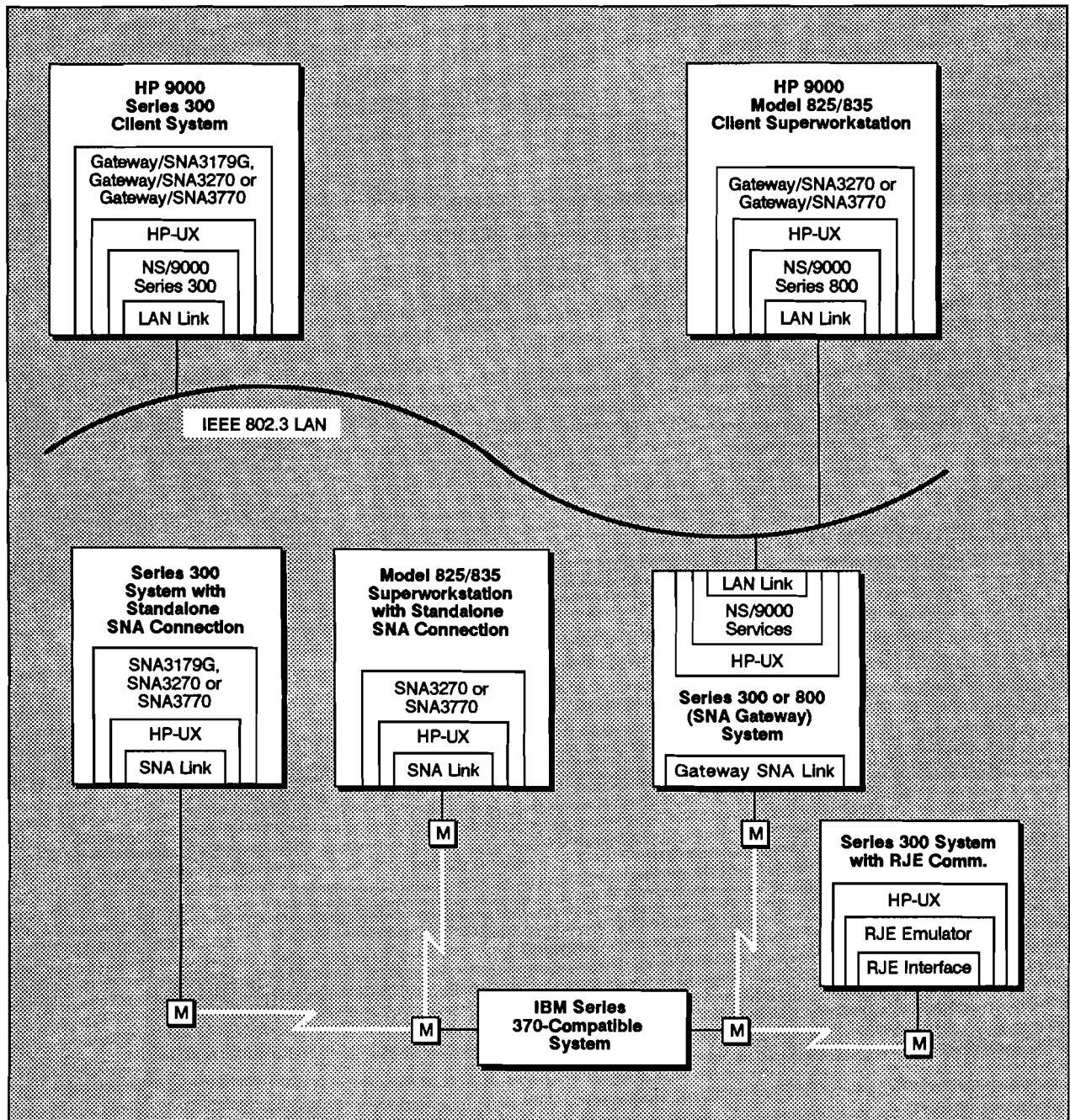


Figure 5-4. IBM Communications for Series 300 Systems and Model 825/835 Superworkstations

Product Summary

Product/ Opt. No.	Description
SNA Products for Series 300 SPU's and Workstations	
B1001A	SNA3179G for Emulation of IBM 3179G Color Graphics Display Station. <i>Requires option AA1.</i>
Opt. AA1	Standalone configuration with software on 1/4-inch cartridge tape (excludes option AA2). <i>Requires 36592A SNALink.</i>
36590A	SNA3270 for Emulation of IBM 3270 Terminals and 3287 printer and PC3270 file transfer, standalone configuration. Includes license to use on one system and software on 1/4-inch cartridge tape. <i>Requires 36592A SNALink.</i>
98188A	SNA3770 for Emulation of standard subset of IBM 3777 Model 1 RJE Communications Terminal capabilities, including batch job entry, standalone configuration. Includes license to use on one system and software on 1/4-inch cartridge tape. <i>Requires 36592A SNA Link.</i>
36592A	SNALink, Series 300 for Emulation of the major features of IBM 3274 Cluster Controller, using SNA protocols, standalone configuration. Includes interface, license to use on one system and software on 1/4-inch cartridge tape. <i>Requires one of options 0A0, 0A1, 001, or 002.</i>
Opt. 0A0	Single-User (2 LUs), with RS-232C (19.2 kbps) interface.
Opt. 0A1	Multi-User (32 LUs), with RS-232C (19.2 kbps) interface.
Opt. 001	Single-User (2 LUs), with V.35 (64 kbps) interface.
Opt. 002	Multi-User (32 LUs), with V.35 (64 kbps) interface.
Gateway SNA Products and related products for Series 300 SPU's and Workstations	
B1001A	SNA3179G for Emulation of IBM 3179G Color Graphics Display Station. <i>Requires option AA2.</i>
Opt. AA2	Gateway configuration with software on 1/4-inch cartridge tape (excludes option AA1). <i>Requires 36593A Gateway SNALink.</i>
36591A	Gateway SNA3270 for Emulation of IBM 3270 Terminals and 3287 printer and PC3270 file transfer. Includes license to use on one system and software on 1/4-inch cartridge tape. <i>Requires 36593A Gateway SNALink.</i>
98184A	Gateway SNA3770 for Emulation of standard subset of IBM 3777 Model 1 RJE Communications Terminal capabilities, including batch job entry. Includes license to use on one system and software on 1/4-inch cartridge tape. <i>Requires 36593A Gateway SNALink.</i>
36593A	Gateway SNALink, Series 300 for Emulation of the major features of IBM 3274 Cluster Controller, using SNA protocols. Includes interface, license to use on one system and software on 1/4-inch cartridge tape. <i>Requires one of options 003, or 004.</i>
Opt. 003	RS-232C (19.2 kbps) interface (excludes option 004).
Opt. 004	V.35 (64 kbps) interface (excludes option 003).
98171A	LAN/300 Link with ThinMAU. <i>Requires one DIO I/O slot and Network Services/ARPA software.</i> NOTE: The 98171A is required for LAN communication with Model 332 or R/332 or to connect to a second LAN from Model 360 or 370. One LAN/300 Link is included in Model 340, 360, and 370 SPU's and Workstations.
Opt. 241	Provides AUI output instead of ThinMAU and BNC "T" connector.
50952L	Network Services/ARPA 300 License-to-Use. <i>Media and Documentation must be available for software installation.</i> NOTE: HP-UX based Model 332, 340, 360, and 370 workstations, instrument controllers, and network servers include 98549L License-to-Use HP-UX that also includes Network Services/ARPA 300. Of these, workstations not supported by a Network Server will also require that the 98594A media product be available for installation.
50952C	Media and Documentation for 50952L. <i>Requires option 022 and prior or concurrent purchase of 50952L.</i>
Opt. 022	Software on 1/4-inch tape cartridge.
RJE Communication for Series 300 Systems	
98641A	RJE Direct I/O (DIO) Interface. <i>Requires 50967A RJE Emulator.</i>
50967A	RJE Emulator for Emulation of IBM 2780 Data Transmission Terminal or 3780 Data Communications Terminal for access to files, peripherals, and data bases of IBM host system. <i>Requires 98641A RJE Direct I/O Interface.</i> Software is provided on 1/4-inch tape cartridge.

Communication with IBM Systems, continued

Product Summary, continued

Product/ Opt. No.	Description
SNA Products for Model 825/835 Superworkstations	
36915A	SNA3270 for Emulation of IBM 3270 Terminals and 3287 printer and PC3270 file transfer, standalone configuration. Includes license to use on one system. <i>Requires option AA0 or AA1 and 98191A SNA Link.</i>
Opt. AA0	Software on 1/4-inch cartridge tape (excludes option AA1).
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape (excludes option AA0).
36915R	Right-to-Copy 36915A SNA3270 software to one additional system.
98179A	SNA3770 for Emulation of standard subset of IBM 3777 Model 1 RJE Communications Terminal capabilities, including batch job entry, standalone configuration. Includes license to use on one system. <i>Requires option AA0 or AA1 and 98191A SNA Link.</i>
Opt. AA0	Software on 1/4-inch cartridge tape (excludes option AA1).
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape (excludes option AA0).
98179R	Right-to-Copy 98179A SNA3777 software to one additional system.
98191A	SNALink, Series 800 for Emulation of the major features of IBM 3274 Cluster Controller, using SNA protocols, standalone configuration. Includes RS-232C (19.2 kbps) interface, license to use on one system, and software. <i>Requires one of options 001, 002, 003, or 004.</i>
Opt. 001	Single-user (4 LUJs) with software on 1/4-inch cartridge tape (excludes options 002, 003, and 004).
Opt. 002	Single-user (4 LUJs) with software on 1/2-inch, 1600 cpi magnetic tape (excludes options 001, 003, and 004).
Opt. 003	Multi-user (32 LUJs) with software on 1/4-inch cartridge tape (excludes options 001, 002, and 004).
Opt. 004	Multi-user (32 LUJs) with software on 1/2-inch, 1600 cpi magnetic tape (excludes options 001, 002, and 003).
Opt. 1AU	Substitutes V.35 (64 kbps) interface for RS-232C interface.
Gateway SNA Products and related products for Model 825/835 Superworkstations	
36918A	Gateway SNA3270 for Emulation of IBM 3270 Terminals and 3287 printer and PC3270 file transfer. Includes license to use on one system. <i>Requires option AA0 or AA1 and 98193A Gateway SNA Link.</i>
Opt. AA0	Software on 1/4-inch cartridge tape (excludes option AA1).
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape (excludes option AA0).
36918R	Right-to-Copy 36918A SNA3270 software to one additional system.
98185A	Gateway SNA3770 for Emulation of standard subset of IBM 3777 Model 1 RJE Communications Terminal capabilities, including batch job entry, standalone configuration. Includes license to use on one system. <i>Requires option AA0 or AA1 and 98193A Gateway SNA Link.</i>
Opt. AA0	Software on 1/4-inch cartridge tape (excludes option AA1).
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape (excludes option AA0).
98185R	Right-to-Copy 98185A SNA3777 software to one additional system.
98193A	Gateway SNALink, Series 800 for Emulation of the major features of IBM 3274 Cluster Controller, using SNA protocols. Includes RS-232C (19.2 kbps) interface, license to use on one system, and software. <i>Requires one of options AA0 or AA1.</i>
Opt. AA0	Software on 1/4-inch cartridge tape (excludes option AA1).
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape (excludes option AA0).
Opt. 1AU	Substitutes V.35 (64 kbps) interface for RS-232C interface.
91786B	LAN/9000 Series 800 Link with Interface and software on 1/4-inch cartridge tape. NOTE: One 91786B is included with Model 825 and 835 Superworkstations.
91787A	Network Services/9000 Series 800 with software on 1/4-inch cartridge tape. NOTE: The 91787A software is included with Model 825 and 835 Superworkstations.

Operational Requirements

Description	Requirements				
For IBM Communication In Series 300 System operating under HP-UX					
Per 36592A or 36593A SNA or GW SNA Link	One DIO I/O Slot.				
RAM and Disk Space:	Per Unit	x No. =	RAM	Disk	
First SNA* Link			0.9 MB	0.5 MB	
Each additional SNA Link*	0.9 MB	x ____ =	____ MB		
SNA3179G*			____ MB	0.75 MB	
SNA3270 First session*			0.25 MB	0.5 MB	
Each additional SNA3270 session*	0.12 MB	x ____ =	____ MB		
SNA3770 First session*			0.25 MB	0.5 MB	
Each additional SNA3770 session*	0.12 MB	x ____ =	____ MB		
Additional Requirements for Gateway	LAN/300 Link and Network Services/ARPA 300 (see page 5-5 for requirements).				
Other SNA3179G* Requirements	X-Window system and 98547A, 98549A, 98550A, 98720A, or 98730A Video Output or Display Controller to any of the monitors they support.				
For IBM Communication In Model 825/835 Superworkstation operating under HP-UX					
Per 98191A or 98193A SNA or GW SNA Link	One CTB slot and the adjacent CIO Slot.				
RAM and Disk Space:	Per Unit	x No. =	RAM	Disk	
First SNA* Link			0.9 MB	0.5 MB	
Each additional SNA Link*	0.9 MB	x ____ =	____ MB		
SNA3270 First session*			0.25 MB	0.5 MB	
Each additional SNA3270 session*	0.12 MB	x ____ =	____ MB		
SNA3770 First session*			0.25 MB	0.5 MB	
Each additional SNA3770 session*	0.12 MB	x ____ =	____ MB		
Additional Requirements for Gateway	LAN/9000 Series 800 Link and Network Services/9000 Series 800 (see page 5-5 for requirements).				

* Requirements for the standalone and gateway versions of this software item are the same.

Additional Information

For data sheets on the IBM communication products, see the "HP AdvanceNet Specification Guide," HP Literature Stock Number 5956-4144 or a later revision, which is available from HP Field Offices.

MAP 3.0 Communications

Description

Manufacturing Automation Protocol 3.0 (MAP 3.0) communication for Model 825/834/835 Superworkstations is illustrated in Figure 5-5, below. Superworkstations connect to a plant-wide broadband or carrierband backbone via an HP OSI Express MAP 3.0 Link interface. HP MAP 3.0 Manufacturing Message Specification/800 (MMS/800) is an OSI layer 7 service that provides a set of service calls for cell controller communication with factory floor devices. HP MAP 3.0 File Transfer, Access, and Management/800 (FTAM/800) is also an OSI layer 7 service that provides distributed file capabilities for OSI communication systems. Together, the HP OSI Express MAP 3.0 Link, MAP 3.0 MMS/800, and MAP 3.0 FTAM/800 provide the most complete MAP 3.0 communications offering available from any major computer systems vendor.

The HP OSI Express MAP 3.0 Broadband or Carrierband Link (32125A or 32124A) consists of a CTB interface that connects to an external converter box which contains the double-height HP-PB MAP interface cards and modem.

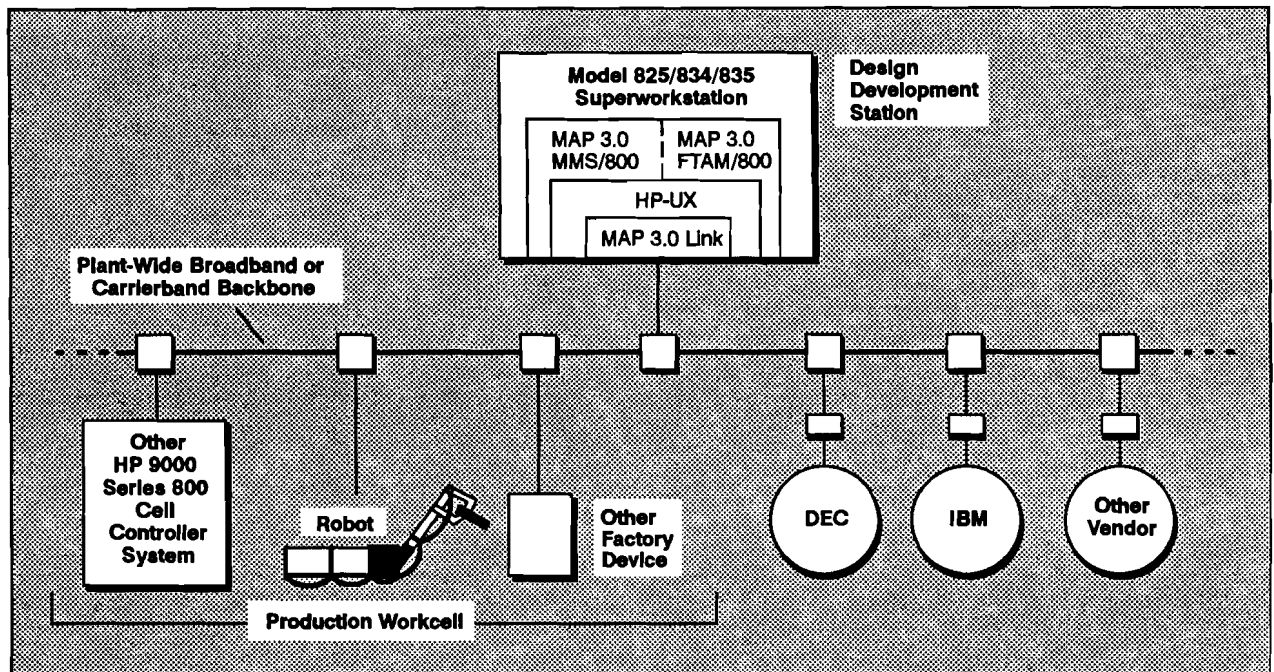


Figure 5-5. Model 825/834/835 Superworkstation MAP 3.0 Communications

Product Summary

Product/ Opt. No.	Description
32124A	HP OSI Express MAP 3.0 Carrierband Link hardware and software (on 1/4-inch cartridge tape). Requires one CTB slot and HP MAP 3.0 MMS/800 or FTAM/800.
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape instead of 1/4-inch cartridge tape.
32125A	HP OSI Express MAP 3.0 Broadband Link hardware and software (on 1/4-inch cartridge tape). Requires one CTB slot and HP MAP 3.0 MMS/800 or FTAM/800.
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape instead of 1/4-inch cartridge tape.

Product Summary, continued

Product/ Opt. No.	Description
B1005A	HP MAP 3.0 MMS/800. <i>Requires option AA0 or AA1 and MAP 3.0 Link, listed on previous page.</i> Provides comprehensive control of factory floor devices, binary file transfer between computer systems on the backbone and program-to-program messaging between computer systems on the backbone.
Opt. AA0	Software on 1/4-inch cartridge tape (excludes option AA1).
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape (excludes option AA0).
B1006A	HP MAP 3.0 FTAM/800. <i>Requires option AA0 or AA1 and MAP 3.0 Link, listed on previous page.</i> Provides text and binary file transfer between MAP 3.0 nodes, remote file access (record-level read, write, and delete), and remote file management (creates and deletes files and reads or changes attributes).
Opt. AA0	Software on 1/4-inch cartridge tape (excludes option AA1).
Opt. AA1	Software on 1/2-inch, 1600 cpi magnetic tape (excludes option AA0).

Operational Requirements

Description	Requirements		
Per 32124A/32125A Link:	One CTB Slot		
RAM and Disk Space:	RAM	Disk	
OSI Express MAP 3.0 Link, MMS/800, and FTAM/800	13 MB	150 MB	

Additional Information

For data sheets on the MAP 3.0 products, see the "HP AdvanceNet Specification Guide," HP Literature Stock Number 5956-4144 or a later revision, which is available from HP Field Offices.

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Series 300 System Processor Units (SPUs)

Introduction

This section contains configuration information on the Series 300 System Processor Units (SPUs). The SPUs are offered without software, display, or keyboard for customers who want to tailor a configuration to meet a requirement not supported by the available workstation or instrument controller bundles.

Contents

Model 332 System Processor Unit	6-2
Model 340: Not available as System Processor Unit; see Model 340 2-D and 3-D Workstations in Sections 7 and 8 and the Model 15NS Network Server in Section 10.	
Model 345: Not available as System Processor Unit; see Model 345 2-D and 3-D Workstations in Sections 7 and 8.	
Model 360 System Processor Unit	6-5
Model 370 System Processor Unit	6-9
Model 375 System Processor Unit	6-13

Model 332 System Processor Unit

Description

The HP 9000 Model 332 is the lowest priced HP 9000 Series 300 System Processor Unit (SPU) that affords expandability. Figures 6-1 and 6-2 illustrate the Model 332 bus architecture and backplane layout and expandability.

CPU: MC68030, clocked at 16.7 MHz.

Bus Types: 32-bit memory bus and 16-bit Direct I/O (DIO) bus.

RAM: 1 MB parity, expandable to 8 MB in mainframe with substitution of 4 MB for 1 MB and a 4 MB add-on RAM card.

Built-in Interfaces: HP-HIL, RS-232, Std HP-IB, 512 by 400 on-board monochrome video, and audio output.

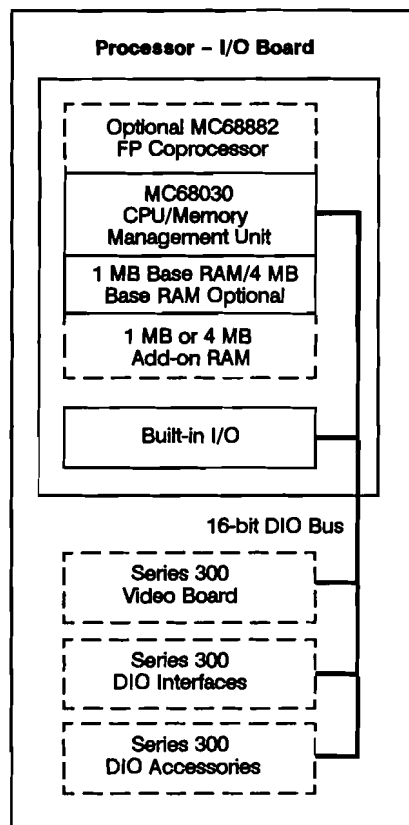


Figure 6-1. Model 332 Bus Architecture

Available DIO I/O Slots: 2 in SPU; 98568A Direct-Connect Expander can be used to add 4; two 9888A DIO Bus Expanders can be used to add up to 14.

Available DIO Accessory Slots: 2 in SPU; 98568A Direct-Connect Expander can be used to add 4; two 9888A DIO Bus Expanders can be used to add up to 14.

LAN Interface: HP 98171A (uses a DIO I/O slot).

Floating Point Coprocessor: MC68882 is opt 882.

Direct Memory Access: Two-channel Direct Memory Access is built-in.

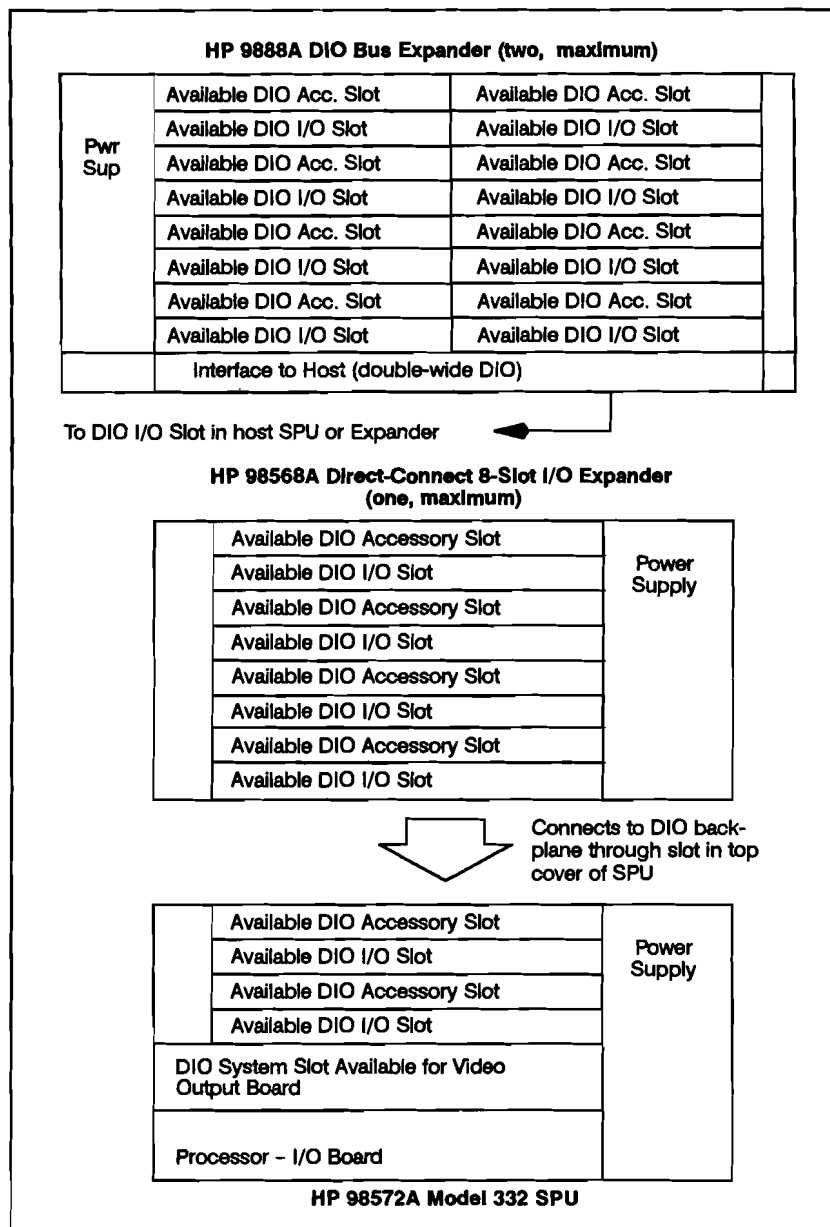


Figure 6-2. Model 332 Backplane Layout and Expandability

Product Summary

Product/ Opt. No.	Description
98572A	Model 332 System Processor Unit, consisting of: A. Processor – I/O (system interface) board with: 32-bit MC68030 CPU. 1 MB of parity-checking RAM. 4 GB virtual memory address space (under HP-UX). 32-bit memory bus and 16-bit DIO bus. - IEEE-488 HP-IB interface and 1 meter HP-IB cable. - RS-232C serial interface (1 port). - HP-HIL interface and HP-HIL keyboard cable. 512 by 400 monochrome video output. - Audio output interface. B. Enclosure with 1 I/O system slot available for video output board, 2 available DIO accessory slots, 2 available DIO I/O slots, and power supply. C. Manuals. D. 90-day on-site warranty.
Opt. 003	Deletes on-board monochrome video output interface from processor – I/O board.
Opt. 004	Deletes 4-slot I/O card cage, leaving slots for CPU board and optional graphics interface.
Opt. 102	Provides 2 MB RAM (adds second 1 MB RAM card).
Opt. 104	Substitutes 4 MB RAM for 1 MB RAM.
Opt. 544	Substitutes high-resolution (1024 by 768) monochrome graphics for medium resolution monochrome graphics (provides functionality of 98544B on Processor – I/O board).
Opt. 882	Adds MC68882 floating point coprocessor (required to support HP-UX operating system).
Add-on Accessories	
98269A	1 MB Parity RAM daughterboard for Model 332 without option 102 (excludes 98269B).
98269B	4 MB Parity RAM daughterboard (excludes 98269A).
98284A	MC68882 floating point coprocessor.
98285A	Field-installable graphics upgrade kit for 1024 by 768 monochrome graphics instead of medium resolution graphics.
98568A	Direct Connect 8-slot I/O Expander (maximum of one per Model 332 SPU).
9888A	16-slot DIO Bus Expander (uses one DIO I/O slot – maximum of two).
46021x	HP-HIL Keyboard (for National Versions, see page 13-9).
46060A	HP-HIL 2-button Mouse.
46060B	HP-HIL 3-button Mouse.
46081A	HP-HIL Buffer box with speaker.
46084A	HP-HIL ID Module.
98203x	HP-HIL Keyboard with rotary knob, for BASIC/WS or Series 200/300 Pascal systems (for National Versions, see page 13-9).
35731A	12-inch Medium-resolution (512 by 400) Monochrome Monitor.
98543A	Medium-resolution (512 by 400 by 4) Color Video Output Board with RGB cable.
35741A	12-inch Medium-resolution (512 by 400) Color Monitor.
35723A	HP-Touch Bezel for 35731A/35741A Monitor.
98544B	High-resolution (1024 by 768) Monochrome Video Output Board (option 544 provides this functionality on processor – I/O board at a lower price and without using another DIO system slot).
98786A	17-inch High-resolution (1024 by 768) Monochrome Monitor.
98546A	Display Compatibility Interface with separate alpha and graphics planes for use with applications software that requires compatibility with Series 200 displays. (Requires adjacent DIO Accessory and DIO I/O slots).

Model 332 System Processor Unit, continued

Product Summary, continued

Product/ Opt. No.	Description
Add-on Accessories, continued	
98547A	High-resolution (1024 by 768 by 6) Color Video Output Board.
98549A	High-resolution (1024 by 768 by 6) Color Video Output Board.
98753A	19-inch High-resolution (1024 by 768) Color Monitor.
98785A	16-inch High-resolution (1024 by 768) Color Monitor.
98548A	High-resolution (1280 by 1024) Monochrome Video Output Board.
98788A	19-inch High-resolution (1280 by 1024) Monochrome Monitor.
98550A	High-resolution (1280 by 1024 by 10) Color Video Output Board.
98754A	19-inch High-resolution (1280 by 1024) Color Monitor.
98789A	16-inch High-resolution (1280 by 1024) Color Monitor.

Operational Requirements

Description	Requirements		
Operating System:	BASIC/WS (pages 4-2 and 4-3) or	Pascal/WS (pages 4-4 and 4-5) or	HP-UX (pages 4-6 through 4-10)
System Console:	Monitor and keyboard (not required).	Monitor and keyboard (not required).	Monitor and keyboard or separate terminal (see page 13-3 for supported console terminals)
System Disk:	3.5-inch or 5.25-inch flexible disk (min.); 10-40 MB hard disk is also desirable (see Section 14)	3.5-inch or 5.25-inch flexible disk (min.); 10-40 MB hard disk is also desirable (see Section 14)	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2) or comparable support from a LAN-connected network server system. For disk choices, see Section 14.
Software Installation/Backup Device:	3.5-inch or 5.25-inch flexible disk.	3.5-inch or 5.25-inch flexible disk.	Cartridge tape subsystem (Section 15) or comparable support from a LAN-connected network server.
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).		

Model 360 System Processor Unit

Description

The HP 9000 Model 360 is a mid-priced HP 9000 Series 300 System Processor Unit (SPU) that affords expandability. Figures 6-3 and 6-4 illustrate the Model 360 bus architecture and backplane layout and expandability.

CPU: MC68030, clocked at 25 MHz.

Bus Types: 32-bit memory and Direct I/O-II (DIO-II) buses.

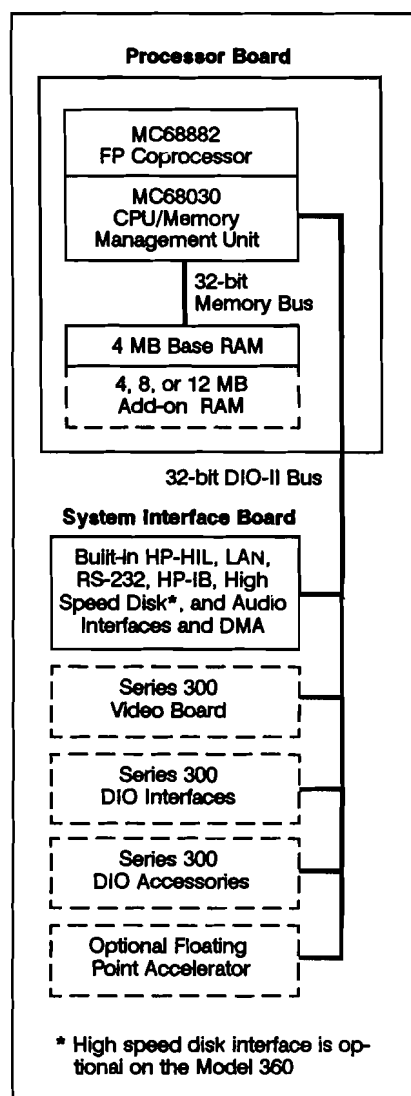


Figure 6-3. Model 360 Bus Architecture

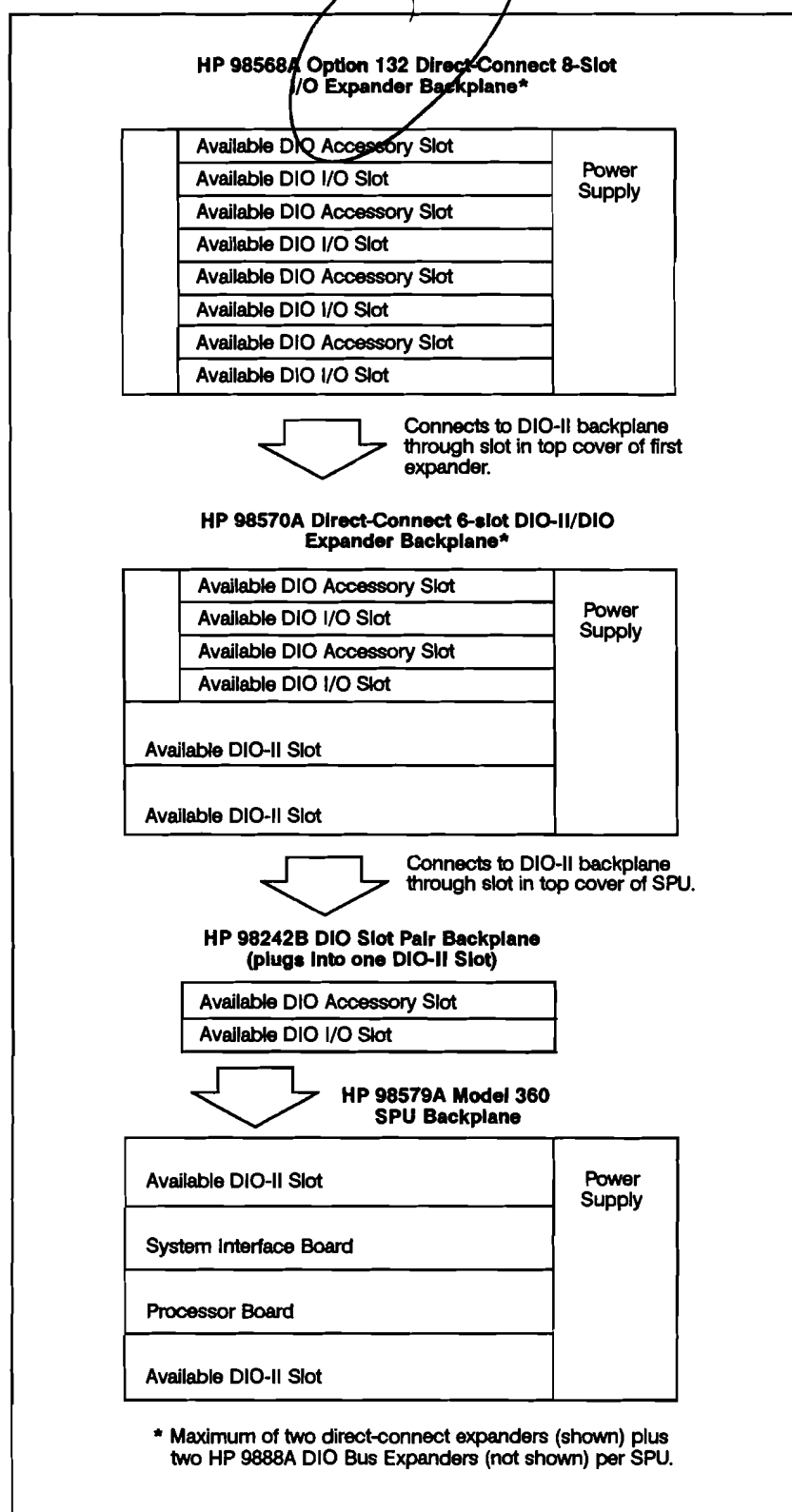


Figure 6-4. Model 360 Backplane Layout and Expandability

Model 360 System Processor Unit, continued

RAM: 4 MB parity, expandable to 8, 12, or 16 MB with add-on 4, 8, or 12 MB RAM board.

Built-in Interfaces: HP-HIL, LAN (AUI or ThinLAN with built-in ThinMAU), RS-232, Std HP-IB, and audio output.

Available DIO I/O Slots: 1 with 98242B DIO Slot Backplane in SPU; two 98568A Direct-Connect Expanders can be used to add 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

Available DIO Accessory Slots: 1 with 98242B DIO Slot Backplane in SPU; two 98568A Direct-Connect Expanders can be used to add 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

Floating Point Coprocessor: MC68882, clocked at 25 MHz, is standard.

Direct Memory Access: Two-channel Direct Memory Access is built-in.

Model 360 Bundles

For a wide variety of products that bundle the Model 360 SPU with keyboards, monitors, and software, see Sections 7 through 9.

Product Summary

Product/ Opt. No.	Description
98579A	Model 360 System Processor Unit, consisting of: A. Processor board with: 32-bit MC68030 25 MHz CPU with MC68882 25 MHz Floating Point Coprocessor. 4 MB of parity-checking RAM, expandable to 8, 12, or 16 MB with addition of a RAM board. 4 GB virtual memory address space (under HP-UX). 32-bit memory and DIO-II buses. B. System interface board with: - IEEE-488 HP-IB interface and 1 meter HP-IB cable. - RS-232C serial interface (1 port) and adapter cable. - HP-HIL interface and HP-HIL keyboard cable. - IEEE 802.3/Ethernet LAN interface. - Audio output interface. C. Enclosure with 2 available DIO-II slots, and power supply. D. Installation manuals. E. 90-day on-site warranty.
Opt. 006	Adds 98242B Two-slot DIO backplane.
Opt. 010	Adds high-speed HP-IB Disk Interface (excludes option 011).
Opt. 011	Adds SCSI single-ended Disk Interface with 1m cable and terminator (excludes option 010).
Opt. 015†	Specifies AUI-type LAN connection (excludes option 017).
Opt. 017†	Specifies ThinMAU and BNC "T" connector for LAN connection (excludes option 015).
Opt. 108	Adds 4 MB RAM for a total of 8 MB (excludes options 112 and 116).
Opt. 112	Adds 8 MB RAM for a total of 12 MB (excludes options 108 and 116).
Opt. 116	Adds 12 MB RAM for a total of 16 MB (excludes options 108 and 112).
Add-on Accessories	
98242A	4-slot DIO backplane.
98242B	2-slot DIO backplane.
98248B	Floating Point Accelerator.

† Must order option 015 or 017.

Product Summary, continued

Product/ Opt. No.	Description
Add-on Accessories, continued	
98267A	4 MB Parity-Checking add-on RAM board for Model 360 without option 108, 112, or 116 (increases total RAM to 8 MB – excludes 98267B and 98267C).
98267B	8 MB Parity-Checking add-on RAM board for Model 360 without option 108, 112, or 116 (increases total RAM to 12 MB – excludes 98267A and 98267C).
98267C	12 MB Parity-Checking add-on RAM board for Model 360 without option 108, 112, or 116 (increases total RAM to 16 MB – excludes 98267A and 98267B).
98568A	Direct Connect 8-slot I/O Expander (first Expander requires 98568A Option 132).*
98570A	Direct Connect I/O Expander with four DIO slots (two DIO slot pairs) and two DIO-II slots.*
9888A	16-slot DIO Expander (uses one DIO I/O slot – maximum of two).
46021x	HP-HIL Keyboard (for National Versions, see page 13-9).
98203x	HP-HIL Keyboard w/rotary knob, for BASIC/WS or Series 200/300 Pascal systems (for National Versions, see page 13-9).
35731A	12-inch Medium-resolution (512 by 400) Monochrome Monitor.
98542A	Medium-resolution Monochrome Video Output Board with cable.
35741A	Medium-resolution (512 by 400) Color Monitor.
35723A	HP-Touch Bezel for 35731A/35741A Monitor.
98543A	Medium-resolution Color Video Output Board with RGB cable.
98544B	High-resolution (1024 by 768) Monochrome Video Output Board.
98786A	17-inch High-resolution (1024 by 768) Monochrome Monitor.
98547A	High-resolution (1024 by 768 by 6) Color Video Output Board.
98549A	High-resolution (1024 by 768 by 6) Color Video Output Board.
98753A	19-inch High-resolution (1024 by 768) Color Monitor.
98785A	16-inch High-resolution (1024 by 768) Color Monitor.
98725A	Local Graphics Bus Interface to 98720A SRX Display Controller.
98726A	Local Graphics Bus Interface to 98730A TurboSRX Display Controller.
98548A	High-resolution (1280 by 1024) Monochrome Video Output Board.
98788A	19-inch High-resolution (1280 by 1024) Monochrome Monitor.
98550A	High-resolution (1280 by 1024 by 10) Color Video Output Board.
98556A	2-D Integer-based graphics accelerator for 98549A or 98550A Color Video Output Board.
98754A	19-inch High-resolution (1280 by 1024) Color Monitor.
98789A	16-inch High-resolution (1280 by 1024) Color Monitor.
46060A	HP-HIL 2-button Mouse.
46060B	HP-HIL 3-button Mouse.
46081A	HP-HIL Buffer box with speaker.
46084A	HP-HIL ID Module.

* Maximum of two 98568A/98570A Direct Connect I/O Expanders per Model 360 SPU.

Operational Requirements

Description	Requirements		
Operating System:	BASIC/WS (pages 4-2 and 4-3) or	Pascal/WS (pages 4-4 and 4-5) or	HP-UX (pages 4-6 through 4-10)
System Console:	Monitor and keyboard (not required).	Monitor and keyboard (not required).	Monitor and keyboard or separate terminal (see page 13-3 for supported console terminals)
System Disk:	3.5-inch or 5.25-inch flexible disk (min.); 10-40 MB hard disk is also desirable (see Section 14)	3.5-inch or 5.25-inch flexible disk (min.); 10-40 MB hard disk is also desirable (see Section 14)	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2) or comparable support from a LAN-connected network server system. For disk choices, see Section 14.
Software Installation/Backup Device:	3.5-inch or 5.25-inch flexible disk.	3.5-inch or 5.25-inch flexible disk.	Cartridge tape subsystem (Section 15) or comparable support from a LAN-connected network server.
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).		

Model 370 System Processor Unit

Description

The HP 9000 Model 370 is a powerful HP 9000 Series 300 System Processor Unit (SPU). Figures 6-5 and 6-6 illustrate the Model 370 bus architecture and backplane layout and expandability.

CPU: MC68030, clocked at 33 MHz.

Cache: 64 KB, 60 ns cycle time, no wait states.

Bus Types: 32-bit system, Floating Point Accelerator, and Direct I/O-II (DIO-II) buses.

RAM: 8 MB parity, expandable to 32 MB parity or 48 MB ECC. See page 6-10.

Floating Point Coprocessor: MC68882, clocked at 33 MHz, is standard.

Built-in Interfaces: HP-HIL, LAN (AUI or ThinLAN with built-in ThinMAU), RS-232, Std HP-IB, HP-IB Disk, and audio output.

Direct Memory Access: Two-channel Direct Memory Access is built-in.

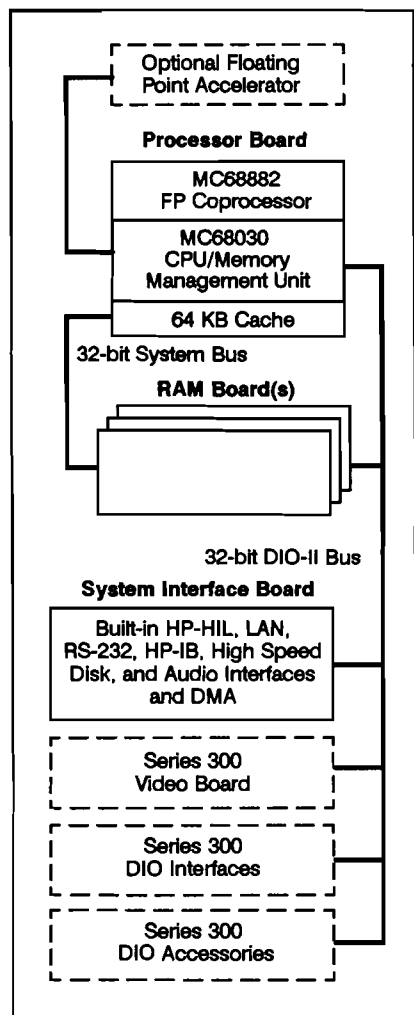


Figure 6-5. Model 370 Bus Architecture

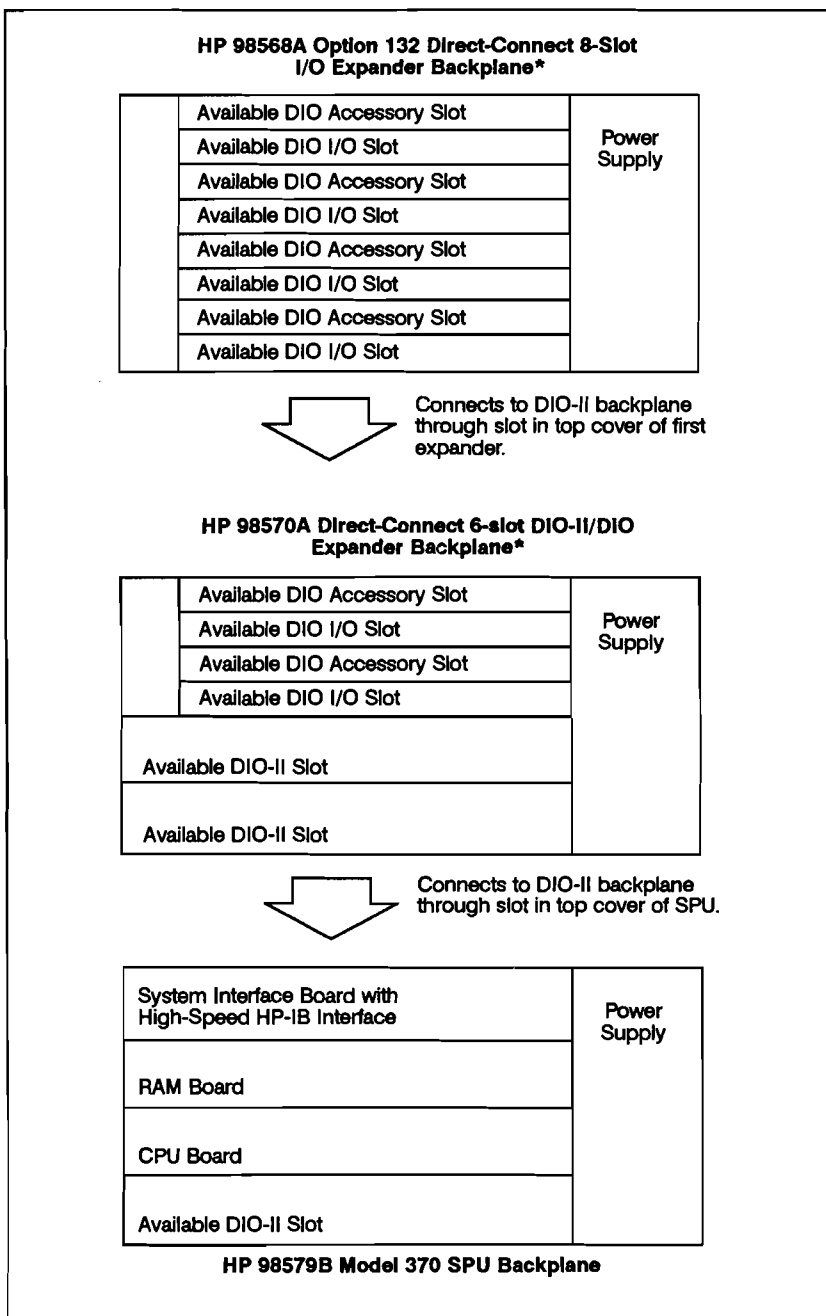


Figure 6-6. Model 370 Backplane Layout and Expandability

Model 370 System Processor Unit, continued

Available DIO I/O Slots: 1 with 98242B DIO Slot Backplane in SPU; two 98568A Direct-Connect Expanders can be used to add 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

Available DIO Accessory Slots: 1 with 98242B DIO Slot Backplane in SPU; two 98568A Direct-Connect Expanders can be used to add 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

Model 370 Bundles

For a wide variety of products that bundle the Model 370 SPU with keyboards, monitors, and software, see Sections 7 and 8.

RAM Configuration and Expansion

Parity RAM

Option 116 provides for doubling the basic 8 MB of parity RAM in Model 370 SPUs to 16 MB on the standard RAM controller board that comes with the SPU. An additional 98258A 4 MB parity RAM board with 98258C 12 MB add-on can be installed in the SPU to provide a total of up to 32 MB of parity RAM, the maximum that has been tested and is supported.

ECC Memory

Options 208 and 216 provide for substitution of 8 or 16 MB of ECC RAM, respectively, for the 8 MB of parity RAM that is provided in the SPU. Two additional 98264B 16 MB ECC RAM boards can be installed in the option 216 SPU to provide a total of up to 48 MB of ECC memory.

Mixed Use of Parity and ECC Memory

The HP 98258A Parity Memory Controller and the HP 98264A/B ECC Memory Controller can be used together in the same system. The ECC protection is provided only for the RAM locations on the ECC Memory Controller board(s). It does not extend to the RAM on the Parity Memory Controller.

Memory Location Considerations

To the extent that RAM boards use DIO-II slots in the SPU that might otherwise be occupied by the system interface board or a display controller interface or a video board, those other boards must be installed in an appropriate expander. Figure 6-7 shows a configuration in which the system interface board has been moved

to an expander to make space for a total of three RAM boards (48 MB of ECC memory). It is important to note that the 98248B Floating Point Accelerator must also occupy a slot in the SPU (the slot directly above the CPU card), if it is to achieve full rated performance. This reduces maximum SPU-resident memory to 32 MB.

Memory Performance in Expander

Although RAM boards can be installed in a 98570A Expander, only RAM in the SPU mainframe, which is frontplane-connected via the system bus, is accessed without wait states. RAM boards in an expander, and therefore not on the system bus, incur wait states during fill or flush upon cache fault, reducing performance.

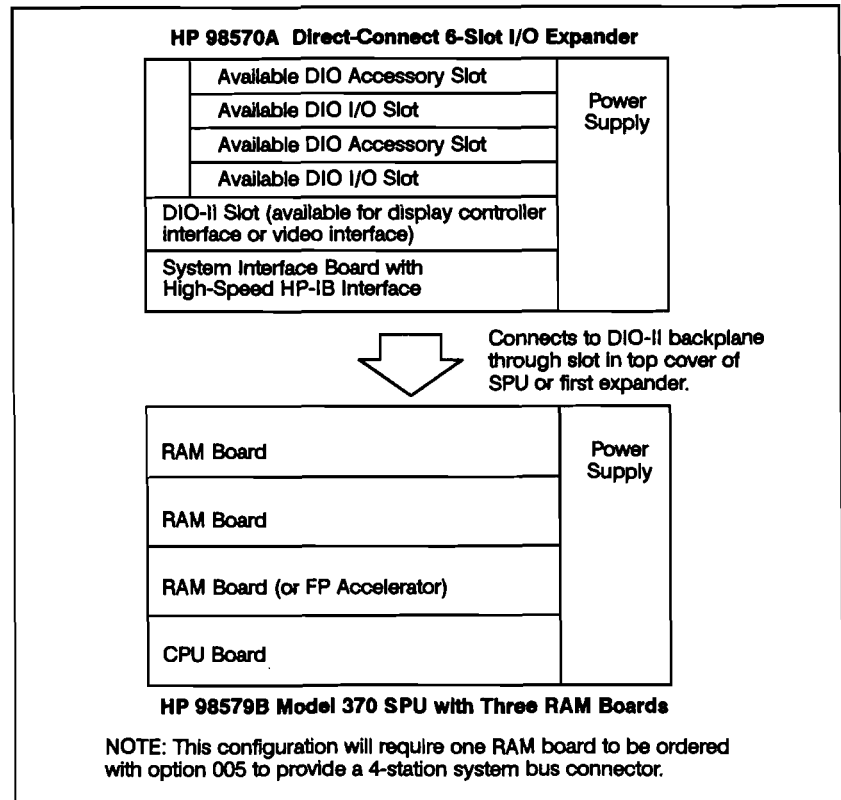


Figure 6-7. Model 370 Configuration with Three RAM Boards in SPU

Product Summary

Product/ Opt. No.	Description
98579B	Model 370 System Processor Unit, consisting of: A. Processor board with: 1. 32-bit MC68030 33 MHz CPU with MC68882 33 MHz Floating Point Coprocessor. 2. 64 KB of 60 ns cache memory. 3. 4 GB virtual memory address space (under HP-UX). 4. 32-bit system and DIO-II buses. B. System Bus Frontplane Connector. C. RAM board with: 1. 8 MB of parity-checking RAM. 2. Dual-port access to 32-bit CPU system bus and 32-bit DIO-II bus. D. System interface board with: 1. IEEE-488 HP-IB interface and 1 meter HP-IB cable. 2. High-speed HP-IB Disk interface and 1 meter HP-IB cable. 3. RS-232C serial interface (1 port) and adapter cable. 4. HP-HIL interface and HP-HIL keyboard cable. 5. IEEE 802.3/Ethernet LAN interface. 6. Audio output interface. 7. Two-channel direct memory access. E. Enclosure with one available DIO-II slot and power supply. F. Installation manuals. G. 90-day on-site warranty.
Opt. 011	Substitutes SCSI single-ended Disk Interface with 1m cable and terminator for high-speed HP-IB interface.
Opt. 015†	Specifies AUI-type LAN connection (excludes option 017).
Opt. 017†	Specifies ThinMAU and BNC "T" connector for LAN connection (excludes option 015).
Opt. 116	Converts 8 MB parity checking RAM to 16 MB parity checking RAM (excludes options 208 and 216).
Opt. 208	Substitutes 8 MB ECC RAM for 8 MB parity checking RAM (excludes options 116 and 216).
Opt. 216	Substitutes 16 MB ECC RAM for 8 MB parity checking RAM (excludes options 116 and 208).
Add-on Accessories	
98248B	Floating Point Accelerator.
98258A	4 MB Parity-Checking RAM controller with 3-slot system bus frontplane connector. 004: Deletes 3-slot system bus frontplane connector. 005: Substitutes 4-slot system bus frontplane connector for 3-slot connector.
98258B	Adds 4 MB Parity-checking RAM to 98258A (excludes 98258C).
98258C	Adds 12 MB Parity-checking RAM to 98258A (excludes 98258B).
98264A	8 MB ECC RAM controller with 3-slot system bus frontplane connector. 004: Deletes 3-slot system bus frontplane connector. 005: Substitutes 4-slot system bus frontplane connector for 3-slot connector.
98264B	16 MB ECC RAM controller with 3-slot system bus frontplane connector. 004: Deletes 3-slot system bus frontplane connector. 005: Substitutes 4-slot system bus frontplane connector for 3-slot connector.
98568A*	Direct Connect 8-slot I/O Expander.
98570A*	Direct Connect I/O Expander with four DIO slots (two DIO slot pairs) and two DIO-II slots.
9888A	16-slot DIO Expander (uses one DIO I/O slot - maximum of two).
46021x	HP-HIL Keyboard (for National Versions, see page 13-9).
98203x	HP-HIL Keyboard w/rotary knob, for BASIC/WS or Series 200/300 Pascal systems (for National Versions, see page 13-9).
35731A	12-inch Medium-resolution (512 by 400) Monochrome Monitor.

† Must order option 015 or 017.

* Maximum of two 98568A/98570A Direct Connect I/O Expanders per Model 370 SPU.

Model 370 System Processor Unit, continued

Product Summary, continued

Product/ Opt. No.	Description
Add-on Accessories, continued	
98542A	Medium-resolution Monochrome Video Output Board with cable.
35741A	Medium-resolution (512 by 400) Color Monitor.
35723A	HP-Touch Bezel for 35731A/35741A Monitor.
98543A	Medium-resolution Color Video Output Board with RGB cable.
98544B	High-resolution (1024 by 768) Monochrome Video Output Board.
98786A	17-inch High-resolution (1024 by 768) Monochrome Monitor.
98547A	High-resolution (1024 by 768 by 6) Color Video Output Board.
98549A	High-resolution (1024 by 768 by 6) Color Video Output Board.
98753A	19-inch High-resolution (1024 by 768) Color Monitor.
98785A	16-inch High-resolution (1024 by 768) Color Monitor.
98725A	Local Graphics Bus Interface to 98720A SRX Display Controller.
98726A	Local Graphics Bus Interface to 98730A TurboSRX Display Controller.
98548A	High-resolution (1280 by 1024) Monochrome Video Output Board.
98788A	19-inch High-resolution (1280 by 1024) Monochrome Monitor.
98550A	High-resolution (1280 by 1024 by 10) Color Video Output Board.
98556A	2-D Integer-based graphics accelerator for 98549A or 98550A Color Video Output Board.
98754A	19-inch High-resolution (1280 by 1024) Color Monitor.
98789A	16-inch High-resolution (1280 by 1024) Color Monitor.
46060A	HP-HIL 2-button Mouse.
46060B	HP-HIL 3-button Mouse.
46081A	HP-HIL Buffer box with speaker.
46084A	HP-HIL ID Module.

Operational Requirements

Description	Requirements		
Operating System:	BASIC/WS (pages 4-2 and 4-3) or	Pascal/WS (pages 4-4 and 4-5) or	HP-UX (pages 4-6 through 4-10)
System Console:	Monitor and keyboard (not required).	Monitor and keyboard (not required).	Monitor and keyboard or separate terminal (see page 13-3 for supported console terminals)
System Disk:	3.5-inch or 5.25-inch flexible disk (min.); 10-40 MB hard disk is also desirable (see Section 14)	3.5-inch or 5.25-inch flexible disk (min.); 10-40 MB hard disk is also desirable (see Section 14)	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2) or comparable support from a LAN-connected network server system. For disk choices, see Section 14.
Software Installation/Backup Device:	3.5-inch or 5.25-inch flexible disk.	3.5-inch or 5.25-inch flexible disk.	Cartridge tape subsystem (Section 15) or comparable support from a LAN-connected network server.
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).		

Model 375 System Processor Unit

Description

The HP 9000 Model 375 is the most powerful HP 9000 Series 300 System Processor Unit (SPU). Figures 6-8 and 6-9 illustrate the Model 375 bus architecture and backplane layout and expandability.

CPU: MC68030, clocked at 50 MHz.

Cache: 32 KB, 60 ns cycle time, no wait states.

Bus Types: 32-bit system and Direct I/O-II (DIO-II) buses.

RAM: 8 MB ECC, expandable to 32 MB.

Floating Point Coprocessor: MC68882, clocked at 50 MHz, is standard.

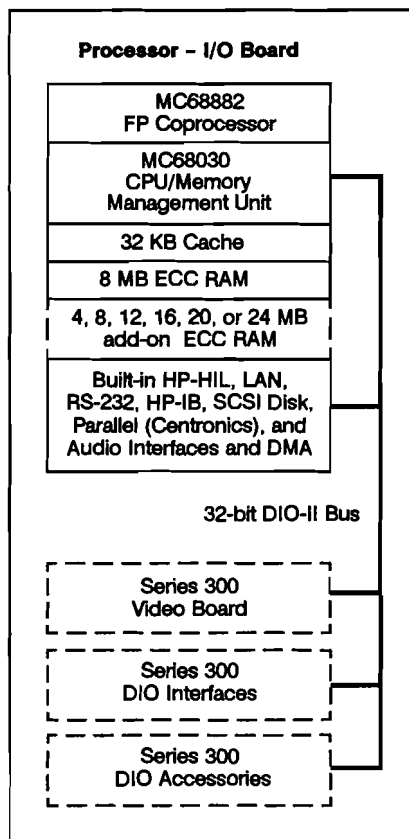


Figure 6-8. Model 375 Bus Architecture

Built-in Interfaces: HP-HIL, LAN (jumper-selectable between AUI and ThinLAN with built-in ThinMAU), RS-232, Std HP-IB, SCSI Disk, Parallel (Centronics), and audio output.

Direct Memory Access: Two-channel Direct Memory Access is built-in.

Available DIO I/O Slots: 2 with 98242A DIO Slot Backplane in SPU, 1 with 98242B DIO Slot backplane in SPU; two 98568A Direct-Connect Expanders can be used to add 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

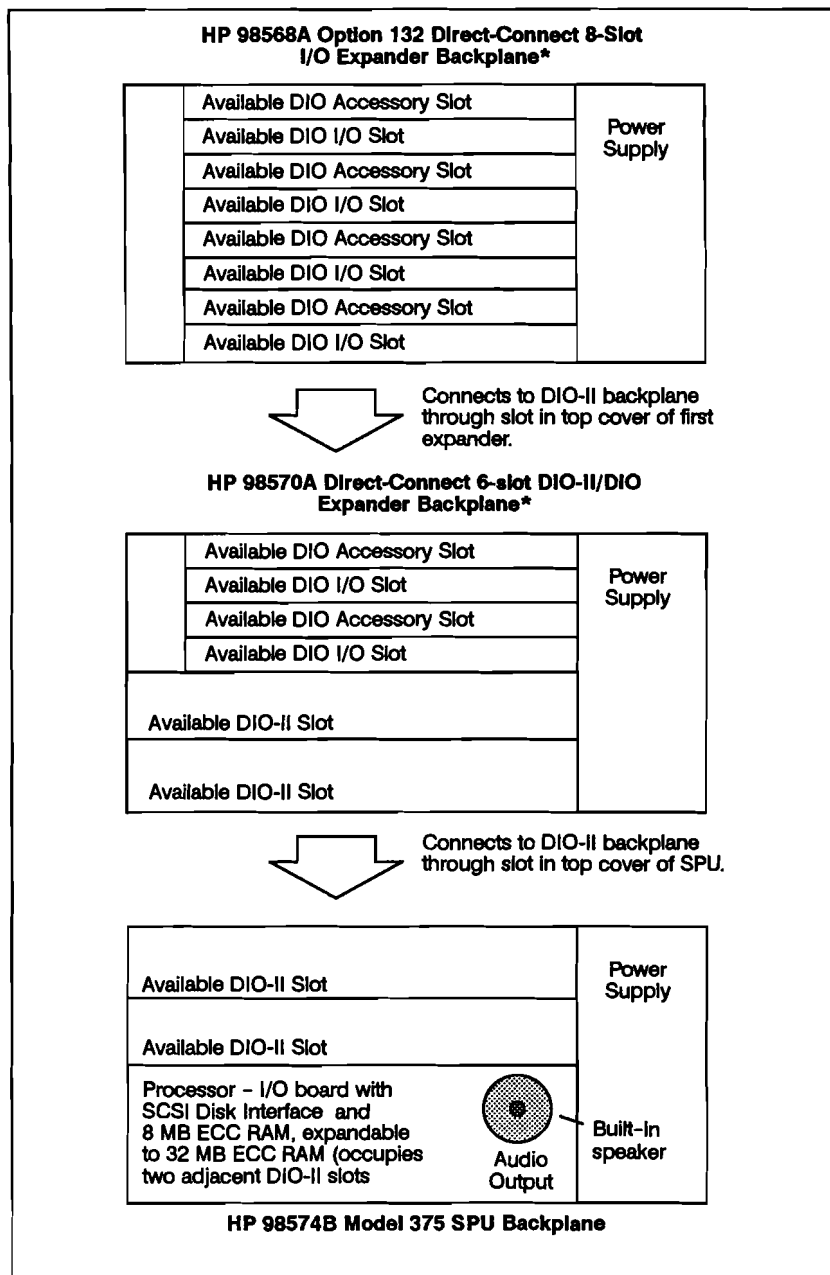


Figure 6-9. Model 375 Backplane Layout and Expandability

Model 375 System Processor Unit, continued

Available DIO Accessory Slots: 2 with 98242A DIO Slot Backplane in SPU, 1 with 98242B DIO Slot Backplane in SPU; two 98568A Direct-Connect Expanders

can be used to add 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

Model 375 Bundles

For a wide variety of products that bundle the Model 375 SPU with keyboards, monitors, and software, see Sections 7 and 8.

Product Summary

Product/ Opt. No.	Description
98574B	Model 375 System Processor Unit, consisting of: A. Processor - I/O board with: 32-bit MC68030 50 MHz CPU with MC68882 50 MHz Floating Point Coprocessor. 32 KB of 60 ns cache memory. 8 MB of ECC RAM, expandable to 32 MB. 4 GB virtual memory address space (under HP-UX). 64-bit memory bus.. 32-bit DIO-II bus. - IEEE-488 HP-IB interface and 1 meter HP-IB cable. - SCSI Disk Interface and 1 meter SCSI cable. - RS-232C serial interface (1 port) and adapter cable. - HP-HIL interface and HP-HIL keyboard cable. - IEEE 802.3/Ethernet LAN interface with ThinMAU and BNC "T" connector and AUI connector (jumper selectable). - Centronics-compatible parallel I/O interface. - Audio output interface with built-in speaker. - Two-channel direct memory access. B. Enclosure with two available DIO-II slots and power supply. C. Installation manuals. D. 90-day on-site warranty.
Opt. 006	Adds 98242B 2-slot DIO backplane.
Opt. 010	Substitutes high-speed HP-IB Disk Interface (with 1 meter Cable) for SCSI single-ended Disk Interface.
Opt. 012	Adds software support for Centronics-compatible parallel I/O interface, including Device Driver.
Opt. 116	Adds 8 MB ECC RAM to bring total to 16 MB of ECC RAM (excludes options 124 and 132).
Opt. 124	Adds 16 MB ECC RAM to bring total to 24 MB of ECC RAM (excludes options 116 and 132).
Opt. 132	Adds 24 MB ECC RAM to bring total to 32 MB of ECC RAM (excludes options 116 and 124).
Add-on Accessories	
98242A	4-slot DIO backplane.
98242B	2-slot DIO backplane.
98229A	4 MB add-on ECC RAM module.
98229B	8 MB add-on ECC RAM module (max. RAM in Model 375 is 32 MB, made up of base 8 MB and up to three 98229Bs).
98568A*	Direct Connect 8-slot I/O Expander.
98570A*	Direct Connect I/O Expander with four DIO slots (two DIO slot pairs) and two DIO-II slots.
9888A	16-slot DIO Expander (uses one DIO I/O slot - maximum of two).
46021x	HP-HIL Keyboard (for National Versions, see page 13-9).
98203x	HP-HIL Keyboard w/rotary knob, for BASIC/WS or Series 200/300 Pascal systems (for National Versions, see page 13-10).
35731A	12-inch Medium-resolution (512 by 400) Monochrome Monitor.
98542A	Medium-resolution Monochrome Video Output Board with cable.

* Maximum of two 98658A/98570A Direct Connect I/O Expanders per Model 375 SPU.

Product Summary, continued

Product/ Opt. No.	Description
Add-on Accessories, continued	
35741A	Medium-resolution (512 by 400) Color Monitor.
35723A	HP-Touch Bezel for 35731A/35741A Monitor.
98543A	Medium-resolution Color Video Output Board with RGB cable.
98544B	High-resolution (1024 by 768) Monochrome Video Output Board.
98786A	17-inch High-resolution (1024 by 768) Monochrome Monitor.
98547A	High-resolution (1024 by 768 by 6) Color Video Output Board.
98549A	High-resolution (1024 by 768 by 6) Color Video Output Board.
98753A	19-inch High-resolution (1024 by 768) Color Monitor.
98785A	16-inch High-resolution (1024 by 768) Color Monitor.
98725A	Local Graphics Bus Interface to 98720A SRX Display Controller.
98726A	Local Graphics Bus Interface to 98730A TurboSRX Display Controller.
98548A	High-resolution (1280 by 1024) Monochrome Video Output Board.
98788A	19-inch High-resolution (1280 by 1024) Monochrome Monitor.
98550A	High-resolution (1280 by 1024 by 10) Color Video Output Board.
98556A	2-D Integer-based graphics accelerator for 98549A or 98550A Color Video Output Board.
98754A	19-inch High-resolution (1280 by 1024) Color Monitor.
98789A	16-inch High-resolution (1280 by 1024) Color Monitor.
46060A	HP-HIL 2-button Mouse.
46060B	HP-HIL 3-button Mouse.
46081A	HP-HIL Buffer box with speaker.
46084A	HP-HIL ID Module.

Operational Requirements

Description	Requirements		
Operating System:	BASIC/WS (pages 4-2 and 4-3) or	Pascal/WS (pages 4-4 and 4-5) or	HP-UX (pages 4-6 through 4-10)
System Console:	Monitor and keyboard (not required).	Monitor and keyboard (not required).	Monitor and keyboard or separate terminal (see page 13-3 for supported console terminals)
System Disk:	3.5-inch or 5.25-inch flexible disk (min.); 10-40 MB hard disk is also desirable (see Section 14)	3.5-inch or 5.25-inch flexible disk (min.); 10-40 MB hard disk is also desirable (see Section 14)	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2) or comparable support from a LAN-connected network server system. For disk choices, see Section 14.
Software Installation/Backup Device:	3.5-inch or 5.25-inch flexible disk.	3.5-inch or 5.25-inch flexible disk.	Cartridge tape subsystem (Section 15) or comparable support from a LAN-connected network server.
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).		

NOTES:

[illegible]

2-D Workstations and AI Development Systems

Introduction

This section contains configuration information on 2-D Workstation bundles based on Series 300 and Model 825/834/835 platforms. All of the 2-D Workstation bundles include keyboard, color or monochrome monitor, and the license-to-use HP-UX. Most of the 2-D Workstation bundles also include an HP-HIL ID module, a 3-button mouse, X-Windows, Network Services, ARPA Services, and NFS.

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National Versions

For convenient use in various nations throughout the world, HP 9000 Series 300 and 800 2-D workstations and Superworkstations and Series 300 AI Development systems are offered in specific national versions. Each national version provides appropriate keyboard, monitor, SPU, power cord and user's manuals. They are specified as **"must order"** options to the respective product number, as follows:

Option	National Version	Option	National Version
ABA	U.S. English	ABQ	Swiss French
ABC	French Canadian	ABS	Swedish
ABD	German	ABU	U.K. English
ABE	European Spanish	ABW	Belgian Dutch
ABF	European French	ABX	Finnish
ABH	Dutch	ABY	Danish
ABJ	Katakana	ABZ	Italian
ABK	Universal English ASCII	AB0	Taiwan (Chinese)
ABM	Latin American Spanish	AB1	Korean
ABN	Norwegian	ACA	Kanji
ABP	Swiss German		

Model 340 2-D Color and Monochrome Workstations

Description

Five different low-priced, restricted configuration, MC68030-based Model 340 2-D color and monochrome workstations offer a choice of resolutions and graphics integer acceleration (see Table 7-1, next page). Figures 7-1 and 7-2 illustrate the Model 340 2-D workstation functions and backplane usage and interconnections.

CPU: MC68030, clocked at 16.7 MHz.

Bus Types: 32-bit memory and Direct I/O-II (DIO-II) buses.

RAM: 4 MB parity, expandable to 16 MB with 4 MB add-on RAM boards.

Built-in Interfaces: HP-HIL, LAN (AUI or ThinLAN with built-in ThinMAU), RS-232C, Std HP-IB, and audio and video outputs.

Floating Point Processor: MC68882, clocked at 16.7 MHz, is standard.

Direct Memory Access: Two-channel Direct Memory Access is built-in.

Monitor Choices: See Table 7-1, next page.

Optional Internal Disk: A 200 MB SCSI disk with HP-UX installed and preconfigured X Windows environment and SCSI interface is available as option 411, which provides connection for up to six additional SCSI devices, or option 412, in which the SCSI interface supports only the internal disk.

Graphics Accelerator: Available with Model 340 2-D color workstations as indicated in Table 7-1, next page. Approximately triples color graphics writing speed.

Operating System: HP 98594L HP-UX License to Use Application Execution and Programming Environments, NS, ARPA, NFS, OSF Motif™ User Interface, and X-Windows Version 11 is included; one set of HP 98594A option 022 media and manuals must be purchased separately to provide installable software for all licensed workstations at a site if one of options 404 through 412 is not purchased.

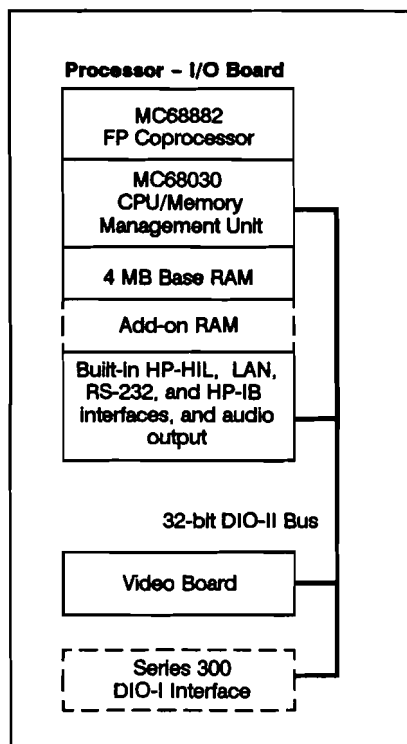


Figure 7-1. Model 340 2-D Workstation Functions

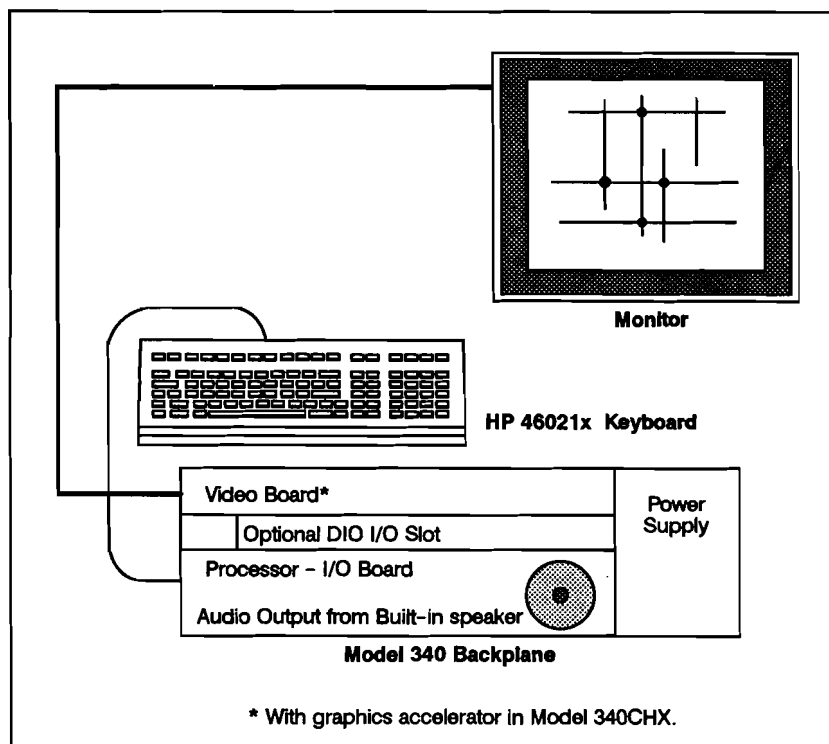


Figure 7-2. Model 340 2-D Workstation Backplane Usage and Interconnections

Table 7-1. Model 340 2-D Workstation Monitor and Graphics Accelerator Choices

	Model 340C +	Model 340CH	Model 340CHX	Model 340M	Model 340MH
Standard Monitor:	1024 by 768 16-inch color	1280 by 1024 16-inch color	1280 by 1024 16-inch color	1024 by 768 17-inch monochrome	1280 by 1024 19-inch monochrome
Option 719 Monitor:	1024 by 768 19-inch color	1280 by 1024 19-inch color	1280 by 1024 19-inch color	Not applicable	Not applicable
Graphics Accelerator:	Available accessory	Available accessory	Included	Not applicable	Not applicable

Product Summary

Product/ Opt. No.	Description
98564C	Model 340C + 2-D Color Workstation, consisting of: A. Processor – I/O board with: 1. 32-bit MC68030 16.7 MHz CPU with MC68882 16.7 MHz Floating Point Processor. 2. 4 MB of parity-checking RAM. 3. 4 GB virtual memory address space. 4. 32-bit memory and DIO-II buses. 5. IEEE-488 HP-IB interface and 1 meter HP-IB cable. 6. RS-232C serial interface (1 port). 7. HP-HIL interface and HP-HIL keyboard cable. 8. IEEE 802.3/Ethernet LAN interface. B. Enclosure with 1 optionally available DIO-I I/O slot and power supply. C. 1024 by 768 by 6 plane color video interface with cable to monitor. D. 98785A 16-inch High Resolution (1024 by 768) Color Monitor. E. 46021x Keyboard. F. Localization, which must be specified by National Version option ABA in the U.S. (see page 7-1 for other countries). G. Installation manuals. H. 98594L HP-UX License to use Application Execution Environment (AXE), Programming Environment (PE), Network Services, ARPA Services, Network File System, OSF Motif™ User Interface, and X Windows Version 11 (X11). Software and documentation must be ordered separately (see operational requirements, next page). I. 90-day on-site warranty.
98564G	Model 340CH 2-D Color Workstation, consisting of: A. Items A, B, and E through G of 98564C, above. B. 1280 by 1024 by 8 plane color video interface with cable to monitor. C. 98789A 16-inch High Resolution (1280 by 1024) Color Monitor.
98564G + 556	Model 340CHX 2-D Color Workstation, consisting of: A. Items A, B, and E through G of 98564C, above. B. 1280 by 1024 by 8 plane color video interface with cable to monitor. C. 98789A 16-inch High Resolution (1280 by 1024) Color Monitor. D. 98566A 2-D Integer-Based Graphics Accelerator.
98563E	Model 340M 2-D Monochrome Workstation, consisting of: A. Items A, B, and E through G of 98564C, above. B. 1024 by 768 monochrome video interface with cable to monitor. C. 98786A 17-inch High Resolution (1024 by 768) Monochrome Monitor.
98563G	Model 340MH 2-D Monochrome Workstation, consisting of: A. Items A, B, and E through G of 98564C, above. B. 1280 by 1024 monochrome video interface with cable to monitor. C. 98788A 19-inch High Resolution (1280 by 1024) Monochrome Monitor.
Model 340 2-D Workstation Options	
Opt. ABA	U.S. Version. (See page 7-1 for National Version options for other countries.)
Opt. 006	Adds 1 DIO-I I/O Slot (98013A). (Excludes options 010 and 011).
Opt. 010	Adds 98625B high speed HP-IB (disk) interface (Includes option 006, excludes option 011).
Opt. 011	Adds 98658A SCSI (disk) interface (Includes option 006, excludes option 010).

Model 340 2-D Color and Monochrome Workstations, continued

Product Summary, continued

Product/ Opt. No.	Description
Model 340 2-D Workstation Options, continued	
Opt. 015†	Specifies AUI-type LAN connection (excludes option 017).
Opt. 017†	Specifies ThinLAN connection (built-in ThinMAU and BNC "T" connector)(excludes option 015).
Opt. 061	Adds 46060B 3-button HP-HIL mouse.
Opt. 084	Adds 46084A HP-HIL ID module.
Opt. 108	Increases RAM to 8 MB (adds one 98268A 4 MB RAM board – excludes options 112 and 116).
Opt. 112	Increases RAM to 12 MB (adds two 98268A 4 MB RAM boards – excludes options 108 and 116).
Opt. 116	Increases RAM to 16 MB (adds three 98268A 4 MB RAM boards – excludes options 108 and 112).
Opt. 404*	Adds 162 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment.
Opt. 405*	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment.
Opt. 408*	Adds 162 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 67 MB 1/4-inch cartridge tape drive (excludes options 404, 405, 409, and 410 and requires option 011).
Opt. 409*	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 67 MB 1/4-inch cartridge tape drive.
Opt. 410*	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 133 MB 1/4-inch cartridge tape drive.
Opt. 411	Adds 200 MB internal SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and SCSI interface with external connection to up to six other SCSI devices (excludes option 412).
Opt. 412	Adds 200 MB internal SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and SCSI interface (excludes option 411).
Opt. 556	Adds 98566A 2-D Integer-Based Graphics Accelerator (Model 340CH 98564G option only).
Opt. 719	Substitutes 19-inch color monitor for 16-inch color monitor. (Model 340C+ 98564C or 340CH 98564G option only).
Model 340 2-D Workstation Add-on Accessories	
98013A	DIO I/O Slot Upgrade for Model 340C+ /CH/CHX/M/MH without option 006, 010, or 011.
98235A	AUI Upgrade for built-in LAN interface.
98237A	ThinLAN Upgrade for built-in LAN interface.
98268A	4 MB add-on Parity RAM board (maximum of three, total).
98556A	2-D Integer-Based Graphics Accelerator (included in Model 340CHX), supported only in Model 340C+ or 340CH).
98571D	200 MB Internal fixed disk upgrade, including internal SCSI interface (equivalent to option 412).

† Must order option 015 or 017. * Excludes all other options 404, 405, 408, 409, and 410 and requires option 011

Operational Requirements

Description	Requirements
Operating System:	HP 98594A option 022 Media and Documentation for 98594L must be available for installation.
System Disk:	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2) or comparable support from a LAN-connected network server system. For disk choices, see options 404 through 412 and Section 14.
Software Installation/Backup Device:	Cartridge tape subsystem (Section 15) or comparable support from a LAN-connected network server.
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Model 345 2-D Color and Monochrome Workstations

Description

Three different high-performance, restricted configuration, MC68030-based Model 345 2-D color and monochrome workstations offer a choice of resolutions (see Table 7-2, below, right). Figures 7-3 and 7-4 illustrate the Model 345 2-D workstation functions and backplane usage and interconnections.

CPU: MC68030, clocked at 50 MHz.

Bus Types: 32-bit memory and Direct I/O-II (DIO-II) buses.

RAM: 4 or 8 MB ECC, expandable to 16 MB in 4 MB increments.

Built-in Interfaces: HP-HIL, LAN (jumper-selectable between AUI and ThinLAN with built-in ThinMAU), RS-232C, Std HP-IB, Parallel (Centronics), and video and audio outputs.

Floating Point Processor: MC68882, clocked at 50 MHz, is standard.

Direct Memory Access: Two-channel Direct Memory Access is built-in.

Monitor Choices: See Table 7-2, below.

Optional Internal Disk: A 200 MB SCSI disk with HP-UX installed and preconfigured X Windows environment and SCSI interface is available as option 411, which provides connection for up to six additional SCSI devices or

option 412, in which the SCSI interface supports only the internal disk.

Operating System: HP 98594L HP-UX License to Use Application Execution and Programming Environments, NS, ARPA, NFS, OSF Motif™ User Interface, and X-Windows Version 11 is included; one set of HP 98594A option 022 media and manuals must be purchased separately to provide installable software for all licensed workstations at a site if one of options 411 or 412 is not purchased.

Table 7-2. Model 345 2-D Workstation Monitor Choices

	Model 345C +	Model 345CH	Model 345MH
Standard Monitor:	1024 by 768 16-inch color	1280 by 1024 16-inch color	1280 by 1024 19-inch monochrome
Option 719 Monitor:	1024 by 768 19-inch color	1280 by 1024 19-inch color	Not applicable

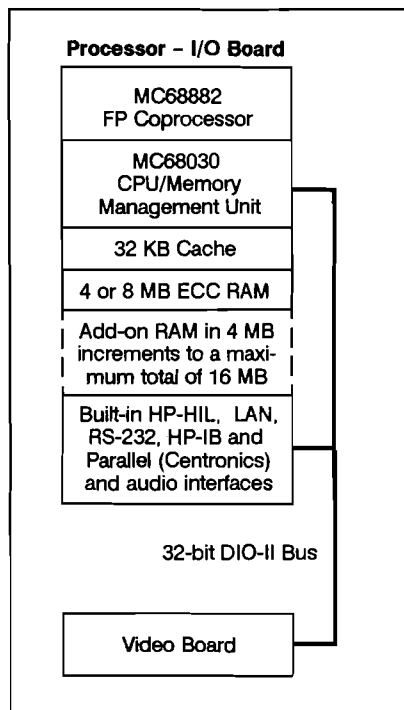


Figure 7-3. Model 345 2-D Workstation Functions

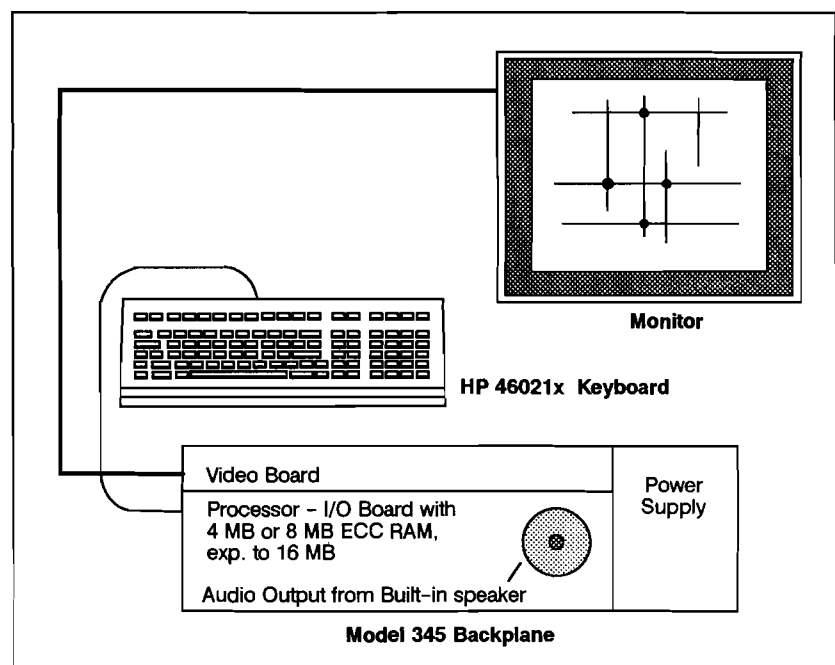


Figure 7-4. Model 345 2-D Workstation Backplane Usage and Interconnections

Model 345 2-D Color and Monochrome Workstations, continued

Product Summary

Product/ Opt. No.	Description
98564H	Model 345C+ 2-D Color Workstation, consisting of: A. System Processor - I/O board with: 1. 32-bit MC68030 50 MHz CPU with MC68882 50 MHz Floating Point Processor. 2. 8 MB of ECC RAM. 3. 4 GB virtual memory address space. 4. 64-bit memory bus. 5. 32-bit DIO-II bus. 6. IEEE-488 HP-IB interface and 1 meter HP-IB cable. 7. RS-232C serial interface (1 port) with 9-to-25 pin converter. 8. HP-HIL interface and HP-HIL keyboard cable. 9. Centronics-compatible parallel I/O interface. 10. IEEE 802.3/Ethernet LAN interface with ThinMAU and BNC "T" connector and AUI connector (jumper selectable). 11. 2-channel DMA controller. 12. Audio output with built-in speaker. B. Enclosure with power supply. C. 98549A 1024 by 768 by 6 plane color video interface with cable to monitor. D. 98785A 16-inch High Resolution (1024 by 768) Color Monitor. E. 46021x Keyboard. F. Localization, which must be specified by National Version option ABA in the U.S. (see page 7-1 for other countries). G. Installation manuals. H. 98594L HP-UX License to use Application Execution Environment (AXE), Programming Environment (PE), Network Services, ARPA Services, Network File System, OSF Motif™ User Interface, and X Windows Version 11 (X11). Software and documentation must be ordered separately (see operational requirements, next page). I. 90-day on-site warranty.
98578H	Model 345CH 2-D Color Workstation, consisting of: A. Items A, B, and E through G of 98564H, above. B. 98550A 1280 by 1024 by 8 plane color video interface with cable to monitor. C. 98789A 16-inch High Resolution (1280 by 1024) Color Monitor.
98563H	Model 345MH 2-D Monochrome Workstation, consisting of: A. Items A, B, and E through G of 98564H, above, but with 4 MB ECC RAM instead of 8 MB. B. 98548A 1280 by 1024 monochrome video interface with cable to monitor. C. 98788A 19-inch High Resolution (1280 by 1024) Monochrome Monitor.
Model 345 2-D Workstation Options	
Opt. ABA	U.S. Version. (See page 7-1 for National Version options for other countries.)
Opt. 010	Adds high speed HP-IB (disk) interface (Excludes options 011, 411, and 412).
Opt. 011	Adds SCSI (disk) interface (Excludes options 010, 411, and 412).
Opt. 012	Adds software support for Centronics-compatible parallel I/O interface, including Device Driver.
Opt. 061	Adds 46060B 3-button HP-HIL mouse.
Opt. 084	Adds 46084A HP-HIL ID module.
Opt. 108	In 98563H Model 345MH only, increases RAM to 8 MB (adds one 98229A 4 MB RAM board - excludes options 112 and 116).
Opt. 112	Increases RAM to 12 MB (excludes options 108 and 116).
Opt. 116	Increases RAM to 16 MB (excludes options 108 and 112).
Opt. 411	Adds 200 MB internal SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and SCSI interface with external connection to up to six other SCSI devices (excludes options 010, 011, and 412).
Opt. 412	Adds 200 MB internal SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and SCSI interface (excludes options 010, 011, and 411).
Opt. 719	Substitutes 19-inch color monitor for 16-inch color monitor. (Model 345C+ 98564H or 345CH 98578H option only).

Product Summary, continued

Product/ Opt. No.	Description
Model 345 2-D Workstation Add-on Accessories	
98229A	4 MB add-on Parity RAM board (maximum of three additional for 345MH, two additional for 345C + /CH).
98433D	200 MB Internal fixed disk upgrade, including Internal SCSI interface (equivalent to option 412).

Operational Requirements

Description	Requirements
Operating System:	HP 98594A option 022 Media and Documentation for 98594L must be available for installation if option 411 or 412 is not purchased.
System Disk:	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2) or comparable support from a LAN-connected network server system. For disk choices, see options 411 and 412 and Section 14.
Software Installation/Backup Device:	Cartridge tape subsystem (Section 15) or comparable support from a LAN-connected network server.
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Model 360 2-D Color and Monochrome Workstations

Description

Four different mid-priced 2-D color and monochrome workstations based on the Model 360 System Processor Unit offer a choice of resolutions and graphics integer acceleration (see Table 7-3, next page). Figures 7-5 and 7-6 illustrate the Model 360 2-D workstation functions and backplane usage and interconnections.

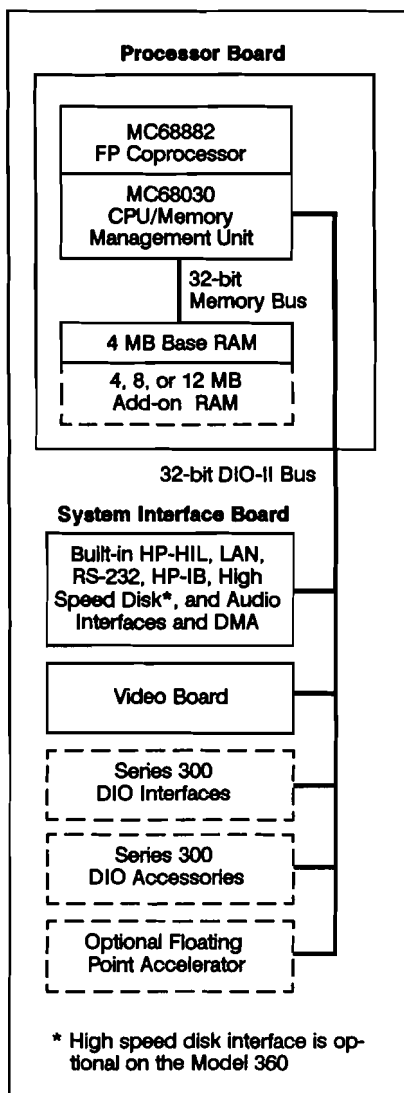


Figure 7-5. Model 360 2-D Workstation Functions

SPU: HP 98579A Model 360, as described on page 6-5.

Expandability: See Figure 6-4, page 6-5.

Available DIO I/O Slots: 1 with 98242B DIO Slot Backplane in SPU; two 98568A Direct-Connect Expanders can be used to add 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

Available DIO Accessory Slots: 1 with 98242B DIO Slot Backplane in SPU; two 98568A Direct-Connect Expanders can be used to add 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

Monitor Choices: See Table 7-3, next page.

Graphics Accelerator: Available with Model 360 2-D color workstations as indicated in Table 7-3, next page. Approximately triples color graphics writing speed.

Operating System: HP 98594L HP-UX License to Use Application Execution and Programming Environments, NS, ARPA, NFS, OSF Motif™ User Interface, and X-Windows Version 11 is included; one set of HP 98594A option 022 media and manuals must be purchased separately to provide installable software for all licensed workstations at a site if none of options 404 through 410 is purchased.

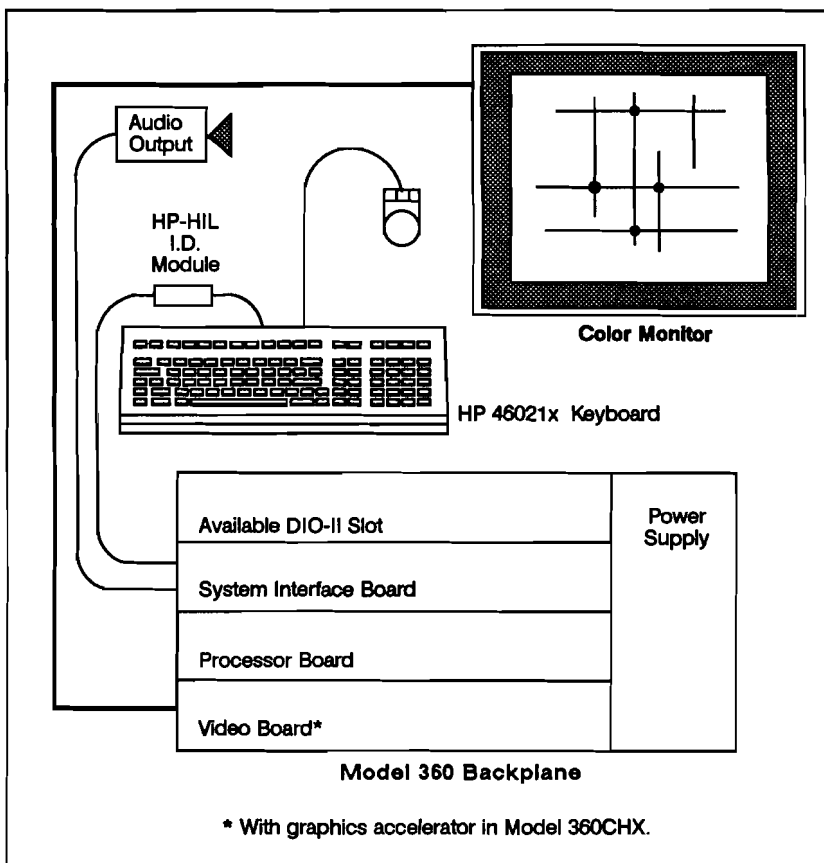


Figure 7-6. Model 360 2-D Workstation Backplane Usage and Interconnections

Table 7-3. Model 360 2-D Workstation Monitor and Graphics Accelerator Choices

	Model 360C +	Model 360CH	Model 360CHX	Model 360MH
Standard Monitor:	1024 by 768 16-inch color	1280 by 1024 16-inch color	1280 by 1024 16-inch color	1280 by 1024 19-inch monochrome
Option 719 Monitor:	1024 by 768 19-inch color	1280 by 1024 19-inch color	1280 by 1024 19-inch color	Not applicable
Graphics Accelerator:	Available accessory	Available accessory	Included	Not applicable

Product Summary

Product/ Opt. No.	Description
98583W	Model 360C + 2-D Color Workstation, consisting of: A. 98579A System Processor Unit, as described on pages 6-5 through 6-8. B. 98549A High Resolution Color Video Board with RGB cable. C. 98785A 16-inch 1024 by 768 Color Monitor. D. 46021x Keyboard. E. Localization, which must be specified by National Version option ABA in the U.S. (see page 7-1 for other countries). F. 46060B HP-HIL 2-button Mouse. ✓ G. 46081A HP-HIL Buffer box with speaker. H. 46084A HP-HIL ID Module. I. Installation manuals. J. 98594L HP-UX License to use Application Execution Environment (AXE), Programming Environment (PE), Network Services, ARPA Services, Network File System, OSF Motif™ User Interface, and X Windows, Version 11 (X11). K. 90-day on-site warranty.
98588W	Model 360CH 2-D Color Workstation, consisting of: A. Items A, and D through K of 98583W, above. B. 98550A High Resolution Color Video Board with RGB cable. C. 98789A 16-inch 1280 by 1024 Color Monitor.
98588W + 556	Model 360CHX 2-D Color Workstation, consisting of: A. Items A, and D through K of 98583W, above. B. 98550A High Resolution Color Video Board with RGB cable. C. 98789A 16-inch 1280 by 1024 Color Monitor. D. 98556A 2-D Integer-based Graphics Accelerator.
98589W	Model 360MH 2-D Monochrome Workstation, consisting of: A. Items A, and D through K of 98583W, above. B. 98548A High Resolution Monochrome Video Board with cable to monitor. C. 98788A 19-inch 1280 by 1024 Monochrome Monitor.

Model 360 2-D Workstation Options

Opt. ABA	U.S. Version. (See page 7-1 for National Version options for other countries.)
Opt. 006	Adds 98242B Two-slot DIO backplane.
Opt. 010	Adds high-speed HP-IB Disk Interface (excludes option 011).
Opt. 011	Adds SCSI single-ended Disk Interface (excludes option 010).
Opt. 015†	Specifies AUI-type LAN connection (excludes option 017).
Opt. 017†	Specifies ThinMAU and BNC "T" connector for LAN connection (excludes option 015).
Opt. 108	Adds 4 MB RAM for a total of 8 MB (excludes options 112 and 116).
Opt. 112	Adds 8 MB RAM for a total of 12 MB (excludes options 108 and 116).

† Must order option 015 or 017.

Model 360 2-D Color and Monochrome Workstations, continued

Product Summary, continued

Product/ Opt. No.	Description
Model 360 2-D Workstation Options, continued	
Opt. 116	Adds 12 MB RAM for a total of 16 MB (excludes options 108 and 112).
Opt. 404	Adds 162 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment (excludes options 405, 408, 409, and 410 and requires option 011).
Opt. 405	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment (excludes options 404, 408, 409, and 410 and requires option 011).
Opt. 408	Adds 162 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 67 MB 1/4-inch cartridge tape drive (excludes options 404, 405, 409, and 410 and requires option 011).
Opt. 409	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 67 MB 1/4-inch cartridge tape drive (excludes option 404, 405, 408, and 410 and requires option 011).
Opt. 410	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 133 MB 1/4-inch cartridge tape drive (excludes option 404, 405, 408, and 409 and requires option 011).
Opt. 556	Adds 98556A 2-D Integer-Based Graphics Accelerator (Model 360CH 98588W option only).
Opt. 719	Substitutes 19-inch color monitor for 16-inch color monitor. (Model 360C+ 98583W or 360CH 98588W option only.)
Model 360 2-D Workstation Add-on Accessories	
98248B	Floating Point Accelerator with 3-slot system bus frontplane connector.
98267A	4 MB Parity-Checking add-on RAM board for Model 360C+ /CH/CHX/MH without option 108, 112, or 116 (increases total RAM to 8 MB - excludes 98267B and 98267C).
98267B	8 MB Parity-Checking add-on RAM board for Model 360C+ /CH/CHX/MH without option 108, 112, or 116 (increases total RAM to 12 MB - excludes 98267A and 98267C).
98267C	12 MB Parity-Checking add-on RAM board for Model 360C+ /CH/CHX/MH without option 108, 112, or 116 (increases total RAM to 16 MB - excludes 98267A and 98267B).
98556A	2-D Integer-Based Graphics Accelerator (included in Model 360CHX). Supported only in Model 360 Color Workstations.
98568A	Direct Connect 8-slot I/O Expander (first expander requires 98568A Option 132)*.
98570A	Direct Connect I/O Expander with four DIO slots (two DIO slot pairs) and two DIO-II slots.*
9888A	16-slot DIO Expander (uses one DIO I/O slot - maximum of two).

* Maximum of two 98568A/98570A Direct Connect I/O Expanders per Model 360C+ /CH/CHX/MH.

Operational Requirements

Description	Requirements
Operating System:	HP 98594A option 022 Media and Documentation for 98594L must be available for installation if one of options 404 through 410 is not purchased.
System Disk:	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2) or comparable support from a LAN-connected network server system. For disk choices, see options 404 through 410 and Section 14.
Software Installation/Backup Device:	Cartridge tape subsystem (Section 15) or comparable support from a LAN-connected network server.
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Model 370 2-D Color and Monochrome Workstations

Description

Four different 2-D color and monochrome workstations are based on the powerful Model 370 System Processor Unit, with a choice of resolutions and graphics integer acceleration (see Table 7-4, next page. Figures 7-7 and 7-8 illustrate the Model 370 2-D workstation functions and backplane usage and interconnections.

SPU: HP 98579B Model 370, described on page 6-9.

Expandability: See Figures 6-6 and 6-7, pages 6-9 and 6-10.

Available DIO I/O Slots: None in SPU; two 98568A Direct-Connect Expanders can be used to provide 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

Available DIO Accessory Slots: None in SPU; two 98568A Direct-Connect Expanders can be used to provide 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

Monitor Choices: See Table 7-4, next page.

Graphics Accelerator: Available with Model 370 2-D color workstations as indicated in Table 7-4, next page. Approximately triples color graphics writing speed.

Operating System: HP 98594L HP-UX License to Use Application Execution and Programming Environments, NS, ARPA, NFS, OSF Motif™ User Interface, and X-Windows Version 11 is included; one set of HP 98594A option 022 media and manuals must be purchased separately to provide installable software for all licensed workstations at a site if none of options 404 through 410 is purchased.

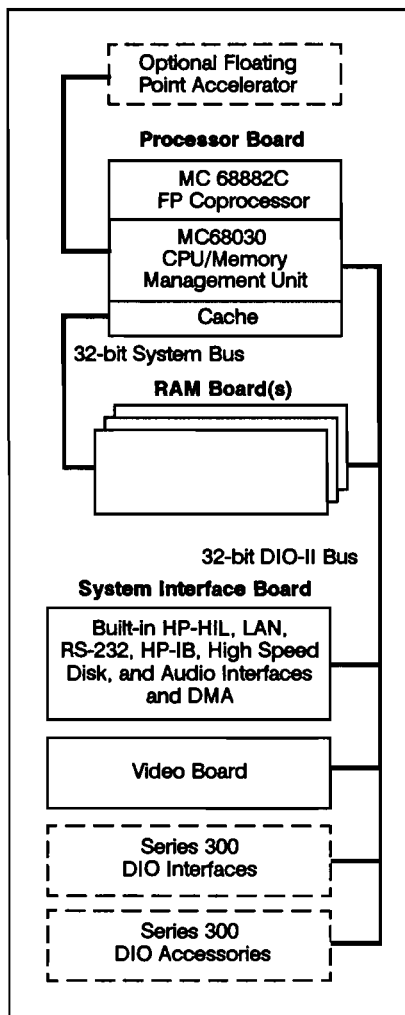


Figure 7-7. Model 370 2-D Workstation Functions

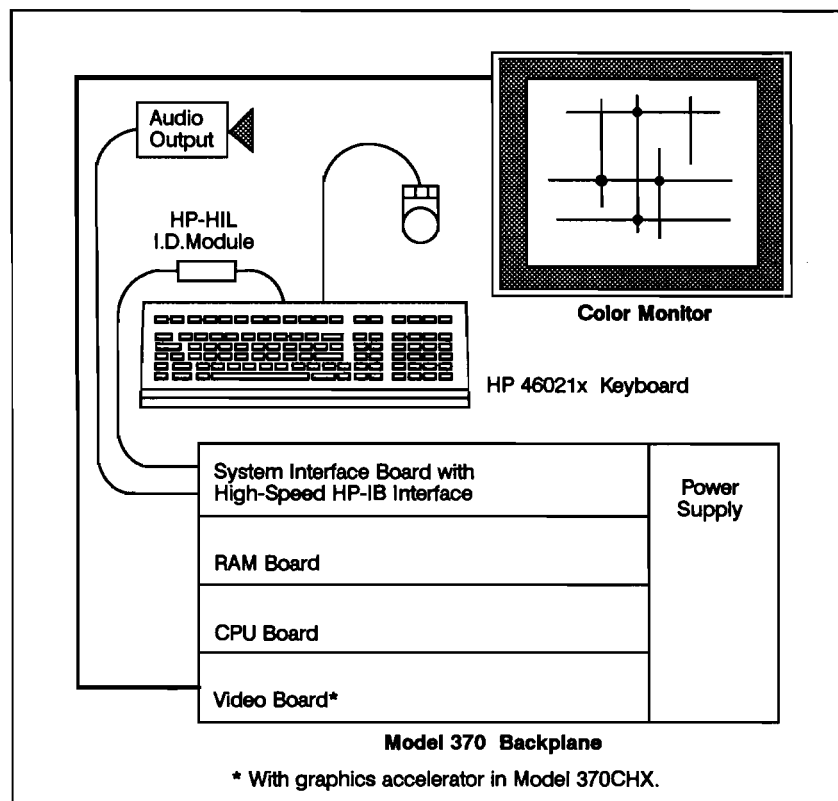


Figure 7-8. Model 370 2-D Workstation Backplane Usage and Interconnections

Model 370 2-D Color and Monochrome Workstations, continued

Table 7-4. Model 370 2-D Workstation Monitor and Graphics Accelerator Choices

	Model 370C +	Model 370CH	Model 370CHX	Model 370MH
Standard Monitor:	1024 by 768 19-inch color	1280 by 1024 19-inch color	1280 by 1024 19-inch color	1280 by 1024 19-inch monochrome
Option 716 Monitor:	1024 by 768 16-inch color	1280 by 1024 16-inch color	1280 by 1024 16-inch color	Not applicable
Graphics Accelerator:	Available accessory	Available accessory	Included	Not applicable

Product Summary

Product/ Opt. No.	Description
98583G	Model 370C + 2-D Color Workstation, consisting of: A. 98579B System Processor Unit, as described on pages 6-9 through 6-12. B. 98549A Color Video Board with RGB Cable. C. 98751A 19-inch 1024 by 768 Color Monitor. D. 46021x Keyboard. E. Localization, which must be specified by National Version option ABA in the U.S. (see page 7-1 for other countries). F. 46060B HP-HIL 3-button Mouse. G. 46081A HP-HIL Buffer Box with Speaker. H. 46084A HP-HIL ID Module. I. Installation manuals. J. 98594L HP-UX License to use Application Execution Environment (AXE), Programming Environment (PE), Network Services, ARPA Services, Network File System, OSF Motif™ User Interface, and X Windows Version 11. K. 90-day on-site warranty.
98588G	Model 370CH 2-D Color Workstation, consisting of: A. Items A and D through K of 98583G, above. B. 98550A High-Resolution Color Video Board with RGB Cable. C. 98752A 19-inch 1280 by 1024 Color Monitor.
98588G + 556	Model 370CHX 2-D Color Workstation, consisting of: A. Items A and D through K of 98583G, above. B. 98550A High-Resolution Color Video Board with RGB Cable. C. 98752A 19-inch 1280 by 1024 Color Monitor. D. 98556A 2-D Integer-based Graphics Accelerator‡.
98589G	Model 370MH 2-D Monochrome Workstation, consisting of: A. Items A, and D through K of 98583G, above. B. 98548A High Resolution Monochrome Video Board with cable to monitor. C. 98788A 19-inch 1280 by 1024 Monochrome Monitor.

Model 370 2-D Workstation Options

Opt. ABA	U.S. Version. (See page 7-1 for National Version options for other countries.)
Opt. 011	Substitutes SCSI single-ended Disk Interface with 1m cable and terminator for high-speed HP-IB interface.
Opt. 015†	Specifies AUI-type LAN connection (excludes option 017).
Opt. 017†	Specifies ThinMAU and BNC "T" connector for LAN connection (excludes option 015).
Opt. 116	Converts 8 MB parity checking RAM to 16 MB parity checking RAM (excludes options 208 and 216).
Opt. 208	Substitutes 8 MB ECC RAM for 8 MB parity checking RAM (excludes options 116 and 216).
Opt. 216	Substitutes 16 MB ECC RAM for 8 MB parity checking RAM (excludes options 116 and 208).
Opt. 404	Adds 162 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment (excludes options 405, 408, 409, and 410 and requires option 011).

‡ A 98549A or 98550A Graphics Board with 98556A 2-D Graphics Accelerator is not supported in the Model 370C + /CH/CHX/MH with ECC RAM. If ECC RAM is used, the graphics board with accelerator must be installed in a 98570A DIO-II Expander.

† Must order option 015 or 017.

Product Summary, continued

Product/ Opt. No.	Description
Model 370 2-D Workstation Options, continued	
Opt. 405	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment (excludes options 404, 408, 409, and 410 and requires option 011).
Opt. 408	Adds 162 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 67 MB 1/4-inch cartridge tape drive (excludes options 404, 405, 409, and 410 and requires option 011).
Opt. 409	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 67 MB 1/4-inch cartridge tape drive (excludes option 404, 405, 408, and 410 and requires option 011).
Opt. 410	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 133 MB 1/4-inch cartridge tape drive (excludes option 404, 405, 408, and 409 and requires option 011).
Opt. 556	Adds 98556A 2-D Integer-Based Graphics Accelerator (Model 370CH 98588G option only).
Opt. 716	Substitutes 16-inch color monitor for 19-inch color monitor. (Model 370C+ 98583G or 370CH 98588G option only.)
Model 370 2-D Workstation Add-on Accessories	
98248B	Floating Point Accelerator.
98258A	4 MB Parity-Checking RAM controller with 3-slot system bus frontplane connector. 004: Deletes 3-slot system bus frontplane connector. 005: Substitutes 4-slot system bus frontplane connector for 3-slot connector.
98258B	Adds 4 MB Parity-checking RAM to 98258A (excludes 98258C).
98258C	Adds 12 MB Parity-checking RAM to 98258A (excludes 98258B).
98264A	8 MB ECC RAM controller with 3-slot system bus frontplane connector. 004: Deletes 3-slot system bus frontplane connector. 005: Substitutes 4-slot system bus frontplane connector for 3-slot connector.
98264B	16 MB ECC RAM controller with 3-slot system bus frontplane connector. 004: Deletes 3-slot system bus frontplane connector. 005: Substitutes 4-slot system bus frontplane connector for 3-slot connector.
98556A	2-D Integer-Based Graphics Accelerator† (included in Model 370CHX). Supported only in Model 370 Color Workstations
98568A	Direct Connect 8-slot I/O Expander (first Expander requires 98568A Option 132).
98570A	Direct Connect I/O Expander with four DIO slots (two DIO slot pairs) and two DIO-II slots.
9888A	16-slot DIO Expander (uses one DIO I/O slot – maximum of two).

† A 98549A or 98550A Graphics Board with 98556A 2-D Graphics Accelerator is not supported in the Model 370C+ /CH/CHX/MH with ECC RAM. If ECC RAM is used, the graphics board with accelerator must be installed in a 98570A DIO-II Expander.

* Maximum of two 98658A/98570A Direct Connect I/O Expanders per Model 370C+ /CH/CHX/MH.

Operational Requirements

Description	Requirements
Operating System:	HP 98594A option 022 Media and Documentation for 98594L must be available for installation if one of options 404 through 410 is not purchased.
System Disk:	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2) or comparable support from a LAN-connected network server system. For disk choices, see options 404 through 410 and Section 14.
Software Installation/Backup Device:	Cartridge tape subsystem (Section 15) or comparable support from a LAN-connected network server.
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Model 375 2-D Color and Monochrome Workstations

Description

Three different 2-D color and monochrome workstations are based on the super powerful Model 375 System Processor Unit, with a choice of resolutions and graphics integer acceleration (see Table 7-5, at right. Figures 7-9 and 7-10 illustrate the Model 375 2-D workstation functions and backplane usage and interconnections.

SPU: HP 98574B Model 375, described on page 6-13.

Expandability: See Figure 6-9, page 6-13.

Monitor Choices: See Table 7-5, at right.

Available DIO I/O Slots: 1 with 98242B DIO Slot backplane in SPU; two 98568A Direct-Connect Expanders can be used to add 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

Available DIO Accessory Slots: 1 with 98242B DIO Slot backplane in SPU; two 98568A Direct-Connect Expanders can be used to add 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

Operating System: HP 98594L HP-UX License to Use Application Execution and Programming Environments, NS, ARPA, NFS, OSF Motif™ User Interface, and X-Windows Version 11 is included; one set of HP 98594A option 022 media and manuals must be purchased separately to provide installable software for all licensed workstations at a site if none of options 404 through 410 is purchased.

Table 7-5. Model 375 2-D Workstation Monitor Choices

	Model 375C +	Model 375CH	Model 375MH
Standard Monitor:	1024 by 768 19-inch color	1280 by 1024 19-inch color	1280 by 1024 19-inch monochrome
Option 716 Monitor:	1024 by 768 16-inch color	1280 by 1024 16-inch color	Not applicable

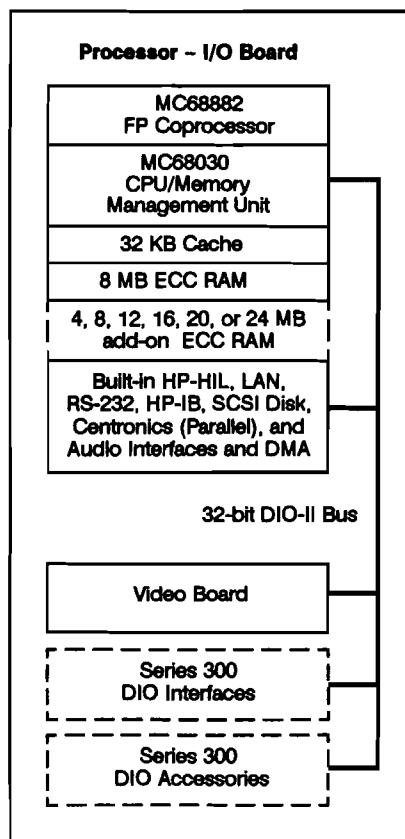


Figure 7-9. Model 375 2-D Workstation Functions

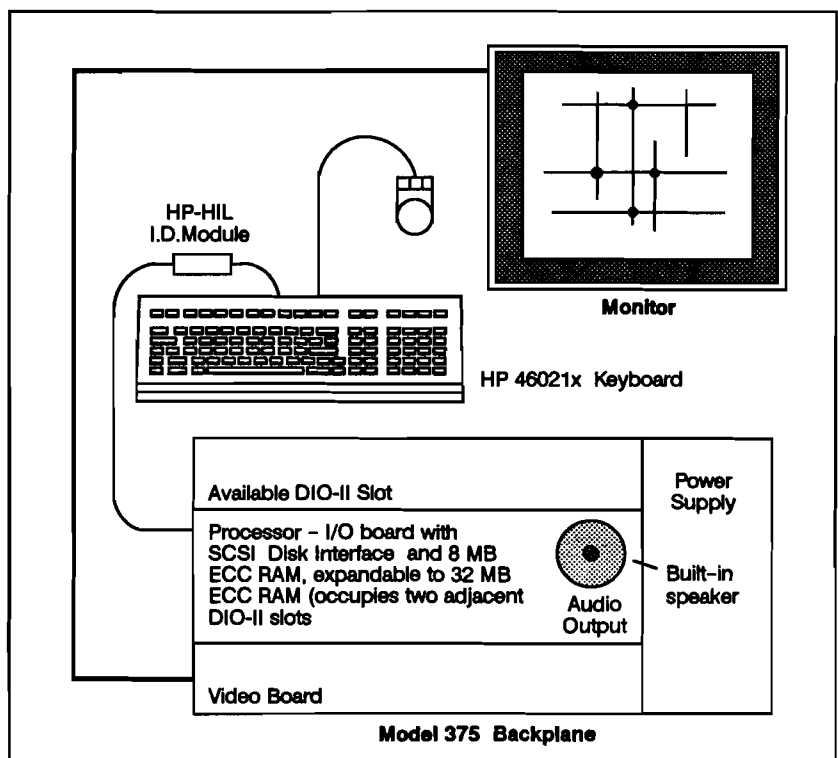


Figure 7-10. Model 375 2-D Workstation Backplane Usage and Interconnections

Product Summary

Product/ Opt. No.	Description
98583J	Model 375C + 2-D Color Workstation, consisting of: A. 98574B System Processor Unit, as described on pages 6-13 through 6-15. B. 98549A Color Video Board with RGB Cable. C. 98751A 19-inch 1024 by 768 Color Monitor. D. 46021x Keyboard. E. Localization, which must be specified by National Version option ABA in the U.S. (see page 7-1 for other countries). F. 46060B HP-HIL 3-button Mouse. G. 46081A HP-HIL Buffer Box with Speaker. H. 46084A HP-HIL ID Module. I. Installation manuals. J. 98594L HP-UX License to use Application Execution Environment (AXE), Programming Environment (PE), Network Services, ARPA Services, Network File System, OSF Motif™ User Interface, and X Windows Version 11. K. 90-day on-site warranty.
98588J	Model 375CH 2-D Color Workstation, consisting of: A. Items A and D through K of 98583J, above. B. 98550A High-Resolution Color Video Board with RGB Cable. C. 98752A 19-inch 1280 by 1024 Color Monitor.
98589J	Model 375MH 2-D Monochrome Workstation, consisting of: A. Items A, and D through K of 98583J, above. B. 98548A High Resolution Monochrome Video Board with cable to monitor. C. 98788A 19-inch 1280 by 1024 Monochrome Monitor.
Model 375 2-D Workstation Options	
Opt. ABA	U.S. Version. (See page 7-1 for National Version options for other countries.)
Opt. 006	Adds 98242B 2-slot DIO backplane.
Opt. 010	Substitutes high-speed HP-IB interface (with 1 meter cable) for SCSI single-ended Disk Interface.
Opt. 012	Adds software support for Centronics-compatible parallel I/O interface, including Device Driver.
Opt. 116	Adds 8 MB ECC RAM to bring total to 16 MB of ECC RAM (excludes options 124 and 132).
Opt. 124	Adds 16 MB ECC RAM to bring total to 24 MB of ECC RAM (excludes options 116 and 132).
Opt. 132	Adds 24 MB ECC RAM to bring total to 32 MB of ECC RAM (excludes options 116 and 124).
Opt. 404	Adds 162 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment (excludes options 405, 408, 409, and 410).
Opt. 405	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment (excludes options 404, 408, 409, and 410).
Opt. 408	Adds 162 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 67 MB 1/4-inch cartridge tape drive (excludes options 404, 405, 409, and 410).
Opt. 409	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 67 MB 1/4-inch cartridge tape drive (excludes option 404, 405, 408, and 410).
Opt. 410	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 133 MB 1/4-inch cartridge tape drive (excludes option 404, 405, 408, and 409).
Opt. 556	To Model 375CH 98588J, adds 98556A 2-D Integer-Based Graphics Accelerator.
Opt. 716	Substitutes 16-inch color monitor for 19-inch color monitor. (Model 375C + 98583J or 375CH 98588J option only.)

Model 375 2-D Color and Monochrome Workstations, continued

Product Summary, continued

Product/ Opt. No.	Description
Model 375 2-D Workstation Add-on Accessories	
98229A	4 MB add-on ECC RAM module.
98229B	8 MB add-on ECC RAM module (max. RAM in Model 375 is 32 MB, made up of base 8 MB and up to three 98229Bs).
98242B	2-slot DIO backplane.
98556A	2-D Integer-Based Graphics Accelerator - supported only in Model 375C+ and 375CH 2-D Color Workstations
98568A	Direct Connect 8-slot I/O Expander (first Expander requires 98568A Option 132).
98570A	Direct Connect I/O Expander with four DIO slots (two DIO slot pairs) and two DIO-II slots.
9888A	16-slot DIO Expander (uses one DIO I/O slot - maximum of two).

* Maximum of two 98658A/98570A Direct Connect I/O Expanders per Model 375C+ /CH/MH.

Operational Requirements

Description	Requirements
Operating System:	HP 98594A option 022 Media and Documentation for 98594L must be available for installation if one of options 404 through 410 is not purchased.
System Disk:	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2) or comparable support from a LAN-connected network server system. For disk choices, see options 404 through 410 and Section 14.
Software Installation/Backup Device:	Cartridge tape subsystem (Section 15) or comparable support from a LAN-connected network server.
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Model 825CHX Superworkstation

Description

The HP 9000 Model 825CHX is a 2D color Superworkstation with 2D integer-based graphics accelerator, keyboard, and a 19-inch 1280 by 1024 color monitor. Figures 7-11 and 7-12 illustrate the Model 825CHX functions and backplane usage and interconnections.

CPU: HP-PA Model 825, clocked at 12.5 MHz.

Cache: 16 KB.

Bus Types: 64-plus-8-ECC-bit memory bus, 32-bit CTB bus, and 16-bit CIO bus.

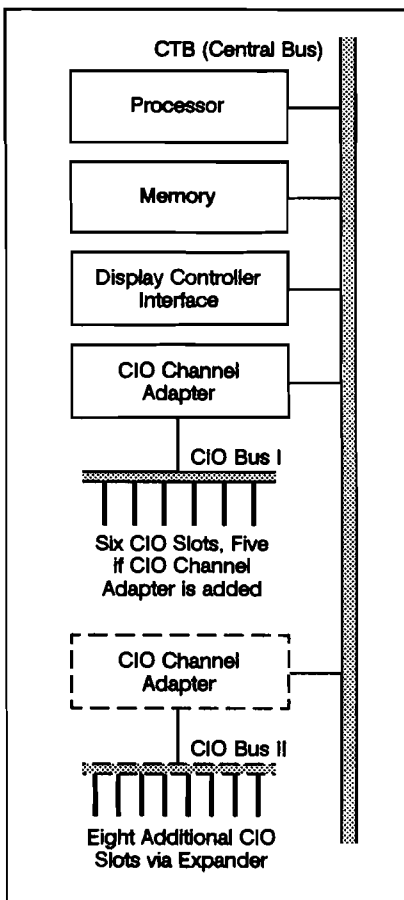


Figure 7-11. Model 825CHX Functions

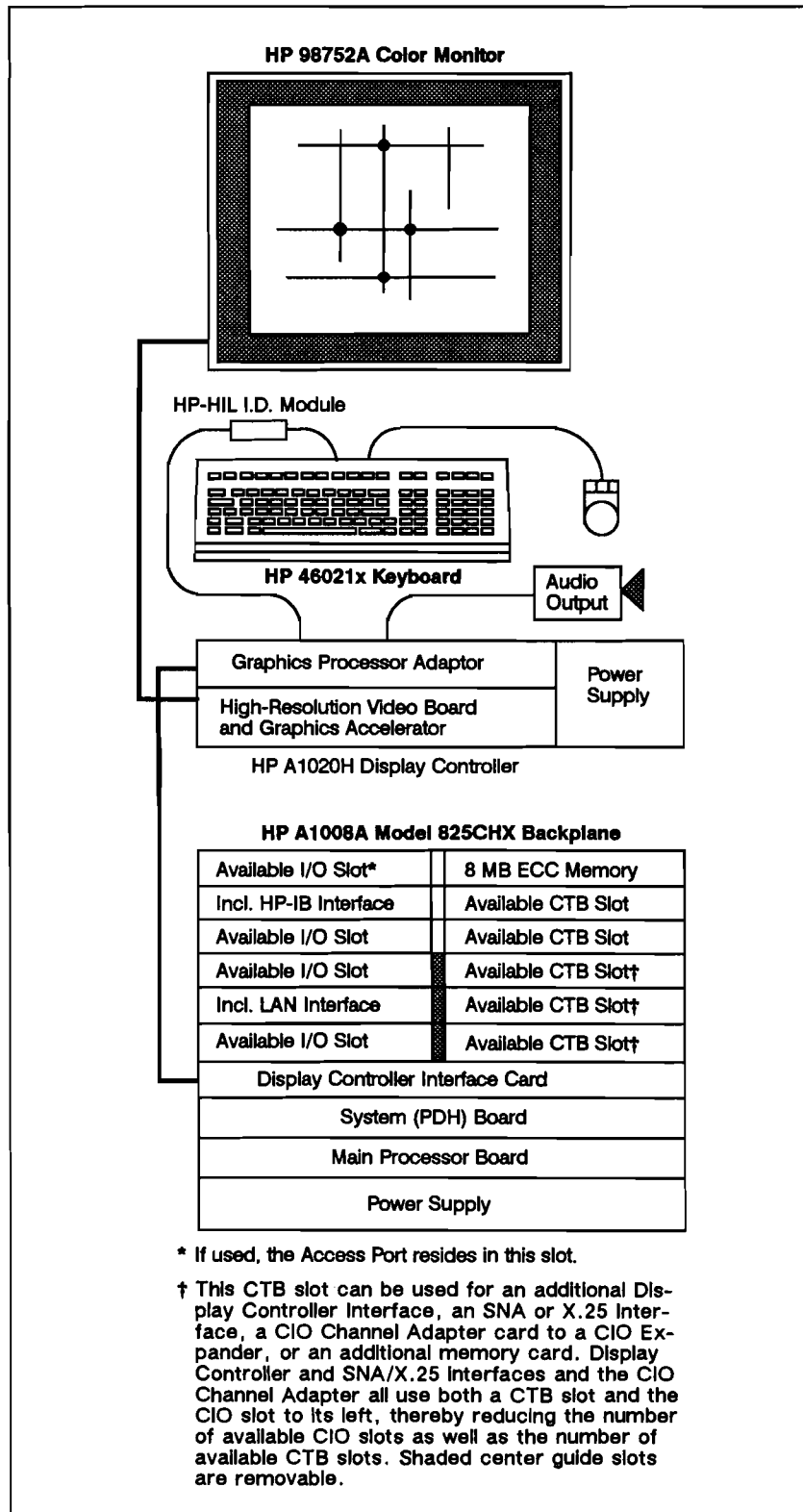


Figure 7-12. Model 825CHX Backplane Usage and Interconnections

Model 825CHX Superworkstation, continued

Included Interfaces: HP-IB Disk interface and LAN/9000 Series 800 Link interface.

RAM: 8 MB ECC, expandable to 96 MB (each CTB slot used for other uses reduces maximum memory capacity by 16 MB).

Floating Point Processor: 0.65 MFLOPs Floating Point Co-processor.

Direct Memory Access: Direct memory access via CIO bus is standard.

Operating System: HP-UX operating system with 16-user license is included.

Monitor: 19-inch 1280 by 1024 Color Monitor.

Product Summary

Product/ Opt. No.	Description
A1008A	Model 825CHX Superworkstation, consisting of: A. System Processor Unit (SPU), including: 32-bit HP-PA Model 825 CPU with floating point co-processor. - A1010A 8 MB ECC Memory Array Card. 27110B HP-IB interface to system disk(s) and cartridge tape subsystem. 91786B w/option 841 LAN/9000 Series 800 Link for Model 825/835. ThinMAU is deleted; must order A1008A option 003 or 004 to obtain MAU. - Enclosure with 4 available CIO slots for I/O cards, 5 available CTB slots for additional memory or other CTB cards, and power supply. B. 2-D Graphics Subsystem, including: - A1020H High-Resolution Color Graphics Subsystem, including: - A1017A Display Controller Interface. - A1020A 2-D Graphics Processor Adapter. 98550A High Resolution Video Board and RGB Cable. 98556A 2-D Integer-Based Graphics Accelerator. 46021x Keyboard. 46060B HP-HIL 3-button Mouse. 46081A HP-HILBuffer Box with Speaker. 46084A HP-HIL ID Module. 98752A 19-inch Color Monitor. C. Software, including: 92452A HP-UX with 16-user License (requires media option AA0 or AA1). 50981A ARPA/BSD Model 825 Networking Software. 91787A NS/9000 Network Services Software. 92445A Starbase Graphics Library. 92524A X Windows System Version 11. D. Manuals. E. Localization, which must be specified by National Version option ABA in the U.S. (see page 7-1 for other countries). F. Installation. G. 90-day on-site warranty.
Options	
Opt. AA0	All software on 1/4-inch cartridge tape.
Opt. AA1	All software on 1/2-inch, 1600 cpi, 9-track magnetic tape.
Opt. ABA	U.S. Version. (See page 7-1 for National Version options for other countries.)
Opt. 002	Adds 8 MB ECC RAM card.
Opt. 003	Adds 28641A ThinMAU (excludes option 004).
Opt. 004	Adds 30241A ThickMAU (excludes option 003).
Opt. 005	Deletes 98556A Graphics Accelerator.
Opt. 006	Adds a 19-inch graphics subsystem (includes product summary items B-1 and 7, but not items B-2 through 6).
Opt. 007	Adds a 16-inch graphics subsystem (includes 98789A 16-inch color monitor and product summary items B-1, but not items B-2 through 7).



Product Summary, continued

Product/ Opt. No.	Description
Options, continued	
Opt. 515	Replaces 8 MB ECC RAM card with 16 MB ECC RAM card (excludes option 531).
Opt. 516	Adds 16 MB ECC RAM card.
Opt. 531	Replaces 8 MB ECC RAM card with two 16 MB ECC RAM cards (excludes option 515).
Opt. 716	Replaces 98752A 19-inch Color Monitor with 98789A 16-inch Color Monitor.
Opt. 0E1	Adds Battery Backup System.
Add-on Accessories	
A1010A	8 MB ECC RAM card.
A1037A	16 MB ECC RAM card.
A1013A	CIO Expander with CIO Channel Adapter (adds 7 CIO slots and uses one CTB slot).
A1014A	Battery Backup System.
A1015A	Access Port.
Interfaces	See page 12-1.
Upgrade Products	
A1036A	Upgrades Model 825CHX to Model 835CHX without CIO Expander supportability (replaces Model 825 processor and PDH boards with those used in the Model 835). NOTE: Order A1038A if CIO Expander is desired.
A1038A	Upgrades Model 825CHX to Model 835CHX with CIO Expander (replaces Model 825 processor and PDH boards with those used in the Model 835SE, adds CIO Expander (deletable with option 1AB), adds 16 MB ECC RAM, and upgrades HP-UX to 64-user license).

Operational Requirements

Description	Requirements
System Disk:	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2). For disk choices, see Section 14.
Software Installation/Backup Device:	Cartridge tape subsystem or magnetic tape unit (Section 15).
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Model 834CH Superworkstation

Description

The HP 9000 Model 834CH is a restricted-configuration 2-D color Superworkstation with keyboard, and a 19-inch 1280 by 1024 color monitor. Figures 7-13 and 7-14 illustrate the Model 834CH functions and backplane usage and interconnections.

CPU: HP-PA Model 834, clocked at 15 MHz.

Cache: 128 KB.

Bus Types: 64-plus-8-ECC-bit memory bus, 32-bit CTB bus, and 16-bit CIO bus.

Included Interfaces: HP-IB Disk interface and LAN/9000 Series 800 Link interface.

RAM: 8 MB ECC, expandable to 48 MB in 16 MB increments after substituting 16 MB RAM for the base 8 MB RAM.

Floating Point Processor: 2.02 MFLOPs Floating Point Co-processor.

Direct Memory Access: Direct memory access via CIO bus is standard.

Operating System: 2-User License-to-Use HP-UX operating system is included.

Monitor: 19-inch 1280 by 1024 Color Monitor.

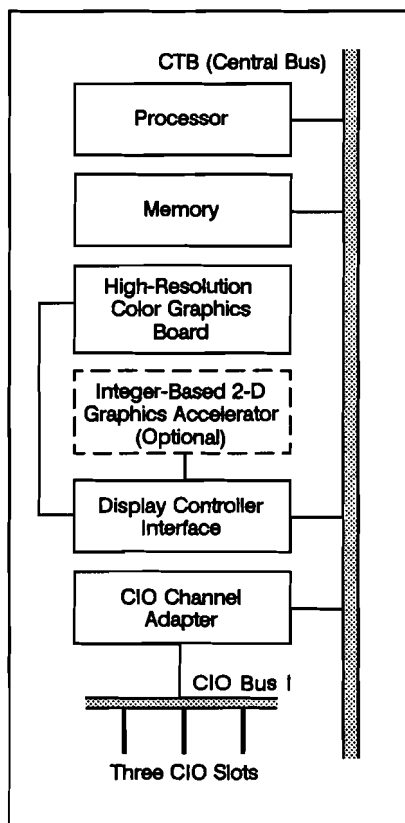


Figure 7-13. Model 834CH Functions

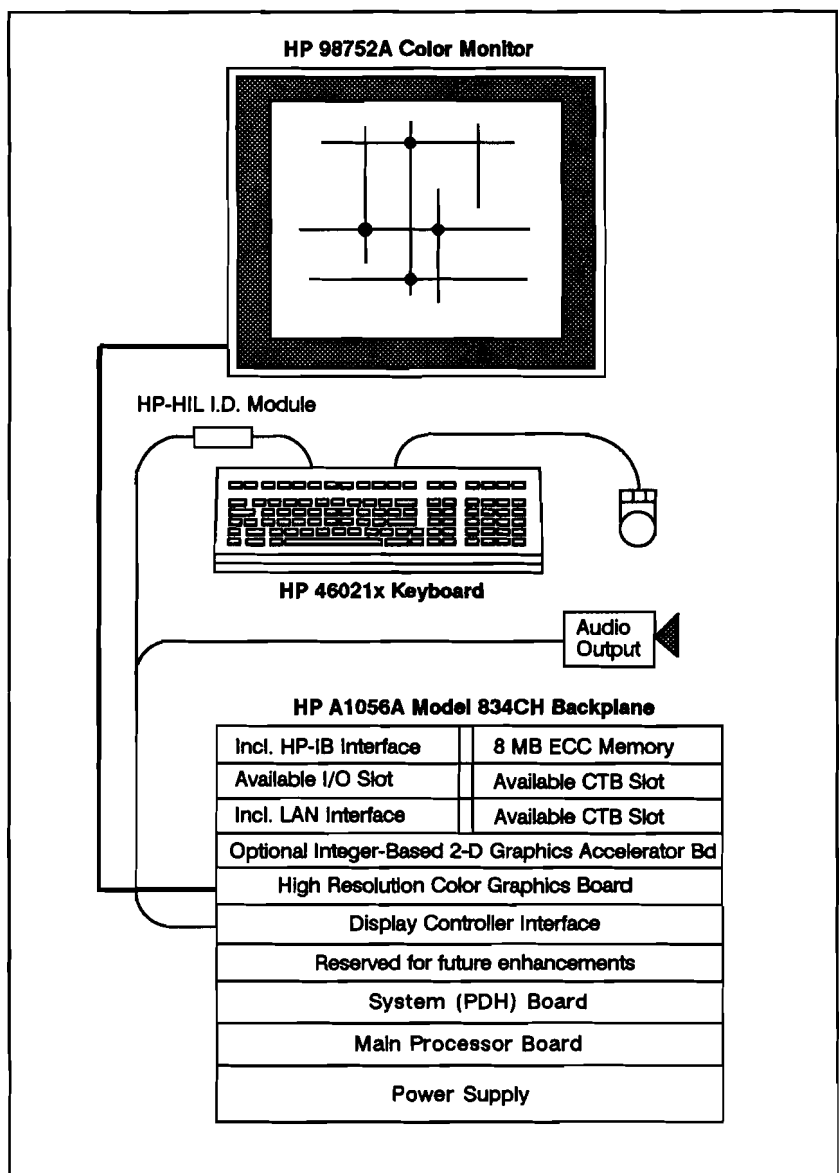


Figure 7-14. Model 834CH Backplane Usage and Interconnections

Product Summary

Product/ Opt. No.	Description
A1056A	Model 834CH Superworkstation, consisting of: A. System Processor Unit (SPU), including: 1. 32-bit HP-PA Model 834 CPU with floating point coprocessor. 2. A1010A 8 MB ECC Memory Array Card. 3. 27110B HP-IB interface to system disk(s) and cartridge tape subsystem. 4. 91786B w/option 841 LAN/9000 Series 800 Link for Model 825/835. ThinMAU is deleted; must order A1056A option 003 or 004 to obtain MAU. 5. Enclosure with 1 available CIO slot for an I/O card, 2 available CTB slots for additional memory, and power supply. B. Integrated 2-D Graphics Boards, including: 1. Display Controller Interface. 2. High Resolution Graphics Board. 3. Video/keyboard cable. 4. 46021x Keyboard. 5. 46060B HP-HIL 3-button Mouse. 6. 46081A HP-HIL Buffer Box with Speaker. 7. 46084A HP-HIL ID Module. 8. 98752A 19-inch Color Monitor. C. Software, including: 1. 92466L 2-User License-to-Use HP-UX Release 7.0 (requires 1/4-inch cartridge tape media and documentation - option 0B1). D. General Usage Documentation. E. Localization, which must be specified by National Version option ABA in the U.S. (see page 7-1 for other countries). F. 90-day on-site warranty. NOTE: CE installation is NOT included; it may be purchased separately.

Options

Opt. 0B1	1/4-inch cartridge tape media and documentation for HP-UX, X Window System, OSF Motif™ User Interface, Starbase Graphics Library, NS/9000 Network Services, and ARPA Network Services.
Opt. ABA	U.S. Version. (See page 7-1 for National Version options for other countries.)
Opt. 001	Adds asynchronous 6-channel multiplexer (maximum of one - uses the only available CIO slot).
Opt. 002	Adds A1010A 8 MB ECC RAM card.
Opt. 003	Adds 28641A ThinMAU (excludes option 004).
Opt. 004	Adds 30241A ThickMAU plus AUI cable (excludes option 003).
Opt. 515	Replaces 8 MB ECC RAM card with 16 MB ECC RAM card (excludes option 531).
Opt. 516	Adds 16 MB ECC RAM card.
Opt. 531	Replaces 8 MB ECC RAM card with two 16 MB ECC RAM cards (excludes option 515).
Opt. 710	Adds 98556A Integer-Based 2-D Graphics Accelerator.
Opt. 716	Replaces 98752A 19-inch Color Monitor with 98789A 16-inch Color Monitor.
Opt. 834	Adds 7959B 304 MB Disk with the following preloaded software: a. 2-user HP-UX operating system. b. OSF Motif™ User Interface. c. Pre-configured X-Windows Environment. d. ARPA Network Services. e. NS/9000 Network Services. f. Starbase Graphics Library. g. X Window System Version 11.

Model 834CH Super-workstation, continued

Product Summary, continued

Product/ Opt. No.	Description
Add-on Accessories	
A1010A	8 MB ECC RAM card.
A1037A	16 MB ECC RAM card.
A1014A	Battery Backup System.
Interfaces	See page 12-1.

Operational Requirements

Description	Requirements
System Disk:	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2). For disk choices, see Section 14.
Software Installation/Backup Device:	Cartridge tape subsystem or magnetic tape unit (Section 15).
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Model 835CHX Superworkstation

Description

The HP 9000 Model 835CHX is a 2-D color Superworkstation with 2-D integer-based graphics accelerator, keyboard, and a 19-inch 1280 by 1024 color monitor. Figures 7-15 and 7-16 illustrate the Model 835CHX functions and backplane usage and interconnections.

CPU: HP-PA Model 835, clocked at 15 MHz.

Cache: 128 KB.

Bus Types: 64-plus-8-ECC-bit memory bus, 32-bit CTB bus, and 16-bit CIO bus.

Included Interfaces: HP-IB Disk interface and LAN/9000 Series 800 Link interface.

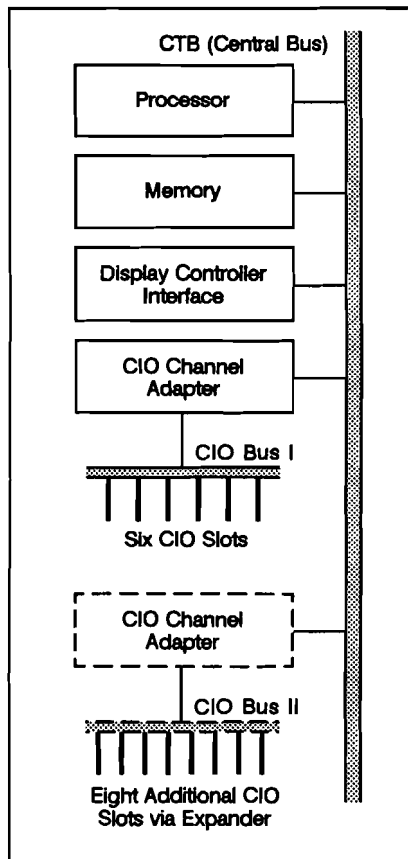


Figure 7-15. Model 835CHX Functions

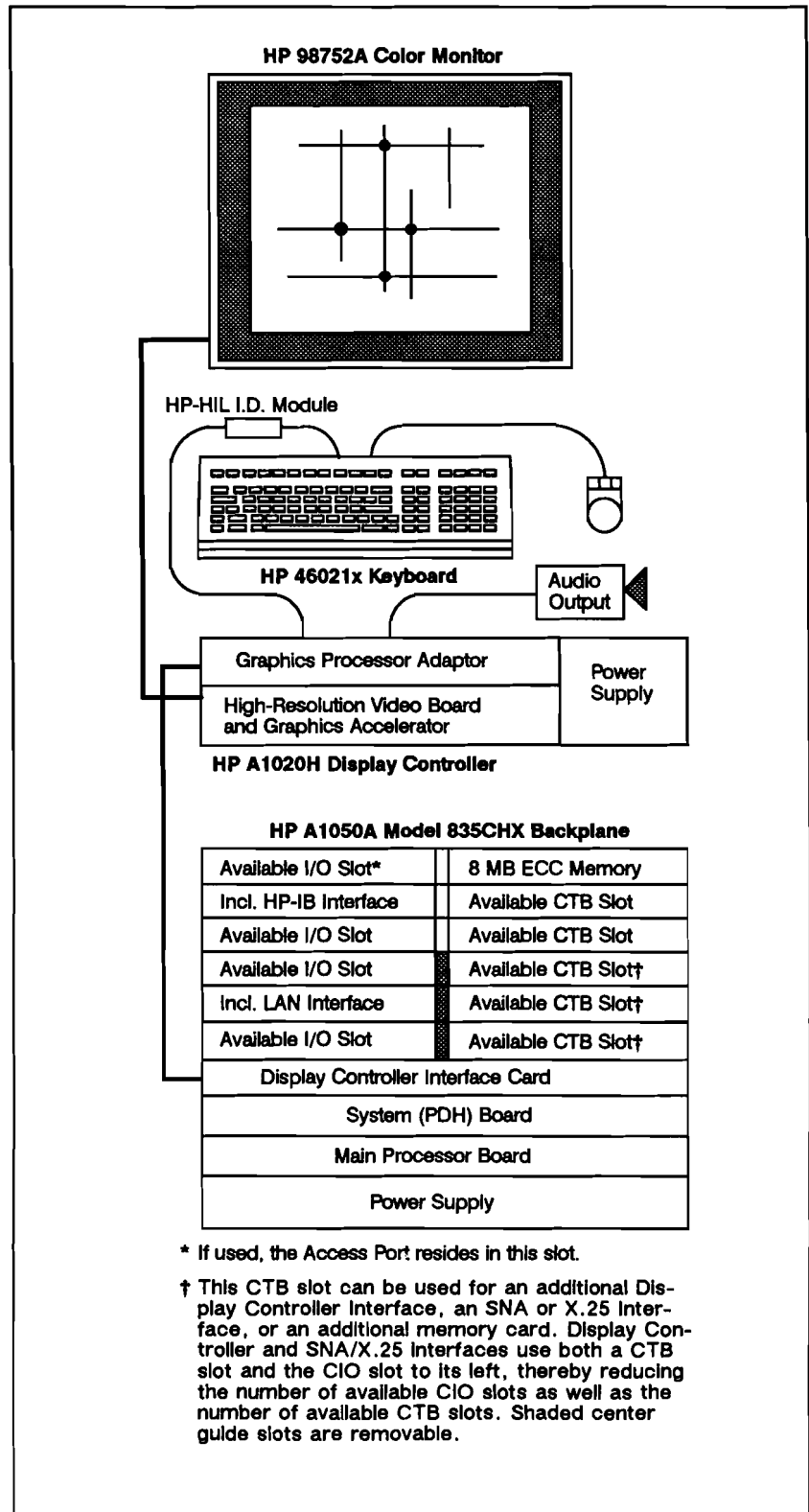


Figure 7-16. Model 835CHX Backplane Usage and Interconnections

Model 835CHX Super-workstation, continued

RAM: 8 MB ECC, expandable to 96 MB (each CTB slot used for other uses reduces maximum memory capacity by 16 MB).

Floating Point Processor: 2.02 MFLOPs Floating Point Coprocessor.

Direct Memory Access: Direct memory access via CIO bus is standard.

Operating System: HP-UX operating system with 16-user license is included.

Monitor: 19-inch 1280 by 1024 Color Monitor.

Product Summary

Product/ Opt. No.	Description
A1050A	Model 835CHX Superworkstation, consisting of: A. System Processor Unit (SPU), including: 32-bit HP-PA Model 835 CPU with floating point coprocessor. - A1010A 8 MB ECC Memory Array Card. 27110B HP-IB interface to system disk(s) and cartridge tape subsystem. 91786B w/option 841 LAN/9000 Series 800 Link for Model 825/835. ThinMAU is deleted; must order A1050A option 003 or 004 to obtain MAU. - Enclosure with 4 available CIO slots for I/O cards, 5 available CTB slots for additional memory or other CTB cards, and power supply. B. 2-D Graphics Subsystem, including: - A1020H High-Resolution Color Graphics Subsystem, including: - A1017A Display Controller Interface. - A1020A 2-D Graphics Processor Adapter. 98550A High Resolution Video Board and RGB Cable. 98556A 2D Integer-Based Graphics Accelerator. 46021x Keyboard. 46060B HP-HIL 3-button Mouse. 46081A HP-HIL Buffer Box with Speaker. 46084A HP-HIL ID Module. 98752A 19-inch Color Monitor. C. Software, including: 92452A HP-UX with 16-user License (requires media option AA0 or AA1). 50981A ARPA/BSD Model 825 Networking Software. 91787A NS/9000 Network Services Software. 92445A Starbase Graphics Library. 92524A X Windows System Version 11. D. Manuals. E. Localization, which must be specified by National Version option ABA in the U.S. (see page 7-1 for other countries). F. Installation. G. 90-day on-site warranty.

Options

Opt. AA0	All software on 1/4-inch cartridge tape (excludes option AA1).
Opt. AA1	All software on 1/2-inch, 1600 cpi, 9-track magnetic tape (excludes option AA0).
Opt. ABA	U.S. Version. (See page 7-1 for National Version options for other countries.)
Opt. 002	Adds 8 MB ECC RAM card.
Opt. 003	Adds 28641A ThinMAU (excludes option 004).
Opt. 004	Adds 30241A ThickMAU (excludes option 003).
Opt. 005	Deletes 98556A Graphics Accelerator.
Opt. 006	Adds a 19-inch graphics subsystem (includes product summary items B-1 and 7, but not items B-2 through 6).
Opt. 007	Adds a 16-inch graphics subsystem (includes 98789A 16-inch color monitor and product summary item B-1, but not items B-2 through 7).

Product Summary, continued

Product/ Opt. No.	Description
Options, continued	
Opt. 515	Replaces 8 MB ECC RAM card with 16 MB ECC RAM card (excludes option 531).
Opt. 516	Adds 16 MB ECC RAM card.
Opt. 531	Replaces 8 MB ECC RAM card with two 16 MB ECC RAM cards (excludes option 515).
Opt. 716	Replaces 98752A 19-inch Color Monitor with 98789A 16-inch Color Monitor.
Opt. 0E1	Adds Battery Backup System.
Add-on Accessories	
A1010A	8 MB ECC RAM card.
A1037A	16 MB ECC RAM card.
A1014A	Battery Backup System.
A1015A	Access Port.
Interfaces	See page 12-1.
Upgrade Products	
A1039A	Upgrades Model 835CHX to Model 835CHX with CIO Expander (replaces Model 835 PDH board with that used in the Model 835SE, adds CIO Expander, adds 16 MB ECC RAM, and upgrades HP-UX to 64-user license).

Operational Requirements

Description	Requirements
System Disk:	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2). For disk choices, see Section 14.
Software Installation/Backup Device:	Cartridge tape subsystem or magnetic tape unit (Section 15).
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Model 370AIC and 370AIM AI Development Systems

Description

The HP 9000 Model 370AIC and 370AIM are AI development system with HP-UX and AI development environment software, keyboard, and 19-inch 1280 by 1024 monitor that is based on the powerful Model 370 System Processor Unit. Figures 7-17 and 7-18 illustrate Model 370AIC/AIM functions and backplane usage and interconnections.

SPU: HP 98579B Model 370, described on page 6-9.

Model 370AIC Monitor: 19-inch 1280 by 1024 color monitor.

Model 370AIM Monitor: 19-inch 1280 by 1024 monochrome monitor.

Expandability: See Figures 6-6 and 6-7, pages 6-9 and 6-10.

Available DIO I/O Slots: None in SPU; two 98568A Direct-Connect Expanders can be used to provide 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

Available DIO Accessory Slots: None in SPU; two 98568A Direct-Connect Expanders can be used to provide 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

Operating System: License to use HP-UX, media, and manuals are included.

Programming Software: License-to-use Common LISP II Development Environment, media, and manuals are included.

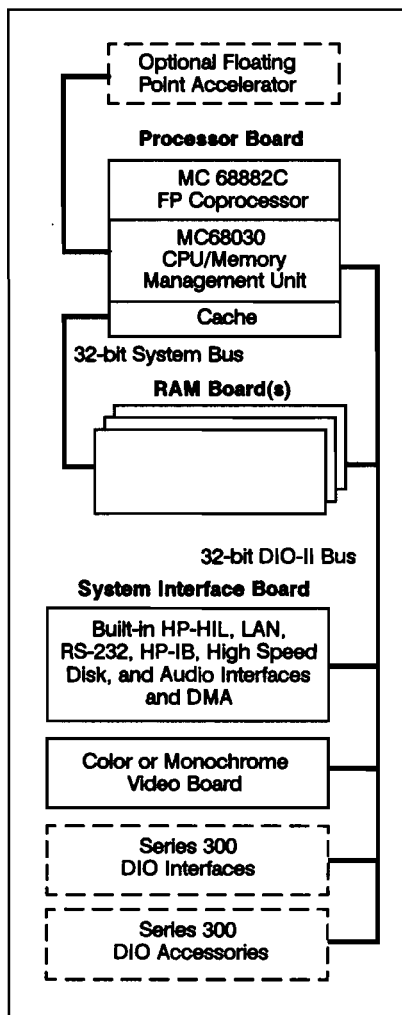


Figure 7-17. Model 370AIC/AIM Functions

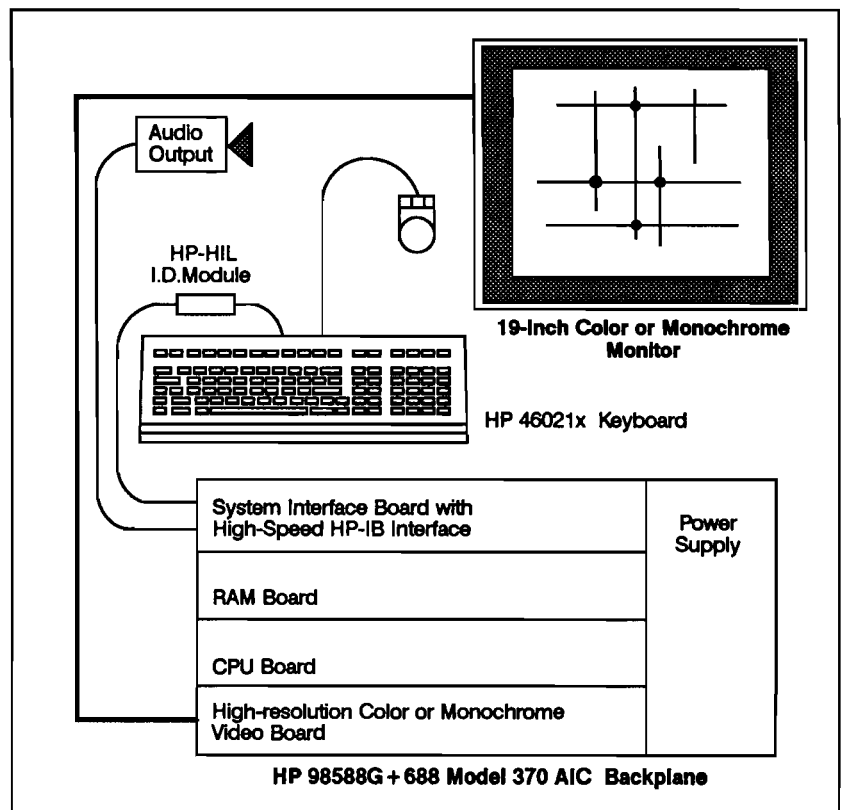


Figure 7-18. Model 370AIC/AIM Backplane Usage and Interconnections

Product Summary

Product/ Opt. No.	Description
98588G + 688	Model 370AIC Color AI Development system, consisting of: A. 98579B System Processor Unit, as described on pages 6-9 through 6-12. B. 98550A High-Resolution Color Video Board with RGB Cable. C. 98752A 19-inch 1280 by 1024 Color Monitor. D. 46021x Keyboard. E. Localization, which must be specified by National Version option ABA in the U.S. (see page 7-1 for other countries). F. 46060B HP-HIL 3-button Mouse. G. 46081A HP-HIL Buffer Box with Speaker. H. 46084A HP-HIL ID Module. I. Installation manuals. J. 98594L HP-UX License to use Application Execution Environment (AXE), Programming Environment (PE), Network Services, ARPA Services, Network File System, OSF Motif™ User Interface, and X Windows Version 11. K. 98594A media and documentation for 98594L software. Software is delivered on 1/4-inch cartridge tape. L. 98794A HP-UX Programmer's Documentation Set. M. 98688L License to use Development Environment for Common LISP II. N. 98688A Opt. 022 Development Environment for Common LISP II. Software is delivered on 1/4-inch cartridge tape. O. 90-day on-site warranty.
98589G + 688	Model 370AIM Monochrome AI Development system, consisting of: A. Items A and D through O of 98588G option 688, above. B. 98548A High-Resolution Monochrome Video Board with cable to monitor. C. 98788A 19-inch 1280 by 1024 Monochrome Monitor.
Options	
Opt. ABA	U.S. Version. (See page 7-1 for National Version options for other countries.)
Opt. 011	Substitutes SCSI single-ended Disk Interface with 1m cable and terminator for high-speed HP-IB interface.
Opt. 015‡	Specifies AUI-type LAN connection (excludes option 017).
Opt. 017‡	Specifies ThinMAU and BNC "T" connector for LAN connection (excludes option 015).
Opt. 116	Converts 8 MB parity checking RAM to 16 MB parity checking RAM (excludes options 208 and 216).
Opt. 208	Substitutes 8 MB ECC RAM for 8 MB parity checking RAM (excludes options 116 and 216).
Opt. 216	Substitutes 16 MB ECC RAM for 8 MB parity checking RAM (excludes options 116 and 208).
Opt. 404	Adds 162 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment (excludes options 405, 408, 409, and 410 and requires option 011).
Opt. 405	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment (excludes options 404, 408, 409, and 410 and requires option 011).
Opt. 408	Adds 162 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 67 MB 1/4-inch cartridge tape drive (excludes options 404, 405, 409, and 410 and requires option 011).
Opt. 409	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 67 MB 1/4-inch cartridge tape drive (excludes option 404, 405, 408, and 410 and requires option 011).
Opt. 410	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 133 MB 1/4-inch cartridge tape drive (excludes option 404, 405, 408, and 409 and requires option 011).
Opt. 716	Substitutes 98789A 16-inch monitor for 98752A 19-inch monitor (98588G option only).

‡ Must order option 015 or 017.

Model 370AIC and 370AIM AI Development Systems, continued

Product Summary, continued

Product/ Opt. No.	Description
Add-on Accessories	
98248B	Floating Point Accelerator.
98258A	4 MB Parity-Checking RAM controller with 3-slot system bus frontplane connector. 004: Deletes 3-slot system bus frontplane connector. 005: Substitutes 4-slot system bus frontplane connector for 3-slot connector.
98258B	Adds 4 MB Parity-checking RAM to 98258A (excludes 98258C).
98258C	Adds 12 MB Parity-checking RAM to 98258A (excludes 98258B).
98264A	8 MB ECC RAM controller with 3-slot system bus frontplane connector. 004: Deletes 3-slot system bus frontplane connector. 005: Substitutes 4-slot system bus frontplane connector for 3-slot connector.
98264B	16 MB ECC RAM controller with 3-slot system bus frontplane connector. 004: Deletes 3-slot system bus frontplane connector. 005: Substitutes 4-slot system bus frontplane connector for 3-slot connector.
98556A	2-D Integer-Based Graphics Accelerator†. Supported only in Model 370AIC.
98568A	Direct Connect 8-slot I/O Expander (first Expander requires 98568A Option 132).
98570A	Direct Connect I/O Expander with four DIO slots (two DIO slot pairs) and two DIO-II slots.
9888A	16-slot DIO Expander (uses one DIO I/O slot – maximum of two).

† A 98550A Graphics Board with 98556A 2-D Graphics Accelerator is not supported in the Model 370AIC SPU with ECC RAM. If ECC RAM is used, the graphics board with accelerator must be installed in a 98570A DIO-II Expander.

* Maximum of two 98658A/98570A Direct Connect I/O Expanders per Model 370AIC/370AIM.

Operational Requirements

Description	Requirements
System Disk:	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2). For disk choices, see Section 14.
Software Installation/Backup Device:	Cartridge tape subsystem (Section 15).
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

3-D Workstations

Introduction

This section contains configuration information on 3-D Workstation bundles based on Series 300 and Model 825/834/835 platforms. The 3-D Workstation bundles include keyboard, color monitor, hardware support for ultra-fast rendering of 3-D solids, and the license-to-use HP-UX. Most of the 3-D Workstation bundles also include an HP-HIL ID module, a 3-button mouse, X-Windows, Network Services, ARPA Services, and NFS. The TurboSRX workstations provide 3 to 10 times the graphics processing speed of the SRX workstations.

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National Versions

For convenient use in various nations throughout the world, HP 9000 Series 300 and 800 3-D workstations and Superworkstations are offered in specific national versions. Each national version provides appropriate keyboard, monitor, SPU, power cord and user's manuals. They are specified as **"must order"** options to the respective product number, as follows:

Option	National Version	Option	National Version
ABA	U.S. English	ABQ	Swiss French
ABC	French Canadian	ABS	Swedish
ABD	German	ABU	U.K. English
ABE	European Spanish	ABW	Belgian Dutch
ABF	European French	ABX	Finnish
ABH	Dutch	ABY	Danish
ABJ	Katakana	ABZ	Italian
ABK	Universal English ASCII	AB0	Taiwan (Chinese)
ABM	Latin American Spanish	AB1	Korean
ABN	Norwegian	ACA	Kanji
ABP	Swiss German		

Model 340SRX Solid Rendering Color Workstation

Description

The HP 9000 Model 340SRX is a low-priced, restricted configuration MC68030-based high-resolution Series 300 solid rendering 3-D color workstation. It includes keyboard and 16-inch 1280 by 1024 color monitor. Figures 8-1 and 8-2 illustrate the Model 340SRX functions and backplane usage and interconnections.

CPU: MC68030, clocked at 16.7 MHz.

Bus Types: 32-bit memory and 16-bit Direct I/O (DIO) buses.

RAM: 4 MB parity built-in, expandable to 16 MB with 4 MB add-on RAM boards.

Built-in Interfaces: HP-HIL, LAN (AUI or ThinLAN with built-in ThinMAU), RS-232C, Std HP-IB, and local graphics bus (display controller) interface.

Floating Point Processor: MC68882, clocked at 16.7 MHz, is standard.

Optional Internal Disk: A 200 MB SCSI disk with HP-UX installed and preconfigured X Windows environment and SCSI interface is available as option 411, which provides connection for up to six additional external SCSI devices, or option 412, in which the SCSI interface supports only the internal disk.

Direct Memory Access: Two-channel Direct Memory Access is built-in.

Monitor: 16-inch 1280 by 1024 Color Monitor.

Operating System: HP 98594L HP-UX License to Use Application Execution Environment, Programming Environment, NS, ARPA, NFS, OSF Motif™ User Interface, and X-Windows Version 11 is included; one set of HP 98594A option 022 media and manuals must be purchased separately to provide installable software for all licensed workstations at a site if none of options 404 through 412 is purchased.

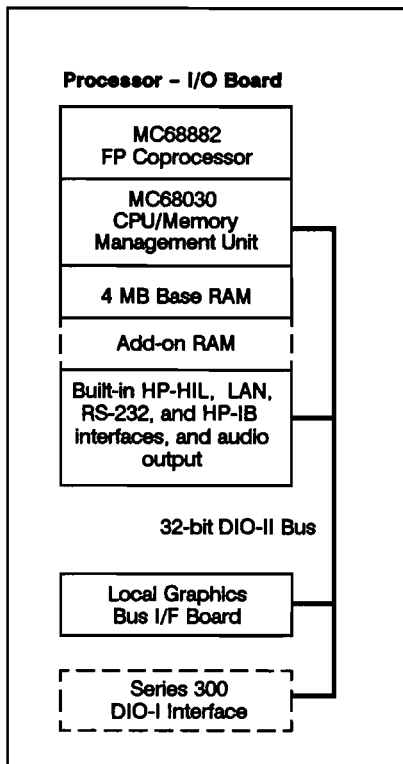


Figure 8-1. Model 340SRX Functions

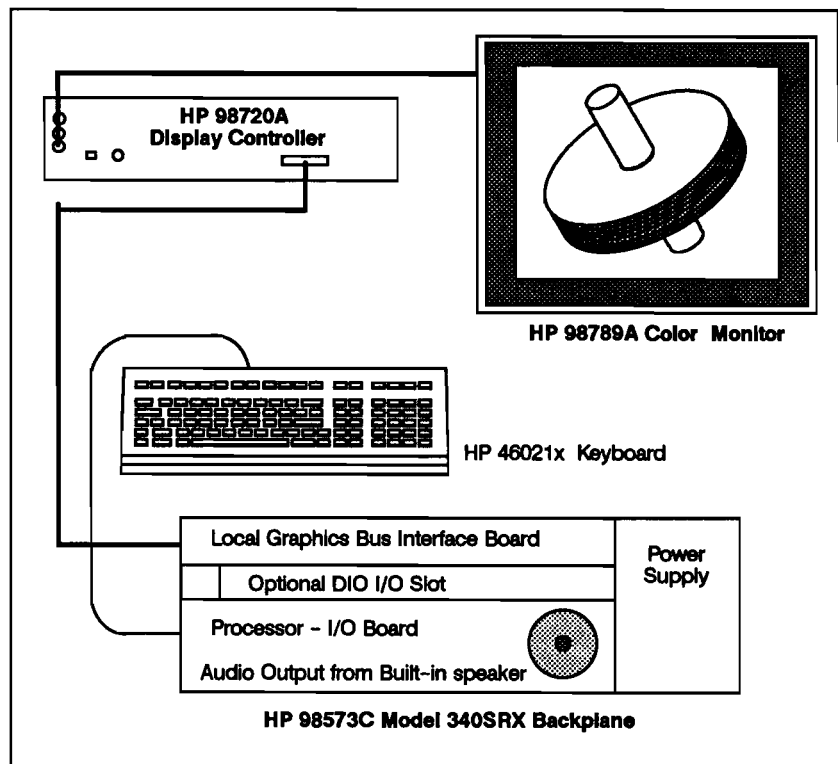


Figure 8-2. Model 340SRX Backplane Usage and Interconnections

Product Summary

Product/ Opt. No.	Description
98573C	Model 340SRX 3-D Color Workstation, consisting of: A. Processor - I/O board with: 1. 32-bit MC68030 16.7 MHz CPU with MC68882 16.7 MHz Floating Point Processor. 2. 4 MB of parity-checking RAM. 3. 4 GB virtual memory address space. 4. 32-bit memory and DIO-II buses. 5. IEEE-488 HP-IB interface and 1 meter HP-IB cable. 6. RS-232C serial interface (1 port). 7. HP-HIL interface and HP-HIL keyboard cable. 8. IEEE 802.3/Ethernet LAN interface. B. Local Graphics Bus Interface to 98720A Display Controller. C. Enclosure with power supply and space for optional disk interface. D. 98720A Display Controller with 3-D solid rendering graphics accelerator and 8 planes of frame buffer memory. E. 98789A 16-inch High Resolution (1280 by 1024) Color Monitor. F. 98290A RGB Cable. G. 46021x Keyboard. H. Localization, which must be specified by National Version option ABA in the U.S. (see page 8-1 for other countries). I. Installation manuals. J. 98594L HP-UX License to use Application Execution Environment (AXE), Programming Environment (PE), Network Services, ARPA Services, Network File System, OSF Motif™ User Interface, and X Windows Version 11 (X11). Software and documentation must be ordered separately (see operational requirements, next page). K. 90-day on-site warranty.

Options

Opt. ABA	U.S. Version. (See page 8-1 for National Version options for other countries.)
Opt. 010	Adds 98625B high speed HP-IB (disk) interface (Excludes option 011).
Opt. 011	Adds 98658A SCSI (disk) interface (Excludes option 010).
Opt. 015†	Specifies AUI-type LAN connection (excludes option 017).
Opt. 016	Increases SRX frame buffers to 16 (adds one 98722A 8-plane frame buffer board and additional power supply - excludes options 024 and 032).
Opt. 017†	Specifies ThinLAN connection (built-in ThinMAU and BNC "T" connector)(excludes option 015).
Opt. 024	Increases SRX frame buffers to 24 (adds two 98722A 8-plane frame buffer boards and additional power supply - excludes options 016 and 032).
Opt. 032	Increases SRX frame buffers to 32 (adds three 98722A 8-plane frame buffer boards and additional power supply - excludes options 016 and 024).
Opt. 061	Adds 46060B 3-button HP-HIL mouse.
Opt. 084	Adds 46084A HP-HIL ID module.
Opt. 108	Increases RAM to 8 MB (adds one 98268A 4 MB RAM board - excludes options 112 and 116).
Opt. 112	Increases RAM to 12 MB (adds two 98268A 4 MB RAM boards - excludes options 108 and 116).
Opt. 116	Increases RAM to 16 MB (adds three 98268A 4 MB RAM boards - excludes options 108 and 112).

† Must order option 015 or 017.

Model 340SRX Solid Rendering Color Workstation, continued

Product Summary, continued

Product/ Opt. No.	Description
Options, continued	
Opt. 404	Adds 162 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment (excludes options 405, 408, 409, and 410 and requires option 011).
Opt. 405	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment (excludes options 404, 408, 409, and 410 and requires option 011).
Opt. 408	Adds 162 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 67 MB 1/4-inch cartridge tape drive (excludes options 404, 405, 409, and 410 and requires option 011).
Opt. 409	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 67 MB 1/4-inch cartridge tape drive (excludes option 404, 405, 408, and 410 and requires option 011).
Opt. 410	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 133 MB 1/4-inch cartridge tape drive (excludes option 404, 405, 408, and 409 and requires option 011).
Opt. 411	Adds 200 MB internal SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and internal SCSI interface with external connection to up to six other SCSI devices (excludes option 412).
Opt. 412	Adds 200 MB internal SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and internal SCSI interface (excludes option 411).
Opt. 719	Substitutes 91752A 19-inch color monitor for 98789A 16-inch color monitor.
Add-on Accessories	
98235A	AUI Upgrade for built-in LAN interface.
98237A	ThinLAN Upgrade for built-in LAN interface.
98268A	4 MB add-on Parity RAM board (maximum of three, total per Model 340SRX).
98722A	8-plane frame buffer board (max. of three additional 8-plane frame buffers per 98720A).
98723A	Additional power supply for 98720A Display Controller with more than 8 planes of frame buffer memory.
98571D	200 MB internal fixed disk upgrade, including SCSI interface (equivalent to option 412).

Operational Requirements

Description	Requirements
Operating System:	HP 98594A option 022 Media and Documentation for 98594L must be available for installation if one of options 404 through 412 is not purchased.
System Disk:	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2) or comparable support from a LAN-connected network server system. For disk choices, see options 404 through 412 and Section 14.
Software Installation/Backup Device:	Cartridge tape subsystem (Section 15) or comparable support from a LAN-connected network server.
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Model 345 3-D Solid Rendering Color Workstations

Description

Two different high-performance, restricted configuration, 3-D color workstations based on the MC68030-based Model 345 3-D color workstations offer a choice of base SRX or 3 to 10 times faster TurboSRX graphics processing speed. Figures 8-3 and 8-4 illustrate the Model 345 3-D workstation functions and backplane usage and interconnections.

CPU: MC68030, clocked at 50 MHz.

Bus Types: 32-bit memory and Direct I/O-II (DIO-II) buses.

RAM: 8 MB ECC, expandable to 16 MB in 4 MB increments.

Built-in Interfaces: HP-HIL, LAN (jumper-selectable between AUI and ThinLAN with built-in ThinMAU), RS-232C, Std HP-IB, Parallel (Centronics), and video and audio outputs.

Floating Point Processor: MC68882, clocked at 50 MHz, is standard.

Direct Memory Access: Two-channel Direct Memory Access is built-in.

Optional Internal Disk: A 200 MB SCSI disk with HP-UX installed and preconfigured X Windows environment and SCSI interface is available as option 411, which provides connection for up to six additional external SCSI devices or option 412, in which the SCSI interface supports only the internal disk.

Model 345SRX Monitor: 16-inch 1280 by 1024 Color Monitor.

Model 345 TurboSRX Monitor: 19-inch 1280 by 1024 Color Monitor.

Operating System: HP 98594L HP-UX License to Use Application Execution and Programming Environments, NS, ARPA, NFS, OSF Motif™ User Interface, and X-Windows Version 11 is included; one set of HP 98594A option 022 media and manuals must be purchased separately to provide installable software for all licensed workstations at a site if one of options 411 or 412 is not purchased.

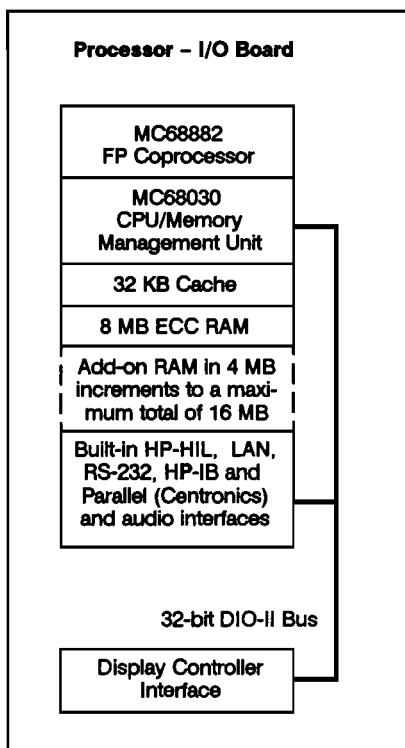


Figure 8-3. Model 345 3-D Workstation Functions

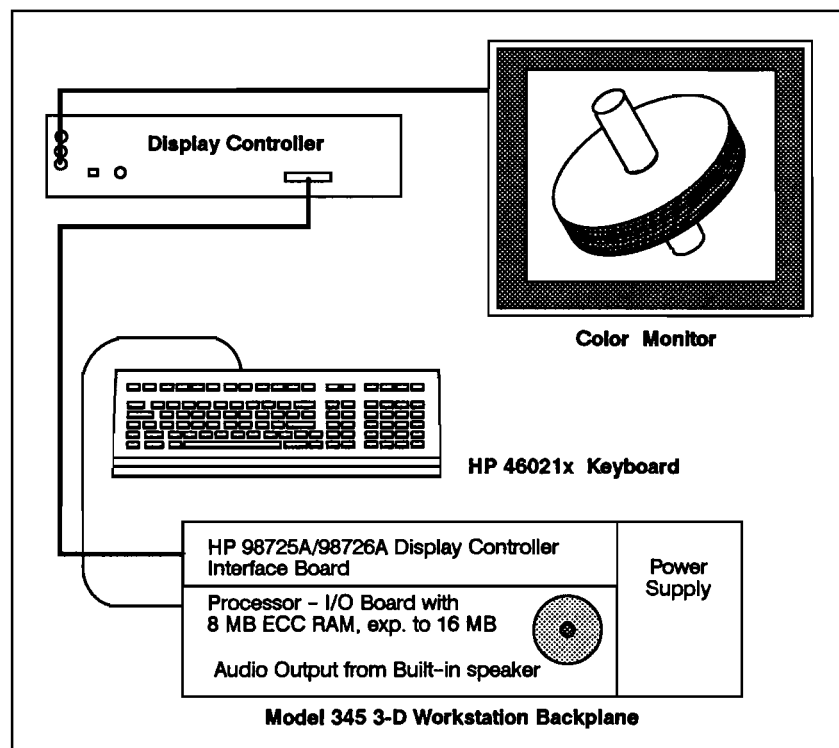


Figure 8-4. Model 345 3-D Workstation Backplane Usage and Interconnections

Model 345 3-D Solid Rendering Color Workstations, continued

Product Summary

Product/ Opt. No.	Description
98573H	Model 345SRX Solid Rendering 3-D Color Workstation, consisting of: A. System Processor - I/O board with: 1. 32-bit MC68030 50 MHz CPU with MC68882 50 MHz Floating Point Processor. 2. 8 MB of ECC RAM. 3. 4 GB virtual memory address space. 4. 64-bit memory bus. 5. 32-bit DIO-II bus. 6. IEEE-488 HP-IB interface and 1 meter HP-IB cable. 7. RS-232C serial interface (1 port) with 9-to-25 pin converter. 8. HP-HIL interface and HP-HIL keyboard cable. 9. Centronics-compatible parallel I/O interface. 10. IEEE 802.3/Ethernet LAN interface with ThinMAU and BNC "T" connector and AUI connector (jumper selectable). 11. 2-channel DMA controller. 12. Audio output with built-in speaker. B. Enclosure with power supply. C. 98720A Display Controller with 3-D solid rendering graphics accelerator and 8 planes of frame buffer memory. D. 98725A Display Controller (local graphics bus) Interface. E. 98290A RGB Cable. F. 98785A 16-inch High Resolution (1280 by 1024) Color Monitor. G. 46021x Keyboard. H. Localization, which must be specified by National Version option ABA in the U.S. (see page 7-1 for other countries). I. Installation manuals. J. 98594L HP-UX License to use Application Execution Environment (AXE), Programming Environment (PE), Network Services, ARPA Services, Network File System, OSF Motif™ User Interface, and X Windows Version 11 (X11). Software and documentation must be ordered separately (see operational requirements, next page). K. 90-day on-site warranty.
98573J	Model 345 TurboSRX Solid Rendering 3-D Color Workstation, consisting of: A. Items A, B, and G through K of 98573H, above. B. 98730A Display Controller with 8 planes of frame buffer memory. C. 98726A Display Controller (local graphics bus) Interface. D. 98752A 19-inch High Resolution (1280 by 1024) Color Monitor.
Model 345 3-D Workstation Options	
Opt. ABA	U.S. Version. (See page 8-1 for National Version options for other countries.)
Opt. 010	Adds high speed HP-IB (disk) Interface (Excludes options 011, 411, and 412).
Opt. 011	Adds SCSI (disk) interface (Excludes options 010, 411, and 412).
Opt. 012	Adds software support for Centronics Interface, including Device Driver.
Opt. 016	In 98573H Model 345SRX only, adds one 8-plane frame buffer board for a total of 16 planes and increases power supply (excludes 98573H options 024 and 032).
Opt. 024	In 98573H Model 345SRX only, adds two 8-plane frame buffer boards for a total of 24 planes and increases power supply (excludes 98573H options 016 and 032).
Opt. 032	In 98573H Model 345SRX only, adds three 8-plane frame buffer boards for a total of 32 planes and increases power supply (excludes 98573H options 016 and 024).
Opt. 061	Adds 46060B 3-button HP-HIL mouse.
Opt. 084	Adds 46084A HP-HIL ID module.
Opt. 112	Increases RAM to 12 MB (adds one 98229A 4 MB RAM board - excludes options 108 and 116).
Opt. 116	Increases RAM to 16 MB (adds two 98229A 4 MB RAM boards - excludes options 108 and 112).
Opt. 411	Adds 200 MB internal SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and SCSI interface with connection to up to six other SCSI devices (excludes options 010, 011, and 412).
Opt. 412	Adds 200 MB internal SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and SCSI interface (excludes options 010, 011, and 411).

Product Summary, continued

Product/ Opt. No.	Description
Model 345 3-D Workstation Options, continued	
Opt. 416	In 98573J Model 345 TurboSRX only, adds one 8-plane frame buffer board for a total of 16 planes and increases power supply (excludes 98573J options 424, 608, 616, and 624).
Opt. 424	In 98573J Model 345 TurboSRX only, adds two 8-plane frame buffer boards for a total of 24 planes and increases power supply (excludes 98573J options 416, 608, 616 and 624).
Opt. 608	In 98573J Model 345 TurboSRX only, adds three accelerators for 3-D solids and a 16-bit Z-buffer and increases power supply (excludes 98573J options 416, 424, 616, and 624).
Opt. 616	In 98573J Model 345 TurboSRX only, adds one 8-plane frame buffer board (16 planes total), three accelerators for 3-D solids, a 16-bit Z-buffer, and increases power supply (excludes 98573J options 416, 424, 608, and 624).
Opt. 624	In 98573J Model 345 TurboSRX only, adds two 8-plane frame buffer boards (24 planes total), three accelerators for 3-D solids, a 16-bit Z-buffer, and increases power supply (excludes 98573J options 416, 424, 608, and 616).
Opt. 716	In 98573J Model 345 TurboSRX only, substitutes 98789A 16-inch monitor for 98752A 19-inch monitor.
Opt. 719	In 98573H Model 345SRX only, substitutes 19-inch color monitor for 16-inch color monitor.
Model 345 3-D Workstation Add-on Accessories	
98229A	4 MB add-on Parity RAM board (maximum of two, total).
98433D	200 MB Internal fixed disk upgrade, including SCSI interface (equivalent to option 412).
98722A	8-plane frame buffer board (max. of three additional 8-plane frame buffers per 98720A in 98587W, two additional 8-plane frame buffers per 98730A in 98587T).
98723A	Additional power supply for Display Controller with more than 8 planes of frame buffer memory or 98732A.
98732A	For 98573J Model 345 TurboSRX only, 3-D Graphics Accelerator with full 16-bit Z-buffer for 98730A).

Operational Requirements

Description	Requirements
Operating System:	HP 98594A option 022 Media and Documentation for 98594L must be available for installation if option 411 or 412 is not purchased.
System Disk:	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2) or comparable support from a LAN-connected network server system. For disk choices, see options 411 and 412 and Section 14.
Software Installation/Backup Device:	Cartridge tape subsystem (Section 15) or comparable support from a LAN-connected network server.
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Model 360 3-D Solid Rendering Color Workstations

Description

Two different mid-priced solid rendering 3-D color workstations based on the Model 360 System Processor Unit offer a choice of base SRX or 3 to 10 times faster TurboSRX graphics processing speed. Figures 8-5 and 8-6 illustrate the Model 360 3-D workstation functions and backplane usage and interconnections.

SPU: HP 98579A Model 360, as described on page 6-5.

Expandability: See Figure 6-4, page 6-5.

Available DIO I/O Slots: 1 with 98242B DIO Slot Backplane in SPU; two 98568A Direct-Connect Expanders can be used to add 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

Available DIO Accessory Slots: 1 with 98242B DIO Slot Backplane in SPU; two 98568A Direct-Connect Expanders can be used to add 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

Model 360SRX Monitor: 16-inch 1280 by 1024 Color Monitor.

Model 360 TurboSRX Monitor: 19-inch 1280 by 1024 Color Monitor.

Operating System: HP 98594L HP-UX License to Use Application Execution Environment, Programming Environment, NS, ARPA, NFS, OSF Motif™ User Interface, and X-Windows Version 11 is included; one set of HP 98594A option 022 media and manuals must be purchased separately to provide installable software for all licensed workstations at a site if none of options 404 through 410 is purchased.

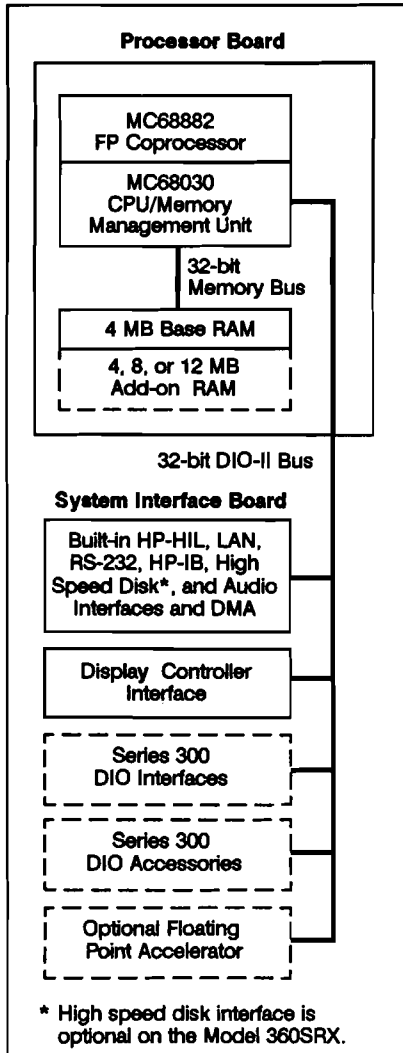


Figure 8-5. Model 360 3-D Workstation Functions

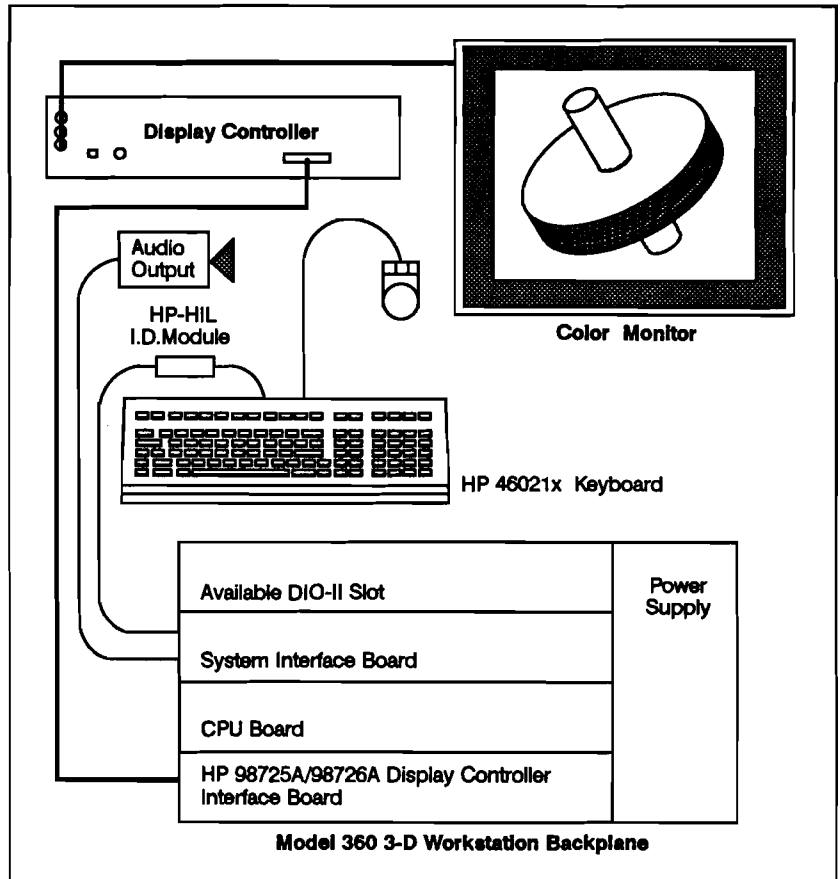


Figure 8-6. Model 360 3-D Workstation Backplane Usage and Interconnections

Product Summary

Product/ Opt. No.	Description
98587W	Model 360SRX Solid Rendering 3-D Color Workstation, consisting of: A. 98579A System Processor Unit, as described on pages 6-5 through 6-8. B. 98720A Display Controller with 3-D solid rendering graphics accelerator and 8 planes of frame buffer memory. C. 98725A Display Controller (local graphics bus) Interface. D. 98789A 16-inch 1280 by 1024 Color Monitor. E. 98290A RGB Cable. F. 46021x Keyboard. G. Localization, which must be specified by National Version option ABA in the U.S. (see page 8-1 for other countries). H. 46060B HP-HIL 3-button Mouse. I. 46081A HP-HIL Buffer box with speaker. J. 46084A HP-HIL ID Module. K. Installation manuals. L. 98594L HP-UX License to use Application Execution Environment (AXE), Programming Environment (PE), Network Services, ARPA Services, Network File System, OSF Motif™ User Interface, and X Windows Version 11 (X11). Software and documentation must be ordered separately (see operational requirements, next page). M. 90-day on-site warranty.
98587T	Model 360 TurboSRX Solid Rendering 3-D Color Workstation, consisting of: A. Items A and F through M of 98587W Model 360SRX Workstation, above. B. 98267A 4 MB additional RAM (brings total RAM to 8 MB). C. 98730A Display Controller with 8 planes of frame buffer memory. D. 98726A Display Controller (local graphics bus) interface. E. 98752A 19-inch 1280 by 1024 Color Monitor. F. 98262A High-Speed HP-IB Disk Interface.

Model 360 3-D Workstation Options

Opt. ABA	U.S. Version. (See page 8-1 for National Version options for other countries.)
Opt. 006	Adds 98242B Two-slot DIO backplane.
Opt. 010	To 98587W Model 360SRX, adds high-speed HP-IB Disk Interface (excludes 98587W option 011).
Opt. 011	To 98587W Model 360SRX, adds SCSI single-ended Disk Interface (excludes 98587W option 010); in 98587T Model 360 TurboSRX, substitutes SCSI Disk Interface for High-Speed HP-IB Disk Interface.
Opt. 015†	Specifies AUI-type LAN connection (excludes option 017).
Opt. 016	In 98587W Model 360SRX only, adds one 8-plane frame buffer board for a total of 16 planes and increases power supply (excludes 98587W options 024 and 032).
Opt. 017†	Specifies ThinMAU and BNC "T" connector for LAN connection (excludes option 015).
Opt. 024	In 98587W Model 360SRX only, adds two 8-plane frame buffer boards for a total of 24 planes and increases power supply (excludes 98587W options 016 and 032).
Opt. 032	In 98587W Model 360SRX only, adds three 8-plane frame buffer boards for a total of 32 planes and increases power supply (excludes 98587W options 016 and 024).
Opt. 108	In 98587W Model 360SRX only, increase total RAM to 8 MB (excludes options 112 and 116).
Opt. 112	Increases total RAM to 12 MB (excludes options 108 and 116).
Opt. 116	Increases total RAM to 16 MB (excludes options 108 and 112).
Opt. 404	Adds 162 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment (excludes options 405, 408, 409, and 410 and requires option 011).
Opt. 405	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment (excludes options 404, 408, 409, and 410 and requires option 011).
Opt. 408	Adds 162 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 67 MB 1/4-inch cartridge tape drive (excludes options 404, 405, 409, and 410 and requires option 011).

† Must order option 015 or 017.

Model 360 3-D Solid Rendering Color Workstation, continued

Product Summary, continued

Product/ Opt. No.	Description
Model 360 3-D Workstation Options, continued	
Opt. 409	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 67 MB 1/4-inch cartridge tape drive (excludes option 404, 405, 408, and 410 and requires option 011).
Opt. 410	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 133 MB 1/4-inch cartridge tape drive (excludes option 404, 405, 408, and 409 and requires option 011).
Opt. 416	In 98587T Model 360 TurboSRX only, adds one 8-plane frame buffer board for a total of 16 planes and increases power supply (excludes 98587T options 424, 608, 616, and 624).
Opt. 424	In 98587T Model 360 TurboSRX only, adds two 8-plane frame buffer boards for a total of 24 planes and increases power supply (excludes 98587T options 416, 608, 616 and 624).
Opt. 608	In 98587T Model 360 TurboSRX only, adds three accelerators for 3-D solids and a 16-bit Z-buffer and increases power supply (excludes 98587T options 416, 424, 616, and 624).
Opt. 616	In 98587T Model 360 TurboSRX only, adds one 8-plane frame buffer board (16 planes total), three accelerators for 3-D solids, a 16-bit Z-buffer, and increases power supply (excludes 98587T options 416, 424, 608, and 624).
Opt. 624	In 98587T Model 360 TurboSRX only, adds two 8-plane frame buffer boards (24 planes total), three accelerators for 3-D solids, a 16-bit Z-buffer, and increases power supply (excludes 98587T options 416, 424, 608, and 616).
Opt. 716	In 98587T Model 360 TurboSRX only, substitutes 98789A 16-inch monitor for 98754A 19-inch monitor.
Opt. 719	In 98587W Model 360SRX only, substitutes 98754A 19-inch monitor for 98789A 16-inch monitor.
Model 360 3-D Workstation Add-on Accessories	
98242B	Two-slot DIO backplane.
98248B	Floating Point Accelerator.
98267A	4 MB Parity-Checking add-on RAM board for 98587W Model 360SRX without option 108, 112, or 116 (increases total RAM to 8 MB - excludes 98267B and 98267C).
98267B	8 MB Parity-Checking add-on RAM board for 98587W Model 360SRX without option 108, 112, or 116 (increases total RAM to 12 MB - excludes 98267A and 98267C).
98267C	12 MB Parity-Checking add-on RAM board for 98587W Model 360SRX without option 108, 112, or 116 (increases total RAM to 16 MB - excludes 98267A and 98267B).
98568A	Direct Connect 8-slot I/O Expander (first expander requires 98568A Option 132)*.
98570A	Direct Connect I/O Expander with four DIO slots (two DIO slot pairs) and two DIO-II slots.*
9888A	16-slot DIO Expander (uses one DIO I/O slot - maximum of two).
98722A	8-plane frame buffer board (max. of three additional 8-plane frame buffers per 98720A in 98587W, two additional 8-plane frame buffers per 98730A in 98587T).
98723A	Additional power supply for Display Controller with more than 8 planes of frame buffer memory or 98732A.
98732A	For 98587T Model 360 TurboSRX only, 3-D Graphics Accelerator with full 16-bit Z-buffer for 98730A).

* Maximum of two 98568A/98570A Direct Connect I/O Expanders per Model 360 3-D Workstation.

Operational Requirements

Description	Requirements
Operating System:	HP 98594A option 022 Media and Documentation for 98594L must be available for installation if one of options 404 through 410 is not purchased.
System Disk:	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2) or comparable support from a LAN-connected network server system. For disk choices, see options 405 through 410 and Section 14.
Software Installation/Backup Device:	Cartridge tape subsystem (Section 15) or comparable support from a LAN-connected network server.
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Model 370 3-D Solid Rendering Color Workstations

Description

Two different solid rendering 3-D color workstationss based on the powerful Model 370 System Processor Unit offer a choice of base SRX or 3 to 10 times faster TurboSRX graphics processing speed. Figures 8-7 and 8-8 illustrate the Model 370 3-D workstation functions and backplane usage and interconnections.

SPU: HP 98579B Model 370, described on page 6-9.

Expandability: See Figures 6-6 and 6-7, pages 6-9 and 6-10.

Available DIO I/O Slots: None in SPU; two 98568A Direct-Connect Expanders can be used to provide 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

Available DIO Accessory Slots: None in SPU; two 98568A Direct-Connect Expanders can be used to provide 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

Monitor: 19-inch 1280 by 1024 Color Monitor.

Operating System: HP 98594L HP-UX License to Use Application Execution Environment, Programming Environment, NS, ARPA, NFS, OSF Motif™ User Interface, and X-Windows Version 11 is included; one set of HP 98594A option 022 media and manuals must be purchased separately to provide installable software for all licensed workstations at a site if none of options 404 through 410 is purchased.

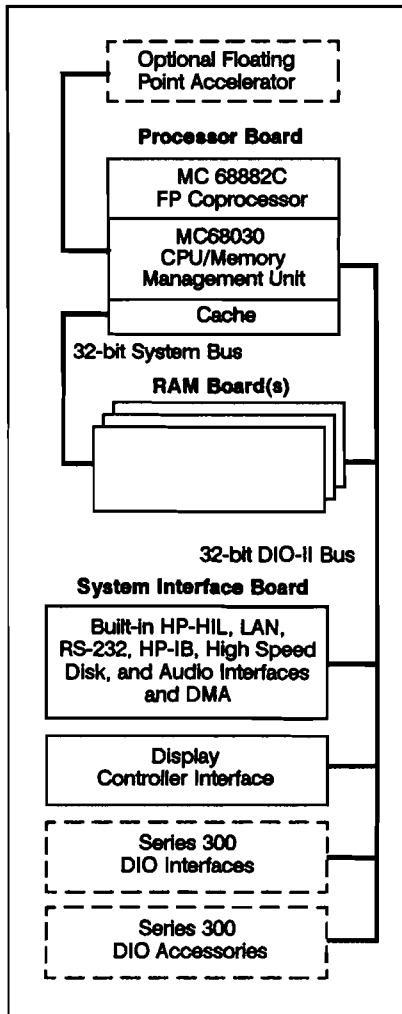


Figure 8-7. Model 370 3-D Workstation Functions

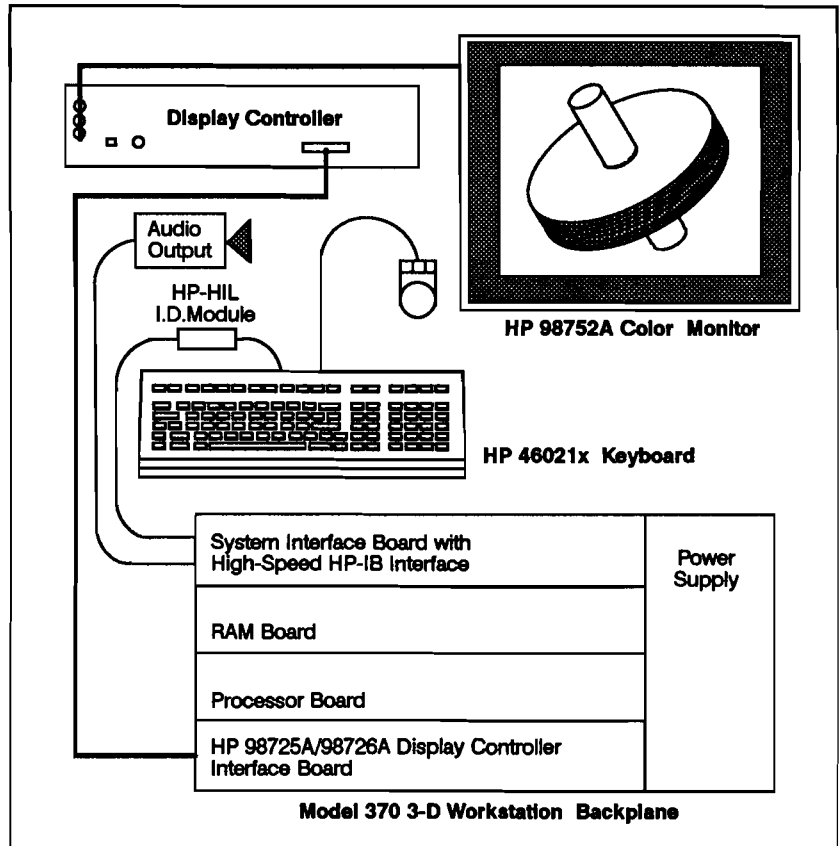


Figure 8-8. Model 370 3-D Workstation Backplane Usage and Interconnections

Product Summary

Product/ Opt. No.	Description
98587G	Model 370SRX Solid Rendering Color Workstation, consisting of: A. 98579B System Processor Unit, as described on pages 6-9 through 6-12. B. 98720A Display Controller with option 721 3-D solid rendering graphics accelerator and option 722 8 planes of frame buffer memory. C. 98725A Display Controller (local graphics bus) Interface. D. 98752A 19-inch 1280 by 1024 Color Monitor. E. 98290A RGB Cable. F. 46021x Keyboard. G. Localization, which must be specified by National Version option ABA in the U.S. (see page 8-1 for other countries). H. 46060B HP-HIL 3-button Mouse. I. 46081A HP-HIL Buffer box with speaker. J. 46084A HP-HIL ID Module. K. Installation manuals. L. 98594L HP-UX License to use Application Execution Environment (AXE), Programming Environment (PE), Network Services, ARPA Services, Network File System, OSF Motif™ User Interface, and X Windows Version 11 (X11). Software and documentation must be ordered separately (see operational requirements, next page). M. 90-day on-site warranty.
98587H	Model 370 TurboSRX Solid Rendering 3-D Color Workstation, consisting of: A. Items A and F through M of 98587G Model 370SRX Workstation, above. B. 98730A Display Controller with 8 planes of frame buffer memory. C. 98726A 32-bit Display Controller (local graphics bus) Interface.

Model 370 3-D Workstation Options

Opt. ABA	U.S. Version. (See page 8-1 for National Version options for other countries.)
Opt. 011	Substitutes SCSI single-ended Disk Interface with 1m cable and terminator for high-speed HP-IB interface.
Opt. 015†	Specifies AUI-type LAN connection (excludes option 017).
Opt. 016	In 98587G Model 370SRX only, adds one 8-plane frame buffer board for a total of 16 planes and increases power supply (excludes options 024 and 032).
Opt. 017†	Specifies ThinMAU and BNC "T" connector for LAN connection (excludes option 015).
Opt. 024	In 98587G Model 370SRX only, adds two 8-plane frame buffer boards for a total of 24 planes and increases power supply (excludes 98587G options 016 and 032).
Opt. 032	In 98587G Model 370SRX only, adds three 8-plane frame buffer boards for a total of 32 planes and increases power supply (excludes 98587G options 016 and 024).
Opt. 116	Converts 8 MB parity checking RAM to 16 MB parity checking RAM (excludes options 208 and 216).
Opt. 208	Substitutes 8 MB ECC RAM for 8 MB parity checking RAM (excludes options 116 and 216).
Opt. 216	Substitutes 16 MB ECC RAM for 8 MB parity checking RAM (excludes options 116 and 208).
Opt. 404	Adds 162 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment (excludes options 405, 408, 409, and 410 and requires option 011).
Opt. 405	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment (excludes options 404, 408, 409, and 410 and requires option 011).
Opt. 408	Adds 162 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 67 MB 1/4-inch cartridge tape drive (excludes options 404, 405, 409, and 410 and requires option 011).
Opt. 409	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 67 MB 1/4-inch cartridge tape drive (excludes option 404, 405, 408, and 410 and requires option 011).
Opt. 410	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 133 MB 1/4-inch cartridge tape drive (excludes option 404, 405, 408, and 409 and requires option 011).
Opt. 416	In 98587H Model 370 TurboSRX only, adds one 8-plane frame buffer board for a total of 16 planes and increases power supply (excludes options 424, 608, 616, and 624).
Opt. 424	In 98587H Model 370 TurboSRX only, adds two 8-plane frame buffer boards for a total of 24 planes and increases power supply (excludes options 416, 608, 616 and 624).

† Must order option 015 or 017.

Model 370 3-D Solid Rendering Color Workstations, continued

Product Summary, continued

Product/ Opt. No.	Description
Model 370 3-D Workstation Options, continued	
Opt. 608	In 98587H Model 370 TurboSRX only, adds three accelerators for 3-D solids and a 16-bit Z-buffer and increases power supply (excludes options 416, 424, 616, and 624).
Opt. 616	In 98587H Model 370 TurboSRX only, adds one 8-plane frame buffer board (16 planes total), three accelerators for 3-D solids, a 16-bit Z-buffer, and increases power supply (excludes options 416, 424, 608, and 624).
Opt. 624	In 98587H Model 370 TurboSRX only, adds two 8-plane frame buffer boards (24 planes total), three accelerators for 3-D solids, a 16-bit Z-buffer, and increases power supply (excludes options 416, 424, 608, and 616).
Opt. 716	Substitutes 98789A 16-inch monitor for 98752A 19-inch monitor.
Model 370 3-D Workstation Add-on Accessories	
98248B	Floating Point Accelerator.
98258A	4 MB Parity-Checking RAM controller with 3-slot system bus frontplane connector. 004: Deletes 3-slot system bus frontplane connector. 005: Substitutes 4-slot system bus frontplane connector for 3-slot connector.
98258B	Adds 4 MB Parity-checking RAM to 98258A (excludes 98528C).
98258C	Adds 12 MB Parity-checking RAM to 98258A (excludes 98528B).
98264A	8 MB ECC RAM controller with 3-slot system bus frontplane connector. 004: Deletes 3-slot system bus frontplane connector. 005: Substitutes 4-slot system bus frontplane connector for 3-slot connector.
98264B	16 MB ECC RAM controller with 3-slot system bus frontplane connector. 004: Deletes 3-slot system bus frontplane connector. 005: Substitutes 4-slot system bus frontplane connector for 3-slot connector.
98568A	Direct Connect 8-slot I/O Expander (first expander requires 98568A Option 132)*.
98570A	Direct Connect I/O Expander with four DIO slots (two DIO slot pairs) and two DIO-II slots.*
9888A	16-slot DIO Expander (uses one DIO I/O slot - maximum of two).
98722A	8-plane frame buffer board (max. of three additional 8-plane frame buffers per 98720A in 98587G, two additional 8-plane frame buffers per 98730A in 98587H).
98723A	Additional power supply for Display Controller with more than 8 planes of frame buffer memory or 98732A.
98732A	For 98587H Model 370 TurboSRX only, 3-D Graphics Accelerator with full 16-bit Z-buffer for 98730A.

* Maximum of two 98568A/98570A Direct Connect I/O Expanders per Model 370 3-D Workstation.

Operational Requirements

Description	Requirements
Operating System:	HP 98594A option 022 Media and Documentation for 98594L must be available for installation if one of options 404 through 410 is not purchased.
System Disk:	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2) or comparable support from a LAN-connected network server system. For disk choices, see options 404 through 410 and Section 14.
Software Installation/Backup Device:	Cartridge tape subsystem (Section 15) or comparable support from a LAN-connected network server.
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Model 375 3-D Solid Rendering Color Workstations

Description

Two different solid rendering 3-D color workstations based on the super powerful Model 375 System Processor Unit offer a choice of base SRX or 3 to 10 times faster TurboSRX graphics processing speed. Figures 8-9 and 8-10 illustrate the Model 375 3-D workstation functions and backplane usage and interconnections.

SPU: HP 98574B Model 375, described on page 6-13.

Expandability: See Figure 6-9, page 6-13.

Monitor: 19-inch 1280 by 1024 Color Monitor.

Available DIO I/O Slots: 1 with 98242B DIO Slot backplane in SPU; two 98568A Direct-Connect Expanders can be used to add 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

Available DIO Accessory Slots: 1 with 98242B DIO Slot backplane in SPU; two 98568A Direct-Connect Expanders can be used to add 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

Operating System: HP 98594L HP-UX License to Use Application Execution and Programming Environments, NS, ARPA, NFS, OSF Motif™ User Interface, and X-Windows Version 11 is included; one set of HP 98594A option 022 media and manuals must be purchased separately to provide installable software for all licensed workstations at a site if none of options 404 through 410 is purchased.

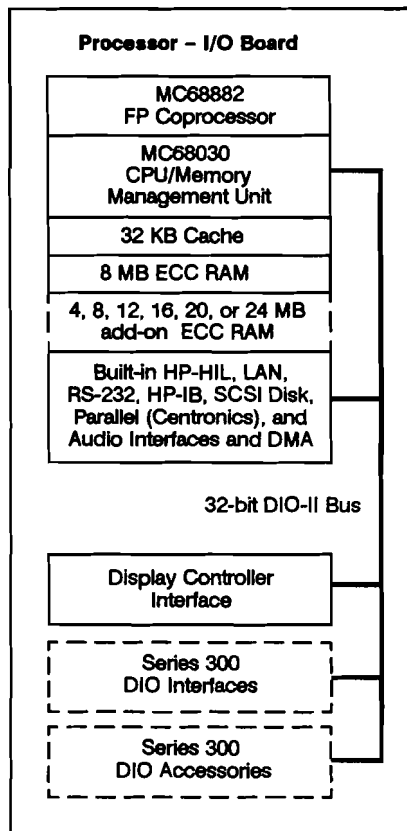


Figure 8-9. Model 375 3-D Workstation Functions

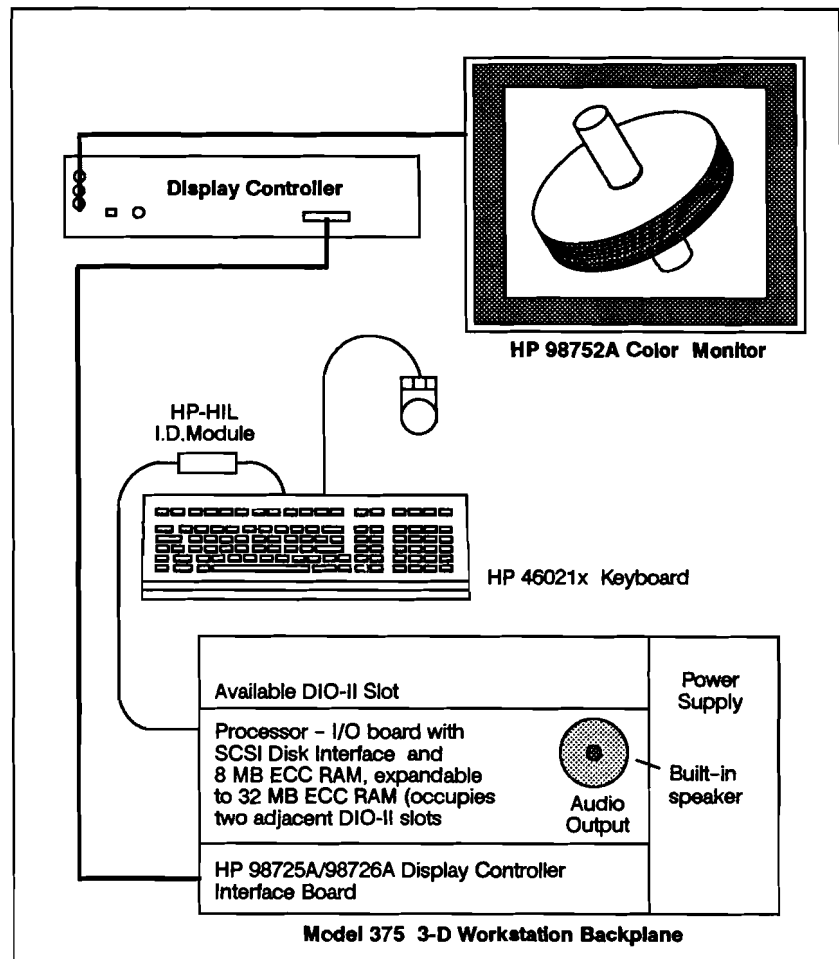


Figure 8-10. Model 375 3-D Workstation Backplane Usage and Interconnections

Model 375 3-D Solid Rendering Color Workstations, continued

Product Summary

Product/ Opt. No.	Description
98587J	Model 375SRX Solid Rendering 3-D Color Workstation, consisting of: A. 98574B System Processor Unit, as described on pages 6-13 through 6-15. B. 98720A Display Controller with option 721 3-D solid rendering graphics accelerator and option 722 8 planes of frame buffer memory. C. 98725A Display Controller (local graphics bus) Interface. D. 98752A 19-inch 1280 by 1024 Color Monitor. E. 98290A RGB Cable. F. 46021x Keyboard. G. Localization, which must be specified by National Version option ABA in the U.S. (see page 7-1 for other countries). H. 46060B HP-HIL 3-button Mouse. I. 46081A HP-HIL Buffer Box with Speaker. J. 46084A HP-HIL ID Module. K. Installation manuals. L. 98594L HP-UX License to use Application Execution Environment (AXE), Programming Environment (PE), Network Services, ARPA Services, Network File System, OSF Motif™ User Interface, and X Windows Version 11. M. 90-day on-site warranty.
98587K	Model 375 TurboSRX Solid Rendering 3-D Color Workstation, consisting of: A. Items A, D, and G through K of 98583J, above. B. 98730A Display Controller with 8 planes of frame buffer memory. C. 98726A 32-bit Display Controller (local graphics bus) Interface.
Model 375 3-D Workstation Options	
Opt. ABA	U.S. Version. (See page 8-1 for National Version options for other countries.)
Opt. 006	Adds 98242B 2-slot DIO backplane.
Opt. 010	Substitutes high-speed HP-IB interface with 1 meter cable for SCSI single-ended Disk Interface.
Opt. 012	Adds software support for Centronics interface, including Device Driver.
Opt. 016	In 98587J Model 375SRX only, adds one 8-plane frame buffer board for a total of 16 planes and increases power supply (excludes 98587J options 024 and 032).
Opt. 024	In 98587J Model 375SRX only, adds two 8-plane frame buffer boards for a total of 24 planes and increases power supply (excludes 98587J options 016 and 032).
Opt. 032	In 98587J Model 375SRX only, adds three 8-plane frame buffer boards for a total of 32 planes and increases power supply (excludes 98587J options 016 and 024).
Opt. 116	Adds 8 MB ECC RAM to bring total to 16 MB of ECC RAM (excludes options 124 and 132).
Opt. 124	Adds 16 MB ECC RAM to bring total to 24 MB of ECC RAM (excludes options 116 and 132).
Opt. 132	Adds 24 MB ECC RAM to bring total to 32 MB of ECC RAM (excludes options 116 and 124).
Opt. 404	Adds 162 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment (excludes options 405, 408, 409, and 410).
Opt. 405	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment (excludes options 404, 408, 409, and 410).
Opt. 408	Adds 162 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 67 MB 1/4-inch cartridge tape drive (excludes options 404, 405, 409, and 410).
Opt. 409	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 67 MB 1/4-inch cartridge tape drive (excludes option 404, 405, 408, and 410).
Opt. 410	Adds 323 MB SCSI Disk Drive with HP-UX installed, including preconfigured X-Windows environment and 133 MB 1/4-inch cartridge tape drive (excludes option 404, 405, 408, and 409).
Opt. 416	In 98587K Model 375 TurboSRX only, adds one 8-plane frame buffer board for a total of 16 planes and increases power supply (excludes options 424, 608, 616, and 624).
Opt. 424	In 98587K Model 375 TurboSRX only, adds two 8-plane frame buffer boards for a total of 24 planes and increases power supply (excludes options 416, 608, 616 and 624).

Product Summary, continued

Product/ Opt. No.	Description
Model 375 3-D Workstation Options, continued	
Opt. 608	In 98587K Model 375 TurboSRX only, adds three accelerators for 3-D solids and a 16-bit Z-buffer and increases power supply (excludes options 416, 424, 616, and 624).
Opt. 616	In 98587K Model 375 TurboSRX only, adds one 8-plane frame buffer board (16 planes total), three accelerators for 3-D solids, a 16-bit Z-buffer, and increases power supply (excludes options 416, 424, 608, and 624).
Opt. 624	In 98587K Model 375 TurboSRX only, adds two 8-plane frame buffer boards (24 planes total), three accelerators for 3-D solids, a 16-bit Z-buffer, and increases power supply (excludes options 416, 424, 608, and 616).
Opt. 716	Substitutes 98789A 16-inch color monitor for 98752A 19-inch color monitor.
Model 375 3-D Workstation Add-on Accessories	
98229A	4 MB add-on ECC RAM module.
98229B	8 MB add-on ECC RAM module (max. RAM in Model 375 is 32 MB, made up of base 8 MB and up to three 98229Bs).
98242B	2-slot DIO backplane.
98568A	Direct Connect 8-slot I/O Expander (first Expander requires 98568A Option 132).
98570A	Direct Connect I/O Expander with four DIO slots (two DIO slot pairs) and two DIO-II slots.
9888A	16-slot DIO Expander (uses one DIO I/O slot – maximum of two).
98722A	8-plane frame buffer board (max. of three additional 8-plane frame buffers per 98720A in 98587J, two additional 8-plane frame buffers per 98730A in 98587K).
98723A	Additional power supply for Display Controller with more than 8 planes of frame buffer memory or 98732A.
98732A	For 98587K Model 375 TurboSRX only, 3-D Graphics Accelerator with full 16-bit Z-buffer for 98730A.

* Maximum of two 98658A/98570A Direct Connect I/O Expanders per Model 375C + /CH/MH.

Operational Requirements

Description	Requirements
Operating System:	HP 98594A option 022 Media and Documentation for 98594L must be available for installation if one of options 404 through 410 is not purchased.
System Disk:	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2) or comparable support from a LAN-connected network server system. For disk choices, see options 404 through 410 and Section 14.
Software Installation/Backup Device:	Cartridge tape subsystem (Section 15) or comparable support from a LAN-connected network server.
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Model 825SRX Solid Rendering Color Superworkstation

Description

The HP 9000 Model 825SRX is a 3-D solid-rendering color Superworkstation with keyboard and a 19-inch 1280 by 1024 color monitor. Figures 8-11 and 8-12 illustrate the Model 825SRX functions and backplane usage and interconnections.

CPU: HP-PA Model 825, clocked at 12.5 MHz.

Cache: 16 KB.

Bus Types: 64-plus-8-ECC-bit memory bus, 32-bit CTB bus, and 16-bit CIO bus.

Included Interfaces: HP-IB Disk interface and LAN/9000 Series 800 Link interface.

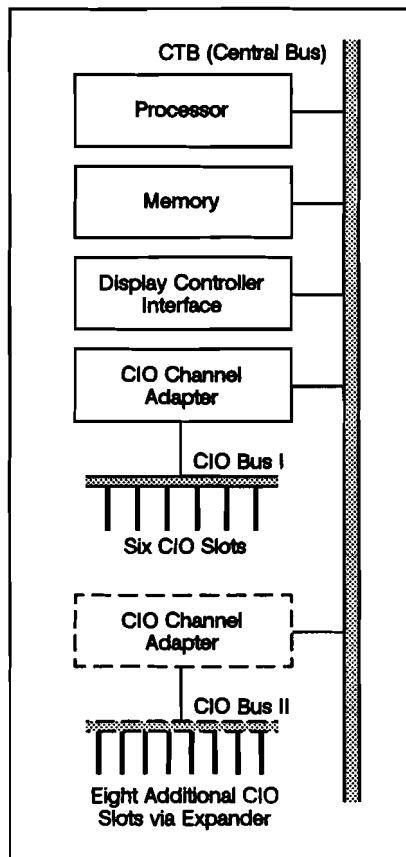


Figure 8-11. Model 825SRX Functions

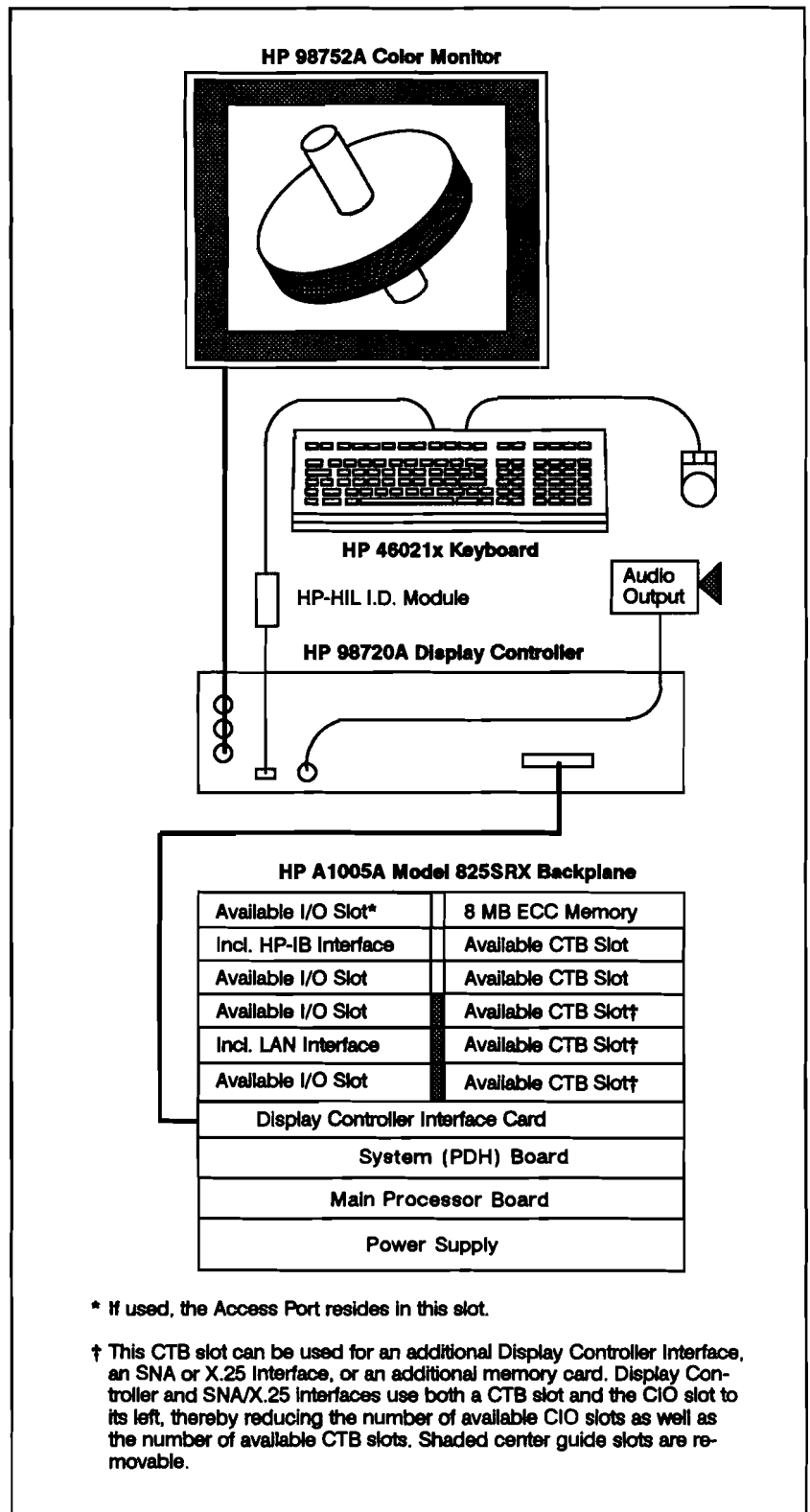


Figure 8-12. Model 825SRX Backplane Usage and Interconnections

RAM: 8 MB ECC, expandable to 96 MB (each CTB slot used for other uses reduces maximum memory capacity by 16 MB).

Floating Point Processor: 0.65 MFLOPs Floating Point Co-processor.

Direct Memory Access: Direct memory access via CIO bus is standard.

Operating System: HP-UX operating system with 16-user license is included.

Monitor: 19-inch 1280 by 1024 Color Monitor.

Product Summary

Product/ Opt. No.	Description
A1005A	Model 825SRX Superworkstation, consisting of: A. System Processor Unit (SPU), including: 32-bit HP-PA Model 825 CPU with floating point co-processor. - A1010A 8 MB ECC Memory Array Card. 27110B HP-IB interface to system disk(s) and cartridge tape subsystem. 91786B w/option 841 LAN/9000 Series 800 Link for Model 825/835. ThinMAU is deleted; must order A1005A option 003 or 004 to obtain MAU. - Enclosure with 4 available CIO slots for I/O cards, 5 available CTB slots for additional memory or other CTB cards, and power supply. B. 3-D Solid Rendering Display Subsystem, including: - A1017A Display Controller Interface. 98720A Display Controller with 4-plane memory overlay. 98721A 3-D Solid Graphics Accelerator. 98722A 8-plane Frame Buffer. 46021x Keyboard. 46060B HP-HIL 3-button Mouse. 46081A HP-HIL Buffer Box with Speaker. 46084A HP-HIL ID Module. 98752A 19-inch Color Monitor. 98290A RGB Cables. C. Software, including: 92452A HP-UX with 16-user License (requires media option AA0 or AA1). 50981A ARPA/BSD Model 825 Networking Software. 91787A NS/9000 Network Services Software. 92445A Starbase Graphics Library. 92524A X Windows System Version 11. D. Manuals. E. Localization, which must be specified by National Version option ABA in the U.S. (see page 8-1 for other countries). F. Installation. G. 90-day on-site warranty.
Options	
Opt. AA0	All software on 1/4-inch cartridge tape (excludes option AA1).
Opt. AA1	All software on 1/2-inch, 1600 cpi, 9-track magnetic tape (excludes option AA0).
Opt. ABA	U.S. Version. (See page 8-1 for National Version options for other countries.)
Opt. 002	Adds 8 MB ECC RAM card.
Opt. 003	Adds 28641A ThinMAU (excludes option 004).
Opt. 004	Adds 30241A ThickMAU (excludes option 003).
Opt. 016	Adds one 8-plane frame buffer card and power supply for 16 planes of graphics memory (excludes options 024 and 032).
Opt. 024	Adds two 8-plane frame buffer cards and power supply for 24 planes of graphics memory (excludes options 016 and 032).
Opt. 032	Adds three 8-plane frame buffer cards and power supply for 32 planes of graphics memory (excludes options 016 and 024).

Model 825SRX Solid Rendering Color Superworkstation, continued

Product Summary, continued

Product/ Opt. No.	Description
Options, continued	
Opt. 515	Replaces 8 MB ECC RAM card with 16 MB ECC RAM card (excludes option 531).
Opt. 516	Adds 16 MB ECC RAM card.
Opt. 531	Replaces 8 MB ECC RAM card with two 16 MB ECC RAM cards (excludes option 515).
Opt. 0E1	Adds Battery Backup System.
Add-on Accessories	
A1010A	8 MB ECC RAM card.
A1037A	16 MB ECC RAM card.
A1013A	CIO Expander with CIO Channel Adapter (adds 7 CIO slots and uses one CTB slot).
A1014A	Battery Backup System.
A1015A	Access Port.
98722A	8-plane frame buffer board (max. of three additional 8-plane frame buffers per 98720A).
98723A	Additional power supply for 98720A Display Controller with more than 8 planes of frame buffer memory.
Upgrade Products	
A1036A	Upgrades Model 825SRX to Model 835SRX without CIO Expander supportability (replaces Model 825 processor and PDH boards with those used in the Model 835). NOTE: Order A1038A if CIO Expander is desired.
A1038A	Upgrades Model 825SRX to Model 835SRX with CIO Expander (replaces Model 825 processor and PDH boards with those used in the Model 835SE, adds CIO Expander (deletable with option 1AB), adds 16 MB ECC RAM, and upgrades HP-UX to 64-user license).

Operational Requirements

Description	Requirements
System Disk:	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2) or comparable support from a LAN-connected network server system. For disk choices, see Section 14.
Software Installation/Backup Device:	Cartridge tape subsystem or magnetic tape unit (Section 15).
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Model 834 3-D Solid Rendering Color Superworkstations

Description

Two different, restricted-configuration Model 834 3-D solid-rendering color Superworkstations offer a choice of base SRX or 3 to 10 times faster TurboSRX graphics processing speed. Both the Model 834SRX and 834 TurboSRX are available in entry-level and fully-configured versions. Figures 8-13 and 8-14 illustrate the Model 834 3-D workstation functions and backplane usage and interconnections.

CPU: HP-PA Model 834, clocked at 15 MHz.

Cache: 16 KB.

Bus Types: 64-plus-8-ECC-bit memory bus, 32-bit CTB bus, and 16-bit CIO bus.

Included Interfaces: HP-IB Disk interface and LAN/9000 Series 800 Link interface.

RAM: 8 MB ECC, expandable to 48 MB in 16 MB increments after substituting 16 MB RAM for base 8 MB ECC RAM.

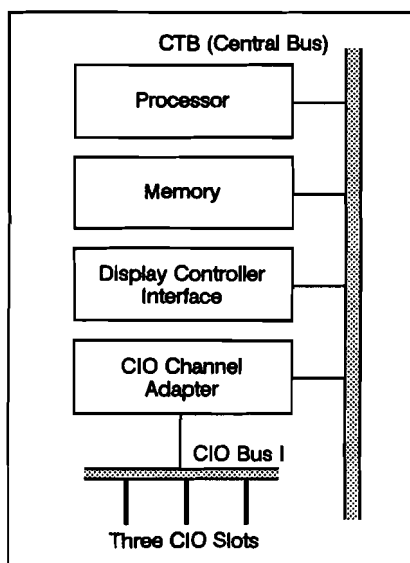


Figure 8-13. Model 834 3-D Workstation Functions

Floating Point Processor: 2.02 MFLOPs Floating Point Co-processor.

Direct Memory Access: Direct memory access via CIO bus is standard.

Monitor: 19-inch 1280 by 1024 Color Monitor.

Operating System: 2-User License-to-Use HP-UX operating system is included.

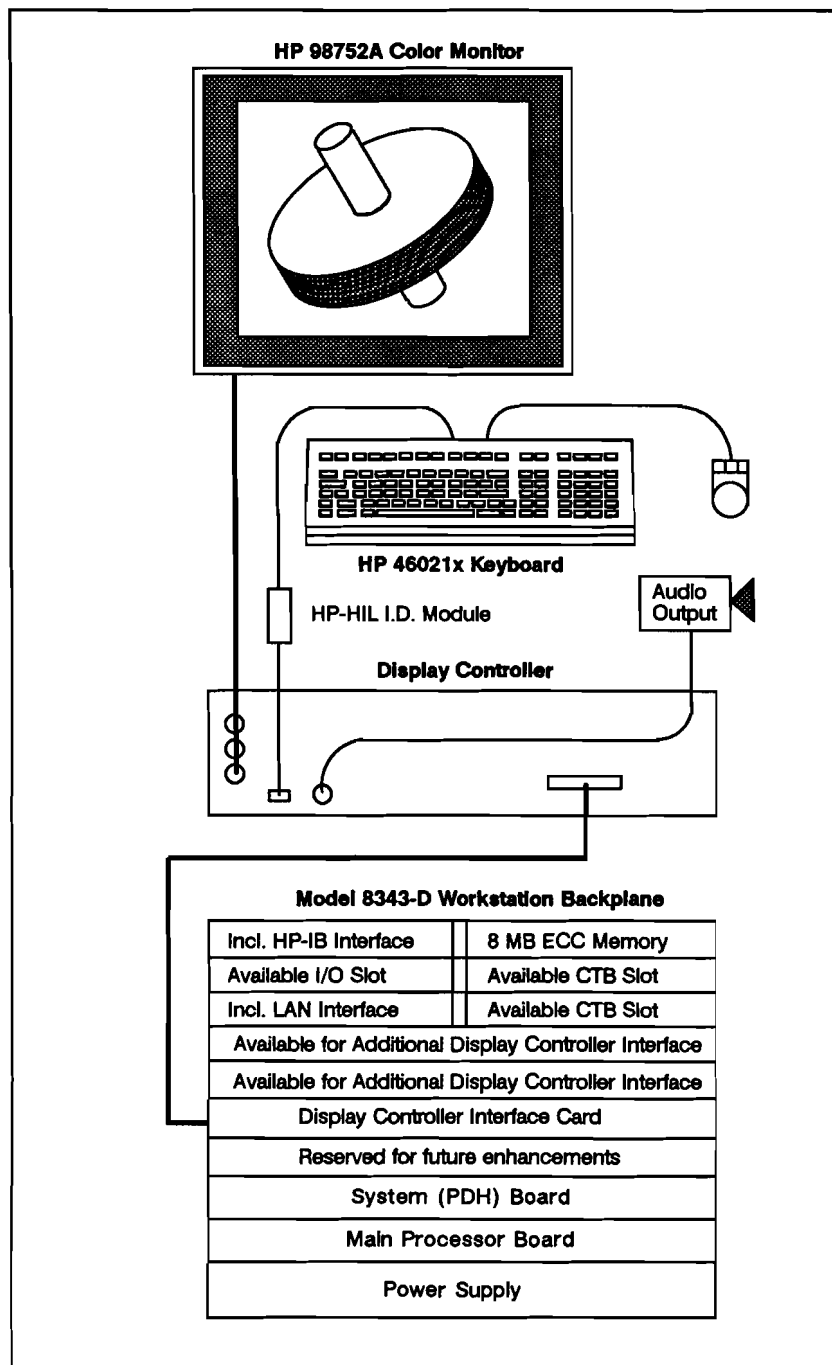


Figure 8-14. Model 834 3-D Workstation Backplane Usage and Interconnections

Model 834 3-D Solid Rendering Color Superworkstations, continued

Product Summary

Product/ Opt. No.	Description
A1089A	Model 834SRX Entry-Level Solid-Rendering Superworkstation, consisting of: A. System Processor Unit (SPU), including: 1. 32-bit HP-PA Model 834 CPU with floating point co-processor. 2. A1010A 8 MB ECC Memory Array Card. 3. 27110B HP-IB interface to system disk(s) and cartridge tape subsystem. 4. 91786B w/option 841 LAN/9000 Series 800 Link for Model 825/835. ThinMAU is deleted; must order A1089A option 003 or 004 to obtain MAU. 5. Enclosure with 1 available CIO slot for an I/O card, 2 available CTB slots for additional memory or other CTB cards, and power supply. B. 3-D Solid Rendering SRX Display Subsystem, including: 1. A1017A Display Controller Interface. 2. 98720A Display Controller with 4 overlay planes. 1 x Opt. 721 3-D Solid Graphics Accelerator. 1 x Opt. 722 8-plane Frame Buffer. 3. 98752A 19-inch Color Monitor. 4. 98290A RGB Cables. 5. 46021x Keyboard. 6. 46060B HP-HIL 3-button Mouse. 7. 46081A HP-HIL Buffer Box with Speaker. 8. 46084A HP-HIL ID Module. C. Software, including: 1. 92466L 2-User License-to-Use HP-UX Release 7.0. (requires 1/4-inch cartridge tape media and documentation - option 0B1). D. General Usage Documentation. E. Localization, which must be specified by National Version option ABA in the U.S. (see page 8-1 for other countries). F. 90-day on-site warranty. NOTE: CE installation is NOT included; it may be purchased separately.
A1090A	Model 834SRX Fully-Configured Solid-Rendering Superworkstation, consisting of: A. A1089A Entry-Level Model 834SRX, as listed above. B. Three additional 98722A 8-plane Frame Buffer cards. C. 98723A Additional Power Supply for the Display Controller. NOTE: CE installation is NOT included; it may be purchased separately.
A1091A	Model 834 TurboSRX Entry-Level Solid-Rendering Superworkstation, consisting of: A. Items A and C through F of A1089A Entry-Level Model 834SRX, as listed above. B. 3-D Solid Rendering Turbo SRX Display Subsystem, including: 1. A1017A Display Controller Interface. 2. 98730A Display Controller with 8-plane frame buffer and 4 overlay planes. 3. 98752A 19-inch Color Monitor. 4. 46021x Keyboard. 5. 46060B HP-HIL 3-button Mouse. 6. 46081A HP-HIL Buffer Box with Speaker. 7. 46084A HP-HIL ID Module. NOTE: CE installation is NOT included; it may be purchased separately.
A1092A	Model 834 TurboSRX Fully-Configured Solid-Rendering Superworkstation, consisting of: A. Items A and C through F of A1089A Entry-Level Model 834SRX, as listed above. B. Item B of A1091A Entry-Level Model 834 TurboSRX, as listed above. C. Two additional 98722A 8-plane Frame Buffer cards for the Display Controller. D. 98723A Additional Power Supply for the Display Controller. E. 98732A Three accelerators for 3-D solids rendering and a full 16-bit Z-buffer for the Display Controller. NOTE: CE installation is NOT included; it may be purchased separately.

Product Summary, continued

Product/ Opt. No.	Description
Model 834 3-D Workstation Options	
Opt. 0B1	1/4-inch cartridge tape media and documentation for HP-UX, X Window System, OSF Motif™ User Interface, Starbase Graphics Library, NS/9000 Network Services, and ARPA Network Services.
Opt. ABA	U.S. Version. (See page 8-1 for National Version options for other countries.)
Opt. 001	Adds asynchronous 6-channel multiplexer (maximum of one – uses the only available CIO slot).
Opt. 002	Adds 8 MB ECC RAM card.
Opt. 003	Adds 28641A ThinMAU (excludes option 004).
Opt. 004	Adds 30241A ThickMAU (excludes option 003).
Opt. 416	For A1091A Model 834 TurboSRX only: adds one 8-plane frame buffer card and power supply for 16 planes of graphics memory (excludes option 424).
Opt. 424	For A1091A Model 834 TurboSRX only: adds two 8-plane frame buffer cards and power supply for 24 planes of graphics memory (excludes option 416).
Opt. 515	Replaces 8 MB ECC RAM card with 16 MB ECC RAM card (excludes option 531).
Opt. 516	Adds 16 MB ECC RAM card.
Opt. 531	Replaces 8 MB ECC RAM card with two 16 MB ECC RAM cards (excludes option 515).
Opt. 716	Replaces 98754A 19-inch Color Monitor with 98789A 16-inch Color Monitor.
Opt. 834	Adds 7959B 304 MB Disk with the following preloaded software: a. 2-user HP-UX operating system. b. OSF Motif™ User Interface. c. Pre-configured X-Windows Environment. d. NS/ARPA Network Services. e. NS/9000 Network Services. f. Starbase Graphics Library. g. X Window System Version 11.

Model 834 3-D Workstation Add-on Accessories

A1010A	8 MB ECC RAM card.
A1037A	16 MB ECC RAM card.
98722A	8-plane frame buffer board for A1089A Model 834SRX or A1091A Model 834 TurboSRX (max. of three additional 8-plane frame buffers in A1089A Model 834SRX, two additional 8-plane frame buffers in Model A1091A Model 834 TurboSRX).
98723A	Additional power supply for Display Controller with more than 8 planes of frame buffer memory or 98732A. for A1089A Model 834SRX or A1091A Model 834 TurboSRX.
98372A	3-D Graphics Accelerator with full 16-bit Z-buffer for A1091A Model 834 TurboSRX.

Operational Requirements

Description	Requirements
System Disk:	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2) or comparable support from a LAN-connected network server system. For disk choices, see Section 14.
Software Installation/Backup Device:	Cartridge tape subsystem or magnetic tape unit (Section 15).
RAM:	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Model 835 3-D Solid Rendering Color Superworkstations

Description

Two different solid-rendering 3-D solid-rendering color Superworkstations based on the powerful Model 835 offer a choice of base SRX or 3 to 10 times faster TurboSRX graphics processing speed. Figures 8-15 and 8-16 illustrate the Model 835 3-D workstation functions and backplane usage and interconnections.

CPU: HP-PA Model 835, clocked at 15 MHz.

Cache: 16 KB.

Bus Types: 64-plus-8-ECC-bit memory bus, 32-bit CTB bus, and 16-bit CIO bus.

Included Interfaces: HP-IB Disk interface and LAN/9000 Series 800 Link interface.

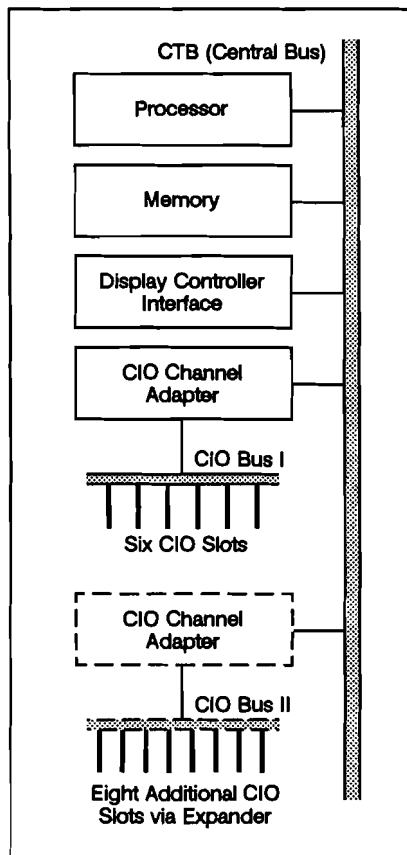


Figure 8-15. Model 835 3-D Workstation Functions

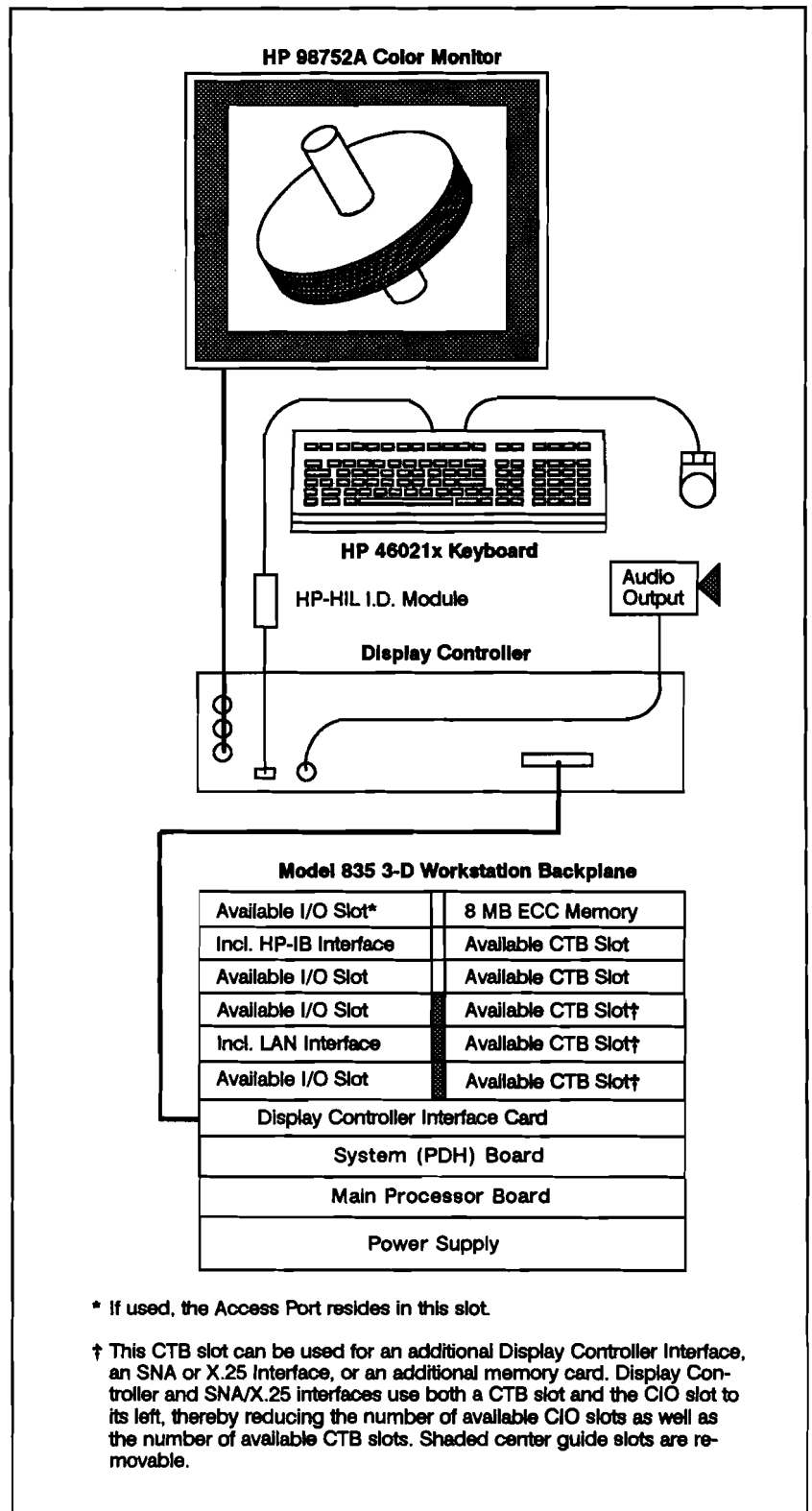


Figure 8-16. Model 835 3-D Workstation Backplane Usage and Interconnections

RAM: 8 MB ECC, expandable to 96 MB (each CTB slot used for other uses reduces maximum memory capacity by 16 MB).

Floating Point Processor: 2.02 MFLOPs Floating Point Co-processor.

Direct Memory Access: Direct memory access via CIO bus is standard.

Operating System: HP-UX operating system with 16-user license is included.

Monitor: 19-inch 1280 by 1024 Color Monitor.

Product Summary

Product/ Opt. No.	Description
A1045A	Model 835SRX Superworkstation, consisting of: A. System Processor Unit (SPU), including: 32-bit HP-PA Model 835 CPU with floating point co-processor. - A1010A 8 MB ECC Memory Array Card. 27110B HP-IB interface to system disk(s) and cartridge tape subsystem. 91786B w/option 841 LAN/9000 Series 800 Link for Model 825/835. ThinMAU is deleted; must order A1045A option 003 or 004 to obtain MAU. - Enclosure with 4 available CIO slots for I/O cards, 5 available CTB slots for additional memory or other CTB cards, and power supply. B. 3-D Solid Rendering Display Subsystem, including: - A1017A Display Controller Interface. 98720A Display Controller with 4-plane memory overlay. 98721A 3D Solid Graphics Accelerator. 98722A 8-plane Frame Buffer. 46021x Keyboard. 46060B HP-HIL 3-button Mouse. 46081A HP-HIL Buffer Box with Speaker. 46084A HP-HIL ID Module. 98752A 19-inch Color Monitor. 98290A RGB Cables. C. Software, including: 92452A HP-UX with 16-user License (requires media option AA0 or AA1). 50981A ARPA/BSD Model 825 Networking Software. 91787A NS/9000 Network Services Software. 92445A Starbase Graphics Library. 92524A X Windows System Version 11. D. Manuals. E. Localization, which must be specified by National Version option ABA in the U.S. (see page 8-1 for other countries). F. Installation. G. 90-day on-site warranty.
A1055A	Model 835 TurboSRX Solid Rendering Color Superworkstation, consisting of: A. Items A and C through G of A1045A Model 835SRX Superworkstation, above. B. 3-D Solid Rendering Display Subsystem, including: - A1017A Display Controller Interface. 98730A Display Controller with 4-plane memory overlay, 8-plane frame buffer memory, and RGB cables. 46021x Keyboard. 46060B HP-HIL 3-button Mouse. 46081A HP-HIL Buffer Box with Speaker. 46084A HP-HIL ID Module. 98752A 19-inch Color Monitor.
Model 835 3-D Workstation Options	
Opt. AA0	All software on 1/4-inch cartridge tape (excludes option AA1).
Opt. AA1	All software on 1/2-inch, 1600 cpl, 9-track magnetic tape (excludes option AA0).
Opt. ABA	U.S. Version. (See page 8-1 for National Version options for other countries.)
Opt. 002	Adds 8 MB ECC RAM card.
Opt. 003	Adds 28641A ThinMAU (excludes option 004).

Model 835 3-D Solid Rendering Color Superworkstations, continued

Product Summary, continued

Product/ Opt. No.	Description
Model 835 3-D Workstation Options, continued	
Opt. 004	Adds 30241A ThickMAU (excludes option 003).
Opt. 016	In A1045A Model 835SRX only, adds one 8-plane frame buffer card and power supply for 16 planes of graphics memory (excludes A1045A options 024 and 032).
Opt. 024	In A1045A Model 835SRX only, adds two 8-plane frame buffer cards and power supply for 24 planes of graphics memory (excludes A1045A options 016 and 032).
Opt. 032	In A1045A Model 835SRX only, adds three 8-plane frame buffer cards and power supply for 32 planes of graphics memory (excludes A1045A options 016 and 024).
Opt. 416*	In A1055A Model 835 TurboSRX only, adds one 8-plane frame buffer card and power supply for 16 planes of graphics memory.
Opt. 424*	In A1055A Model 835 TurboSRX only, adds two 8-plane frame buffer cards and power supply for 24 planes of graphics memory.
Opt. 515	Replaces 8 MB ECC RAM card with 16 MB ECC RAM card (excludes option 531).
Opt. 516	Adds 16 MB ECC RAM card.
Opt. 531	Replaces 8 MB ECC RAM card with two 16 MB ECC RAM cards (excludes option 515).
Opt. 608*	In A1055A Model 835 TurboSRX only, adds three accelerators for 3-D solids and full 16-bit Z-buffer and increases power supply.
Opt. 616*	In A1055A Model 835 TurboSRX only, adds one 8-plane frame buffer card and power supply for 16 planes of graphics memory and three accelerators for 3-D solids and full 16-bit Z-buffer.
Opt. 624*	In A1055A Model 835 TurboSRX only, adds two 8-plane frame buffer cards and power supply for 24 planes of graphics memory and three accelerators for 3-D solids and full 16-bit Z-buffer.
Opt. 716	Substitutes 98789A 16-inch color monitor for 98754A 19-inch color monitor.
Opt. 747	Substitutes A1047A Graphics Animation Interface for A1017A Display Controller Interface.
Opt. 0E1	Adds Battery Backup System.
Add-on Accessories	
A1010A	8 MB ECC RAM card.
A1037A	16 MB ECC RAM card.
A1013A	CIO Expander with CIO Channel Adapter (adds 7 CIO slots and uses one CTB slot).
A1014A	Battery Backup System.
A1015A	Access Port.
98722A	8-plane frame buffer board (max. of three additional 8-plane frame buffers per Model 835SRX or two additional 8-plane frame buffers per Model 835 TurboSRX).
98723A	Additional power supply for Display Controller with more than 8 planes of frame buffer memory or 98732A.
98732A	For A1055A Model 835 TurboSRX only, 3-D Graphics Accelerator with full 16-bit Z-buffer for 98730A).
Interfaces	See page 12-1.
Upgrade Products	
A1039A	Upgrades Model 835SRX/TurboSRX to Model 835SRX/TurboSRX with CIO Expander (replaces Model 835 PDH board with that used in the Model 835SE, adds CIO Expander (deletable with A1039A option 1AB), adds 16 MB ECC RAM, and upgrades HP-UX to 64-user license).

* Excludes all other options 416, 424, 608, 616, and 624.

Operational Requirements

Description	Requirements
System Disk:	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2) or comparable support from a LAN-connected network server system. For disk choices, see Section 14.
Software Installation/Backup Device:	Cartridge tape subsystem or magnetic tape unit (Section 15).
RAM:	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Model 835 TurboSRX Animation Color Superworkstation

Description

The HP 9000 Model 835 TurboSRX is also available as a 3-D Graphics Animation color Superworkstation with keyboard and a 19-inch 1280 by 1024 color monitor. Figures 8-17 and 8-18 illustrate the backplane usage and interconnections of the graphics animation version of the Model 835 TurboSRX Superworkstation.

CPU: HP-PA Model 835, clocked at 15 MHz.

Cache: 16 KB.

Bus Types: 64-plus-8-ECC-bit memory bus, 32-bit CTB bus, and 16-bit CIO bus.

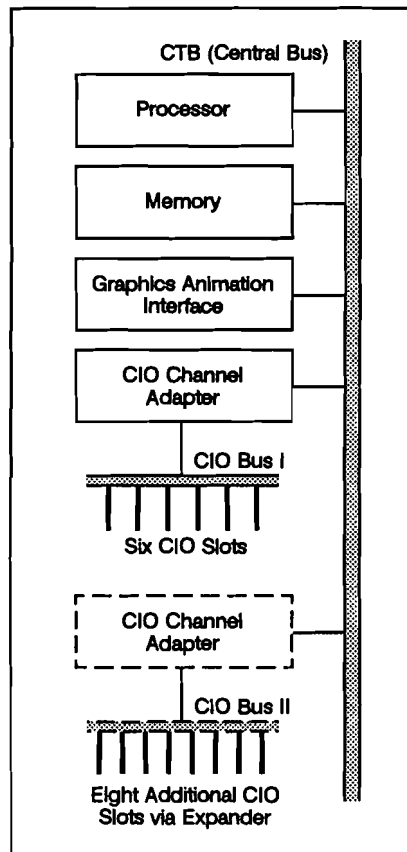


Figure 8-17. Model 835 TurboSRX Functions

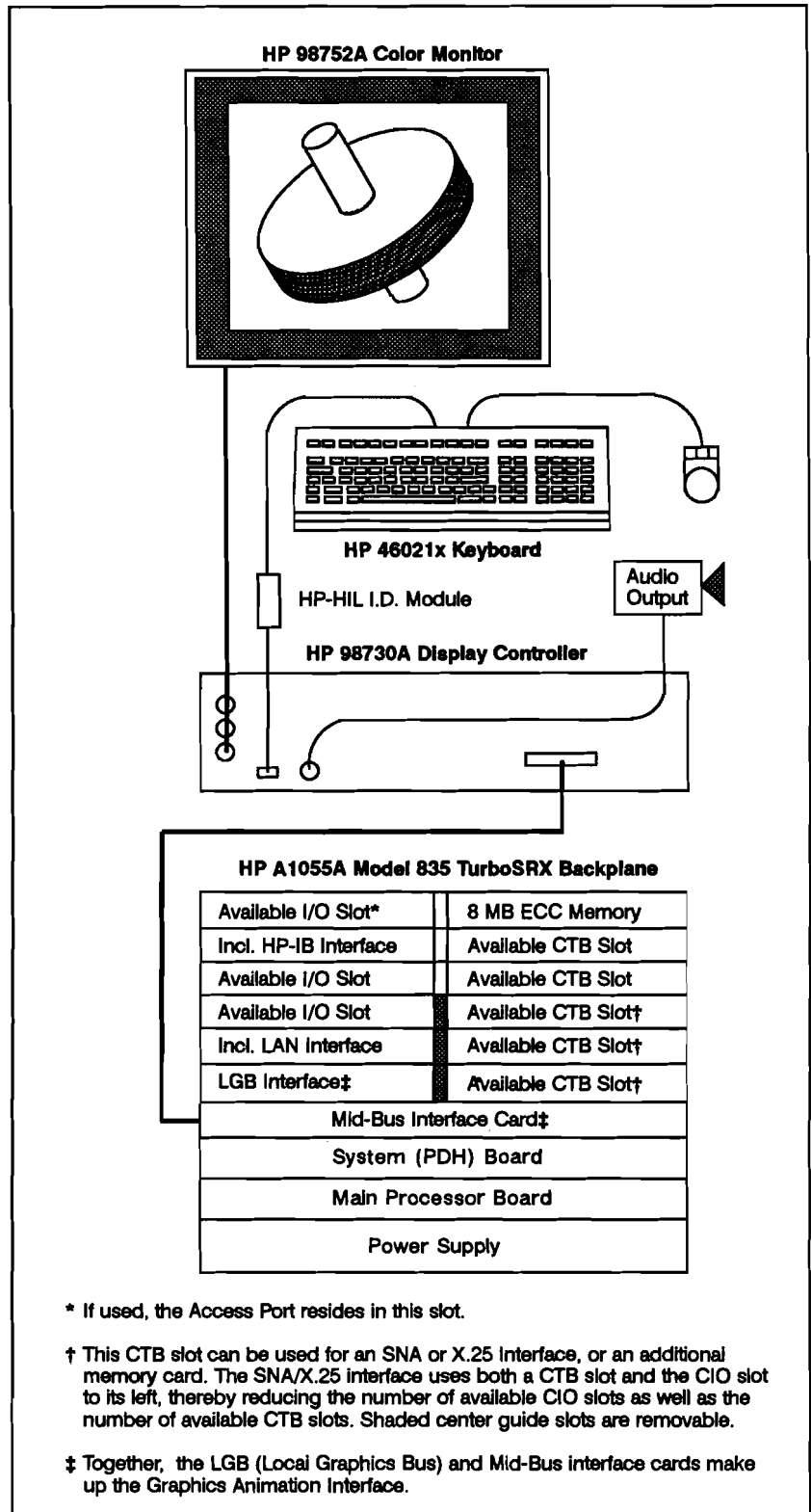


Figure 8-18. Model 835 TurboSRX Backplane Usage and Interconnections

Included Interfaces: HP-IB Disk interface and LAN/9000 Series 800 Link interface.

Floating Point Processor: 2.02 MFLOPs Floating Point Co-processor.

Operating System: HP-UX operating system with 16-user license is included.

RAM: 8 MB ECC, expandable to 96 MB (each CTB slot used for other uses reduces maximum memory capacity by 16 MB).

Direct Memory Access: Direct memory access via CIO bus is standard.

Monitor: 19-inch 1280 by 1024 Color Monitor.

Product Summary

Product/ Opt. No.	Description
A1055A + 747	Model 835 TurboSRX Graphics Animation Superworkstation, consisting of: A. System Processor Unit (SPU), including: 1. 32-bit HP-PA Model 835 CPU with floating point co-processor. 2. A1010A 8 MB ECC Memory Array Card. 3. 27110B HP-IB interface to system disk(s) and cartridge tape subsystem. 4. 91786B w/option 841 LAN/9000 Series 800 Link for Model 825/835. ThinMAU is deleted; must order A1055A option 003 or 004 to obtain MAU. 5. Enclosure with 4 available CIO slots for I/O cards, 5 available CTB slots for additional memory or other CTB cards, and power supply. B. 3-D Solid Rendering Display Subsystem, including: 1. A1047A Graphics Animation Interface. 2. 98730A Display Controller with 4-plane memory overlay, 8-plane frame buffer memory, and RGB cables. 3. 46021x Keyboard. 4. 46060B HP-HIL 3-button Mouse. 5. 46081A HP-HIL Buffer Box with Speaker. 6. 46084A HP-HIL ID Module. 7. 98752A 19-inch Color Monitor. C. Software, including: 1. 92452A HP-UX with 16-user License (requires media option AA0 or AA1). 2. 50981A ARPA/BSD Model 825 Networking Software. 3. 91787A NS/9000 Network Services Software. 4. 92445A Starbase Graphics Library. 5. 92524A X Windows System Version 11. D. Manuals. E. Localization, which must be specified by National Version option ABA in the U.S. (see page 8-1 for other countries). F. Installation. G. 90-day on-site warranty.

Options

Opt. AA0	All software on 1/4-inch cartridge tape (excludes option AA1).
Opt. AA1	All software on 1/2-inch, 1600 cpi, 9-track magnetic tape (excludes option AA0).
Opt. ABA	U.S. Version. (See page 8-1 for National Version options for other countries.)
Opt. 002	Adds 8 MB ECC RAM card.
Opt. 003	Adds 28641A ThinMAU (excludes option 004).
Opt. 004	Adds 30241A ThickMAU (excludes option 003).
Opt. 416*	Adds one 8-plane frame buffer card and power supply for 16 planes of graphics memory.
Opt. 424*	Adds two 8-plane frame buffer cards and power supply for 24 planes of graphics memory.
Opt. 515	Replaces 8 MB ECC RAM card with 16 MB ECC RAM card (excludes option 531).
Opt. 516	Adds 16 MB ECC RAM card.
Opt. 531	Replaces 8 MB ECC RAM card with two 16 MB ECC RAM cards (excludes option 515).
Opt. 608*	Adds three accelerators for 3-D solids and full 16-bit Z-buffer and increases power supply.

* Excludes all other options 416, 424, 608, 616, and 624.

Model 835 TurboSRX Animation Color Superworkstation, continued

Product Summary, continued

Product/ Opt. No.	Description
Options, continued	
Opt. 616*	Adds one 8-plane frame buffer card and power supply for 16 planes of graphics memory and three accelerators for 3-D solids and full 16-bit Z-buffer.
Opt. 624*	Adds two 8-plane frame buffer cards and power supply for 24 planes of graphics memory and three accelerators for 3-D solids and full 16-bit Z-buffer.
Opt. 716	Substitutes 98789A 16-inch color monitor for 98754A 19-inch color monitor.
Opt. 0E1	Adds Battery Backup System.
Add-on Accessories	
A1010A	8 MB ECC RAM card.
A1037A	16 MB ECC RAM card.
A1013A	CIO Expander with CIO Channel Adapter (adds 7 CIO slots and uses one CTB slot).
A1014A	Battery Backup System.
A1015A	Access Port.
A1048A	Add-on Graphics Animation Interface to drive second 98730A TurboSRX display controller.
98722A	8-plane frame buffer board (max. of two additional 8-plane frame buffers per 98730A).
98723A	Additional power supply for 98730A Display Controller with more than 8 planes of frame buffer memory or 98732A.
98372A	3-D Graphics Accelerator with full 16-bit Z-buffer.
Interfaces	See page 12-1.
Upgrade Products	
A1039A	Upgrades Model 835 TurboSRX to Model 835 TurboSRX with CIO Expander (replaces Model 835 PDH board with that used in the Model 835SE, adds CIO Expander (deletable with A1039A option 1AB), adds 16 MB ECC RAM, and upgrades HP-UX to 64-user license).

* Excludes all other options 416, 424, 608, 616, and 624.

Operational Requirements

Description	Requirements
System Disk:	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2) or comparable support from a LAN-connected network server system. For disk choices, see Section 14.
Software Installation/Backup Device:	Cartridge tape subsystem or magnetic tape unit (Section 15).
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Instrument Controllers

Introduction

This section contains configuration information on Instrument Controller bundles based on Series 300 platforms. The Instrument Controller bundles include keyboard, color or monochrome monitor, and a BASIC/WS system or HP-UX operating system with BASIC/UX.

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National Versions

Introduction

For convenient use in various nations throughout the world, HP 9000 Series 300 Instrument Controllers are offered in specific national versions, either including keyboard or with keyboard deleted, as listed separately below.

National Versions with Keyboard

Each national version with keyboard provides appropriate keyboard, monitor, SPU, power cord and user's manuals. They are specified as **"must order"** options to the respective product number, as follows:

Option	National Version	Option	National Version
ABA	U.S. English	ABQ	Swiss French
ABC	French Canadian	ABS	Swedish
ABD	German	ABU	U.K. English
ABE	European Spanish	ABW	Belgian Dutch
ABF	European French	ABX	Finnish
ABH	Dutch	ABY	Danish
ABJ	Katakana	ABZ	Italian
ABK	Universal English ASCII	AB0	Taiwan (Chinese)
ABM	Latin American Spanish	AB1	Korean
ABN	Norwegian	ACA	Kanji
ABP	Swiss German		

National Versions with Keyboard Deleted

Instrument Controllers based on the BASIC/WS operating system offer options that delete the standard 46021x keyboard, for applications in which it is desired to instead use a 98203x keyboard or no keyboard is needed. National versions of instrument controllers without the standard keyboard are specified as **"must order"** alternate options to ABx, ACx keyboard options listed above, to ensure that correct power settings are made and correct manuals are supplied for the destination country. See the lists below.

Option	National Version	Option	National Version
05A	U.S. English	05F	European French
05C	French Canadian	05K	Universal English ASCII
05D	German	05M	Latin American Spanish
05E	European Spanish	05Z	Italian

Model 332CMA Instrument Controller, continued

Product Summary

Product/ Opt. No.	Description
98581C	Model 332CMA Color Instrument Controller, consisting of: A. 98572A Option 003 System Processor Unit, as described on pages 6-2 through 6-4 (monochrome graphics deleted). B. 98543A Medium Resolution Color Video Board with RGB cable. C. 35741A 12-inch Medium Resolution (512 by 400) Color Monitor. D. 46021x Keyboard. E. Localization, which must be specified by National Version option ABA in U.S. (see page 9-2 for other countries) unless keyboard is deleted with a keyboard delete option. F. 98616A Option 044 BASIC Language System software on 3.5-inch flexible disks. G. Manuals. H. 90-day on-site warranty.
Options	
Opt. ABA	U.S. Version with keyboard (excludes option 05A). (See page 9-2 for National Version options with keyboard for other countries.)
Opt. 05A	English controller with 46021x keyboard deleted (excludes option ABA). (See page 9-2 for National Version options without keyboard for other countries.)
Opt. 008	Adds 98546A Display Compatibility Interface with separate alpha and graphics planes for use with applications software that requires compatibility with Series 200 displays. (Requires adjacent DIO Accessory and DIO I/O slots.)
Opt. 042	Provides BASIC Software on 5.25-inch flexible disks instead of 3.5-inch flexible disks.
Opt. 100	Deletes BASIC reference manuals.
Opt. 102	Provides 2 MB RAM (adds second 1 MB RAM card).
Opt. 104	Substitutes 4 MB RAM for 1 MB RAM.
Opt. 613	Deletes BASIC Language System (media, license, and manuals).
Opt. 618	Adds BASIC Compiler media and manuals.
Opt. 882	Adds MC68882 floating point coprocessor (required to support HP-UX operating system).
Add-on Accessories	
98269A	1 MB Parity RAM daughterboard for Model 332CMA without option 102 (excludes 98269B).
98269B	4 MB Parity RAM daughterboard for Model 332CMA without option 102 (excludes 98269B).
98284A	MC68882 floating point coprocessor.
98568A	Direct Connect 8-slot I/O Expander (maximum of one per Model 332 SPU).
9888A	16-slot DIO Bus Expander (uses one DIO I/O slot - maximum of two).
46060B	HP-HIL 3-button Mouse.
46081A	HP-HIL Buffer box with speaker.
46084A	HP-HIL ID Module.
98203x	HP-HIL Keyboard with rotary knob, for BASIC/WS or Series 200/300 Pascal systems (for National Versions, see page 13-9).

Operational Requirements

Description	Requirements
System Disk and Software installation/Backup Device:	3.5-inch or 5.25-inch flexible disk. Hard disk(s) if needed to provide capacity to support the application, as determined using the suggested configuration procedure (Section 2). For disk choices, see Section 14.
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Model 332CMAX Instrument Controller

Description

The HP 9000 Model 332CMAX is an HP BASIC/UX instrument controller with keyboard and 16-inch color monitor that is based on the Model 332 System Processor Unit. Figures 9-3 and 9-4 illustrate the Model 332CMAX functions and backplane usage and interconnections.

SPU: HP 98572A Model 332, as described on page 6-2.

RAM: 4 MB parity, expandable to 8 MB with a 4 MB add-on RAM card.

Operating System: HP-UX and BASIC/UX License to Use, media, and manuals are included.

Expandability: See Figure 6-2, page 6-2.

Monitor: 16-inch 1024 by 768 Color Monitor.

Available DIO I/O Slots: 2 in SPU; 98568A Direct-Connect Expander can be used to add 4; two 9888A DIO Bus Expanders can be used to add up to 14.

Available DIO Accessory Slots: 2 in SPU; 98568A Direct-Connect Expander can be used to add 4; two 9888A DIO Bus Expanders can be used to add up to 14.

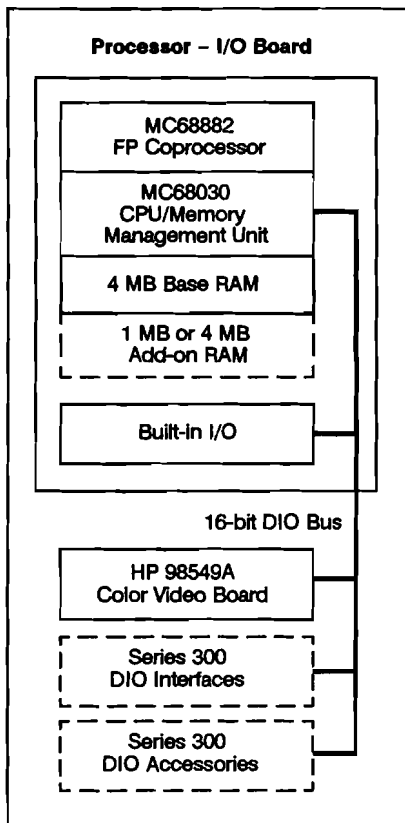


Figure 9-3. Model 332CMAX Functions

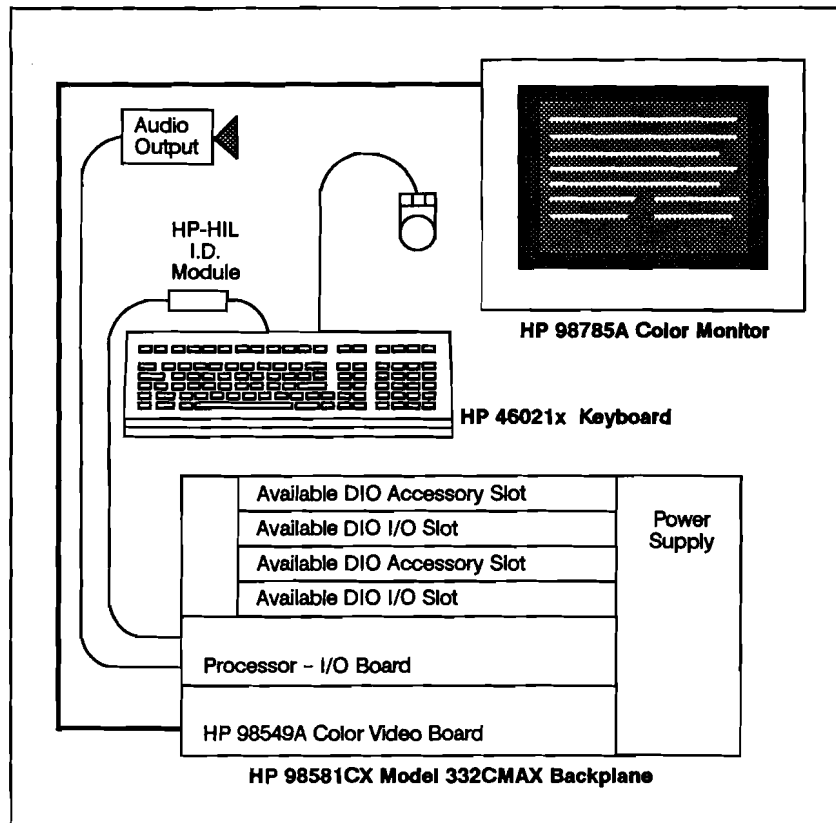


Figure 9-4. Model 332CMAX Backplane Usage and Interconnections

Model 332CMAX Instrument Controller, continued

Product Summary

Product/ Opt. No.	Description
98581CX	Model 332CMAX Color Instrument Controller, consisting of: A. 98572A System Processor Unit, as described on pages 6-2 through 6-4, with: - Opt. 003 Deletes monochrome graphics. - Opt. 104 Substitutes 4 MB RAM for 1 MB. - Opt. 882 Adds MC68882 floating point coprocessor. B. 98549A High Resolution Color Video Board with RGB cable. C. 98785A 16-inch High Resolution (1024 by 768) Color Monitor. D. 46021x Keyboard. E. Localization, which must be specified by National Version option ABA in U.S. (see page 9-2 for other countries). F. 46060B HP-HIL 3-button Mouse. G. 46081A HP-HIL Buffer box with speaker. H. 46084A HP-HIL ID Module. I. Installation manuals. J. 98594L HP-UX License to use Application Execution Environment (AXE), Programming Environment (PE), Network Services, ARPA Services, Network File System, OSF Motif™ User Interface, and X Windows Version 11. K. 98594A + 022 Media (1/4-inch cartridge tape) and documentation for 98594L software. L. 98796L HP BASIC/UX License to use. M. 98796A + 022 HP BASIC/UX software on 1/4-inch cartridge tape and documentation. N. 90-day on-site warranty.

Options

Opt. ABA	U.S. Version. (See page 9-2 for National Version options for other countries.)
Opt. 100	Deletes media and documentation.
Opt. 108	Adds 4 MB RAM for a total of 8 MB.
Opt. 402	Adds 7958B 152 MB Disk Drive with software installed and high speed HP-IB interface..
Opt. 403	Adds 7959B 304 MB Disk Drive with software installed and high speed HP-IB interface.

Add-on Accessories

98269B	4 MB Parity RAM daughterboard.
98568A	Direct Connect 8-slot I/O Expander (maximum of one per Model 332 SPU).
9888A	16-slot DIO Bus Expander (uses one DIO I/O slot - maximum of two).
98203x	HP-HIL Keyboard with rotary knob, for BASIC/WS or Series 200/300 Pascal systems (for National Versions, see page 13-9).

Operational Requirements

Description	Requirements
System Disk:	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2) or comparable support from a LAN-connected network server system. Order option 402 or 403 or select other disk in Section 14.
Software Installation/Backup Device:	Cartridge tape subsystem (Section 15) or comparable support from a LAN-connected network server.
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Model 332MMA Instrument Controller

Description

The HP 9000 Model 332MMA is an instrument controller with keyboard and 12-inch monochrome monitor that is based on the Model 332 System Processor Unit. Figures 9-5 and 9-6 illustrate the Model 332MMA functions and backplane usage and interconnections.

SPU: HP 98572A Model 332, as described on page 6-2.

RAM: 1 MB parity, expandable to 8 MB with substitution of 4 MB for 1 MB and a 4 MB add-on RAM card.

Operating System: BASIC/WS.

Expandability: See Figure 6-2, page 6-2.

Monitor: 12-inch 512 by 400 Monochrome Monitor connected via built-in video interface on the processor - I/O board.

Available DIO I/O Slots: 2 in SPU; 98568A Direct-Connect Expander can be used to add 4; two 9888A DIO Bus Expanders can be used to add up to 14.

Available DIO Accessory Slots: 2 in SPU; 98568A Direct-Connect Expander can be used to add 4; two 9888A DIO Bus Expanders can be used to add up to 14.

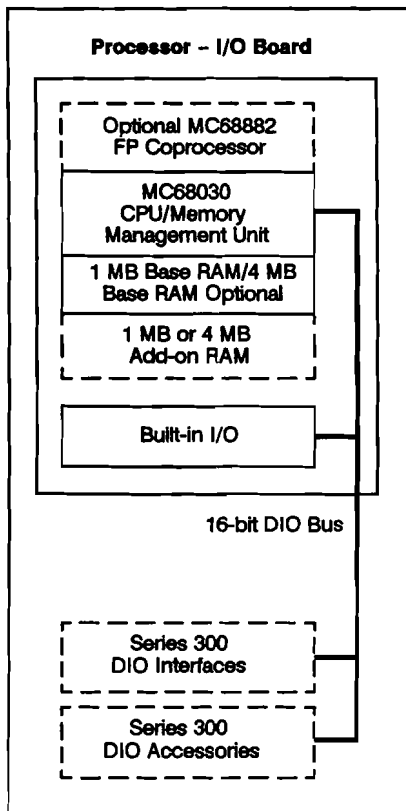


Figure 9-5. Model 332MMA Functions

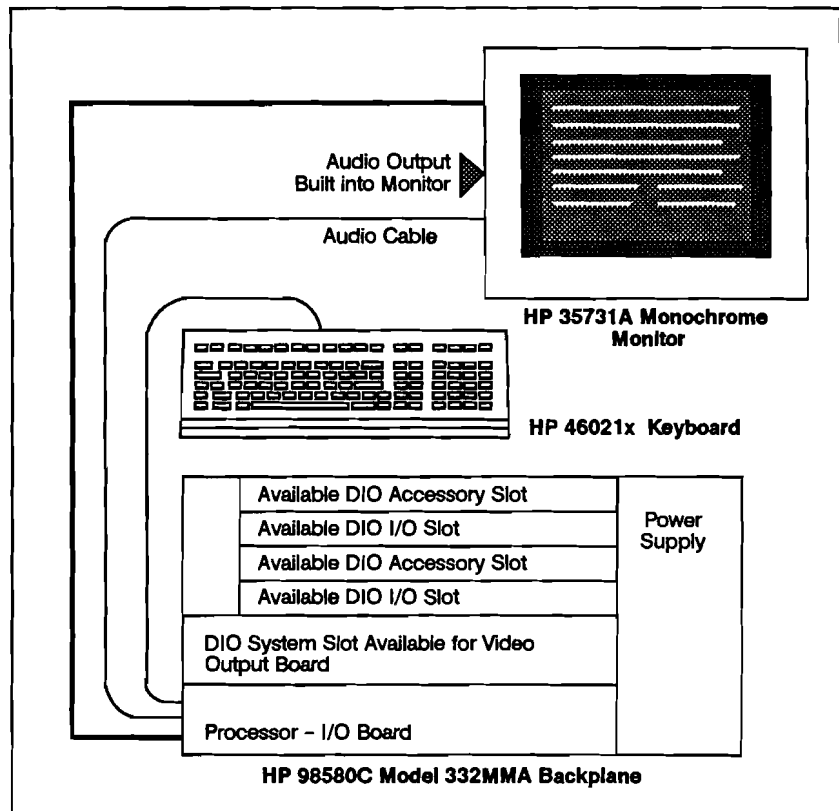


Figure 9-6. Model 332MMA Backplane Usage and Interconnections

Model 332MMA Instrument Controller, continued

Product Summary

Product/ Opt. No.	Description
98580C	Model 332MMA Monochrome Instrument Controller, consisting of: A. 98572A System Processor Unit, as described on pages 6-2 through 6-4. B. 35731A 12-inch Medium Resolution (512 by 400) Monochrome Monitor. C. 46021x Keyboard. D. Localization, which must be specified by National Version option ABA in U.S. (see page 9-2 for other countries) unless keyboard is deleted with a keyboard delete option. E. 98616A Option 044 BASIC Language System software on 3.5-inch flexible disks. F. Manuals. G. 90-day on-site warranty.

Options

Opt. ABA	U.S. Version with keyboard (excludes option 05A). (See page 9-2 for National Version options with keyboard for other countries.)
Opt. 05A	English controller with 46021x keyboard deleted (excludes option ABA). (See page 9-2 for National Version options without keyboard for other countries).
Opt. 008	Adds 98546A Display Compatibility Interface with separate alpha and graphics planes for use with applications software that requires compatibility with Series 200 displays. (Requires adjacent DIO Accessory and DIO I/O slots.)
Opt. 042	Provides BASIC Software on 5.25-inch flexible disks instead of 3.5-inch flexible disks.
Opt. 100	Deletes BASIC reference manuals.
Opt. 102	Provides 2 MB RAM (adds second 1 MB RAM card).
Opt. 104	Substitutes 4 MB RAM for 1 MB RAM.
Opt. 613	Deletes BASIC Language System (media, license, and manuals).
Opt. 618	Adds BASIC Compiler media and manuals.
Opt. 882	Adds MC68882 floating point coprocessor (required to support HP-UX operating system).

Add-on Accessories

98269A	1 MB Parity RAM daughterboard for Model 332MMA without option 102 (excludes 98269B).
98269B	4 MB Parity RAM daughterboard for Model 332MMA without option 102 (excludes 98269B).
98284A	MC68882 floating point coprocessor.
98568A	Direct Connect 8-slot I/O Expander (maximum of one per Model 332 SPU).
9888A	16-slot DIO Bus Expander (uses one DIO I/O slot - maximum of two).
46060B	HP-HIL 3-button Mouse.
46081A	HP-HIL Buffer box with speaker.
46084A	HP-HIL ID Module.
98203x	HP-HIL Keyboard with rotary knob, for BASIC/WS or Series 200/300 Pascal systems (for National Versions, see page 13-9).

Operational Requirements

Description	Requirements
System Disk and Software installation/Backup Device:	3.5-inch or 5.25-inch flexible disk. Hard disk(s) if needed to provide capacity to support the application, as determined using the suggested configuration procedure (Section 2). For disk choices, see Section 14.
RAM:	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Model 332MMAX Instrument Controller

Description

The HP 9000 Model 332MMAX is an HP BASIC/UX instrument controller with keyboard and 17-inch monochrome monitor that is based on the Model 332 System Processor Unit. Figures 9-7 and 9-8 illustrate the Model 332MMAX functions and backplane usage and interconnections.

SPU: HP 98572A Model 332, as described on page 6-2.

RAM: 4 MB parity, expandable to 8 MB with a 4 MB add-on RAM card.

Operating System: HP-UX and BASIC/UX License to Use, media, and manuals are included.

Expandability: See Figure 6-2, page 6-2.

Monitor: 17-inch 1024 by 768 Monochrome Monitor connected via built-in video interface on the processor - I/O board.

Available DIO I/O Slots: 2 in SPU; 98568A Direct-Connect Expander can be used to add 4; two 9888A DIO Bus Expanders can be used to add up to 14.

Available DIO Accessory Slots: 2 in SPU; 98568A Direct-Connect Expander can be used to add 4; two 9888A DIO Bus Expanders can be used to add up to 14.

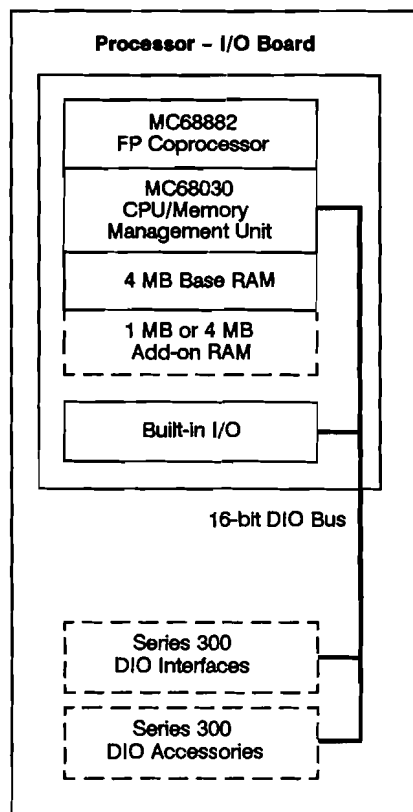


Figure 9-7. Model 332MMAX Functions

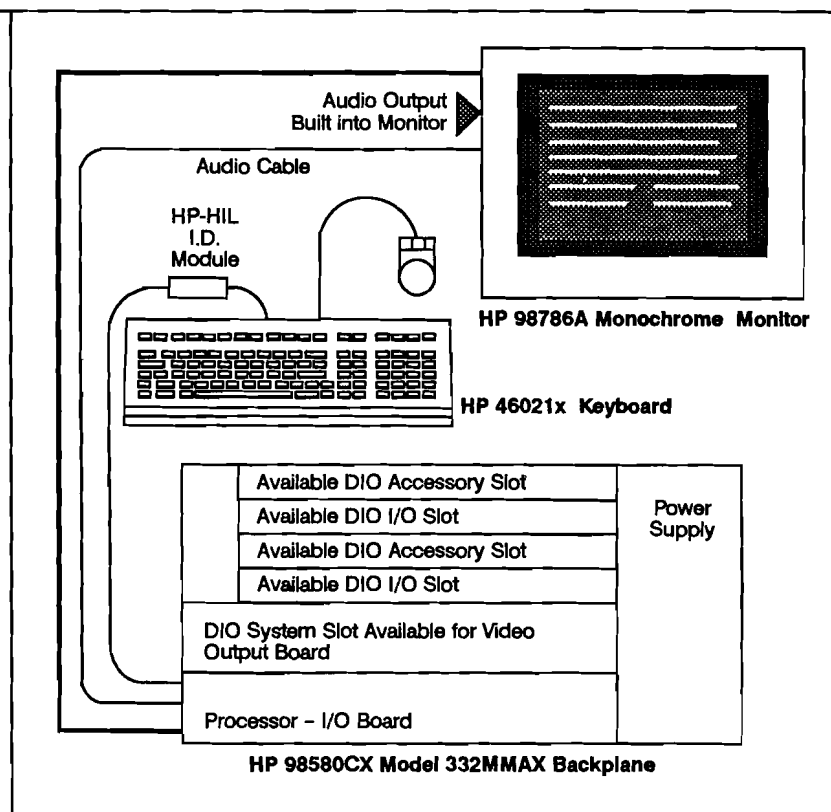


Figure 9-8. Model 332MMAX Backplane Usage and Interconnections

Model 332MMAX Instrument Controller, continued

Product Summary

Product/ Opt. No.	Description
98580CX	Model 332MMAX Monochrome Instrument Controller, consisting of: A. 98572A System Processor Unit, as described on pages 6-2 through 6-4, with: - Opt. 104 Substitutes 4 MB RAM for 1 MB. - Opt. 544 Substitutes high resolution (1024 by 768) monochrome graphics for medium resolution monochrome graphics. - Opt. 882 Adds MC68882 floating point coprocessor. B. 98786A 17-inch High Resolution (1024 by 768) Monochrome Monitor. C. 46021x Keyboard. D. Localization, which must be specified by National Version option ABA in U.S. (see page 9-2 for other countries). E. 46060B HP-HIL 3-button Mouse. F. 46084A HP-HIL ID Module. G. Installation manuals. H. 98594L HP-UX License to use Application Execution Environment (AXE), Programming Environment (PE), Network Services, ARPA Services, Network File System, OSF Motif™ User Interface, and X Windows Version 11). I. 98594A + 022 Media (1/4-inch cartridge tape) and documentation for 98594L software. J. 98796L HP BASIC/UX License to use. K. 98796A + 022 HP BASIC/UX software on 1/4-inch cartridge tape and documentation. L. 90-day on-site warranty.

Options

Opt. ABA	U.S. Version. (See page 9-2 for National Version options for other countries.)
Opt. 100	Deletes media and documentation.
Opt. 108	Adds 4 MB RAM for a total of 8 MB.
Opt. 402	Adds 7958B 152 MB Disk Drive with software installed and high speed HP-IB interface.
Opt. 403	Adds 7959B 304 MB Disk Drive with software installed and high speed HP-IB interface.

Add-on Accessories

98269B	4 MB Parity RAM daughterboard.
98568A	Direct Connect 8-slot I/O Expander (maximum of one per Model 332 SPU).
9888A	16-slot DIO Bus Expander (uses one DIO I/O slot - maximum of two).
46081A	HP-HIL Buffer box with speaker.
98203x	HP-HIL Keyboard with rotary knob, for BASIC/WS or Series 200/300 Pascal systems (for National Versions, see page 13-9).

Operational Requirements

Description	Requirements
System Disk:	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2) or comparable support from a LAN-connected network server system. Order option 402 or 403 or select other disk in Section 14.
Software Installation/Backup Device:	Cartridge tape subsystem (Section 15) or comparable support from a LAN-connected network server.
RAM:	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Model R/332 Instrument Controller



Description

The HP 9000 Model R/332 is an instrument controller packaged with keyboard and 9-inch monochrome touchscreen display, Model 332 Processor - I/O board, 8 slot DIO backplane, built-in flexible disk, and built-in hard disk in some versions. Figures 9-9 and 9-10 illustrate the Model R/332 functions and backplane layout and interconnections.

CPU: MC68030, clocked at 16.7 MHz.

Bus Types: 32-bit memory bus and 16-bit Direct I/O (DIO) bus.

RAM: 1 MB parity is standard, 2, 4, 5, or 8 MB is optional.

Built-in Interfaces: HP-HIL, RS-232C, Std HP-IB, 512 by 400 monochrome video to built-in display, and audio output to built-in beeper.

LAN Interface: HP 98171A (uses a DIO I/O slot).

Floating Point Coprocessor: MC68882 is option 882.

Available DIO I/O Slots: 4 in SPU; two 9888A DIO Bus Expanders can be used to add up to 14.

Available DIO Accessory Slots: 4 in SPU; two 9888A DIO Bus Expanders can be used to add up to 14.

Expandability: Up to two 9888A DIO Bus Expanders can be connected to the Model R/332.

Direct Memory Access: Two-channel Direct Memory Access is built-in.

Operating System: BASIC/WS, Version 5.13, is included; R/332 is also supported by Pascal/WS Version 3.22 and HP-UX Version 6.5.

Display: 9-inch 512 by 400 monochrome display with Touchscreen.

Flexible Disk: 3.5-inch 1.4 MB flexible disk drive is standard on all versions.

Hard Disk: 20 MB hard disk is standard on A1305A; 40 MB hard disk is standard on A1307A.

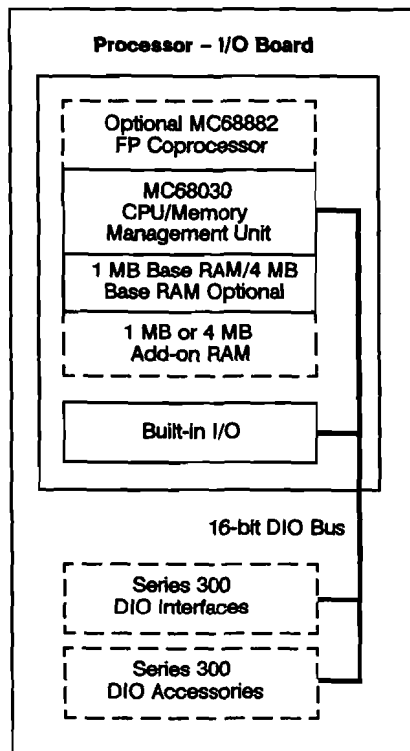


Figure 9-9. Model R/332 Functions

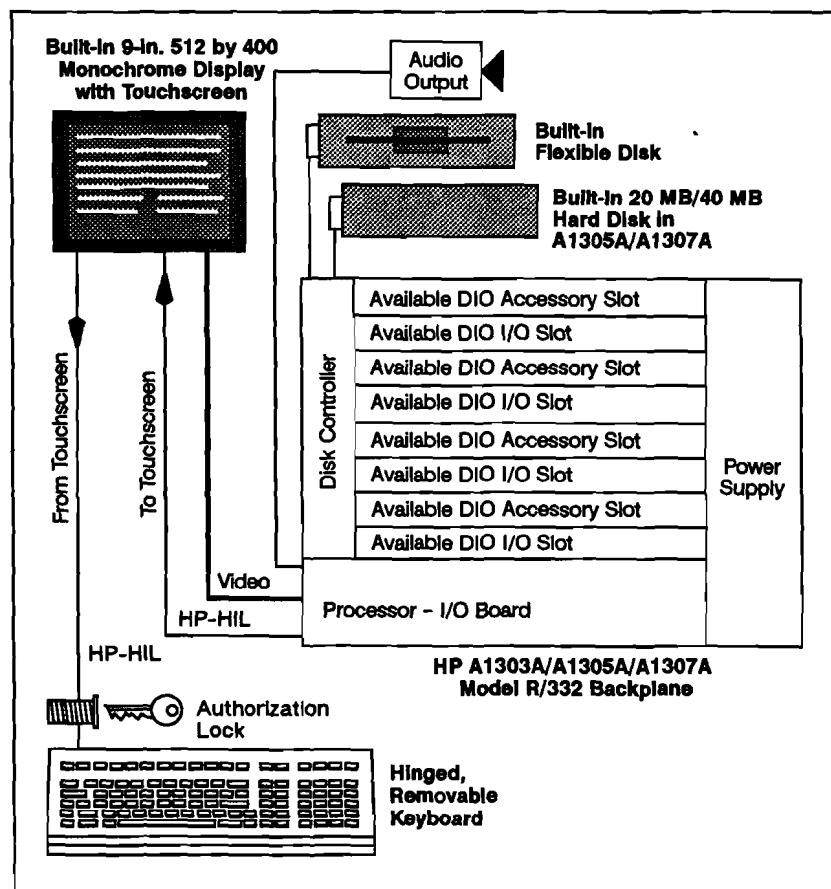


Figure 9-10. Model R/332 Backplane Layout and Interconnections,

Model R/332 Instrument Controller, continued

Product Summary

Product/ Opt. No.	Description
A1303A	Model R/332 Instrument Controller, consisting of: A. Processor - I/O board with: 32-bit MC68030 CPU. 1 MB of parity-checking RAM. 32-bit memory bus and 16-bit DIO bus. - IEEE-488 HP-IB interface. - RS-232C serial interface (1 port). - HP-HIL interface. 512 x 400 monochrome video interface. - Audio output. B. Enclosure with built-in 9-inch 512 by 400 monochrome display with touchscreen, 4 available DIO accessory slots, 4 available DIO I/O slots, and power supply. C. Hinged, removable keyboard. D. Localization, which must be specified by National Version option (see options, below). E. 98616A Option 045 BASIC Language System software on double-sided 3.5-inch flexible disks. F. Built-in 3.5-inch double-sided 1.4 MB flexible disk drive. G. Manuals. H. 1 year return-to-HP warranty. To convert to 90-day on-site warranty, order option W03.
A1305A	Model R/332 Instrument Controller, consisting of: A. A1303A Model R/332 Instrument Controller, as defined above. B. 20 MB built-in hard disk with BASIC/WS preinstalled.
A1307A	Model R/332 Instrument Controller, consisting of: A. A1303A Model R/332 Instrument Controller, as defined above. B. 40 MB built-in hard disk with BASIC/WS preinstalled.
Options	
Opt. ABA	Provides U.S. keyboard, manuals in English, and 110V U.S. Power (excludes options ABD, ABF, ABJ, ABK, and ABU).
Opt. ABD	Provides German keyboard and manuals in German (excludes options ABA, ABF, ABJ, and ABU).
Opt. ABF	Provides French keyboard and manuals in French (excludes options ABA, ABD, ABJ, and ABU).
Opt. ABJ	Provides Katakana keyboard and manuals in Japanese (excludes options ABA, ABD, ABF, and ABU).
Opt. ABK	Provides U.S. keyboard, manuals in English, and 220V Power (excludes options ABA, ABD, ABF, ABJ, and ABU).
Opt. ABU	Provides United Kingdom keyboard and manuals in English (excludes options ABA, ABD, ABF, and ABJ).
Opt. 001	Deletes touchscreen.
Opt. 100	Deletes BASIC reference manuals.
Opt. 102	Provides 2 MB RAM (adds second 1 MB RAM card; excludes options 104, 105, and 108).
Opt. 104	Provides 4 MB RAM (substitutes 4 MB RAM card for 1 MB RAM card; excludes options 102, 105, and 108).
Opt. 105	Provides 5 MB RAM (adds 4 MB RAM card; excludes options 102, 104, and 108).
Opt. 108	Provides 8 MB RAM (substitutes two 4 MB RAM cards for 1 MB RAM card; excludes options 102, 104, and 105).
Opt. 613	Deletes BASIC Language System and BASIC reference manuals.
Opt. 882	Adds MC68882 floating point coprocessor.
Opt. 908	Adds A1309A Rack Mount Flange Kit. Also requires 1494-0059 or 1494-0063 Rack Slides or 12679B slide rails.
Add-on Accessories	
A1308A	Custom Engineering Kit.
A1309A	Rack Mount Flange Kit for the Model R/332. Also requires 1494-0059 or 1494-0063 Rack Slides or 12679B slide rails.
98284A	MC68882 floating point coprocessor.
9888A	16-slot DIO Bus Expander (uses one DIO I/O slot - maximum of two).
46080A	HP-HIL Extension Cable (required for keyboard if used detached).

Model 360CMA

Instrument Controller

Description

The HP 9000 Model 360CMA is a mid-priced instrument controller with keyboard and 12-inch color monitor that is based on the Model 360 System Processor Unit. Figures 9-11 and 9-12 illus-

trate the Model 360CMA functions and backplane usage and interconnections.

SPU: HP 98579A Model 360, as described on page 6-5.

Operating System: BASIC/WS.

Expandability: See Figure 6-4, page 6-5.

Monitor: 12-inch 512 by 400 Color Monitor.

Available DIO I/O Slots: 1 in SPU; two 98568A Direct-Connect Expanders can be used to add 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

Available DIO Accessory Slots: 1 in SPU; two 98568A Direct-Connect Expanders can be used to add 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

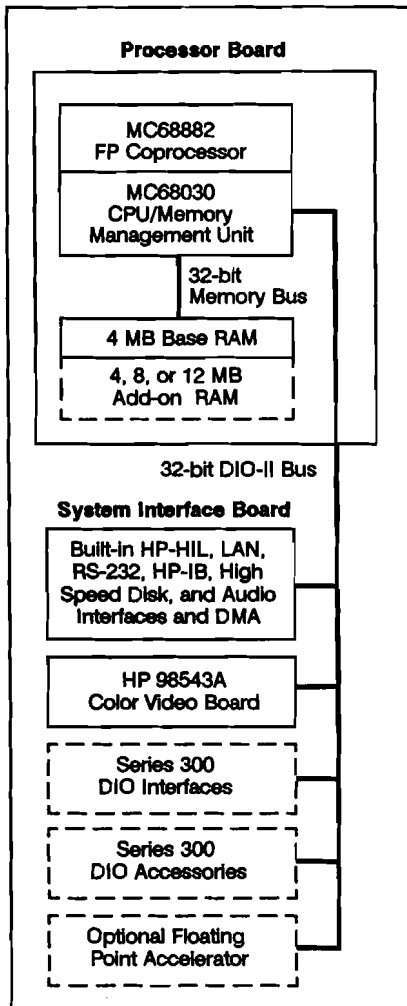


Figure 9-11. Model 360CMA Functions

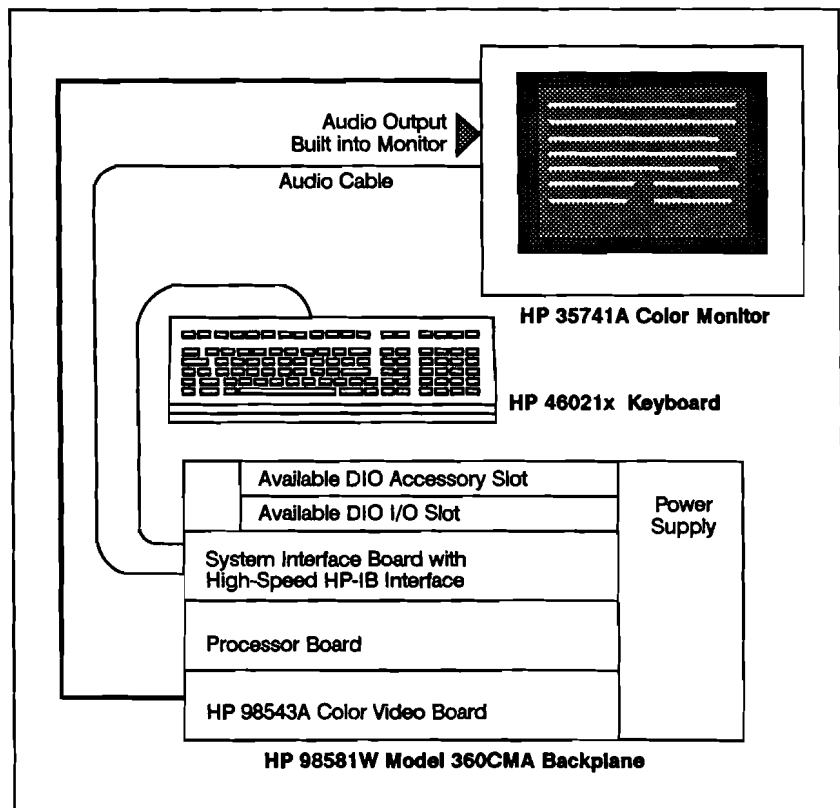


Figure 9-12. Model 360CMA Backplane Usage and Interconnections

Operational Requirements

Description	Requirements
System Disk and Software Installation/Backup Device:	3.5-inch or 5.25-inch flexible disk. Hard disk(s) if needed to provide capacity to support the application, as determined using the suggested configuration procedure (Section 2). For disk choices, see Section 14.
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Model 360CMA Instrument Controller, continued

Product Summary

Product/ Opt. No.	Description
98581W	Model 360CMA Color Instrument Controller, consisting of: A. 98579A System Processor Unit, as described on pages 6-5 through 6-8. B. 98242B 2-Slot DIO Backplane. C. 98262A High-Speed HP-IB Disk Interface. D. 98543A Medium Resolution Color Video Board with RGB cable. E. 35741A 12-inch Medium Resolution (512 by 400) Color Monitor. F. 46021x Keyboard. G. Localization, which must be specified by National Version option ABA in the U.S. (see page 9-2 for other countries), unless keyboard is deleted with a keyboard delete option. H. 98616A Option 044 BASIC Language System software on 3.5-inch flexible disks. I. Manuals. J. 90-day on-site warranty.

Options

Opt. ABA	U.S. Version with keyboard (excludes option 05A). (See page 9-2 for National Version options with keyboard for other countries.)
Opt. 05A	English controller with 46021x keyboard deleted (excludes option ABA). (See page 9-2 for National Version options without keyboard for other countries).
Opt. 015†	Specifies AUJ-type LAN connection (excludes option 017).
Opt. 017†	Specifies ThinMAU and BNC "T" connector for LAN connection (excludes option 015).
Opt. 042	Provides BASIC Software on 5.25-inch flexible disks instead of 3.5-inch flexible disks.
Opt. 108	Adds 4 MB RAM for a total of 8 MB (excludes options 112 and 116).
Opt. 112	Adds 8 MB RAM for a total of 12 MB (excludes options 108 and 116).
Opt. 116	Adds 12 MB RAM for a total of 16 MB (excludes options 108 and 112).
Opt. 613	Deletes BASIC Language System (media, license, and manuals).

Add-on Accessories

98248B	Floating Point Accelerator.
98267A	4 MB Parity-Checking add-on RAM board for Model 360CMA without option 108, 112, or 116 (increases total RAM to 8 MB - excludes 98267B and 98267C).
98267B	8 MB Parity-Checking add-on RAM board for Model 360CMA without option 108, 112, or 116 (increases total RAM to 12 MB - excludes 98267A and 98267C).
98267C	12 MB Parity-Checking add-on RAM board for Model 360CMA without option 108, 112, or 116 (increases total RAM to 16 MB - excludes 98267A and 98267B).
98568A	Direct Connect 8-slot I/O Expander (first expander requires 98568A Option 132)*.
98570A	Direct Connect I/O Expander with four DIO slots (two DIO slot pairs) and two DIO-II slots*.
9888A	16-slot DIO Expander (uses one DIO I/O slot - maximum of two).
35723A	HP-Touch Bezel for 35731A/35741A Monitor.
46060B	HP-HIL 3-button Mouse.
46081A	HP-HIL Buffer box with speaker.
46084A	HP-HIL ID Module.
98203x	HP-HIL Keyboard with rotary knob, for BASIC/WS or Series 200/300 Pascal systems (for National Versions, see page 13-9).

† Must order option 015 or 017.

* Maximum of two 98568A/98570A Direct Connect I/O Expanders per Model 360CMA.

Model 360CMAX Instrument Controller

Description

The HP 9000 Model 360CMAX is an HP BASIC/UX instrument controller with keyboard and 16-inch color monitor that is based on the Model 360 System Processor Unit. Figures 9-13 and 9-14 show the Model 360CMAX functions and backplane usage and interconnections.

SPU: HP 98579A Model 360, as described on page 6-5.

Operating System: HP-UX and BASIC/UX License-to-use, media, and manuals are included.

Expandability: See Figure 6-4, page 6-5.

Monitor: 16-inch 1280 by 1024 Color Monitor.

Available DIO I/O Slots: 1 in SPU; two 98568A Direct-Connect Expanders can be used to add 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

Available DIO Accessory Slots: 1 in SPU; two 98568A Direct-Connect Expanders can be used to add 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

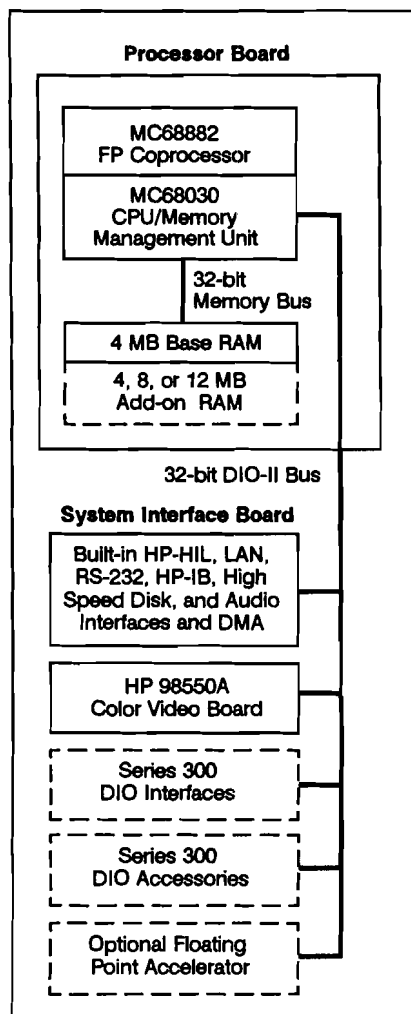


Figure 9-13. Model 360CMAX Functions

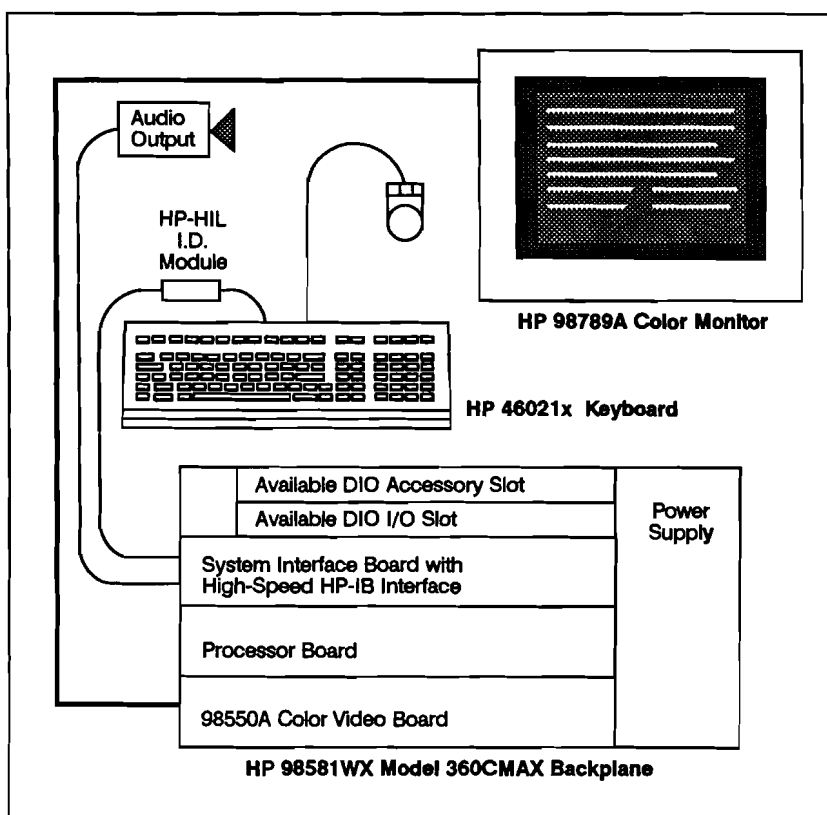


Figure 9-14. Model 360CMAX Backplane Usage and Interconnections

Model 360CMAX Instrument Controller, continued

Product Summary

Product/ Opt. No.	Description
98581WX	Model 360CMAX Color Instrument Controller, consisting of: A. 98579A System Processor Unit, as described on pages 6-5 through 6-8. B. 98242B 2-Slot DIO Backplane. C. 98262A High-Speed HP-IB Disk Interface. D. 98550A High Resolution Color Video Board with RGB cable. E. 98789A 16-inch 1280 by 1024 Color Monitor. F. 46021x Keyboard. G. Localization, which must be specified by National Version option ABA in the U.S. (see page 9-2 for other countries). H. 46060B HP-HIL Two-button Mouse. I. 46081A HP-HIL Buffer box with speaker. J. 46084A HP-HIL ID Module. K. Installation manuals. L. 98594L HP-UX License to use Application Execution Environment (AXE), Programming Environment (PE), Network Services, ARPA Services, Network File System, OSF Motif™ User Interface, and X Windows Version 11. M. 98594A + 022 Media (1/4-inch cartridge tape) and documentation for 98594L software. N. 98796L HP BASIC/UX License to use. O. 98796A + 022 HP BASIC/UX software on 1/4-inch cartridge tape and documentation. P. 90-day on-site warranty.
Options	
Opt. ABA	U.S. Version. (See page 9-2 for National Version options for other countries.)
Opt. 015†	Specifies AUI-type LAN connection (excludes option 017).
Opt. 017†	Specifies ThinMAU and BNC "T" connector for LAN connection (excludes option 015).
Opt. 108	Adds 4 MB RAM for a total of 8 MB (excludes options 112 and 116).
Opt. 112	Adds 8 MB RAM for a total of 12 MB (excludes options 108 and 116).
Opt. 116	Adds 12 MB RAM for a total of 16 MB (excludes options 108 and 112).
Opt. 402	Adds 7958B 152 MB Disk Drive with software installed (excludes option 403).
Opt. 403	Adds 7959B 304 MB Disk Drive with software installed (excludes option 402).
Opt. 710	Substitutes 98785A 16-inch 1024 by 768 Monitor and 98549A Color Video board for items D and E, above.
Add-on Accessories	
98248B	Floating Point Accelerator.
98267A	4 MB Parity-Checking add-on RAM board for Model 360CMAX without option 108, 112, or 116 (increases total RAM to 8 MB - excludes 98267B and 98267C).
98267B	8 MB Parity-Checking add-on RAM board for Model 360CMAX without option 108, 112, or 116 (increases total RAM to 12 MB - excludes 98267A and 98267C).
98267C	12 MB Parity-Checking add-on RAM board for Model 360CMAX without option 108, 112, or 116 (increases total RAM to 16 MB - excludes 98267A and 98267B).
98568A	Direct Connect 8-slot I/O Expander (first expander requires 98568A Option 132)*.
98570A	Direct Connect I/O Expander with four DIO slots (two DIO slot pairs) and two DIO-II slots*.
9888A	16-slot DIO Expander (uses one DIO I/O slot - maximum of two).

† Must order option 015 or 017.

* Maximum of two 98568A/98570A Direct Connect I/O Expanders per Model 360CMAX.

Operational Requirements

Description	Requirements
System Disk:	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2) or comparable support from a LAN-connected network server system. Order option 402 or 403 or select other disk in Section 14.
Software Installation/Backup Device:	Cartridge tape subsystem (Section 15) or comparable support from a LAN-connected network server.
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Model 360MMA Instrument Controller

Description

The HP 9000 Model 360MMA is a mid-priced instrument controller with keyboard and 12-inch monochrome monitor that is based on the Model 360 System

Processor Unit. Figures 9-15 and 9-16 illustrate the Model 360MMA functions and backplane usage and interconnections.

SPU: HP 98579A Model 360, as described on page 6-5.

Operating System: BASIC/WS.

Expandability: See Figure 6-4, page 6-5.

Monitor: 12-inch 512 by 400 Color Monitor.

Available DIO I/O Slots: 1 in SPU; two 98568A Direct-Connect Expanders can be used to add 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

Available DIO Accessory Slots: 1 in SPU; two 98568A Direct-Connect Expanders can be used to add 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

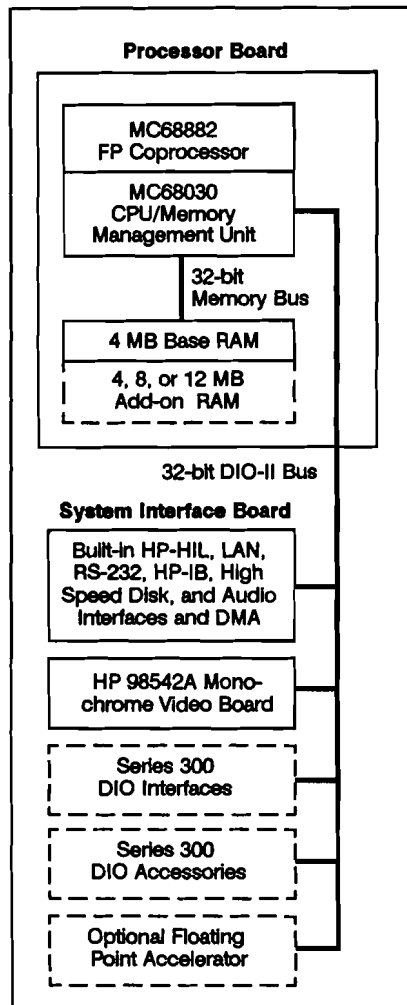


Figure 9-15. Model 360MMA Functions

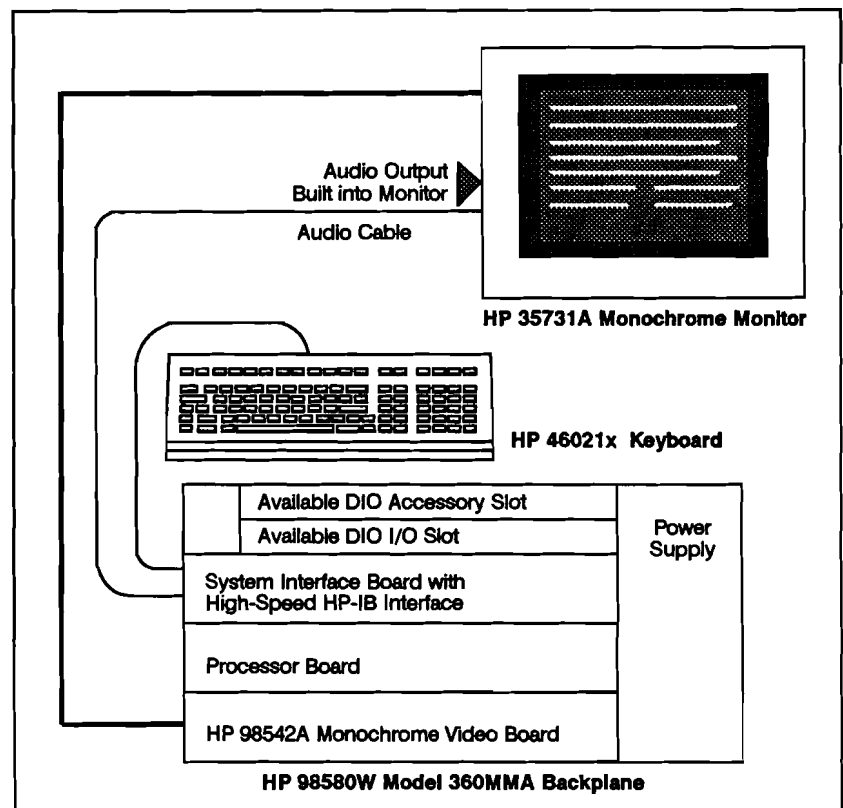


Figure 9-16. Model 360MMA Backplane Usage and Interconnections

Operational Requirements

Description	Requirements
System Disk and Software Installation/Backup Device:	3.5-inch or 5.25-inch flexible disk. Hard disk(s) if needed to provide capacity to support the application, as determined using the suggested configuration procedure (Section 2). For disk choices, see Section 14.
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Product Summary

Product/ Opt. No.	Description
98580W	Model 360MMA Color Instrument Controller, consisting of: A. 98579A System Processor Unit, as described on pages 6-5 through 6-8. B. 98242B 2-Slot DIO Backplane. C. 98262A High-Speed HP-IB Disk Interface. D. 98542A Medium Resolution Monochrome Video Board with cable. E. 35731A 12-inch Medium Resolution (512 by 400) Color Monitor. F. 46021x Keyboard. G. Localization, which must be specified by National Version option ABA in the U.S. (see page 9-2 for other countries), unless keyboard is deleted with a keyboard delete option. H. 98616A Option 044 BASIC Language System software on 3.5-inch flexible disks. I. Manuals. J. 90-day on-site warranty.
Options	
Opt. ABA	U.S. Version with keyboard (excludes option 05A). (See page 9-2 for National Version options with keyboard for other countries.)
Opt. 05A	English controller with 46021x keyboard deleted (excludes option ABA). (See page 9-2 for National Version options without keyboard for other countries.)
Opt. 015†	Specifies AUI-type LAN connection (excludes option 017).
Opt. 017†	Specifies ThinMAU and BNC "T" connector for LAN connection (excludes option 015).
Opt. 042	Provides BASIC Software on 5.25-inch flexible disks instead of 3.5-inch flexible disks.
Opt. 108	Adds 4 MB RAM for a total of 8 MB (excludes options 112 and 116).
Opt. 112	Adds 8 MB RAM for a total of 12 MB (excludes options 108 and 116).
Opt. 116	Adds 12 MB RAM for a total of 16 MB (excludes options 108 and 112).
Opt. 613	Deletes BASIC Language System (media, license, and manuals).
Add-on Accessories	
98248B	Floating Point Accelerator.
98267A	4 MB Parity-Checking add-on RAM board for Model 360MMA without option 108, 112, or 116 (increases total RAM to 8 MB - excludes 98267B and 98267C).
98267B	8 MB Parity-Checking add-on RAM board for Model 360MMA without option 108, 112, or 116 (increases total RAM to 12 MB - excludes 98267A and 98267C).
98267C	12 MB Parity-Checking add-on RAM board for Model 360MMA without option 108, 112, or 116 (increases total RAM to 16 MB - excludes 98267A and 98267B).
98568A	Direct Connect 8-slot I/O Expander (first expander requires 98658A Option 132)*.
98570A	Direct Connect I/O Expander with four DIO slots (two DIO slot pairs) and two DIO-II slots*.
9888A	16-slot DIO Expander (uses one DIO I/O slot - maximum of two).
35723A	HP-Touch Bezel for 35731A/35741A Monitor.
46060B	HP-HIL 3-button Mouse.
46081A	HP-HIL Buffer box with speaker.
46084A	HP-HIL ID Module.
98203x	HP-HIL Keyboard with rotary knob, for BASIC/WS or Series 200/300 Pascal systems (for National Versions, see page 13-9).

† Must order option 015 or 017.

* Maximum of two 98568A/98570A Direct Connect I/O Expanders per Model 360MMA.

Model 360MMAX Instrument Controller

Description

The HP 9000 Model 360MMAX is an HP BASIC/UX instrument controller with keyboard and 17-inch monochrome monitor that is based on the Model 360 System Processor Unit. Figures 9-17 and 9-18 illustrate the Model 360MMAX functions and backplane usage and interconnections.

SPU: HP 98579A Model 360, as described on page 6-5.

Operating System: HP-UX and BASIC/UX License-to-use, media, and manuals are included.

Expandability: See Figure 6-4, page 6-5.

Monitor: 17-inch 1024 by 768 Monochrome Monitor.

Available DIO I/O Slots: 1 in SPU; two 98568A Direct-Connect Expanders can be used to add 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

Available DIO Accessory Slots: 1 in SPU; two 98568A Direct-Connect Expanders can be used to add 8 slots; with one or two 98658A Expanders, two 9888A DIO Bus Expanders can be used to add 14 slots.

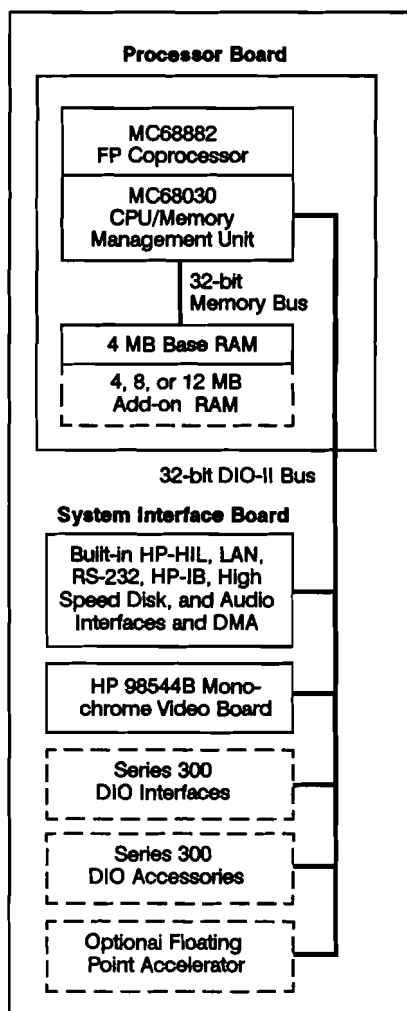


Figure 9-17. Model 360MMAX Functions

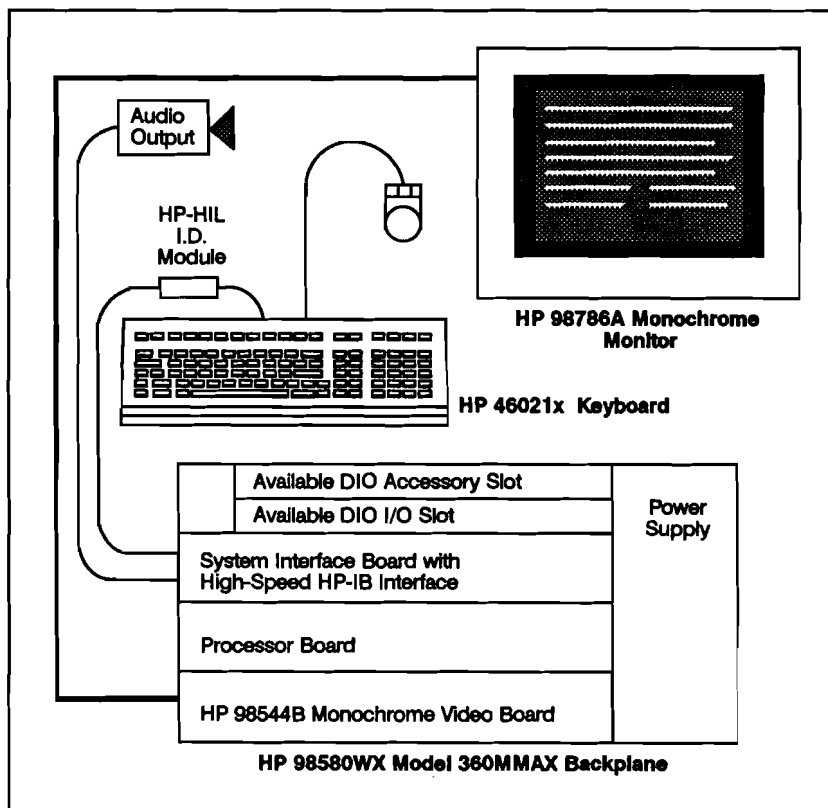


Figure 9-18. Model 360MMAX Backplane Usage and Interconnections

Product Summary

Product/ Opt. No.	Description
98580WX	Model 360MMAX Monochrome Instrument Controller, consisting of: A. 98579A System Processor Unit, as described on pages 6-5 through 6-8. B. 98242B 2-Slot DIO Backplane. C. 98262A High-Speed HP-IB Disk Interface. D. 98544B High Resolution Monochrome Video Board with cable to monitor. E. 98786A 17-inch 1024 by 768 Monochrome Monitor. F. 46021x Keyboard. G. Localization, which must be specified by National Version option ABA in the U.S. (see page 9-2 for other countries). H. 46060B HP-HIL 3-button Mouse. I. 46081A HP-HIL Buffer box with speaker. J. 46084A HP-HIL ID Module. K. Installation manuals. L. 98594L HP-UX License to use Application Execution Environment (AXE), Programming Environment (PE), Network Services, ARPA Services, Network File System, OSF Motif™ User Interface, and X Windows Version 11. M. 98594A + 022 Media (1/4-inch cartridge tape) and documentation for 98594L software. N. 98796L HP BASIC/UX License to use. O. 98796A + 022 HP BASIC/UX software on 1/4-inch cartridge tape and documentation. P. 90-day on-site warranty.

Options

Opt. ABA	U.S. Version. (See page 9-2 for National Version options for other countries.)
Opt. 015†	Specifies AUI-type LAN connection (excludes option 017).
Opt. 017†	Specifies ThinMAU and BNC "T" connector for LAN connection (excludes option 015).
Opt. 108	Adds 4 MB RAM for a total of 8 MB (excludes options 112 and 116).
Opt. 112	Adds 8 MB RAM for a total of 12 MB (excludes options 108 and 116).
Opt. 116	Adds 12 MB RAM for a total of 16 MB (excludes options 108 and 112).
Opt. 402	Adds 7958B 152 MB Disk Drive with software installed (excludes option 403).
Opt. 403	Adds 7959B 304 MB Disk Drive with software installed (excludes option 402).

Add-on Accessories

98248B	Floating Point Accelerator.
98267A	4 MB Parity-Checking add-on RAM board for Model 360MMAX without option 108, 112, or 116 (increases total RAM to 8 MB – excludes 98267B and 98267C).
98267B	8 MB Parity-Checking add-on RAM board for Model 360MMAX without option 108, 112, or 116 (increases total RAM to 12 MB – excludes 98267A and 98267C).
98267C	12 MB Parity-Checking add-on RAM board for Model 360MMAX without option 108, 112, or 116 (increases total RAM to 16 MB – excludes 98267A and 98267B).
98568A	Direct Connect 8-slot I/O Expander (first expander requires 98568A Option 132)*.
98570A	Direct Connect I/O Expander with four DIO slots (two DIO slot pairs) and two DIO-II slots*.
9888A	16-slot DIO Expander (uses one DIO I/O slot – maximum of two).

† Must order option 015 or 017.

* Maximum of two 98568A/98570A Direct Connect I/O Expanders per Model 360MMA.

Model 360MMAX Instrument
Controller, continued

Operational Requirements

Description	Requirements
System Disk:	Hard disk(s) with enough capacity to support the application, as determined using the suggested configuration procedure (Section 2) or comparable support from a LAN-connected network server system. Order option 402 or 403 or select other disk in Section 14.
Software Installation/Backup Device:	Cartridge tape subsystem (Section 15) or comparable support from a LAN-connected network server.
RAM	Enough RAM to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Network Servers

Introduction

This section contains configuration information on Network Server bundles based on Series 300 and 600 platforms. The Model 15NS and 25NS (Series 300) Network Server bundles include keyboard, a choice of color or monochrome monitor, the HP-UX operating system preinstalled on the included system disk, and a cartridge tape subsystem for software installation and backup. Unlike the Models 15NS and 25NS, which can function as 2-D workstations in addition to performing their server function, the Model 635SV (Series 600) Server does not include operator communications hardware. Instead, the Model 635SV features a more powerful RISC-based processor for computational as well as file system support, for which it includes a system disk and cartridge tape subsystem.

Contents

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Model 15NS Network Server	10-4
Model 25NS Network Server	10-6
Model 635SV General-Purpose Server	10-8

National Versions

For convenient use in various nations throughout the world, HP 9000 Model 15NS and 25NS Network Servers are offered in specific national versions. Each national version with keyboard provides appropriate keyboard, monitor, SPU, power cord and user's manuals. They are specified as "**must order**" options to the respective product number, as follows:

Option	National Version	Option	National Version
ABA	U.S. English	ABP	Swiss German
ABC	French Canadian	ABQ	Swiss French
ABD	German	ABS	Swedish
ABE	European Spanish	ABU	U.K. English
ABF	European French	ABW	Belgian Dutch
ABH	Dutch	ABX	Finnish
ABJ	Katakana	ABY	Danish
ABK	Universal English ASCII	ABZ	Italian
ABM	Latin American Spanish	ACA	Kanji
ABN	Norwegian		

Diskless Workstations

Introduction

HP 9000 Model 340, 345, 360, 370, and 375 workstations and other HP-UX 6.x-based (or later) Series 300 systems, linked via a Local Area Network (LAN) to a network server in an HP-UX cluster can all function without a local disk. The diskless workstations share a common root file system on the disk on the supporting network server system. The network server includes the cartridge tape subsystem used for software installation and backup. A Model 15NS or 25NS server can also be used as a 2-D workstation. Network Server Models 15NS and 25NS, pages 10-4 through 10-7, are preconfigured to support diskless workstations.

ThinLAN Connection Example

Figure 10-1 shows the diskless workstations connected to the network server via ThinLAN cable. When ThinLAN connection is to be used, all diskless workstations and the network server should be ordered with the same LAN connect option to assure interconnect compatibility. Option 017 in Models 340, 360, and 370 provides a built-in ThinMAU and BNC connector. Option 015 in Models 340, 360, and 370, though more versatile, requires the separate purchase of an HP 28641A ThinMAU for each server and workstation. Models 345 and 375 include both the ThinLAN and AUI connections, which are jumper-selectable alternates.

Swap Space Choices

The network server provides disk support for the diskless workstations it serves. Each diskless workstation requires the same amount of application-dependent swap space on the server's disk as it would if it had its own disk. Each network server offers a choice of preconfigured swap spaces, ranging from 50 MB to 150 MB (to 200 MB in Model 25NS) in 50 MB increments. The network server swap space option should be selected to support the maximum requirements of the different applications to be run on all of the diskless workstations being served.

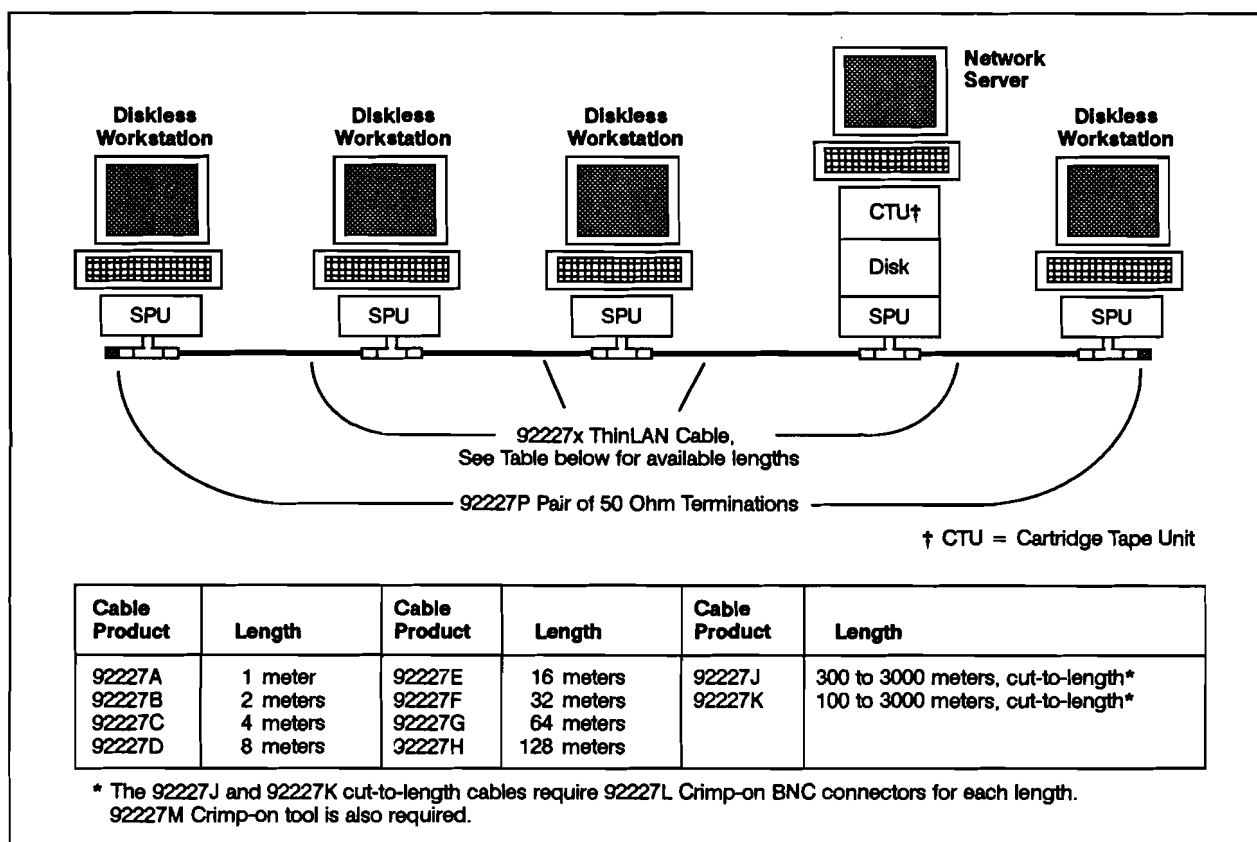


Figure 10-1. ThinLAN Connection of Diskless Workstations to Network Server

A1082A Workgroup Clusters



Description

System number A1082A identifies a highly flexible set of workgroup cluster solutions that are offered at a system solutions adjustment (discount). As shown in Figure 10-2, below, an A1082A Workgroup Cluster consists of:

- A 15NS or 25NS Network Server (pages 10-4 through 10-7).
- One to four 3-D workstations.
- Enough 2-D workstations to bring the total number of workstations in the A1082A workgroup cluster to four.

Connections and Swap Space Choices

See *Diskless Workstations* on previous page.

Selectable 3-D Workstations

- Model 360 TurboSRX, product number 98587T, page 8-8.
- Model 370SRX, product number 98587G, page 8-11.
- Model 370 TurboSRX, product number 98587H, page 8-14.

Selectable 2-D Workstations

- Model 340MH, product number 98563G, page 7-5.
- Model 340C+, product number 98564C, page 7-2.
- Model 340CH, product number 98564G, page 7-2.
- Model 360MH, product number 98589W, page 7-11.

- Model 360C+, product number 98583W, page 7-8.
- Model 360CH, product number 98588W, page 7-8.
- Model 370MH, product number 98589G, page 7-17.
- Model 370C+, product number 98583G, page 7-14.
- Model 370CH, product number 98588G, page 7-14.

Selectable Accessories

- 98248B Floating Point Accelerator for Model 370.
- 98570A DIO-II Expander.
- 98568A 8-Slot DIO Expander.

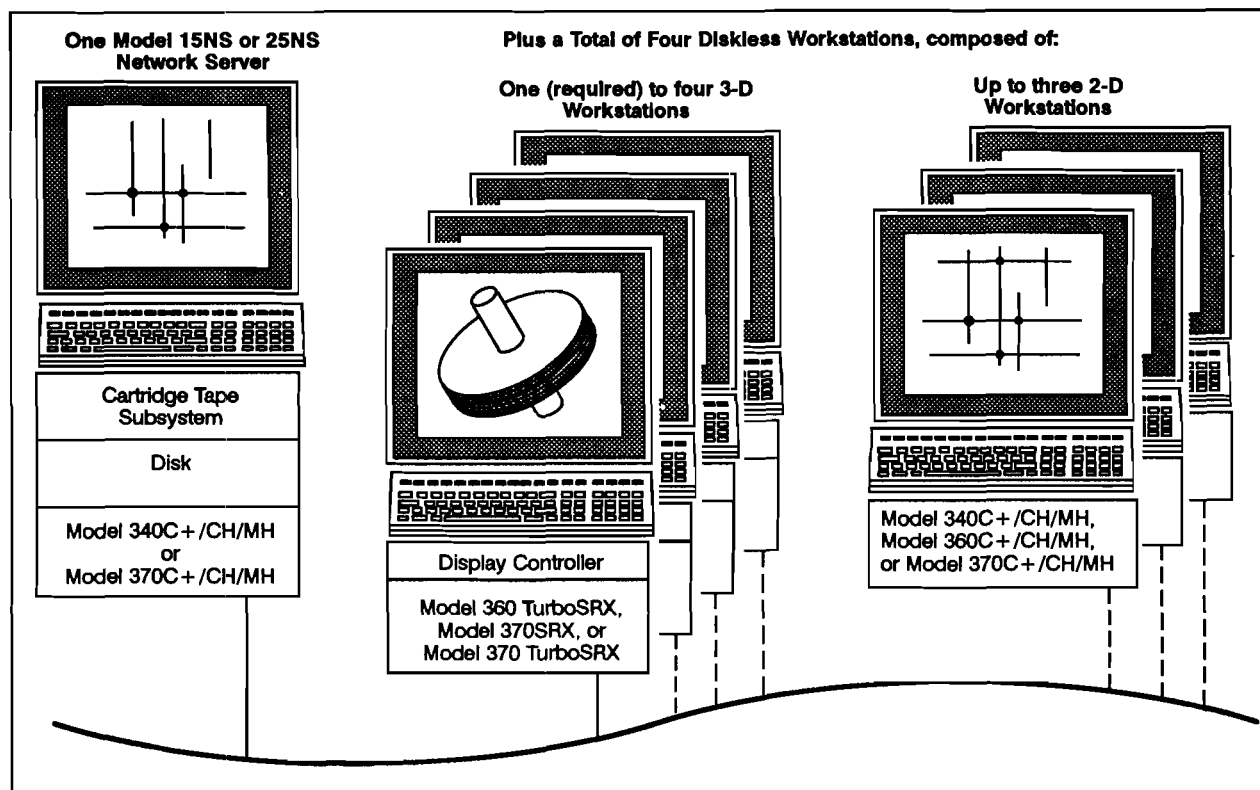


Figure 10-2. A1082A Workgroup Cluster Summary

Model 15NS Network Server

Description

The HP 9000 Model 15NS is a low-priced, restricted configuration Model 340-based Design Automation Network Server for up to 10 diskless workstations. It includes 304 MB fixed disk, cartridge tape subsystem, minirack cabinet, and keyboard. The 15NS is integrated at the factory and the HP-UX operating system is pre-loaded onto the disk. It is available with three different optional (color or monochrome) monitors and it can also function as a 2-D workstation. Figure 10-3 illustrates Model 15NS functions and Figure 10-4 shows 15NS backplane usage and interconnections.

CPU: MC68030, clocked at 16.7 MHz.

Bus Types: 32-bit memory and 16-bit Direct I/O (DIO) buses.

RAM: 8 MB parity built-in, expandable to 16 MB with 4 MB add-on RAM boards.

Interfaces: Built-in HP-HIL, LAN, RS-232C, and Std HP-IB interfaces and 98625B High-Speed HP-IB interface to disk.

Floating Point Coprocessor: MC68882, clocked at 16.7 MHz, is standard.

Direct Memory Access: Two-channel Direct Memory Access is built-in.

Operating System: License-to-use HP-UX, media, and manuals, are included.

Monitor: Is option selectable (see options 548, 549, and 550).

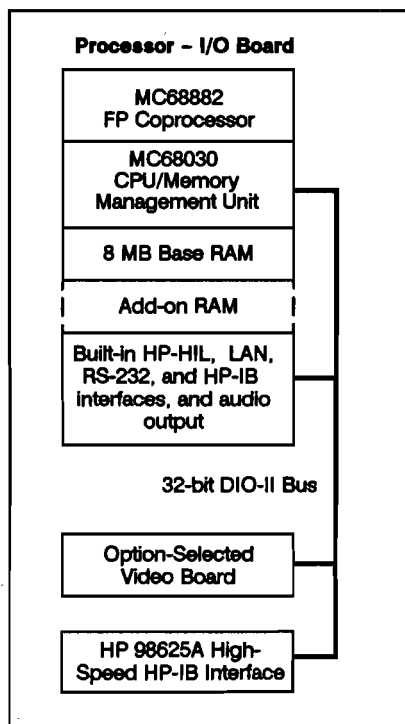


Figure 10-3. Model 15NS Functions

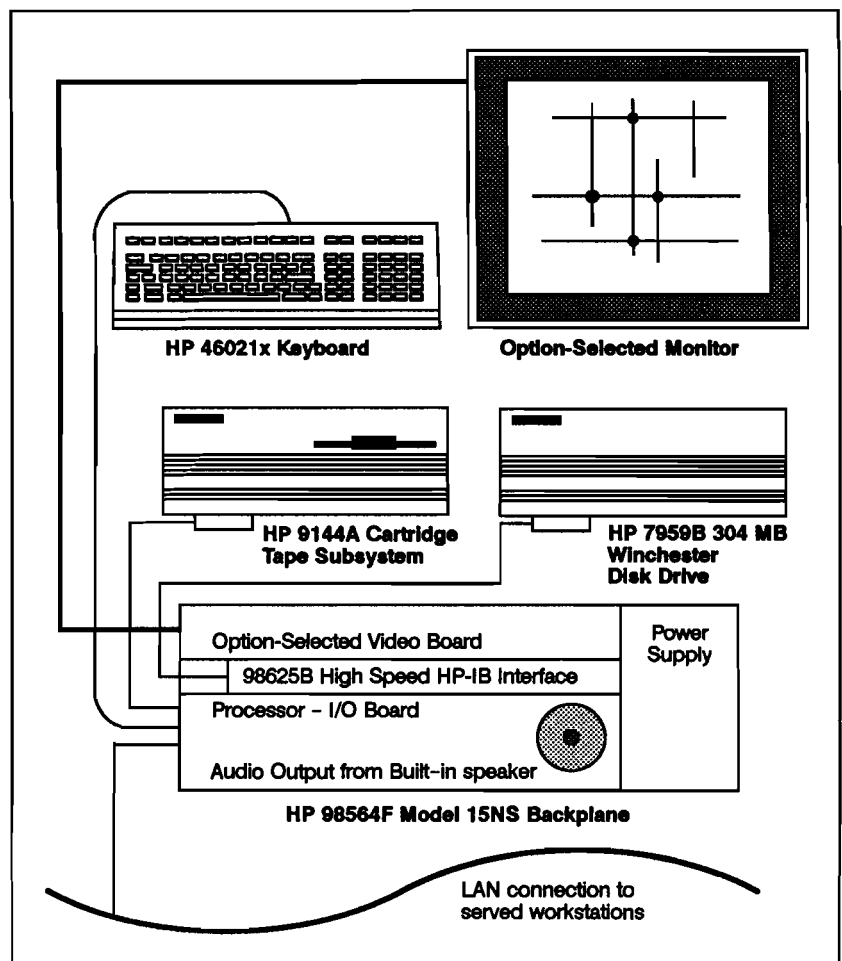


Figure 10-4. Model 15NS Backplane Usage and Interconnections

Product Summary

Product/ Opt. No.	Description
98564F	Model 15NS Design Automation Network Server, consisting of: A. Processor - I/O board with: 1. 32-bit MC68030 16.7 MHz CPU with MC68882 16.7 MHz Floating Point Processor. 2. 8 MB of parity-checking RAM. 3. 4 GB virtual memory address space. 4. 32-bit memory and DIO-II buses. B. Enclosure with power supply and space for optional disk interface. C. 98625B High-Speed HP-IB Disk Interface. D. 7959B 304 MB Winchester Disk Drive. E. 9144A Cartridge Tape Subsystem. F. Option-selected video interface and monitor. G. 46021x Keyboard. H. Localization, which must be specified by National Version option ABA in the U.S. (see page 10-1 for other countries). I. 92211R Minirack Cabinet. J. Installation manuals. K. 98594L HP-UX License to use Application Execution Environment (AXE), Programming Environment (PE), Network Services, ARPA Services, Network File System, OSF Motif™ User Interface, and X Windows Version 11 (X11). L. 98594A + 022 Media (1/4-inch cartridge tape) and documentation for 98594L software. M. 98794A HP-UX Programmer's Documentation Set. N. 90-day on-site warranty.

Options

Opt. ABA	U.S. Version. (See page 10-1 for National Version options for other countries.)
Opt. 015†	Specifies AUI-type LAN connection (excludes option 017).
Opt. 017†	Specifies ThinLAN connection (built-in ThinMAU and BNC "T" connector)(excludes option 015).
Opt. 1AP	Preloads HP-UX on the disk with 50 MB swap space (excludes options 1AQ and 1AR).
Opt. 1AQ	Preloads HP-UX on the disk with 100 MB swap space (excludes options 1AP and 1AR).
Opt. 1AR	Preloads HP-UX on the disk with 150 MB swap space (excludes options 1AP and 1AQ).
Opt. 112	Increases RAM to 12 MB (adds one 98268A 4 MB RAM board - excludes option 116).
Opt. 116	Increases RAM to 16 MB (adds two 98268A 4 MB RAM boards - excludes option 112).
Opt. 401	Substitute: 35401A 536 MB Autochanger Cartridge Tape Subsystem for 9144A 67 MB Cartridge Tape Subsystem.
Opt. 548	Adds MH Graphics Package, consisting of High-Resolution Monochrome Video Board, 98788A 19-inch 1280 by 1024 Monochrome Monitor, 46060B 3-button Mouse, and 46084A HP-HIL ID Module.
Opt. 549	Adds C+ Graphics Package, consisting of 1024 by 768 Color Video Board, 98785A 16-inch 1024 by 768 Color Monitor, 46060B 3-button Mouse, and 46084A HP-HIL ID Module.
Opt. 550	Adds CH Graphics Package, consisting of 1280 by 1024 Color Video Board, 98752A 19-inch 1280 by 1024 Color Monitor, 46060B 3-button Mouse, and 46084A HP-HIL ID Module.

Add-on Accessories

98268A	4 MB add-on Parity RAM board (maximum of two, total per Model 15NS).
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† Must order option 015 or 017; see page 5-4 for guidance.

Operational Requirements

Description	Requirements
System Disk:	Select an additional disk(s) in Section 14 if necessary to support the application, as determined using the suggested configuration procedure (Section 2).
RAM:	Select additional RAM if needed to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Model 25NS Network Server

Description

The HP 9000 Model 25NS is a Design Automation Network Server for 8 to 35 diskless workstations that is based on the powerful Model 370 System Processor Unit. It includes 571 MB fixed disk in rollabout cabinet, autochanger cartridge tape subsystem, minirack cabinet, and keyboard. The 25NS is integrated at the factory and the HP-UX operating system is preloaded onto

the disk. It is available with three different optional (color or monochrome) monitors and can also function as a 2-D workstation.

Figure 10-5 illustrates Model 25NS functions and Figure 10-6 shows 25NS backplane usage and interconnections.

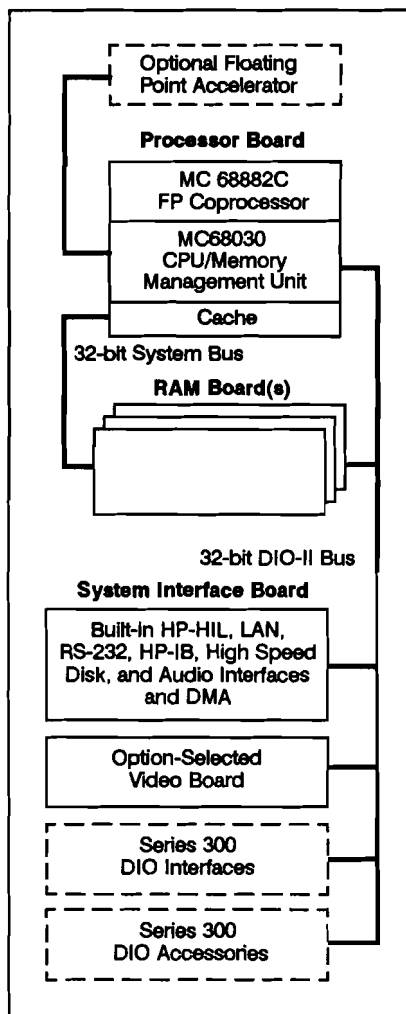


Figure 10-5. Model 25NS Functions

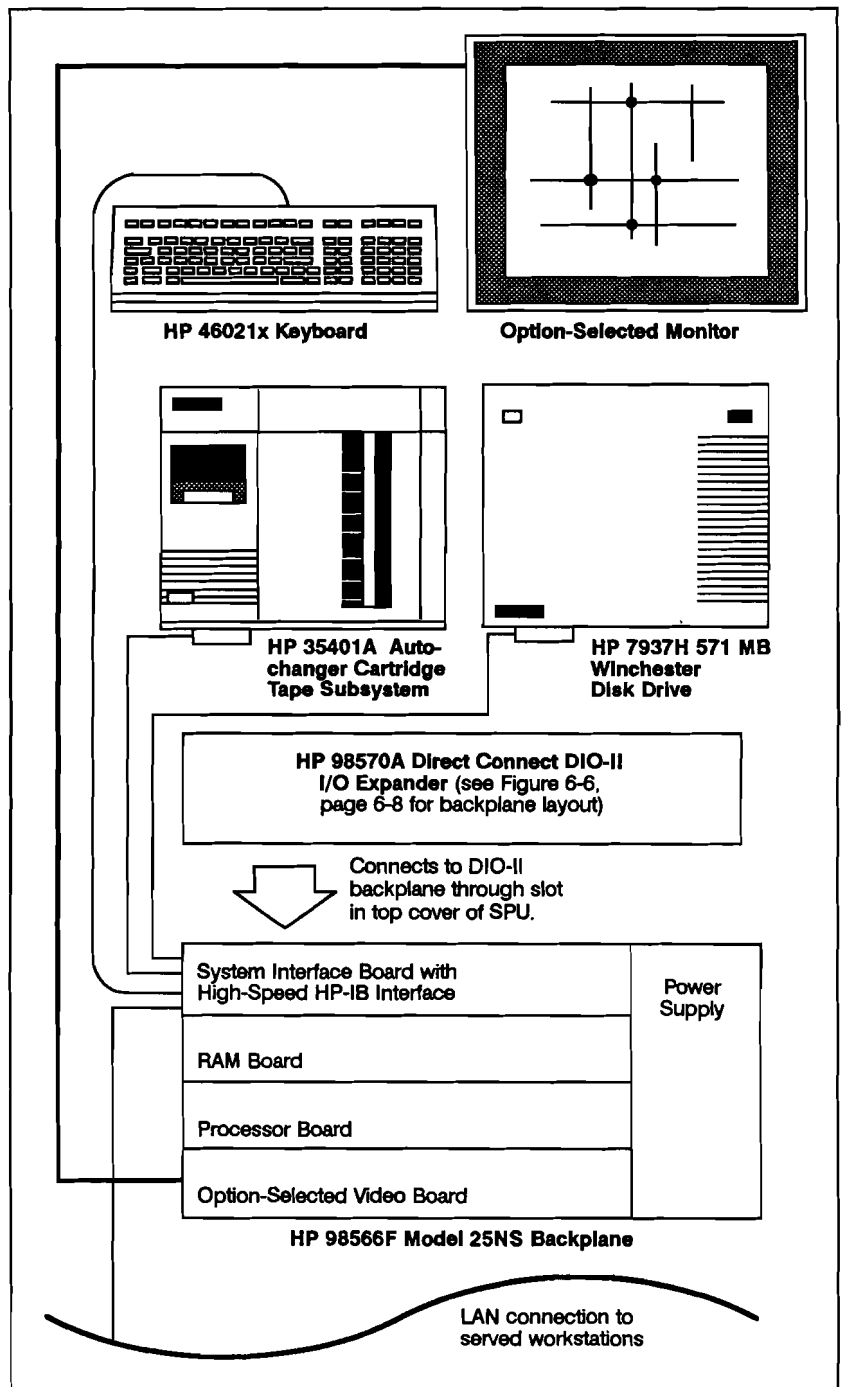


Figure 10-6. Model 25NS Backplane Usage and Interconnections

SPU: HP 98579B Model 370,
described on page 6-9.

Monitor: Is option selectable
(see options 548, 549, and 550).

Operating System: License-to-
use HP-UX, media, and manuals,
are included.

Expandability: See Figures 6-6
and 6-7, pages 6-9 and 6-10.

Product Summary

Product/ Opt. No.	Description
98566F	Model 25NS Design Automation Network Server, consisting of: A. 98579B System Processor Unit, as described on pages 6-9 through 6-12, with option 208 8 MB ECC RAM instead of 8 MB parity-checking RAM. B. 98570A Direct Connect DIO-II Expander. C. 7937H 571 MB Winchester Disk Drive and 19511A Disk Cabinet. D. 35401A Autochanger Cartridge Tape Subsystem. E. Option-selected video interface and monitor. F. 46021x Keyboard. G. Localization, which must be specified by National Version option ABA in the U.S. (see page 10-1 for other countries). H. 92211R Minirack Cabinet. I. Installation manuals. J. 98594L HP-UX License to use Application Execution Environment (AXE), Programming Environment (PE), Network Services, ARPA Services, Network File System, OSF Motif™ User Interface, and X Windows Version 11 (X11). K. 98594A + 022 Media (1/4-inch cartridge tape) and documentation for 98594L software. L. 98794A HP-UX Programmer's Documentation Set. M. 90-day on-site warranty.
Options	
Opt. ABA	U.S. Version. (See page 10-1 for National Version options for other countries.)
Opt. 015‡	Specifies AUI-type LAN connection (excludes option 017).
Opt. 017‡	Specifies ThinLAN connection (built-in ThinMAU and BNC "T" connector)(excludes option 015).
Opt. 1AP	Preloads HP-UX on the disk with 50 MB swap space (excludes options 1AQ, 1AR, and 1AS).
Opt. 1AQ	Preloads HP-UX on the disk with 100 MB swap space (excludes options 1AP, 1AR, and 1AS).
Opt. 1AR	Preloads HP-UX on the disk with 150 MB swap space (excludes options 1AP, 1AQ, and 1AS).
Opt. 1AS	Preloads HP-UX on the disk with 200 MB swap space (excludes options 1AP, 1AQ, and 1AR).
Opt. 316	Substitutes 16 MB ECC RAM for 8 MB ECC RAM - excludes option 332).
Opt. 332	Substitutes 32 MB ECC RAM for 8 MB ECC RAM - excludes option 316).
Opt. 548	Adds MH Graphics Package, consisting of High-Resolution Monochrome Video Board, 98788A 19-inch 1280 by 1024 Monochrome Monitor, 46060B 3-button Mouse, and 46084A HP-HIL ID Module.
Opt. 549	Adds C+ Graphics Package, consisting of 1024 by 768 Color Video Board†, 98785A 16-inch 1024 by 768 Color Monitor, 46060B 3-button Mouse, and 46084A HP-HIL ID Module.
Opt. 550	Adds CH Graphics Package, consisting of 1280 by 1024 Color Video Board†, 98752A 19-inch 1280 by 1024 Color Monitor, 46060B 3-button Mouse, and 46084A HP-HIL ID Module.
Add-on Accessories	
98248B	Floating Point Accelerator.
98264B	16 MB ECC RAM controller with 3-slot system bus frontplane connector. 004: Deletes 3-slot system bus frontplane connector. 005: Substitutes 4-slot system bus frontplane connector for 3-slot connector.

‡ Must order option 015 or 017; see page 5-4 for guidance.

† If a 98556A 2-D Graphics Accelerator is added, the graphics board with accelerator daughter board must be installed in the 98570A DIO-II Expander because it cannot be supported in the same 25NS card cage with ECC RAM.

Operational Requirements

Description	Requirements
System Disk:	Select an additional disk(s) in Section 14 if necessary to support the application, as determined using the suggested configuration procedure (Section 2).
RAM:	Select additional RAM if needed to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

Model 635SV General-Purpose Server

Description

The HP 9000 Model 635SV is a General-Purpose Server for PCs and diskless workstations. It is based on the powerful Model 835S System Processor Unit and includes two 304 MB fixed disks and an autochanger cartridge tape subsystem. Figure 10-7 illustrates Model 635SV functions and Figure 10-8 shows Model 635SV backplane usage and interconnections.

CPU: HP-PA Model 835, clocked at 15 MHz.

Cache: 16 KB.

Bus Types: 64-plus-8-ECC-bit memory bus, 32-bit CTB bus, and 16-bit CIO bus.

Included Interfaces: Two HP-IB interfaces (to disk and cartridge tape drive), 6-channel multiplexer, and LAN/9000 Series 800 Link.

RAM: 24 MB ECC, expandable to 104 MB (each CTB slot taken for other uses reduces maximum memory capacity by 16 MB).

Floating Point Processor: 2.02 MFLOPs Floating Point Coprocessor.

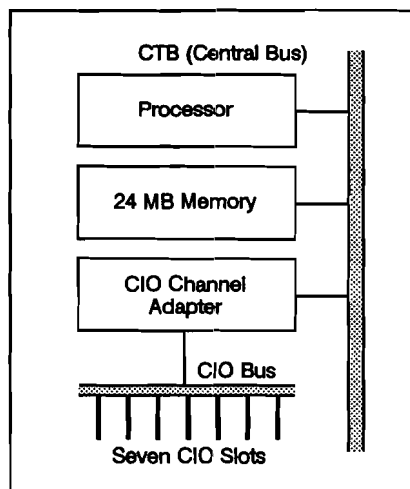


Figure 10-7. Model 635SV Functions

Direct Memory Access: Direct memory access via CIO bus is standard.

Operating System: Server License to use HP-UX is included. This license provides unlimited programmatic access while limiting direct log-ons to 2 users via multiplexer or LAN connection.

One set of HP 92508A option AA0 or AA1 media and system administration manuals must be purchased separately to provide installable software for all licensed Model 635SV Servers at a site.

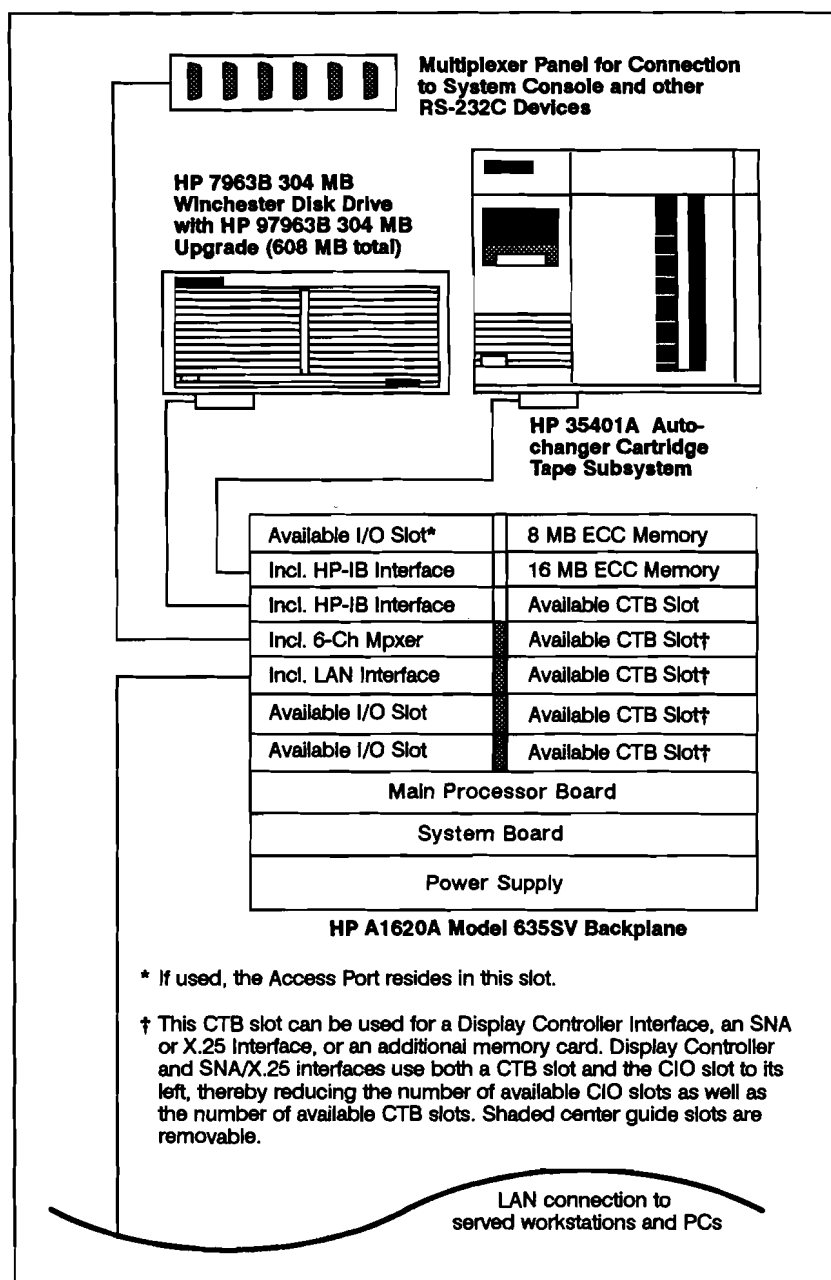


Figure 10-8. Model 635SV Backplane Usage and Interconnections

Model 635SV General-Purpose Server, continued

Product Summary

Product/ Opt. No.	Description
A1620A	Model 635SV General-Purpose Server, consisting of: - System Processor Unit (SPU), including: 32-bit PA-RISC Model 835 CPU with floating point co-processor. - A1010A 8 MB ECC Memory Array Card. - A1037A 16 MB ECC Memory Array Card. - Two 27110B HP-IB interfaces, to system disk(s) and cartridge tape subsystem. 98196A 6-Channel Multiplexer interface to system console and other RS-232C devices. 91786B LAN/9000 Series 825 Link. - Enclosure with 3 available CIO slots for I/O cards, 5 available CTB slots for additional memory or other CTB cards, and power supply. 7963B 304 MB Winchester Disk Drive and 97963B 304 MB upgrade (608 MB total). 35401A Autochanger Cartridge Tape Subsystem. - Software, including: 92508L 2-User HP-UX Server License-to-Use and general usage documentation. (92508A media and system administration documentation product is required for use). 50981A ARPA/BSD Model 825 Networking Software. 50970A Network File System (NFS) Services/800 Software). - B1155A X Windows System Version 11. 98876A SoftPC Emulation System Software. - Installation manuals. 90-day on-site warranty.
Options	
Opt. AA0	Provides furnished software on 1/4-inch cartridge tape.
Opt. AA1	Provides furnished software on 1/2-inch, 1600 cpi magnetic tape.
Opt. AFK	Adds 28664A Twisted Pair MAU (excludes options 003 and 004).
Opt. 1AN	Deletes 35401A Autochanger Cartridge Tape Subsystem.
Opt. 1BC	Deletes 7963B, 97963B, and one 27110B HP-IB interface.
Opt. 0E1	Adds Battery Backup System.
Opt. 003	Adds 28641A ThinMAU (excludes options 004 and AFK).
Opt. 004	Adds 302441A ThickMAU (excludes options 003 and AFK).
Opt. 501	Adds 8 MB ECC RAM).
Opt. 516	Adds 16 MB ECC RAM).
Opt. 517	Replaces A1010A 8 MB ECC RAM with A1037A 16 MB ECC RAM, increasing total RAM to 32 MB.
Add-on Accessories	
92508A	Media and System Administration Documentation for 92508L (requires option AA0 or AA1). - AA0: Provides HP-UX software on 1/4-inch cartridge tape. - AA1: Provides HP-UX software on 1/2-inch, 1600 cpi magnetic tape.

Operational Requirements

Description	Requirements
Operating System:	HP 92508A option AA0 or AA1 Media and Documentation for 92508L must be available for installation.
System Console:	HP C1001A/G/W or (discontinued) 2392A Option S12 Terminal connected to the multiplexer panel via an HP 40242M cable.
System Disk:	Select an additional disk(s) in Section 14 if necessary to support the application, as determined using the suggested configuration procedure (Section 2).
Software Installation/Backup Device:	Select a magnetic tape unit (Section 15) to install software from media option AA1.
RAM:	Select additional RAM if needed to support the applications, operating system, and other software, as determined using the suggested configuration procedure (Section 2).

NOTES:

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Series 300 Interfacing and Accessories

Contents

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Built-in Interfaces

Introduction

All HP 9000 Series 300 SPUs, instrument controllers, workstations, and network servers include a basic set of interfaces, as listed in Table 11-1 at right. In Models 332, 340, 345, and 375 these interfaces are on the Processor - I/O board. In Models 360 and 370 they are on a separate system interface board.

HP-HIL Interface

The HP-HIL Interface is used to connect the keyboard and up to six other HP-HIL devices to the system. These can include:

- A mouse.
- A digitizer (graphics tablet).
- A rotary control knob for 2-axis cursor positioning.
- A control dial box for multi-axis positioning of displayed objects.
- An ID module for user identification.
- A button box for entry of user-definable functions.
- A bar code reader.
- A touchscreen bezel.
- A trackball.

RS-232C Interface

A single-port RS-232C interface with 9-pin female connector can be used to connect a terminal, printer, plotter, or other serial device to Series 300 systems.

Standard HP-IB Interface

The standard HP-IB interface can be used to connect up to 14 instruments, 91xx disks, printers, plotters, or other standard speed HP-IB devices to Series 300 systems. However, the standard HP-IB interface does not provide maximum speed if used to connect 79xxB/H disks. The high-speed HP-IB interface is recommended for connection of 79xxB/H disks.

Table 11-1. Built-in Interfaces in HP 9000 Series 300 Systems

Model	332	340	345	360	370	375
HP-HIL Interface	Yes	Yes	Yes	Yes	Yes	Yes
RS-232C Interface	Yes	Yes	Yes	Yes	Yes	Yes
Standard HP-IB Interface	Yes	Yes	Yes	Yes	Yes	Yes
Parallel (Centronics) Interface	No	No	Yes	No	No	Yes
Audio Output	Yes	Yes*	Yes*	Yes	Yes	Yes*
Video I/F	Yes	Yes	Yes	No	No	No
LAN Interface	No	Yes	Yes	Yes	Yes	Yes
SCSI Disk Interface	No	Opt.	Opt.	Opt.	Opt.	Yes
High-Speed HP-IB Disk I/F	No	Opt.	Opt.	Opt.	Yes	Opt.

* Audio output in Models 340, 345, and 375 is provided by a built-in speaker.

Audio Output

To "beep" action completions to the user, HP 9000 Series 300 systems provide an audio output, which comes from a built-in speaker or a female RCA type audio jack that can be connected to an external speaker.

Video Interface

The Model 332 SPU includes a video interface to a 512 by 400 monochrome monitor or a 1024 by 768 monochrome monitor (option 544). For Model 332x Instrument Controllers that provide color display, the built-in monochrome video interface is deleted. Model 340x bundles include the appropriate monochrome or color video interface.

LAN Interface

Models 340, 345, 360, 370, and 375 include a Local Area Network (LAN) interface for communication with other systems on a Local Area Network. The Models 340, 360, and 370 offer an option-specified choice of Attachment Unit Interface (AUI) connection (Option 015) or ThinLAN (Option 017) connection with built-in ThinMAU. In Models 360 and 370, this choice determines the system interface board, which must be replaced

be replaced if the type of LAN connection has to be changed. Models 345 and 375 include both ThinLAN and AUI connection, which are selectable alternates. (The Model 332 can be connected to a LAN via a separately-purchased 98643A LAN interface.)

Single-ended SCSI Disk Interface

The Model 375 system includes a single-ended SCSI interface interface for connection to up to seven SCSI Disks or Digital Data Storage Tapes. In the Model 370, the SCSI interface option replaces the standard high-speed HP-IB interface.

High-Speed HP-IB (Disk) Interface

As an alternative to the SCSI Disk interface, Model 340, 345, 360, and 375 systems can optionally be equipped with a high-speed HP-IB interface that is standard in Model 370 systems. This interface can connect up to eight HP 79xxB/H Disks and 7979A and 7980A/XC Magnetic Tape Units to the system. In the Model 375, the high-speed HP-IB interface option replaces the standard SCSI interface.

Series 300 Buses and Expanders

Direct I/O Bus

The Direct I/O (DIO) bus is a 16-bit bus that is used by most Series 300 interfaces and accessories and by the Model 332. I/O bandwidth is 3 MB/second.

Direct I/O-II Bus

The Direct I/O-II (DIO-II) bus is the standard bus used in the Model 340, 345, 360, 370, and 375. The doubled width of the 32-bit DIO-II bus, as compared to the 16-bit DIO bus, speeds transfers between the processor and memory cards and I/O cards that use the full 32-bit bus width. I/O bandwidth is 6 MB/second.

Adaptation from DIO-II to DIO

Connection of 16-bit DIO interfaces to the 32-bit DIO-II bus used in the Model 360, 370, and 375 uses an HP 98242A or 98242B DIO 4-Slot or 2-slot Backplane (adapter). See Figure 11-1 at right. The 98242A adapter plugs into the top two adjacent DIO-II slots to provide two DIO accessory slots and two DIO I/O slots. The 98242A Backplane is the same 4-slot DIO-I backplane as provided by the Model 332. The HP 98242B adapter plugs into the top DIO-II slot of a DIO-II backplane to provide one accessory slot and one DIO I/O slot. Only one 98242B is permitted – a 98242A must be used if three or four DIO slots are needed.

Series 300 Expanders

Except for the non-expandable Model 340 and 345, Series 300 System Processor Units, Instrument Controllers, and Workstations can have their basic backplane capacity expanded. Three different DIO/DIO-II expanders are available, as described in the following paragraphs.

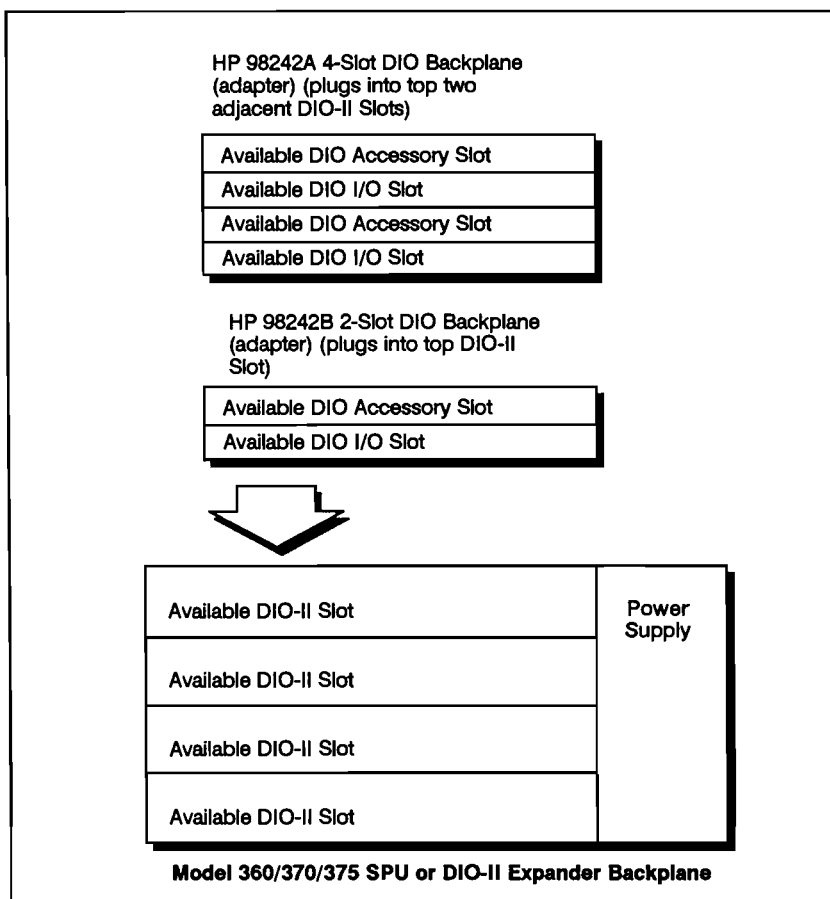


Figure 11-1. DIO-II to DIO Slot Adapters

98568A 8-Slot DIO Expander

The HP 98568A is an 8-slot, direct-connect DIO Expander that provides four DIO slot pairs (four DIO accessory slots and four DIO I/O slots).

The 98568A stacks directly onto the SPU or other extender it is extending. As indicated in Figure 11-2, next page, the 98568A connects directly to the backplane of the SPU or extender it is stacked upon through a slot in the top cover. (The slot is actually in the top cover of the Expander and is interchanged with the top cover

of the SPU when the expander is installed.) A second 98568A Expander can be stacked onto the first one to expand a Model 360, 370, or 375, as shown in Figure 11-2. For use with Model 360, 370, or 375 SPUs and workstations, the first 98568A must be ordered with option 132 to equip it to connect correctly with the DIO-II backplane of those Models.

Only one 98568A DIO Expander can be used with the Model 332. For use with the DIO-I backplane of the Model 332, 98568A option 132 is not necessary.

Series 300 Buses and Expanders, continued

NOTE: Second 98568A is not supported with Model 332 SPU.

Available DIO Accessory Slot	Power Supply
Available DIO I/O Slot	
Available DIO Accessory Slot	
Available DIO I/O Slot	
Available DIO Accessory Slot	
Available DIO I/O Slot	
Available DIO Accessory Slot	
Available DIO I/O Slot	

HP 98568A Direct-Connect 8-Slot I/O Expander



Connects to DIO backplane through slot in top cover of expander

Available DIO Accessory Slot	Power Supply
Available DIO I/O Slot	
Available DIO Accessory Slot	
Available DIO I/O Slot	
Available DIO Accessory Slot	
Available DIO I/O Slot	
Available DIO Accessory Slot	
Available DIO I/O Slot	

HP 98568A Direct-Connect 8-Slot I/O Expander



Connects to DIO backplane through slot in top cover of SPU

Available DIO Accessory Slot	Power Supply
Available DIO I/O Slot	
Available DIO Accessory Slot	
Available DIO I/O Slot	
Available DIO Accessory Slot	
Available DIO I/O Slot	
Available DIO Accessory Slot	
Available DIO I/O Slot	

HP 98568A Option 132 Direct-Connect 8-Slot I/O Expander



Connects to DIO-II backplane through slot in top cover of SPU

Available DIO Accessory Slot	Power Supply
Available DIO I/O Slot	
Available DIO Accessory Slot	
Available DIO I/O Slot	
Available DIO System Slot	Processor - I/O Board
Processor - I/O Board	

Model 332 SPU

Available DIO-II Slot (360 or 375) or System Interface Board (370)	Power Supply
System Interface Board (360) or RAM Board (370)	
Processor Board	
Available DIO-II Slot	

Model 360/370/375 SPU

Figure 11-2. 98568A DIO Expanders

98570A DIO-II Expander

The HP 98570A is a direct-connect DIO-II Expander that provides two DIO-II slots and two DIO slot pairs. The 98570A Option 004 Expander deletes the two DIO slot pairs to provide a total of four DIO-II slots. Up to two 98570As can connect to the Model 360/370/375 SPU as shown in Figure 11-3 at right. Standard and Option 004 Expanders can be mixed as in Figure 11-3 or both the same. To obtain a 98570A with two DIO slots and three DIO-II slots, select the 98570A option 004 Expander and a 98242B 2-slot DIO Backplane for the top DIO-II slot.

Model 370 system bus connections are supported only in the SPU mainframe. For that reason, although Model 370 RAM and accelerator cards are supported in the 98570A, they will not achieve full rated performance in that expander. Installing the system interface board and video board in the expander leaves maximum space for RAM and accelerator boards in the SPU mainframe.

9888A DIO Bus Expander

The HP 9888A is a DIO Bus Expander that provides eight DIO slot pairs, but uses one DIO I/O slot in the SPU or 98568A/98570A Expander. The 9888A is an external expander that connects to the host SPU or expander via a DIO I/O buffer card and a 1.5 meter shielded ribbon cable. (See Figure 11-4.) It is designed to be placed on top of a 92211L/R minirack cabinet or in a 19-inch EIA rack cabinet.

Available DIO-II Slot	Power Supply
Available DIO-II Slot	
Available DIO-II Slot	
Available DIO-II Slot	

HP 98570A Option 004 Direct-Connect 4-Slot DIO-II I/O Expander



Connects to DIO-II backplane through slot in top cover of expander

Available DIO Accessory Slot	Power Supply
Available DIO I/O Slot	
Available DIO Accessory Slot	
Available DIO I/O Slot	
Available DIO-II Slot	
Available DIO-II Slot	

HP 98570A Direct-Connect 6-Slot DIO-II/DIO I/O Expander



Connects to DIO-II backplane through slot in top cover of SPU

Available DIO-II Slot (360 or 375) or System Interface Board (370)	Power Supply
System Interface Board (360) or RAM Board (370)	
Processor Board	
Available DIO-II Slot	

Model 360/370/375 SPU

Figure 11-3. 98570A DIO-II Expanders

Series 300 Buses and Expanders, continued

The following restrictions apply to use of the 9888A:

- A maximum of two 9888As for any Series 300 SPU.
- RAM cards and bus masters are not supported.
- Cards using Auto-DTACK are not supported.
- Cards capable of DMA are supported only with the Model 332.

For a 9888A I/O card support summary, see page 11-17.

VME Bus Connection

The 98577A VME Expander is a direct-connect backplane that provides four VME C.1 slots for customers wishing to use VME bus interfaces. As indicated in Figure 11-5, the 98577A connects directly to the DIO-II backplane of the Model 360/370/375 SPU or 98570A Expander beneath it. No additional expanders can be connected to the top of the 98577A, which limits the system to one 98577A VME Expander. Except for the VME end of the 98646A VME Adapter, The VME cards listed in this interfacing section are transparently supported only in the 98577A VME Expander. The 98577A includes an HP-UX Driver Development Guide and a VME Accessory Development Guide.

98646A VME Adapter. The 98646A VME Adapter consists of a DIO I/O card, a 1.3 meter shielded ribbon cable, and a single VME C.1 card for connection between a Series 300 system and a customer-supplied VME or VXI card cage, such as an HP E1400A VXI mainframe.

Direct Connect Expander Combinations

Figure 11-6, next page, shows the combinations of direct connect expanders that can be used with Model 360/370/375 systems. For Model 332, see Figure 11-2.

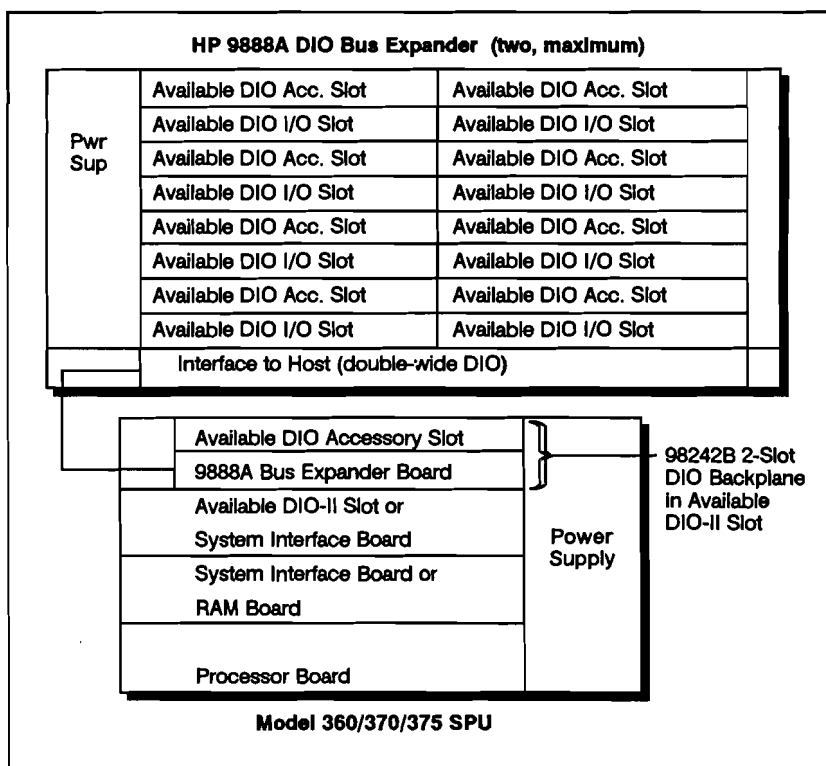


Figure 11-4. 9888A DIO Bus Expander Connection Example

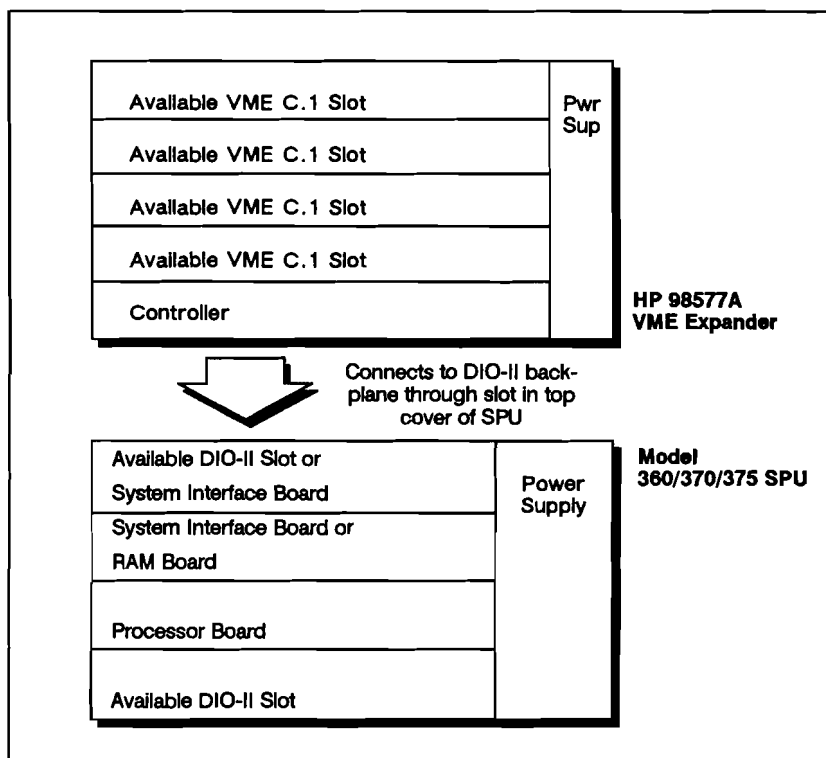


Figure 11-5. 98577A VME Expander

DIO (pair)	
DIO (pair)	
DIO (pair)	
DIO (pair)	
DIO-II or DIO (pair)	
DIO-II or DIO (pair)	
DIO-II	
DIO-II	
DIO-II or DIO (pair)	
DIO-II or DIO (pair)	
DIO-II	
DIO-II	

- 98568A Opt 132 DIO Exp.
- 98570A Std/Opt 004 DIO-II Exp.
- Model 360/370/375 SPU.

DIO (pair)	
DIO (pair)	
DIO (pair)	
DIO (pair)	
DIO (pair)	
DIO (pair)	
DIO (pair)	
DIO (pair)	
DIO-II or DIO (pair)	
DIO-II or DIO (pair)	
DIO-II	
DIO-II	

- 98568A Standard DIO Exp.
- 98568A Opt 132 DIO Exp.
- Model 360/370/375 SPU.

DIO-II or DIO (pair)	
DIO-II or DIO (pair)	
DIO-II	
DIO-II	
DIO-II or DIO (pair)	
DIO-II or DIO (pair)	
DIO-II	
DIO-II	
DIO-II or DIO (pair)	
DIO-II or DIO (pair)	
DIO-II	
DIO-II	

- 98570A Std/Opt 004 DIO-II Exp.
- 98570A Std/Opt 004 DIO-II Exp.
- Model 360/370/375 SPU.

VME C.1	
VME C.1	
VME C.1	
VME C.1	
DIO-II or DIO (pair)	
DIO-II or DIO (pair)	
DIO-II	
DIO-II	
DIO-II or DIO (pair)	
DIO-II or DIO (pair)	
DIO-II	
DIO-II	

- 98577A VME Expander
- 98570A Std/Opt 004 DIO-II Exp.
- Model 360/370/375 SPU.

DIO (pair)	
DIO (pair)	
DIO (pair)	
DIO (pair)	
DIO-II or DIO (pair)	
DIO-II or DIO (pair)	
DIO-II	
DIO-II	

- 98568A Opt 132 DIO Exp.
- Model 360/370/375 SPU.

DIO-II or DIO (pair)	
DIO-II or DIO (pair)	
DIO-II	
DIO-II	
DIO-II or DIO (pair)	
DIO-II or DIO (pair)	
DIO-II	
DIO-II	

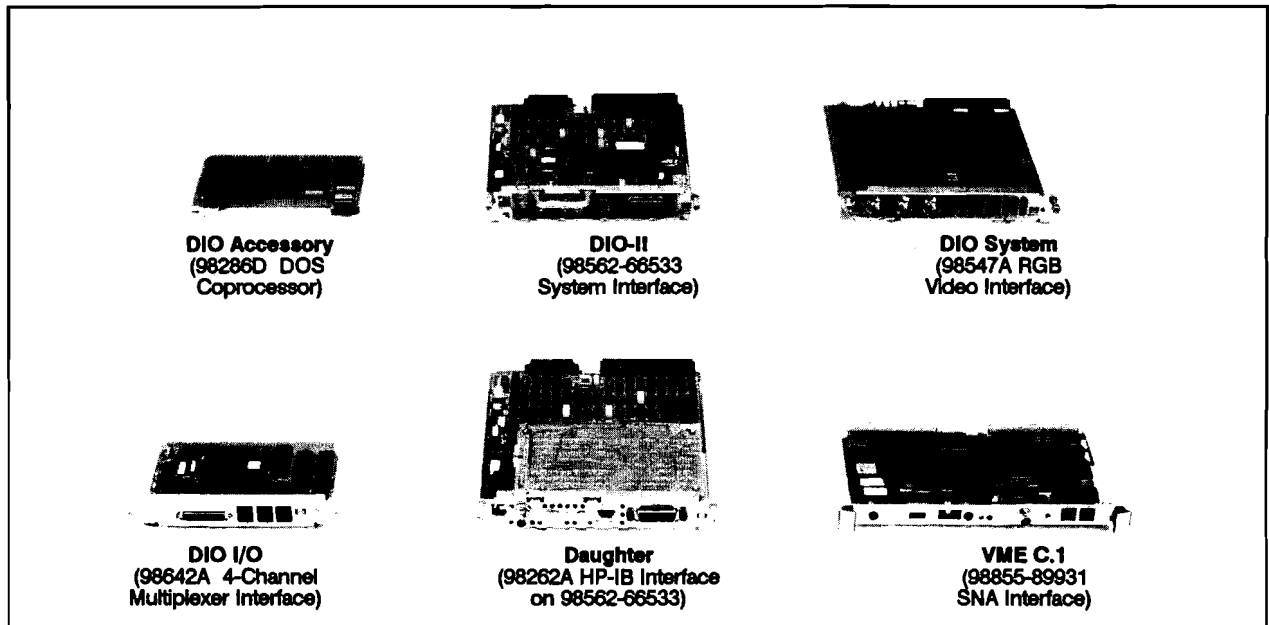
- 98570A Std/Opt 004 DIO-II Exp.
- Model 360/370/375 SPU.

VME C.1	
VME C.1	
VME C.1	
VME C.1	
DIO-II or DIO (pair)	
DIO-II or DIO (pair)	
DIO-II	
DIO-II	

- 98577A VME Expander
- Model 360/370/375 SPU.

Figure 11-6. Direct Connect Expander Combinations

Series 300 Interfaces



Types of Cards Used in Series 300 Systems

DIO Slots

Except for the single DIO I/O-only slot of the Model 340, DIO System slots, and DIO-II slots, DIO slots occur in slot pairs. The upper slot is designated the "accessory" slot and the lower is the "I/O" slot.

Model 360, 370, and 375 SPUs and bundles will require a 98242B backplane adapter or a direct-connect DIO or DIO-II Expander to provide DIO slots.

DIO Accessory Cards

A DIO accessory card is a card without cover plate or I/O connection (except for the 98255A EPROM card, which has an external ribbon cable connected to it when it is programmed).

A DIO accessory card is intended to be installed in the upper slot of a DIO slot pair. However, a DIO accessory card can also be installed in a lower I/O slot that is not needed for a DIO I/O card. If that is done or a DIO I/O slot is not occupied, a blank cover plate

must be fitted over the slot pair to maintain proper cooling air-flow and RFI integrity.

DIO I/O Cards

A DIO input/output card is a card with a metal plate that covers both slots in the pair. The cover plate usually includes an I/O connector or permanently attached cable to an external device.

DIO System Cards

A DIO system card is a wider card, such as a processor card or video interface card that plugs into a DIO system slot. DIO system slots occupy the same vertical space as a pair of DIO slots. The external side of the card is equipped with an attached or separately attachable cover plate.

DIO-II Cards

A DIO-II card is similar to a DIO system card, but includes an additional backplane connector that expands the 16-bit DIO bus to the 32-bit DIO-II definition.

Although a DIO-II slot supports a DIO system card, DIO-II cards are supported only in DIO-II slots unless a card is identified as supported in both types of slot.

Daughter Boards

Daughter boards are boards that connect to a DIO System card or a DIO-II card to provide additional RAM on a processor or RAM board, an additional interface on the system interface board, an accelerator on a video board, or other augmentation of system capabilities.

VME Cards

VME C.1 cards plug into the 98577A VME Expander. At the present time, aside from the VME C.1 card in the 98646A VME Adapter, Hewlett-Packard offers only one VME C.1 card.

Series 300 Interfaces to Peripheral Devices

Table 11-2 lists the Series 300 interfaces used for connection to peripheral devices. These include the 98562-66533 and 98562-66534 multi-interface System Interface cards, which provide the built-in interfaces that are discussed on page 11-2.

SCSI Interfacing

Model 340, 345, 360, and 370 computers all offer a built-in Small System Computer Interface (ANSI X3.131-1986) as an option (or in Model 360 as a 98265A field-installable upgrade) for a system interface card with its disk daughterboard space available. The SCSI interface is standard in the Model 375. A separate 98658A DIO I/O interface is also available. For technical details, see the HP 9000 Series 300 SCSI cards data sheet, literature stock number 5951-7100, or a later revision.

All current Series 300 SCSI interfaces are single-ended, are capable of synchronous and asynchronous operations, and are supplied with an ALT-2 50-pin shielded connector or cable and a plug-on termination resistor module.

SCSI is presently supported only in HP-UX. Source code for the HP-UX SCSI driver is provided in the Programming Environment (PE) software product.

Table 11-2. Series 300 Cards and Daughter Boards for Interfacing to Peripheral Devices

Type	Product or Part Number and Name	Use	Cable or Bus Conn. Included?
DIO I/O	98624A Standard HP-IB Interface	Interfacing to HP-IB instruments, printers, plotters, cartridge tape subsystems, and other standard-speed HP-IB devices (14, max.).	No
DIO I/O	98625B High-Speed HP-IB Interface	Interfacing to HP 79xxB/H Disks, 7979A, 7980A, or 7980XC Magnetic Tape Units, or other high-speed HP-IB devices (8 devices, maximum).	No
Daughter	98262A High-Speed HP-IB Interface	Interfacing to 79xxB/H Disks and 7979A/7980A/7980XC Magnetic Tape Units.	1.0 meter
DIO I/O	98658A SCSI Single-ended Interface	Interfacing to 79xxS Disks and C1700A/C1701A Optical Disks.	1.0 meter
Daughter	98265A Single-ended SCSI I/F	Interfacing to 79xxS Disks and C1700A/C1701A Optical Disks.	1.0 meter
DIO-II	98562-66533 System Interface Card with ThinLAN output	Interfacing to HP-HIL, RS-232C, and HP-IB devices and to LAN via ThinLAN (BNC output) connection.	With SPU
DIO-II	98562-66534 System Interface Card with LAN AUJ output	Interfacing to HP-HIL, RS-232C, and HP-IB devices and to LAN via Attachment Unit Interface (AUJ).	With SPU
DIO I/O	98626A RS-232C Serial (single-port) Interface Option 001 Option 002	Interfacing to modem, terminal, printer, plotter, or other RS-232C device. (98644A is preferable.) Adds 5061-4215 Male DTE cable Adds 5061-4215 Female DCE cable	No 4.6 meters 4.6 meters
DIO I/O	98628A Data Communications (single-port) Interface Option 001 Option 002 Option 003	Interfacing to RS-232C (CCITT V.28), RS-422, RS-423, and RS-449 devices. It supports asynchronous serial and HP asynchronous multipoint (MTS or DSN/DL slave) protocol. Adds 5061-4215 Male DTE cable Adds 5061-4215 Female DCE cable Adds 5061-4250 Male DTE RS-449/423 cable	No 4.6 meters 4.6 meters 4.6 meters
DIO I/O	98642A 4-channel RS-232C Multiplexer Interface	Interfacing to modem, terminals, printers, plotters, or other RS-232C devices.	Yes
DIO I/O	98644A RS-232C Serial (single-port) Interface 17255D 40242C 40242G 40242M	Interfacing to modem, terminal, printer, plotter, or other RS-232C device. Female DCE-terminated cable Female DTE-terminated cable Male DCE-terminated cable Male DTE-terminated cable	No 1.7 meters 5.0 meters 5.0 meters 5.0 meters

Series 300 Interfaces, continued

SCSI is implemented as:

1. An HP 98265A DIO-II daughter board (standard in Model 375, option 011 in Models 345, 360, and 370) with 1 meter cable, that supports a maximum 4 MB/sec data rate.
2. An HP 98658A DIO I/O card with 1 meter cable (option 011 in Model 340), supporting a maximum 2.7 MB/sec data rate.

Because of its better data rate, the 98265A (Model 360/370 option 011) daughterboard should be selected over the 98658A.

An SCSI interface supports a maximum of 7 device addresses (1-7); the interface is address 0. Only devices having pairs of ALT-2 connectors are supportable.

Cabling topology is a single daisy-chained string, up to 6 meters long, including internal device cables. Any mix of supported SCSI devices can be operated on the same bus with minimal performance degradation.

SCSI Cables and Components

Cables for SCSI devices may have to be purchased separately. The following are available.

Product or Part Number	Description
1252-2297	Termination Resistor.
92222A	0.5m Dev-Dev Cable
92222B	1.0m Dev-Dev Cable
92222C	2.0m Dev-Dev Cable
92222D	1.0m Extension Cable
98265-90010	SCSI Technical Reference Manual
98577-90010	Driver Development Guide

SCSI Bus Termination

Bus loading is provided by a 1252-2297 termination resistor module included with the SCSI interface or option 011 SPU.

This module is plugged onto the last device in the chain. Some non-HP devices have internal termination resistors. Only one such device is permitted per bus, it must be the last device in the chain, and the external termination resistor module is not used.

Supported SCSI Devices

Release 7.0 of HP-UX supports magnetic disks and the new optical disks and digital data storage tape drives. The use of Series 300 SCSI interfaces with other serial devices requires non-trivial modifications to the SCSI driver.

HP-IB (IEEE-488) Interfacing

The Hewlett-Packard Interface Bus (HP-IB) is Hewlett-Packard's implementation of IEEE standard 488-1978 and the equivalent IEC 625-1 and ANSI MC1.1 standards. A standard HP-IB interface supports devices representing a maximum of 15 device loads. High speed HP-IB interfaces support up to 8 device loads.

Standard HP-IB cards support a maximum DMA rate of 300 KB per second and a non-DMA rate of 50 KB per second. The maximum rates for High-speed HP-IB cards are 1.2 MB per second via DMA and 50 KB per second without DMA. Overhead per transaction is 5 milliseconds, except with the 98624A card, which takes 15 milliseconds because it lacks interrupt on parallel poll response capability.

HP-IB Speed Modes

Standard speed permits a maximum rate of approximately 500 KB/sec (300 KB/sec, maximum, in Series 300). Most Hewlett-Packard HP-IB devices, particularly instruments, are compatible with standard speed. Standard speed devices often operate at much less than the maximum transfer rate.

High speed permits a maximum rate of 1.2 MB/sec. Most Hewlett-Packard HP-IB peripherals, particularly disks, cartridge tape subsystems, and magnetic tape units are compatible with high speed mode. Some of those require high speed mode.

HP-IB Cables

HP-IB cables for connection of HP-IB devices may have to be purchased separately. The following cables are available:

Product Number	Length	Comments
10834A	0.0m	Stand-off for recessed conn.
92220R	0.3m	Right-angle conn. on one end.
10833D	0.5m	
10833A	1.0m	Right-angle conn. on one end.
82977A*	1.0m	
10833B	2.0m	Right-angle conn. on one end.
82977B*	2.0m	
10833C	4.0m	
8120-3448	6.0m	Check device loads before using
8120-3449	8.0m	

* Not on HP Corporate Price List; can be ordered from HP Direct Marketing Division (DMK).

The 82977A/B cables with right-angle connectors on one end are recommended for use with stacked 325 mm wide *Design-Plus* components.

The maximum cable length allowed depends on the interface used and several attributes of the devices connected to the interface.

1. When only standard speed devices are used, the total HP-IB cabling on a standard speed interface is limited to 2 meters per standard device load or 20 meters total, whichever is less.

- When any high-speed device or interface is used, the total HP-IB cabling is limited to 1 meter per device load or 15 meters total, whichever is less.
- The cable length between any two devices (or the interface and first device) may be any length, as long as the total length does not exceed that specified by rule 1 or 2, as appropriate.
- The recommended topology for HP-IB cabling is a single run of multi-drop (daisy-chained) segments, and not a star configuration. Unlike SCSI, a termination resistor is not required.

HP-IB Device Connection Recommendations

Exclusion: Simple HP-IB devices cannot be connected to the same HP-IB interface as a mounted file system or swap disk.

For best performance:

- Use a high speed interface to connect HP C2200A, C2203A, 793xH, 795xA/B, 796xB, and 926xB Disks.
- Use the built-in standard speed interface to connect cartridge tape subsystems or disks that have cartridge tape drives.
- Use a separate standard speed interface to connect instruments, plotters, and low cost printers.

Safe combinations: Any mix of the following devices can be safely connected to the same bus without serious performance impairment:

- 256xA/B/C Line Printers.
- Any supported HP-IB Disks.
- Any supported Cartridge Tape Subsystems.
- Any supported Magnetic Tape Units.

HP-IB Extension

HP 37204A or 37201A HP-IB Extenders can be used to exceed

the total cable limit on standard speed HP-IB connection. These units translate local bus traffic and, with high data integrity, exchange it with one or more remote buses served by another extender. Each adds one external device load to the local bus.

Extender Feature	37204A	37201A
Topology	Multi-drop	Point-to-point
Interconnect via	Simplex coax or duplex fiber optic cable	Dual twisted pair or RS-232C
Max Length - ext-to-ext	1.2 km	1 km/unlimited*
- total ext.	31 km	not appl.
Max transfer rate	60 KB/sec	775 bytes/second
Prog?	No(transp)	Yes
Ext Bus Addr	None	1
Pass Control Transparent?	Yes	No
PPOLL Transparent?	Yes†	No

* RS-232C connection length is unlimited, via appropriate cables, repeaters, modems, etc.

† Use of 37204A Extenders introduces a 0.025 to 1 ms propagation delay. The HP-UX Device I/O Library sets a PPOLL sense delay timeout of 0.1 ms.

More than one extender can be connected to each local (computer hosted) bus. Each remote bus is essentially a new bus for device-load purposes, but not for address purposes.

RS-232C Serial Interfacing

All Series 300 computers include a "built-in" 25-pin EIA RS-232C asynchronous serial interface (CCITT V24/V28) equivalent to 98644A. Additional interfaces listed in Tables 11-3 and 11-4 (next page) are available in

several implementations, including a 4-channel multiplexer, one of whose channels supports full modem control.

Data Terminal Equipment (DTE) devices transmit on pin 2 and receive on pin 3. Nominally DTE devices are actual terminals, host computers, and hardcopy peripherals.

Data Communications Equipment (DCE) devices transmit on pin 3 and receive on pin 2. Nominally DCE devices are modems and protocol converters.

To make an electrical connection which has a complete data path, each DTE termination must mate with a DCE termination and, of course, each pair of connectors must be of the opposite sex. Table 11-4 (next page) summarizes the connections from Series 300 RS-232C serial interfaces.

Any arbitrary DTE/DCE connection only guarantees that transmit (Tx/D), receive (Rx/D) and ground lines are present and correctly mated. The devices at each end must also be configured identically for bit rate (bps), bits-per-character, start bits, stop bits, parity, character codes, and flow control. All Series 300 RS-232C interfaces support the following capabilities:

Data Rates	110, 134.5, 150, 300, 600, 1200, 1800, 2400, 4800, 9600, 19200, and 38400* bps
Start Bits	1
Char Size	5, 6, 7, or 8 bits
Parity	Odd, even, or none
Stop Bits	1 or 2 (at 6, 7, or 8 bits per character)
Char Codes	Transparent. HP Operating systems support ASCII, HP ROMAN8, and HP/15 (Asian, HP-UX only)

* 38400 bps is not available on 98628A

Series 300 Interfaces, continued

RS-232C Interface Recommendations

The single-byte buffered interfaces (98626A and 98644A) are not recommended for any application that generates burst mode input to the computer, such as 4800 bps or faster modems (UUCP_{cu}(1)), graphics terminals, serial instruments, industrial controllers, and other serial "black boxes".

Aggregate multiplexer throughput is card-limited to 76,800 bps continuous input data. A busy system may further reduce this figure, but no data loss should occur if a handshake (such as host-initiated Xon/Xoff receive pacing) is used.

To ensure that no data is lost due to overruns, applications at data rates above 1200 bps should implement some type of flow control between DTE and DCE. The flow control that is supported under the various Series 300 operating systems is summarized in Table 11-4, below.

Table 11-3. Series 300 Serial Interfacing Summary

RS-232C Interface	No. of Ports	Cable Length	Type of Conn.	Buffer Size	Comment
Built-in Serial w/40242G cable w/40242M cable w/17255D cable w/40242G cable	1	0.3m* 5.0m 5.0m 1.4m 5.0m	DTE (25F) DTE(25F) DTE(25M) DCE(25F) DCE(25M)	1 byte	Full modem control Full modem control Full modem control TxD, RxD, & DTR only TxD, RxD, & DTR only
98626A Serial w/Opt 001 cable w/Opt 002 cable	1	None 4.6m 4.6m	50-pin DTE(25M) DCE(25F)	1 byte	Full modem control TxD & RxD only
98628A Datacomm w/Opt 001 cable w/Opt 002 cable	1	None 4.6m 4.6m	50-pin DTE(25M) DCE(25F)	256 bytes	Full modem control TxD & RxD only
98642A Multiplexer w/Opt 100	1 3	5.0m 5.0m Deleted	DTE(25M) DCE(25M) See Note	128 bytes/ port	Full modem control TxD & RxD only
98644A Low-Cost Serial w/40242G cable w/40242M cable w/17255D cable	1	None 5.0m 5.0m 1.4m	DTE (25F) DTE(25F) DTE(25M) DCE(25F)	1 byte	Full modem control Full modem control TxD, RxD, & DTR only

* 0.3m is length of 9M to 25F adapter cable included with the built-in Interface of Model 360 and 370 systems.

NOTE: 98642A Option 100 deletes all cables. At the cover plate, Port 0 is a DTE (25F) connection and Ports 1 through 3 are three-wire RJ-11C. If you specify 98642A Option 100, use cables for 98644A for Port 0 of 98642A.

Table 11-4. Series 300 RS-232C Flow Control

	In HP BASIC/UX	In HP BASIC/WS	In HP-UX	In Pascal/WS
Built-in, 98644A, or 98626A Opt 001*	Outbound CTS† or bidirectional Xon/Xoff	Outbound CTS†, DSR, CD, or RI	Outbound CTS† or bidirectional Xon/Xoff	Outbound CTS†, DSR, CD, or RI, bidirectional Xon/Xoff, or Enq/Ack
98628A Opt 001*	Outbound CTS† or bidirectional Xon/Xoff	Outbound CTS†, DSR, CD, RI bidirectional Xon/Xoff, or Enq/Ack	Outbound CTS† or bidirectional Xon/Xoff	Outbound CTS†, DSR, CD, RI, bidirectional Xon/Xoff, or Enq/Ack
98642A Port 0	Outbound CTS† or or bidirectional Xon/Xoff	Card not supported	Outbound CTS† or bidirectional Xon/Xoff	Card not supported
98642A Ports 1 - 3	Bidirectional Xon/Xoff	Card not supported	Bidirectional Xon/Xoff	Card not supported

* Most HP and non-HP peripherals use DTR (Data Terminal Ready) for hardware flow control. The HP 17255D (male/female), 17355F (female/female), and 40242G (male/male) cables wire DTR on one end to CTS (Clear To Send) and to DSR (Data Set Ready) on the other. One of these cables is generally necessary when hardware flow control is desired.

† With cable option 002, output hardware flow control is possible only in HP BASIC/WS and Pascal/WS, and only with external lines CTS and DTR, which are wired, respectively, to CD (Carrier Detect) and RI (Ring Indicator) at the card.

NOTE: Flow control in HP-UX/DOS depends upon the application.

RS-232C Cabling Distances

RS-232C connections commonly provide satisfactory service to distances of 1000 feet or more. However, HP commits to resolve only problems that can be demonstrated at a distance of 50 feet, the EIA specified maximum, or less.

Workstation Video Display Interfaces

Table 11-5, below, lists the Series 300 interfaces used for connection to the monochrome and color monitors that are used for instrument controller and workstation displays.

Communications Interfaces

Table 11-6, next page, lists the Series 300 interfaces that are available for system-to-system communications.

Table 11-5. Series 300 Cards and Daughter Boards for Interfacing to Workstation Display Monitors

Type‡	Product or Part Number and Name	Use	Cables Included?
DIO I/O	98287A† Display Station I/F	Interfacing to 98700H Display Station.	2.0 meter
DIO Syst	98542A 512 by 400 Monochrome Video Output	Interfacing to 35731A Monochrome Monitor.	2.4 meter
DIO Syst	98543A 512 by 400 by 4 Color Video Output	Interfacing to 35741A Color Monitor.	Three 2.4 meter
DIO Syst	98544B 1024 by 768 Monochrome Video Output	Interfacing to 98786A Monochrome Monitor.	2.4 meter
DIO I/O and DIO Acc.	98546A† Display Compatibility Interface	Interfacing to 35741A Color or 35731A Monochrome monitor for use with software that requires a high degree of compatibility with Series 200 displays. (Bit-mapped video output also requires a built-in or 98542A monochrome video output or a 98543A color video output.)	2.4m and 0.6m BNC-RCA, 2.4m RCA-RCA, and 0.6m BNC-BNC
DIO Syst	98547A 1024 by 768 by 6 "C" Color Video Output	Interfacing to 98751A or 98785A Color Monitor.	3 meter
DIO-II or	98548A 1280 by 1024 "MH" Monochrome Video Output	Interfacing to 98788A Monochrome Monitor.	Yes
DIO Syst	98549A 1024 by 768 by 6 "C + " Color Video Output	Interfacing to 98751A or 98785A Color Monitor.	Yes
DIO-II	98550A 1280 by 1024 by 8 "CH" Color Video Output	Interfacing to 98752A or 98788A Color Monitor.	Yes
Daughter	98556A Integer-based 2-D "CHX" Graphics Accelerator for 98549A or 98550A	Acceleration of 2D graphics output via 98549A or 98550A Color Video Output. DIO-II addressing is required for use of the accelerator.	n/a
DIO I/O	98627A† Color Video I/F	Interfacing to (discontinued) 13279B Color Monitor.	2.4 meters
DIO I/O	98724A† Display Controller (local graphics bus) Interface	Interface to 98720A SRX Display Controller.	Yes
DIO Syst	98725A Display Controller (local graphics bus) Interface	Interface to 98720A SRX Display Controller.	Yes
DIO-II only	98726A† Display Controller (local graphics bus) Interface	Interface to 98730A TurboSRX Display Controller.	Yes

‡ For definitions of interface types, see page 11-8.

† This interface is not supported in Model 340C + /CH/CHX/M/MH/SRX Workstation.

Series 300 Interfacing and Accessories, continued

Other Series 300 Interfaces

Table 11-7, next page, lists the Series 300 interfaces that are available for miscellaneous general-purpose and special purpose connections.

Maximum I/O Cards

The hardware architecture limit is 23 DIO cards, if that number of I/O slots is available. The reason is that only select codes 8 and 10 through 31 are available for plug-in I/O cards. Select codes 0 through 6 are not available for plug-in interfaces in BASIC and

Pascal. Select codes 7 and 9 are used for built-in HP-IB and RS-232C and cannot be disabled. Consult an HP Systems Engineer for assistance with configuration of large Series 300 systems.

Table 11-6. Series 300 Cards for Communications Interfacing

Type	Product or Part Number and Name	Use	Cable or Bus Conn. Included?
DIO I/O	36592A HP-UX SNA Link (98649A interface card)	Interfacing standalone system to SNA Link to IBM 370 or plug-compatible system.	Yes
DIO I/O	36593A HP-UX Gateway SNA Link (98649A interface card)	Interfacing gateway system to SNA Link to IBM 370 or plug-compatible system.	Yes
DIO I/O	36941A X.25/300 Link	Interfacing system to public or private X.25 PacketSwitching network.	Yes
DIO I/O	50955A IBM 3278 Display Station Emulator	Interfacing to IBM or plug-compatible mainframe, emulating an IBM 3278 Display Station.	No
DIO I/O	50962A Shared Resource Management Interface	Interfacing to Shared Resource Management (coaxial) Network	No
DIO I/O	98171A LAN Interface Card with ThinMAU Option 740 (excludes option 840) Option 840 (excludes option 740)	Interfacing to Local Area Network via ThinLAN Provides ThickMAU Assembly instead of ThinMAU and BNC Tee Provides Twisted Pair MAU instead of ThinMAU and BNC Tee	BNC Tee 6 meter AUJ 1 meter
Daughter	98235A AUJ LAN connection (Model 340 only)	Interfacing of Model 340 to Local Area Network via Attachment Unit Interface (AUJ).	No
Daughter	98237A ThinLAN connection (Model 340 only)	Interfacing of Model 340 to Local Area Network via ThinLAN (BNC output) connection.	BNC Tee
DIO-II	98562-66533 System Interface Card with ThinLAN output.	Interfacing to HP-HIL, RS-232C, and HP-IB devices and to LAN via ThinLAN (BNC output) connection.	With SPU
DIO-II	98562-66534 System Interface Card with LAN AUJ output.	Interfacing to HP-HIL, RS-232C, and HP-IB devices and to LAN via Attachment Unit Interface (AUJ).	With SPU
DIO I/O	98641A RJE Interface	Emulation of IBM 2780 or 3780 workstation for Remote Job Entry to an IBM 360/370 or plug-compatible system.	4.6 meters
DIO I/O	98643A* LAN AUJ Interface Option 241	Interfacing to Local Area Network via ThinLAN. Delete ThinMAU and BNC Tee	BNC Tee
DIO I/O	98691A Programmable Datacommunications Interface Option 001 Option 002 Option 003	Interfacing to user-developed communications applications. Adds 5061-4215 Male DTE cable Adds 5061-4215 Female DCE cable Adds 5061-4250 Male DTE RS-449/423 cable	No 4.6 meters 4.6 meters 4.6 meters
VME C.1	98855-89931 IBM 5080 Emulator	Interface to IBM or plug-compatible system.	No

* Discontinued product, listed here for reference.

Table 11-7. Miscellaneous Series 300 Interface Cards

Type	Product or Part Number and Name	Use	Cable or Bus Conn. Included?
DIO I/O	98622A General Purpose I/O (GPIO) Interface Option 001 Option 002	Interfacing to a variety of devices via input and output, up to 16 bits wide. Adds 5061-4209 Untermated cable. Adds 5061-4210 Cable to 6940B Multiprogrammer	No 4.6 meters 4.6 meters
Cable	98053A GPIO Cable	Connection to Versatec Plotter.	4.6 meters
DIO I/O	98623A Binary Coded Decimal (BCD) Interface Option 001	Connection of BCD inputs (43 input lines) and control outputs (8 output lines) to instruments or other BCD or digital devices. Adds 5061-4217 Untermated cable	No 4.6 meters
DIO I/O	98630A Breadboard Interface Option 001	User-development of interface for unique needs. Adds 98630-66502 Service Extender Card	No
DIO I/O	98633A Multiprogrammer Interface 14704A 14704B 14704C	Interfacing to 6944A Multiprogrammer Cable to Multiprogrammer Cable to Multiprogrammer Cable to Multiprogrammer	No 1.0 meter 2.0 meters 4.0 meters
DIO I/O	98640A 7-channel Analog Input Interface	Interfacing to multiple analog inputs (supported by 98645A Measurement Library in BASIC/WS and Series 200/300 Pascal operating systems only)	No
DIO I/O & VME	98646A DIO-to-VME Adapter	Interfacing to customer-furnished VME or VXI card cage.	Yes

Direct Memory Access

Direct Memory Access (DMA) supports transfer of data between RAM and an I/O card at high speed and in parallel with other CPU and I/O operations. A DMA controller is standard on all Series 300 computers. A maximum of one two-channel DMA controller is supported on any Series 300 computer.

Two independent, dynamically-assignable DMA channels are provided by the DMA controller. Only two DMA-compatible I/O cards can be using DMA at any instant in time. DMA channels are allocated automatically by the operating system.

If three or more DMA-compatible I/O cards are present and a third DMA I/O request is made while the two channels are busy, the operation proceeds in fast-handshake (non-DMA) mode. The algorithms for arbitrating DMA contention vary among operating systems. There is no supported way for users or system programmers to guarantee that any given I/O request will be granted a DMA channel. There is also no supported way to disable DMA on cards that support it.

Power Limitations

The only power limitation presently imposed on Series 300 computers is that a 98549A "C+" or 98550A "CH" video card with a 98556A accelerator must not be used in the same Model 370 (or 350) card cage as 98264A/B ECC memory. Generally, this means that the video card is installed in a 98570A DIO-II Expander.

Series 300 Accessories

Accessory and Memory Cards

Table 11-8, below, lists the accessory and memory cards that are available for Series 300 computers.

Table 11-8. Series 300 Accessory and Memory Cards

Type	For Model	Product or Part Number and Name	Use	Cable or Bus Conn. Included?
Daughter	345/375	98229A 4 MB add-on RAM	Adds 4 MB ECC RAM.	n/a
Daughter	375	98229B 8 MB add-on RAM	Adds 8 MB ECC RAM.	n/a
DIO-II & System Bus	360 370 (or 330)	98248B Floating Point Accelerator Option 004 Option 005	Speeds floating point calculations in Model 360, 370, (or 330). Deletes 3-station system bus conn. Substitutes 4-station system bus connector.	3-station system bus 4-station
DIO Acc	332 360 370	98253A† EPROM Development Kit with EPROM programmer interface.	Supports development of EPROM programs and programming of the EPROM memory card in BASIC/WS and Pascal/WS operating system.	No
DIO Acc	All	98255A EPROM Memory Card	Provides EPROM storage that emulates a read-only disk in BASIC/WS or Pascal/WS operating system.	No
DIO-II & System Bus Daughter Daughter	370 (or 330* or 350)	98258A 4 MB RAM Controller Option 004 98258B 4 MB Add-on RAM‡ 98258C 12 MB Add-on RAM	Provision of 4 MB of parity memory*, expandable to 8 MB or 16 MB (max. of two for 32 MB total). Deletes 3-station system bus conn.* Increases RAM on 98258A Card to 8 MB Increases RAM on 98258A Card to 16 MB	3-station system bus n/a n/a
DIO Acc	332/360/ 370	98259A 128 KB Bubble Memory	As 128 KB electronic disk in BASIC/WS or Pascal/WS operating system.	n/a
DIO-II & System Bus	370 (or 350)	98264A 8 MB ECC RAM Controller Option 004 Option 005	Provision of 8 MB of ECC memory for Model 370 (or 350). Deletes 3-station system bus conn. Substitutes 4-station system bus connector	3-station system bus 4-station
DIO-II & System Bus	370 (or 350)	98264B 16 MB ECC RAM Controller Option 004 Option 005	Provision of 16 MB of ECC memory for Model 370 (or 350). Deletes 3-station system bus conn. Substitutes 4-station system bus connector.	3-station system bus 4-station
Daughter	360	98267A 4 MB add-on RAM‡	Adds 4 MB Parity-Checking RAM.	n/a
Daughter	360	98267B 8 MB add-on RAM	Adds 8 MB Parity-Checking RAM.	n/a
Daughter	360	98267C 12 MB add-on RAM	Adds 12 MB Parity-Checking RAM.	n/a
Daughter	340	98268A 4 MB add-on RAM	Adds 4 MB Parity-Checking RAM.	n/a
Daughter	332	98269A 1 MB RAM	Provides 1 MB Parity-Checking RAM.	n/a
Daughter	332	98269B 4 MB RAM	Provides 4 MB Parity-Checking RAM.	n/a
DIO Acc	All 300	98286A DOS Coprocessor	Adds ability to execute DOS programs.	n/a
DIO Acc	310/320°/ 330/350	98603B° ROM-based BASIC	Provides BASIC 5.1 executable from ROM.	n/a

† The HP 98253A EPROM Development Kit is not supported in Model 340C+ /CH/CHX/M/MH/SRX Workstation.

* The HP 98258A 4 MB RAM Controller, not expandable with 98258B/C add-on RAM board, can also be used to add memory to Model 330; Option 004 should also be ordered to delete the unneeded system bus frontplane connector.

‡ No trade-in credit is offered for 98258B toward purchase of 98258C or for 98267A toward purchase of 98267B or C.

° Discontinued product, listed for reference.

DIO Card Supportability in 9888A Expander

DIO Card Support in 9888A Expander

Table 11-9, below, summarizes the supportability of DIO cards in the 9888A Expander.

Table 11-9. Series 300 DIO Card Supportability in 9888A Expander

Card Product or Part Number	Name	Supported?
09826-66544	Service Extender	Depends upon handshaking modes implemented by designer of circuitry on the extended card.
36592A/36593A 50955A 50961A° 50962A 98171A	SNA Link (includes 98649A interface) IBM 3278 Coaxial Interface SRM Coaxial Interface SRM Coaxial Interface LAN Interface	Yes Yes Yes Yes Yes
98204B° 98255A 98256A 98257A 98259A	512x340 Monochrome Video Interface EPROM Memory Card 256 KB RAM 1 MB RAM 128 KB Bubble Memory	No No No No Yes
98286A/S/D 98287A 98546A 98603A 98603B	DOS Coprocessor 98700H Display Station Interface 512x390 Video Compatibility Interface ROM-based BASIC 4.0 ROM-based BASIC 5.1	No No Yes No No
98620A°/B 98622A 98623A 98624A 98625A°/B	DMA Controller General-Purpose I/O Interface Binary Coded Decimal (BCD) Interface HP-IB Interface (standard speed) High-Speed HP-IB Interface	No Only in Models 310 and 320° Yes Only in Models 310 and 320° Only in Models 310 and 320°
98626A 98627A 98628A 98629A° 98630-66502	RS-232C Serial Interface 576x455x4 Color Video Output Interface Data Communications Interface SRM Interface Service Extender Card	Yes Yes Yes Yes Depends upon card plugged into the service extender.
98633A 98640A 98641A 98642A 98643A°	6944A Multiprogrammer Interface 7-Channel Analog Input Interface RJE 2780/3780 Interface 4-Channel RS-232C Multiplexer Interface Local Area Network (LAN) AUI Interface	Only in Models 310 and 320° Yes Yes Yes Yes
98644A 98646A 98647A 98649A° 98658A	RS-232C Serial Interface DIO-to-VME Adapter PC-IB Interface SNA Interface SCSI Single-Ended Interface	Yes No No Yes No
98691A 98695A° 98724A 9888A	Programmable Datacomm Interface IBM 3270 Coaxial Interface Display Controller Interface to 98720A Daisy-chained additional 9888A	Yes Yes No No

° Identifies discontinued product listed here for reference.

NOTES:

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Series 800 Interfacing

Series 800
Interfacing

The Interfaces

HP 9000 Series 800 Superworkstations and Network Servers use CIO interfaces for most applications. They also use CTB interfaces for graphics connection to display controllers and for SNA communication with IBM and plug-compatible systems or for communication with X.25 packet switching networks. Table 12-1, below, lists the available interfaces by CIO or CTB and their category of use.

In Series 800 Superworkstations, some CTB interfaces may actually occupy the width of both a CTB slot and the adjacent CIO slot, which is made possible by removable center guide slots, as shown in Figure 12-1, next page. With its piggybacked SBX module, the 28667A RTI interface is too thick to fit into a single CIO slot, so Table 12-1 provides an interface card size column that indicates how many slots each interface occupies.

CIO Expansio.

The CIO channel carries 800 Superworkstations, except for the restricted configuration Model 834 Superworkstations, can be expanded with the addition of a CIO Expander. (Figure 12-1, next page.) The A1013A CIO Expander adds 7 CIO channels (net) to Model 825s. The A1039A Upgrade adds 8 CIO channels to Model 835s.

Table 12-1. HP 9000 Series 800 Input/Output Interfaces

Category	Product Number and Name	Use	Interface Card Size
CIO Multi-device	HP 27110B HP-IB Interface	Interfacing disks, cartridge tape subsystems, magnetic tape units, printers, plotters, and other HP-IB devices to the system.	1 CIO slot
	HP 27111A HP-FL Interface	Interfacing HP-FL disks (up to 8 disks per interface).	1 CIO slot
	HP 98196A 6-Channel Multiplexer	Interfacing terminals, printers, plotters, and other serial devices to the system.	1 CIO slot
CIO System-to-System Comm	HP 91786B LAN/9000 Series 825 Link Interface	Communication with other HP and non-HP systems via IEEE 802.3 Local Area Network connection.	1 CIO slot
CIO Real-Time Interface	HP 28667A* Real-Time Interface	Via HP 28672A 8-channel Serial SBX module or other SBX Module, connects system to real-time processes that require faster real-time response than the host system can routinely provide.	2 CIO slots
Other CIO Interfaces	HP 27114A Parallel Asynchronous FIFO Interface	Interfacing 8 or 16-bit data buses to the system.	1 CIO slot
Graphics Interfaces	HP A1017A Display Controller Interface	Interfacing graphics display controllers to the system (4, maximum) (Not usable in same system with A1047A interface.)	1 CTB + CIO CIO slot
	HP A1047A Graphics Animation Interface	Interfacing TurboSRX display controller to Model 835 (1, max.) for Animation uses (Not usable in same system with A1017A interface.)	1 CIO slot & 1 CTB slot
	HP A1048A Second Graphics Animation Interface	Interfacing second TurboSRX display controller to Model 835 for Animation uses (1, maximum; requires A1047A Interface)	1 CIO slot
CTB Network Interfaces	HP 98191A* or 98193A* HP-UX SNA Link Interface	Interfacing standalone or gateway system to SNA Link to IBM or plug-compatible system.	1 CTB + CIO slot
	HP 36940A* X.25/800 Link Interface for Model 825/835	Communication via private or public X.25 Packet Switching Network.	1 CTB + CIO slot
	HP 32124A OSI Express MAP 3.0 Carrierband Interface	Communication with MAP 3.0-compliant factory floor devices and systems via carrierband cables (includes external CTB to HP-PB backplane converter and four-card MAP 3.0 OSI Express Carrierband Interface).	1 CTB slot
	HP 32125A OSI Express MAP 3.0 Broadband Interface	Communication with MAP 3.0-compliant factory floor devices and systems via broadband cables (includes external CTB to HP-PB backplane converter and four-card MAP 3.0 OSI Express Broadband Interface).	1 CTB slot

* Not supported in Model 834 Superworkstations because of their configuration restrictions.

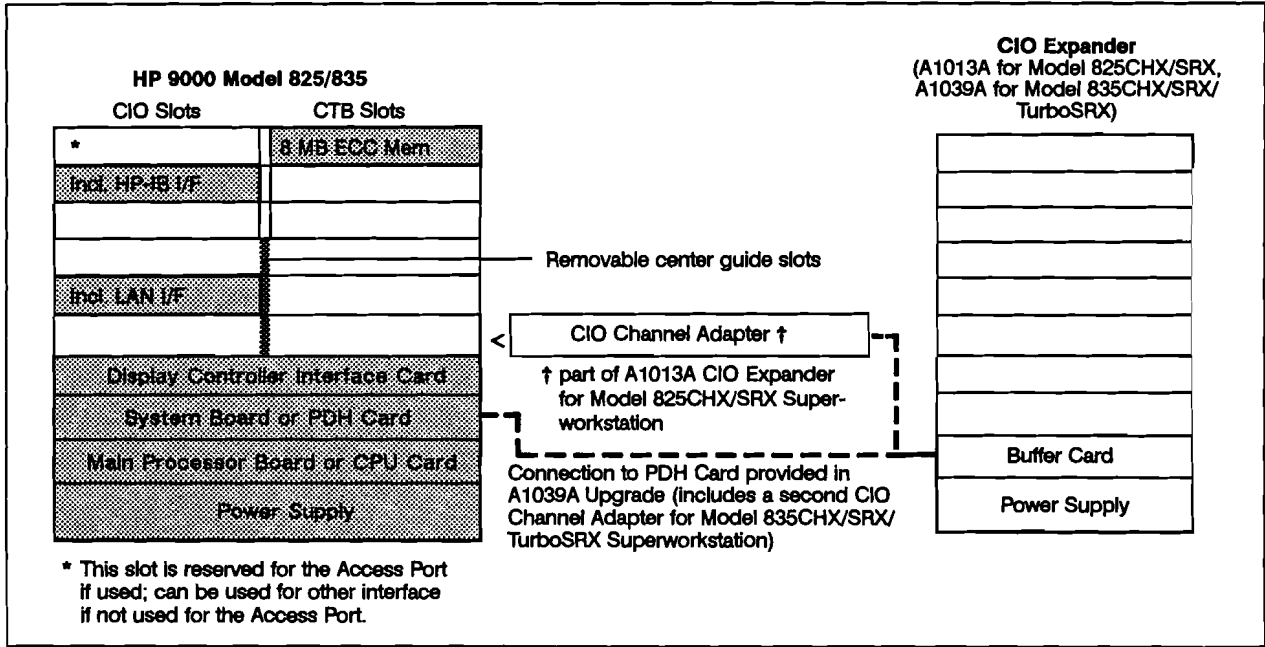


Figure 12-1. Expansion of CIO Channel Capacity of Model 825/835 Superworkstations

Multi-Device Interface Connections

Multiple devices connect to the HP 27110B HP-IB interface, HP 27111A HP-FL interface, and the HP 98196A 6-Channel Multiplexer as shown in Figures 12-2 through 12-4, below and on next page.

HP-IB represents the full name "Hewlett-Packard Interface Bus", which is Hewlett-Packard's implementation of IEEE Standard 488-1978 and the equivalent IEC 625-1 and ANSI MC1.1 standards.

The HP-IB interface connects to multiple devices via a bus cable whose connection should daisy-chain from one device to the next, as illustrated in Figure 12-2.

HP-FL represents the full name "Hewlett-Packard Fiber Link", which is a fiber optic connection to as many as eight HP-FL disks, as shown in Figure 12-3, next page.

Multiple devices connect to the multiplexer via its 6-connector panel, as shown in Figure 12-4, next page.

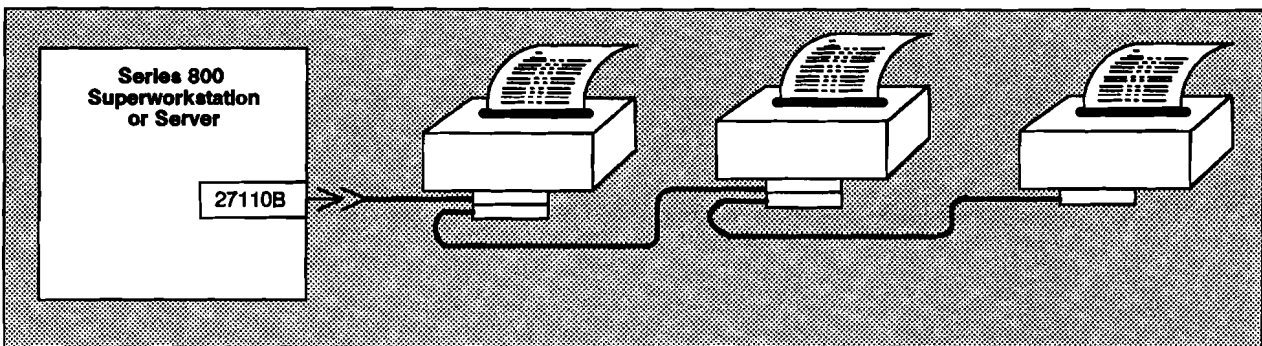


Figure 12-2. HP-IB Device Connections via 27110B HP-IB Interface

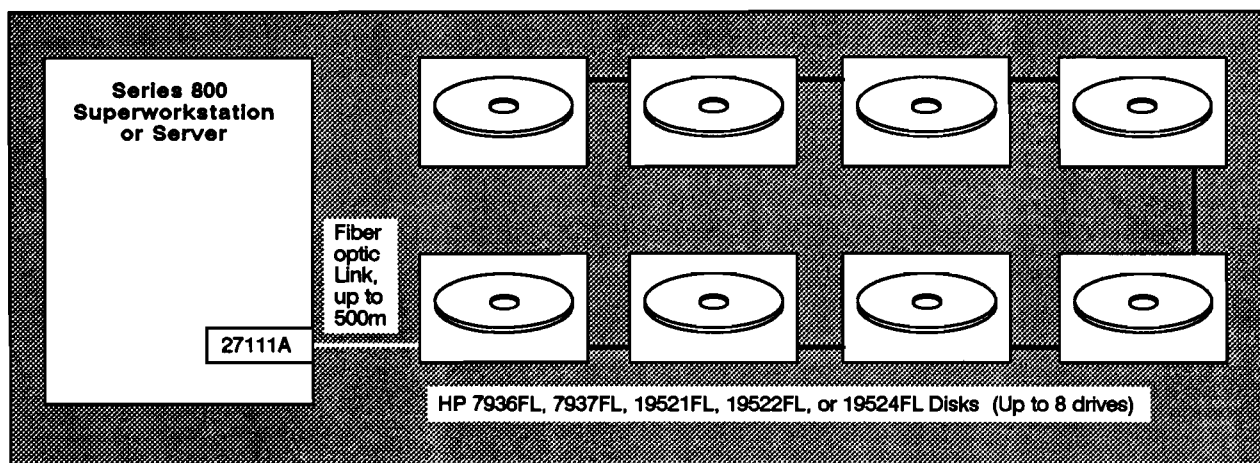


Figure 12-3. HP-FL Connections to Disks via 27111A HP-FL Interface

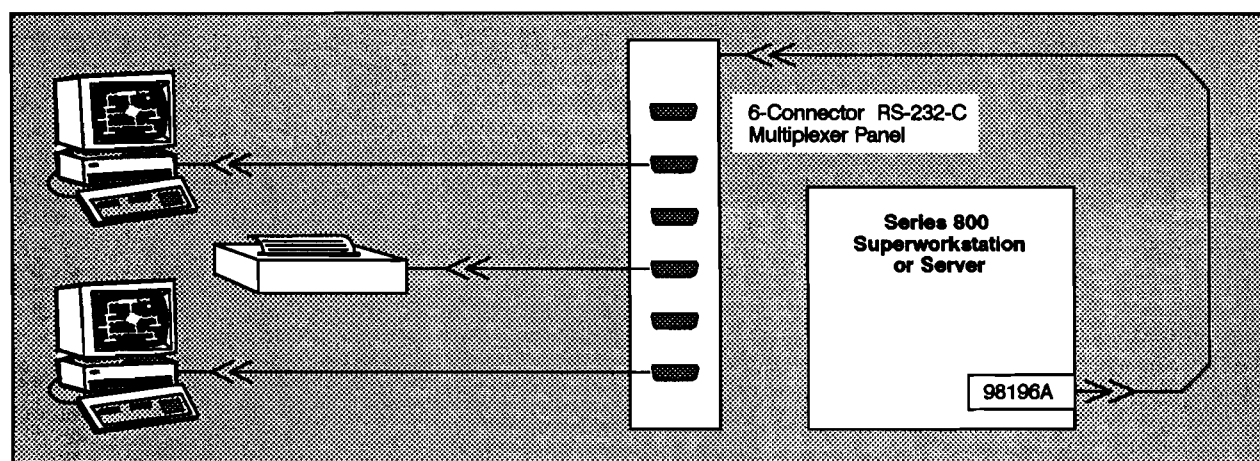


Figure 12-4. RS-232-C Device Connections via 98196A 6-Channel Multiplexer

HP-IB Cables

HP-IB cables for connection of HP-IB devices may have to be purchased separately. The available cables are listed at right.

The cables with right-angle connectors on one end are recommended for use with stacked 325 mm wide *Design-Plus* components.

NOTE: 82977A/B cables are not on the HP Corporate Price List; they can be ordered from HP's Direct Marketing Division (DMK).

Product Number	Length	Comments
10834A	0.0m	Stand-off for recessed conn.
92220R	0.3m	Right-angle conn. on one end.
10833D	0.5m	
10833A 82977A	1.0m 1.0m	Right-angle conn. on one end.
10833B 82977B	2.0m 2.0m	Right-angle conn. on one end.
10833C	4.0m	
8120-3448 8120-3449	6.0m 8.0m	Check device loads before using

The maximum cable length allowed depends on the interface used and several attributes of the devices connected to the interface.

1. When only standard speed devices are used, the total HP-IB cabling on a standard speed interface is limited to 2 meters per standard device load or 20 meters total, whichever is less.
2. When any high-speed device or interface is used, the total HP-IB cabling is limited to 1 meter per device load or 15 meters total, whichever is less.

Series 800 Interfacing, continued

- 3 The cable length between any two devices (or the interface and first device) may be any length, as long as the total length does not exceed that specified by rule 1 or 2, as appropriate.
- 4 The recommended topology for HP-IB cabling is a single run of multi-drop (daisy-chained) segments, and not a star configuration.
2. A separate 27110B set to high speed to connect HP 7979A, 7980A, and 7980XC magnetic tape units, up to four per interface.
3. A separate 27110B set to standard speed to connect printers, up to four per interface.
4. A separate 27110B set to standard speed to connect plotters, up to four per interface.
5. A separate 27110B set to standard speed to connect instruments, up to eight per interface.

HP-IB Speed Modes

Standard speed permits a maximum rate of approximately 500 KB/sec. Most Hewlett-Packard HP-IB devices, particularly instruments, are compatible with standard speed. Standard speed devices often operate at much less than the maximum transfer rate.

High speed permits a maximum rate of 1.2 MB/sec. Most Hewlett-Packard HP-IB peripherals, particularly disks, cartridge tape subsystems, and magnetic tape units are compatible with high speed mode. Some of those require high speed mode.

HP-IB Device Connection Recommendations

For connections to Series 800 Superworkstations or Servers, use:

1. A 27110B set to high speed to connect HP 793xH, 795xA/B, 796xB, 9122C, and 9127A Disks and 35401A or 914xA Cartridge Tape Subsystems*, up to four per interface.

* For best performance, use separate HP-IB interfaces for disks and cartridge tape subsystems.

HP-IB Extension

HP 37204A or 37201A HP-IB Extenders can be used to exceed the total cable limit on standard speed HP-IB connection. These units translate all local bus traffic and, with high data integrity, exchange it with one or more remote buses served by another extender. Each adds one external device load to the local bus. See table at right for extender information.

Extender Feature	37204A	37201A
Topology	Multi-drop	Point-to-point
Interconnect via	Simplex coax or duplex fiber optic cable	Dual twisted pair or RS-232C
Max Length - ext-to-ext	1.2 km	1 km/unlimited*
- total ext.	31 km	not appl.
Max transfer rate	60 KB/sec	775 bytes/second
Prog?	No(transp)	Yes
Ext Bus Addr	None	1
Pass Control Transparent?	Yes	No
PPOLL Transparent?	Yes†	No

* RS-232C connection length is unlimited, via appropriate cables, repeaters, modems, etc.

† Use of 37204A Extenders introduces a 0.025 to 1 ms propagation delay. The HP-UX Device I/O Library sets a PPOLL sense delay timeout of 0.1 ms.

More than one extender can be connected to each local (computer hosted) bus. Each remote bus is essentially a new bus for device-load purposes, but not for address purposes.

User Communications

User Communications Components

HP 9000 Series 300 systems and workstations and HP 9000 Series 800 Superworkstations and Servers can use the following components for user communication:

- Workstation Display Monitor Subsystem (see Table 13-1) and HP-HIL Keyboard (see Figures 13-1 and 13-2, next page).
- Display Terminals and PCs (see Table 13-2, page 13-4, and Figures 13-3 and 13-4, pages 13-3 and 13-5).
- LAN-connected X-Window PCs (see Figure 13-5 and Table 13-3, page 13-6).
- LAN-connected X-Window Graphics Terminals (see Figure 13-6 and Table 13-4, page 13-7).
- HP-HIL Devices (see Table 13-5, page 13-8, and Figure 13-7, page 13-9).
- Bar Code Readers.



National Versions

For National Versions of Keyboards and Terminals, see page 13-10.

Table 13-1. Workstation Display Subsystems

Monitor P/N Size/Type Resolution	35731A 12" Mono 512 by 400	35741A 12" Color 512 by 400	98751A 19" Color 1024 by 768	98752A 19" Color 1280 by 1024	98785A 16" Color 1024 by 768	98786A 17" Mono 1024 by 768	98788A 19" Mono 1280 by 1024	98789A 16" Color 1280 by 1024
Series 300 Video and Display Controller (Local Graphics Bus) Interfaces	332MMA, built-in	98543A, CMA	340C+, built-in	340CH/CHX, built-in	340C+, built-in	340M, built-in	340MH, built-in	340CH, built-in
	98542A, MMA	----- -----	98549A, C+	340SRX, built-in, 98550A, CH/CHX/AIC	98549A, C+	98544B, MMAX, 98544A°	98548A, MH/AIM	340SRX, built-in 98550A, CMA
	98546A, Compat- ibility	----- -----	98547A, C	98725A & 98720A, SRX	98547A, C	----- -----	----- -----	98725A & 98720A, SRX
	----- -----	----- -----	98545A°	98726A & 98730A, TurboSRX	98545A°	----- -----	----- -----	98726A & 98730A, TurboSRX
Model 825/834/ 835 Display Controller Interfaces	----- -----	----- -----	----- -----	A1017A & A1020H, CHX	----- -----	----- -----	----- -----	A1017A & A1020H, CHX
	----- -----	----- -----	----- -----	A1017A & 98720A, SRX	----- -----	----- -----	----- -----	A1017A & 98720A, SRX
Model 835 Display Controller Interfaces	----- -----	----- -----	----- -----	A1017A & 98730A, TurboSRX	----- -----	----- -----	----- -----	A1017A & 98730A, TurboSRX
	----- -----	----- -----	----- -----	A1047A & 98730A, TurboSRX	----- -----	----- -----	----- -----	A1047A & 98730A, TurboSRX
	----- -----	----- -----	----- -----	A1048A & 98730A, TurboSRX	----- -----	----- -----	----- -----	A1048A & 98730A, TurboSRX

° Discontinued product, listed here for reference.

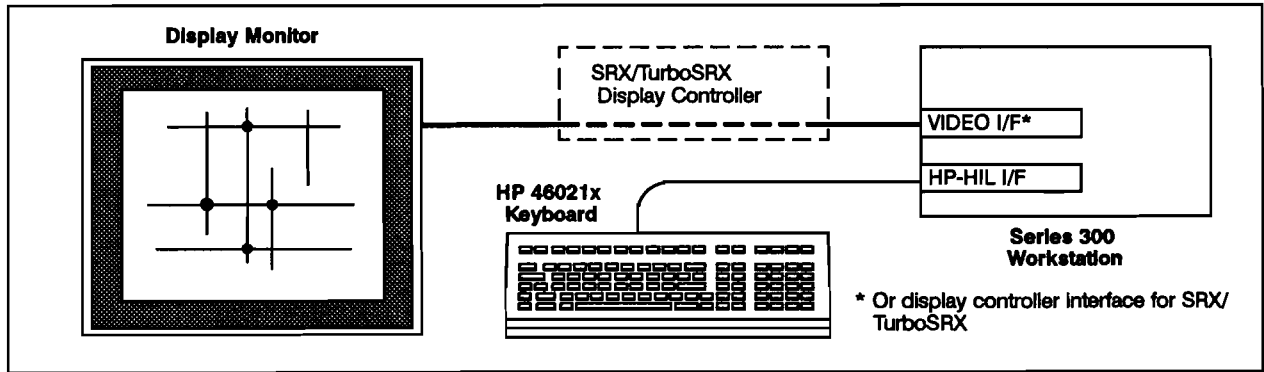


Figure 13-1. Display Monitor and Keyboard Connections to Series 300 Workstations

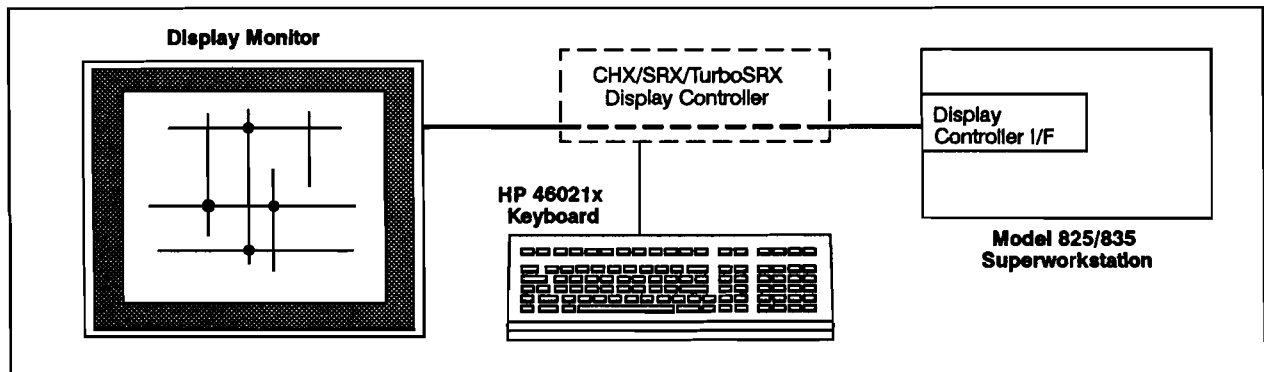


Figure 13-2. Display Monitor and Keyboard Connections to Model 825/835 Superworkstations

Display Terminal Interfacing

Via RS-232C Interfaces

Series 300 SPUs and Workstations and Series 800 Superworkstations and Servers connect to display terminals and PCs via RS-232C interfaces as shown in Figure 13-3, next page, and cables as summarized in Table 13-2, page 13-4. The Series 300 system console can connect to any of the single-port RS-232C interfaces, but must connect to Port 0 of the 98642A four-port multiplexer. A display terminal used as system console in a Model 825 or 835 Superworkstation uses one of the six multiplexer ports and the optional access port uses another. No single-port RS-232C interface is available for Model 825 or 835 Superworkstations.

Via 8-Port Terminal Server

Terminals can also connect to Series 300 SPUs and Workstations and Series 800 Superworkstations and Servers via an HP 2342A HP LAN 8-Port Terminal Server, as shown in Figure 13-4, page 13-5, and summarized in the last column of Table 13-2, page 13-4.

Customers who already have ThinLAN or ThickLAN cabling installed can use those existing cables to expedite connection to clusters of terminals at remote locations, saving the implementation time and costs of running new cables from RS-232C interfaces to the terminals. Moreover, the terminals can be located at a greater distance from the system than if they were directly-connected via an RS-232C interface. The system connects to the LAN via LAN/9000 Series 300/800 Link (the interface card and lower level LAN software).

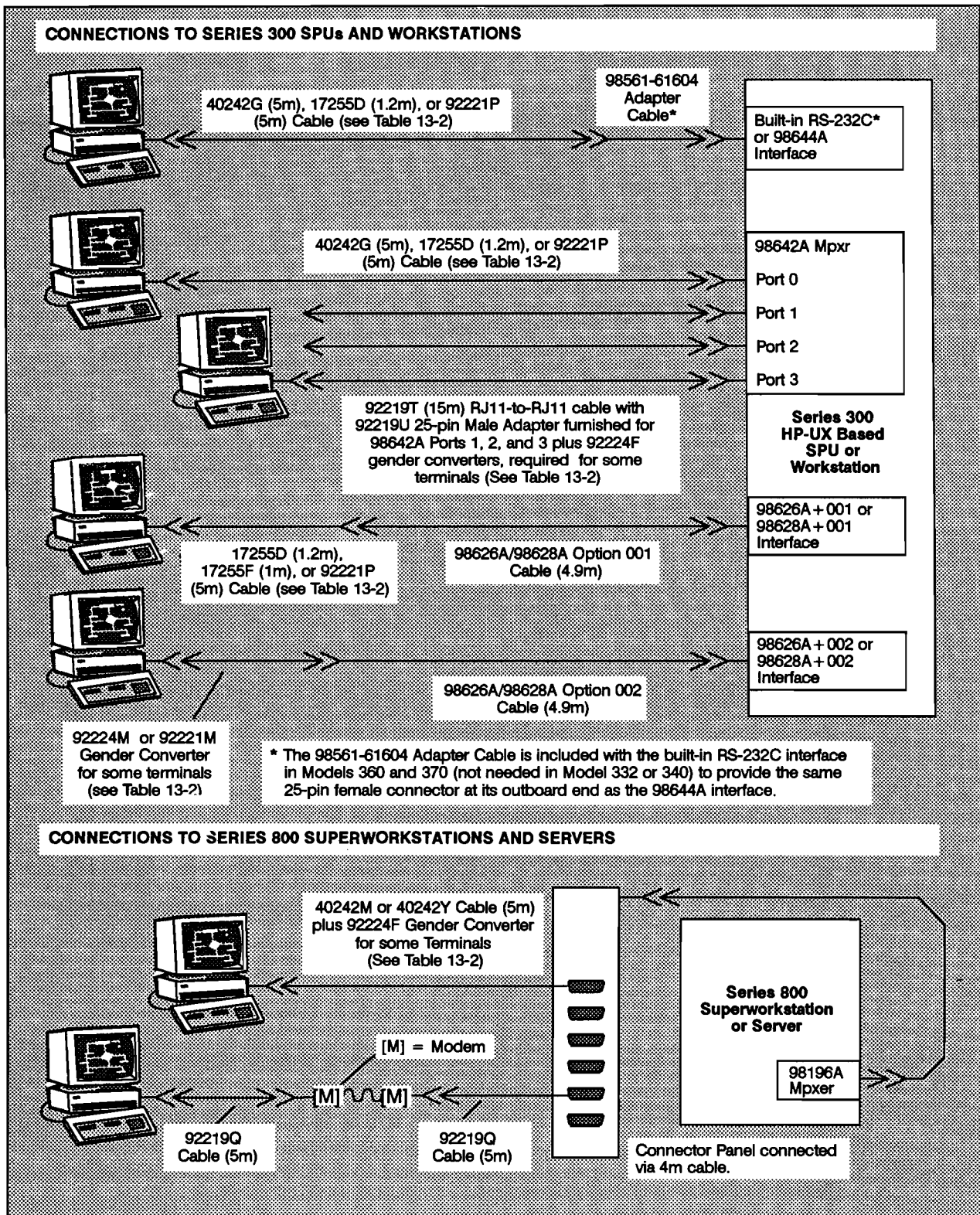


Figure 13-3. Display Terminal RS-232C Connections to Series 300 SPU^s and Workstations and Series 800 Superworkstations and Servers

Table 13-2. Display Terminals and PCs Supported for User Communication in Series 300 (HP-UX based) and Series 800 Superworkstations and Servers

Product No.	Name or Description	Command Set	Console Sup.	Cable Required for Connection From:					
				Series 300				Series 800	Series 300/800
				Built-In, 98642A Port 0, 98644A	98626A/98628A Opt 001	98626A/98628A Opt 002	98642A Ports 1, 2, and 3	98196A Ports	2342A Term Server Ports
C1001A/G/W†	700/92 Alpha	term0	Yes	40242G	17255D	92224M	Cbl. Incl.	40242M	40242Y
C1002A/G/W†	700/94 Alpha	term0	S300 only	40242G	17255D	92224M	Cable Included	40242M	40242Y
C1003A/G†	700/41 Alpha	WYSE30	No	40242G	17255D	92224M	Cbl. Incl.	40242Y	40242Y
C1004A/G/W†	700/22 Alpha	VT100	No	17255D	17255F	Cable Included	92224F	40242M + 92224F	40242Y + 92224F
C1017A/G/W†	700/32 Alpha	VT100	No	17255D	17255F	Cable Included	92224F	40242M + 92224F	40242Y + 92224F
C1006A/G/W†	700/43 Alpha	WYSE30	No	40242G	17255D	92224M	Cbl. Incl.	40242M	40242Y
C1007A/G/W†	700/44 Alpha	VT100	No	17255D	17255F	Cable Included	92224F	40242M + 92224F	40242Y + 92224F
C1018A/G/W†	700/45 Alpha	VT100	No	40242G	17255D	92224M	Cbl. Incl.	40242M	40242Y
2392A°	Alpha	term0	Yes‡	40242G	17255D	92224M	Cbl. Incl.	40242M	40242Y
2393A	Mono Graphics	term0	S300 only	40242G	17255D	92224M	Cable Included	40242M	40242Y
2397A	Color Graphics	term0	S300 only	40242G	17255D	92224M	Cbl. Incl.	40242M	40242Y
3082A°/B	Industrial Touch	term0 & VT100	No	17255D	17255F	Cable Included	92224F	40242C	40242Y
45711A°-D°	HP Portable Plus	term0	Unsup	92221P	92221P + 92224F	92221M	92221M + 92224F	92221M	Not Spec'd
45711E/F	HP Portable Plus	term0	Unsup	92221P	92221P + 92224F	92221M	92221M + 92224F	92221M	Not Spec'd
9666A	Industrial 2397A	term0	S300 only	40242G	17255D	92224M	Cable Included	40242M	40242Y

† C100x suffix letters A/G/W, respectively identify display color as Amber/Green/White background.

° Discontinued product, listed here for reference.

‡ 2392A requires option S12 to function as system console for Series 800 Superworkstation or Server.

Connection via the LAN terminal server affords great flexibility of use of the LAN-connected terminals. Up to 24 sessions (3 per port) are supported by the Terminal Server. Asynchronous devices connected to the Terminal Server can access any system on the LAN that either implements the industry-standard ARPA Telenet-TCP/IP Ethernet protocol, or uses an RS-232C multiplexer accessed via "back-to-back" connection using a second multiplexer-connected 2342A terminal server. For information on "back-to-back" connection (required for HP 1000 systems or HP 3000 MPE-V systems), see the 2342A data sheet in the HP Advance-Net Specification Guide, 5956-4144, or a later revision. This "host switching" affords a very wide access to applications running on different systems on the same LAN. From the Series 300 SPU or Workstation or the Series 800 Superworkstation or Server, the same LAN card can support access to terminals and to other systems on the LAN.

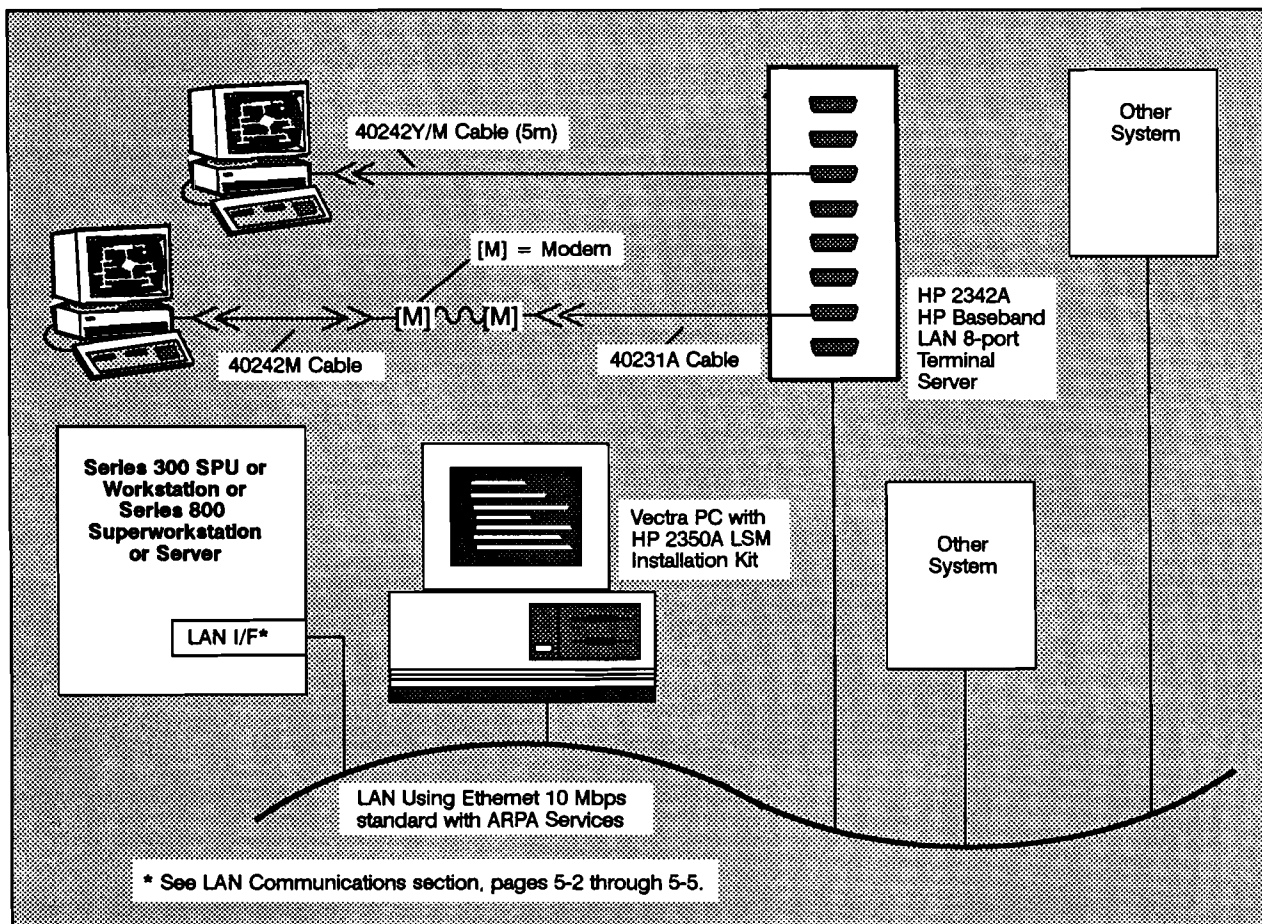


Figure 13-4. Display Terminal Connections to Series 300 SPU or Workstation or Series 800 Superworkstation or Server via LAN 8-Port Terminal Server

In addition to the server, the LAN terminal server connection requires a Vectra ES or ES/12 PC with HP 2350A LSM Installation Kit. The Vectra PC and the LSM installation kit together function as a Local Server Manager that downloads software to the terminal servers during initial start-up, and also in the event of restart after a power failure. The Local Server Manager can support multiple HP 2342A LAN terminal servers and can also perform other functions provided they do not involve use of interfaces other than that needed to use the HP 2350A LSM Installation Kit.

LAN-Connected X-Window PCs

Vectra CS, ES, QS, and RS family PCs with the HP 82328A Intelligent Graphics Controller (ICG) card can be equipped to access Series 300 or Series 800 Superworkstations or Servers via LAN connection. When equipped as summarized in Figure 13-5 and Table 13-3, on the next page, the PC functions as an X-Server displaying the results of X-Client processes on the LAN-connected host computers. Because the X-Window PC uses the Intelligent Graphics Controller card to execute the Accelerated X-Window Display Server/PC (AXDS/PC) software, performance is not limited by the RAM or type of processor in the PC. HP AXDS/PC has been designed to provide graphics performance equivalent to that of a 2 MIPS workstation configured as an X-Window display server. For more information, refer to the Accelerated X Window Display Server product brief and technical data, HP Literature Stock Numbers 5953-3765 and 5953-3767, or later revisions.

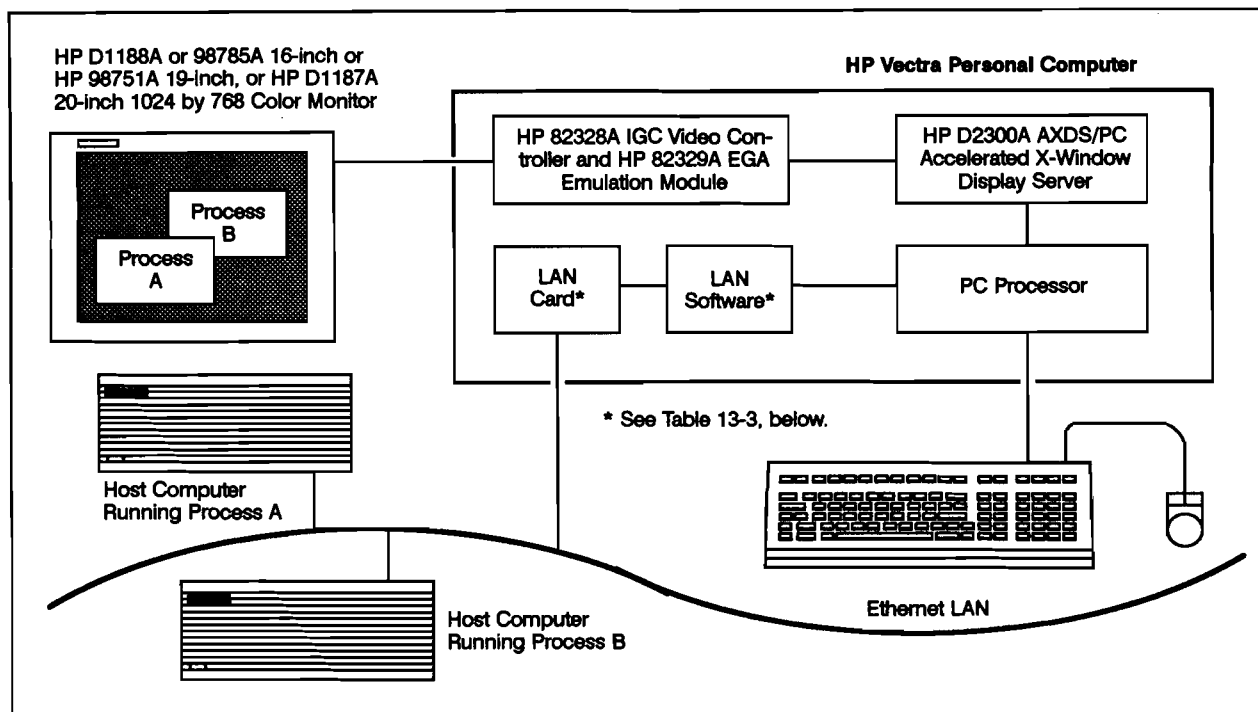


Figure 13-5. LAN-connected Accelerated X-Window Personal Computer

Table 13-3. Accelerated X-Window Personal Computer Components

Product Number	Description
Accelerated X-Window Display Server software	
HP D2300A	HP AXDS/PC Accelerated X-Window Display Server software and X11 R2/R3 fonts on 5.25-inch and 3.5-inch flexible disks, including installation guide.
Video Controller	
HP 82328A HP 82329A	HP Intelligent Graphics Controller and HP EGA Emulation Module
LAN Card and LAN Software (choose one)	
3COM-503 PC-220 (Ver 2.03 PL3)	3 COM ETHERLINK II LAN Card (available from 3 COM or a local PC dealer) PC/TCP LAN Software (available from FTP Software Inc.* or a local PC dealer)
WD8003E PC-221 (Ver 2.03 PL3)	Western Digital ETHERCARD PLUS LAN Card (available from Western Digital or a local PC dealer) PC/TCP LAN Software (available from FTP Software Inc.* or a local PC dealer)
1024 by 768 Color Monitors (choose one) NOTE: These monitors are not supported on Series 300.	
HP D1188A HP 98785A HP 98751A HP D1187A	HP 16-inch Color Monitor. HP 16-inch Color Monitor. HP 19-inch Color Monitor. HP 20-inch Color Monitor.
Pointing Devices (choose one)	
HP 46060A HP M1309A	HP two-button Mouse. Trackball.

* FTP Software, Inc., 26 Princess Street, Wakefield, MA, 01880-3004, Phone (617) 246-0900.

X Window Graphics Terminals

The HP 700/X family of X Window Graphics terminals offer a means of adding user seats to a network at lower cost than a diskless workstation or a LAN connected X Window PC. X Window Graphics Terminals are based on the HP C2301A Base Unit (Figure 13-6 at right). With 1 MB RAM, expandable to 4 MB, the base unit supports color displays of 16 colors from a palette of 4096 or monochrome displays with 16 levels of gray scale. Resolutions of 640 by 480, 800 by 600, and 1024 by 768 are supported. For HP 700/X bundles, components, and peripherals, see Table 13-4, below.

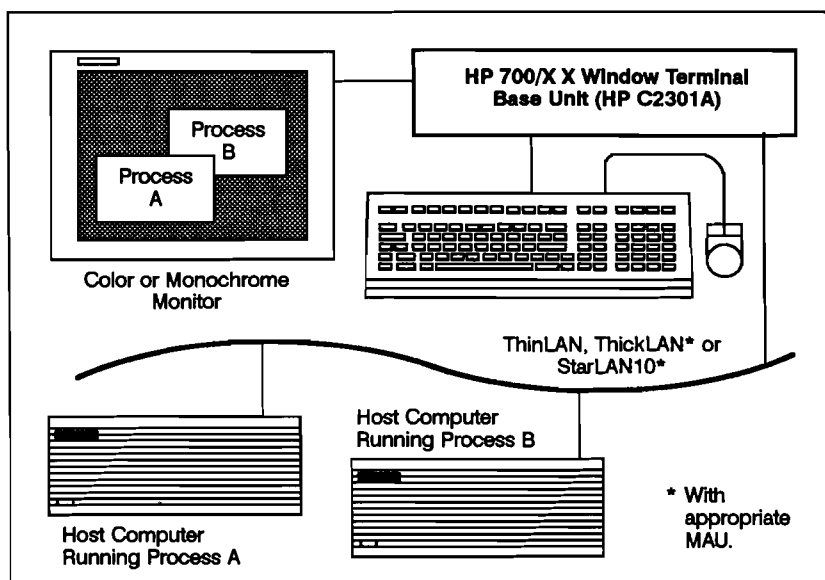


Figure 13-6. LAN-connected X Window Graphics Terminal

Table 13-4. HP 700/X Family of X Window Graphics Terminal Bundles, Components, and Peripherals

Product No.	Description
HP 700/X Graphics Terminal Bundles and Components (Note A: one copy of C2310A X Window Server software is required per site) (Note B: Option IC3 can be applied to all C230xA bundles to delete the 46060B Three-button Mouse)	
HP C2301A	X-Window Terminal Base Unit with: 1. X-Window Processor Base Unit. 2. 46021A HP-HIL Keyboard, including keyboard cable. 3. 46060B HP-HIL Three-button Mouse. 4. D1191A Video Monitor Cable.
HP C2302A	Monochrome X-Window Terminal with: 1. 98786A 17-inch 1024 by 768 Monochrome Monitor. 2. C2301A X-Window Terminal Base Unit.
HP C2303A	Color X-Window Terminal with: 1. D1182B 14-inch 640 by 480 Color Graphics Monitor with video cable. 2. C2301A X-Window Terminal Base Unit.
HP C2304A	Color X-Window Terminal with: 1. 98785A 16-inch 1024 by 768 Color Graphics Monitor. 2. C2301A X-Window Terminal Base Unit.
HP C2310A	X-Window Server Software: Option AA0: Software on 1/4-inch cartridge tape. Option AA1: Software on 1/2-inch 1600 cpi, 9-track magnetic tape.
HP C2320A	Additional 1 MB of customer-installable RAM (maximum of 3 MB additional, 4 MB total)
HP 700/X Supported Peripherals	
Graphics Monitors	D1182A/B 14-inch Color Monitor with 640 by 480 pixel resolution (includes video cable). D1188A 16-inch Color Monitor with 1024 by 768 pixel resolution. 98785A 16-inch Color Monitor with 1024 by 768 pixel resolution. 98786A 17-inch Monochrome Monitor with 1024 by 768 pixel resolution. 98751A 19-inch Color Monitor with 1024 by 768 pixel resolution. D1187A 20-inch Color Monitor with 1024 by 768 pixel resolution.
User Input Devices	46021A HP-HIL Keyboard (requires language suffix). 46060A HP-HIL Two-Button Mouse. 46060B HP-HIL Three-Button Mouse. M1309A HP-HIL Three-Button Trackball.

HP-HIL Interfacing

The Hewlett-Packard Human Interface Link (HP-HIL) is a proprietary 4-wire serial link for connecting input devices (see Table 13-5, at right, for a list of HP-HIL devices) to a wide variety of HP computers and peripherals.

All Series 300 computers include a built-in HP-HIL host interface as do the display controllers of Series 800 Superworkstations. Most HP-HIL devices have a "towards host" (●) and an "away from host" (●●) female connector. Using appropriately keyed and coded HP-HIL cables, which are available in various lengths, multiple HP-HIL devices are daisy-chained from the single host interface. See Figure 13-7 connection example on next page.

HP-HIL devices may be used with:

- The built-in HP-HIL interface of a Series 300 mainframe or a Series 800 Superworkstation Display Controller.
- The HP-HIL interface of a 2393A or 2397A Terminal (HP-UX only).

The HP-HIL port of 98700H (CX), 98720A (SRX), and 98730A (TurboSRX) Display Controllers is not supported by any Series 300 operating system.

All Series 300 SPUs and bundles include an 0.8-3m coiled HP-HIL cable. The bundles also include a 46021x keyboard and may include a 46060A 2-button mouse, a 46081A HP-HIL Extension, and a 46084A ID Module.

Table 13-5. HP-HIL Devices for Series 300 and Series 800 Workstations

Product Number	Name/Description	Cable Incl.	Addr. Used	Power (mA)†
Keyboards				
46021x	Keyboard (46021A through 46021AZ; see page 13-10 for list of national versions)	None	1	106
98203x	Keyboard (98203C through 98203CS; see page 13-10 for list of national versions)	None	1	106
Graphics Pointing/Picking Devices				
M1309A*	3-button trackball	0.8-3m	1	100
35723A	HP-Touch bezel for 357x1A Monitor	0.7m	1	200
46060A*	2-button HP Mouse	1.4m	1	200
46060B*	3-button HP Mouse	1.4m	1	200
46094A	Quadrature Port	0.5m	1	200
46095A	3-button HP Mouse Interfacing to 46094A Quadrature Port	1.2m	None	80
46083A	Rotary Control Knob	0.4m	1	100
46085A	Control Dials Box (for 3-axis control of displayed objects)	0.4m	3	320
46086A	Button Box	0.8-3m	1	60
Graphics Digitizers and Tablets				
45911A	1-button 11 x 11 inch Tablet	0.8-3m	1	150
46087B	3-button A-Size Digitizer	0.8-3m	1	200
46088B	3-button B-Size Digitizer	0.8-3m	1	200
46089B	4-button cursor for 46087B/46088B	Incl.	None	None
Bar Code Reader				
92916A	Bar Code Reader	0.5m	1	200
Software Security Device				
46084A	ID Module	0.4m	1	60
HP-HIL Extensions and Cables				
46080A	HP-HIL Extension, no audio	2.4m	None	25
46081A	HP-HIL Extension, with audio	2.4m	None	25
46082A	HP-HIL 15m Extension and RGB 0.5m coax cable extension with audio Deletes module-module & RGB cables Deletes RGB cables	15m & 0.5m	None	40
Opt 015 Opt 343				
46082B	HP-HIL 30m Extension and RGB 0.5m coax cable extension with audio	30m & 0.5m	None	40
46080-61601	2.4m, flat, male-male cable	2.4m	None	n/a
46083-61601	0.4m, flat, male-male cable	0.4m	None	n/a
46020-60001	0.8m to 3.0m, coiled, male-male cable	0.8-3m	None	n/a

† HP-HIL interface can supply up to 1000 mA.

* Only one device from this set of devices may be used on a single HP-HIL interface because none of them provide a "downstream" connector for additional devices.

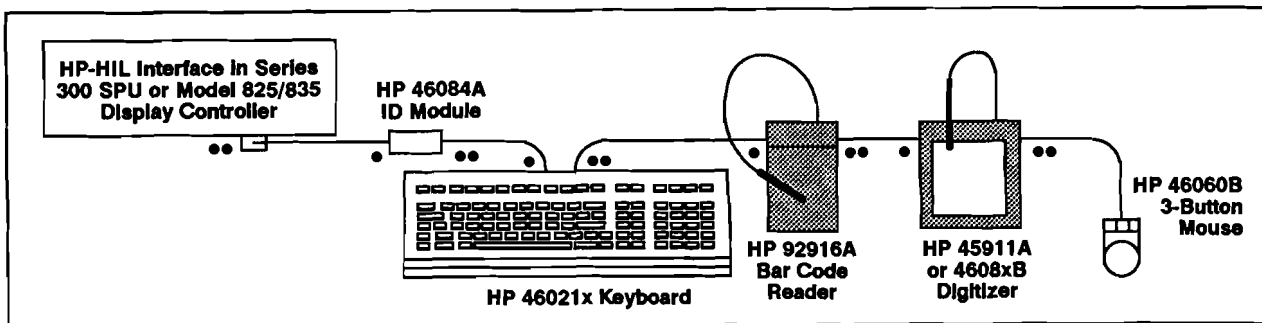


Figure 13-7. HP-HIL Connection Example

The following limitations apply to HP-HIL configurations:

- The total number of addressable devices must be seven (7) or less. Most devices use one address, except for extensions, which have no address, and the 46085A Control Dial Module, which has three addresses. See Table 13-5 for device addressing.
- The maximum cabling has "per-device" and "total length" limits. The first is 2.4m per device (other than 46082A/B remote extensions). The total length limit is 21m (48.6m if a 46082A/B remote extension is used). Multiple 46080A/46081A extensions or a *single* 46082A/B remote extension may be used.
- The total power used by all devices on the HP-HIL must be 12 watts or less (1000 mA at 12Vdc). The current used by the various HP-HIL devices is listed in Table 13-5 on the previous page. Series 300 mainframes have ample power for all configurations of up to three devices, and all configurations of up to seven devices that do not include the 46085A Control Dial Box.
- A device, such as a 46060A/B mouse, that has only one HP-HIL connection, must be the last device on the link. If both a M1309A Trackball and a mouse are required, specify the 46095A quadrature mouse and 46094A quadrature adapter, which has both HP-HIL connectors.
- It is possible to have more than one of the same device on the link. With respect to keyboards, the operating system establishes its single internal key-location-to-character code conversion table based on the language ID of the first keyboard-type device encountered. An application using a 92916A bar code reader, which emulates a keyboard, should have the reader configured "downstream" of the keyboard, as shown in Figure 13-7, above. An application, such as text translation, that uses two different keyboards must perform a secondary conversion on characters sent from the second keyboard.
- HP-HIL devices auto-configure their addresses based on their position on the link. When directly addressing an HP-HIL device in HP-UX, you must not remove any but the last device from the link, or the */dev* special files will no longer correctly designate the desired devices downstream from the removed device.

Bar Code Reader Input

The time and error potential in the entry of routine data can be minimized by using bar coded labels, tags, badges, or cards. Information as diverse as product part or stock numbers or patient identification numbers for hospital records can be imprinted in an appropriate bar code. Thereafter, the single sweep of a wand can scan and enter the encoded data in about one-third of the time required for keystroked entry by a skilled operator, and with monotonous accuracy.

The HP-HIL connected HP 92916A Bar Code Reader emulates the terminal keyboard in that the bar coded characters it reads are sent to the display and the computer as if they had been keystroked. The 92916A Bar Code Reader connects via HP-HIL as shown in Figure 13-7, above.

Bar code printing is optional on the HP 2563B, 2564B, 2566B, and 2567B Line Printers and standard on the 2562C Line Printer and the 2934A Printer. A font cartridge (92286WI) is also available for printing bar codes on HP 33440A/D *LaserJet* Series II printers.

National Versions of Keyboards and Display Terminals

National Versions of the 46021x HP-HIL Keyboard

National versions of the 46021x Keyboard are selected by substituting a suffix letter(s) for the x in 46021x product number, as follows:

Suffix	National Version
A	U.S. English
AC	French Canadian
AD	German
AE	European Spanish
AF	French
AH	Dutch
AJ	Katakana
AL	English Canadian
AM	Latin Am. Spanish
AN	Norwegian
AP	Swiss German
AQ	Swiss French
AS	Swedish
AT	Hebrew
AU	U.K. English
AV	Arabic
AW	Belgian Dutch
AX	Finnish
AY	Danish
AZ	Italian
W + ZAA	Taiwan Chinese
W + ZAB	Korean
W + ZAC	Chinese
W + ZAG	Arabic/French
W + ZAL	Kanji

National Versions of the 98203x HP-HIL Keyboard

National versions of the 98203x Keyboard are selected by substituting a suffix letter(s) for the x in 98203x product number, as follows:

Suffix	National Version
C	U.S. English
CD	German
CE	European Spanish
CF	French
CJ	Katakana
CS	Swedish-Finnish

National Versions of C100xA/G/W Terminals

National versions of C100xA/G/W Terminals provide appropriate keyboard, user's manuals, and power cable. They are specified as "must order" options to the respective product number, as follows:

Opt	Keyboard	User's Manual	Pwr Cable
ABA	U.S. English	English	U.S.
ABC	French Can.	French	U.S.
ABD	German	German	Eur.
ABE	Eur. Spanish	Spanish	Eur.
ABF	Eur. French	French	Eur.
ABH	Dutch	DutchEur.	
ABL	Can. English	English	U.S.
ABM	Latin Amer. Spanish	Spanish	U.S.
ABN	Norwegian	Norweg.	Eur.
ABP	Sw. German	German	Eur.
ABQ	Sw. French	French	Eur.
ABR	U.S. English	English	S.Afr.
ABS	Swedish	Swedish	Eur.
ABU	U.K. English	English	U.K.
ABW	Flemish	DutchEur.	
ABX	Finnish	Finnish	Eur.
ABY	Danish	Danish	Eur.
ABZ	Italian	Italian Eur.	
ACC	U.S. English	English	U.K.
ACD	U.S. English	English	Swiss
ACE	U.S. English	English	Danish
ACF	U.S. English	English	Japan
ACG	U.S. English	English	Aus.

National Versions of 239xA Terminals

National versions of 239xA terminals provide appropriate keyboard and user's manuals. They are specified as "must order" options to the respective product number, as follows:

Option	Nat'l Version
Std	U.S. English
015	Int'l Monitor
101	Swedish
102	Norwegian
103	French
104	German
105	U.K. English
106	Spanish
107	French Canadian
108	Canadian English
109	Italian
110	Dutch
111	Finnish
112	Danish
113	Swiss German
114	Swiss French
115	Latin Am. Spanish
116	Flemish

National Versions of C230xA HP 700/X X-Window Graphics Terminals

National versions of C230xA Terminals provide appropriate keyboard, user's manuals*, and power cable. They are specified as "must order" options to the respective product number, as follows:

Opt	Keyboard	User's Manual*	Pwr Cable
ABA	U.S. English	English	U.S.
ABC	French Can.	French*	U.S.
ABD	German	German*	Eur.
ABE	Eur. Spanish	Spanish*	Eur.
ABF	Eur. French	French*	Eur.
ABH	Dutch	Dutch*	Eur.
ABJ	Katakana	English	Japan
ABK	Eur. ASCII	English	Eur.
ABM	Latin Amer. Spanish	Spanish*	U.S.
ABN	Norwegian	Norweg.*	Eur.
ABP	Sw. German	German*	Eur.
ABQ	Sw. French	French*	Eur.
ABR	U.S. English	English	S.Afr.
ABS	Swedish	Swedish*	Eur.
ABU	U.K. English	English	U.K.
ABW	Flemish	Dutch*	Eur.
ABX	Finnish	Finnish*	Eur.
ABY	Danish	Danish*	Eur.
ABZ	Italian	Italian*	Eur.

* Only English user's manuals will be provided at first release.

Mass Storage

Mass Storage Functions

Disks (disk memories) provide high-capacity, non-volatile, fast-access mass storage for programs and data for the system. The key functions performed by disks are discussed below.

Support of System Boot-up

The most cost-effective way of supporting system bootup is from a mass storage device that is capable of fast transfers, such as a disk memory. If not supported from the disk in a networked host system, the bootup device is usually a locally-connected hard disk memory. When the bootup device is a local disk, it is called the system disk. For this function, fast transfer shortens the time required to boot-up the system. In Series 300, BASIC/WS and Pascal/WS systems can use a flexible disk as the system disk.

Fast-Access Storage and Retrieval File System

Applications in all but the harshest environments typically use a disk for storing programs and data not currently in use, from which these are retrieved when and as needed. The disk may be local or may be on a LAN-connected network server. For this function, hard disks are preferred because of the greater capacity and faster storage and retrieval rates available with hard disks.

HP-UX Swap Space

Under HP-UX, when the total size of executing processes and their data exceeds the capacity of installed RAM, process data is written to disk temporarily when needed to make room for other processes or data. It is also possible for individual programs to exceed the capacity of installed

RAM. The capability of shifting code and data from RAM to disk, which thus becomes "virtual" memory (VM), is managed by the virtual memory system.

Each process has a virtual memory space of 4 GB, which is in practice limited by available disk space. Whenever a process is dispatched (run), a space equal to its "total" size is allocated in swap space. Swap space must therefore at least equal the installed RAM and should, in fact, equal the total size of all the processes to be run in a maximum simultaneous mix.

Each CPU may have up to 8 disks with swap space on them, on separate or shared buses.

Direct Access Secondary Storage

Series 300 HP-UX based systems now offer rewritable optical disk drive products. Positioned as direct access secondary storage devices, the 650 MB standalone drive and a 20.8 GB library system provide vast amounts of low-cost storage for infrequently-used information. The removable optical disk media is compact and durable with a cost per megabyte comparing roughly to that of 1/4-inch cartridge tape.

Software Input and Limited Volume Backup

In HP-UX based systems, flexible disks may provide a good medium for installation and backup of individual application programs that can all fit on one flexible disk. However, a cartridge tape subsystem in Series 300 or a cartridge tape unit or magnetic tape unit in Model 825/834/835 Superworkstations (Section 15) must be used for installation. The tape should be used for backup of all but the smallest software systems

or data bases if a rewritable optical disk product is not being used to provide direct access secondary storage.

Series 300 Disk Requirements and Performance

In HP-UX

HP-UX commands and utilities are usually read in from disk each time they are executed. Disk performance is, therefore, key to providing adequately fast response to user's requests. In multi-user systems and in certain single-user applications, multiple system disks provide an aggregate performance which exceeds that of a single disk. The I/Os per second for two similar disks is generally 1.5 or more times that of one disk alone, provided that the system and user demands are well-distributed between the two disks.

A slight performance increase can be gained in a multi-disk system by connecting the disks via separate HP-IB and/or SCSI interfaces. However, before using a third interface to connect disks on a Series 300 system, both of two existing disk interfaces should each be supporting four disks. The reason for this is that, with two Direct Memory Access (DMA) channels available, the DMA contention initiated by adding a third disk interface may easily dissipate the performance gained by reducing contention for bus bandwidth. Series 800 Superworkstations and servers are not as limited with respect to the amount of DMA that can be performed. They can support three HP-IB disk interfaces via DMA, with four disks per interface.

WARNING: Simple HP-IB devices cannot be connected to the same HP-IB interface as a mounted file system or swap disk.

In BASIC/WS or Pascal/WS

Standalone RAM-based HP BASIC/WS or Pascal/WS installation in a Series 300 system requires any supported 3.5-inch or 5.25-inch flexible disk. For most convenient use of the system, an external (hard) disk of any capacity or dual flexible disks with at least 788 KB each are recommended.

Maximum Number of Disks

With Series 300 Systems

The theoretical maximum number of disks supportable under HP-UX for the Series 300 is:

- 8 HP-IB Disk Drives with up to 16 total units and any number of volumes, plus
- 7 SCSI Disk Drives with no units limit.

There are only two DMA channels, so only two disk interface bus cards can use DMA at the same time. Additional simultaneous disk I/O requests are executed using "fast handshake" I/O, which is considerably slower than DMA.

A slight performance increase can be gained in a multi-disk system by connecting the disks via separate HP-IB and/or SCSI interfaces. However, before using a

third interface to connect disks, both of two existing disk interfaces should each be supporting four discs. The reason for this is that, with two DMA channels available, the DMA contention initiated by adding a third disk interface may easily dissipate the performance gained by reducing contention for bus bandwidth.

With Series 800 Superworkstations and Servers

The maximum number of disks supportable under HP-UX for Series 800 Superworkstations and Servers is:

- 16 HP-FL Disk Drives connected via two interfaces, or
- 12 HP-IB Disk Drives connected via three interfaces.

Disk Connections

Disks connect to Series 300 SPUs and workstations via SCSI or HP-IB interfaces, as shown in Figures 14-1, below, and 14-2, next page. Disks connect to Series 800 Superworkstations or Servers via an HP-FL or HP-IB interface, as shown in Figures 14-3 and 14-4, next page.

As shown in Figure 14-3, the fiber optic link connects from the system to one or a group of disks. A 30m fiber optic cable is included

with the 27111A interface. The 30 meter cable can be replaced by a custom fiber optic cable, up to 500m long, which is ordered from Hewlett-Packard as HFBR-AWQnnn, where nnn is length in meters.

The HP-FL disks in a group connect to each other via electrical PBus cables. Up to eight disks can be connected when installed in a single cabinet. The HP 19524FL product includes eight HP 7937FL disks in an HP 19514A cabinet. The HP 46299Y product includes eight HP C2201A or C2204A disk drives installed in a 1.6 meter 19-inch EIA rack.

PBus cabling limitations restrict the number of HP-FL disk drives supported in multiple cabinets. Up to seven HP C2201A or C2204A disk drives are supported in in two HP 92211Y cabinets. Up to six HP-FL disks can be supported in three HP 19511A cabinets. Disks in adjacent cabinets are connected using the longer HP 13367A PBus cables.

Option 1BG available on the HP C2201A and C2204A disk drives deletes the fiber optic interface from the disk drive. These disk drives can be connected to the PBus, but not directly to the system via the fiber optic cable. At least two disk drives on the channels should have fiber optic circuits (the standard drive).

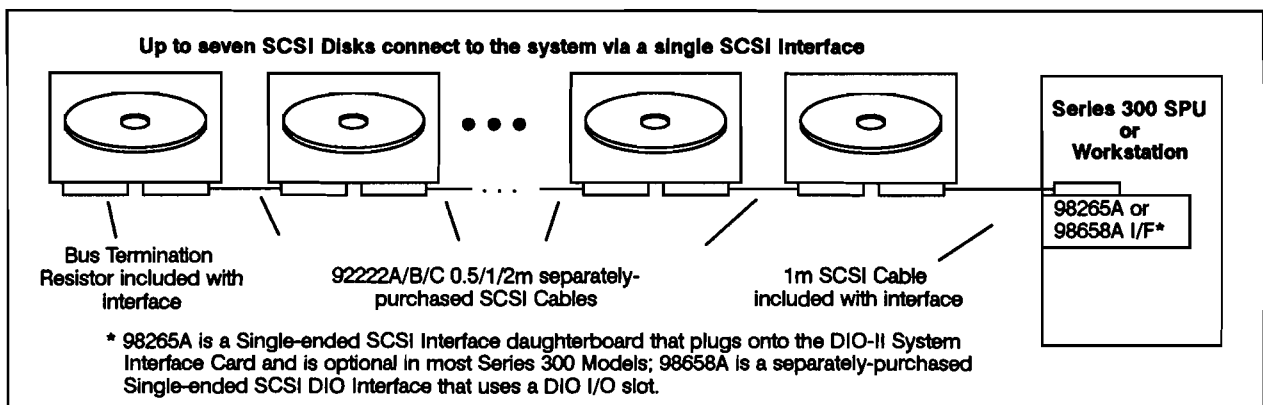


Figure 14-1. Connection of SCSI Disks to Series 300 System via SCSI Interface

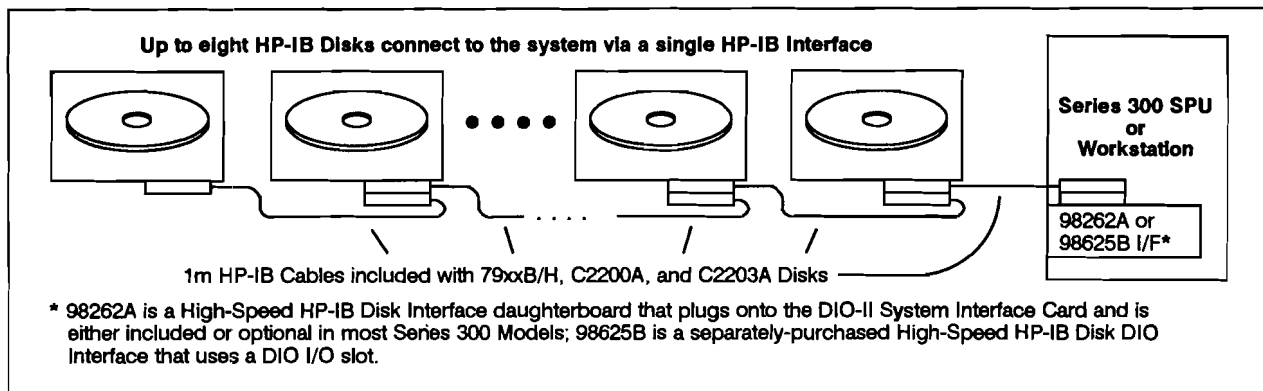


Figure 14-2. Connection of HP-IB Disks to Series 300 System via High-Speed HP-IB Interface

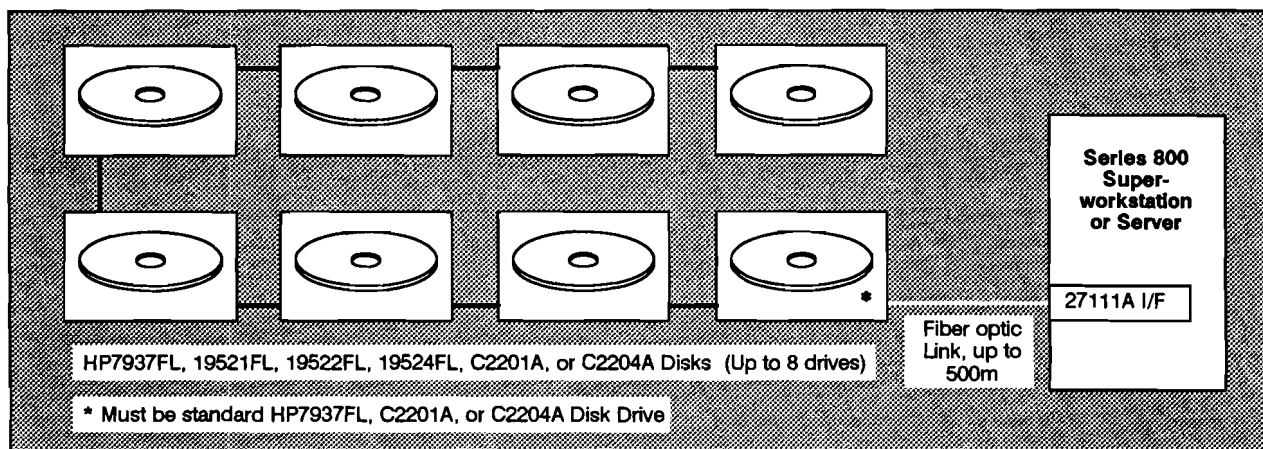


Figure 14-3. Connection of HP-FL Disks to Series 800 Superworkstations or Servers

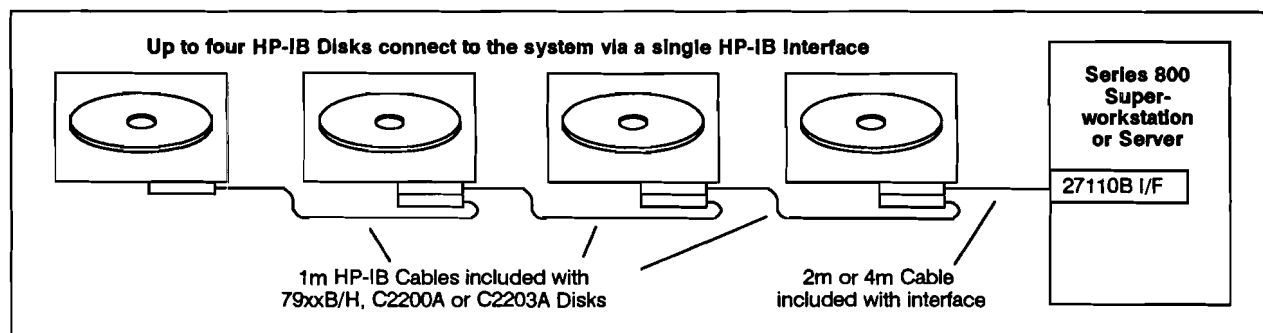


Figure 14-4. Connection of HP-IB Disks to Series 800 Superworkstations or Servers

Disk Selection

Tables 14-1, 14-2, and 14-3, on the next pages, list the available SCSI, HP-FL, and HP-IB disks, respectively, giving capacity and basic disk hardware performance infor-

mation for them. SCSI disks in Series 300 (only) and HP-FL disks in Series 800 Superworkstations or Servers (only) provide the best performance. In addition, the SCSI disks are available in a versatile, integrated mass storage subsystem that supports multiple

disk, tape, rewritable optical disk drive, and CD-ROM mechanisms, as illustrated in Figure 14-5, page 14-5.

Mass Storage,
continued

Table 14-1. SCSI Disks Supported in Series 300 SPU's and Workstations

Product Number	Name/Description	Usable as System Disk?	Capacity		Avg. Access Time		Async Transfer Rate (KB per sec)*
			Total	Directly Accessible	For Mtd Disk/Tape	Disk XChg	
C2212A	Integrated Mass Storage Subsystem	Yes	330 MB	330 MB	24 ms	n/a	1500
001	Adds one C2290A Disk§		330 MB	330 MB	24 ms	n/a	1500
003	Adds one C2292A Digital Data Storage (4 mm tape) Mechanism§		1.3 GB	1.3 GB	20 sec	n/a	183
004	Adds one C2293A CD-ROM Drive§		600 MB	600 MB	400 ms	n/a	154
005	Adds one C2294A Rewritable Optical Disk Drive§		650 MB	325 MB†	107.5 ms	n/a	680 read 340 write
024	Adds two C2293A CD-ROM Drives§		1.2 GB	1.2 GB	400 ms	n/a	154
C2213A	Integrated Mass Storage Subsystem	Yes	660 MB	660 MB	24 ms	n/a	1500
001	Adds one C2290A Disk§		330 MB	330 MB	24 ms	n/a	1500
002	Adds one C2291A Disk§		660 MB	660 MB	24 ms	n/a	1500
003	Adds one C2292A Digital Data Storage (4 mm tape) Mechanism§		1.3 GB	1.3 GB	20 sec	n/a	183
004	Adds one C2293A CD-ROM Drive§		600 MB	600 MB	400 ms	n/a	154
005	Adds one C2294A Rewritable Optical Disk Drive§		650 MB	325 MB†	107.5 ms	n/a	680 read 340 write
022	Adds two C2291A Disks§		1.3 GB	1.3 GB	24 ms	n/a	1500
024	Adds two C2293A CD-ROM Drives§		1.2 GB	1.2 GB	400 ms	n/a	154
C2290A	330 MB SCSI Disk U/G Kit for C221xA§	No	330 MB	330 MB	24 ms	n/a	1500
C2291A	660 MB SCSI Disk U/G Kit for C221xA§	No	660 MB	660 MB	24 ms	n/a	1500
C2292A	1.3 GB Digital Data Storage (4 mm tape) Mechanism U/G Kit for C221xA§	Not Disk	1.3 GB	1.3 GB	20 sec	n/a	183
C2293A	600 MB CD-ROM Drive U/G Kit for C221xA§	No	600 MB	600 MB	400 ms	n/a	154
C2294A	650 MB Rewritable Optical Drive U/G Kit for C221xA§	No	650 MB	325 MB†	107.5 ms	n/a	680 read 340 write
7957S	Fixed Disk	No	107 MB	107 MB	28.4 ms	n/a	700
7958S	Fixed Disk	Yes	161 MB	161 MB	28.4 ms	n/a	700
7959S	Fixed Disk	Yes	323 MB	323 MB	28.4 ms	n/a	700
C1700A	Series 6300 Model 20GB/A Rewritable Optical Disk Library System (removable media). NOTE: The C1700A uses three SCSI bus addresses.	No	20.8 GB	650 MB	107.5 ms	7 sec	680 read 340 write
C1701A	Series 6300 Model 650/A Rewritable Optical Disk Drive (removable media).	Yes, but very slow	650 MB	325 MB†	107.5 ms	n/a	680 read 340 write
98571D	Internal Fixed Disk Upgrade for Model 340 (equivalent to Model 340 Option 412).	Yes	200 MB	200 MB	18 ms	n/a	920
98433A	Internal Fixed Disk Upgrade for Model 345 (equivalent to Model 345 Option 412; not compatible with Model 345 with option 010, 011, or 411).	Yes	200 MB	200 MB	18 ms	n/a	920

§ See Figure 14-5, next page, for available combinations of disks, tape mechanisms, and rewritable optical disk drives that are supported in C2212A or C2213A Integrated Mass Storage Subsystems.

* Asynchronous transfer rate; this is a capability of the disk-system interface hardware; it is not a system-achievable transfer rate.

† 325 MB per side; the disk can be removed from the drive, turned over, and reinserted to gain access to 325 MB on the other side.

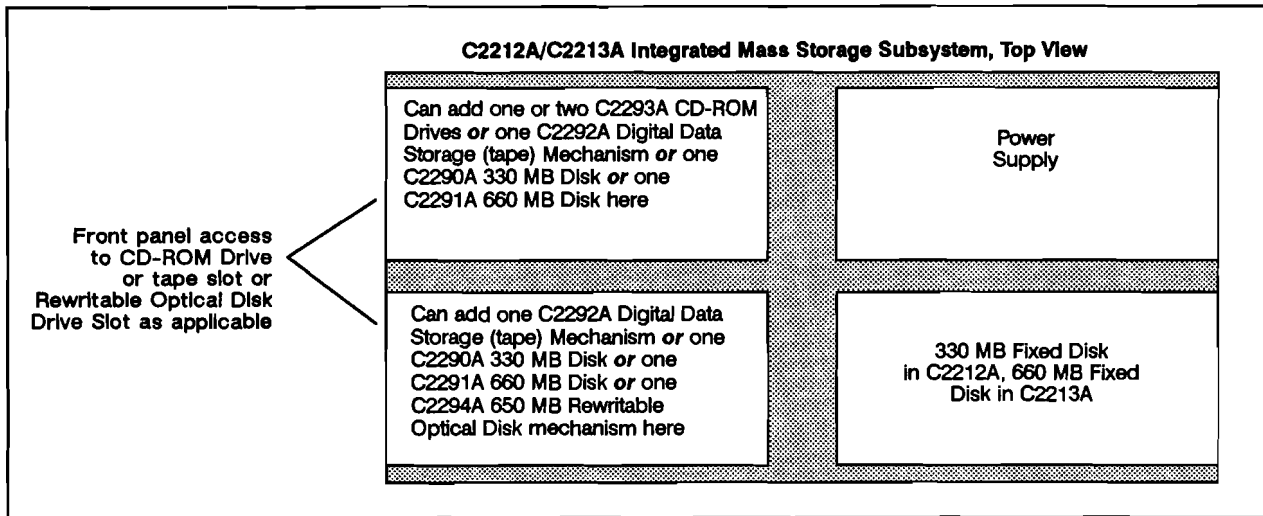


Figure 14-5. C2212A/C2213A Integrated Mass Storage Subsystem Configuration

Disk Mirroring

Series 800 Superworkstation or Server users with special concern for data protection and high availability of software and design/data files may want to configure part or all of their disk storage capacity in mirrored pairs. The 92623A DataPair/800 software product protects users from storage access problems by maintaining two identical copies of records on separate disks. DataPair/800 is available with 7937FL, C2201A, and C2204A disk drives. It does not support HP-IB disks.

DataPair/800 works by mirroring the same sections on two different disks or sets of disks. For that reason, only sections on disks with the same product number (two C2201A, two C2204A, or two 7937FL) can be mirrored. While both disks can be connected to the Superworkstation via the same 27111A HP-FL interface card, use of separate HP-FL interfaces is recommended to prevent the interface card from being a single point of failure. This effectively duplicates the connection shown in Figure 14-3 on the previous page. It doubles the number

of disks that are required to support the mirrored volume and doubles the number of HP-FL interfaces. DataPair/800 is not supported on Model 834 Superworkstations because they have only one CIO slot available for interfacing.

Any type of data or software can be mirrored, including the boot and swap disks. Disks can have both mirrored and unmirrored sections. Unmirrored disk capacity is available to the system as ordinary disk storage capacity.

Table 14-2. HP-FL Disks Supported in Model 825 and 835 Superworkstations and Model 635SV Servers

Product Number	Name/Description	Usable as System Disk?	Capacity (MB per Product)	Access Time (msec)	Average Transfer Rate (KB per sec)*
C2201A 1BG	Fixed Disk with Fiber Optic/PBus Controller Deletes Fiber Optic Capability	Yes	670	24.5	1,410**
C2204A 1BG	Fixed Disk with Fiber Optic/PBus Controller Deletes Fiber Optic Capability	Yes	1340	24.5	1,410**
7937FL	Fixed Disk	Yes	571	30.8	1,890
19521FL	Two 7937FL Disks in 19511A Cabinet	Yes	1142	30.8	1,890
19522FL	Four 7937FL Disks in 19514A Cabinet	Yes	2284	30.8	1,890
19524FL	Eight 7937FL Disks in 19514A Cabinet	Yes	4568	30.8	1,890

* The average transfer rates listed here indicate the capability of the disk hardware; they are not system-achievable transfer rates.

** Transfer rate for full volume, smaller transfers are at higher speed up to 1.9 KB per second.

Mass Storage, continued

**Table 14-3. HP-IB Disks Supported in Series 300 SPU's and Workstations
and Series 800 Superworkstations and Servers**

Product Number	Name/Description (Command Set)	Usable as System Disk?	Capacity (MB per Product)	Access Time (msec)	Average Transfer Rate (KB per sec)*
C2200A◆	Fixed Disk (CS/80)	Yes	335	24	1,000
C2203A◆	Fixed Disk (CS/80)	Yes	670	24	1,000
7907A°	Fixed Disk/Removable Disk (CS/80)	In Series 300° only	20.5/20.5	44.3	600
7914CT°	Fixed Disk with Cartridge Tape (CS/80)	In Series 300° only	132	44.3	600
7914P°/R°	Fixed Disk with Cartridge Tape (CS/80)		132	44.3	600
7914ST°	Fixed Disk (CS/80) with Magnetic Tape		132	44.3	600
7933H°	Fixed Disk (CS/80)	Yes	404	35.1	1,000
7935HR	Removable Disk (CS/80)	Yes	404	35.1	1,000
7936H	Fixed Disk (CS/80)	Yes	307	30.8	1,000
7937H	Fixed Disk (CS/80)	Yes	571	30.8	1,000
7957A°	Fixed Disk (CS/80)	In Series 300° only	81	41.5	853
7957B	Fixed Disk (CS/80)	In Series 300° only	81	28.4	875
7958A°	Fixed Disk (CS/80)	In Series 300° only	130	41.5	853
7958B	Fixed Disk (CS/80)	In Series 300° only	152	28.4	875
7959B	Fixed Disk (CS/80)	Yes	304	28.4	875
7962B	Fixed Disk (CS/80)	In Series 300° only	152	28.4	875
7963B	Fixed Disk (CS/80)	Yes	304	28.4	875 ✓
9122C Opt 001	Dual 3.5-inch Flexible Disks (SS/80) Delete one drive	In Series 300° only◇	2 x 1.42 -1 x 1.42	185	35
9122D°	Dual 3.5-inch Flexible Disks (SS/80)	In Series 300° only◇	2 x 0.63	175	63
9122S°	Single 3.5-inch Flexible Disk		0.63	175	63
9127A	5.25-inch Flexible Disk (SS/80)	In Series 300° only◇	0.5	93	250
9153C Opt 010 Opt 020 Opt 040	Fixed Disk and 3.5-inch Flexible Disk (SS/80) 10 MB Fixed/3.5-inch Flexible 20 MB Fixed/3.5-in. Flexible 40 MB Fixed/3.5-in. Flexible	In Series 300° only◇	10/1.42	75/200	185/32
			20/1.42	75/200	185/32
			40/1.42	75/200	185/32
9262B	Removable Winchester Disk Drive (CS/80)	In Series 300° only	152	28.4	875
9263B	Removable Winchester Disk Drive (CS/80)	Yes	304	28.4	875
19521H	Two 7937H Disks in 19511A Cabinet (CS/80)	Yes	1142	30.8	1,000
19522H	Four 7937H Disks in 19514A Cabinet (CS/80)	Yes	2284	30.8	1,000
19524H	Eight 7937H Disks in 19514A Cabinet (CS/80)	Yes	4568	30.8	1,000
97902B†	Add'l Removable Disk for 9262B or 9263B	No	152	28.4	875
97903B†	Add'l Removable Disk for 9262B or 9263B	No	304	28.4	875
97962B‡	Add'l Fixed Disk for 7962B or 7963B (CS/80)	No	152	28.4	875
97963B‡	Add'l Fixed Disk for 7962B or 7963B (CS/80)	No	304	28.4	875

* The average transfer rates listed here indicate the capability of the disk-system interface hardware; they are not system-achievable transfer rates. The C2200A and C2203A Disks have the same transfer rate capability as the C2201A and C2204A HP-FL Disks, but the HP-IB system interface limits maximum transfer rate to 1,000 KB per second.

◆ An HP C2206A upgrade kit is available to convert C2200A or C2203A disks to HP-FL operation, at the same transfer rates as the C2201A and C2204A, listed in Table 14-2, previous page.

● Usable as system disk only in BASIC/WS or Pascal/WS operating system. ◇ Also used with SoftPC DOS Emulation.

° Discontinued product, listed here for reference.

† Maximum of one additional removable drive per 9262B or 9263B.

‡ Maximum of two additional fixed disks per 7962B or 7963B.

Software Installation and Backup

Software Installation and Backup in Series 300 Systems

Software installation is currently supported in Series 300 Systems operating under HP-UX only via cartridge tape subsystems. The cartridge tape subsystem can also be used for backup of the system or data bases. New digital data storage (4 mm) tape drives with 20 second average access time to any part of the 1.3 GB cassette are also available. These new tape drives are also available as the

C2292A add-on module to the C2212A and C2213A Integrated Mass Storage Subsystem (see page 14-4). See Table 15-1, below, for a summary of supported cartridge tape subsystems and digital data storage drives.

Software Installation and Backup in Series 800 Systems

In Series 800 Superworkstations and Servers, software installation and backup are supported via cartridge tape subsystems or 9-track,

open reel 1/2-inch magnetic tape units. Because of the greater capacity and high sequential transfer rate of magnetic tape, it should be used for backup of systems with 608 MB or more disk capacity. See Table 15-1, below, for a summary of supported cartridge tape subsystems and magnetic tape units. The 7978A Mag Tape Unit is NOT supported.

Table 15-1. Cartridge Tape Subsystems Digital Data Storage Tape Drives, and Magnetic Tape Units Support in Series 300 Systems and Series 800 Superworkstations and Servers

Product Number	Name/Description	For Series	Interface Used	Recording Density	Operating Mode	Transfer Rate (KB/sec)	Reel/Cartridge Capacity
9144A	16-Track Cartridge Tape Subsystem	300 & 800	HP-IB	10,000 bpi	Streaming	35	67 MB per cartridge
9145A	32-Track Cartridge Tape Subsystem‡	300 & 800	HP-IB	20,000 bpi	Streaming	70	133 MB per cartridge
35401A	16-Track Auto-changer Cartridge Tape Subsystem	300 & 800	HP-IB	10,000 bpi	Streaming	35	Magazine of eight 67 MB cartridges (536 MB total)
C1511A	Model 1300H Digital Data Storage Tape Drive	300 only	HP-IB	not specified	not specified	183	1.3 GB per 60 meter tape cassette
C1512A	Model 1300S Digital Data Storage Tape Drive	300 only	SCSI	not specified	not specified	183	1.3 GB per 60 meter tape cassette
7979A	Autoloading Mag Tape Unit	300 & 800	HP-IB	1600 cpi, 800 cpi optional	Streaming	200	40 MB in 2400 ft.
7980A	Autoloading Mag Tape Unit	300 & 800	HP-IB	6250/1600 cpi, 800 cpi optional	Streaming	781/200	140/40 MB in 2400 ft.
7980XC	Autoloading Mag Tape Unit with data compression	300 & 800	HP-IB	CPR†/6250/1600 cpi	Streaming	C†/781/200	280-420/140/40 MB in 2400 ft.
7974A°	Magnetic Tape Unit	300 & 800	HP-IB	1600 cpi, 800 cpi optional	St-Stp/Str	80/40/160/80	40 MB in 2400 ft.
7978B°	Magnetic Tape Unit	300 & 800	HP-IB	6250/1600 cpi	Streaming	468/120	140/40 MB in 2400 ft.

‡ The 9145A 32-track Cartridge Tape Subsystem can read 16-track Cartridge Tapes for installation of software or exchange of programs and data recorded by 9144A or 35401A Cartridge Tape Subsystems.

† CPR (compression) gives 2 to 3 times tape data capacity and transfer rate of 6250 cpi recording density without compression.

° Discontinued product, listed here for reference.

Tape Device Support in Series 300 Systems

HP BASIC/WS, HP-UX, and Pascal/WS all support the 1/4-inch cartridge tape subsystems that are listed in Table 15-1, but only HP-UX offers software on 1/4-inch

tape cartridges. Only HP-UX supports the new digital data storage tape drives and 1/2-inch open reel magnetic tape units, but Series 300 software is not offered on either digital data storage (4 mm) tape media or 1/2-inch magnetic tape media.

Series 300 Connections

See Figure 15-1, below.

Series 800 Connections

See Figure 15-2, next page.

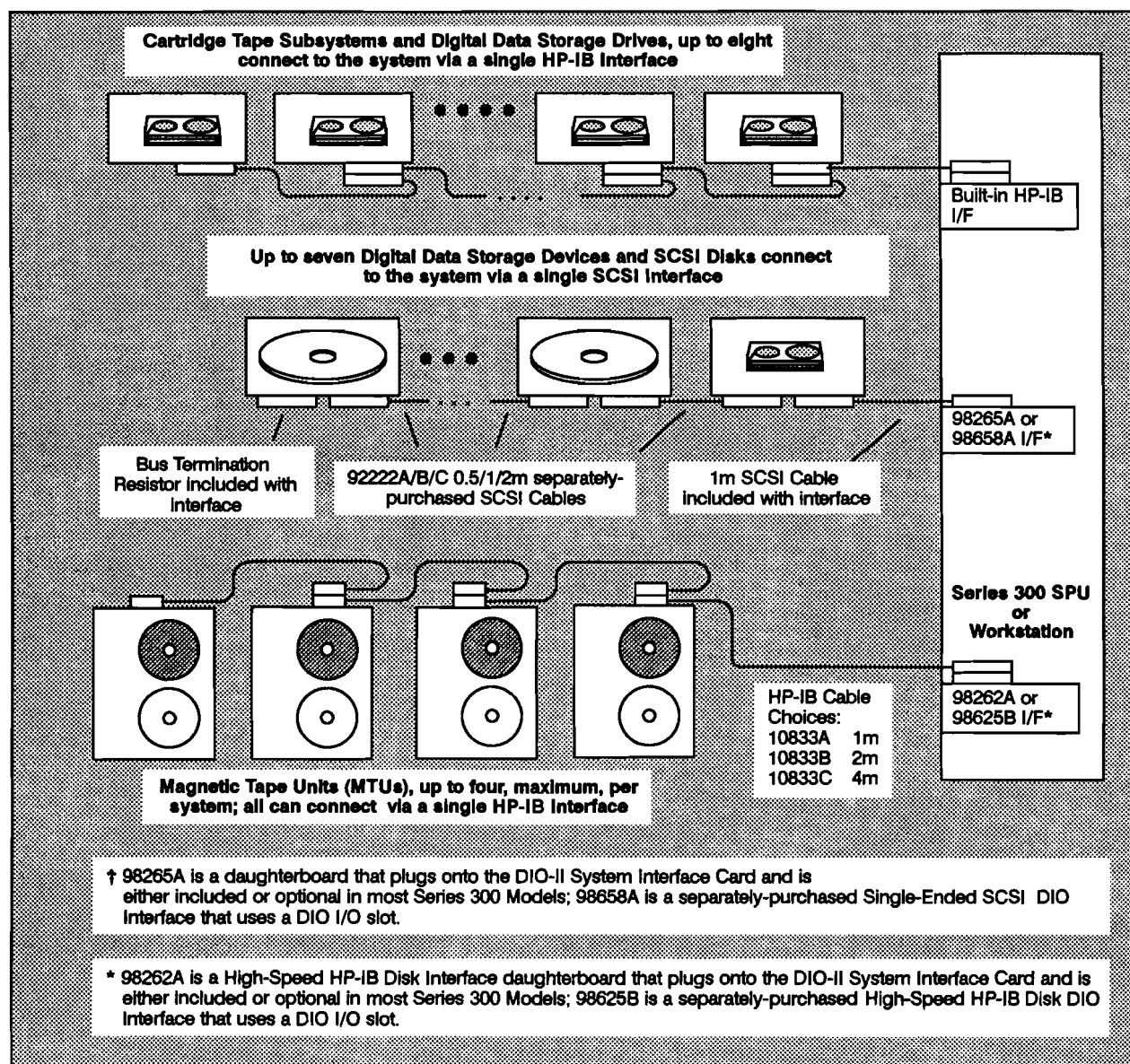


Figure 15-1. Connection of Cartridge Tape Subsystems Digital Data Storage Tapes, and Magnetic Tape Units to Series 300 Systems

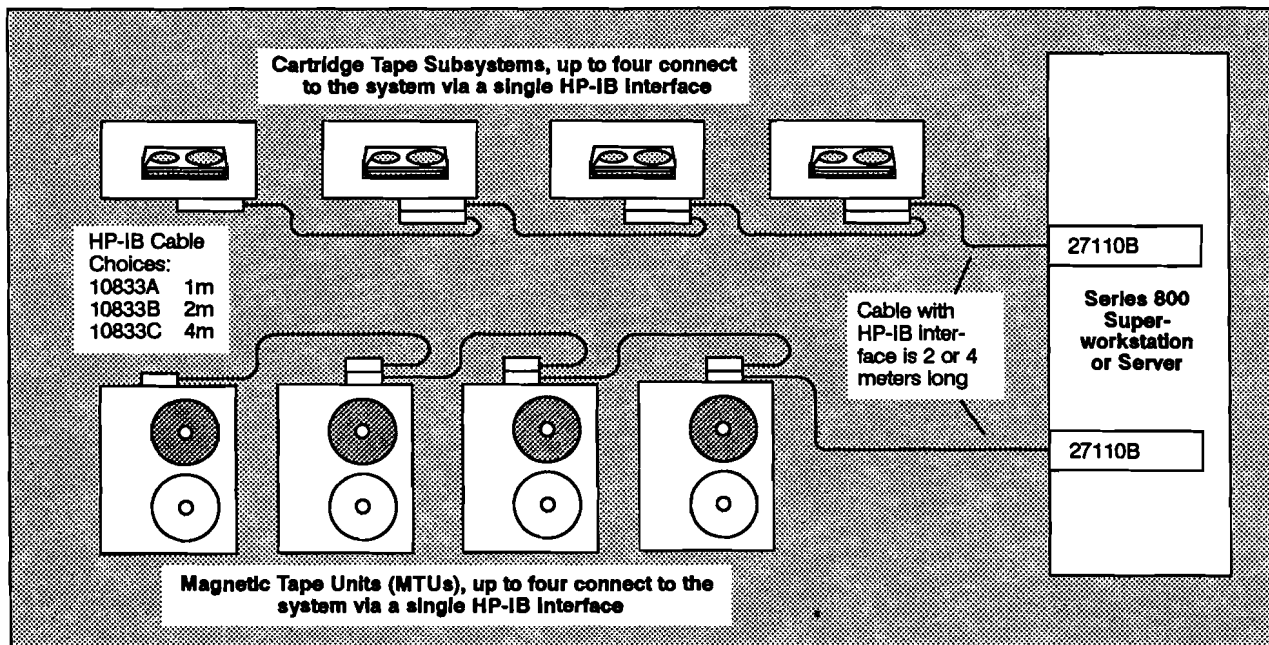


Figure 15-2. Connection of Cartridge Tape Subsystems and Magnetic Tape Units to Series 800 Superworkstations and Servers

Cartridge Tape Subsystem on Same HP-IB Bus as Disk

Although the cartridge tape subsystems use the same CS/80 command set as most HP-IB disks, they have only a 12 KB FIFO buffer. Because of the small buffer, they can significantly degrade performance of a disk on the same bus. For that reason, a cartridge tape subsystem should be used on the same bus as a disk only if it will be used during system idle time, such as for late night backup.

Magnetic Tape Performance in Series 300 Systems

The 9-track magnetic tape units have a 256 KB buffer. They never consume more than 10% of the bus bandwidth and, for that reason, may safely be configured on the same bus with a disk.

Although the 9-track magnetic tape units have a hardware capability of 200 or 781 KB per second, the standard HP-UX backup utilities generate output at between 100 and 150 KB per second, including the time required to identify, locate, and read files within the file system. Rated transfer rates are generally achieved only by direct raw disk-to-tape transfers and user-written data-logging applications.

NOTES:

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Printer Output

Printer Selection

The four types of printers supported on Series 300 Systems and Series 800 Superworkstations and servers are compared in Table 16-1 at right with respect to relative cost, print speed, noise level, and estimated print quality. They are further compared in Table 16-2, below, with respect to paper type, text quality, and bar code printing capability.

Table 16-1. Types of Printers Available for Series 300 Systems and Series 800 Superworkstations and Servers

Printer Type	Times ThinkJet Price	Print Speed	Noise Level (dBA)	Print Quality
Monochrome Inkjet	1.0-2.0	150-240 cps	50	C, B, A
Color Inkjet	2.8-5	167 cps	50	B
Dot-Matrix Impact Serial	3.8-6.1	40-480 cps	56-63	C, B+
Laser	5.4-40	8-20 ppm	50	A
Dot-Matrix Impact Line	11.1-58.9	300-1200 lpm	65	B

Inkjet Printers

Inkjet (ThinkJet, QuietJet, DeskJet, and PaintJet) printers offer low price, reasonably fast print speed, and the quietest operation of all printers. Of these printers, the DeskJet offers Laser printer print quality. The PaintJet has

the added advantage of being able to make full-color overhead transparencies. This type of printer is useful mainly as a low-cost, light-workload, workstation printer. It should never be considered for use as the only printer in a system.

Dot-Matrix Serial Impact Printers

Dot-matrix serial impact printers combine versatility at reasonable cost with good print speed. Versatility can include graphics image and bar code printing and the ability to trade print speed for better print quality. Good

Table 16-2. Printers Supported in Series 300 Systems and Series 800 Superworkstations and Servers

Printer Product Number and Name	Support In Series	Maximum Print Rate	Paper Type	Print Quality	Bar Codes
2225A*/D ThinkJet Printer 2227A/B QuietJet Plus Printer 2228A QuietJet Printer 2276A DeskJet Printer 2277A DeskJet Plus Printer 3630A PaintJet Printer C1602A PaintJet XL Printer	300 & 800	150 cps 160/192 cps 160/192 cps 120/240 cps 120/240 cps 167 cps 167 cps	Std fanfold/cut sheets Wide fanfold/cut sheets Std fanfold/cut sheets Std fanfold/cut sheets Std fanfold/cut sheets Std fanfold/cut sheets Std fanfold/cut sheets Wide cut sheets with autoseed	Draft NLQ/Draft NLQ/Draft LQ/Draft LQ/Draft NLQ NLQ	No No No No No No No No
2235A/B/C/D RuggedWriter 2932A° General-Purpose Printer 2934A Office Printer 41063A Asian Workstation Printer	300 & 800	240/480 cps 200 cps 40/67/200 cps 40/80 cps† 60/120 cps‡	Wide fanfold, 6-part forms Wide fanfold, 6-part forms Wide fanfold, 6-part forms Wide fanfold/cut sheets	LQ/Draft Draft LQ/Draft NLQ/Draft	No No Yes No
C1202A Asian High Speed Printer	300 only	110/220 cps† 165/330 cps‡	Wide fanfold/cut sheets	NLQ/Draft	No
33440A LaserJet II Printer 33447A LaserJet IID Printer 2684A LaserJet/2000 Printer	300 & 800	8 pages/min. 8 pages/min. 20 pages/min.	Single sheets Single sheets & Duplex Single sheets	Letter Quality Letter Quality Letter Quality	Yes Yes Yes
2562C Industrial (Line) Printer 2563B Line Printer 2564B Line Printer 2566B Line Printer C1200A Asian Line Printer	300 & 800	300/150 lpm 300/150 lpm 600/300 lpm 900/248 lpm 270/330 lpm	Wide fanfold, 6-part forms Wide fanfold, 6-part forms Wide fanfold, 6-part forms Wide fanfold, 6-part forms Wide fanfold, 6-part forms	Draft/NLQ Draft/NLQ Draft/NLQ Draft/NLQ NLQ/Draft	Yes Opt Opt Opt No
2567B Line Printer	800 only	1200/320 lpm	Wide fanfold, 6-part forms	Draft/NLQ	Opt

Print Quality Legend: NLQ = Near Letter Quality LQ = Letter Quality

* Not supported in Series 800.

° Discontinued product, listed for reference.

† Rates when printing two-byte Asian characters. ‡ Rates when printing Roman8 and other one-byte characters.

Printer Output continued

print speed means that a dot-matrix serial impact printer can be used as the only printer on a system with modest-to-average printing requirements.

Laser Printers

Laser printers combine excellent print quality with print speed faster than the fastest dot-matrix serial printers at higher cost. Laser printers are recommended for systems with average printing workload in which high print

quality and quiet operation are important and the lack of multi-part forms print capability is irrelevant.

Dot-Matrix Impact Line Printers

Dot-matrix impact line printers offer versatility similar to dot-matrix serial impact printers at faster print speeds and higher prices. A dot-matrix impact line printer should be selected for heavy printing workloads.

Printer Interfacing

For details, see Figures 16-1, below, and 16-2, next page, and Table 16-3 on the following page.

RS-232C Interfacing

Printers can be connected to an RS-232C interface as shown in Figure 16-1, below, for local or remote printing.

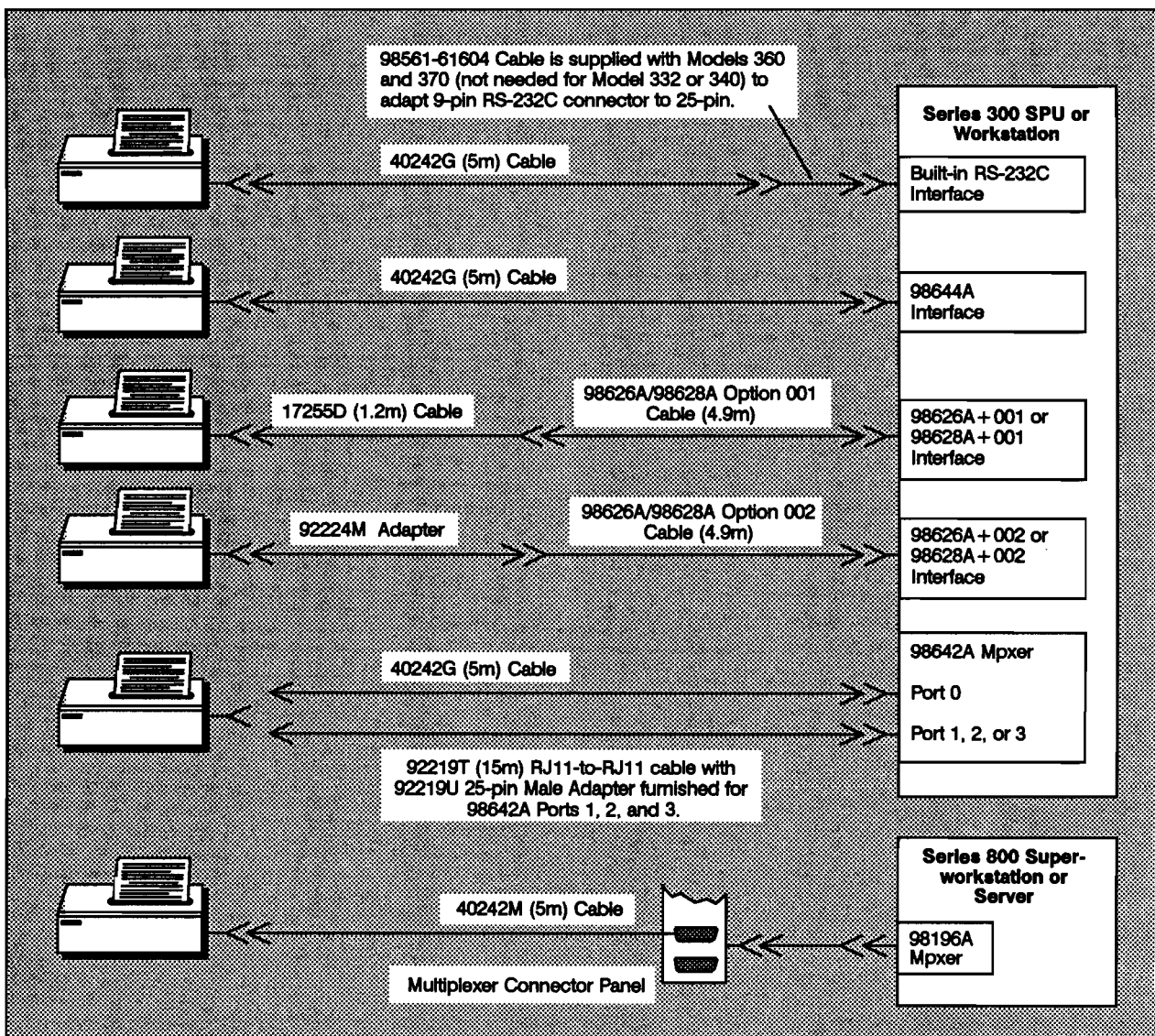


Figure 16-1. RS-232C Connection of Printers to Series 300 Systems and Series 800 Superworkstations and Servers

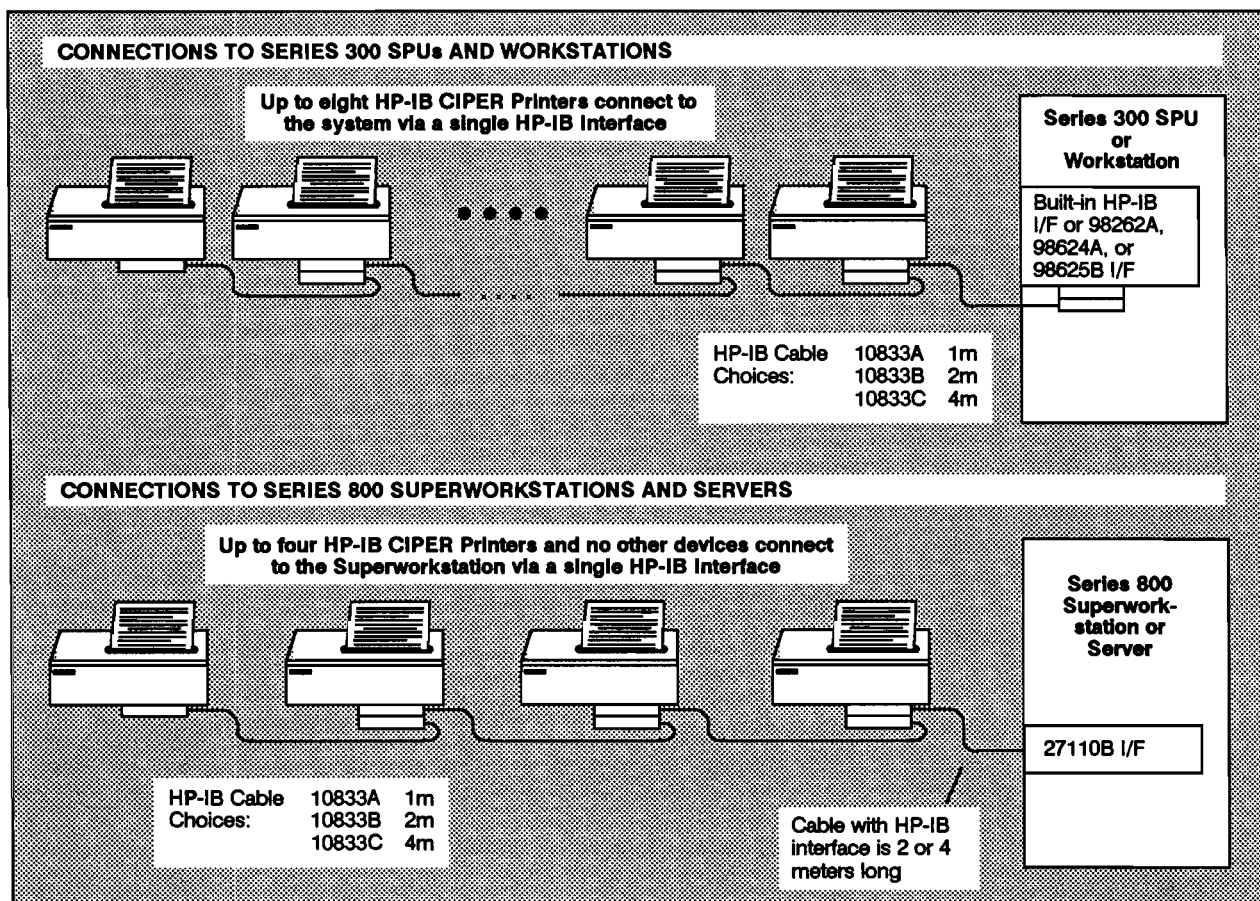


Figure 16-2. HP-IB Connection of Printers to Series 300 Systems and Series 800 Superworkstations and Servers

HP-IB Interfacing

Printers can be connected to an HP-IB interface as shown in Figure 16-2, above.

In Series 300. The HP-IB CIPER interface that is standard on the 2562C Printer and available for 256xB Printers as Option 290 has extra intelligence that enables the printer to share an HP-IB interface with other devices more efficiently than a simple HP-IB interface. For that reason, HP-IB CIPER printers can be used on the same HP-IB interface as a disk in Series 300 systems operating under HP-UX.

HP-UX can support up to eight HP-IB CIPER printers, which can use one HP-IB interface; the number of simple HP-IB printers that can be supported are limited only by the maximum number of HP-IB interfaces that can be supported, which is five (5).

WARNING: Simple HP-IB printers or other simple HP-IB devices cannot be connected to the same HP-IB interface as a mounted file system or swap disk.

In BASIC/WS systems, the number of printers is limited only by physical connections (select codes and addresses).

In Pascal/WS systems, the number of printers is limited by the number of permitted logical units, which is approximately 45.

In Series 800 Superworkstations or Servers, the only supported HP-IB interface for 256xB printers is the Option 290 HP-IB CIPER interface. Also, unlike the Series 300, the rules for Model 825/835 Superworkstations, based on the configurations tested, specify that each 27110B HP-IB interface can be used for up to four HP-IB printers.

National Versions

See page 16-5 for national versions of printers.

Printer Output continued

Table 16-3. Series 300 and Series 800 Workstations Printer Interfacing Summary

Product Number	Name or Description	Host Interface	HP-IB Cable	Cable Required for RS-232C Connection From:				
				Series 300				Ser 800
				Built-In, 98642A Port 0, 98644A	98626A/98628A Opt 001	98626A/98628A Opt 002	98642A Ports 1, 2, and 3	98196A Ports
C1200A C1202A	Asian Line Printer Asian High-Speed Serial Printer	RS-232C RS-232C	n/a n/a	40242G 40242G	17255D 17255D	92224M* 92224M*	Cbl. Incl. Cbl. Incl.	40242M† Not Sup.
C1602A Opt 1AX Opt 1A8	PainJet XL Printer Serial HP-IB	See Options RS-232C HP-IB	----- n/a Any 10833x	----- 40242G n/a	----- 17255D n/a	----- 92224M* n/a	----- Cbl. Incl. n/a	----- Not Sup. n/a
2225A 2225D	ThinkJet Printer ThinkJet Printer	HP-IB‡ RS-232C	Any 10833x n/a	n/a 40242G	n/a 17255D	n/a 92224M*	n/a Cbl. Incl.	n/a 40242M†
2227A 2227B 2228A	QuietJet Plus Printer QuietJet Plus Printer QuietJet Printer	RS-232C HP-IB RS-232C	n/a Any 10833x n/a	40242G n/a 40242G	17255D n/a 17255D	92224M* n/a 92224M*	Cbl. Incl. n/a Cbl. Incl.	40242M† n/a 40242M†
2235A-D 2235B/D	RuggedWriter Printer RuggedWriter Printer	RS-232C HP-IB	n/a Any 10833x	40242G n/a	17255D n/a	92224M* n/a	Cbl. Incl. n/a	40242M† n/a
2276A 2277A	DeskJet Printer DeskJet Plus Printer	RS-232C RS-232C	n/a n/a	40242G 40242G	17255D 17255D	92224M* 92224M*	Cbl. Incl. Cbl. Incl.	40242M† 40242M†
2562C Opt 049	300 LPM Ind. Printer Serial	HP-IB CIPER RS-232C	4m included n/a	n/a 40242G	n/a 17255D	n/a 92224M*	n/a Cbl. Incl.	n/a 40242M†
2563B 2564B 2566B Opt 049 Opt 200 Opt 290	300 LPM Line Printer 600 LPM Line Printer 900 LPM Line Printer Serial HP-IB (simple)‡ HP-IB (CIPER)	See Options See Options See Options RS-232C HP-IB simple HP-IB CIPER	----- ----- ----- n/a 4m included 4m included	----- ----- ----- 40242G n/a n/a	----- ----- ----- 17255D n/a n/a	----- ----- ----- 92224M* n/a n/a	----- ----- ----- Cbl. Incl. n/a n/a	----- ----- ----- 40242M† n/a n/a
2567B§ Opt 049 Opt 200 Opt 290	1200 LPM Line Printer Serial HP-IB (simple)‡ HP-IB (CIPER)	See Options RS-232C HP-IB simple HP-IB CIPER	----- n/a 4m included 4m included	----- Not Sup. n/a n/a	----- Not Sup. n/a n/a	----- Not Sup. n/a n/a	----- Not Sup. n/a n/a	----- 40242M† n/a n/a
2684A* w/26843A	LaserJet/2000 Printer Interface Kit	RS-232C	n/a	40242G	17255D	92224M*	Cbl. Incl.	40242M†
2932A° Opt 046	Gen'l Purpose Printer HP-IB Interface	RS-232C HP-IB	n/a Any 10833x	40242G n/a	17255D n/a	92224M* n/a	Cbl. Incl. n/a	40242M† n/a
2934A Opt 046	Office Printer HP-IB Interface	RS-232C HP-IB	n/a Any 10833x	40242G n/a	17255D n/a	92224M* n/a	Cbl. Incl. n/a	40242M† n/a
33440A 33447A	LaserJet Series II LaserJet Series IID	RS-232C	n/a	40242G	17255D	92224M*	Cbl. Incl.	40242M†
3630A Opt 001 Opt 002	PaintJet (Color) Serial HP-IB	See Options RS-232C HP-IB	n/a Any 10833x	40242G n/a	17255D n/a	92224M* n/a	Cbl. Incl. n/a	40242M† n/a
41063A	Asian Workstation	HP-IB‡ RS-232C	Any 10833x n/a	n/a 40242G	n/a 17255D	n/a 92224M*	n/a Cbl. Incl.	n/a 40242M†

* DTR-CTS hardware flow control is not possible with this cabling. Only Xon/Xoff is supported. † Or 92218A Cable.

‡ HP-IB interface or HP-IB simple interface to this printer is not supported in Series 800; in Series 300, this printer cannot be connected to the system via the same HP-IB interface as a file system or swap disk.

° Discontinued product, listed here for reference.

§ The 2567B Line Printer is not supported in Series 300.



National Versions of Printers, Except the C1602A PaintJet XL

Version	ThinkJet	QuietJet Plus	QuietJet	DeskJet & DeskJet Plus	PaintJet	Rugged Writer	LaserJet 2000	LaserJet Series II & Series IID
U.S.	2225D	2227A	2228A	2276A 2277A	3630A	2235x*	2684x†	33440A 33447A
South African	N/A	2227AA	2228AA	2276AA 2277AA	3630AA	2235xA*	2684x†	33440AA 33447AA
European	2225DB	2227AB	2228AB	2276AB 2277AB	3630AB	2235xB*	2684xB†	33440AB 33447AB
German	N/A	2227AD	2228AD	N/A N/A	3630AD	N/A	N/A	33440AD 33447AD
Spanish	2225DE	2227AE	2228AE	N/A N/A	3630AE	N/A	N/A	33440AE 33447AE
French	N/A	2227AF	2228AF	N/A N/A	3630AF	N/A	2684xF†	33440AE 33447AE
Australian	N/A	2227AG	2228AG	2276AG 2277AG	N/A	N/A	N/A	33440AG 33447AG
Japanese (Katakana)	2225DJ	N/A	N/A	N/A	N/A	2235xJ*	N/A	N/A
European ASCII	N/A	N/A	N/A	2276AK 2277AK	N/A	2235xK*	2684xK†	N/A
Swiss French	N/A	2227AP	2228AP	N/A	N/A	2235xP*	N/A	33440AP 33447AP
Swiss	2225DQ	2227AQ	2228AQ	2276AQ 2277AQ	3630AQ	N/A	2684xQ†	33440AQ 33447AQ
United Kingdom	2225DU	2227AU	2228AU	2276AU 2277AU	3630AU	2235xU*	2684xU†	33440AU 33447AU
Danish	2225DY	2227AY	2228AY	2276AY 2277AY	3630AY	2235xY*	2684xY†	33440AY 33447AY
Italian	N/A	2227AZ	2228AZ	N/A	3630AZ	N/A	N/A	33440AZ 33447AZ

* 2235x denotes 2235A, 2235B, 2235C, or 2235D. † 2684x denotes 2684A, 2684D, or 2684P.

National Versions of the C1602A PaintJet XL

National versions of the C1602A HP PaintJet XL Printer provide user's manuals in the national language, except where otherwise indicated, and appropriate power cable. They are specified as **"must order"** options to the product number, as follows:

Option	Version	Option	Version	Option	Version	Option	Version	Option	Version
ABA	U.S.	ABF	French	ABP	Swiss-German	AB2	Chinese*	ACQ	S. African*
ABB	European*	ABG	Australian	ABQ	Swiss-French	AB5	Hong Kong*	AC9	U.S. 120V metric
ABD	German	ABJ	Japanese	ABU	U.K. English	ACE	Danish*		
ABE	Euro Spanish	ABM	Latin Spanish	ABZ	Italian	ACF	Japanese*		

* English user's manual is supplied with this version.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Graphics Input/Output

Software Support

Basic Requirement

Graphics I/O support of CGBDI calls under HP-UX requires *Starbase* graphics software, which includes device subroutines for the supported devices listed in this section. Series 300 workstations include a license to use *Starbase*. The 98594A Option 022 media for the HP-UX Series workstation bundles includes the *Starbase* software and documentation. The 92445A *Starbase* Graphics Library is included with Model 825/835 Superworkstations and available in a bundle option with Model 834 Superworkstations and thus does not have to be ordered separately.

Graphics Kernel System (GKS) Compatibility

Series 300 users desiring to write graphics applications to GKS standards can purchase the 98672L license to use the HP-GKS Graphics Library and the 98672B media and documentation for 98672L with media option 022, which provides software on 1/4-inch cartridge tape. For Series 800 Superworkstations, order 92521A HP-GKS/HP-UX, which offers a choice of 1/4-inch cartridge tape (option AA0) or 1/2-inch magnetic tape (option AA1) media. GKS requires *Starbase*.

Interactive Graphics

Interactive graphics involves pointing and picking using a mouse or graphics tablet. It may also involve image control using a multi-axis control dial box), which is used interactively while observing a monochrome or color graphics display. Series 300 Workstations and Series 800 Superworkstations offer a choice

of high resolution graphics displays, as described in the respective 2-D and 3-D Workstation sections (Sections 7 and 8) of this guide. HP-HIL devices used for pointing, picking, and digitizing are described on pages 13-7 and 13-8.

Multiple Graphics Display Monitors

In Series 300

Series 300 computers can support multiple C+, CH, and MH graphics monitors to the extent that DIO system or DIO-II slots are available for their respective interfaces (98549A, 98550A, and 98548A). A 98570A Expander will almost certainly be required to house the interface to a second monitor. Interactive graphics with more than one monitor requires additional programming to relate tablet or mouse input to the monitor whose display it is to interact with.

In Series 800 Superworkstation

Up to four CHX/SRX/TurboSRX display monitors can be used on a Model 825/835 Superworkstation, each connected via its own A1017A display controller interface card.

Because each display controller has its own HP-HIL interface, up to four CHX displays can be interactive.

In a workstation with SRX or TurboSRX displays (with or without CHX displays as well), up to two of the four permitted displays can be interactive. The other two displays must function non-interactively as "soft plotters."

A1047A Animation Interfaces cannot be used in the same workstation as A1017A display controller interfaces. Up to two TurboSRX displays, the first connected via an A1047A Animation Interface, the second connected via an A1048A second seat interface, can be interactive, or either can function as a "soft plotter."

RS-170 RGB and NTSC Outputs

Model 360 and 370 Workstations can be interfaced to color monitors that require RS-170 RGB or NTSC inputs via the Video/300 DIO-II boardset. Similar capability is available for Model 825 and 835 Superworkstations. For more information, contact Folsom Research, Inc., 526 East Bidwell Street, Folsom, CA 95630, telephone (916) 985-2481.

3-D Controller Configurability

The 98720A SRX and 98730A TurboSRX Display Controllers are available separately as well as in bundled systems. A complete 3-D subsystem consists of the monitor (98789A 16-inch or 98752A 19-inch) and a local graphics bus interface (98725A to 98720A SRX or 98726A to 98730A) in Series 300 systems. The TurboSRX subsystem also requires a 3 meter 98290A RGB cable, which is not included with either the 98730A Display Controller or the 98726A interface.

The 98720A and 98730A Display Controllers are configurable external 325mm-wide devices. The tables on the next page show slot assignments for the respective controllers.

Graphics Input/Output, continued

SRX Slot Assignments

98720A SRX		
Component	Opt.	Upgrade
Aux. Power Supply	723	98723A
Main Power Supply	Std	-----
3-D Transform Board	721	98721A
3-D Scan Converter	721	98721A
Frame Buffer Ctrlr.	Std	-----
Frame Buffer 3*	722	98722A
Frame Buffer 2*	722	98722A
Frame Buffer 1*	722	98722A
Frame Buffer 0	722	98722A
Color Map	Std	-----

* The auxiliary power supply is required if any of these frame buffer cards is installed.

The standard 98720A has four planes of frame buffer memory on the frame buffer controller. If planes are added, as multiple orders of option 722 or 98722A, the first four planes are used for overlay planes.

TurboSRX Slot Assignments

98730A TurboSRX		
Component	Opt.	Upgrade
Aux. Power Supply	Std†	98723A
Main Power Supply	Std	-----
Frame Buffer 2*	024	98722A
Frame Buffer 1*	016/024	98722A
Frame Buffer 0	Std	-----
Color Map	Std	-----
Fast Z-Buffer*	060	98732A
Frame Buffer Ctrlr.	Std	-----
Master Board*	060	98732A
Slave Board*	060	98732A

† Option 123, supported only on 98730s with single 8-plane frame buffer, deletes the auxiliary power supply.

* The auxiliary power supply is required if any of these slots are used.

The standard 98730A has eight planes of frame buffer memory (one 98722A) plus four overlay planes.

Graphics Hardcopy Output

Graphics Printing

Printers are supported as raster-to-raster hardcopy devices, primarily via the DUMP GRAPHICS facility in BASIC/WS and Pascal/WS, and by the *pcltrans(1)* command in HP-UX. Graphics resolution is that supported by the printer (see Table 17-1). Without user programming, the bit size of an image is limited to the screen pixel size.

The only color hardcopy raster device supplied by HP is the 3630A PaintJet or C1602A PaintJet XL printer. For Series

300, the 98053A option 022 product supplies a GPIO cable and software for supporting a customer-supplied Versatec C2552, C2558, C2562, or C2568 color raster plotter. The 98622A GPIO card is ordered separately.

Graphics Plotting

Supported graphics plotters are compared in Table 17-2 with respect to speed, plot area, usable resolution, and special features. The electrostatic plotters provide the fastest graphics speed with a monochrome image. The pen plotters are considerably slower, but can produce multi-color plots.

Interfacing

Display Monitors

See Table 13-1 and Figures 13-1 and 13-2 on pages 13-1 and 13-2.

Graphics Terminals

See Figure 13-3 and Table 13-4 on pages 13-3 and 13-4.

HP-HIL Mouse, Tablets, etc.

See Table 13-5 and Figure 13-7 and discussion, on pages 13-8 and 13-9.

Printers

See Figures 16-1 and 16-2 and Table 16-3, pages 16-2 through 16-4.

Plotters

HP-UX supports all plotters via HP-IB or RS-232C interface. Unless a dedicated HP-IB interface is available, use of RS-232C interfacing is recommended. HP BASIC/WS and Pascal/WS in Series 300 support only HP-IB interfacing to plotters. For details, see Figures 17-1 and 17-2 and Table 17-3 on pages 17-4 through 17-6.

WARNING: HP-IB plotters and simple HP-IB printers cannot be connected to the same HP-IB interface as a mounted file system or swap disk.

Table 17-1. Graphics Printers Supported in Series 300 Systems and Series 800 Superworkstations and Servers

Device Product Number and Name	Data Rate or Plotting Speed	Print Area	Usable Resolution
C1200A Asian Line Printer	Not specified	345 x 241 mm	70.8 x 70.8 dots/cm.
C1202A Asian High Speed Serial Printer	Not specified	345 x 241 mm	70.8 x 70.8 dots/cm.
C1602A <i>PainJet</i> XL Printer	3 min/B-Size color graphics page 3/6 min/A-Size transparency	16.5 x 10.5 in. (419 x 266 mm)	180 x 180 dots/in.
2225x <i>ThinkJet</i> Printer	Not specified	7.5 x 9.5 in. (190 x 241 mm)	96 x 96 dots/in. (37.7 x 37.7 dots/cm.)
2227x <i>QuietJet</i> Plus Printer	Not specified	13.2 x 9.5 in. (335 x 241 mm)	96 x 96 dots/in. (37.7 x 37.7 dots/cm.)
2228A <i>QuietJet</i> Printer	Not specified	7.5 x 9.5 in. (190 x 241 mm)	
2235x <i>RuggedWriter</i> Printer	Not specified	13.6 x 9.5 in. (345 x 241 mm)	90 x 90 dots/in. (35.4 x 35.4 dots/cm.)
2276A <i>DeskJet</i> Printer	Not specified	7.5 x 9.5 in. (190 x 241 mm)	Up to 300 x 300 dots/in. (118 x 118 dots/cm.)
2563B Line Printer	14.5 in./min. (36.8 cm/min.)	13.2 x 42.6 in. (335 x 1083 mm)	70 x 72 dots/in. (27.5 x 28.3 dots/cm.)
2564B Line Printer	29 in./min. (73 cm/min.)		
2566B/2567B Line Printer	50 in./min. (127 cm/min.)		
2684x <i>LaserJet</i> /2000 Printer	Up to 20 ppm	8 x 10.6 in. (203 x 269 mm)	300 x 300 dots/in. (118 x 118 dots/cm.)
2932A° General-Purpose Printer 2934A Office Printer	8 in./min. (20.3 cm/min.)	11.3 x 42.6 in. (289 x 1083 mm)	90 x 90 dots/in. (35 x 35 dots/cm.)
33440A <i>LaserJet</i> II Printer 33447A <i>LaserJet</i> IID Printer	Up to 8 ppm	8 x 10.6 in. (203 x 269 mm)	300 x 300 dots/in. (118 x 118 dots/cm.)
3630A <i>PaintJet</i> Color Printer	4 min/color graphics page, 8 min/transparency	8 x 10.6 in. (203 x 269 mm)	180 x 180 dots/in. (70.8 x 70.8 dots/cm.)
41063A Asian Workstation Printer	Not specified	345 x 241 mm	70.8 x 70.8 dots/cm.

° Discontinued product, listed here for reference.

Graphics Input/Output, continued

Table 17-2. Graphics Plotters Supported in Series 300 Systems and Series 800 Superworkstations and Servers

Device Product Number and Name	Plotting Speed	Plot Area	Usable Resolution	Graphics Features
C1600A 7600/240D Electrostatic Plotter	0.67 in./sec (1.6 cm/sec)	23.6 in. width (600 mm width)	406 dots/in. (160 dots/cm)	< 1 minute per drawing
C1601A 7600/240E Electrostatic Plotter	0.86 in./sec (2.2 cm/sec)	35.3 in. width (896 mm width)	406 dots/in. (160 dots/cm.)	< 1 minute per drawing
7440A ColorPro Plotter	15.7 in./sec (40 cm/sec)	7.5 x 10.7 in. (191 x 272 mm)	0.004 in. (0.1 mm)	8 pens
7475A Graphics Plotter	15 in./sec (38.1 cm/sec)	10.8 x 16.2 in. (275 x 414 mm)	0.004 in. (0.1 mm)	6 pens
7550A Graphics Plotter	31.5 in./sec (80 cm/sec)	10.7 x 16.1 in. (272 x 411 mm)	0.004 in. (0.1 mm)	8 pens, auto sheet feed
7570A DraftPro Plotter	15.7 in./sec (40 cm/sec)	25.2 x 39.4 in. (550 x 1000 mm)	0.004 in. (0.1 mm)	8 pens
7575A DraftPro DXL Plotter	32 in./sec (80 cm/sec)	24 x 37.2 in. (610 x 946 mm)	0.001 in. (0.0254 mm)	8 pens
7576A DraftPro EXL Plotter	32 in./sec (80 cm/sec)	36.4 x 46.2 in. (897 x 1176 mm)	0.001 in. (0.0254 mm)	8 pens
7595A DraftMaster I Plotter	24 in./sec (60 cm/sec)	36.4 x 44.6 in. (897 x 1232 mm)	0.004 in. (0.1 mm)	8 pens
7596A DraftMaster II Plotter	24 in./sec (60 cm/sec)	34.8 x 46.8 in. (884 x 1135 mm)	0.004 in. (0.1 mm)	8 pens, auto roll feed

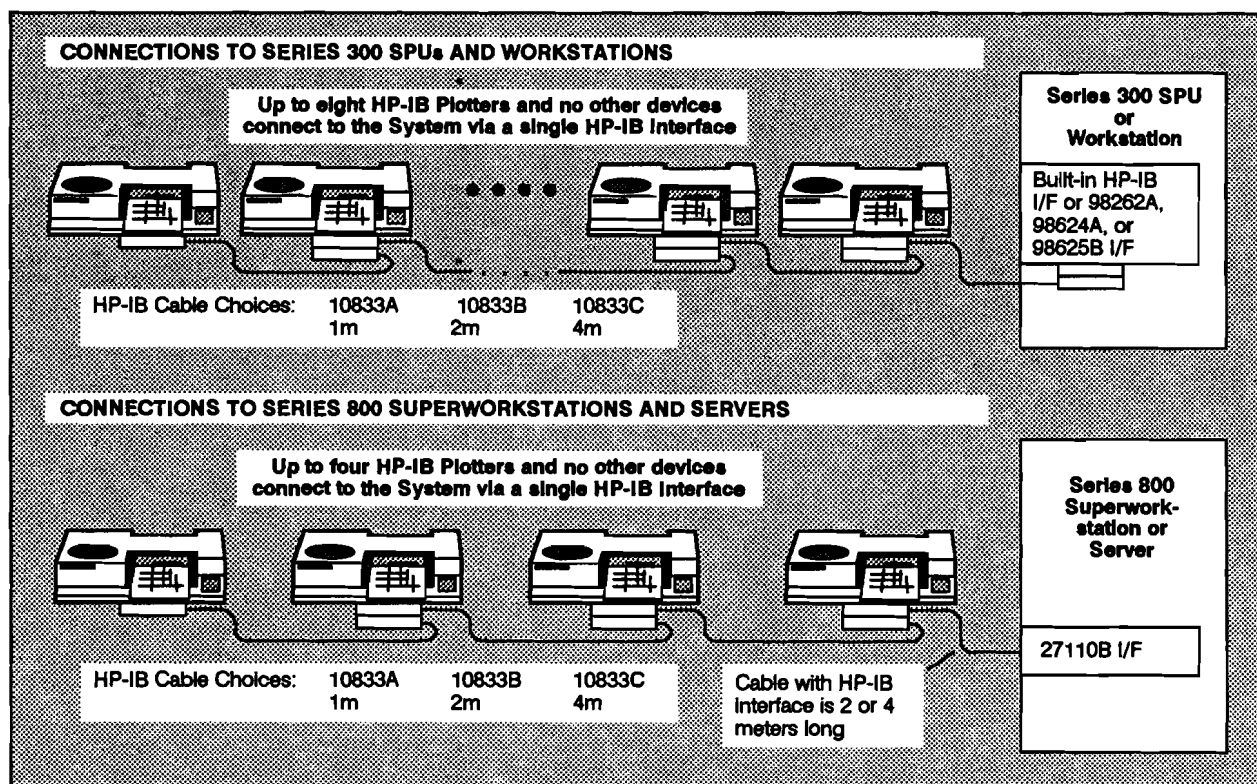


Figure 17-1. HP-IB Connection of Plotters to Series 300 Systems and Series 800 Superworkstations and Servers

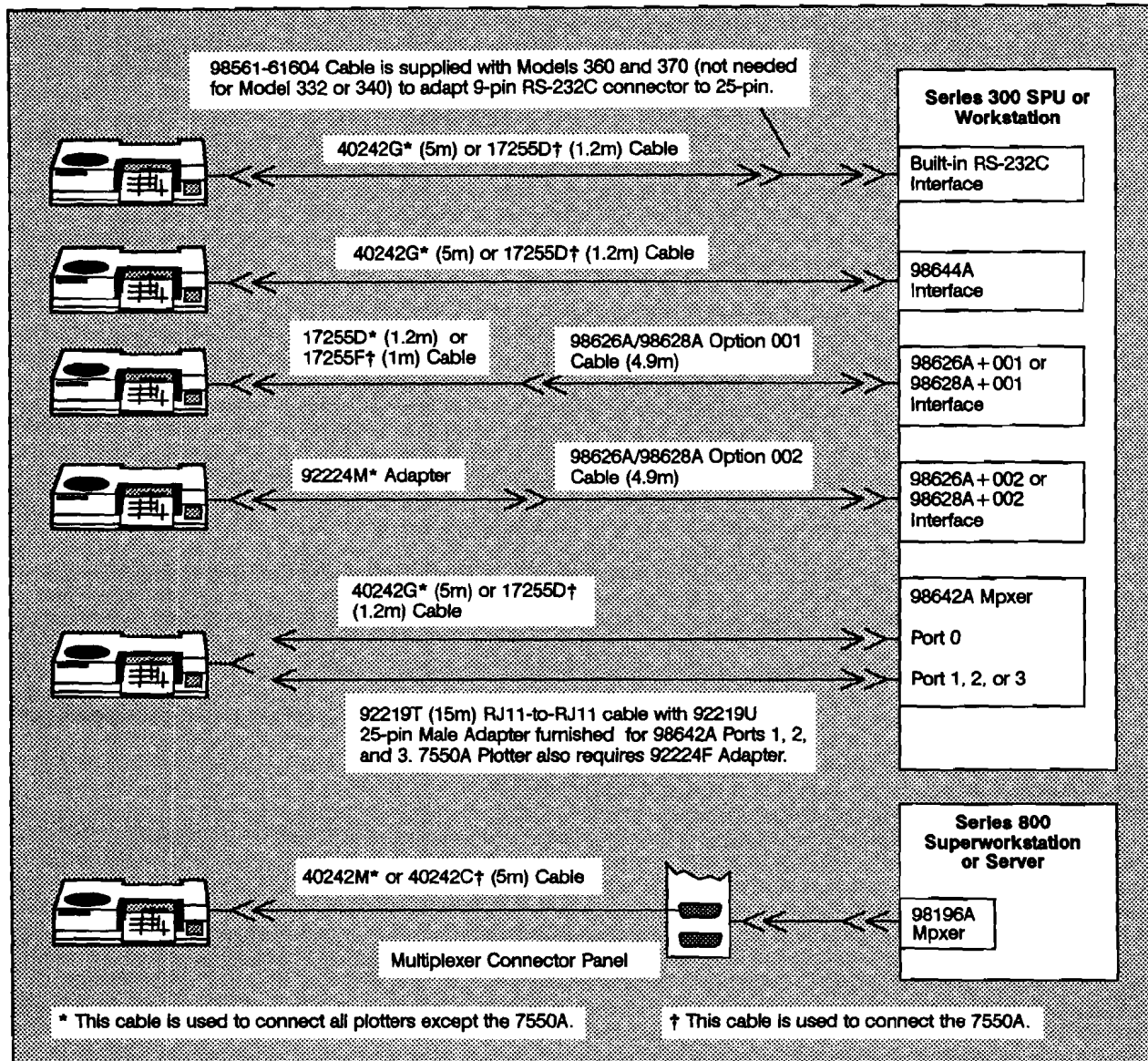


Figure 17-2. RS-232C Connection of Plotters to Series 300 Systems and Series 800 Superworkstations and Servers

National Versions

National Versions of Electrostatic Plotters

National versions of C1600A/C1601A Electrostatic Plotters provide english user's manuals, and appropriate power cable. They are specified as "must order" options to the respective product number, as follows:

Option	Power Cable	Option	Power Cable	Option	Power Cable	Option	Power Cable
ABA	U.S.	ABK	Intercon	AB4	Singapore	ACE	Danish
ABB	European	ABL	Canadian	AB5	Hong Kong	ACF	Japanese
ABG	Australian	ABU	U.K.	ACD	Swiss	ACQ	South African

For national versions of multi-pen graphics plotters, see next page.

Graphics Input/Output, continued

Table 17-3. Series 300 and Series 800 Workstations Plotter Interfacing Summary

Product Number	Name or Description	Host Interface	HP-IB Cable	Cable Required for RS-232C Connection From:				
				Series 300				Ser 800
				Built-In, 98642A Port 0, 98644A	98626A/98628A Opt 001	98626A/98628A Opt 002	98642A Ports 1, 2, and 3	98196A Ports
C1600A	7600/240D Electrostatic Plotter	RS-232C HP-IB simple	n/a Any 10833x	40242G n/a	17255D n/a	92224M* n/a	Cbl. Incl. n/a	40242M† n/a
C1601A	7600/240E Electrostatic Plotter	RS-232C HP-IB simple	n/a Any 10833x	40242G n/a	17255D n/a	92224M* n/a	Cbl. Incl. n/a	40242M† n/a
7440A Opt 001 Opt 002	ColorPro Plotter Serial HP-IB (simple)	See Options RS-232C HP-IB simple	n/a Any 10833x	40242G n/a	17255D n/a	92224M* n/a	Cbl. Incl. n/a	40242M† n/a
7475A Opt 001 Opt 002	Graphics Plotter Serial HP-IB (simple)	See Options RS-232C HP-IB simple	n/a Any 10833x	40242G n/a	17255D n/a	92224M* n/a	Cbl. Incl. n/a	40242M† n/a
7550A	Graphics Plotter	RS-232C HP-IB simple	n/a Any 10833x	17255D n/a	17255F n/a	Cbl. Incl. n/a	92224F* n/a	40242C‡ n/a
7570A Std 17570A	DraftPro Plotter Serial HP-IB interface	See Options RS-232C HP-IB simple	n/a Any 10833x	40242G n/a	17255D n/a	92224M* n/a	Cbl. Incl. n/a	40242M† n/a
7575A Std 17570A	DraftPro DXL Plotter Serial HP-IB interface	See Options RS-232C HP-IB simple	n/a Any 10833x	40242G n/a	17255D n/a	92224M* n/a	Cbl. Incl. n/a	40242M† n/a
7576A Std 17570A	DraftPro EXL Plotter Serial HP-IB interface	See Options RS-232C HP-IB simple	n/a Any 10833x	40242G n/a	17255D n/a	92224M* n/a	Cbl. Incl. n/a	40242M† n/a
7595A	DraftMaster I Plotter	RS-232C HP-IB simple	n/a Any 10833x	40242G n/a	17255D n/a	92224M* n/a	Cbl. Incl. n/a	40242M† n/a
7596A	DraftMaster II Plotter	RS-232C HP-IB simple	n/a Any 10833x	40242G n/a	17255D n/a	92224M* n/a	Cbl. Incl. n/a	40242M† n/a

† Or 92218A (15m) Cable.

‡ Or 92215F (15m) Cable.

National Versions of Multi-Pen Graphics Plotters

U.S. Version	S. African Version	European Version	German Version	French Version	Swiss Version	U.K. Version	Danish Version	Italian Version
7440A	7440AA* 7440BA*	7440AB* 7440BB*	7440AD* 7440BD*	7440AF* 7440BF*	7440AQ* 7440BQ*	7440AU* 7440BU*	7440AY* 7440BY*	7440AZ* 7440BZ*
7475A	7475AA* 7475BA*	7475AB* 7475BB*	7475AD* 7475BD*	7475AF* 7475BF*	7475AQ* 7475BQ*	7475AU* 7475BU*	7475AY* 7475BY*	7475AZ* 7475BZ*
7550A	7550AA	7550AB	7550AD	7550AF	7550AQ	7550AU	7550AY	7550AZ
757xA	757xAA	757xAB	757xAD	757xAF	757xAQ	757xAU	757xAY	757xAZ
759xA	759xAA	759xAB	759xAD	759xAF	759xAQ	759xAU	759xAY	759xAZ

* 7440AA/7475AA through AZ specify the plotter with RS-232C interface; 7440BA/7475BA through BZ specifies the plotter with HP-IB interface.

Rack Mounting and Standby Power System Information

Rack Mounting

Design Plus Cabinets

Series 300 SPUs and workstations, 825/834/835 Superworkstations, and most rackable expanders and peripherals for them are 325mm wide devices designed to be housed in HP *Design Plus* cabinets. These devices have removable front feet and rear pads and a top groove for interlocked stacking of units to a maximum supported height of 0.6m, or 24 *Design Plus* units. A *Design Plus* Unit is 26 mm (1.024 inch).

Devices of lesser depth should be stacked atop those of greater depth and, with depth the same, lighter devices should be stacked on heavier ones.

Table 18-1, at right, compares the cabinets that are available for housing HP 325mm *Design Plus* devices. Table 18-2, next page, lists the devices that can be housed in the cabinets.

HP 92211M/L Taborets. The 92211M/L taborets are designed for under-table use. The taller 92211L is the maximum height that will fit under typical tables. The shorter 92211M is intended to provide a base for a 19-inch wide HP System-II device, such as a 9888A DIO Bus Expander.

Both taborets have a flat floor with slots for the feet of the bottom device. The included rails and shelf are useful when the equipment does not fill the full vertical space and you want certain devices at the top.

Both taborets are shipped with four removable casters, with locking brakes on the front pair of casters. However, because the foot/groove interlock system relies on gravity for the security of housed devices, these cabinets are not intended for routine movement with devices in them.

Table 18-1. *Design Plus* Cabinets

Product Number	92211M	92211L	92211R
Common Name	Small Taboret	Large Taboret	Mobile Mini-rack
Usable Rack Height	13 units	20 units	22 units
Exterior Height	435mm	620mm	720mm
Interior Width Exterior Width	325mm 425mm	325mm 425mm	325mm 375mm
Interior Depth Exterior Depth	400mm 425mm	500mm 525mm	700mm 711mm
Equipment Rails	One pair included	One pair included	Four pairs included
Shelf	One included	One included	None
Front Filler Panels	None Available	None Available	Order 92211T (20 units)
Rear Door	None	None	Included
Power Strip	None	None	None

The taborets are open at front and rear. There are no cooling concerns so long as nothing more than I/O cables and power cables is placed behind any device housed in the taboret.

HP 92211R Mini-Rack. The 92211R is designed for desk-side use, with an external height which matches that of other HP *Design Plus* furniture. It includes four casters, with locking brakes on the front pair of casters.

Because the Mini-Rack does not have a flat floor, at least one pair of 92211S rails must be used for installing rack mounted devices. The 92211S kit includes four rails. The rails do not have locking slots for device feet.

The 92211S kit also includes five pairs of module locks, each of which secures one device to the frame of the 92211R. At a minimum, one rail pair and one lock pair are required for the bottom device in a stack, so one 92211S kit can serve up to four 92211R cabinets.

If a rack is to be moved often, or is to be shipped, a pair of rails and locks should be used for each device in the cabinet. HP supports shipping of 92211R racks with equipment installed only for specific tested configurations in custom crating. Customers assume responsibility for all other shipped configurations.

A 92211T kit of 20 1-unit-high snap-in filler panels is available for cooling and cosmetic purposes. The 92211R has a removable rear door with ventilation slots. When the door is installed, any unoccupied vertical space at the front of the 92211R must be occupied by filler panels to prevent recirculation of heated air.

HP 19511A Disk-Mounting MiniRack. The 19511A is a special version of the 92211R Mini-Rack for housing two 7936/7937 disk drives. Modifications include anti-tip feet, safety interlock, extended-depth rear door, and two pairs of ball-bearing slide rails for mounting two disks. The 19511A also includes 11 filler panels.

Rack Mounting and Standby Power System Information, continued

Where only a single 7936/7937 disk is installed (at the bottom), the upper rails can be removed and the available 11-unit space above the disk can be used for other devices. At least one pair of ordinary 92211S rails are required because the 7936/7937 does not

have a flat, grooved top. Filler panels must be used to ensure adequate cooling of the device(s) in the top of the 19511A cabinet. In addition, if the second device is not a 35401A Autochanger Cartridge Tape Subsystem, the rear door must be removed.

Table 18-2. Design Plus Device Sizes

Model or Product No.	Name/Description	Height (units)	Depth (mm)
310, 320, 332	Computers	5	400
319, 340, 345	Computer	4	470
360, 370, 375	Computer	5	400
825/834/835	Superworkstation	9	500
A1013A	Expander for 825/835 Superworkstation	9	500
C1511A/C1512A	Digital Data Storage (4 mm) Tape Drive	4	290
C2201A-C2204A	Fixed Disks	5	554
C2212A/C2213A	Integrated Mass Storage Subsystem	5	554
C1701A	Optical Disk Drive	4	285
2393/2397	Terminal Processor	4	350
35401A	Autochanger Cartridge Tape Subsystem	10	640
7907A	Fixed/Removable Disk	9	468
7936/7937*	Fixed Disk	11	735
7941A°/7945A°	Fixed Disks	5	310
7942A°/7946A°	Fixed Disks with Cartridge Tape Drive	12	310
7957x-7959x	Winchester Disks	5	310
7962B/7963B	Winchester Disks	5	570
9121°/9122	Flexible Disks	3	310
9125°/9127A	Flexible Disks	4	310
9144A/9145A	Cartridge Tape Subsystems	5	310
9153	Disks	4	310
98568A	Expander	5	400
98570A	Expander	5	400
98577A	Expander	5	400
98720A	SRX Display Controller	9	580
98730A	TurboSRX Display Controller	12	580

° Discontinued product, listed for reference.

* Requires 19511A version of 92211R rack.

For more information on HP Design Plus cabinets and accessories. For more information on HP Design Plus cabinets and accessories, see the "Hewlett-Packard Computer Users Catalog," HP Literature Stock Number 5953-2450D or a later revision, available from Hewlett-Packard's Direct Marketing Division, telephone 800-538-8787.

19-inch EIA Rack-Mount Accessories

Table 18-3, next page, lists HP cabinets and accessories available for customers who want to rack-mount Model R/332 Instrument Controllers, Series 300 systems, or Model 825/835 Superworkstations in 19-inch EIA rack cabinets instead of Design Plus cabinets.

Standby Power System for Series 300 Systems

To prevent data loss in case of mains power failure, Series 300 systems can be equipped with a standby power system. Standby power systems with 800 VA and 1200 VA capacity can provide 7 to 30 minutes of power (depending upon the load) to bridge across relatively brief mains power failures. The supplier of these standby power systems is:

Sola Electric Company
1717 Busse Highway
Elk Grove Village, IL 60007

(312) 228-1250 (U.S.)
(416) 253-6465 (Canada)

For detailed information on implementing the Standby Power Supply, refer to the HP 9000 Series 300 Battery Backup Application Brief, HP Part Number 98561-90615.

Table 18-3. 19-inch EIA Rack Cabinets and Accessories

Supported Device Model or Product Number	Cabinet/Adapter Product Number	Vertical Rack Space (Inches)		Name/Description
		Avail.	Used	
Various	29402C	62.6		Cabinet.
Various	29431G	54.87		Cabinet divided equally into two compartments, ventilated upper and non-ventilated lower.
Various	46298A	21.8		Cabinet frame, two side panels, top cover, four non-lockable casters, HP system name plate, and leveler screws. For front and rear doors, and related accessories, see 46298E through 46298K and 40112A, 40113A, and 40115A.
Various	46298B	32.8		
Various	46298C	56.4		
46298A 46298B 46298C	46298E 46298F 46298G			Blank front door with key lock for 46298A Cabinet. Blank front door with key lock for 46298B Cabinet. Blank front door with key lock for 46298C Cabinet.
46298A 46298B 46298C	46298H 46298J 46298K			Rear door with key lock and ventilation louvers for 46298A Cabinet. Rear door with key lock and ventilation louvers for 46298B Cabinet. Rear door with key lock and ventilation louvers for 46298C Cabinet.
46298A 46298B 46298C	40112A 40113A 40115A			Right and left front caps for 46298A Cabinet. Right and left front caps for 46298B Cabinet. Right and left front caps for 46298C Cabinet.
R/332	A1309A		7.5	Rack Mounting Flange Kit for Model R/332 Instrument Controller (also requires 1494-0059 or 1494-0063 rack slides or 12679B slide rails).
332/360/370 & 98568A or 98570A or 98577A	98569A		7 & 5.25	Two-part rack adapter; the lower section supports the Model 332/360/370 SPU chassis and the upper section provides cosmetic wings for a single 98568A/98570A/98577A Expander or other 5-unit high device that is shorter than 400mm.
825/834/835	97099A		10.25	Rack Mount Kit for Model 825/834/835 Superworkstation or A1013A I/O Expander.
A1014A	A1019A		3.5	Rack adapter for A1014A Battery Backup Unit for Model 825/835 Superworkstation.
C1701A	19500B		5.25	Rack adapter for C1701A Optical Disk Drive with 1 unit filler panel.
C220xA	35199C		5.25	Rack adapter for C2200A – C2204A Fixed Disks.
C2212A/13A	35199C		5.25	Integrated Mass Storage Subsystems.
46021x	12131A		3.5	Keyboard racking kit; includes pivot for keyboards wider than 19 inches.
2225x	44496A		8.75	Locking drawer for 2225x <i>ThinkJet</i> Printer.
35401A	35490A		12	Rack adapter for 35401A Autochanger Cartridge Tape Subsystem.
35731A	98567A		15.75	Rack adapter for 35731A Monochrome Monitor.
35741A	98567B		15.75	Rack adapter for 35741A Color Monitor.
7907A	19507A		7	Rack adapter for 7907A Disk.
793xH/FL	19512A		12	Rack adapter for 7936/7937 Disk.
795xA/B/S 9122C 9153C	19500B		5.25	Rack adapter for all 300mm to 400mm deep devices. Includes 1 and 2 unit filler panels for devices that are less than 5 units high.
796xB	19560B		7	Rack adapter for 7962B/7963B Disks.
98720A	97099A		10.5	Rack adapter for 98720A SRX Display Controller.
Various	40101-6A		Various	1.75, 3.5, 5.25, 7, 8.25, and 10.5 inch blank, parchment white filler panels.

NOTES:

[illegible]

Configuration Record

Introduction

This section contains blank HP 9000 Configuration Record forms that can be duplicated on a copying machine and used to fill out a configuration as outlined in Section 2.

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Configuration Summary

System for: _____
(customer's name and location)

Application: _____
(type of application, such as mechanical design, PC design, desktop publishing, etc.)

Application Software Package(s): _____

(name(s) and supplier(s) of software package(s) to be used to implement application)

Diskless Workstation?: ____ / Network Server? ____ No. of Seats Served? ____
(Indicate "yes" and "no" where appropriate)

Monitor(s) Required: _____
(indicate color or monochrome and required resolution of each)

Peripherals Required:

Display Terminal(s): _____

(indicate type and required specifications)

Graphics Image Control Device(s): _____

(indicate type and required specifications)

Printer(s): _____

(indicate type and required specifications)

Plotter(s): _____

(indicate type and required specifications)

Disk(s): _____

(indicate type and required specifications)

Tape Unit(s): _____

(indicate type and required specifications)

Other Device(s): _____

(indicate type and required specifications)



□ ☐ ☐

Configuration List, continued

Software and Communications, continued[illegible]

SPUs, Workstations, Network Servers, and Peripherals, options and accessories

[illegible]



Series 300 Backplane/ Interface Use Records

Model 332 Computer Backplane/Interface Use Record

Please use this page to keep track of your Model 332 configuration as you select it. (For Model R/332, see next page.) Enter DIO accessory, I/O, and system cards by product number in the appropriate backplane at right as items are selected. Identify multiple multiplexer interfaces as 98642A-1, -2, -3, etc., HP-IB interfaces as 98624A -G1,-G2 and 98625B-D1,-D2, and SCSI interfaces as 98658A-D1, -D2, for keying with multi-device interface use records on page 19-14.

Use of Model 332 Built-in Interfaces

HP-HIL Interface Record

Device P/N and Name

RS-232C Interface Record

Device P/N	Cable P/N

Std HP-IB Interface Record

Device P/N	Cable P/N
	Incl. w/SPU

HP 9888A DIO Bus Expander

Acc

I/O

Acc

I/O

Acc

I/O

Acc

I/O

Interface to Host (double-wide DIO)

To DIO I/O Slot in host SPU or Expander

HP 9888A DIO Bus Expander

Acc

I/O

Acc

I/O

Acc

I/O

Acc

I/O

Interface to Host (double-wide DIO)

To DIO I/O Slot in host SPU or Expander

HP 98568A Direct-Connect 8-Slot I/O Expander

Acc

I/O

Acc

I/O

Acc

I/O

Acc

I/O

Power Supply

Acc

I/O

Acc

I/O

Processor - I/O Board

Model 332

Series 300 Backplane/Interface Use Records, continued

Model R/332 Computer Backplane/Interface Use Record

Please use this page to keep track of your Model R/332 configuration as you select it. Enter DIO accessory, I/O, and system cards by product number in the appropriate backplane at right as items are selected. Identify multiple multiplexer interfaces as 98642A-1, -2, -3, etc., HP-IB interfaces as 98624A -G1, -G2 and 98625B-D1, -D2, and SCSI interfaces as 98658A-D1, -D2, for keying with multi-device interface use records on page 19-14.

Use of Model R/332 Built-in Interfaces

HP-HIL Interface Record

Device P/N and Name
Keyboard

RS-232C Interface Record

Device P/N	Cable P/N

Std HP-IB Interface Record

Device P/N	Cable P/N
Built-in flex disk	Incl. w/SPU

HP 9888A DIO Bus Expander

Acc		
I/O		
Acc		
I/O		
Acc		
I/O		
Acc		
I/O		
	Interface to Host (double-wide DIO)	

To DIO I/O Slot in host SPU ←

HP 9888A DIO Bus Expander

Acc		
I/O		
Acc		
I/O		
Acc		
I/O		
Acc		
I/O		
	Interface to Host (double-wide DIO)	

To DIO I/O Slot in host SPU ←

Acc		Power Supply
I/O		
Acc		
I/O		
Acc		
I/O		
Acc		
I/O		
Processor - I/O Board		

Model R/332

Please use this page, and extenders pages 19-12 and 19-13 if needed, to keep track of your Model 360 configuration as you select it. Enter DIO accessory, I/O, and DIO-II or DIO system cards by product number in the appropriate backplane diagram as items are selected. Identify multiple multiplexer interfaces as 98642A -1, -2, -3, etc., HP-IB interfaces as 98624A-G1, -G2 and 98625B -D1, -D2, and SCSI interfaces as 98658A-D1, -D2, for keying with multi-device interface use records on page 19-14.

HP-HIL Interface Record

[illegible]

Device P/N	Cable P/N

[illegible][illegible][illegible]

* Cross out the Option 010 and/or Option 011 Disk Interface Record if the Option is not included.

HP 98242A 4-Slot DIO Backplane
(adapter) (plugs into top two
adjacent DIO-II Slots)

Acc	
I/O	
Acc	
I/O	

HP 98242B 2-Slot DIO Backplane
(adapter) (plugs into top DIO-II Slot)

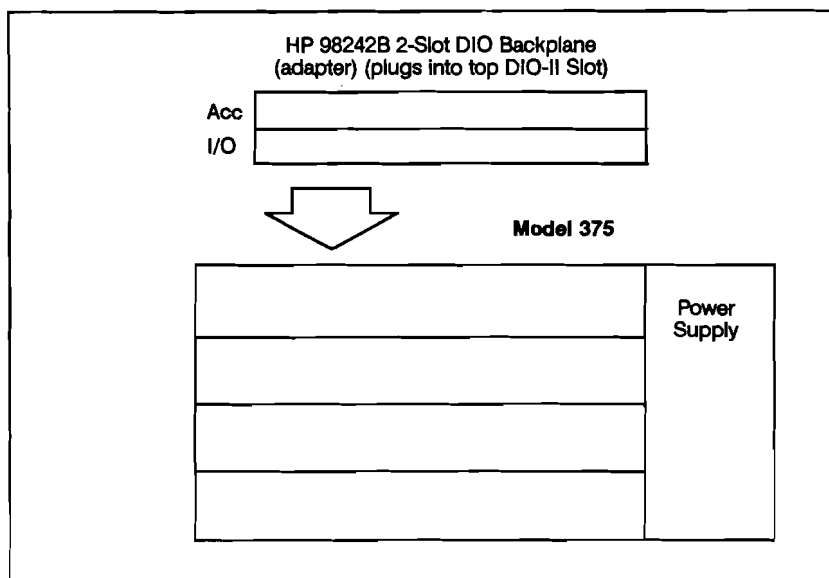
Acc	
I/O	



Model 360

	Power Supply

Please use this page, and extenders pages 19-12 and 19-13 if needed, to keep track of your Model 375 configuration as you select it. Enter DIO accessory, I/O, and DIO-II or DIO system cards by product number in the appropriate backplane diagram as items are selected. Identify multiple multiplexer interfaces as 98642A -1, -2, -3, etc., HP-IB interfaces as 98624A-G1, -G2 and 98625B -D1, -D2, and SCSI interfaces as 98658A-D1, -D2, for keying with multi-device interface use records on page 19-14.



HP-HIL Interface Record

[illegible]

RS-232C Interface Record

Device P/N	Cable P/N

Centronics Interface Record

Device P/N	Cable P/N
	included

Std HP-IB Interface Record

[illegible]

* Cross out the SCSI Single-Ended Disk Interface record if Option 010 is ordered or the Option 010 High-Speed-Disk Interface Record if Option 010 is not ordered.

SCSI Single-Ended Disk Interface Record*

Device P/N	Cable P/N
	Included

Option 010 High-Speed HP-IB Disk Interface Record*

[illegible]

Model 360/370/375 Expanders Backplane Use Records

Please use this page and the next page as needed to keep track of your Model 360/370/375 configuration as you select it. Cross out expanders that are not used. A maximum of two of the expanders shown on this page is permitted per Model 360/370/375 SPU.

HP 98577A VME Expander		
VME C.1		Pwr Sup
VME C.1		
VME C.1		
VME C.1		
Controller		

HP 98568A 8-Slot DIO Expander		
Acc		Power Supply
I/O		
Acc		
I/O		
Acc		
I/O		
Acc		
I/O		

HP 98570A 6-slot DIO-II/DIO Expander		
Acc		Power Supply
I/O		
Acc		
I/O		
DIO-II		
DIO-II		

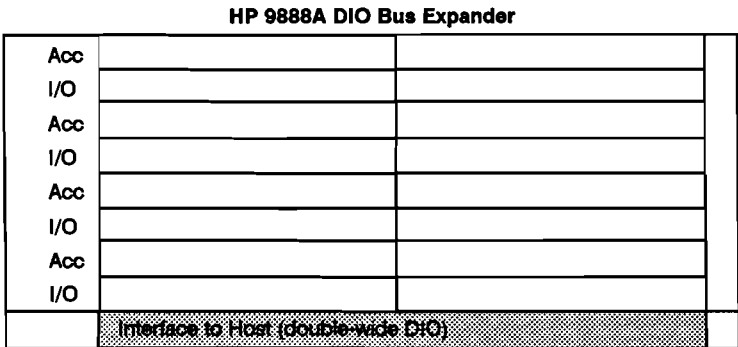
HP 98568A Option 132 8-Slot DIO Expander		
Acc		Power Supply
I/O		
Acc		
I/O		
Acc		
I/O		
Acc		
I/O		

HP 98570A Option 004 4-slot DIO-II Expander		
DIO-II		Power Supply
DIO-II		
DIO-II		
DIO-II		

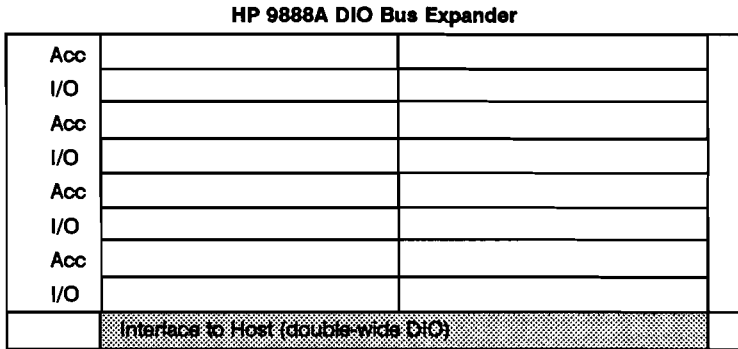
HP 98570A 6-slot DIO-II/DIO Expander		
Acc		Power Supply
I/O		
Acc		
I/O		
DIO-II		
DIO-II		

HP 98570A Option 004 4-slot DIO-II Expander		
DIO-II		Power Supply
DIO-II		
DIO-II		
DIO-II		

A maximum of two of the 9888A DIO Bus Expanders shown on this page is permitted per Model 360/370/375 SPU. This is in addition to the two direct-connect expanders that can be selected on the previous page.



To DIO I/O Slot in host SPU or Expander ←



To DIO I/O Slot in host SPU or Expander ←

Multiplexer/HP-IB/SCSI DIO Interface Use Records

Please use this page to keep track of your configuration. As each multiplexer, HP-IB, and/or SCSI DIO I/O interface is selected for the configuration, place a check by its title and enter the product numbers of each of the devices it interfaces and the cable used for connection of that device. (Device and cable product numbers are given in the workstations configuration guide.) In this way, you will be able to continuously keep track of how many more devices can be connected by the interfaces you've selected, and thereby determine if and when you have to select the next interface.

98642A Multiplexer No. 1

Device P/N	Cable P/N
0	
1	
2	
3	

98642A Multiplexer No. 2

Device P/N	Cable P/N
0	
1	
2	
3	

98642A Multiplexer No. 3

Device P/N	Cable P/N
0	
1	
2	
3	

98642A Multiplexer No. 4

Device P/N	Cable P/N
0	
1	
2	
3	

98625B High-Speed HP-IB Disk Interface D1

[illegible]

98625B High-Speed HP-IB Disk Interface D2

[illegible]

98658A SCSI Single-Ended Disk Interface D1

[illegible]

98658A SCSI Single-Ended Disk Interface D2

[illegible]

98624A HP-IB Interface G1

[illegible]

98624A HP-IB Interface G2

[illegible]

98624A HP-IB Interface G3

[illegible]

Superworkstation Backplane/Interface Use Records

Superworkstation Backplane Use Record

Please use this page and the next page to keep track of your Superworkstation configuration as you select it. Enter CIO or CTB cards by product number in the appropriate SPU or expander card cage as items are selected. Identify multiple multiplexer interfaces as 98196A-1, -2, etc., HP-IB interfaces as 27110B-D1, -M1, PR1, etc., and HP-FL interfaces as 27111A-D1, -D2, etc. for keying with the interface use records on the next page.

Part of the division between CIO slots and CTB slots in the diagram below is shaded to indicate that the center guide slots can be removed to install CTB interfaces, such as the A1017A Display Controller Interface or the (98191A or 98193A) HP-UX SNALink interface, which occupy

the full width of adjacent CTB and CIO slots. Interfaces in affected CIO slots have to move up to make room for CTB interfaces.

Note that connection of an A1013A CIO Expander to a Model 825CHX or SRX Superworkstation requires the installation of a CIO Channel Adapter in the CTB (and CIO) slot immediately above the Display Controller Interface Card.

As you determine the need and add memory or CIO interfaces, enter the respective product numbers into the card cage record. Remember that the HP 28667A Real-Time Interface requires two adjacent CIO slots.

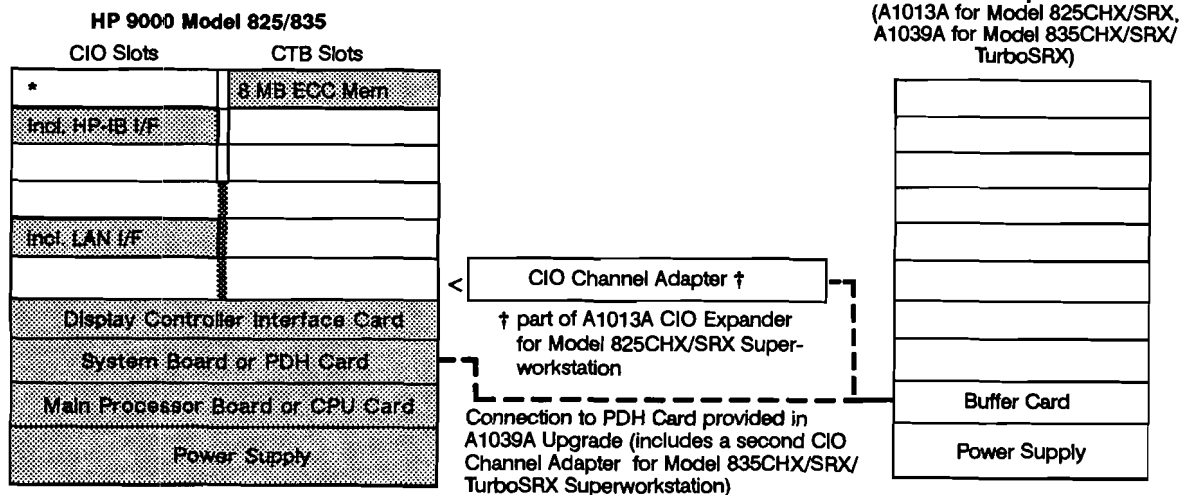
The Interface Use Records

On the next page are Multiplexer, HP-IB, and HP-FL Inter-

face Use records. Into these records, enter the product numbers of the various terminals, printers, and plotters, and the cables used to connect them via 98196A 6-channel Multiplexer Interfaces. Similarly, enter the product numbers of the discs, cartridge tape subsystems, magnetic tape units, printers, plotters, etc. into the record sections for 27110B HP-IB interfaces or the discs into the records for the 27111A HP-FL interfaces. An 27110B HP-IB interface dedicated to disk connections is designated D1 and one dedicated to printer connections is designated PR1. One 27110B HP-IB disk interface is standard, and indicated as such in the record. These various record sections provide a graphic means of keeping track of device interfacing capacity as it is used for the configuration.

MODEL 825 AND 835 SUPERWORKSTATION BACKPLANE USE RECORD

Enter memory and I/O Cards by product number in the appropriate backplane for your system as items are selected in later sections of this guide. Identify multiplexer interfaces as 98196A-1, -2, etc., HP-IB interfaces as 27110B-D1, -PR1, etc., and HP-FL interfaces as 27111A-D1, -D2 for keying with the use records on the next page.



* This slot is reserved for the Access Port if used; can be used for other interface if not used for the Access Port.

Multiplexer, HP-IB, and HP-FL CIO Interface Use Record

As each multiplexer, HP-IB, and/or HP-FL CIO interface is selected for the configuration, place a check by its title and enter the product numbers of each of the devices it interfaces and the cable used for connection of that device. (Device and cable product numbers are given in the workstations configuration guide.) This will help you to continuously track of how many more devices can be connected by the interfaces you've selected, and thereby determine if and when you have to select the next interface.

98196A Multiplexer No. 1

Device P/N	Cable P/N

98196A Multiplexer No. 2

Device P/N	Cable P/N

98196A Multiplexer No. 3

Device P/N	Cable P/N

27110B HP-IB I/F No. D1 for Disks and/or Tapes (Std)

Device P/N	Cable P/N
	Included with I/F

27110B HP-IB I/F No. D2 for Disks and/or Tapes

Device P/N	Cable P/N
	Included with I/F

27110B HP-IB I/F No. D3 for Disks and/or Tapes

Device P/N	Cable P/N
	Included with I/F

27110B HP-IB I/F No. PR1 for Printers

Device P/N	Cable P/N
	Included with I/F

27110B HP-IB I/F No. PR2 for Printers

Device P/N	Cable P/N
	Included with I/F

27110B HP-IB I/F No. PL1 for Plotters

Device P/N	Cable P/N
	Included with I/F

27110B HP-IB I/F No. G1 for General HP-IB Devices

Device P/N	Cable P/N
	Included with I/F

27110B HP-IB I/F No. G2 for General HP-IB Devices

Device P/N	Cable P/N
	Included with I/F

27110B HP-IB I/F No. G3 for General HP-IB Devices

Device P/N	Cable P/N
	Included with I/F

27111A HP-FL I/F No. D1

Device P/N	Cable P/N

27111A HP-FL I/F No. D2

Device P/N	Cable P/N

NOTE: HP 27111A HP-FL interfaces can connect up to eight discs when they are selected as the 19524FL 4 GB package, which contains all eight drives in a single, tall cabinet. Otherwise, the maximum number of discs supported per 27111A interface is six.

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