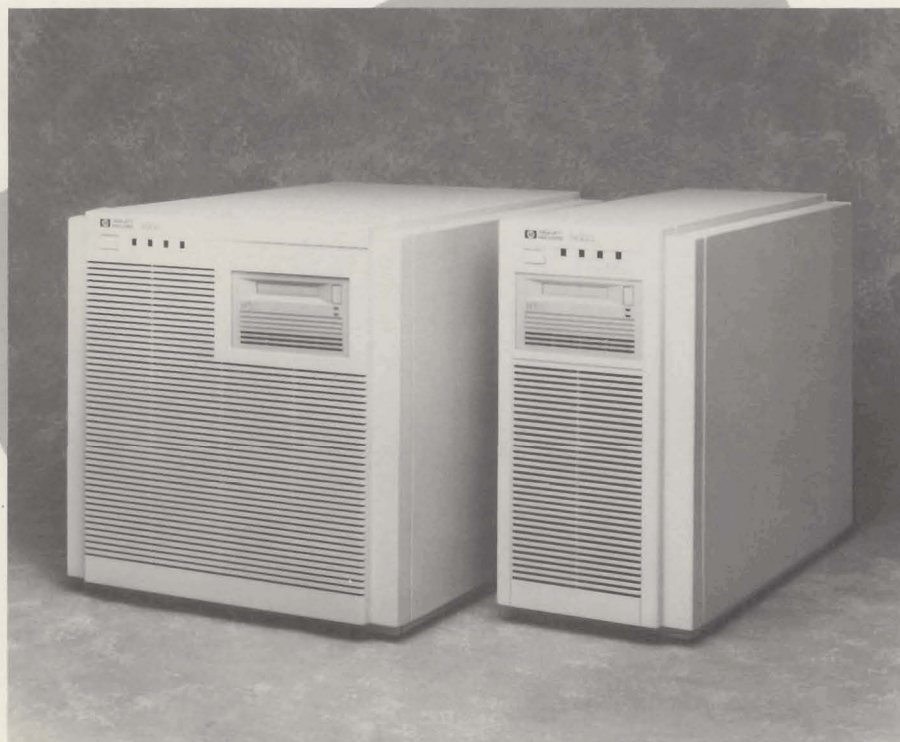


Jürgen

HP 3000 900 Series Computer Systems

Configuration Guide

June 1991



HP Computer Museum
www.hpmuseum.net

For research and education purposes only.

Printing History

The June 1988 edition of the HP 3000 Configuration Guide contains configuration information for many older MPE V/E systems. This information has been placed on the InforOM CD internal support subscription service. We no longer print new configuration guidelines for these older systems. For information on MPE V/E systems, consult the June 1988 edition of the Configuration Guide or obtain an InforOM subscription. For information or questions about ordering an InforOM subscription, send an HPDESK message to INFOROM / HP4700/M2.

The August 1990 *Configuration Guide Update* (P/N 5954-9354) is the last revision to contain information on the MICRO family of systems and information on the MPE/XL Series 925LX, 925, 935 and 949. Please refer to that revision for configuration guidelines for those systems.

Preface

This configuration guide is designed to help in the configuration of HP 3000 systems including:

- Series 920, 922LX, 922RX, 922, 932, 948 and 958
- Series 950, 955, 960, 980/100 and 980/200
- The new Series 9x7LX (917LX, 927LX, 937LX, 947LX, 957LX, and 967LX) and 9x7 (937, 947, 957, and 967)

The system configuration sections provide a review of the standard and required equipment comprising a minimum and maximum system configuration along with general configuration guidelines. Use the guidelines and information provided to check that a proposed configuration is valid and does not violate any of the system maximums or physical limitations.

Federal Communications Commission (FCC)

The US Federal Communications Commission (in 47 CFR 15,818) has specified that the following notice be brought to the attention of the users of products in this document.

Warning



This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits of a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever steps may be required to correct the interference.

Verband Deutscher Elektroniker (VDE)

This equipment has been certified to comply with the German standard VDE 0871 Level A.

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900 Series Business Computers

General System Configuration Information

The following information is common to all MPE/XL 900 Series systems.

Supplied Hardware

- Central Processing Unit
- Error Correcting Memory with Controllers
- One 802.3 LAN interface channel for network and Datacommunications and Terminal Controller (DTC) communication
- 6 meter AUI cable; ThinMAU with integrated AUI cable for attachment to ThinLAN cable (For Series 9x7LX and 9x7 systems, ThinMAU is built-in as part of Multi-Function I/O card)
- Console attachment hardware
- Power supply
- Manual set
- Battery backup unit
- System cabinet includes card cages and power supply supporting the CPU, memory, and I/O card slots and additional mass storage

Supplied Software

The Fundamental Operating System (FOS) software product (3265xA) and, ALLBASE/XL (36216A) are provided as part of the preconfigured systems and include all the required software for an HP supported system:

- Multiprogramming Executive Operating System (MPE/XL)
- MPE V/E V-MIT compatibility mode software
- ALLBASE/XL database management system including network model (TurboIMAGE) and relational model (ALLBASE/SQL) databases
- Keyed sequential access method software (KSAM/XL)
- TurboIMAGE Database inquiry language (QUERY/V)
- Data entry and forms management (VPLUS/XL)
- Sort and merge software (SORT-MERGE/XL)
- File copying utility (FCOPY/XL)
- Text editor (EDIT/XL)
- System debug utility (DEBUG/XL)

Preconfigured System

For ordering convenience and economy, preconfigured systems are available including:

- One of the following SPUs:

SPU	Part Number
Series 917LX	A1770A
Series 927LX	A1771A
Series 937LX	A1758A
Series 947LX	A1752A
Series 957LX	A1707A
Series 967LX	A1757A
Series 937	A1772A
Series 947	A1708A
Series 957	A1709A
Series 967	A1710A
Series 920	A1702A
Series 922LX	A1027A
Series 922RX	A1046A
Series 922	A1033A
Series 932	A1041A
Series 948	A1700A
Series 958	A1701A
Series 950	32490B
Series 955	A1109A
Series 960	A1130A
Series 980/100	A1134A
Series 980/200	A1149A

- FOS software (32650A)
- ALLBASE/XL (36216A) database management system including ALLBASE/SQL and TurboIMAGE

One or more of the 900 Series preconfigured systems' database management systems may be deleted by specifying one of the following preconfigured system options. It is also possible to delete both database management systems and FOS for all systems leaving a hardware only system.

- Option 910: ALLBASE/SQL only (deletes TurboIMAGE)
- Option 915: TurboIMAGE only (deletes ALLBASE/SQL)
- Option 920: MPE/XL only (deletes ALLBASE/SQL and TurboIMAGE)
- Option 930 (ICON only): SPU hardware only (deletes ALLBASE/SQL, TurboIMAGE, and FOS). The FOS software product (3265xA) must be ordered separately when ordering option 930.

MPE Media Products

One MPE media product (51453A) **MUST** be ordered with each system. Server versions also require the MPE/XL Server Media Product (36396A) for shipment of the networking software associated with server Option 100. See Chapter 8, Software Media and FOS Learning Products, for specific options to order.

For preconfigured Series 920 through 958, 9x7LX and 9x7 systems, the operating system will be installed at the factory and the software support tape and license will ship with the system. For Series 9x7LX and 9x7 systems, subsystem software products will be installed at the factory and requires that option 0D1 be ordered on the MPE media product (51453A).

Server Option

A server version of each system may be ordered. Ordering option 100 "Server Version" as part of the preconfigured system will configure the 900 Series as a server. Server versions do not allow terminals (or PCs configured as terminals) to establish a log-on via the DTC. DTCs are supported on the server for X.25 and serial device connections. PCs connected to the server via a local area network can access the server using NetIPC communications and virtual terminal emulation.

Required Hardware Ordered Separately

In addition to the preconfigured system, the following items are required for an HP supported system:

- One Datacommunications and Terminal Controller (DTC48 product 2345A with option 625 for modem connect or DTC16 product 2340A with option 640, 641, or 642 for modem connect). At least one modem connect is required for each system for remote support purposes. Series 9x7LX and 9x7 systems come standard with one modem-capable port and do not require a DTC for remote support purposes. DTCs are not required for server systems.
- 802.3 LAN cabling: Thick or Thin (system includes both ThickLAN and ThinLAN connections – Series 9x7LX and 9x7 systems come with built-in ThinMAU). The Datacommunications and Terminal Controller (DTC) has options for either ThickLAN, ThinLAN or EtherTwist. Integrated 900 Series systems are provided standard with one 2 meter 802.3 ThinLAN cable.

For Series 950 through 980/200 the following is also required

1. One system disk: C2201A, C2202A, C2203A, C2204A, 7937H/XP/FL*, 7935H/XP*.
2. One user disk: C2200A, C2201A, C2202A, C2203A, C2204A, 7937H/XP/FL*, 7936H/XP/FL*, 7935H/XP*, or 7963B*.
3. One tape drive for system backup: 7979A, 7980A, 7980XC, C1511A, C2292, or C2463
4. One system console: 700/92 (C1001A/G) and a 40242M cable

* *Discontinued*

Note



It is required that 400 Mbytes of disk space be allocated for exclusive use of the operating system.

Data Communications

Workstation Connections

Point-to-point workstation (terminals, personal computers and serial printers) connections are made to the 900 Series systems through the Datacommunications and Terminal Controller (DTC16 or DTC48) which connects to the SPU via the 802.3 LAN. The DTC supports local RS-232C and RS-422 (DTC48 only) connections and remote RS-232C modem connections. Server versions do not allow terminals (or PCs configured as terminals) to establish a log-on via the DTC.

Note

Systems with user licenses will specify the maximum number of logged-on users. Performance considerations may limit the number of concurrent users. The practical number of concurrent users is dependent on the application mix and response time/throughput requirements. Please consult with an HP performance specialist to determine the number of logons that can be concurrently active with a particular application.

802.3 LANIC Cards (ThinLAN Link)

Each 900 Series system is supplied with one LAN interface channel (LANIC) which is required for DTC connections. Each LANIC uses one I/O card slot and connects to one Local Area Network. The Asynchronous Serial Communication (ASC) software included with FOS uses this card and the 802.3 LAN to communicate between the SPU and the Datacommunications and Terminal Controller (DTC). Each 900 Series system (excluding Series 9x7LX and 9x7 systems) is supplied with both ThickLAN and ThinLAN Medium Attachment Units (MAU), taps, and Attachment Unit Interface (AUI) cables. Series 9x7LX and 9x7 systems come with a Multi-Function I/O (MFIO) card which has the LANIC and a ThinLAN MAU built onto it. In addition, the Multi-Function I/O card supplied with Series 9x7LX and 9x7 systems has an external AUI connector for customers who want connection to either a Thick MAU (30241A) or EtherTwist MAU (28685A). These products must be ordered separately.

For system-to-system traffic, whether the customer can use the card supplied with the system or needs to order a second card will depend on which HP 3000 900 Series system the customer has. Series 920 through 932 and Series 9x7LX and 9x7 systems support only one LANIC card, therefore the card supplied with the system must be used for both system-to-system and DTC traffic. The ThinLAN Link (36923A with the appropriate software option) provides the downloadable software for the LANIC to manage system-to-system traffic. All other 900 Series systems support up to two cards.

For Series 935, 949, 950, and 955 systems, a second LANIC card is not required for system-to-system communication. There are times when a second card should be considered:

- if the system has the old LANIC card (i.e. not Turbo card)
- if the customer wants to split DTC traffic from system-to-system traffic
- if the LAN traffic on a particular machine is high enough, it may bottleneck on the card

For Series 948, 958, 960, and 980 systems, a second LANIC card is required for system-to-system communication. This requirement is based on the system's ability to create enough traffic to bottleneck the card. ThinLAN Link (36923A) must be ordered with the appropriate software and hardware option.

802.3 LANIC Channel Card Summary

Systems	DTC Connection (supplied with system)	System-to-System Communication
920, 922LX, 922RX, 932	LANIC card ThickMAU and ThinMAU, AUI cable	Use same LANIC card supplied with system Must order ThinLAN/XL (36923A)
9x7LX, 9x7	LANIC and ThinMAU included on MFIO card	Use MFIO card supplied with system Use same LANIC on MFIO card supplied with system Must order ThinLAN/XL (36923A)
935, 949, 950, 955	LANIC card ThickMAU and ThinMAU, AUI cable	Second card not required, but should be considered for certain situations (see above for details) Must order ThinLAN/XL (36923A)
960, 980/100, 980/200	LANIC card ThickMAU and ThinMAU, AUI cable	Second card is required Must order ThinLAN/XL (36923A)



Network Link Products (PSI)

For MPE/XL systems, the Programmable Series Interface (PSI) card is the hardware component for SNA Link/XL, BSC Link/XL and NS Point to Point 3000/XL remote communications and is included with each order of the appropriate Network Link product. HP Network Link Products include a software and a hardware component. PSI cards are not interchangeable among all 900 Series systems. Because different systems require different PSI cards, be sure to order the correct remote network link hardware option.

Series 920 through 958, 9x7LX and 9x7. The PSI cards for the Series 920 through 958, 9x7LX and 9x7 interface to the HP Precision Bus and are supported in all available expansion slots. Each PSI card is a single-high board which occupies a full slot. *Refer to pages 2-1 and 3-1 for PSI maximums.*

Series 950 through 980/200. Each network link PSI card requires one CTB slot. *Refer to page 4-1 for PSI maximums.*

X.25 Network Link Products

X.25 and PAD communications are provided by the DTC/X.25 XL Network Link which is part of the same Datacommunications and Terminal Controller subsystem used for terminal and serial device communications. X.25 configuration requirements may be found in the *Datacommunications and Terminal Controller* chapter.

X.400/3000

X.400 connections are provided by the X.400/3000 Server. The server system can connect single or multiple HP DeskManager nodes into an X.400 environment. The X.400/3000 server (32057A) includes an HP 9000 Series 360 system with the hardware and software needed to run X.400. The X.400/3000 server offers options to connect to ThickLAN, ThinLAN or X.25. X.400 connection also requires HP X.400/HPDesk software (32055A opt 3xx).

System Console

One hardwired point-to-point 700/92 terminal must be used as the system console. The console connects directly to the system. It has no direct connection to the DTC. Console printing is accomplished via a terminal attached serial printer. Each preconfigured Series 920 through 958, 9x7LX and 9x7 system is shipped with the required console and hardware. For the Series 950 through 980, the 700/92 console (C1001A,G or W) must be ordered separately. To connect the 700/92 terminal as a console a 40242M cable must be ordered.

900 Series Localized Console Options

Option Number	Description
ABA	English localized display
ABB	English/Europe localized display
ABC	Canada - French localized display
ABD	German localized display
ABE	Spanish localized display
ABF	French localized display
ABH	Dutch localized display
ABL	Canada - English localized display
ABM	Spanish/Latin American localized display
ABN	Norwegian localized display
ABP	Swiss/German localized display
ABQ	Swiss/French localized display
ABR	Republic of South Africa (US keyboard and manual; local power card)
ABS	Swedish localized display
ABU	English (UK) localized display
ABV	Arabic/English localized display
ABW	Flemish localized display
ABX	Finnish localized display
ABY	Danish localized display
ABZ	Italian localized display
ACC	UK/Ireland localized display (US keyboard and manual; local power card)
ACD	Switzerland localized display (US keyboard and manual; local power card)
ACE	Denmark localized display (US keyboard and manual; local power card)
ACF	Japan localized display (US keyboard and manual; local power card)
ACG	Austria localized display (US keyboard and manual; local power card)

Support Modem

Under the HP Remote Support Program, all new systems with a qualifying HP support agreement are supplied with an HP Support Modem. This modem is loaned to the customer for support purposes during the time period that the support agreement is in effect, and remains the property of Hewlett-Packard Company. This modem is connected to the system's remote console port.

Remote Session

For Series 9x7LX and 9x7 systems, the remote console port may also be used to establish a remote user session. However, on all other systems, an additional connection is required for the remote console to simulate a user session. The most common method to establish this connection is to connect the console MUX to a nearby DTC via the 15 foot RS-232 modem cable included with the system. Alternatively, customers may purchase a second modem for connection to any DTC. HP personnel can then log into the second modem for application support. Note that either method requires the presence of a DTC with a modem interface card.



Series 9x7LX and 9x7 Systems

General System Configuration Information

System Information Summary

	917LX	927LX	937LX	937	947LX	947	957LX	957	967LX	967
MPE/XL Release Support	3.1									
User license										
Standard	8	20	32	32	64	64	64	64	100	100
Optional					100	100	100	100	160	160
Optional					UL	UL	UL	UL	UL	UL
Typical users	8	16	24	24	48	64-100	64-100	64-160	64-100	96-250
Maximum connected workstations	64	64	152	152	250	400	600	600	600	600
Performance relative to 917LX	1.0	1.0	1.0	1.0	1.0	1.0	1.6	1.6	2.3	2.3
HP-PB Slots	2	2	2	12	2	12	2	12	2	12
Standard memory (Mb)	24	24	32	32	48	64	64	64	64	64
Maximum memory (Mb)	192									
Maximum disk storage (Gb)	24	24	24	66	24	66	24	66	24	66
Maximum disks	18	18	18	49	18	49	18	49	18	49
Maximum SCSI disks	18	18	18	25	18	25	18	25	18	25
Maximum HP-FL disks	0	0	0	24	0	24	0	24	0	24
Maximum HP-IB disks	6	6	6	12	6	12	6	12	6	12
Maximum tape drives	6	6	6	8	6	8	6	8	6	8
Maximum system printers	6	6	6	8	6	8	6	8	6	8
Maximum serial printers	32	32	32	48	32	48	32	64	32	64
Maximum DTCs	4	4	6	6	12	12	24	24	24	24
Maximum PBA-IB (HP-IB)	1	1	1	2	1	2	1	2	1	2
Maximum PBA-FL (HP-FL)	0	0	0	3	0	3	0	3	0	3
Maximum PBAs	1	1	1	3	1	3	1	3	1	3
Maximum SCSI cards ¹	2	2	2	10	2	10	2	10	2	10
Maximum LANICs ²	1									
Floating point coprocessor	N/A	N/A	N/A	N/A	N/A	N/A	opt	opt	opt	opt
Maximum PSI cards	2	2	2	5	2	5	2	5	2	5
Supplied Manual Set ³	9x7LX Core	9x7LX Core	9x7LX Core	Sys Mgmt Core	9x7LX Core	Sys Mgmt Core	9x7LX Core	Sys Mgmt Core & Core Plus	9x7LX Core	Sys Mgmt Core & Core Plus
¹ Add-on cards, does not include integrated SCSI interface										
² Included standard on Multi-Function I/O card										
³ See Chapter 7 for description of manual sets										
UL = unlimited										

Unique Supplied Hardware

- One Multi-Function I/O card (MFIO) containing LAN, two RS-232 C ports (for console and remote support connections), SCSI interface, integrated ThinMAU, and AUI connector
- One 2 meter ThinLAN cable and a pair of ThinLAN terminators
- Integrated SCSI disk drive: 673 Mb (917LX, 927LX), 1355 Mb (937LX, 937, 947LX, 947, 957LX, 957, 967LX, 967)
- Integrated SCSI DDS format tape drive with 1.3 Gbytes capacity per cassette, 1 DDS cleaning cassette
- One 700/92 terminal (console) and cable (40242X)

Unique Supplied Software

- HP Easytime/XL system management interface (Series 9x7LX only)

Packaging

The Series 9x7LX and 9x7 systems are offered in two different package types:

- The Series 9x7LX package is a small, integrated deskside package offering two I/O expansion slots, space for one 5 1/4-inch DDS format tape drive, and one internal 5 1/4-inch disk mechanism.
- The Series 9x7 package is a larger deskside package offering twelve I/O expansion slots and space for one internal 5 1/4-inch DDS format tape drive, and up to three 5 1/4-inch disk mechanisms.

Upgrades from the small package to the large package are available. Also, both packages are rack mountable in a 1.1 or 1.6 meter cabinet (P/Ns A1883A, A1884A). Option 1CM under the system product number provides the necessary hardware to rack mount the systems in a 1.1 meter or 1.6 meter cabinet. *See page 2-8 to 2-12 for more information on cabinet solutions.*

Memory Expansion

Error correcting memory is supplied with each SPU. Additional memory can be obtained by ordering options 503-513 with the system, or by ordering the stand-alone products: A2230A (8 Mbytes), A2231A (16 Mbytes), or A2232A (32 Mbytes).

Memory consists of memory modules of 4, 8, and 16 Mbytes which must be installed in pairs of identical size. Add-on memory products consist of an identical pair of memory modules. For example, the 32 Mbyte add-on memory product (A2232A) contains two 16 Mbyte modules.

The systems have the capacity to support a total combination of six pairs of memory modules. Maximum memory of 192 Mbytes can be achieved only through the use of six pairs of 16 Mbyte memory modules. Adding memory in smaller increments will reduce the maximum amount of memory possible.

Memory modules are installed on the private memory bus and do not use HP Precision Bus expansion slots.

Floating Point Coprocessor

An IEEE floating point coprocessor is available as an option (8Z7) to Series 957LX, 957, 967LX, and 967 systems for high performance in numerical applications. The coprocessor is built into the SPU so no installation is required.

A separate floating point coprocessor is not available on the Series 917LX, 927LX, 937LX, 937, 947LX, and 947. Floating point operations for these systems are handled via the system processor and high speed system software routines.

Note



Several HP 3000 third party applications and tools require the floating point coprocessor for optimal performance. Consult your third party software supplier for the floating point requirements of their specific application.

HP EasyTime/XL

HP EasyTime/XL is an easy-to-use interface for commonly performed system management functions on Series 9x7LX systems. HP EasyTime/XL is provided standard and pre-loaded on the system disk at the factory on all Series 9x7LX systems.

Based upon an easy-to-use user interface, HP EasyTime/XL provides novice system managers and end users with limited computer experience access to commonly used system management utilities while shielding the user from the complexity of MPE/XL.

Subsystem Software

In order to have all HP subsystem software pre-installed at the factory, order MPE/XL media product (51453A) option 0D1 on the same section of the order as the system, and specify a coordinated shipment.

User Licenses

All Series 9x7LX and 9x7 systems are supplied with a software class/concurrent license specifying the maximum number of logged-on users. Some systems are available with options to increase the maximum number of users. The practical number of concurrent users is dependent on the application mix and response time/throughput requirements.

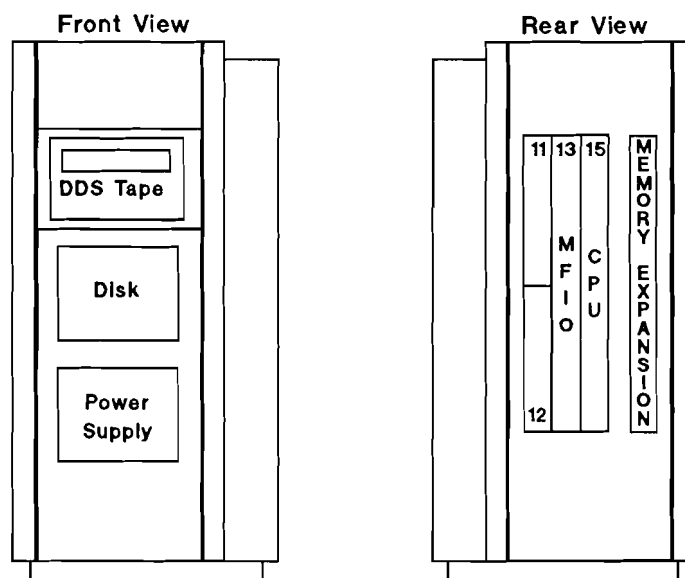
I/O Channel Configuration Information

HP Precision Bus (HP-PB)

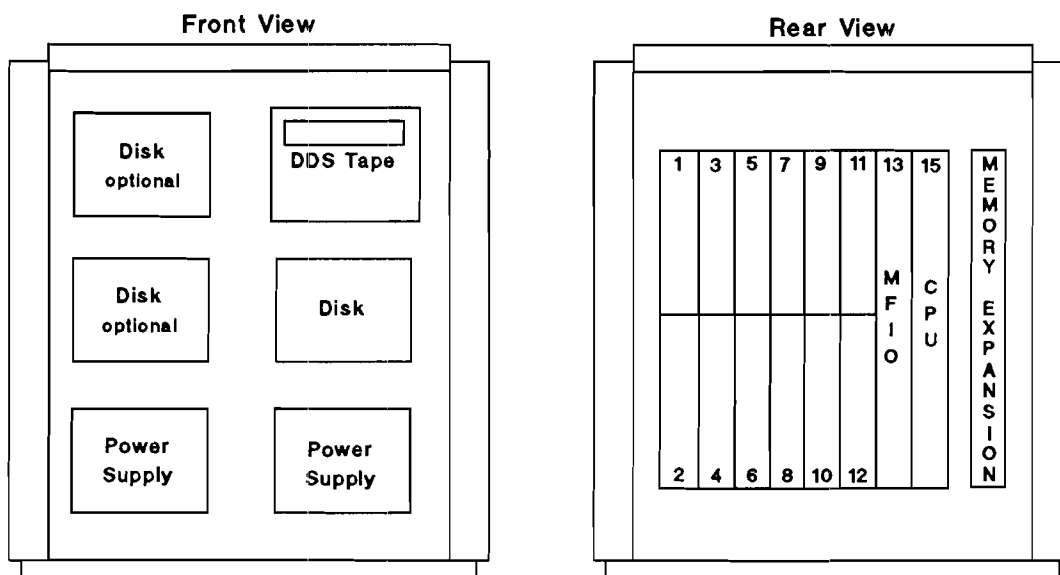
HP 3000 Series 9x7LX and 9x7 systems connect to peripheral devices and data communication networks via the HP Precision Bus (HP-PB). In compliance with the Eurocard standard, the HP Precision Bus supports both single-high and double-high I/O cards. Single-high I/O cards use one Precision Bus slot each and double-high I/O cards use two slots each. Single-high Precision Bus cards include SCSI and PSI cards. Double-high Precision Bus cards include PBA-IB and PBA-FL interfaces. The table below illustrates the slot usage for the various adapter cards supported on the Series 9x7LX and 9x7 systems.

Adapter Card	Size	HP-PB slots used per card
SCSI	Single-high	1
PSI	Single-high	1
PBA-IB (HP-IB)	Double-high	2
PBA-FL (HP-FL)	Double-high	2

The Series 9x7LX systems support up to two SCSI or PSI cards, or one PBA-IB card. The Series 9x7 systems support up to twelve single-high cards (SCSI or PSI) or three double-high cards (PBA-IB, PBA-FL) or a combination of both.



Series 9x7LX System Layout



Series 9x7 System Layout

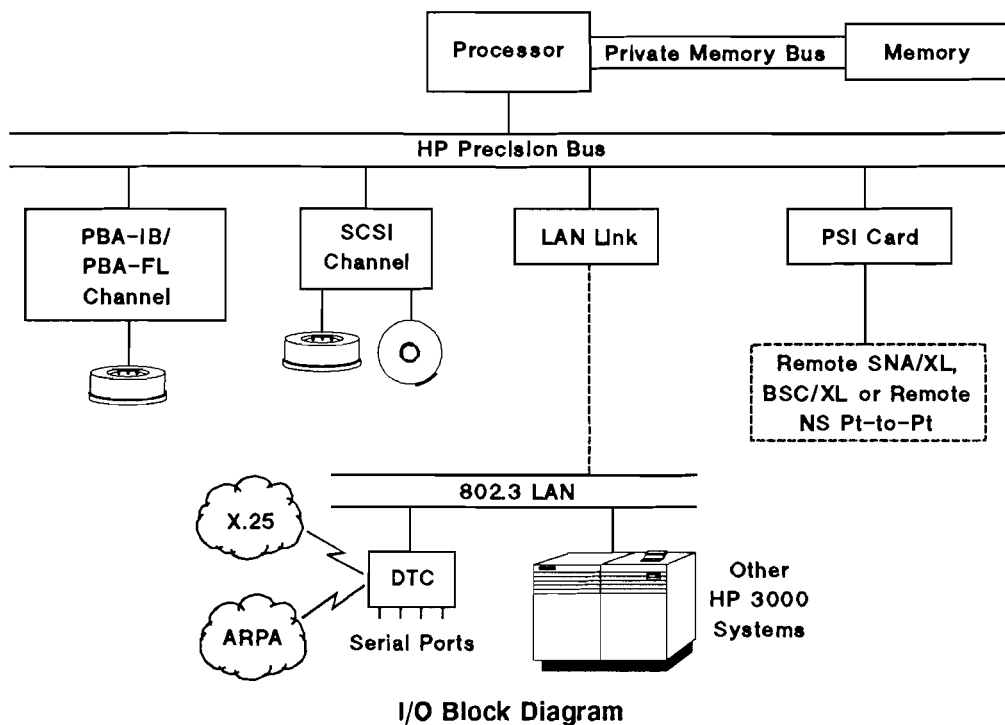
Note



Installing double-high cards will impact the number of available single wide slots available for single-high cards. Use the table below to determine slot availability.

System	HP-PB Slots Available	Double-High Cards Used	HP-PB Slots Remaining
Series 9x7LX	2	0	2
		1	0
Series 9x7	12	0	12
		1	10
		2	8
		3	6

For example, if a customer has one HP-IB printer or HP-IB back-up device on a Series 9x7LX system, no HP-PB slot remains. Consequently, a Series 9x7 package with its expanded I/O slots may need to be purchased.



Multi-Function I/O Card (MFIO)

One MFIO card is supplied standard with each Series 9x7LX and 9x7 system. This card provides:

- LAN connection for use with both DTC and system-to-system LAN traffic
- two RS-232-C ports for console and remote support connections
- one SCSI interface which provides connection for five SCSI devices

Note

The MFIO card does not utilize any Precision Bus slots.



External DDS are not supported on the integrated SCSI interface. An add-on SCSI interface card is required to support external DDS tape drives.

Precision Bus Adapter (PBA)

The Precision Bus Adapter (PBA) is supported in the Series 9x7LX and 9x7 systems to provide connectivity to CIO HP-IB and CIO HP-FL adapters. The PBA combines the functionality of a CIB adapter and physical bus adapter into a single card. Only one CIO HP-IB or HP-FL adapter can be connected to each PBA.

The Series 9x7LX systems support one PBA-IB (PBA with HP-IB) while the Series 9x7 systems support a maximum of three PBAs, both PBA-IB and PBA-FL. *Consult page 2-1 for PBA-IB and PBA-FL maximums.*

Integrated Peripherals

The Series 9x7LX systems come standard with and support two embedded SCSI peripherals:

- one DDS format tape drive
- one 5 1/4-inch disk mechanism (673 Mbyte or 1.3 Gbyte capacity)

For additional disk storage or tape backup, external peripherals are required.

The Series 9x7 systems come standard with two embedded SCSI peripherals:

- one DDS format tape drive
- one 1.3 Gbyte capacity 5 1/4-inch disk mechanism

Up to two additional 1.3 Gbyte SCSI disk mechanisms are supported inside the package, providing up to 4 Gbytes of internal disk storage.

Refer to pages 2-4 and 2-5 for a diagram of the system layout.

Customer Installability

Everything the customer needs for easy SPU installation is included on all Series 9x7LX systems. Installation by the HP Customer Engineer is available at an extra cost for these systems. The Series 9x7 systems include CE installation.

Many add-on products to Series 9x7LX systems will include HP CE installation. Some of the most common are networking products, additional I/O products, DTC48s (2345A), and large disk configurations. Customers purchasing Series 9x7LX systems with these CE installable products are expected to perform the routine system set-up and complete minimum site preparation activities prior to HP CE arrival. Cabinets with systems and peripherals racked at the factory include HP CE installation.

All Series 9x7LX systems come from the factory with CPU, memory, base I/O, and integrated mass storage devices. In addition, the MPE/XL operating system and HP subsystem software comes pre-installed on the internal disk. Special easy-to-understand learning products are shipped with the system to assist the novice customer through the initial startup.

Many Series 9x7LX system products and options are customer-installable. They are:

- SPU and memory
- Multi-Function I/O card (LAN/Console connection/SCSI)
- system console
- DTC16 (option 0DG – 6 modem/8 direct connect ports, ThinLAN)

The SPU, memory, and base I/O come preinstalled at the factory. Default configurations for up to three 14 port (6 modem/8 direct) DTC16s are preloaded on the system at the factory as well. Customers are expected to connect the system console and DTC16 only.

Many peripherals are customer installable. Some of the most common are:

- additional workstations
- RS-232 printers
- external peripheral package (up to 1 Series 6000 multi-mechanism package)
- additional DTC16s (up to 3 total in 14 port configurations)

While not included in the system price, installation and site services can be purchased for these "customer installable" components from HP's Professional Services and Systems Support organizations. Since larger configurations increase the installation time and complexity, there is a limit to customer installable configurations. The limits are one external peripheral package only and up to three DTC16s.

Many peripherals, networking, and I/O include HP CE installation. They are:

- HP-IB interfaces/devices
- HP-FL interfaces/devices
- additional SCSI interfaces
- Wide Area Networking products based on PSI
- X.25
- DTC16 in configurations other than 14 ports (6 remote, 8 local)
- DTC48
- add-on memory not ordered as an option to the system

Note

In Europe, HP CE installation is bundled into the system price for all Series 9x7LX and 9x7 systems.



Cabinets

Two cabinets are available for racking HP 3000 Series 9x7LX and 9x7 systems as well as associated peripherals and DTCs. Both a 1.1 meter cabinet, providing 21 EIA units (1 EIA unit = 1.75 in.) of usable rack height, and a 1.6 meter cabinet, with 32 EIA units of rack space, are available.

The cabinets support a variety of combinations of HP 3000 systems, disk drives, tape drives, and DTCs. Combinations of supported products are limited only by space inside the cabinet. Cabinets may be ordered as a total integrated solution assembled at the factory or as stand-alone products where the system and peripherals are rack mounted in the cabinet at the customer site.

Cabinet Summary

Product Number	Factory Integrated	Racking Space Available (EIA units)	Power Distribution	Maximum Current	Height	Width	Depth
C2785A	No	21	100-120V/200-240V	16A	1.1 m	.48 m	.9 m
A1883A	Yes	21	100-120V/200-240V	16A	1.1 m	.48 m	.9 m
C2786A	No	32	200-240V	16A	1.6 m	.48 m	.9 m
A1884A	Yes	32	200-240V	16A	1.6 m	.48 m	.9 m

Integrated System Solution (A1883A and A1884A)

To ease ordering and speed installation, integrated cabinet products are the preferred choice for customers desiring a racked system solution. These products contain options for disk storage, DTCs, and a DDS tape drive. When the system and racking options are ordered together, the entire system (including SPU, disk, tape, and DTC) will be pre-installed in the cabinet prior to shipment from the factory.

Customers desiring to have peripheral only configurations (DTC48, disk, DDS) can use these products to meet their racking needs as well. Add-on DTC48, Series 6000 multi-mechanism products (disk and DDS), and 7980/7980XC tape drives not in the Integrated Cabinet product structure will need to be installed at the customer site. *Refer to table on page 2-11 for the necessary hardware to rack these components.*

Note



Customers requiring DTC configurations not provided by the Integrated Cabinet product can either order a stand-alone DTC48 (2345A) or select one of the configurations offered in the Integrated Cabinet product and order additional DTC Connector cards (X.25 etc.) for installation in the field.

Integrated Cabinet Product Structure

Product Number	Description
A1883A	1.1m 21U cabinet
A1884A	1.6m 32U cabinet
Options	
ABA	(A1883A) U.S. 100-120V power
ABA	(A1884A) U.S. 200-240V power
ABB	European 200-240V power
201	Add 1.3 Gbyte disk
202	Add 2.7 Gbyte disk
203	Add 4 Gbyte disk
212	Add 2.6 Gbyte disk and 1.3 Gbyte DDS
316	Add DTC48 with 16 local RS-232 ports
324	Add DTC48 with 24 local RS-232 ports
330	Add DTC48 with 24 local, 6 remote RS-232 ports
346	Add DTC48 with 40 local, 6 remote RS-232 ports
348	Add DTC48 with 48 local RS-232 ports

Use the Factory-Integrated Cabinet selection worksheet on the following page to choose the cabinet that best meets the customer's needs. Simply fill in the desired quantities of each component to determine the appropriate cabinet product for the configuration. Filler panels to cover unused space will be installed automatically at the factory and do not need to be ordered for the integrated cabinet products.

Factory Integrated Cabinet Selection Worksheet

Component	Quantity	EIA Units	Vertical Space Required (EIA units)
I. SPU (select SPU to be racked) <i>Option 1CM must be ordered for factory racking - factory racking recommended.</i>			
a. 917LX,927LX,937LX,947LX,957LX,967LX	_____ X	6	= _____
b. 937,947,957,967	_____ X	10	= _____
II. Cabinet options (available on A1883A and A1884A) A1883A - 1.1 meter cabinet A1884A - 1.6 meter cabinet			
a. Option 201 - 1.3 Gbyte disk	_____ X	4	= _____
b. Option 202 - 2.7 Gbyte disk	_____ X	4	= _____
c. Option 203 - 4 Gbyte disk	_____ X	4	= _____
d. Option 212 - 2.7 Gbyte disk + DDS	_____ X	4	= _____
e. Option 316 - DTC48 with 16 local ports	_____ X	6	= _____
f. Option 324 - DTC48 with 24 local ports	_____ X	6	= _____
g. Option 330 - DTC48 with 24 local, 6 remote ports	_____ X	6	= _____
h. Option 346 - DTC48 with 40 local, 6 remote ports	_____ X	6	= _____
i. Option 348 - DTC48 with 48 local ports	_____ X	6	= _____
III. Add-on peripherals (not factory-racked and requiring racking kits - see page 2-11 for details)			
1. 2345A - DTC48	_____ X	6	= _____
2. Series 6000 multi-mechanism	_____ X	4	= _____
3. 7980/7980XC tape drives	_____ X	5	= _____
IV. Total EIA units required (Sum of Total EIA column)			= _____
V. Integrated cabinet selection			
If line IV is less than or equal to 21, order cabinet A1883A with appropriate power, disk, DDS, and DTC48 options.			
If line IV is less than or equal to 32, order cabinet A1884A with appropriate disk, DDS, and DTC48 options.			
If line IV is greater than 32, more than one cabinet is required.			

Field-Installed Cabinets

Standalone cabinets are also available for customers who decide to rack their system components after the initial system installation. Care must be exercised when configuring these cabinets to ensure that all appropriate cabinet components (filler panels, peripheral mounting kits, etc) are ordered to successfully rack the system. Component racking for these cabinets is performed at the customer site.

For each of the components that need to be racked, the appropriate racking hardware must be ordered. Order filler panels to cover unused cabinet space.

Rack Mounting Information

Product Structure

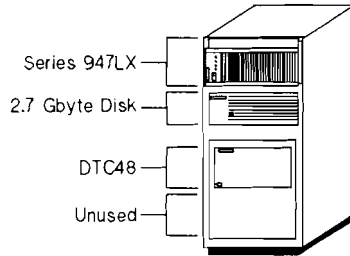
Product/Option	Description
C2785A	1.1 meter cabinet (21 EIA units)
ABA	100-120V with U.S. power cord
ABB	200-240V with European power cord
0E3	Substitute 200-240V for U.S.
1F9	Add six 1-unit filler panels.
C2786A	1.6 meter cabinet (32 EIA units)
ABA	200-240V with U.S. power cord
ABB	200-240V with European power cord
0E2	100-120V with U.S. power cord
1F9	Add six 1-unit filler panels

Supported Rack Mounted Equipment	EIA Units Required	Hardware Required
917LX, 927LX, 937LX, 947LX, 957LX, 967LX	6	Option 1CM on SPU P/N (or C2797A)
937, 947, 957, 967	10	Option 1CM on SPU P/N (or C2798A)
7980, 7980XC	5	Option TBD on 7980
Series 6000 multi-mechanism package (Disk/DDS)	4	Included
DTC48 (2345A)	6	C2799A
Filler panels (P/N)	1	N/A

1.1 Meter Cabinet (A1883A)

Example 1:

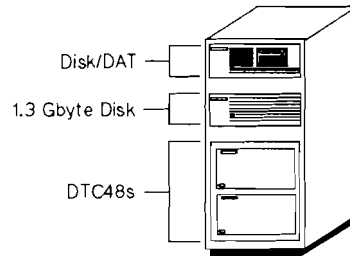
Series 947LX with 4 Gbyte, 46 ports



Quantity	Part Number	Description
1	A1752A	Series 947LX with 1.3 Gb disk, 48 Mb memory
1	option 1CM	Add racking hardware
1	option UBD	100 user license
1	A1883A	1.1 meter cabinet
1	option 202	2.7 Gbyte disk
1	option 346	46 port DTC48

Example 2:

Peripherals only - 4 Gbyte disk, DDS, 72 ports

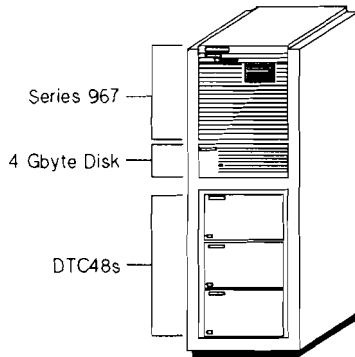


Quantity	Part Number	Description
1	A1883A	1.1 meter cabinet
1	option 201	1.3 Gb disk
1	option 202	2.7 Gb disk, 1.3 Gb DDS
1	option 324	24 port DTC48
1	option 348	48 port DTC48

1.6 Meter Cabinet (A1884A)

Example 3:

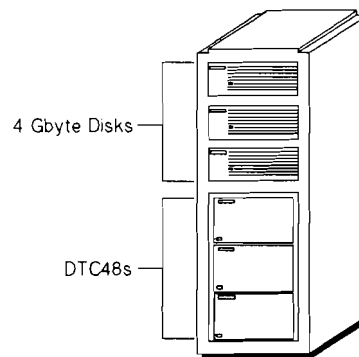
Series 967 with 8 Gbyte, 142 ports



Quantity	Part Number	Description
1	A1710A	Series 967 with 1.3 Gb disk, 64 Mb memory
1	option 1CM	Add racking hardware
1	option 011	Increase disk to 4 Gb
1	A1884A	1.6 meter cabinet
1	option 203	4 Gb disk
1	option 346	46 port DTC48
2	option 348	48 port DTC48

Example 4:

Peripherals only - 12 Gbyte disk, 144 ports



Quantity	Part Number	Description
1	A1884A	1.6 meter cabinet
3	option 203	4 Gb disk
3	option 348	48 port DTC48

Factory Integrated Cabinet Ordering Examples

Product Summary

The Series 9x7LX and 9x7 systems share a common product option structure. The following tables represent information for all of the products and should be used with the specific configuration rules. They are intended as a general reference for configuring systems and some caution should be used, because not all options are available on all systems. Please consult the HP 3000 Computer Systems Price Guide for the latest product structure.

Product Structure

Product Number	Description *	Standard Memory	Standard Disk	Standard User License
A1770A	Series 917LX	24 Mb	670 Mb	1-8
A1771A	Series 927LX	24 Mb	670 Mb	1-20
A1758A	Series 937LX	32 Mb	1.3 Gb	1-32
A1772A	Series 937	32 Mb	1.3 Gb	1-32
A1752A	Series 947LX	48 Mb	1.3 Gb	1-64
A1708A	Series 947	64 Mb	1.3 Gb	1-64
A1707A	Series 957LX	64 Mb	1.3 Gb	1-64
A1709A	Series 957	64 Mb	1.3 Gb	1-64
A1757A	Series 967LX	64 Mb	1.3 Gb	1-100
A1710A	Series 967	64 Mb	1.3 Gb	1-100
<i>* All preconfigured systems include 1.3 Gbytes DDS format tape drive, MPE/XL FOS, TurboIMAGE, and ALLBASE/SQL in addition to the standard memory, disk, and user licenses indicated above.</i>				

Option Structure

Option Structure (not all options available on all systems)

Option	Description
1B6	Delete 700/92 console
1CM	Add cabinet racking hardware
8Z7	Add floating point coprocessor
0E4	Delete battery backup unit
UA9	64 user license
UBD	100 user license
UCN	160 user license
UAT	Unrestricted user license
007	Increase disk to 1.3 Gb
009	Increase disk to 2.7 Gb
011	Increase disk to 4 Gb
100	Server version
401	Add SCSI interface card
405	Add PBA-IB (PBA with HP-IB) adapter
407	Add PBA-FL (PBA with HP-FL) adapter
503	Increase memory to 32 Mb
504	Increase memory to 40 Mb
505	Increase memory to 48 Mb
506	Increase memory to 64 Mb
508	Increase memory to 96 Mb
509	Increase memory to 128 Mb
511	Increase memory to 160 Mb
513	Increase memory to 192 Mb
910	SQL only system (deletes TurboIMAGE)
915	TurboIMAGE only system (deletes ALLBASE/SQL)
920	MPE/XL only system (deletes TurboIMAGE, SQL)
930	Hardware only (deletes TurboIMAGE, SQL, MPE/XL) ICON only

Upgrade Structure

Option	Description
704	Return MICRO 3000, 3000LX w/2 Mb
705	Return MICRO 3000GX, RX w/2 Mb
706	Return MICRO 3000XE
707	Return Series II, III, 30, 33, 37, 37XE
708	Return HP 250, 260
709	Return Series 39, 40, 42, 44, 48
710	Return Series 42XP, 52, 58
711	Return Series 64, 68 w/2 Mb
712	Return Series 70 w/2 or 4 Mb
713	Return Series 920 w/24 Mb
714	Return Series 925LX w/24 Mb
715	Return Series 922LX w/24 Mb
716	Return Series 922RX, 922, 925 w/32 Mb
717	Return Series 932, 935 w/32 Mb
718	Return Series 948 w/64 Mb
719	Return Series 955
720	Return Series 960
721	Return Series 950

Note



HP's policy for upgrading HP 3000 systems mandates that systems must be returned for credit and must have been installed at the customer's site at least 6 months. Customers must provide documentation of installation date or proof of support for at least 6 months.

Field Upgrades

Field Upgrade Structure

Product	Description
A1789A	Field Upgrade to Series 927LX
A1791A	Field Upgrade to Series 937LX
A1790A	Field upgrade to Series 937
A1759A	Field Upgrade to Series 947LX
A1792A	Field Upgrade to Series 947
A1760A	Field upgrade to Series 957LX
A1761A	Field Upgrade to Series 957
A1763A	Field Upgrade to Series 967LX
A1762A	Field upgrade to Series 967

Field Upgrade Structure (continued)

Option	Description
501	Add 16 Mb memory
503	Add 32 Mb memory
8Z7	Add floating point coprocessor
UBD	1-100 user license
UCN	1-160 user license
UAT	Unrestricted user license
UCC	Credit for 100 user license on 947LX
UCD	Credit for unlimited user license on 947LX
UCE	Credit for 100 user license on 947
UCF	Credit for unlimited user license on 947
UCG	Credit for 100 user license on 957LX
UCH	Credit for unlimited user license on 957LX
UCJ	Credit for 100 user license on 957
UCK	Credit for unlimited user license on 957
851	From Server 917LX
852	From Server 927LX
853	From Server 937LX
854	From Server 937
855	From Server 947LX
856	From Server 947
857	From Server 957LX
858	From Server 957
861	From Series 917LX
862	From Series 927LX
863	From Series 937LX
864	From Series 937
865	From Series 947LX
866	From Series 947
867	From Series 957LX
868	From Series 957
869	From Series 967LX

Note HP 3000 board upgrades require return of original processor board to HP.



Configuration Worksheet

The worksheet below will help in configuring a basic multiuser Series 9x7LX or 9x7 system. Use it as a guideline, but note that particular customer needs (performance, etc) may dictate different configuration choices.

STEP 1 - Select a system

Select the HP 3000 that best fits the customer's performance and user needs.

System	Standard Memory	Standard Disk	Expansion Slots
Series 917LX, 927LX	24 Mb	670 Mb	2
Series 937LX	32 Mb	1.3 Gb	2
Series 937	32 Mb	1.3 Gb	12
Series 947LX	48 Mb	1.3 Gb	2
Series 957LX, 967LX	64 Mb	1.3 Gb	2
Series 947, 957, 967	64 Mb	1.3 Gb	12

STEP 2 - Determine memory requirements

Memory requirements will vary depending on the specific applications running on the system. If there is not information available on the memory requirements of the customer's applications, the following rule of thumb may be used:

- Memory = 13 Mbytes + (0.7 x number of concurrent users)

Note that the maximum supported memory is 192 Mbytes.

The table below illustrates the ordering recommendation for the typical memory configurations.

System	Memory								
	24 Mb	32 Mb	40 Mb	48 Mb	64 Mb	96 Mb	128 Mb	160 Mb	192 Mb
917LX, 927LX*	Std	Opt 503	Opt 504	Opt 505					
937LX*	N/A	Std	Opt 504	Opt 505					
937*	N/A	Std	Opt 504	Opt 505	Opt 506				
947LX*	N/A	N/A	N/A	Std	Opt 506	Opt 508			
947	N/A	N/A	N/A	N/A	Std	Opt 508	Opt 509	Opt 511	Opt 513
957LX, 967LX	N/A	N/A	N/A	N/A	Std	Opt 508	Opt 509	Opt 511	Opt 513
957	N/A	N/A	N/A	N/A	Std	Opt 508	Opt 509	Opt 511	Opt 513
967	N/A	N/A	N/A	N/A	Std	Opt 508	Opt 509	Opt 511	Opt 513
* For memory requirements beyond available options, stand-alone memory must be ordered: ■ 8 Mbytes - A2230A ■ 16 Mbytes - A2231A ■ 32 Mbytes - A2232A									

STEP 3 - Determine disk storage needs

Disk requirements will vary with the number of active users and the nature of the customer's application. As a general rule of thumb the following formula can be used:

$$\blacksquare \text{ Disk Storage} = 400 \text{ Mbytes} + (40 \text{ Mbytes} \times \text{Number of Concurrent Users})$$

For disk storage beyond what is supported internal to the system package, external disks will need to be ordered as stand-alone products. *Refer to Chapter 6 for more information on external add-on SCSI, HP-FL, and HP-IB disk drives.*

System	Standard Disk (SCSI)	Internal Disk Options (SCSI only)	Maximum Disk (internal and external)
917LX, 927LX	.67 Gb	1.3 Gb	24 Gb
937LX, 947LX, 957LX, 967LX	1.3 Gb	N/A	24 Gb
937, 947, 957, 967	1.3 Gb	2.7 Gb / 4 Gb	66 Gb

Enter the number of SCSI disks required (including internal) _____

Enter the number of HP-IB disks required _____

Enter the number of HP-FL disks required _____
(Note: LX versions do not support HP-FL)

STEP 4 - Choose a tape backup solution

Every Series 9x7LX and 9x7 system comes standard with a 1.3 Gb DDS format tape drive capable of backing up data at 11 Mb/minute. The chart below can be used as a guide for selecting an appropriate backup solution. *See Chapter 6 for more detailed information on back-up solutions.*

Tape Back-Up Recommendation

Type of Back-Up	Disk Storage to be backed up (Gbytes)				
	2.5	2.5 - 4	4 - 6	6 -10	> 10
Unattended (w/ TurboSTORE/XL II)	1 DDS	1 DDS	2 DDS	3 DDS	> 4 DDS
On-line (w/ TurboSTORE/XL II)	1 DDS	2 DDS	3 DDS	4 DDS	> 4 DDS

Enter the number of SCSI DDS drives required (including internal) _____

STEP 5 - Select a printer

Both system and serial printers are supported on the 9x7LX and 9x7 systems. *Consult chapter 6 for supported printers.*

Note

HP-IB system printers require a PBA-IB card (A1747A) which uses two HP-PB slots (Series 9x7LX systems have only two slots). Consequently, having an HP-IB printer or HP-IB back-up device may indicate the purchase of a Series 9x7 package with its expanded number of slots.

Record the number of HP-IB printers required _____

Record the number of serial printers required _____

STEP 6 - Network link products

For MPE/XL systems, NS 3000/XL Point-to-point and IBM (SNA, BSC) communications require a HP Network Link product. The hardware component of these products is PSI card. Each PSI card occupies one HP-PB slot.

Record the number of PSI cards required _____

STEP 7 - I/O interface cards

I/O interface cards allow the system to communicate with peripheral devices. The number of each card required depends on the number and type of peripheral devices that will be connected to the system. Use the configuration rules in Chapter 5 to determine the number of SCSI, PBA-IB, and PBA-FL interfaces required.

To verify that the number of cards required do not exceed the capacity of the system package enter the quantity of each interface card required in the slot worksheet below.

I/O Interface Cards	Quantity	Number of Slots
Enter number of SCSI interfaces (not including integrated SCSI on MFIO) (9x7LX maximum = 2) (9x7 maximum = 10)	_____ X 1 = _____	
Enter number of PBA-IB interfaces (9x7LX maximum = 1) (9x7 maximum = 2)	_____ X 2 = _____	
Enter number of PBA-FL interfaces (9x7LX maximum = 0) (9x7 maximum = 3)	_____ X 2 = _____	
Enter number of PSI cards (from Step 6) (9x7LX maximum = 2) (9x7 maximum = 5)	_____ X 1 = _____	
Total slots required (9x7LX maximum = 2) (9x7 maximum = 12)		= _____

STEP 8 - Terminal connect (DTC16 and DTC48)

DTCs are used to connect HP 3000s to local terminals, remote terminals (via modems), serial printers, and provide access to X.25 and ARPA networks. The number of DTCs required will depend on the number of ports needed to connect users, printers etcetera and the mode of network distribution.

The table below illustrates the recommended solution for various port configurations. *For further detail on DTC16 or DTC48 or information on X.25 or Telnet connections, consult Chapter 7.*

DTC Recommendations

	Number of ports required	
	1-32	> than 32
9x7LX - Unracked - Racked *	2340A A1883A/A1884A	2345A A1883A/A1884A
9x7 - Unracked - Racked *	2340A A1883A/A1884A	2345A A1883A/A1884A
* Provides a factory integrated solution with SPU, DTC48, and external disk racked in a 1.1 or 1.6 meter cabinet. See pages 2-8 to 2-12 for more details on these integrated solutions.		

STEP 9 - LAN cabling

A 2 meter 802.3 LAN cable is included with each Series 9x7LX and 9x7 system for attaching the DTC. Distributed DTC configurations will need longer cables which are orderable from CPO.

STEP 10 - Console/terminals

Each Series 9x7LX and 9x7 system is supplied with one 700/92 terminal as the system console. All necessary console attachment hardware is included.

Several high-quality terminals are available for the HP 3000:

Product	Description	Memory	Additional Features
700/43	Multipersonality ASCII	4 pages	Supports 12 popular compatibility modes
700/92	Blockmode VPLUS	8 pages	
700/94	High performance blockmode VPLUS	16 pages	Local forms cache, edit checks, modified data tag
<i>Note: VPLUS requires a 700/92 or 700/94 terminal. Oracle's SQL*Forms, INGRES forms, and JAM will run on any 700 series terminal. JAM also runs on a block mode terminal, giving the user optimal performance.</i>			





Series 920, 922LX, 922RX, 922, 932, 948, 958

General System Configuration Information

System Information Summary

	920	922LX	922RX	922	932	948	958
Supported as of MPE/XL Release	Rel 2.1	Rel 2.1	Rel 2.1	Rel 2.1	Rel 2.1	Rel 2.2	Rel 2.2
User license	20	32	64	unlimited	1-64 or unlimited	1-64 or unlimited	unlimited
Typical users	10-20	16-32	32-64	50-75	50-100	75-125	100-200
Maximum connected workstations	48	152	152	152	250	400	600
Performance relative to S920	1.0	1.6	1.6	1.6	2.7	6.0	8.5
Standard memory (Mbytes)	24	24	32	32	32	64	96
Maximum memory (Mbytes)	56	128	128	128	128	256	256
Maximum disk (Gbytes)	12	12	12	12	22	34.8	34.8
Maximum disk drive total	10	10	10	10	18	28	28
Maximum tape drive total	4	4	4	4	4	5	5
Maximum system printers	4	4	4	4	6	8	8
Maximum serial printers	16	16	16	16	28	48	48
Maximum DTCs supported	4	6	6	6	12	16	24
Maximum number of I/O channels ²	5	5	5	5	5	7 ¹	7 ¹
Maximum number of HP-IB channels	3	3	3	3	3	5 ¹	5 ¹
Maximum number of HP-FL channels	2	2	2	2	2	3 ¹	3 ¹
Maximum number of LAN channels	1	1	1	1	1	2	2
Maximum number of disk I/O channels	4	4	4	4	4	4	4
Precision Bus Adapter support	No	No	No	No	No	Yes	Yes
Floating point coprocessor	No	Std	Std	Std	Std	Opt	Opt
Maximum PSI cards	3	3	3	3	3	5	5
Supplied manual set	Core A	Core A	Core A	Core A	Core A	Core A + Core Plus	Core A + Core Plus
¹ Requires 2nd Precision Bus Adapter							
² HP-IB, HP-FL and/or LAN channels (a maximum of 7 are supported)							

Unique Supplied Hardware

- One Channel I/O Bus (CIB) adapter
- One Precision Bus Adapter (PBA) Series 948 and 958 ONLY
- One CIO HP-IB device adapter (920, 922LX, 922RX, 922) or two CIO HP-IB device adapters (932, 948, 958)
- 2 meter ThinLAN cable and a pair of ThinLAN terminators
- 6 meter AUI cable, ThickMAU and tap for SPU attachment to ThickLAN cable; ThinMAU with integrated AUI cable for attachment to ThinLAN cable
- Integrated disk drive(s): 670 Mbytes (920, 922LX), 1340 Mbytes (922RX, 922, 932, 948, 958)
- Integrated DDS format cassette tape drive with 1.3 Gbytes capacity per cassette
- One 700/92 terminal (console)

Memory Expansion

Error correcting memory is supplied with each SPU. Additional memory can be obtained by ordering options 504-508 (Series 920-932) and 509-513 (Series 948 and 958) with the system, or by ordering the stand-alone products: A1404A (8 Mbyte), A1436A (16 Mbyte), or A1437A (32 Mbyte). The A1436A and A1437A require a patch to MPE/XL 2.1. Systems shipped from the factory with release 2.1 preloaded contain the appropriate patch.

Each 8, 16 or 32 Mbyte memory card is a half-size board which occupies a full slot¹.

¹If memory size is greater than 64 Mbytes, then the sum of memory cards plus PSI cards cannot exceed 8. If memory is 7 cards, then the maximum number of I/O channels is 6. If memory is 8 cards, then the maximum number of I/O channels is 5.

Floating Point Coprocessor

The Series 920 does not come with a separate floating point coprocessor (floating point calculations are performed on the system processor.). The Series 922LX, 922RX, 922, and 932 come standard with an IEEE floating point coprocessor for high performance in numerical applications. The coprocessor is built into the SPU so no installation is required. The Series 948 and 958 do not come standard with a floating point coprocessor, but there is an option to add one (opt.# 8Z7).

Note

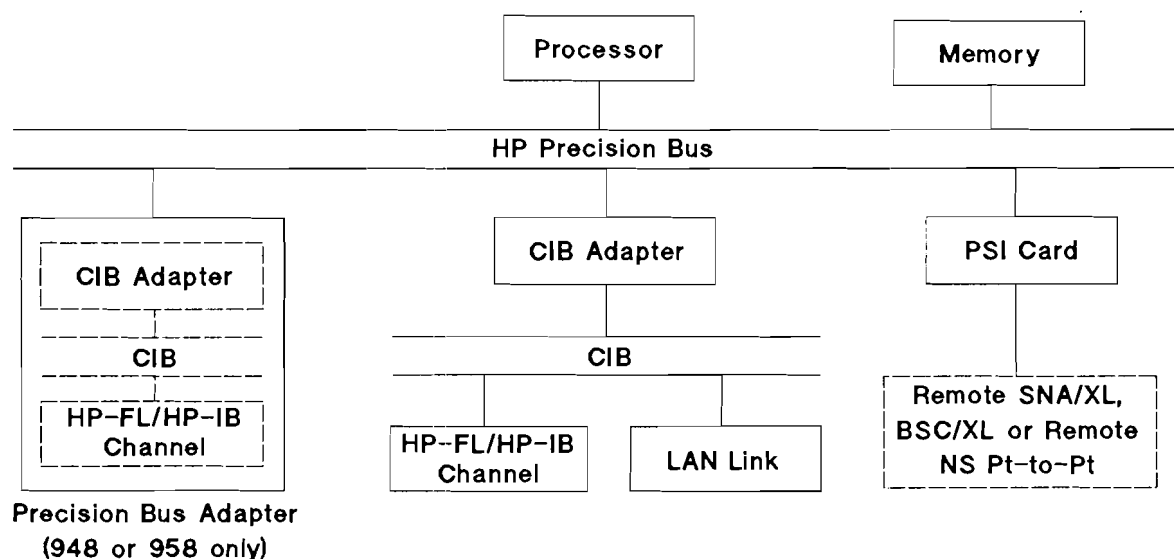


If option 8Z7 on the Series 948 and 958 is not selected at the time of initial purchase, it cannot be added later. Note that some VAB applications will need the floating point coprocessor.

I/O Channel Configuration Information

Channel I/O Bus (CIB)

The 900 Series systems connect to peripheral devices and data communication networks via the Channel I/O Bus (CIB). The Series 920, 922LX, 922RX, 922, and 932 support a maximum combination of 5 HP-FL, HP-IB, and LAN cards. The Series 948 and 958 support a maximum combination of 7 I/O cards. The 920, 922LX, 922RX, and 922 come standard with one 802.3 LAN card and one HP-IB channel, making three slots available for expansion (up to the supported limit for channel type). The 932 comes standard with two HP-IB channels and one 802.3 LAN card making two slots available for HP-IB or HP-FL expansion. The Series 948 and 958 come standard with one 802.3 LAN card and two HP-IB channels (one of which is configured using a Precision Bus Adapter (with an HP-IB channel)).



Precision Bus Adapter (PBA) Series 948 and 958 only

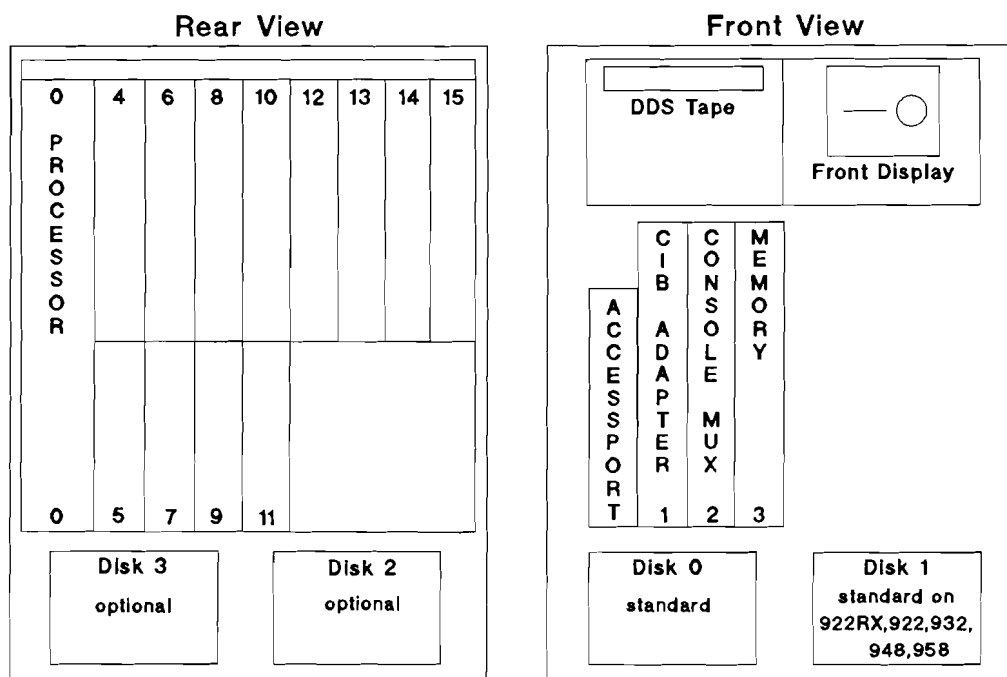
Disk I/O channels (HP-IB & HP-FL device adapters) can be inserted into the system in one of two ways. The first is via the existing CIB adapter in conjunction with bus connectors used to physically connect CIO device adapters. Multiple device adapters may be connected to a single CIO channel in this manner. The second is via a new single card CIO bus known as the Precision Bus Adapter (PBA). This new adapter combines the functionality of the existing CIB adapter and the physical bus connector onto a single card. Only one CIO device adapter can be connected to each PBA. Ldev 1, for performance reasons, must be configured using a Precision Bus Adapter. For this reason, the PBA is included with the standard HP-IB disk channel on all new S948 and S958 systems. A maximum of two PBAs is supported, for connecting HP-IB or HP-FL channels exclusively.

Note



The reason a customer may choose to add a second PBA (HP-IB or HP-FL) is to add a fourth disk channel. The PBA only supports disk channels. A second PBA is supplied with option 553 on the Series 948 and 958.

Expansion Slot Availability



Expansion Slot Availability

System	P/N	Slot Number													
		3	4	5	6	7	8	9	10	11	12	13	14	15	
920	A1702A	16 MB		8 MB									LAN	HP-IB	
922LX	A1027A	16 MB		8 MB									LAN	HP-IB	
922RX	A1046A	32 MB											LAN	HP-IB	
922	A1033A	32 MB											LAN	HP-IB	
932	A1041B	32 MB									HP-IB		LAN	HP-IB	
948	A1700A	32 MB		32 MB			HP-IB*					HP-IB		LAN	
958	A1701A	32 MB		32 MB		32 MB	HP-IB*					HP-IB		LAN	

* Together with PBA

* Together with PBA

Expansion Slot Usage

Add-on	Slots
Memory/PSI ^{1,2}	4, 5, 6, 7, 8, 9, 10, 11, 12, 13
HP-IB/HP-FL	6 (948, 958 only with PBA), 10, 12, 13
LAN (948, 958 only)	14

¹ Up to system maximum memory.

² If memory size is greater than 64 MB, then the sum of memory cards plus PSI cards cannot exceed 8.

Product Summary

The Series 920, 922LX, 922RX, 922, 932, 948, and 958 all share a common product option structure. The following tables represent information for all of the products and should be used with the specific Series 9xx configuration rules. They are intended as a general reference for configuring systems and some caution should be used. For example, a Series 958's memory cannot be upgraded using option 504 (increase memory to 32Mbyte) because its minimum memory is already at 96 Mbyte. Please consult a *HP 3000 Computer Systems Price Guide* for the latest product structure.

Common Product Structure

Product Number	Description
A1702A	Series 920 preconfigured system w/24 Mb memory and a 1 – 20 user license ¹
A1027A	Series 922LX preconfigured system w/24 Mb memory and a 1 – 32 user license ¹
A1046A	Series 922RX preconfigured system w/32 Mb memory and a 1 – 64 user license ¹
A1046A	Series 922 preconfigured system w/32 Mb memory ¹
A1041A	Series 932 preconfigured system w/32 Mb memory and a 1 – 64 user license ¹
A1700A	Series 948 preconfigured system w/64 Mb memory and a 1 – 64 user license ¹
A1701A	Series 958 preconfigured system w/96 Mb memory ¹
¹ All preconfigured systems include software and a class license to use MPE/XL FOS, TurboIMAGE/XL, and SQL software or the specified HP 3000 computer system.	

Product Structure¹

Option Number	Description
AA1	Diagnostics Support Tape supplied on 1/2-inch tape
001	Load subsys (Europe only)
1B6	Delete 700/92 Console
1C4	Delete DDS
1CE	Delete one 670 Mbyte disk (Not available on the S920, 922LX)
003	Increase disk to 1005 Mbyte (920 and 922LX only)
004	Increase disk to 1340 Mbyte (920 and 922LX only)
005	Increase disk to 1675 Mbyte (920 through 932)
006	Increase disk to 2010 Mbyte
007	Increase disk to 2345 Mbyte (920 through 932)
008	Increase disk to 2680 Mbyte
100	Server version
200	MPE/XL latest release
402	Increase HP-IB to 2 (total of 2)
403*	Increase HP-IB to 3 (total of 3)
* Slot limitations prohibit the combination of options 403, 513, and 553	
¹ All options not available on all systems.	

Product Structure¹ (continued)

Product Option	Description
504	Increase memory to 32 Mbyte (920 and 922LX only)
505	Increase memory to 40 Mbyte (920 through 932)
506	Increase memory to 48 Mbyte (920 through 932)
507	Increase memory to 56 Mbyte (920 through 932)
508	Increase memory to 64 Mbyte (922LX through 932)
509	Increase memory to 96 Mbyte (948 only)
510	Increase memory to 128 Mbyte (948 and 958 only)
511	Increase memory to 160 Mbyte (948 and 958 only)
512	Increase memory to 192 Mbyte (948 and 958 only)
513*	Increase memory to 224 Mbyte (948 and 958 only)
550	Substitute 1 HP-FL for 1 HP-IB (S932 only)
551	Increase HP-FL to 1 (for Series 948 and 958 only)
552	Increase HP-FL to 2 (for Series 948 and 958 only)
553*	Increase HP-FL to 3 (for Series 948 and 958 only - contains 2nd PBA)
8Z7	Add floating point coprocessor (for Series 948 and 958 only)
910	SQL only system (deletes TurboIMAGE)
920	MPE only system (deletes TurboIMAGE* and SQL)
930	Hardware only (deletes TurboIMAGE, SQL, and MPE/XL) for ICON only
UAT	Upgrade to unlimited user license (S932 and S948 only)
<i>* Slot limitations prohibit the combination of options 403, 513, and 553; 514 and 553; 514, 403, and 552; 514, 403, and 553</i> ¹ All options not available on all systems.	

Upgrade Structure

Option Number	Description
700	Return credit 4 Mbyte memory w/MICRO LX/GX/RX
701	Return credit 81 Mbyte disk w/MICRO LX
702	Return credit 152 Mbyte disk w/MICRO LX/GX/RX
703	Return credit 304 Mbyte disk w/MICRO LX/GX/RX
704	Upgrade MICRO 3000 or 3000LX w/2 Mbyte
705	Upgrade MICRO 3000 w/4 Mbyte 3000GX/RX w/2 Mbyte
706	Upgrade MICRO 3000XE w/4 Mbyte (922LX through 958)
707	Upgrade pre-Series II/30/33, HP 2000
708	Upgrade from Series III (922LX through 958)
709	Upgrade from HP 250
710	Upgrade from HP 260
711	Upgrade Series 37, 37XE, 39, 40 w/no memory
712	Upgrade from Series 39HP, 42, 44 (922LX through 958)
713	Upgrade from Series 48 (922LX through 958)
714	Upgrade from 42XP, 52 (922LX through 958)
715	Upgrade from 58 (922LX through 958)
716	Upgrade from Series 64 with 2 Mbyte (948 and 958 only)
717	Upgrade from Series 68 with 2 Mbyte (948 and 958 only)
718	Upgrade from Series 70 with 2 or 4 Mbyte (948 and 958 only)

Note



HP's policy for upgrading HP 3000 systems mandates that systems must be returned for credit and must have been installed at customer's site at least 6 months. Customer must provide documentation of installation date or proof of support for at least 6 months.

Field Upgrades

Product Number	Description
A1711B	Field Upgrade to Series 922LX ¹
A1175B	Field Upgrade to Series 922RX ¹
A1177B	Field Upgrade to Series 922 ¹
A1176C	Field Upgrade to Series 932 ¹
A1742A	Field Upgrade to Series 948 ¹
A1743A	Field Upgrade to Series 958 ¹
Option Number	
003	Add 335 Mbyte disk
004	Add 670 Mbyte disk
402	Add CIB-HP-IB
508	Add-on 8 Mbytes of memory
516	Add-on 16 Mybtes of memory
532	Add-on 32 Mbytes of memory
551	Add HP-FL
830	From Server 920
831	From Server 922LX
832	From Server 922RX
833	From Server 922
834	From Server 932
835	From Server 948
840	From Series 920
841	From Series 922LX
842	From Series 922RX
843	From Series 922
844	From Series 932
845	From Series 948
¹ The Field Upgrade requires the return of the original processor board.	

Series 950, 955, 960, 980/100, 980/200

General System Configuration Information

System Information Summary

	950	955	960	980/100	980/200
Supported as of MPE/XL release	Rel 1.0	Rel 2.05	Rel 2.05	Rel 2.2	Rel 3.0
Typical users	75-150	100-200	150-300	200-400	300-600
Maximum connected workstations	400	600	600	850 ¹	850 ¹
Performance relative to S950	1.0	1.5	2.0	3.4	5.3
Standard memory (Mbytes)	64	96	128	192	256
Maximum memory (Mbytes)	192	256	256	512	1024
Maximum disk (Gbytes)	64	85	85	85	85
Maximum disk drive total	48	64	64	64	64
Maximum tape drive total	8	8	8	8	8
Maximum system printers	12	12	12	12	12
Maximum serial printers	32	48	64	104	156
Maximum DTC48s supported	16	16	16	24	24
Maximum number of I/O channels	12	12	12	12	12
Maximum number of disk I/O channels	6	6	6	6	6
Maximum number of HP-IB channels	12	12	12	12	12
Maximum number of HP-FL channels	12	12	12	12	12
Maximum number of LAN channels	2	2	2	2	2
Maximum number of PSI links	8	8	8	8	8
Maximum number of disk drives per HP-IB channel	6	6	6	6	6
Maximum number of disk drives per HP-FL channel	8	8	8	8	8
¹ 1250 logged-on users will be available mid-1992					

Unique Supplied Hardware

- Dual Channel I/O Busses (CIBs)
- Two CTB adapters and 10 I/O card slots
- Two HP-IB device adapters for HP-IB devices
- 6 meter AUI cable, ThickMAU and tap for SPU attachment for ThickLAN cable; ThinMAU with integrated AUI cable for attachment to ThinLAN cable
- SPU Bay including card cages and power supplies for CPU, cache, up to four CIB adapters, up to 20 I/O card slots and up to 192 Mbytes of main memory (Series 950) or 256 Mbytes (Series 955-960) or 512 Mbytes (Series 980/100) or 1024 Mbytes (Series 980/200)

Memory Expansion

Memory consists of 1 Mbit RAM Error Correcting Memory configured on 16 Mbyte memory cards or 4 Mbit memory configured on 64 Mbyte cards. The Series 950, 955 and 960 only support 16 Mbyte memory cards. The Series 980 supports both 16 Mbyte and 64 Mbyte (A1152A) memory cards. Memory cards may be obtained by ordering multiple option 50x with the system or as stand-alone products.

Note



Configuration of a Series 950/955/960 system with greater than 128 Mbytes of memory requires the installation of an additional memory controller (system option 504 on Series 960 or product number A1103A for all systems). Series 980 systems and upgrades are provided two memory controllers which support up to 512 Mbytes each. Series 950-960 and Series 980 memory controllers are not interchangeable.

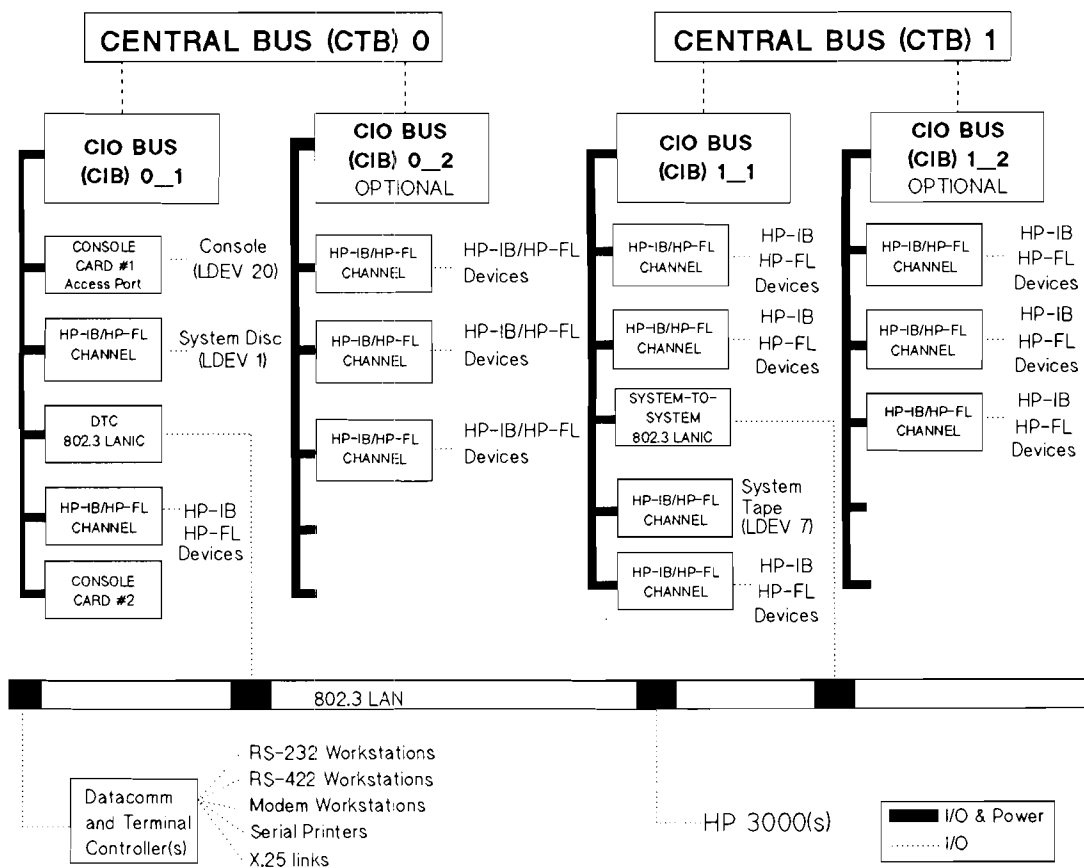
AutoRestart/XL is not supported in certain system configurations containing greater than 512 Mbytes of memory. Consult your HP Representative before using AutoRestart/XL to determine whether or not it is supported in your configuration. In addition, AutoRestart/XL requires a separate dedicated volume set containing 1 or more volumes for dump file storage. *Refer to page 6-6 for dump file space recommendations.*

I/O Channel Configuration Information

Channel I/O Bus (CIB)

The Series 950, 955, 960, 980/100, and 980/200 are shipped standard with two CIB's, a third and fourth are optional. They are connected to the CPU via a CIB adapter (A1101A). CIB adapters have reserved slots in the SPU, so they do not affect I/O slot configuration. Each CIB can be configured with up to 5 I/O expansion cards. Up to four CIBs may be configured in a 950, 955, 960, 980/100 and 980/200 providing a maximum of 20 I/O expansion slots.

In general, the third CIB is appropriate for systems which have more than six channels installed (HP-IB, HP-FL and LAN cards), or which have more than 24 disk drives attached. A fourth CIB is appropriate for systems which have more than nine channels installed (HP-IB, HP-FL and LAN cards), or which have more than 36 disk drives attached.



Conceptual Schematic: Series 950, 955, 960, 980 I/O Configuration

Slot Availability

Two VLSI CIB Adapters are included with each system. Each CIB adapter creates 5 available I/O slots. Five I/O cards are included with each system, occupying five I/O slots. Two VLSI CIB Adapters each connect the Channel I/O Bus. Two boards are supplied on the CIB for console attachment and system diagnostic support. One 802.3 LANIC board is included on the CIB for workstation attachment. Two HP-IB channel cards are supplied for peripheral connections. This leaves five I/O slots for additional HP-IB, HP-FL or LANIC cards. A third and fourth CIB adapter (A1101A) are optional. Each provides an additional 5 I/O slots.

CIO 1_2					CTB-1					SMB					CTB-0					CIO 0_2														
0	1	2	3	4																														
		NS LANIC	HP-IB 1	HP-FL 1	Channel Adapter for CIO 1_1					Opt. Channel Adapter for CIO 1_2					PSI (Optional)					PSI (Optional)					PSI (Optional)					PSI (Optional)				
					PSI (Optional)					PSI (Optional)					PSI (Optional)					PSI (Optional)														
					Bus Converter 1					Memory Controller 1					Memory Controller 0					Bus Converter 0														
					PSI (Optional)																													

HP 3000 Series 950-980 SPU (Back)

CIB Card Cage Rules

Console card #1 (Access Port PCA) must be in slot 4 of the CIB 0_1 card cage (factory installed). Console card #2 (MUX PCA) must be in slot 1 of the CIB 0_1 card cage (factory installed). Factory installed HP-IB channels are positioned for MPE/XL auto-boot capability.

The factory installed workstation 802.3 LANIC and optional NS Service 802.3 LANIC are shown in slot 2 of CIB 0_1 and slot 2 of CIB 1_1 respectively. There is a maximum of four HP-IB channels per CIB. There is a maximum of three HP-FL channels per CIB and a combined maximum of five HP-IB, HP-FL and 802.3 LANIC boards per CIB.

Note



Series 950-960 come standard with Memory Controller 0. Series 980/100 and 980/200 come standard with Memory Controller 0 and Memory Controller 1.

Product Summary

The Series 950, 955, 960, 980/100 and 980/200 all share a common product option structure. The following tables represent information for all of the products and should be used with the specific Series 9xx configuration rules. They are intended as a general reference for configuring systems and some common sense should be exercised when using these product structure tables.

Common Product Structure

Product Number	Description
32490B	Series 950 preconfigured system w/64 Mbyte memory ³
A1109A	Series 955 preconfigured system w/96 Mbyte memory ³
A1130A	Series 960 preconfigured system w/128 Mbyte memory ³
A1134A	Series 980/100 preconfigured system w/192 Mbyte memory ³
A1149A	Series 980/200 preconfigured system w/256 Mbyte memory ³
Option Number	
015	380V/50Hz System Operation
016	415V/50Hz System Operation
0E3	200 – 240 VAC operation
100	Server version (950, 955, and 960 only)
500	Add-on 16 Mbyte memory ¹
502	Add-on 64 Mbyte memory ²
550	Substitute 1 HP-FL for 1 HP-IB
910	SQL only system (deletes TurboIMAGE)
920	MPE only system (deletes TurboIMAGE and SQL)
¹ An additional memory controller (P/N A1103A) is required to support memory sizes greater than 128 Mbytes on the Series 950-960.	
² Available with 980/100 and 980/200 only. 980/100 memory maximum is 512 Mbytes with MPE/XL Release 3.0 (256 Mybtes with MPE/XL Release 2.2).	
³ All preconfigured systems include software and a class license to use MPE/XL FOS, TurboIMAGE/XL, and SQL software on the specified HP 3000 computer system.	

Upgrade Options

The Series 950, 955, 960, 980/100, and 980/200 upgrade systems have been restructured to be the same product number as the new system product number. Use the specific Series 9xx product number with the following option numbers for the appropriate upgrade, consult the *HP 3000 Computer Systems Price Guide* or CPL for pricing information.

Common Upgrade Option Structure

Option Number	Description
700	Return credit 4 Mbyte memory w/MICRO LX/GX/RX
701	Return credit 81 Mbyte disk w/MICRO LX
702	Return credit 152 Mbyte disk w/MICRO LX/GX/RX
703	Return credit 304 Mbyte disk w/MICRO LX/GX/RX
704	Upgrade MICRO 3000 or 3000LX w/2 Mbyte
705	Upgrade MICRO 3000 w/4 Mbyte 3000GX/RX w/2 Mbyte
706	Upgrade MICRO 3000XE
707	Upgrade pre-Series II/30/33, HP 2000
708	Upgrade from Series III
709	Upgrade from HP 250
710	Upgrade from HP 260
711	Upgrade Series 37,37XE,39,40 w/no memory
712	Upgrade from Series 39HP, 42, 44
713	Upgrade from Series 48 with 2 Mbyte
714	Upgrade from 42XP, 52 with 4 Mbyte
715	Upgrade from 58 with 4 Mbyte
716	Upgrade from Series 64 with 2 Mbyte
717	Upgrade from Series 68 with 2 Mbyte
718	Upgrade from Series 70 with 4 Mbyte
719	Upgrade from Series 925LX with 24 Mbyte
720	Upgrade from Series 925 with 32 Mbyte
721	Upgrade from Series 935 with 48 Mbyte
722	Upgrade from Series 949 with 64 Mbyte
723	Upgrade from Series 922LX
724	Upgrade from Series 922RX
725	Upgrade from Series 922
726	Upgrade from Series 932
727	Return 304 Mbyte disk mechanism
728	Return 670 Mbyte disk mechanism

Field Upgrades

Product/Option	Description
A1117A	Field Upgrade Series 950 to Series 955 ¹
A1132A	Field Upgrade Series 950 to Series 960 ¹
A1133A	Field Upgrade Series 955 to Series 960 ¹
500	Add 16 Mbyte memory ²
503	Delete 16 Mbyte memory
A1137A	Field Upgrade to Series 980/100
A1138A	Field Upgrade to Series 980/200
020 ⁴	Required power option for SPU with serial code prefix (first 4 digits) of 2816 or less
021 ⁴	Required power option for SPU with serial code prefix (first 4 digits) of 2845 or greater
503	Delete 16 Mbyte memory
509	Delete 64 Mbyte memory
704	Return of MICRO 3000,3000LX with 2 Mbyte
705	Return of MICRO 3000 with 4 Mbyte, MICRO 3000GX,RX with 2 Mbyte
706	Return of MICRO 3000XE
707	Return of pre Series II,30,33,HP 2000
708	Return of Series III
709	Return of HP 250
710	Return of HP 260
711	Return of Series 37,37XE,30,40 with 0 Mbyte
712	Return of Series 39HP,42,44 with 0 Mbyte
713	Return of Series 48 with 1 Mbyte
714	Return of Series 42XP,52 with 4 Mbyte
715	Return of Series 58 with 4 Mbyte
716	Return of Series 64 with 2 Mbyte
717	Return of Series 68 with 2 Mbyte
718	Return of Series 70 with 4 Mbyte
871	Upgrade from Series 950, includes 128 Mbyte memory ¹
872	Upgrade from Series 955, includes 96 Mbyte memory ¹
873	Upgrade from Series 960, includes 64 Mbyte memory ¹
874	Upgrade from Series 980/100 ^{1,3}
875	Upgrade from Series 980/100 ^{1,3}

¹The field upgrade requires the return of the original processor board and the PDH board. With the 950, 955 and 960, PDH board is not required when upgrading to the 980/100 or 980/200.

²An additional memory controller (P/N A1103A) is required to support memory sizes greater than 128 Mbytes on the Series 950-960.

³Option 875 is required when the Processor Reference Label, PRL-V2, exists on the Series 980/100. This would be located near the SPU serial number. If it does not exist, then option 874 is required.

⁴Options for A1138A only; one option is required.

Note



HP's policy for upgrading HP 3000 systems mandates that systems must be returned for credit and must have been installed at customer's site at least 6 months. Customer must provide documentation of installation date or proof of support for at least 6 months.



900 Series Input/Output Channels

Peripheral Channels

HP Small Computer System Interface (SCSI)

HP's SCSI link is an interface card used to connect disks, DDS devices and Optical drives to the 900 Series Systems. The new interface card available for the new 900 Series Systems is:

28642A - HP-PB host adapter card (for use on HP-PB based systems). Supports disk and DDS – card will support optical drives in the future.

In addition, there is a CIB SCSI card:

27251A - CIB SCSI host adapter card (for use on CIB based systems). Currently supports only Optical Autochanger on CIB systems.

With this new HP-PB interface card, SCSI peripherals listed in this configuration guide are supported on the new Series 9x7LX and 9x7 systems. Third party SCSI peripherals are NOT supported on Series 900 systems.

Maximum Cable Length

The maximum combined length of Single Ended SCSI bus is six meters. The maximum length applies to cables that interconnect each daisy-chained device and to the cable lengths that are internal to each device.

The total cable length is the sum of the length of all SCSI cables:

Where	Cable Length
Inside SPU	
Series 9x7LX	1.5 meters
Series 9x7	2.2 meters
Inside Series 6000 Multi-Mechanism Package	
Mini-tower	1.1 meters
Rackmount	1.6 meters*
Between the SPU and the first peripheral	1 or 1.5 meters
Between Peripherals	.5, 1, or 2 meters
* See chapter 6 for further discussion on mini-tower and rackmount for Series 9x7LX and 9x7 systems.	

To increase cabling flexibility, the following SCSI cables may be ordered separately:

- .5 meter SCSI cable: P/N 92222A
- 1.0 meter SCSI cable: P/N 92222B
- 2.0 meter SCSI cable: P/N 92222C

The cables listed above are peripheral-to-peripheral cables with male-to-male connectors. For an extender cable order P/N 92222D, a 1 meter cable with female-to-male connectors.

For best performance results with SCSI, follow these guidelines:

- connect 5 or less disks per SCSI bus on systems with heavy disk I/O workloads
- connect tape and back-up devices on separate SCSI bus from disks on systems with ≥ 10 Gbytes of storage

Device Loading

A maximum of 7 peripheral devices can be attached to each bus.

Note



The integrated SCSI interface on Series 9x7LX and 9x7 systems supports only 5 devices and does not support external DDS. A SCSI interface card is required to support external DDS.

The 900 Series SCSI implementation adheres to the HP Common SCSI (HPCS) specification which is a superset of the ANSI SCSI-2 specification.

The Rewritable Optical Autochanger (C1700A) is also supported via CIB SCSI. C1700A is supported as a serial device accessed through TurboSTORE/XL II. Two versions of TurboSTORE/XL II are available for support of the Rewritable Optical Autochanger: 36397A Support for Rewritable Optical Disk and 36398A Support for Online Backup for Rewritable Optical Disk. For Support of the Optical Autochanger on CIB-based Systems you must order the CIB SCSI card:

27251A - CIB SCSI host adapter card (for use on CIB based Systems)

Configuration limitations for C1700A are:

- No boot capabilities are provided.
- Only one C1700A per SCSI channel.
- Only three C1700A products per system.
- The SCSI channel includes a 2m cable. P/N 92222D can be ordered for 1m SCSI cable extender.
- The SCSI channel has to be configured at address 7 (factory standard).
- The maximum cable length is 6 meters (including internal cables).

Note



The Rewritable Optical Autochanger (C1700A) is not supported on Series 9x7LX and 9x7 systems at first release. Support will be available as soon as possible, dependent on certification of the device.

SCSI Guidelines

- Third party SCSI devices are not supported.
- SCSI switch boxes are not supported.
- Use daisy chain configuration for all devices.

- All devices must have a unique address between 0 and 6.
- All cables should be attached to a device at both ends.
- The last SCSI device in the chain must have a terminator installed in its second connector.
- All devices must be connected to a common (single point) reference ground. Refer to appropriate Site Preparation Guide for details.
- All devices must be powered up with the self-test completed before power is applied to SPU.
- Keep all devices powered up during and after system boot-up.

HP-IB Channels

The HP-IB channel (27113A) is a hardware controller used to interface HP-IB (IEEE 488 protocol) peripherals to the 900 Series systems. Each HP-IB channel is a board that uses one I/O card (CIB) slot and supports one HP-IB cabling system. Each HP-IB cabling system may be used to connect from one to six HP-IB peripherals. Peripherals connected to one HP-IB channel are linked together with HP-IB cables. The number of peripherals which may be practically connected to a single HP-IB channel depends on cable length restrictions and performance considerations.

Series 9x7LX and 9x7

HP-IB channels are only supported in the Series 9x7LX and 9x7 via the Precision Bus Adapter (PBA-IB). Each PBA-IB uses 2 HP-IB slots.

HP-IB channels may be ordered two ways:

- option 401 (9x7 only) at time of initial purchase
- A1747A (PBA-IB) after initial purchase

Refer to page 2-1 for HP-IB channel maximums of Series 9x7LX and 9x7 systems.

Series 920 through 958

For additional HP-IB channels, order the following at time of initial purchase:

- option 402 (Series 920 through 922) - increase HP-IB to total of 2
- option 403 (Series 920 through 958) - increase HP-IB to total of 3

Add on HP-IB channels can be ordered and include an adapter to interface with the CIB:

- P/N 27113A option 003 (Series 920 through 958) - add on HP-IB channel cards
- P/N A1747A (Series 948, 958) - add on PBA-IB channel for 4th HP-IB channel

The Series 948 and 958 come standard with a Precision Bus Adapter with HP-IB (PN A1747A) to connect to LDEV 1.

Mixing disks on the same channel with printers and tape drives is not recommended for performance reasons. *Refer to page 3-1 for HP-IB channel maximums of Series 920 through 958 systems.*

Note



Series 920 through 922 systems with four internal disk mechanisms require at least two HP-IB channel adapters.

Series 950 through 980/200

The Series 950, 955, 960, 980/100 and 980/200 are supplied standard with two HP-IB channels. Additional HP-IB channels may be ordered as product number 27113A. System option 550 will delete one HP-IB channel and replace it with an HP-FL channel.

Up to 4 HP-IB channels are supported on each CIB. As a rule of thumb, you should not exceed 3 HP-IB channels per CIB without consulting a performance specialist. Order product 27113A to obtain additional HP-IB channels. *Refer to page 4-1 for HP-IB channel maximums of Series 950 through 980/200 systems.*

Configuring HP-IB Cabling

Performance Considerations/Device Loading

- A maximum of six non-disk devices may be attached to each HP-IB device adapter
- A maximum of 4 disks should be attached to each HP-IB device adapter for consistent performance results
- A mixture of disk, tapes, and printers may be attached to an HP-IB device adapter as long as the firmware date code is 2912 or greater
- Any variance from these guidelines must have prior written approval from your local Hewlett-Packard Support office
- The electrical device load maximum remains at 8 external device loads per HP-IB device adapter

HP-IB Guidelines

- HP-IB Switch Boxes are not supported
- Use daisy-chain configuration for all devices
- All devices must have a unique address between 0 and 7
- All cable connections should occur at device (i.e., no cables should be connected together simply to extend to effective cable length)
- There should be no unterminated cables. All cables should be attached to a device at both ends
- All devices must be connected to a common (single point) system reference ground. Refer to appropriate Site Preparation Guide for details.
- All devices must be powered with the self test completed before power is applied to the SPU
- Keep all devices powered during and after system boot-up

Maximum Cable Length

The maximum combined length of HP-IB cables connected to a single device adapter is 15 meters. However, this maximum may be further restricted by the "seven plus one rule" described below. When connecting multiple peripherals to a single device adapter, the first device in the chain connects via a special 4 meter HP-IB cable included with the device adapter.

The calculation of maximum cable length also includes the length of HP-IB cable internal to the system and/or peripherals. The maximum length applies to the combination of cables whether they are "daisy-chained" in a line or connected in a branched layout.

The total cable length is the sum of the length of all HP-IB cables:

- a. Inside the peripheral devices
- b. Between peripherals
- c. Between the nearest peripheral and the junction panel (HP-IB interface)
- d. Between the HP-IB DA and the first device (4m)

The Seven Plus One Rule

The maximum combined length of HP-IB cables is restricted by electrical device loading as well as total cable length. *The total HP-IB cable length may not exceed seven meters plus one meter for each electrical device load attached to the HP-IB cable, up to a 15 meter maximum.* This calculation optimizes data transfer rates, ensuring correct performance.

All HP-IB cables internal to either the system or the peripherals are supplied standard with the product ordered. A special 4 meter cable is supplied standard with the HP-IB device adapter. External HP-IB cables are usually supplied with the peripheral, but there are exceptions.

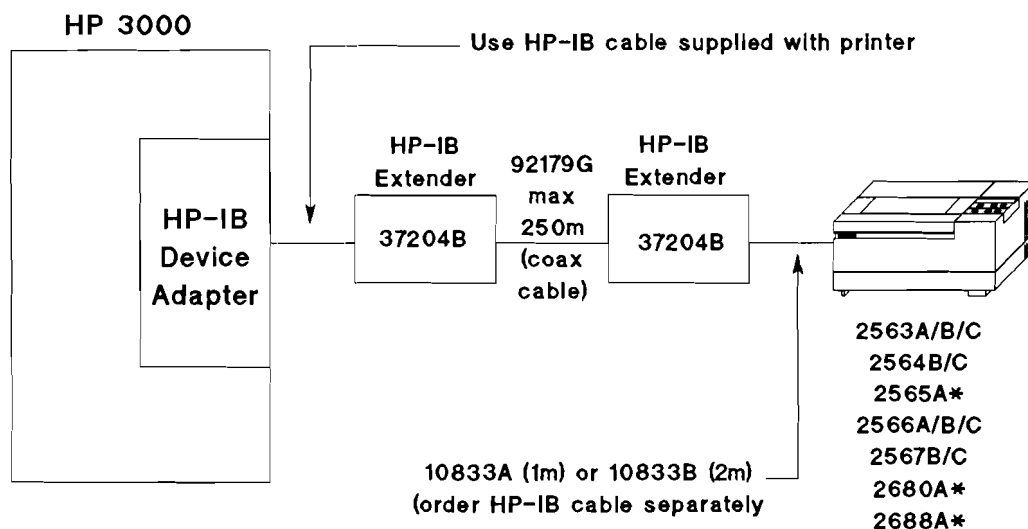
To increase cabling flexibility, the following HP-IB cables may be ordered separately:

- 1 meter HP-IB cable: P/N 10833A
- 2 meter HP-IB cable: P/N 10833B
- 4 meter HP-IB cable: P/N 10833C

HP-IB Extenders (for printers only)

For environments which require printers to be located longer distances from a 900 Series system, an HP-IB extender configuration may be installed. Extenders are available with coaxial cabling. Coaxial cable lengths are supported up to 250 meters. Coaxial cables must be ordered separately. Coaxial cable is P/N 92179G.

Each extender configuration requires a pair of extenders, one at each end. A configuration example is shown below.



* Discontinued

Single Printer Cabling with HP-IB Extenders (37204B)

An HP-IB extender configuration is subject to the following limits:

- HP-IB extenders are supported on MPE/XL release 1.2 or later
- A maximum of four printers are supported per extender configuration. These may be a combination of 256x, 2688A* or 2680A* printers. However, only two page printers (2688A or 2680A) are supported per extender configuration.
- When multiple printers are connected to an extender configuration, a maximum of 1 meter HP-IB cable (P/N 10833A) can be installed between printers. This cable must be ordered separately.
- Two sets of extender pairs may be connected to a single HP-IB device adapter, but only 256x printers may be used on both extender pairs.

* *Discontinued*

Note

For HP-IB device adapters with firmware 27113-81002 (Rev 2733), a firmware upgrade is required to support HP-IB extenders. See service note 27113A-02 for details.

HP Fiber-Optic Link Channels

HP's Fiber-Optic link, HP-FL (27115A), is an interface channel used to connect HP-FL disk drives to the 900 Series systems.

Each interface uses one I/O (CIB) slot and attaches one fiber-optic cable. The cable needed to connect the channel to its first disk drive is included with the HP-FL channel. Each channel may support up to 8 disks in a daisy-chain using a disk-to-disk bus called P-Bus.

The advantages of HP-FL relative to HP-IB are numerous. First, up to eight HP-FL disks can be placed on a single HP-FL Device Adapter (DA) while, for performance reasons, it is not recommended to exceed four HP-IB disks per HP-IB DA. This means larger disk configurations can be achieved with HP-FL using fewer system I/O slots. Second, HP-FL supports fiber-optic cable lengths up to 500 meters while HP-IB supports a maximum cable length of 15 meters. This allows HP-FL a higher degree of configuration flexibility because disks can be placed further away from the CPU. Third, HP-FL offers an improved data transfer rate relative to HP-IB, 5 megabytes per second versus 1 megabyte per second, respectively.

HP-FL also has advantages over SCSI. The HP-FL interface uses the link more efficiently than SCSI, providing higher sustained data transfer rates. In addition, HP-FL supports high availability solutions such as Disk Mirroring and SPU Switchover/XL and supports larger configurations.

Series 9x7LX and 9x7

HP-FL channels are not supported on the Series 9x7LX systems due to power and cooling constraints of the system packaging.

HP-FL channels may be ordered for the Series 9x7 systems either as an option to the system (option 403) or via a Precision Bus Adapter with HP-FL (P/N A1748A). *Refer to page 2-1 for HP-FL channel maximums.*

Series 920 through 958

To obtain additional HP-FL channels, order product 27115A with option 003. Add-on HP-FL channels for the 900 Series systems include an adapter to interface with the CIB adapter. (This adapter is unique to the Series 920, 922LX, 922RX, 922, 932, 948, and 958.) For the Series 932 only, option 550 substitutes one HP-FL for an HP-IB channel in the standard configuration.

For the Series 948 and 958 only, order P/N A1748A to add a Precision Bus Adapter with an HP-FL channel. *Refer to page 3-1 for HP-FL channel maximums.*

Note



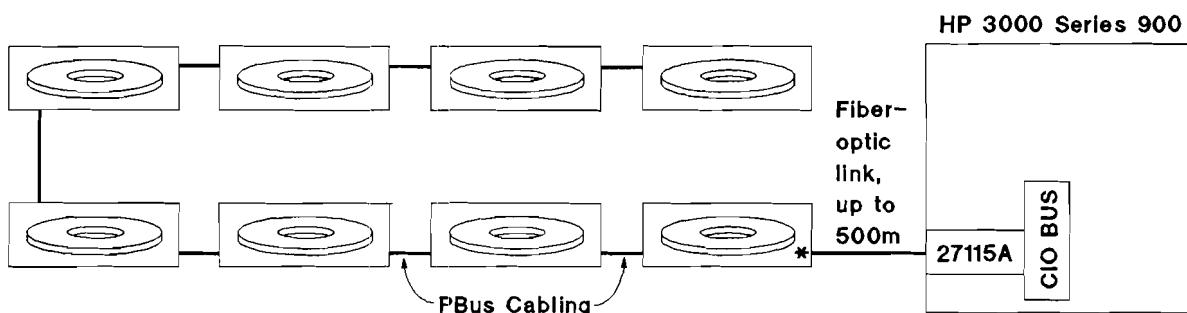
For Series 920 through 958, the integrated disk drives must be HP-IB and use one HP-IB channel. In the preconfigured Series 948 and Series 958 systems, LDEV 1 is one of the integrated disk drives which are configured to an HP-IB interface which uses the Precision Bus Adapter.

Series 950 through 980/200

Each system supports a maximum of 3 HP-FL channels per CIB. As a rule of thumb, you should not exceed 2 HP-FL channels per CIB without consulting a performance specialist. *Refer to page 4-1 for HP-FL channel maximums.*

HP-FL Cabling

Unlike HP-IB, there are two cabling methods incorporated into the HP-FL interface. The fiber-optic cable is used to connect a group of HP-FL disk drives to the HP-FL DA. The fiber-optic cable is a duplex cable of glass fiber containing two fiber-optic strands. One strand is used to transmit data from the CPU to the disks and the other is used to transmit data from the disks to the CPU. As shown in the figure below, the fiber-optic link connects from the system to one or a group of disks. A 30 meter fiber-optic link is included with P/N 27115A. The 30 meter cable can be replaced by a custom fiber-optic cable, up to 500 meter long. This is orderable as HFBR-AWQnnn, where nnn is the length in meters.



C2201A or C2204A disks (up to 8 drives)

* Must be standard HP C2201A or C2204A disk drive

HP-FL Disk Interface

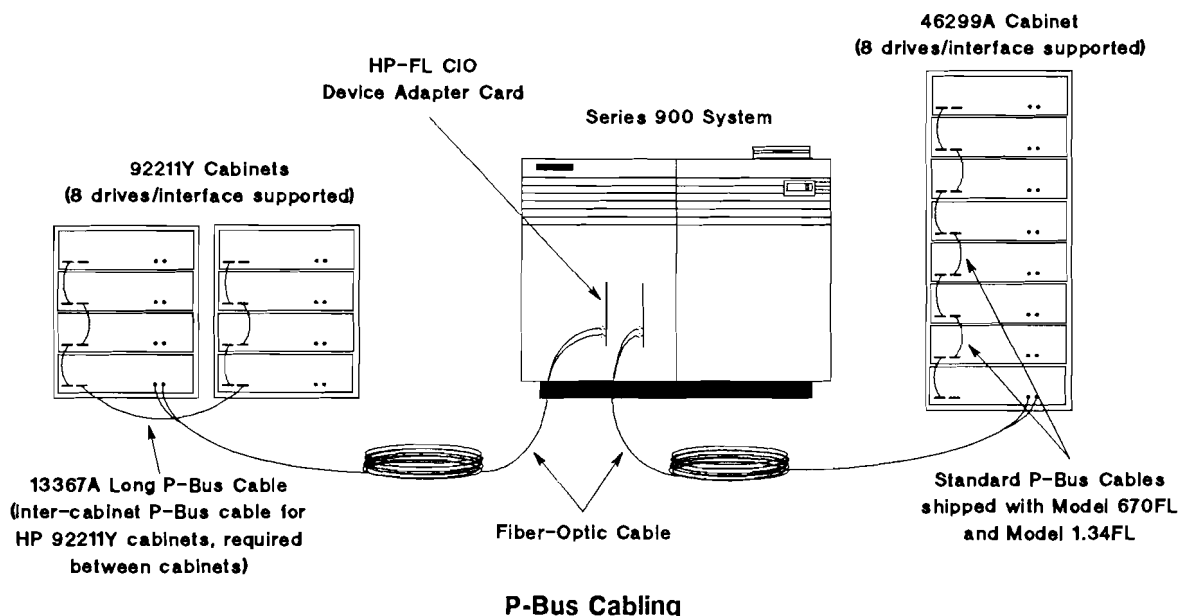


As a space and cost savings solution, a multi-wire P-Bus cable is used to daisy-chain up to eight HP-FL disk drives together on a single HP-FL interface card in a single cabinet. (The HP 46299A is a 19-inch EIA cabinet, 1.6m tall. It can hold up to eight HP C2201A and/or

C2204A disk drives.) The P-Bus cable is a 64-wire copper cable. The transfer rate capabilities of the P-Bus cable match that of the fiber-optic cable at 5 megabytes per second.

P-Bus cabling limitations restrict the number of HP-FL disk drives supported in multiple cabinets. Up to eight HP C2201A or C2204A disk drives are supported in two HP 92211Y cabinets. Disks in adjacent cabinets are connected using a long P-Bus cable, P/N 13367A. The C22XXA product P-Bus cables are backward compatible. The older P-Bus cables on the 793X products are not forward compatible.

Option 1BG available on the HP C2201A and C2204A disk drives deletes the fiber-optics hardware from the controller. These disk drives can be interconnected via the P-Bus, but not directly to the system via the fiber-optic cable. At least two disk drives per channel should have fiber-optic circuits (the standard drive) for configuration flexibility.



Performance Considerations

To enhance performance with TurboSTORE/XL or TurboSTORE/XL II, modified configurations are suggested. If backup devices will only be used sequentially, they may share an HP-IB channel. If devices are used in parallel or parallel in device pools, it is suggested that each backup device have its own HP-IB DA. Additional performance increases can occur with:

- FL disks connected to at least one HP-FL DA. If HP-IB disks are used, they should be spread over at least four HP-IB DAs.
- A maximum of two HP-FL DAs per CIB.
- HP-IB and HP-FL channels on separate CIB.
- A maximum of 3 HP-IB channels per CIB.

For best performance results with SCSI disks, follow these guidelines:

- Place add-on DDSs or other back-up device on a separate SCSI bus.
- Connect 5 or less disks per SCSI bus

Interconnect Positioning

	HP-IB	SCSI	HP-FL
Primary focus	Upgrade systems with HP-IB devices 1/2-inch tape Printers	Disk/DDS on new low end and midrange systems Optical Autochanger	Disks on high end
High availability	No	No	Yes
Cable length maximum	15M	6M	500M
Maximum throughput	1 MB/sec	5 MB/sec	5 MB/sec
Sustained throughput relative to HP-IB	1	2x	4x
Maximum disks per interface card	4	7 (5 for performance)	8

SCSI

Use SCSI to:

- connect disks and other peripherals for Series 9x7LX and 9x7 low end and midrange systems (configurations larger than 12 Gbytes should consider using HP-FL disks)
- satisfy industry standard and open system requirements
- replace HP-IB as customers migrate to new 900 Series low end and midrange systems
- connect the Rewritable Optical Disk Library System

HP-IB

Use HP-IB to:

- connect 1/2-inch tape devices
- meet customers need to migrate HP-IB peripherals
- connect HP-IB printers

HP-FL

Use HP-FL to:

- connect disks on the 900 Series High End Systems
- satisfy high performance requirements for disk
- satisfy High Availability requirements for midrange and high end systems (Disk Mirroring, SPU Switchover/XL)
- satisfy longer distance requirements between host and disk
- satisfy larger disk configurations (disk configurations over 15 Gb are not recommended for SCSI)
- satisfy fiber-optic requirements (EMI/RFI noise)

900 Series Systems and Interconnect Support

	917LX-967LX	937-967	920-958	950-980
HP-IB	Yes	Yes	Yes	Yes
SCSI	Yes	Yes	No*	No*
HP-FL	No	Yes	Yes	Yes
* SCSI supported for Optical Library System only				

Interconnect Product Number Summary

Interface Card	Part Number	Cable(s)	Extender
HP-IB	27113A	10833A (1 meter)	37204B
	A1747A (PBA)	10833B (2 meter)	
		10833C (4 meter)	
SCSI	27251A (CIB)	K2286 (1 meter host → storage system)	92222D (1 meter; male-to-female)
	28642A (HP-PB)	K2285 (1.5 meter host → storage system)	
		92222A (.5 meter → storage system to storage system)	
		92222B (1 meter → storage system to storage system)	
		92222C (2 meter → storage system to storage system)	
		1252-3920 (terminator single ended)	
HP-FL	27115A	HFBR-AWQnnn	
	A1748A (with PBA)		

Peripherals

HP 3000 900 Series Disks and Performance

The HP 3000 900 Series and the MPE/XL operating system provide outstanding disk performance, ideal for OLTP applications. Outstanding disk performance occurs by:

- Eliminating disk I/O where possible
- Moving data in large transfer sizes
- Reducing time waiting for disk I/O given larger disk prefetches
- Eliminating substantial number of disk I/O operations for repeated file reference as large volumes of disk file data is managed in main memory

HP 3000 900 Series Disk Support

Capacity and Performance Specifications	Series 6000 Models 335H/670H C2200A/C2203A	Series 6000 Model 670XP C2202A	Series 6000 Models 670FL/1.34FL C2201A/C2204A	Series 6000 Models C2461/62 F/R (multi-mechanism package)
Mbytes (formatted)	335/670	670	670/1.34 Gb	673/1.35 Gb
Interface	HP-IB	HP-IB Cache	Fiber Optic Link	SCSI
Seek time (ms)	17	17	17	15
Latency (ms)	7.5	7.5	7.5	7.5
Controller Overhead (ms)	1.1	1.4	1.6	< 1.0
Internal disk transfer rate (MB/second) Burst	2.50	2.50	2.50	2.88
Internal disk transfer rate (MB/second) Sustained	1.40	1.40	1.40	2.2
Operating system release	2.0	2.0	2.0	3.1

NOTE: 795XB disk drives are NOT supported on 900 Series systems.

Series 9x7LX and 9x7 Peripherals

Disks

The Series 9x7LX and 9x7 systems are preconfigured with one integrated SCSI disk. Additional disks can be ordered and integrated into the System package or added as standalone disks. The standalone disks are packaged in the Series 6000 multi-mechanism package. The Series 6000 package can be thought of as a "peripheral hotel" and is available in several models:

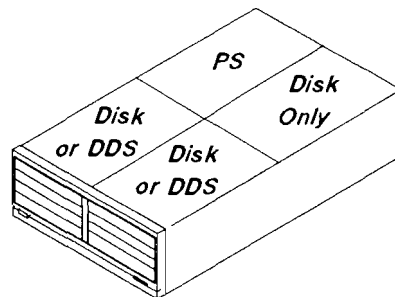
- Model 670 F/R - for 673 Mbyte SCSI Disks for Floor or Rackmount package
- Model 1350 F/R - for 1.35 Gbyte SCSI Disks for Floor or Rackmount package
- Model 1300D F/R - for 1.35 Gbyte DDS drive for Floor or Rackmount package

Series 6000 Package Maximums*

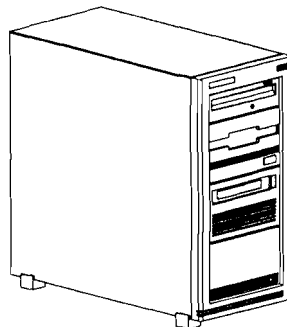
	Product Number	Maximum
Model F (Floor Mini Tower)		
5 1/4-inch full height disks	C2461/62F	3
5 1/4-inch DDS full height	C2463F	3
Model R (Rackmount)		
5 1/4-inch full height disks	C2461/62R	3
5 1/4-inch DDS full height	C2463R	2

* See Series 6000 Sales Guide (5091-1686E) for more details.

Rack (R) Model



**Mini Tower
Floor (F) Model**



SCSI Disks 5 1/4" full height
SCSI DDS 5 1/4" full height

7 half height equivalents or
3 full height equivalents
(any combination of mechanisms)

HP Series 6000 Model 670F/R, 1355F/R, and 1300D F/R

The SCSI adapter card is capable of a maximum data transfer rate of 5 Mbyte/second. While this is equal to the maximum data transfer rate of HP-FL, HP-FL disks will offer significantly higher I/O throughput because the HP-FL interface uses the link more efficiently.

SCSI disks are initially supported only on Series 9x7LX and 9x7 systems.

Back-Up

The Series 9x7LX and 9x7 systems include a standard integrated SCSI DDS drive. Additional DDS tape drives can be ordered and added as a standalone devices. The standalone devices are available in the Series 6000 multi-mechanism package *See the Series 6000 multi-mechanism table above.*

While disks and DDS tape drives can be mixed on a SCSI bus, for performance sensitive systems, any add-on back-up devices (beyond integrated DDS) should be on a separate SCSI bus from the disks.

SCSI DDS drives are initially supported only on Series 9x7LX and 9x7 systems.

Series 9x7LX and 9x7 Device Configuration Rules

The following configuration rules must be adhered to for SCSI devices connected to the 9x7LX and 9x7 systems. These configuration restrictions are necessary to support Powerfail.

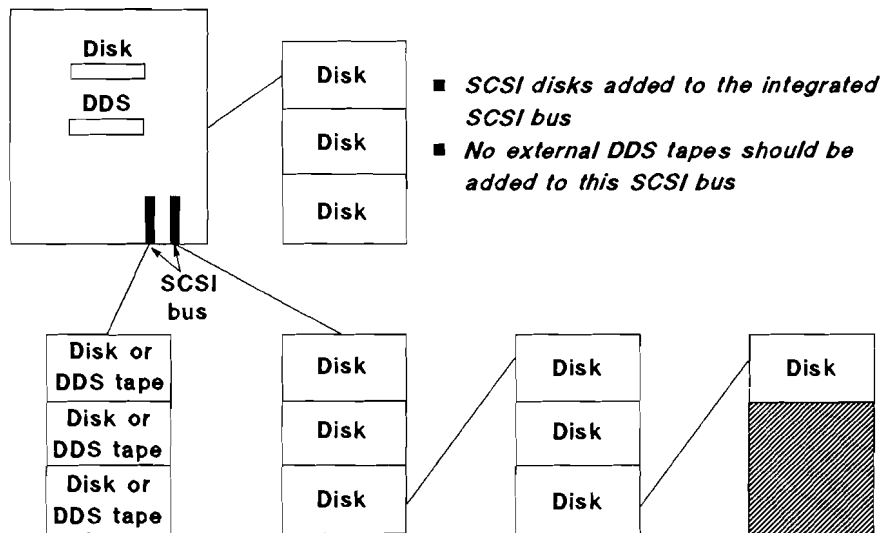
Any Series 6000 multi-mechanism package which contains one or more DDS tape drives must be connected to the new Series 9x7LX and 9x7 system via its own SCSI bus. It can NOT be daisy-chained to another multi-mechanism package NOR can it be connected via the same SCSI bus as the integrated peripherals.

Any Series 6000 multi-mechanism package which contains ONLY disks can be connected to the same SCSI bus as the integrated peripherals and can be daisy-chained to another multi-mechanism package containing ONLY disks or can be connected via its own SCSI bus up to the limit of 7 devices per SCSI bus.

Note



The SCSI bus which supports the integrated mechanisms can ONLY support a maximum of five devices.



If a DDS tape is in the package, then additional Series 6000 packages CANNOT be daisy-chained

If ONLY disks in Series 6000 package, then up to seven devices can be daisy-chained together

HP 3000 Series 9x7LX Configuration Guidelines

Maximum Disk Drive Configurations

	9x7LX*	9x7	920 922LX	922RX 922	932	949 958	955 960 980/100 980/200
HP-IB disk drives^A	6	12	9	8	16	16	24
HP-FL disk drives^B	0	24	9	8	16	24	64
SCSI disks^C	18	N/A	25	N/A	N/A	N/A	N/A
Embedded disks							
C2280A	N/A	N/A	N/A	N/A	N/A	4	N/A
C2281A ¹	N/A	N/A	3	3	3	4	N/A
C2282A	N/A	N/A	4	4	4	4	N/A
2473S ¹	1	3	N/A	N/A	N/A	N/A	N/A
2497S ¹	1	3	N/A	N/A	N/A	N/A	N/A
Total disk drives	18	49	10	10	18	28	64
<i>* If HP-IB interface is used, system supports only 3 additional SCSI disks.</i>							
¹ Disk drive not supported as a system disk (LDEV 1). Minimum capacity for system disk for MPE/XL is 400 Mbytes							

A (HP-IB)	B (HP-FL)	C (SCSI)
7933H/XP ^{1,4} *	7936FL ^{1,4} *	C2473S
7935H/XP ^{1,4} *	7937FL ^{1,4} *	C2474S
7936H/XP ¹ *	C2201A	C2461F/R
7937H/XP *	C2204A ³	C2462F/R
7962B ¹ *		
7963B ^{1,2} *		
C2200A ¹		
C2202A		
C2203A		
<i>* Discontinued</i>		
NOTES:		
¹ Disk drive not supported as a system disk (LDEV 1). Minimum capacity for system disk for MPE/XL is 400 MB.		
² Each 7963B unit may hold up to 3 disk drives each with a separate controller. Support is for the total number of disk drives.		
³ Each C2204A unit holds two disk mechanisms which share a controller and is considered a single disk drive.		
⁴ Not supported on Series 9x7LX and 9x7 systems.		

Disk Space Recommendations for Dump File Storage

HP will be able to provide remote dump analysis on customer systems in a timely manner if enough disk space is allocated for dump file storage on customer systems. In order to better help customers plan for enough disk space to restore dump files or to dump to disks via AutoRestart/XL, average file sizes for various system configurations are provided below in the following table.

Dump sizes are determined by the amount of main memory, the number of active processes and the dump compression rate which is affected by the application mix. The dump sizes are

listed by number of processes assuming an average of three processes per job or session. One should note that for systems that have greater than three processes per job or session, the dump file could be larger. Conversely, for systems that have less than three processes per job or session, the dump file could be smaller.

Dump/XL and AutoRestart/XL automatically compress the dump file. The compression rate will vary depending on the type of data stored in each dump file. An average compression rate of 40% is used to calculate the dump size estimates listed in the following table.

Note



AutoRestart/XL requires a separate dedicated volume set containing one or more volumes for dump file storage. *Refer to the table below for dump file space recommendations.*

Disk Space Recommendations for Dump/XL

Number of Processes	Main Memory Size (Mbytes)	Estimated Average Compressed Dump Size* in Sectors
24	24	205,000
	96	410,000
75	24	410,000
	96	615,000
150	24	615,000
	96	615,000
300	24	615,000
	96	820,000
600	128	1,230,000
	256	1,640,000
	512	2,255,000
1200	128	2,255,000
	256	2,460,000
	512	3,075,000
	1024	4,510,000
1800	128	3,075,000
	256	3,485,000
	512	4,100,000
	1024	5,325,000
2400	128	4,100,000
	256	4,305,000
	512	4,920,000
	1024	6,145,000
* Actual dump sizes may vary by +/- 25%		

Back-Up Solutions

The choice of a back-up solution is specific to the customer, based on applications, back-up goals, and other MIS strategies. The appropriate solution can depend on many of the following variables: mass storage configurations today and in the future, amount of data interchange with non-HP systems, level of operator intervention or unattendedness of the back-up, continuous 24 hour processing, CPU utilization and user impact, price/performance of solution, future applications of back-up technology (ie, rewritable optical disk library system as a future archival solution).

HP 3000 900 Series customers have many backup solutions from which to choose to meet their specific backup needs. On the hardware side, HP offers 1/2-inch magnetic tape, DDS-format Digital Audio Tape (DAT) drives, and Rewritable Optical Disk Library System. HP also offers a family of backup software products, TurboSTORE and TurboSTORE/XL II, to provide fast, unattended, and online backup solutions.

The 1/2-inch magnetic tape is ideal for data interchange with non-HP systems. In addition, with TurboSTORE/XL, the 7980XC with hardware data compression can provide fast, online, attended solutions for heavily loaded systems.

The DDS cassette can provide up to 1.3 GB of storage with no data compression. As the amount of data per cassette increases, so does the need to improve the access time to the stored data. An MPE/XL capability called Fast Search minimizes the time to locate individual files, resulting in an average 20-second access time per file. Fast Search on DDS is available with a patch to MPE/XL version 2.1. In addition, Fast Search will be supported on MPE/XL FOS STORE versions 2.2 and forward. Single and multiple DDS devices can provide low cost and unattended backup for small to medium configurations.

Note



"DDS format quality" cassettes must be purchased by customer either from HP or other vendors. Not all generic DAT tapes meet HP standards.

The HP Series 6300 Model 20GB/A Rewritable Optical Disk Library System (C1700A) provides unattended backup for large configurations on the HP 3000. To ensure operability on the HP 3000, three pieces need to be ordered:

1. TurboSTORE/XL II with support for Rewritable Optical Disk (P/N 36397A) or TurboSTORE/XL II with Online Backup for Rewritable Optical Disk (P/N 36398A)
2. Rewritable Optical Disk Library System (P/N C1700A, option 1AC or option 133). Option 1AC provides the 1 meter, 19-inch rack version of the library system. Option 133 provides the library system without the cabinet for installation into an existing 1 meter cabinet. Option AFJ provides 2 meter SCSI cable.
3. SCSI host-adapter for CIB HP 3000 systems (P/N 27251A) includes 2 meter cable. P/N 92222D can be ordered for 1 meter SCSI cable extender. SCSI host-adapter for HP-PB systems (P/N 28655A) includes a 1 meter cable.*

** C1700A is not supported on Series 9x7LX and 9x7 systems at their first release. This device will be supported pending completion of certification testing.*

In configuring the Optical Disk Library, each Library System must have its own SCSI channel.

HP 3000 900 Series Summary of Back-Up Devices

	Operating System Release	Approximate Device Capacity	Media Size	Media Refresh Requirements
DDS	2.05	1.3 Gbytes	1.3 Gbytes	10 years
1/2-inch tape				
7979A	1.1	140 Mbytes	140 Mbytes	1-2 years
7980A	1.0	140 Mbytes	140 Mbytes	1-2 years
7980XC	1.2	300-700 Mbytes	300-700 Mbytes	1-2 years
Rewritable Optical Disk Library System	3.0	20 Gbytes	32 disks = 20 Gbytes (325 Mbytes per side)	10 years

HP 3000 900 Series Summary of Transfer Rates in Gbytes/Hour

	Series 9x7LX, 9x7, 948, 958, 960, 980/100 +
DDS	
No data compression	.65
Fast data compression	2.0
High density compression	2.5
Rewritable Optical Disk Library System*	
No data compression	2.0
Fast data compression	6.0
High density compression	6.0
1/2-inch tape	
No data compression	
7979A	.6
7980A	2.5
7980A w/ TS/XL II fast d.c.	8.0
Hardware data compression	
7980XC	≥2.5
+ Transfer rates for Series 920, 922LX, 922RX, 922, and 932 may be lower.	
* Not supported on HP-PB systems at first release.	

Note



These transfer rates are based on TurboIMAGE databases being backed up under optimal conditions. Your customer may get different results depending on their environment.

Transfer rates depend on back-up device, number of devices per bus, processor performance, TurboSTORE/XL II compression ratio, and type of data being compressed. The above transfer rates assume one device; additional devices obviously increase transfer rates. Data compression (other than 7980XC) requires TurboSTORE/XL II.

Maximum Tape Drive Configurations

	9x7LX	9x7	920 922LX	922RX 922	932	948 958	955 960 980/100 980/200
1/2-inch Tape Drives ^A	4	8	4	4	4	5	8
DDS tape drive	4	8	4	4	4	5	8
Embedded DDS	1	1	1	1	1	1	N/A
Total Tape Drives	4	8	4	4	4	5	8

^A 7974A, 7978A/B, 7979A, 7980A, 7980XC*

* Highest performance with TurboSTORE/XL requires configuring each 7980XC to a separate HP-IB channel.

TurboSTORE/XL II

TurboSTORE/XL II offers fast, unattended dedicated and online back-up. For maximum flexibility, TS/XL II has two software data compression algorithms from which to choose: fast and high density. The fast algorithm provides an average of 2-3:1 data compression while the high density algorithm provides an average of 3-6:1 data compression. Actual compression rates will depend on the type of data being compressed.

HP 3000 900 Series Back-Up Recommendations

System with mass storage (Gbytes)	927LX 1	947 4	Series 948 4	Series 958 6	Series 960 9	Series 980/100 18	
Dedicated Unattended	1 DDS	1 DDS	1 DDS	2 DDS	2 DDS (A)	1 Rewritable Optical Disk Library System	
Approximate Time To Back-Up	1.5 hours	2 hours	2 hours	2 hours	2.5 hours	2 hours	
TurboSTORE/XL II Compression Ratio*	N/A	Fast	High	High	High	High	
Online	1 DDS	2 DDS	2 DDS	2 DDS	3 DDS (C)	1 Rewritable Optical Disk Library System	4 7980A
Unattended (B)	X	X	X	X	X	X	
Attended							X
Approximate Time To Backup	2 hours	1.5 hours	1.5 hours	2 hours	3 hours	2.5 hours	1 hour**
TurboSTORE/XL II Compression Ratio*	N/A	Fast	Fast	Fast	Fast	Fast	Fast

* The exact compression ratio will vary depending on the type of data being compressed.

** Does not include tape changes

NOTES:

A = Assumes parallel store with each device on its own device adapter. Parallel store with devices daisy-chained will have decreased performance.

B = Online defined as <50% CPU utilization using TurboSTORE/XL II data compression.

C = Parallel device pool

Note

Fast data compression is recommended for *online* back-up for all systems.



Parallel devices provide the capability of reducing back-up time (depending on the characteristics of your files and your backup device) by storing different files on different devices at the same time. When files are stored to a set of parallel devices, the files are grouped before the *Store* begins and then copied to multiple devices simultaneously. TurboSTORE/XL II supports up to a maximum of eight parallel back-up devices.

Parallel device pools are multiple sets of sequential devices used in parallel. (In a sequential backup, the system stores to one backup device first. Once that backup device is filled, the system stores to another device.) Using large device pools is often the most efficient way to store a large set of files when you have several backup devices. Parallel device pools give you the advantage of both parallel and sequential devices. File subsets are copied to different devices simultaneously, while another sequential device is ready when the tape is filled in any device pool. TurboSTORE/XL II supports up to eight backup devices within a parallel device pool. Maximum performance is obtained by using three or four parallel sets, each consisting of two sequential devices.

To enhance performance with TS/XL or TS/XL II, modified configurations are suggested. If backup devices will only be used sequentially, they may share an HP-IB DA. If devices are used in parallel or parallel in device pools, it is suggested that each backup device have its own HP-IB DA. Additional performance increases can occur with:

- HP-IB disks spread over at least four HP-IB DAs
- A maximum of two HP-FL DAs per CIB.
- Have HP-IB and HP-FL DAs on separate CIB.
- A maximum of 3 HP-IB DAs per CIB.

For Series 9x7 systems with greater than 12 Gbytes storage, spread disks across 3 SCSI busses. Back-up performance is enhanced with TurboSTORE/XL II and SCSI disks and DDS by having the disks on a separate SCSI bus from the DDS tapes and/or 1/2-inch tape drives.

TurboSTORE/XL II can create compatibility mode tapes which can be recovered on MPE V systems and MPE/XL systems using the "TRANSPORT" parameter. You cannot create tapes with TurboSTORE/XL or TurboSTORE/XL II in Native Mode and recover in Compatibility Mode. Compatibility Mode tapes can be created, but no TurboSTORE/XL or TurboSTORE/XL II options (data compression, online, etc.) can be used.

The 1/2-inch tape compressed on the 7980XC cannot be read by TurboSTORE/XL II if restored from a drive other than 7980XC. The 1/2-inch tape compressed with TurboSTORE/XL II cannot be read by the 7980XC.

A patch is available for STORE/XL and TurboSTORE/XL, as of MPE/XL version 2.1, which allows systems without TS/XL II to restore backup tapes created by TurboSTORE/XL II.

STORE and TurboSTORE/XL Products

Product	Part Number	Description
STORE/XL		Single device store/restore, fastsearch for DDS as of 2.2 and forward
TurboSTORE/XL	30319A	Up to 8 parallel tape drives, up to 8 sequential tape drives, support dissimilar devices (7980XC and 7978), interleaving, fastsearch as of 2.2 and forward
TurboSTORE/XL II	36387A	Software data compression, up to 8 parallel or serial devices, DDS and fastsearch on DDS, parallel restore, IBM/ANSI label tapes, dissimilar tape devices, interleaving
TurboSTORE/XL II with Online Backup	36388A	All functionality in P/N 39387A plus capabilities for online backup
TurboSTORE/XL II with support for Rewritable Optical Disk	36397A	All functionality in P/N 39387A plus support for Rewritable Optical Disk
TurboSTORE/XL II with Online Backup for Rewritable Optical Disk	36398A	All functionality in P/N 39397 plus online backup

Printers

Description

Three categories of printers are supported directly connected to HP 3000 Series 900 systems. Character printers tend to be less expensive yet versatile in capabilities, including the handling of multipart forms. Line printers offer much of the same versatility and are cost effective and more reliable for larger volumes of printing. Page printers are quieter in the office environment and offer crisp, letter quality output in a range of print speeds. The table below summarizes the various printers supported directly connected to 900 Series systems.

Summary of Printers Supported on HP 3000 900 Series Systems

	Maximum Print Speed	Paper Type	Print Quality	Bar Codes	Interface	Modem Support
Dot Matrix Impact Character Printers						
2932A* General Purpose Printer	200 cps	FF/MPF	Dft	No	Serial	Yes
2933A* Factory Data Printer	200 cps	FF/MPF	Dft	Yes	Serial	Yes
2934A Business Printer	40/67/200 cps	FF/MPF/CS	LQ/NLQ/Dft	Yes	Serial	Yes
C1202A Asian Character Printer	110/220 cps	FF/MPF/CS	NLQ/Dft	No	Serial or HP-IB	Yes
Dot Matrix Impact Line Printers						
2562C Industrial Line Printer	150/300 lpm	FF/MPF	NLQ/Dft	Yes	Serial or HP-IB	No
2563A*/B*/C Line Printer	150/420 lpm	FF/MPF	NLQ/Dft	Opt	Serial or HP-IB	No
2564B*/C Line Printer	300/840 lpm	FF/MPF	NLQ/Dft	Opt	Serial or HP-IB	No
2566A*/B*/C Line Printer	248/1200 lpm	FF/MPF	NLQ/Dft	Opt	HP-IB	No
2576B*/C Line Printer	320/1600 lpm	FF/MPF	NLQ/Dft	Opt	HP-IB	No
C1200A Asian Line Printer	270 lpm	FF/MPF	NLQ/Dft	No	Serial	Yes
Page Printers						
2686A* LaserJet	8 ppm	CS	LQ	Opt	Serial	No
33440A* LaserJet Series II	8 ppm	CS	LQ	Opt	Serial	No
33447A* LaserJet Series IID	8 ppm	CS	LQ	Opt	Serial	No
33449A LaserJet Series III	8 ppm	CS	LQ	Opt	Serial	No
33459A LaserJet Series IIID	8 ppm	CS	LQ	Opt	Serial	No
33491A LaserJet Series IIISi	17 ppm	CS	LQ	Opt	Serial or LAN	No
2687A* Page Printer	12 ppm	CS	LQ	Opt	Serial	No
2688A* Page Printer	12 ppm	CS	LQ	Opt	HP-IB	No
2684A* LaserJet 2000	20 ppm	CS	LQ	Opt	Serial	No
2680A* High Speed Page Printer	45 ppm	FF	LQ	Yes	HP-IB	No
* Discontinued product, listed for support reference						

cps = characters per second
lpm = lines per minute
ppm = pages per minute

FF = fanfold
MPF = multipart forms
CS = cutsheet

Dft = draft
NLQ - near letter quality
LQ = letter quality

Maximum Printer Support

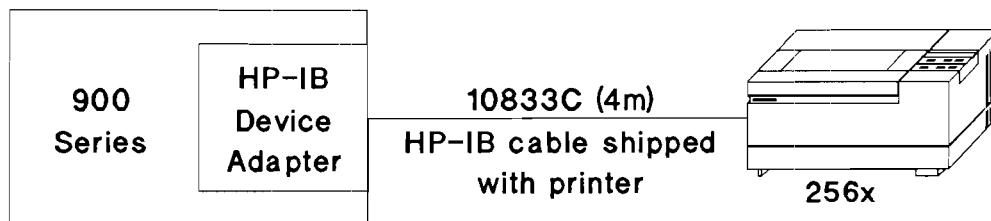
System Printers

System printers connect through the HP-IB interface. This configuration generally offers higher printer throughput, guarantees data integrity, ensures print job independence and reports operational status to the system. More information on HP-IB interfacing printers is in Chapter 5.

The following tables list the total number of system printers as well as the maximum number of each type of printer supported on 900 Series systems.

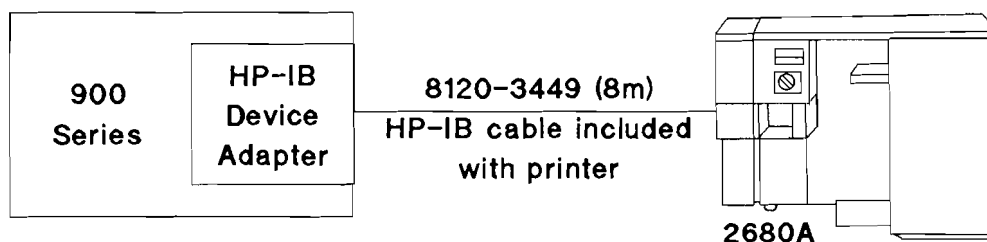
Maximum System Printer Configurations

	9x7LX	9x7	920, 922LX, 922RX, 922	932	948, 958	950, 955, 960, 980/100, 980/200
2562C	6	8	4	6	8	8
2563A/B/C	6	8	4	6	8	8
2564B/C	6	8	4	6	8	8
2566A/B/C	6	8	4	6	8	8
2567B/C	6	8	4	6	8	8
2680A*	2	4	4	4	4	4
2688A*	2	4	4	4	4	4
Total System Printers	6	8	4	6	8	12
* Discontinued						



Cable Configuration for 256X Printers

- Order the 256X option 393 to obtain the HP-IB interface and a 4 meter HP-IB cable.
- 256X printers are shipped configured with one device load (configurable from 1 to 7).
- A maximum of six 256X printers are supported per HP-IB device adapter. *See Chapter 5 for device loading and cable length rules.*
- Up to four 256X printers are supported on an HP-IB extender configuration.



Cable Configuration for 2680A Page Printer

- 2688A and 2680A printers are both shipped configured with four device loads and are both configurable from 1 to 7.
- Both printers include a 1 meter internal HP-IB cable.
- Both printers are shipped with an 8 meter HP-IB cable.
- A maximum of two 2688A or 2680A printers are supported per HP-IB device adapter. See previous discussion for device loading and cable length rules.
- Up to two 2688A or 2680A printers are supported on an HP-IB extender configuration.

Note: 2680A is discontinued. Information listed here is for reference only.

Serial Printers

900 Series systems support spooled serial printers through the Data Communications and Terminal Controller (DTC). Serial printers connect to a DTC port either via a hardwired RS-232/422 cable or via a modem.

The following tables list the maximum number of total serial printers as well as maximum number of each type of printer supported on 900 Series systems.

Note



The following configurations have been determined to impose an acceptable impact on system performance. These represent the maximum factory supported configurations. In many cases, customers have successfully exceeded these maximums. There is no electrical or operating system limit that would prevent connecting printers to all available system ports. However, a careful evaluation of system loading should be performed before attempting to exceed the specified maximum configuration.

Maximum Serial Printer Configurations

	9x7LX	920, 922LX, 922RX, 922	932	948, 958, 955 937 947	950	960, 957, 967	980/100	980/200
2562C	14	4	4	21	14	28	44	68
2563A/B/C	14	4	4	21	14	28	44	68
2564B/C	7	4	4	10	7	14	22	34
2932A	32	16	28	48	32	64	104	156
2934A	32	16	16	48	32	64	104	156
2684A/D LaserJet 2000	3	2	3	5	3	7	10	16
2686A/D LaserJet	10	5	8	15	10	20	> 20	> 20
2687A	3	2	3	5	3	7	7	> 7
33440A LaserJet II	10	5	8	15	10	20	32	48
33447A LaserJet IID	10	5	8	15	10	20	32	48
33449A LaserJet III	10	5	8	15	10	20	32	48
33459A LaserJet IIID	10	5	8	15	10	20	32	48
33491A LaserJet IIISi	5	3	4	8	5	10	16	24
C1200A	4	4	4	4	4	4	> 4	> 4
C1202A	4	4	4	4	4	4	> 4	> 4
7550 Plotter	4	4	4	4	4	4	4	4
Total Serial Printers	32	16	28	48	32	64	104	156

Serial Printing Interfacing

Serial printers are considered either “local spooled” or “remote spooled” when connected to a 900 Series system. Local spooled printers are hardwired to the DTC via either RS-232C or RS-422. Remote spooled printers connect to the DTC via a modem. *For more information on connecting to the DTC, see Chapter 7.*

Note Only 293x printers are supported as remote spooled.



Status Checking

If the serial printer supports the “ESC” status checking capability, the MPE Spooler or “hot” printing application has the ability to determine whether a printer is on-line before spooling the print job. This will prevent the data from being sent (and lost) to a printer that is out of paper or encountered a fault condition.

With status checking, if the printer goes off-line for any reason, the spooler will stop printing, save the print job, and automatically resume printing when the printer comes back on-line. Without status checking, printer faults or out-of-paper conditions cannot be detected. The spooler will always send the print job “blind” and purge the spoolfile assuming it printed successfully. The spoolfile will then have to be re-created in order to restart the printing process.

With the exception of some LaserJet models, all supported serial printers provide the status checking feature as standard. All printers with the status checking feature are configured as Term Type 26.

On the LaserJet IID, LaserJet III, and LaserJet IIID, a status checking card (26013A) is installed in the printer to support the status checking feature. On the LaserJet IIISi, a special MIO RS-232 card (C2059H) must be installed in the printer to provide status checking. In each of these cases, the status checking feature is ordered separately.

If the status checking feature is not installed in a LaserJet IID, LaserJet III, LaserJet IIID, or LaserJet IIISi, these printers would be configured as Term Type 18.

LAN Printers

Printers connected to the HP 3000 via the LAN are a new class of printers supported by NetWare for the HP 3000 (P/N 32020A). LAN-based printers offer convenience and connectivity that has been difficult to achieve by HP-IB and serial-connected printers. LAN-connected printers can be located in the workgroup via the same LAN cable used to connect to PC workstations to the system.

The first LAN-based printer available to the HP 3000 is the LaserJet IIISi. By using NetWare for the HP 3000 and the LaserJet IIISi Network Printer Interface cards for NetWare, the LaserJet IIISi is directly supported for PC applications when the LaserJet is operating the Queue Server mode. Token Ring LANs can also be used if a PC-based Novell NetWare file server the Ethernet and Token Ring cards is used to connect the two media types.

NetWare for the HP 3000 provides LAN printer access to PC applications. It does NOT provide transparent access to LAN printers for MPE/XL applications. Consult your local HP representative regarding the availability of third party solutions and/or applications programming interfaces which could be used in conjunction with NetWare for the HP 3000 to provide LAN printer access from MPE/XL applications.

To support PC clients using NetWare or "Network aware" applications on MPE/XL you will need the following:

- NetWare for the HP 3000 (and a LAN link if not already installed)
- LaserJet IIISi with a Network Interface card (C2059A for Ethernet or C2059C for Token Ring – remember currently Token Ring networks require a NetWare file server or HP Router to connect Token Ring to the HP 3000)

At the time of this writing, full performance testing of NetWare for the HP 3000 had not been completed. The number of LAN-based printers which can be used will depend on system loading and any NetWare for the HP 3000 printer configuration limits. Consult the NetWare for the HP 3000 documentation for further information.

Workstations

Terminals

HP designs and manufactures high-quality terminals specifically for HP 3000 systems. These terminals offer:

- anti-glare displays
- high character definition
- functional keyboard layouts
- display screen tilt and swivel
- enhanced keyboard with tactile feedback

Product	Description	Memory	Additional Features
700/43	Multipersonality ASCII	4 pages	Supports 12 popular compatibility modes
700/92	Blockmode VPLUS	8 pages	
700/94	High performance blockmode VPLUS	16 pages	Local forms cache, edit checks, modified data tag

NOTE:
VPLUS requires a 700/92 or 700/94 terminal. Oracle's SQL*Forms, INGRES forms, and JAM will run on any 700 series terminal. JAM also runs on a block mode terminal, giving the user optimal performance.

All terminals have:

- 14-inch screen
- printer port
- selectable 80 or 132 column display modes
- detachable adjustable keyboard with 8 shiftable function keys
- green, white, or amber phosphor

VPLUS/Windows

VPLUS/Windows is an MS Windows 3.0 PC based user interface for standard VPLUS applications. It allows users to take advantage of increased productivity and performance benefits of a cooperative computing environment with no changes to current applications. Users get the benefits of MS Windows interface including:

- multiple PC and HP 3000 applications from multiple HP 3000 servers and systems integrated on the PC
- field-sensitive help
- color enhanced VPLUS displays

Required Software

- VPLUS/Windows
- VPLUS (and B.06.XX or subsequent version)
- MPE/XL (version 2.2 and subsequent versions)
- Microsoft® MS-DOS (version 3.2 and subsequent versions)
- Microsoft® Windows (version 3.0 and subsequent versions)

PC Configuration

- 640K memory
- 286 microprocessor or greater

Optional Software

- To take advantage of NewWave encapsulation - NewWave 3.0 (requires version 3.0 of Microsoft® Windows)
- To take advantage of Application Online Help
 - Microsoft® Software Development Kit (version 3.0)
 - A "Rich Text Format" (RTF) editor. Some examples include Microsoft® Word for Windows (version 1.0), Microsoft® Word for PC (version 5.0), and other editors that support RTF

Networking Environment

- NS 3000 Network Services (HP 36920A), 2.1
- HP EtherTwist, HP StarLAN 10 or HP ThinLAN Network PC Link
- LAN/3000 Link

HP Personal Computers

HP's personal computers are easily integrated with HP 3000 systems. User's can take advantage of the rich functionality available in PC applications while utilizing the full range of HP 3000 resources. Processing power can then be focused on the PC, reducing the demand on the host system.

Supported PCs:

- HP Vectra ES/12
- HP Vectra QS/16S and QS/20
- HP Vectra RS/20C and RS/25C
- HP Vectra 486/25
- HP Vectra 386/25
- HP Vectra 286/12

Workstation Cabling

Refer to Chapter 7 for workstation cabling.

Datacommunications and Terminal Controller

End-User Connectivity

The DTC is a modular and flexible LAN-based controller which provides asynchronous connectivity and PAD Support for local and remote terminals, PCs in terminal emulation mode and printers.

Note



Previously, two versions of DTCs were available, the DTC/3000 and the DTC/9000. They are now combined into a single DTC providing multivendor location-independent access to HP and non-HP systems.

The DTC also implements Telnet Access and X.25 system-to-system networking for the HP 3000 900 Series. For more details on any of the products discussed in this section, refer to the appropriate datasheets in the *HP Networking Communications Specifications Guide* (5091-1303E). For specific information about HP 9000 connectivity, refer to the *HP 9000 Configuration Guide* (5091-1532E).

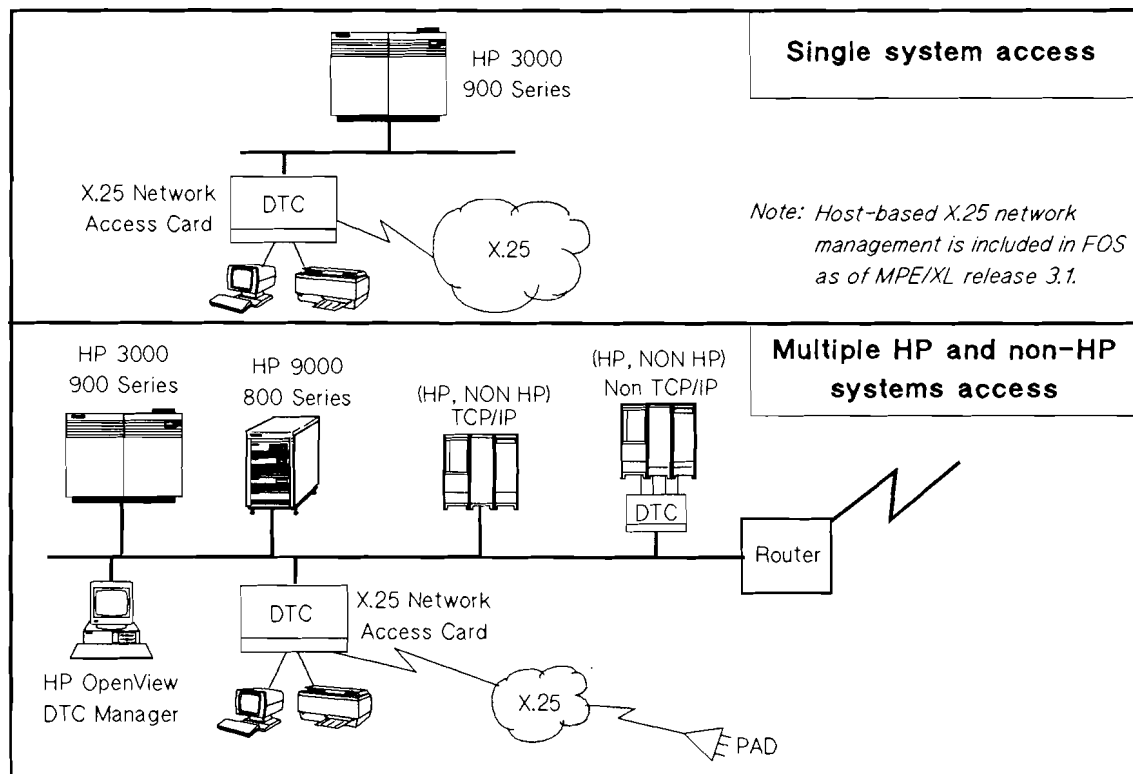
Two DTCs are available; they are 100% functionality compatible:

- the DTC16 (P/N 2340A) provides up to 16 asynchronous connections (RS-232 Direct Connect and RS-232 Modem Connect) and one X.25 link supporting up to 32 virtual circuits at speeds up to 19.2kbps. The DTC16 is an ideal solution in an environment where a small concentration of connections is needed (either centralized or distributed throughout buildings).
- the DTC48 (P/N 2345A) provides up to 48 asynchronous connections (RS-232 Direct Connect, RS-232 Modem Connect and RS-422 Direct Connect) and up to three X.25 links supporting up to 256 virtual circuits at speeds up to 64kbps. The DTC48 is best suited in an environment where a large number of connections is needed.

The minimum required terminal communications subsystem for HP 3000 900 Series systems consists of the 802.3 LANIC card (ThinLAN link) installed in the SPU, the ASC software (Asynchronous Serial Communications software residing on the SPU), one DTC with one modem port card (for remote support) and 802.3 cabling (ThinLAN, ThickLAN or EtherTwist).

Each HP 3000 900 Series system (except Series 9x7LX and 9x7 systems) is delivered with the 802.3 LANIC, the ASC software and connection hardware for both Thick and Thin 802.3 LAN. For the ThickLAN, this connection hardware includes the Medium Access Unit (MAU), tap and 6 meters Attachment Unit Interface (AUI) cable. A ThinMAU with integral 1 meter AUI cable is provided for Thin MAU connection. Series 9x7LX and 9x7 systems come with a Multi-Function I/O card which has a built in ThinMAU. The Multi-Function I/O card is also supplied with an external AUI connector for customers who want connection to either a ThickLAN MAU (30241A) or EtherTwist MAU (28685A). These products must be ordered separately.

Each 900 Series system can support multiple DTCs on the LAN. The number of active connections supported will be determined by the application load on the system. See the General System Configuration Information page of each system family for details on numbers of DTCs supported and numbers of logged-on workstations supported for each SPU.



Datacommunication and Terminal Controller End-User Connectivity

Network Management

Two types of software are available to download and manage DTCs according to the level of functionality which is required and the network management needs:

For single system stand-alone environments, the system will download software to manage all the DTCs. This software is included in the Fundamental Operating System (FOS).

When access to multiple systems, PAD Support or Telnet is needed to a non-HP 3000 900 Series single system, an HP OpenView workstation running the HP OpenView DTC Manager Software (D2355A) is required. Customers can use the same PC to manage other equipment, like X.25 switches and PADs, through the use of the HP OpenView Switch/PAD Manager Software (J2017A). To ease ordering and installation, a fully configured, turn-key HP OpenView Windows Workstation (32054B) is available. Please refer to the DTC family datasheet in the HP Networking Communication Specification Guide (5091-1303E) for the complete list of requirements for the HP OpenView workstation.

Local and Remote End-User Access

Local and remote (from X.25/PADs) end-users can access systems through:

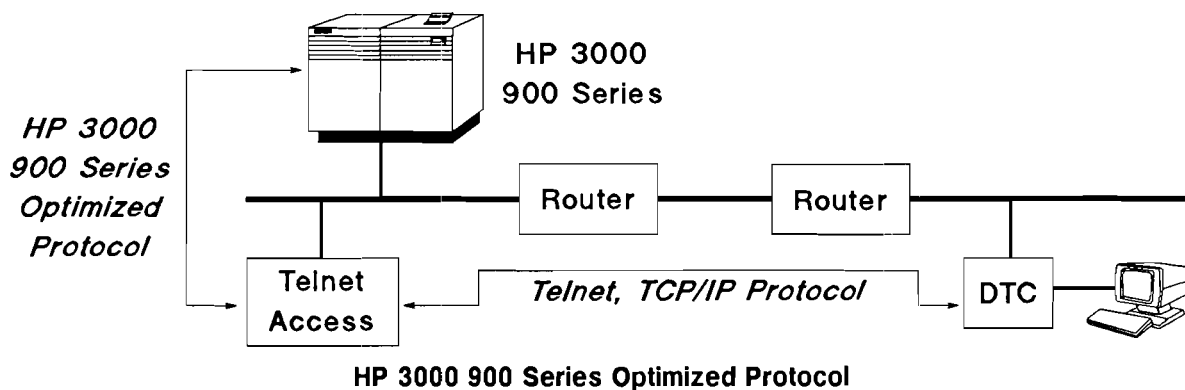
- direct access on the LAN: this is true for the HP 3000 900 Series, the 300/400/800 Series HP 9000, HP 1000 and other non-HP Telnet/TCP/IP systems.
- back-to-back: any system with asynchronous (RS-232) links can be connected to the asynchronous ports of the DTC. Terminal users connected to the DTC can access systems connected to the same DTC (local switching) or to another DTC (extended switching). HP 3000 MPE/V Systems release V-delta-7 or later can be accessed using the back-to-back configuration through the HP ATP (Pass 3,5 or 6) or ATP/M. Remote PAD terminals support to HP 3000 MPE/V Systems through this back-to-back configuration is also provided.

PAD support is provided through the use of an X.25 Network Access Card. As stated above, this functionality requires a configured HP OpenView workstation with DTC Manager software when access is needed to multiple systems or to a non HP 3000 900 Series single system. Host-Based X.25 is provided when access is needed to a single HP 3000 900 Series. (For more information about the X.25 Network Access Card, please refer to the "Datacommunications and Terminal Controller/X.25 Network Link for HP 3000 900 Series Environments" section).

Extended LAN Configuration

The DTC supports extended LAN configurations with bridges (using the HP 3000 900 Series optimized protocol) and level 3 IP routers (using TCP/IP protocol). This means that a DTC user can access a system located on remote segment of a LAN. When access is done through level 3 IP routers, the Telnet, TCP/IP protocol must be available on the remote system. In the case of an HP 3000 900 Series, the Telnet, TCP/IP protocol would be provided by the DTC-based Telnet products. More information on these products is provided in the *Datacommunications and Terminal Controller/Telnet Services for the 900 Series* section of this chapter.

The figure below diagrams a DTC connected user accessing an HP 3000 900 Series on a remote LAN segment via level 3 IP routers.



Currently, a PC-based HP OpenView DTC Manager is required on each segment of the LAN to download and manage the local DTCs. (This requirement may change in future releases.)

The first step will be to allow HP OpenView DTC Manager PCs to communicate across IP routers).

Note



For access to Multiple systems, the DTC48 must have date code 3110 or later. A DTC48 with date code less than 3110 must be upgraded with the DTC48 Upgrade Kit HP 2348A (memory extension for the HP 2345A). The DTC16 does not require any upgrade kit.

Datacommunications and Terminal Controller/X.25 Network Link for HP 3000 900 Series Environments

The DTC/X.25 XL Network Link provides access to public and private X.25 packet-switching networks for communication with remote systems and PAD devices. (Note that this link also supports PAD devices for non-HP 900 Series systems as described in the *End-User Connectivity* section of this chapter).

For HP 3000 900 Series environments, two X.25 solutions are offered; PC-Based X.25 management and Host-Based X.25 management. While both X.25 solutions provide X.25 capabilities for the user, there are differences between the two products. The main difference is that Host-Based X.25 management is limited to a single system use of the X.25 card, whereas, PC based X.25 management allows for the X.25 card to be shared between multiple systems. Therefore, Host-Based X.25 management is targeted for users with one system on a LAN and PC based X.25 management is targeted for users with multiple system on a LAN and multiple types of devices (i.e., DTCs, switches, PADs, and soon bridges and Hubs).

PC-Based X.25 Management Solution

With PC-based X.25 management, the X.25 link is managed by HP OpenView DTC Manager. This requires the following products:

- A PC running HP Openview DTC Manager software (D2355A)
- DTC/X.25 Network Access card installed in the DTC (see below for P/Ns).
- One or more DTCs attached to the 802.3 LAN
- X.25 System Access software (36939A) which resides on the Series 900 SPU and makes system-to-system communication possible. System Access is NOT needed for users who only need PAD support.

Host-Based X.25 Management Solution

Host-Based X.25 management provides the capability to manage an X.25 link from the XL host instead of the PC. Host-Based X.25 software is included on the Fundamental Operating System (FOS) MPE/XL release 3.1. Thus, Host-Based X.25 will not be a product listed on the CPL. There are three products required for Host-Based X.25 management to be operational:

- DTC/X.25 Network Access card installed in the DTC (see below for P/Ns).
- A DTC attached to the 802.3 LAN
- X.25 System Access software (36939A) which resides on the Series 900 SPU and makes system-to-system communication possible. System Access is NOT required for users who only need PAD support.

PC-based and Host-Based X.25 management support both DTC16 and DTC48 configurations. Each DTC48 supports a maximum of three DTC/X.25 Network Access cards and a total maximum of six interface cards. The available DTC48/X.25 Network Access cards include:

- DTC48/X.25 Network Access card with RS-232 interface (2346D)
- DTC48/X.25 Network Access card with V.35 interface (2346E)
- DTC48/X.25 Network Access card with V.36 interface (2346F)
- DTC48/X.25 Network Access card with RS-422 interface (2346G)

The DTC16 can accommodate only one DTC16/X.25 Network Access card with the RS-232 interface.

For additional information on differences between PC-based and host-based X.25 management, see Network Hotline Subject "HBX25".

Datacommunications and Terminal Controller/Telnet Services for the 900 Series

Telnet is now available on the HP 3000 900 Series and has been implemented in the DTC. There are two key features provided by Telnet:

- access to HP 3000 900 Series applications from a Telnet host user
- access to applications on a Telnet host from a DTC-connected user

Access to HP 3000 900 Series Applications from a Telnet Host

Access to HP 3000 900 Series applications from a Telnet host requires Telnet hardware as well as HP OpenView DTC Manager Release 10.5 or later. Two hardware packages are available for Telnet access:

- HP ARPA Telnet Express (HP 2344A) - a dedicated LAN-based processor which can provide up to a maximum of 80 concurrent Telnet sessions. Of these 80 sessions logged on, up to 60 can be active if VPLUS applications are being accessed and up to 12 can be active if character mode applications are being accessed. The disparity between the number of active sessions is due to the increased number of packets and DTC CPU overhead needed to process character mode applications. The Telnet Express connects directly to a LAN and is orderable with options for ThickLAN or ThinLAN use.
- HP ARPA Telnet Access (HP 2347A) - a card which is installed in an open slot of a DTC48 and can provide up to a maximum of 40 concurrent Telnet sessions. Of these 40 sessions logged on, up to 40 can be active if VPLUS applications are being accessed and up to 9 can be active if character mode applications are being accessed. There are a few rules to observe when installing the Telnet access card:
 - If the DTC48 to be used has a datecode less than 3110, a memory upgrade is required.
This upgrade is available as an option to the Telnet Access product.
 - Only one Telnet Access card can reside in a given DTC48.
 - The Telnet Access card and DTC/X.25 card CANNOT reside in the same DTC48.

Access to Applications on a Telnet Host from a DTC-Connected User

Access to applications on a Telnet host from a DTC connected user does not require any additional hardware. Users connected to a DTC16 or a DTC48 can access remote hosts via the Telnet protocol provided the DTCs are managed by HP OpenView DTC Manager Release 10.5 or later. DTC48s with a datecode less than 3110 require a memory upgrade. This upgrade is available as an option to the Telnet Access product or as a stand-alone product if the Telnet Access hardware is not needed.

Note



For more information on access to applications on a Telnet host, refer to the *End-User Connectivity* section of this guide. For additional information on Telnet refer to the ARPA/XL datasheet in the *HP Networking Communication Specification Guide*.

Configuring the DTC in your HP 3000 900 Series System Environment

Service	DTC16	DTC48	Network Management
Local end-user access			
Single HP 3000 900 Series	2340A + async cards + options	2345A + async cards + LAN options	Included in MPE/XL FOS tape (MNNGR, TermDSM)
Multiple systems			
HP 3000 900 Series + access to non-3.0 TCP/IP hosts (back-to-back)	2340A + async cards + LAN options	2345A + async cards + LAN options	HP OpenView PC with D2355A release 3.0 or later
HP 3000 900 Series + access to non-10.5 TCP/IP hosts (back-to-back) + HP 9000 access + multivendor connect	2340A + async cards + LAN options	2345A + async cards + LAN options + Multivendor Upgrade Kit (HP 2348A) if DTC48 date code less than 3110	HP OpenView PC with D2355A release 10.5 or later
Remote end-user access			
Single HP 3000 900 Series	2340A + async cards (minimum 1 in slot 0) + LAN options + X.25 card	2345A + async cards (minimum 1 in slot 0) + LAN options + X.25 card	Included in MPE/XL FOS tape (HBX.25)
HP 3000 900 Series + HP 9000 + multivendor + access to non-TCP/IP hosts (back-to-back)	2340A + async cards (minimum 1 in slot 0) + LAN options + X.25 LAN card	2345A + async cards (minimum 1 in slot 0) + LAN options + Multivendor Upgrade Kit (HP 2348A) if DTC48 date code less than 3110	HP OpenView PC with D2355A release 10.5 or later
System-to-HP 3000 900 Series			
X.25 communications			
Single HP 3000 900 Series	2340A + async cards (minimum 1 in slot 0) + LAN options + X.25 card	2345A + async cards (minimum 1 in slot 0) + LAN options + X.25 card	Included in MPE/XL FOS tape (HBX.25)
Multiple HP 3000 900 Series	2340A + async cards (minimum 1 in slot 0) + LAN options + X.25 card	2345A + async cards (minimum 1 in slot 0) + LAN options + X.25 card	HP OpenView PC with D2355A release 3.0 or later
Telnet services for HP 3000 900 Series	2340A + async cards + LAN options	2345A + async cards + LAN options + 2347A + Multivendor Upgrade Kit (HP 2348A) if DTC48 date code less than 3110	HP OpenView PC with D2355A release 10.5 or later

Configuring the DTC48

When ordering the DTC48, a LAN interface option must be specified. Three types of cards can be installed in the DTC :

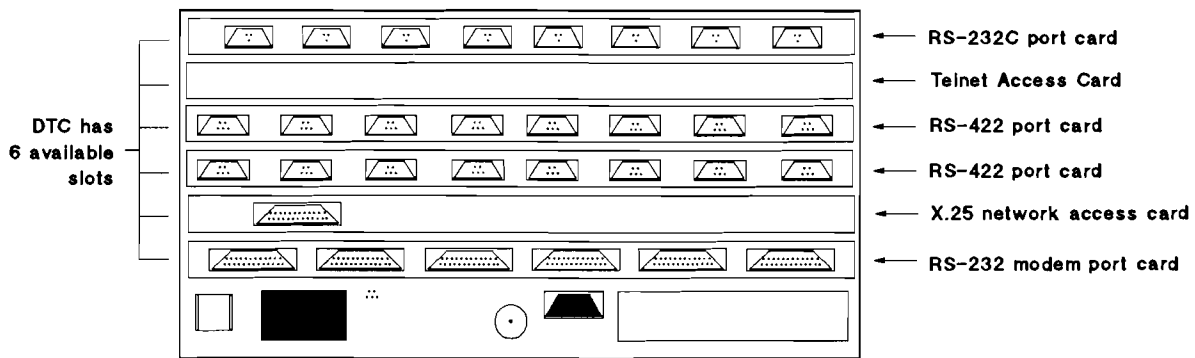
- Asynchronous Interface Card*
- DTC48/X.25 Network Access Card*
- The Telnet Access Card (can only be ordered as a stand-alone product)

* May be ordered as options to the DTC48 or as stand-alone products.

Note



The DTC48/X.25 Network Access Card cannot be accommodated with a Telnet Access Card in the same DTC48.



DTC Configuration Example

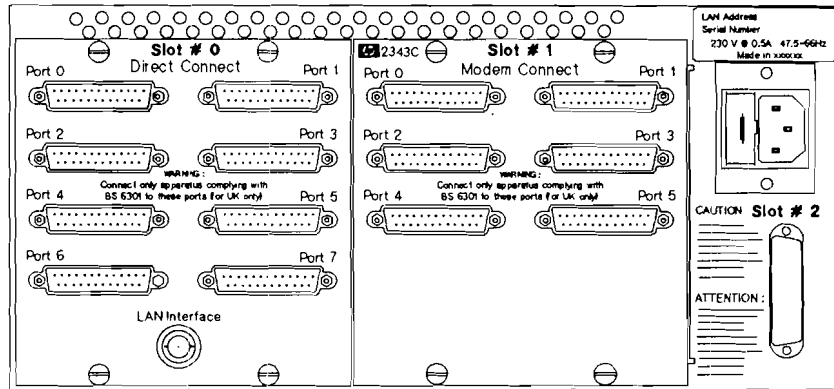
Ordering the DTC48

Also orderable via factory integrated cabinets A1883A and A1884A.

Access	ThinLAN Configuration	AUI (no MAU) Configuration ¹	ThickLAN Configuration
Order and from 1 to 6 following asynchronous cards	2345A #242	2345A #241	2345A #240
8 direct ports	2345A #803	2345A #803	2345A #803
6 modem ports	2345A #625	2345A #625	2345A #625
8 RS-422 ports	2345A #805	2345A #805	2345A #805
X.25	Add #310 (RS-232), #320 (V35), #330 (V36) or #340 (RS-422) to the DTC48 configuration (HP 2346D/E/F/G when ordered after initial DTC48 purchase)		
Telnet	2347A #001 is required for DTC48 memory upgrade if date code is less than 3110		
8 additional direct	Order HP 2346A (when ordered after initial DTC48 purchase)		
8 additional RS-422	Order HP 2346B (when ordered after initial DTC48 purchase)		
6 additional modem	Order HP 2346C (when ordered after initial DTC48 purchase)		
¹ To connect to EtherTwist, order in addition the EtherTwist MAU (P/N HP 28685A)			
Note: Option 015 - set for 220V operation			

Configuring the DTC16

From one to two asynchronous interface modules may be ordered with the DTC16. Each DTC16 supports a maximum of two asynchronous modules and one DTC16/X.25 Network Access Card. No Telnet Access Card is currently available for the DTC16.



DTC16 Configuration Example
with 8 ports DC + 6 port MC, configured for ThinLAN

Ordering the DTC16

Access	ThinLAN Configuration	AUI (no MAU) Configuration ¹	ThickLAN Configuration
6 modem ports ²	2340A #642	2340A #641	2340A #640
8 direct ports	2340A #842	2340A #841	2340A #840
12 modem ports	2340A #642 and #650	2340A #641 and #650	2340A #640 and #650
6 modem + 8 direct	2340A #642 and #850	2340A #641 and #850	2340A #640 and #850
16 direct	2340A #842 and #850	2340A #841 and #850	2340A #840 and #850
X.25	Add #310 to the DTC16 configuration (HP 2343D when ordered after initial DTC16 purchase)		
8 additional direct	Order HP 2343A (when ordered after initial DTC16 purchase)		
8 additional RS-422	Order HP 2343B (when ordered after initial DTC16 purchase)		
6 additional modem	Order HP 2343C (when ordered after initial DTC16 purchase)		
¹ To connect to EtherTwist, order in addition the EtherTwist MAU (P/N HP 28685A)			
² One modem port is needed per HP 3000 900 Series system to do remote diagnostics			
Note: Option 015 - set for 220V operation			

Note



The ordering instructions for the DTC48 and the DTC16 are different. The DTC48 LAN connection is in a separate option. On the DTC16, the LAN connection is tied to the first asynchronous module.

Ordering HP ARPA Telnet

The HP ARPA Telnet products previously mentioned are part of the HP ARPA Services family of products. The structure for the ARPA Services/XL products was designed for maximum flexibility. Two bundled products, containing Telnet hardware and HP ARPA File Transfer Protocol (FTP), were created to meet some specific low- and high-end customer needs. Since not every customer's environment will be suited for the bundled products, all of the ARPA Services/XL products are also available as stand-alone products. The bundled and stand-alone products can be mixed in any combination to accommodate the customer's exact Telnet and FTP needs.

Telnet Ordering

Product/Option	Description
2344A	HP ARPA Telnet Express (must order one LAN option 240, 241, or 242)
option 015	Set for 220v operation
option 240	Configure for ThickLAN use (AUI and MAU provided)
option 241	Configure for ThickLAN use (no AUI or MAU provided)
option 242	Configure for ThinLAN use (BNC T-connector provided)
2347A	HP ARPA Telnet Access (order option 001 for DTC48s with datecode less than 3110)
option 001	DTC48 Upgrade Kit required memory upgrade for 2345A
36955A	HP ARPA/40 Services/XL - includes Telnet Access & FTP (Must order one processor option 310, 315, or 320. Also order option 001 for DTC48s with datecode less than 3110)
option 001	DTC48 Upgrade Kit required memory upgrade for 2345A
36956A	HP ARPA/80 Services/XL - includes Telnet Express & FTP (Must order one processor option 330, 335, 340, or 350 and one LAN option 240, 241, or 242.)
option 015	Set for 220V operation
option 240	Configure for ThickLAN use (AUI and MAU provided)
option 241	Configure for ThickLAN use (no AUI or MAU provided)
option 242	Configure for ThinLAN use (BNC T-connector provided)

Ordering the DTC Management Products

To order the DTC Management products, please use the following rules:

Local end user access/single system access

- nothing to order, provided on FOS tape

Remote end-user access or multi-system access

- order D2355A if PC available with HP OpenView Windows Workstation configuration
- order 32054B option 201 and one network connection option if PC not available

Product/Option	Description
HP D2355A	HP OpenView DTC Manager software
HP J2120A	HP OpenView DTC Entry-Level Manager/UX software
	One of the following AA0, AA1, AAH MUST be ordered:
option AA0	Software on 1/4-inch cartridge tape
option AA1	Software on 1/2-inch magnetic reel tape 1600 bpi
option AAH	Software on DDS cartridge tape
option OCC	Update to latest version
HP 32054B	HP OpenView Windows Workstation
	The HP OpenView Windows Workstation is a specially configured HP Vectra, with PC software already installed. It includes 2 Mbyte additional memory, Thinkjet printer, MS-DOS, MS-Windows, HP OfficeShare, HP OpenView Windows, HP AdvanceLink for Windows software. It provides the required PC hardware and software to run the HP OpenView DTC Manager.
option ABA - ABZ	Localization options (MUST ORDER)
	Network connection options (MUST ORDER ONE ; only one may be ordered per workstation)
option 101	ThinLAN connection
option 102	ThickLAN connection
option 103	EtherTwist connection
	Application options (MUST ORDER). Additional HP OpenView products such as the Switch/PAD Manager can be ordered via options to HP 32054B.
option 201	HP OpenView DTC Manager software

DTC Supported Peripherals

Terminals

- HP 2392A,93A,94A,97A
- HP 700/22,32,41,43,44
- HP 700/92,93,94
- HP 3081A, 3082A/B
- HP 2622A,23A,24B,27A,28A

Note



The specified firmware is necessary for the following terminals

- 2622A: ROM 3199 or later
 - 2623A: ROM 3223 or later
 - 2624B: ROM 3139 or later
 - 2627A: ROM 1818-3487 or later
-

Personal Computers

- HP 150A/B/II
- HP Portable PLUS
- HP Vectra
- HP Vectra CS,ES,RS,QS, 286/12, 486/25
- IBM PS/2 Model 30,50,60,80
- COMPAQ DESKPRO 286,386,386S

Note



These personal computers have been supported when operating in terminal emulation mode with HP AdvanceLink 2392.

Printers and Plotters

- HP 7550A/B Plotter
- HP 2562A, 63A/B/C, 64B/C Line Impact Dot Matrix
- HP 2932A, 34A Impact Printer
- HP 2684D/P, 86A/D LaserJet 2000
- HP 33440A/F, 47A/F, 49A, 59A, LaserJet Series II, III
- HP C1200A, C1202A Asian Printers

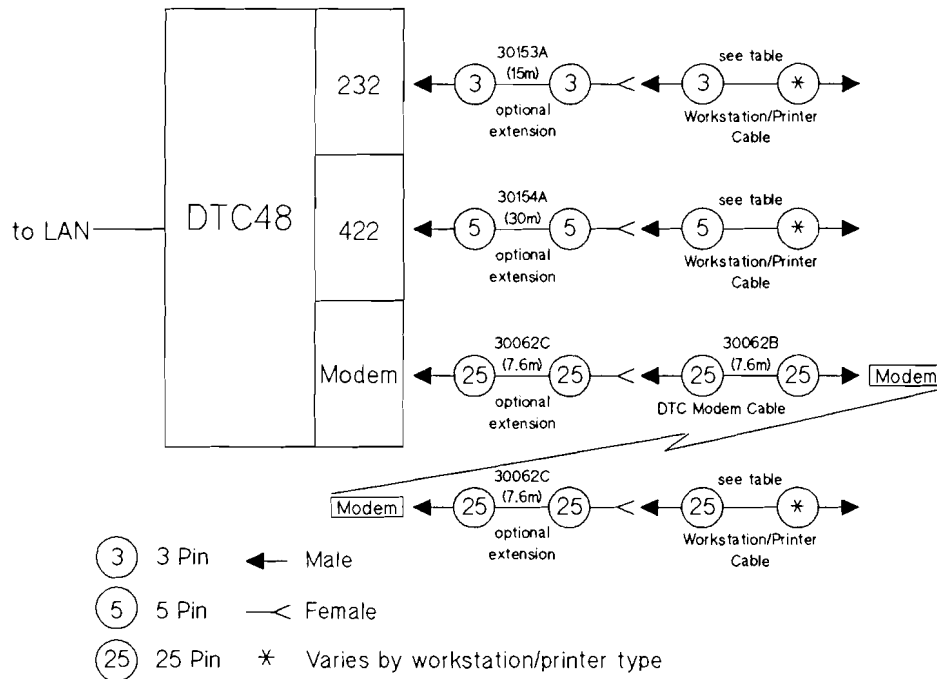
Note



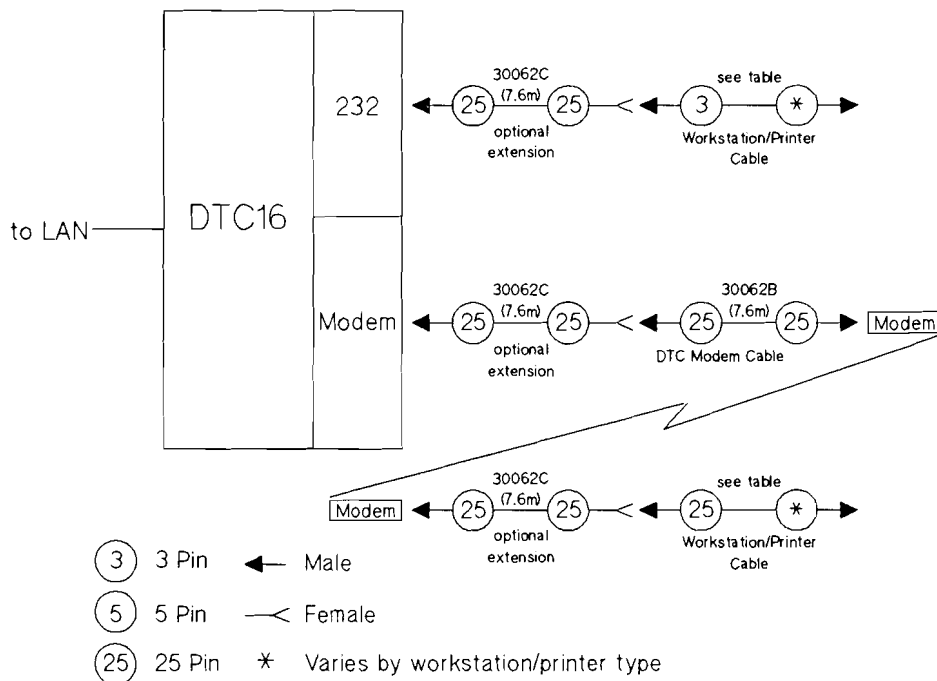
Xon/Xoff protocol is used between the DTC and printers. Modem connections are not supported with the HP laser printer.

DTC-to Workstation Connection Cables

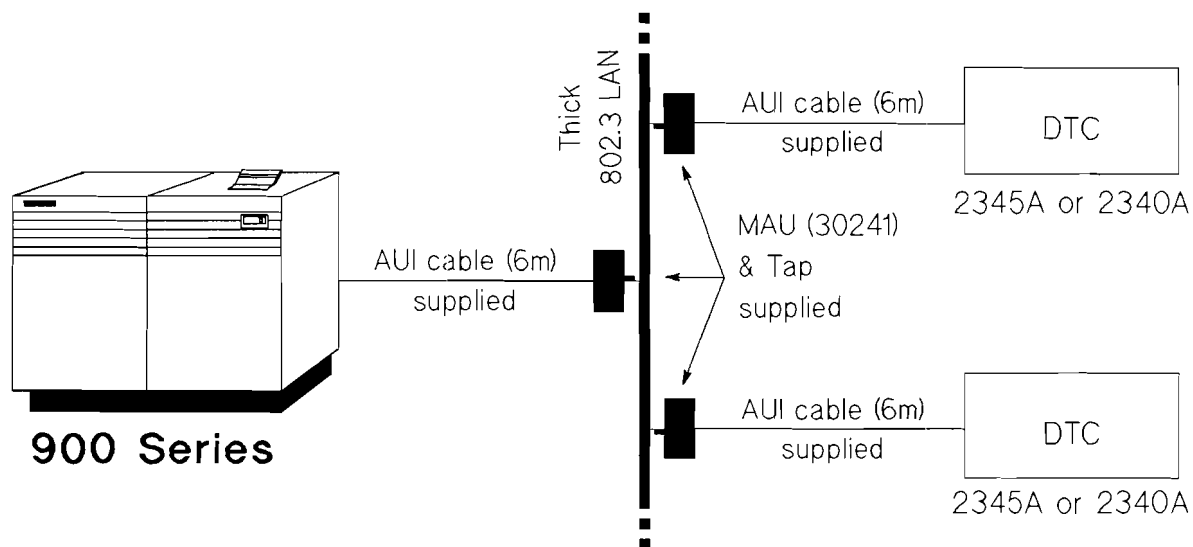
Devices	DTC Connectors		
	DTC16 and DTC48 RS-232 25 pins (modem or direct)	DTC48 only RS-232 3 pins	DTC48 only RS-422 5 pins
Terminals and personal computers			
HP 2392A,93A,94A,97A	40234A	40242X	40242P
HP 700/22,32,43,45,92,93,94			
HP 150X			
HP Vectra with HP 24541B/ptB (25 pins)			
HP 3081A, 3082A/B			
HP 2622A,23A,24B,27A	13222M/N*	13222X	13222P
HP 2625A,24B (port 2)	40234A	40242X	N/A
Portable Plus	92221M	N/A	N/A
HP Vectra (9 pins)			
24540B/ptA	24542M	N/A	N/A
24541B/ptA			
Printers and plotters			
HP 7550A/B	17355D	30152A	N/A
HP 2562A,63A/B/C,64A/B/C			
HP 2932A,34A			
HP 2684D/P,86A/D	40234A	40242X	40242P
HP 33440A/F,47A/F,49A,59A			
HP C1200A,C1202A	13242N	N/A	N/A
Modem	300062B	N/A	N/A
Extended switching access through "back-to-back" configurations			
HP 2334/2335A X.25 multiplexer			
- terminal	40221A	N/A	N/A
- printer	40220A	N/A	N/A
HP 2342A	30062B	N/A	N/A
HP 3000 ATP, ATPM	40233A	N/A	N/A
HP 9000 40299A, 98642A			
* M - European modem; N - U.S. modem			



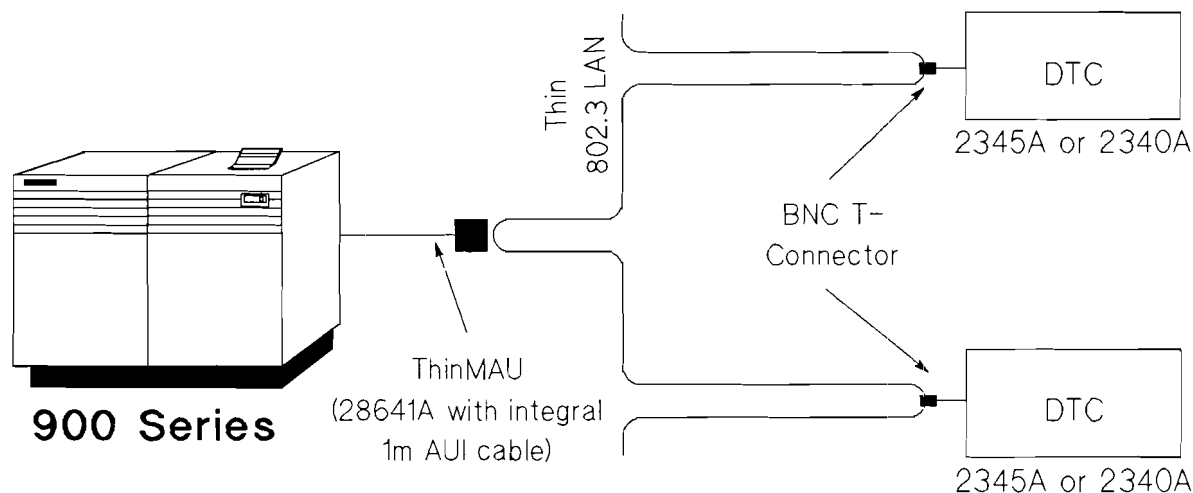
DTC48-to-Workstation/Serial Printer Cabling



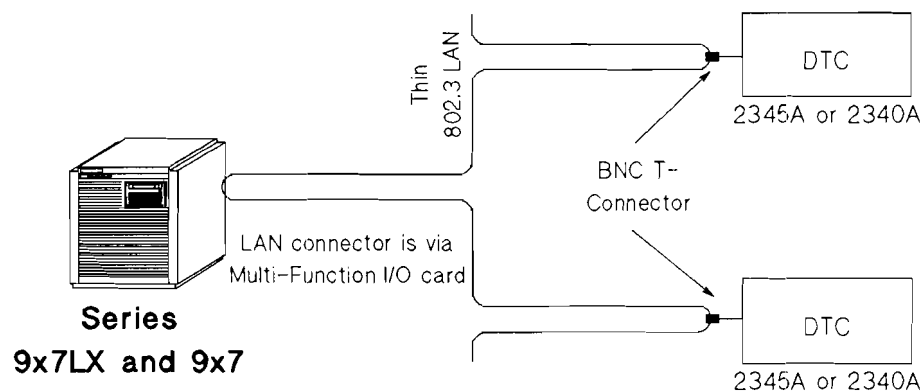
DTC16-to-Workstation/Serial Printer Cabling



DTC-to-SPU Thick (10Base5) LAN Connection

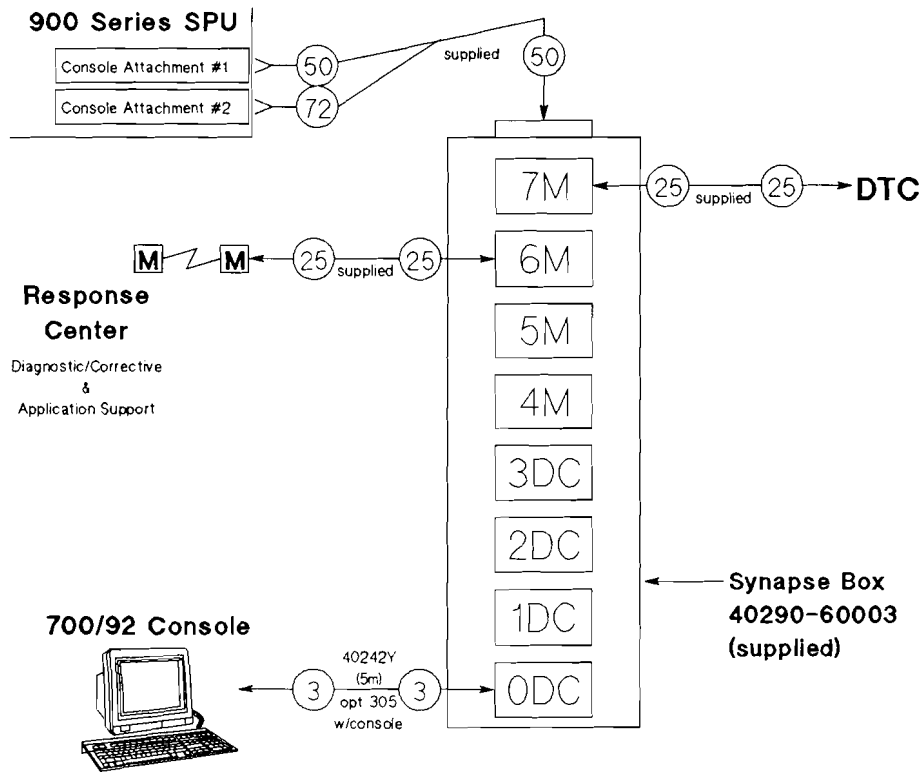


DTC-to-SPU Thin (10Base2) LAN Connection

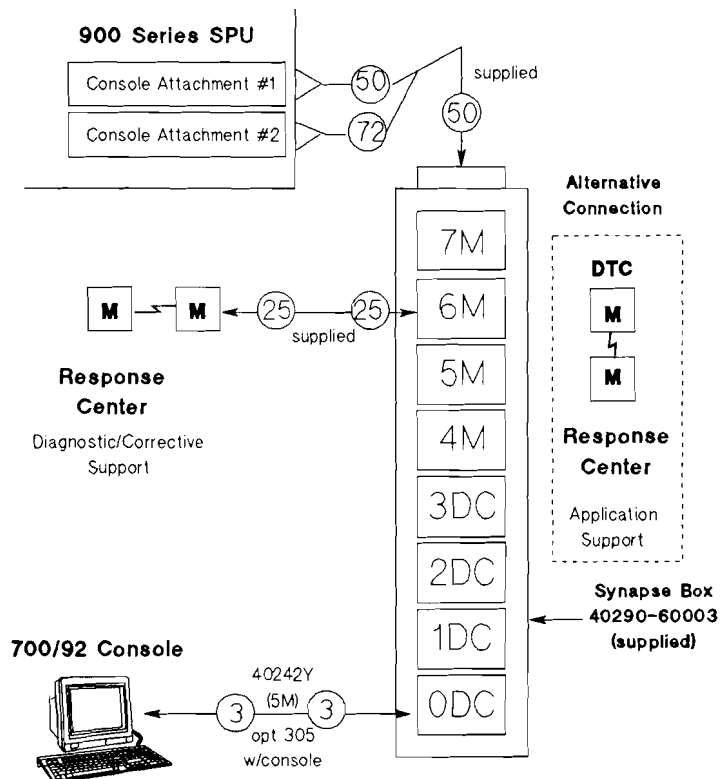


**DTC-to-SPU Thin (10Base2) LAN Connection
(via MFIO with integrated LANIC and ThinMAU)**





DTC Console Connection (preferred method)



Alternative DTC Console Connection

Software Media and FOS Learning Products

MPE/XL Media Products

One MPE media product (51453A) **MUST** be ordered with each system. Order one option from Group A, one option from Group B, one option from Group C and one option from Group D.

Media (51453A) Options

	9x7LX	937, 947	957, 987	920, 922LX, 922RX, 922, 932	948, 958	950	955	960	980/100, 980/200
Group A - FOS/Database									
Preconfigured System	812	810	811	810	811	811	811	811	811
ALLBASE/SQL only	802	800	801	800	801	801	801	801	801
TurboIMAGE only	912	910	911	910	911	911	911	911	911
MPE/XL only	902	900	901	900	901	901	901	901	901
Group B - MPE Release									
Latest release	231	231	231	200	200	200	200	200	200
Minimum supported release	231	231	231	210	220	202	203	206	220
Group C - Media Type									
DDS Cassette	AAH for all 900 Series systems								
1600 bpi	AA1 for all 900 Series systems								
6250 bpi	AA2 for all 900 Series systems								
Group D - Localized Learning Products									
English Manuals	ABA for all 900 Series systems								
German Manuals	ADA for all 900 Series systems								
French Manuals	AFA for all 900 Series systems								

Note: Ordering option 0D1 of P/N 51453A provides factory loading of subsystem products for Series 9x7LX and 9x7 systems.

Media Option	MPE/XL Release
200	Latest Release
202	Release 1.1
203	Release 1.2
204	Release 2.0
205	Release 1.20 Prime
206	Release 1.25
207	Release 2.05
210	Release 2.1
220	Release 2.2
230	Release 3.0
231	Release 3.1 for 9x7LX and 9x7 systems only

For preconfigured Series 920 through 958, 9x7LX, and 9x7 systems, the operating system will be installed at the factory and the software support tape and license will ship with the system.

One or more of the 900 Series preconfigured systems' database management systems may be deleted by specifying one of the following preconfigured system options.

- Option 910: ALLBASE/SQL only (deletes TurboIMAGE).
- Option 915: TurboIMAGE only (deletes ALLBASE/SQL)
- Option 920: MPE/XL only (deletes ALLBASE/SQL and TurboIMAGE).
- Option 930: SPU hardware only (deletes ALLBASE/SQL, TurboIMAGE, and FOS). The FOS software product (3265xA) must be ordered separately when ordering option 930.
ICON only

Ordering FOS Separately

When ordering system option 930 (SPU hardware only), FOS must be ordered separately.

- When system option 930 is specified, order FOS product 32651A to receive MPE/XL only **or** order FOS product 32652A to receive MPE/XL, ALLBASE/SQL, and TurboIMAGE. Ordering FOS product 32651A creates an **MPE XL only system**. Ordering FOS product 32652A creates a **preconfigured system**. The appropriate 51453A MPE media product and options must also be ordered whenever ordering the FOS product.

MPE Media Software Products (3265XA)

	Description
Product #	
32651A	Fundamental Operating System (FOS). Includes MPE/XL operating system, VPLUS, KSAM, tools, utilities, and English manual set.
32652A (ICON Only)	Preconfigured system software. Includes MPE/XL operating system, TurboIMAGE, ALLBASE/SQL, VPLUS, KSAM, tools, utilities, and English manual set.
32653A	System Software Upgrade for SQL-only system configurations. It adds TurboIMAGE/XL database software to these systems.
32654A	System software upgrade for MPE-only system configurations. It adds TurboIMAGE/XL and ALLBASE/SQL to these systems.
30368A	ALLBASE/SQL for HP 3000 MPE/XL systems
Option #	
416	For use on Series 917LX
418	For use on Series 920
419	For use on Series 922LX
421	For use on Series 922RX
422	For use on Series 922
426	For use on Series 927LX
432	For use on Series 932
436	For use on Series 937LX
437	For use on Series 937
446	For use on Series 947LX
447	For use on Series 947
448	For use on Series 948
455	For use on Series 955
456	For use on Series 957LX
457	For use on Series 957
466	For use on Series 967LX
467	For use on Series 967
458	For use on Series 958
460	For use on Series 960
480	For use on Series 980/100
482	For use on Series 980/200

MPE/XL Learning Products

The table below outlines which manual sets are shipped with each 900 Series system. Additional sets may be ordered by using the corresponding part number in the table below:

	Series 9x7LX	Series 922, 922LX, 922RX, 932, 937, 947	Series 948, 958, 955, 957, 960, 967, 980
Series 9x7LX System Management Core B2460A, A1707-92001	X		
System Management Core 36367A		X	X
System Management Core Plus 36368A			X

Note: Individual items found in Learning Products for Series 9x7LX systems (B2460A, A1707-92001) can not be ordered separately.

Series 9x7LX System Management Core

These two sets of learning products allow for efficient operation of Series 9x7LX systems. These sets are shipped automatically with 917LX, 927LX, 937LX, 947LX, 957LX, and 967LX systems. The set consists of the following learning products:

Learning Product	Order Number
Series 9x7LX Video Introduction Kit	B2460A
Series 9x7LX System Documentation	A1707-92001
- Start Here	N/A
- Setting Up and Maintaining Your System	N/A
- Concepts Guide	N/A
- Quick Reference Manual	N/A

System Management Core 36367A

These learning products aid users in efficient operation of an MPE/XL system. This set ships with systems listed on page 8-4. Additional sets can be ordered separately by using product number 36367A. Individual learning products can be ordered by using the corresponding order number provided in the table below.

Learning Product	Order Number
MPE/XL Documentation Guide	32650-90144
MPE/XL Quick Reference Guide	32650-60045
Performing System Operations Tasks	32650-90137
Performing System Management Tasks	32650-90004
MPE/XL Error Messages Manual	32650-60016
EDIT/3000 Reference Manual (Volumes 1 & 2)	32650-60027
TurboIMAGE/XL Database Management System Reference Manual	30391-90001
QUERY/V Reference Manual	32216-60001
KSAM/3000 Reference Manual	32208-60001
Using KSAM/XL	32650-60061
Using the 900 Series HP 3000: Fundamental Skills	31126A Opt. 001
Using the 900 Series HP 3000: Advanced Skills	31126A Opt. 002
Native Mode Spooler Reference Manual	32650-90166
Managing Spooler Operations Quick Reference Pocket Guide	32650-90268*
CI Programming Quick Reference Pocket Guide	32650-90269*
Up and Running with HP ALLBASE/SQL	36389-90011
Configuring Systems for Terminals, Printers, and Other Serial Devices	32022-61000
<i>* These learning products are now for release 3.0.</i>	

System Management Core Plus 36368A

This set provides additional detail for the management of complex MIS centers and large networks, as well as more advanced system management and administration tasks. This set ships automatically with the 900 Series systems listed in the table on page 8-4. Additional sets can be ordered separately by using product number 36368A. Individual learning products can be ordered by using the corresponding part number provided in the table below.

Learning Product	Order Number
MPE/XL Glossary of Terms and Acronyms	32650-60044
MPE/XL Commands Reference Manual	32650-90003
FCOPY Reference Manual	32212-90003
SORT-MERGE/XL General User's Guide	32214-60001
MPE/XL System Utilities Reference Manual	32650-60029
System Administrator's Quick Reference Guide	32650-60008
System Startup, Configuration, and Shutdown Reference Manual	32650-60005
Controlling System Activity	32650-60031
Volume Management Reference Manual	32650-60006
ALLBASE/ISQL Reference Manual	36216-90004
Getting Started with the DTC	32098-61000
Using the Node Management Services (NMS) Utilities	32022-61005
Troubleshooting Terminal, Printer, and Serial Device Connections	32022-61002
Customizing Terminal and Printer Type Files, Using Workstation Configurations	5959-2870

Programming Core 36369A

This set is designed for basic programming environments. It describes the mechanics of compiling and linking as well as other MPE/XL programming techniques. This set does not ship with any system unless ordered separately by the customer. Use product number 36369A to order this set. Individual learning products can be ordered by using the corresponding order number provided in the table below.

Learning Product	Order Number
Getting Started as an MPE/XL Programmer	32650-60009
HP Compiler Library/XL Reference Manual	32650-60014
HP Link Editor/XL Reference Manual	32650-90030
MPE Segmenter Reference Manual	32650-60026

Programming Core Plus 36370A

This is a general reference set for larger, more advanced programming environments. This set does not ship with any system unless specified. It must be ordered separately by the customer. Use product number 36370A to order this set. Individual learning products can be ordered by using the corresponding order number provided in the table below.

Learning Product	Order Number
Accessing Files, Trap Handling, and Data Types Conversion	32650-60010
Process Management, Resource Management, and Interprocess Communication Programmer's Guide	32650-60011
Native Language, Message Catalogs, and User Logging Kit	32650-60012
VPLUS/XL Reference Manual, Using VPLUS	32209-60002
Hi-Li/XL Reference Manual	32424-60001
MPE/XL Asynchronous Serial Communications Programmer's Reference Manual	32022-61001
MPE/XL Intrinsics Reference Manual	32650-90028
KSAM/3000 Reference Manual	32208-60001
Using KSAM/XL	32650-60061
TurboIMAGE/XL Database Management System Reference Manual	30391-90001
QUERY/V Reference Manual	32216-60001
MPE/XL Error Message Manual (volumes I & II)	32650-60016
Getting System Information Programmer's Guide Command Interpreter Access and Variables Programmer's Guide	32650-60021

ALLBASE Set 36372A

This set is designed for programmers who use ALLBASE, Hewlett-Packard's relational database management system. This set does not ship with any system. It must be ordered separately by the customer. Use product number 36372A to order this set. Individual manuals can be ordered by using the corresponding part number provided in the table below.

Learning Product	Order Number
ALLBASE/SQL Pascal Application Programming Guide	36216-60008
ALLBASE/SQL COBOL Application Programming Guide	36216-60009
ALLBASE/SQL C Application Programming Guide	36216-90023
ALLBASE/SQL FORTRAN Application Programming Guide	36216-90030
ALLBASE/SQL Reference Manual	36216-90001
ALLBASE/ISQL Reference Manual	36216-90004
ALLBASE/SQL Database Administration Guide	36216-90005
ALLBASE/SQL Message Manual	36216-90009
ALLBASE/SQL Quick Reference Guide	36216-90038
ALLBASE/SQL Application Programming Bulletin for MPE/XL Release 3.0	36216-90044
ALLBASE/TurboCONNECT Administrator's Guide	36385-90001
Up and Running with ALLBASE/SQL	36389-90011
ALLBASE/DB2 CONNECT User's Guide	30700-90001

General Usage Set 36373A

This set provides additional basic information about the usage of MPE/XL systems. It is designed to help users speed through their learning curves with the system. This set does not ship with any system. It must be ordered separately by the customer. Use product number 36373A to order this set. Individual learning products can be ordered by using the corresponding order number provided in the table below.

Learning Product	Order Number
MPE/XL Quick Reference Guide	32650-60045
MPE/XL Commands Reference Manual	32650-90003
Using the 900 Series HP 3000: Fundamental Skills Training	31126A Opt. 001
Using the 900 Series HP 3000: Advanced Skills Training	31126A Opt. 002
Using the 900 Series HP 3000: Setup Tape (1600 bpi)	31126A Opt. 003
Using the 900 Series HP 3000: Setup Tape (DAT)	31126A Opt. 004

Migration Set 30231A

This set is designed to aid in the migration from MPE V systems to MPE/XL systems. This set does not ship with any system. It must be ordered separately by the customer. Use product number 30231A to order this set. Individual learning products can be ordered by using the corresponding order number provided in the table below.

Learning Product	Order Number
MPE V to MPE/XL: Getting Started (self-paced training)	30367-90002
MPE V to MPE/XL: Getting Started (self-paced training - mentor's guide)	30367-90004
Introduction to MPE/XL for MPE V System Administrators	30367-90003
MPE V to MPE/XL: Getting Started	30367-60002
MPE/XL Languages Migration Guides (PASCAL, FORTRAN, COBOL)	31502-60004
SPL to HP C/XL Migration Guide	30231-60001
Migration Process Guide	30367-60003
Switch Programming Guide	32650-60030
Introduction to MPE/XL for MPE V Programmers	30367-60004
HP Pascal/XL Migration Guide	31502-60004
HP FORTRAN 77/XL Migration Guide	31502-60004

Additional Learning Products

The following learning products are purchasable separately using the order numbers below.

Languages

Learning Product	Order Number
HP RPG/XL Programmer's Guide	30318-60001
HP RPG/XL Reference Manual	30318-60002
HP RPG/XL Utilities Reference Manual	30318-60003
HP RPG/XL Pocket Guide Card	30318-90002
HP Pascal Reference Manual	31502-90001
HP Pascal Programmer's Guide	31502-90002
HP Pascal Quick Reference Guide	31502-90003
HP COBOL II Reference Manual	31500-60001
HP COBOL II/XL Programmer's Guide	31500-60002
HP COBOL II Quick Reference Guide	31500-60003
HP COBOL II/XL Reference Manual Supplement	31500-60001
HP FORTRAN 77/XL Reference Manual	31501-90010
HP FORTRAN 77/XL Programmer's Guide	31501-90011
HP FORTRAN 77/XL Quick Reference Guide	31501-90014
HP Symbolic Debugger/XL User's Guide	31508-90003
HP C/XL Library Reference Manual	31506-60001
HP C/XL Programmer's Guide	31506-60002
HP C/XL Reference Manual	31506-60001
HP Business BASIC/XL Reference Manual	32715-60001
HP Business BASIC/XL Migration Guide	32715-60002

Data Communications

Data Communications

Learning Product	Order Number
Guide to NS3000/XL Documentation	36923-61001
NS3000/XL Local Area Network Configuration Guide	36922-61000
NS3000/XL Configuration Planning and Design Guide	36922-61002
NS3000/XL NMMGR Screens Reference Manual	36922-61003
NS3000/XL Operations and Maintenance Reference Manual	36922-61005
NS3000/XL Error Messages Reference Manual	36923-61000
Using NS3000/XL Network Services	36920-61000
NS Point-To-Point 3000/XL Network Configuration Guide	36922-61001
NetIPC 3000/XL Programmer's Reference Manual	36920-61005
NS Cross-System NFT Reference Manual	36920-61003
NS X.25 3000/V System Link Guide	24405-90002
HP SNA Server/Access User's Guide	30254-61000
HP SNA Link/XL Node Manager's Guide	30291-61000
HP SNA NRJE User/Programmer's Manual	30292-61001
HP SNA NRJE Node Manager's Guide	30292-61000
HP SNA IMF Programmer's Guide	30293-61004
HP SNA IMF/XL Node Manager's Guide	30293-61000
HP SNA Products	30291-61005
SNA DHCF/XL User Support Guide	36935-61001
SNA DHCF/XL Node Manager's Guide	36935-61002
SNA DHCF/XL Application Programmer's Manual	36935-61003
SNA DHCF/XL Diagnostic Message Manual	36935-61004
APPC Subsystem on MPE/XL Node Manager's Guide	30394-61002

Data Communications (continued)

Learning Product	Order Number
HP SNADS/XL HPDesk Gateway Administrator's Guide	32006-61001
HP SNADS/XL Node Manager's Guide	32006-61002
HP SNADS/XL SNA/XL Distribution Services	32006-61003
HP SNADS/XL HPDesk User Support Guide	32006-61004
HP OpenView System Manager User's Guide	36936-61001
HP OpenView System Manager Manager's Guide	36936-61002
Using HP OpenView DTC Manager	D2355-90001
X.25 XL System Access Configuration Guide	36939-61001
Installing and Managing HP ARPA File Transfer Protocol Network Manager's Guide	36957-61001
HP ARPA File Transfer Protocol User's Guide	36957-61002
Using HP OpenView DTC Manager	D2355-90001
Asian SNA/IMF/XL User Support Guide (Taiwanese)	30293-60211
Asian SNA/IMF/XL User Support Guide (Japanese)	30293-60221
Asian SNA/IMF/XL User Support Guide (Korean)	30293-60231
Using SNA IMF Pass Thru	30293-61008
SNA IMF Programmer's Reference Manual	30293-61005
LU6.2 API Application Programmer's Reference Manual	30294-61000
LU6.2 API/XL Node Manager's Guide	30294-61001
RJE User/Programmer Reference Manual	30295-61001
RJE/XL Node Manager's Guide	30295-61002
NS over SNA/XL Configuration Guide	30296-61000

Programmer Productivity Tools

Learning Product	Order Number
HP Toolset/XL Reference Manual	36044-60001
INFORM/V User's Guide	32246-60002
REPORT/V Reference Manual	32245-60001
Getting Started With TRANSACT	32247-60002
TRANSACT Reference Manual	30138-60001
TRANSACT/XL Migration Guide	32247-60004
Virtuoso COBOL Sample Library Reference Manual	30426-60001
Virtuoso Code Generator Reference Manual	30422-60001
HP EDIT Reference Manual	30316-90001
Learning HP EDIT	30316-90002
HP EDIT Quick Reference Card	30316-90005
Getting Started with HP Software Revision Controller, Implementation Guide, User's Guide	30234-60002
HP Browse/XL User's Guide	36384-60001
HP Search/XL User's Guide	36383-60001

Other Learning Products Available

Learning Product	Order Number
Silhouette Reference Manual	30302-60003
ALLBASE/NET User's Guide	36216-90031
Dictionary/3000 Reference Manual	32244-61000
SORT-MERGE/XL Programmer's Guide	32650-60059
System Debug Reference Manual	32650-60017
The HP 3000: Logging On and Off	32650-90098
AutoRestart/XL User's Guide	36375-60062
SPU Switchover/XL User's Guide	36378-90001
TurboSTORE/XL II User's Guide	36388-90001
VPLUS/Windows Programmer's Guide	36393-90002
Magneto-Optical Media Manager User's Guide	36398-90001
TurboSTORE/XL Reference Manual	30319-60002
Mirrored Disk/XL User's Guide	30349-60002
ALLBASE/DB2 CONNECT User's Guide	30700-90001
ALLBASE / TurboCONNECT Administrators's Guide	36385-90001
DBchange Plus User's Guide	36386-90001



Hardware and Software Support

Customer Support Services

Hewlett-Packard's customer support services are designed to ensure long-term, productive use of HP 3000 systems. Support is available throughout the life of a system to meet the needs of particular applications and working environment. HP offers a complete range of customer support services for the HP 3000 systems:

- Hardware maintenance service provides various levels of hardware support for systems, workstations, and office products
- A comprehensive network support program covers HP and multivendor networks
- A choice of software support programs provides the level of software support that best meets customer's needs
- Standardized and custom consulting services allow customers to develop tailored solutions to meet their application needs
- Fundamental and advanced training courses help customers quickly take full advantage of their system's capabilities
- Disaster recovery planning and back-up services prepare customers for the unexpected

HP customer support is delivered by a worldwide network of systems engineers (SEs), customer engineers (CEs), and HP Response Center engineers (RCEs). These extensively trained professionals work closely with HP sales representatives to provide customers with complete support for their HP 3000 products.

Hardware Maintenance Services

An on-site warranty for 90 days is included for each HP 3000 system and all HP computer products purchased with the system. After the warranty period, service can be continued under an HP support agreement. All HP hardware services include parts and labor for remedial maintenance.

HP SuccessLine service, HP's hardware maintenance service, provides high-quality support that enables the customer to maximize computer system uptime and productivity. It provides superior value and the flexibility to choose response times and coverage periods.

When the customer purchases an HP 3000 support agreement, a CE is assigned to the account personally manages the maintenance program. The CE performs preventive maintenance on a regularly scheduled basis and, if necessary, adjusts or replaces parts to ensure a continued high level of performance. The CE also installs equipment, updates the customer's system with engineering improvements, monitors the customer's site environment, and maintains a current system log.

HP's remote support is included with HP hardware support for HP 3000 systems. A communications link via phone line and a qualified modem enables specialists in the HP Response Center to access an HP 3000 system and remotely run tests and diagnose functional problems.

HP Predictive Support is also included with hardware support for HP 3000 systems. HP Predictive Support software provides early warning of potential problems in HP disk drives, magnetic tape media, and system memory. This allows the customer to avoid unscheduled downtime and increase system availability.

Should the customer's system require troubleshooting, the CE has the training and materials to rapidly resolve most problems. The CE stays on site until the customer's problem is solved, even if this involves working beyond the customer's coverage hours. For very difficult problems, the CE can initiate an escalation procedure that enlists all the HP resources necessary to provide a solution.

Features included in HP 3000 support agreements are detailed below.

HP SuccessLine Service Features

- Account-assigned CE
- HP Predictive Support software
- Work to completion
- Remote support
- Escalation management program
- Preventive maintenance
- HP Response Center network
- Engineering improvements
- Local parts inventory
- Site environment survey
- Warranty enhancement
- Installation add-ons

HP SuccessLine service offers the customer the flexibility to choose from four service levels:

Priority Plus Support

If the customer's applications are extremely critical and call for maximum availability, this service level provides them with maximum coverage hours and days and HP's best possible response. This coverage is ideal for crucial applications or multiple shift operations.

Priority Support

If the customer requires maximum availability during standard business hours and evenings and HP's best possible response, then this service level is a good choice. On-site assistance is available for several business hours beyond the standard business day, and HP will respond to the customer's service request as quickly as possible. This coverage is provided during the normal work week.

Next Day Support

If the customer's application allows for service delivery on the following business day, then this service level is the most cost-effective solution for system support. This solution is ideal for the customer with spare or substitute equipment. HP engineers arrive on site as quickly as possible to begin solving the problem.

Scheduled Support

If the customer has HP workstation and office products, this service level offers the lowest-cost on-site support. It is an economical support solution for the customer with alternative PCs or workstations and users who run less critical applications. An HP engineer makes a scheduled weekly visit to a central site. To qualify for HP SuccessLine service scheduled support, the customer's monthly charges for a site for this service level must exceed a minimum dollar amount.

Support Selection Guide for HP SuccessLine Service

	Priority Plus	Priority	Next Day	Scheduled
Coverage Hours	24 hours 7 days	8 a.m.-9 p.m. Monday-Friday	8 a.m.-5 p.m. Monday-Friday	8 a.m.-5 p.m. Monday-Friday
Response Time	Best response; not to exceed 4 hours	Best response; not to exceed 4 hours	Next working day	Scheduled weekly visits
Usage Environment	Highly critical	Urgent	Less critical	Workstation/office products only; multiple units

For HP workstation or office products, HP Customer Return service offers an additional low-cost alternative. This service offers support for situations where applications are not critical and service economy is a priority. With this service, the customer returns the product to an HP Customer Service Center for repair. Within 3 days of its arrival, the repaired unit will be shipped (prepaid) back to the customer via normal land carrier.

HP can also fully supports selected non-HP terminals and PCs and multivendor PC local area networks (LANs).

HP Multivendor Network Support Program

The Network Life Cycle

HP recognizes that successful network management does not begin or end with the purchase of network products. The customer begins by recognizing a need to improve the organization's information flow, then plans a network that will meet those needs. Implementation follows design, with the equipment purchased and installed, the customer's people trained to use and manage it, and the system fully tested and operational. Once the network is implemented, the customer operates it as part of business. However, new information needs are always emerging that require planning for changes and enhancements, thus creating a continuous process: the network life cycle.

Integrated, Flexible Assistance

HP's objective is to give the customer complete, integrated, and flexible support solutions. Recognizing that different support needs occur at different stages of the cycle, HP offers a variety of network support services. The HP Multivendor Network Support program integrates services so that they work logically together and so that the work performed at one stage increases the effectiveness of services performed at a later stage. The program is also flexible. HP recommends only the services that complement their customer's capabilities. Using HP's highly regarded implementation and support planning process, HP tailors various aspects of each service to the customer's unique needs. For special needs, HP can provide

custom consulting services that allow the customer to leverage HP's considerable experience in network support.

HP Network Consulting

HP provides experienced network consultants who develop a custom network design that can best support the customer's business needs. A range of service modules enables the customer to tailor services to ensure successful network implementation and operation.

HP WireTest

HP evaluates the suitability of the customer's existing cables prior to implementing a new or upgraded network.

HP CableSite

HP takes responsibility for the design and installation of the cable infrastructure needed for information transport over LANs.

HP Network Startup

HP coordinates the installation and testing of the customer's HP and multivendor network to ensure that it operates as designed.

HP NetAssure

HP provides a single point of contact for troubleshooting and managing fault resolution on the customer's HP and multivendor network.

NP Network Operations

HP can efficiently operate and manage a customer's network 24 hours a day, 7 days a week, working through HP Customer Network Centers worldwide.

HP's customer education offers a wide variety of network training, from classroom to self-paced or even custom programs delivered at the customer's site.

Software Support Services

HP's software support program provides HP 3000 computer users with help in implementing and operating HP software solutions. Different levels of assistance and problem-solving are available, and services can be customized for a particular customer or site.

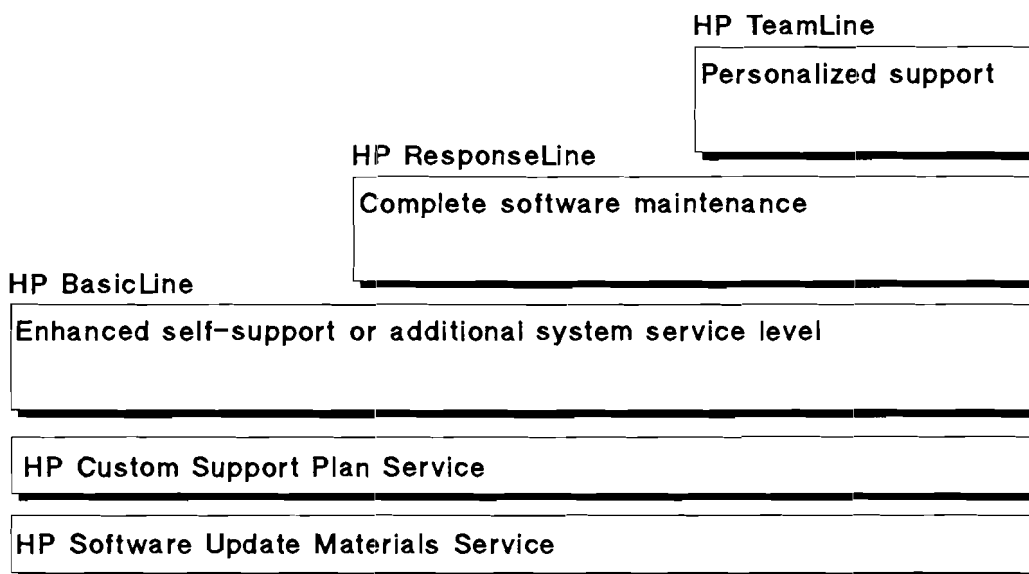
Software support is an extremely powerful selling and customer satisfaction tool. Most of its strength comes from the tremendous flexibility and range built into the various support options available to your customers.

HP's software support is provided on a per-system basis. For each system, the customer chooses one of three software support services for HP 3000 systems:

- HP TeamLine (top-level software support)
- HP ResponseLine (complete software maintenance)
- HP BasicLine (economical basic service or additional system service level)

The customer also orders:

- HP Software Update Materials service (where software and manual updates are needed)



HP's Software Support for HP 3000 Systems

HP TeamLine

HP TeamLine software support service for HP 3000 systems is our premier, top-of-the-line software support service. It provides customers with personalized software support and on-site applications assistance. A locally assigned account consultant becomes familiar with your customer's specific system environment and manages all software support issues.

Key features:

- HP account support consultant
- Proactive future support planning
- Personalized technical assistance to help the customer use the HP system most effectively
- Periodic technical and support management reviews

This service offers the closest relationship between HP and the customer by providing personalized assistance in addition to industry leading telephone and remote support. HP ResponseLine support is a prerequisite for this service. HP TeamLine Upgrade service is purchased on top of HP ResponseLine service.

Account Support Consultant

The account support consultant is an integral part of the HP TeamLine software support service, and becomes a valuable part of the customer's team. This consultant:

- Understands HP systems
- Understands the customer's business
- Helps plan how HP systems and the customer's applications can best fit together

HP ResponseLine

HP ResponseLine software support service for HP 3000 systems provides a complete software maintenance service for HP 3000 customers. HP ResponseLine delivers this through a comprehensive set of software maintenance features with guaranteed coverage and response times.

Key features:

- HP Response Center access for software problem-solving and product-usage assistance
- Remote diagnostics through an HP-installed remote support modem
- Electronic call submittal via HP SupportLine electronic support, with callback within two hours or next-day written response
- PowerPatch
- On-site visit by an HP representative if the problem cannot be solved remotely
- All the features of HP BasicLine

Extended Hours

Extended hours HP Response Center support is available for HP 3000 customers. For customers who perform system maintenance functions outside of HP's normal business hours, such as backups and software update installations, extended-hours support provides telephone assistance and remote diagnostics. Operating system, system interrupts, and select data communications software support is available 24 hours a day, 7 days a week. Extended coverage is also provided for HP Desk: 24 hours a day, 5 days a week, and 4:00 am to 8:00 pm (U.S. eastern time) on weekends. For Europe and Intercon, contact the local support management for hours and availability.

Electronic Call Submittal

HP ResponseLine software support service provides unlimited access to the HP Response Center and HP SupportLine on-line electronic databases. Customers can call the HP Response Center with software problems or usage questions, or submit an electronic call through HP SupportLine.

The customer may choose between guaranteed telephone response within two hours or next-day written response to calls submitted electronically. In addition, HP ResponseLine software support service features a well-defined escalation management procedure for critical software problems.

PowerPatch

PowerPatch tapes include operating system data communication and subsystem patches that resolve many known problems proactively, before the customers see them. The customer can request tapes from the response center and receive them within 3 days in the U.S. or 1 week outside the U.S.

HP BasicLine

HP BasicLine software support service for HP 3000 systems is a self-maintenance service for customers with significant HP 3000 software experience who do not require direct support contact with HP. In addition, HP BasicLine provides a cost-effective support alternative for customers with multiple systems.

Key features:

- Read-only access to HP SupportLine electronic support, HP's electronic databases of current, comprehensive support information used by the HP Response Center
- Right to use software updates for all licensed software
- Right to use updates copied from another system to additional systems (for customers with multiple HP 3000 systems)

HP SupportLine

HP SupportLine problem-solving databases have powerful browse and keyword search facilities that enable customers to find solutions to problems and questions quickly. HP SupportLine contains:

- New product news
- Problem-solving information
- HP Response Center application notes
- Software status bulletins
- Common questions and answers
- Technical tips

HP BasicLine customers have read-only access to databases.

HP Custom Support Plan

Although most customers' requirements are met by the standard HP 3000 software support offerings, HP Custom Support Plan service lets you tailor a solution to specialized needs.

Here are some examples of where HP Custom Support Plan service may be used:

- The customer wants you to modify existing service deliverables
- The customer wants to add education and consulting services to the contract
- The customer wants simplified ordering, with a single line-item quote

For more information, refer to CSP guidelines (HP publication number 5959-7862), available at the Literature Distribution Center.

HP Software Update Materials

HP Software Update Materials service provides software update materials directly to customers. The service provides:

- Software updates: operating system updates and software product updates
- Software format: floppy disk, cartridge tape, digital data storage (DDS), compact disk, or 1/2-inch magnetic tape
- Manual updates: reference and user manual updates, the HP communicator software release bulletins, and software status bulletins
- Manual format: paper or CD-ROM

Configuring Software Support

Configure software support on a per-system basis, following a series of well-defined steps:

1. Choose the appropriate software support service: HP TeamLine, HP ResponseLine or HP BasicLine.
2. Select the appropriate processor tier for the system.
3. Add applications options and additional service options, if required.
4. Select the appropriate update materials service.

Processor Tiers

Pricing for HP's software support services is based on the processor tiers. A single tier may contain one or more processor types.

Applications Options

When the customer purchases one of the three services for a specified processor tier, most of the software that resides on the system is automatically supported. The exceptions are specified application software products determined to be more difficult for the HP Response Center or field to support. In the case of these products, an applications option is required to receive support for purchasing them.

Application options contain families of related software products. All products that reside under an application option are called "trigger products," because the presence of one or more of these products necessitates the purchase of the application option.

Application options exist only under HP TeamLine and HP ResponseLine software support services. They extend the features of these services to the software supported under the option. Application options typically increase the number of reviews or HP Response Center callers.

For example, under a typical HP ResponseLine contract, the customer is entitled to one HP Response Center caller and one alternate. If the customer has a product that triggers the purchase of an application option, the customer receives an additional HP Response Center caller and alternate with the purchase of this option.

Additional Service Options

Each of the three support services has specified deliverables. Additional service options provide customers with the option to purchase multiples of these deliverables, if desired.

For instance, an HP TeamLine software support service customer can purchase an additional account review or an additional HP Response Center caller. Additional services are limited to specified support services.

Guidelines for Quoting HP's Software Support

Each system must be configured separately. HP maintains a specific system handle for each system under software support.

Each system must have HP ResponseLine or HP BasicLine software support service. HP TeamLine Upgrade service is purchased on top of HP ResponseLine to obtain TeamLine level software support for your customer.

For each service, the customer must order one processor tier. The processor tier determines the price of the service.

For HP TeamLine or HP ResponseLine software support service only. If any applications to be supported belong to an application family, the corresponding application option must be ordered.

If any update materials are required, HP Operating System Update Materials service must be ordered. This provides operating system media and documentation updates. One processor tier and one media type must be ordered with this product.

If any subsystem or application materials are required, HP Software Update Materials service must be ordered. Order this product once for each subsystem or application software product. If a software product is a bundle, it must be separated into its individual component products. (See Software Support Appendix H.) HP Operating System Update Materials service must be ordered as a prerequisite to this product.

Materials may be copied to any system that has the original software license and is supported by HP ResponseLine or HP BasicLine software support service.

Software Support for Multiple Systems

A customer with more than one system may choose to support additional systems through a single central system manager, thereby centralizing the support burden of these systems and saving money.

Support Service for Additional Systems. An HP 3000 system manager for HP ResponseLine service may call the HP Response Center on behalf of their other HP 3000 systems covered by HP BasicLine software support service. Therefore, any system that can be supported through another HP ResponseLine service need only be supported with HP BasicLine service. Note that if a problem cannot be resolved remotely, HP will escalate, free of charge, only to systems with HP ResponseLine service or HP BasicLine service located at the same site as the central system with HP ResponseLine service.

Materials may be copied to any supported system having the original software license.

Software Support Configuration Aids

HP's software support information is updated monthly and is available through the Customer Support Hotline on HPDesk:

Subject	Index Number
Software Support Appendices	SW01
Software Support Quote Worksheets	SW02
Software Support Price Lists	SW03

To request a copy, sent an HPDesk message as follows:

```
Intray > SEND
Subject: _____
To: CUSTOMER SUPPORT HOTLINE/HP5000
Text: //
Message > MAIL
```

Make sure to type only one subject per request. You should receive your copy back from the Hotline within 48 hours.

Software Support Quote Worksheet

Use a quote worksheet when configuring and quoting software support. There is one quote worksheet for each software support service. Each worksheet lists all relevant components: services offered, processor tiers, applications options, additional services, and software materials services.

Quote worksheets are updated monthly to reflect current system and program information. To receive an updated set of software support quote worksheets, send a desk message to:
CUSTOMER SUPPORT HOTLINE - Subject SW02

Software Support Appendices

Appendix	Description
B Supported commercial PC Software	Listing of all software supported under the Commercial PC program
C HP Software Support Credit and Discount	Explanation of current program
E Applications Options and Products	Listing of all applications options and corresponding trigger products
H Bundled Product Reference	Listing of all known bundled software products and their corresponding components
J Software Support Training Requirements	Listing of required training courses for HP TeamLine and HP ResponseLine customers
K Supported HP Vectra PC Software	Listing of all software supported under the HP Vectra PC program

The two most frequently used Appendixes are E, "Applications Options and Products," and H, "Bundled Product Reference." Appendix H is especially important because HP's software support program does not support bundled software products. Therefore, every software

product must be unbundled—that is, broken down into its components for support purposes. Appendix H provides a reference to aid you in this process.

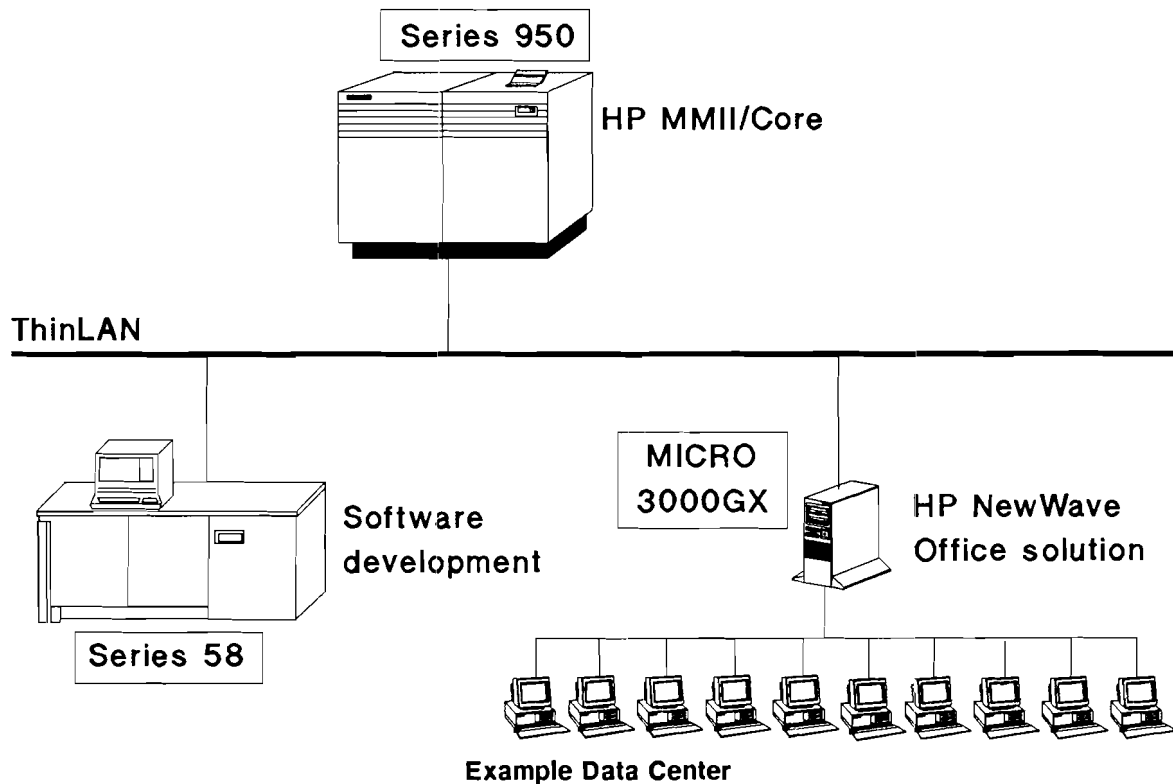
Software support appendices are updated monthly. To receive an updated set of appendices, send a desk message to: *CUSTOMER SUPPORT HOTLINE - Subject SW01*

Price Lists

HP's software support price lists are updated monthly. To receive a package containing a complete set of price lists, send a desk message to: *CUSTOMER SUPPORT HOTLINE - Subject SW03*

Example Data Center

The customer has three HP systems in the data center. The largest, an HP 3000 Series 950, is running the HP MM II/Core application. The customer is a fast-growing canned food manufacturer and would like HP to be involved in the planning for future computing needs. HP TeamLine software support seems like a good fit for Series 950 support. The second system in the data center is an older HP 3000 Series 58, used primarily for software development. HP BasicLine software support for this system extends the ResponseLine support on the central system to maintenance in the classic MPE operating system environment. The last system, a MICRO 3000GX, is supporting four HP NewWave Office PCs. This system will be configured with HP BasicLine software support service as well.



Manufacturing HP 3000 Series 950

Software Configuration Materials

	Product	Description	Materials
Operating system	32651A	MPE/XL FOS	Y
No charge update	36391A	TurboIMAGE	Y
Software products	30368A	SQL	Y
	32256A	System Dictionary/XL	Y
	36920A	NS3000/XL	Y
	36923A	ThinLAN/XL	Y
	32926A	MM/Adv Ver	Y
	32636A	Product Planning	Y
	32270A	PM	Y
	32920A	PCM	Y
	32399A	SCM	Y
	34006A	Purchasing	Y
	32308A	AP	Y
	36070	BRW	Y

Support Configuration

Product/Option Number	Quantity	Total
H2000A + T00 HP TeamLine 3000		
#0J1 950, 955, 960	1	12
#0F5 Manufacturing applications	1	12
#0F7 Financial applications	1	12
#0LG Integrated PC office MB	1	12
#0FA Additional management review	2	24
H2072A + S00 HP OS Materials 3000		
#0J1 950, 955, 960	1	12
#AA2 6250 BPI Tape	1	12
H2004A + S00 HP SW Materials 3000		
#0J1 950, 955, 960	12	144
36373A + Q00 MUS General Usage	1	12

Notes:

MM II/Core needs to be unbundled in the software configuration. Check software support Appendix H for complete bundled product information.

HP SQL, HP System Dictionary, and HP TurboIMAGE databases all need to be added to the software support configuration for inclusion on the update tape. HP TurboIMAGE, however, is a no-charge update.

The Series 950 updates include system management core and core+ documentation. To receive manual updates for additional manual sets, be sure to order the +Q00 service.

This system is configured with PC office support, even though the software is actually on the MICRO 3000. This allows the customer to call in with these questions on the Series 950 ResponseLine contract.

Development Series 58

Software Configuration Materials

	Product	Description	Materials
Operating system	32558B	Series 58	Y
No charge updates	30539B	Disk cache	Y
Software products	30240A	ThinLAN/V	Y
	32344A	NS3000/V	Y
	32233A	COBOL II/V	Y
	36570A	HP DESK	Y

Support Configuration

Product/Option Number	Quantity	Total
H2003A + H00 HP BasicLine 3000		
#0J5 44, 48, 58	1	12
#0FZ software distribution CD-ROM	1	12
H2072A + S00\HP OS materials 3000		
#0J5 44, 48, 58	1	12
#0LB CD-ROM media	1	12
H2004A + S00 HP software materials 3000		
#0J5 44, 48, 58	4	48
#0LB CD-ROM media	4	48

Notes:

The customer will get his software updates on CD-ROM media. Option #0FZ provides the actual HP-IB CD-ROM drive. (U.S. only.)

Office MICRO 3000GX

Software Configuration Materials

	Product	Description	Materials
Operating system	32563A	MICRO 3000GX	Y
No charge updates	30539B	DiscCache	N
	35303A	HP Easytime	Y
Software Products	30240A	ThinLAN/V	N
	32344A	NS3000/V	N
	B1727A	Resource Sharing V	Y
	B1726B	Information Access V Server	Y
	B2502A	Information Access PC	Y
	D1811A	NS-User Server	Y

Support Configuration

Product/Option Number	Quantity	Total
H2002A + L00\HP BasicLine 3000		
#0J9 MICRO 3000LX, GX, XE	1	12
H2072A + S00\HP OS materials 3000		
#0J9 MICRO 3000 LX, GX, XE	1	12
#0LB CD-ROM media	1	12
H2004A + S00 HP SW materials 3000		
#0J9 MICRO 3000LX, GX, XE	2	24
#0LB CD-ROM media	2	24
H2016A + S00 HP SW materials PC		
#0A9 RTC 10 PCs	2	24

Notes:

This system will also be updated from CD-ROM. The configuration provides an additional compact disc and codewords.

PC updates for the ThinLAN link are included on this configuration.

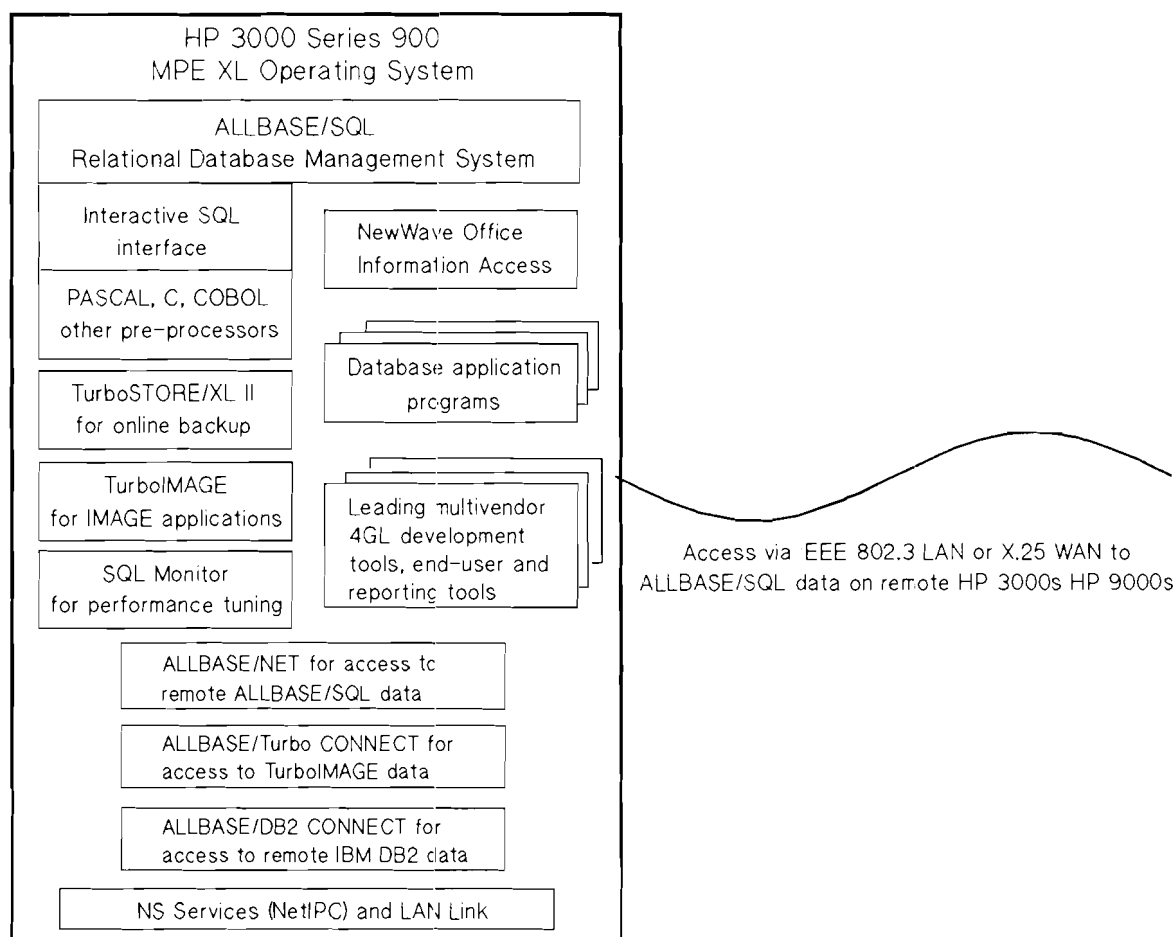
Miscellaneous Configuration Information

HP ALLBASE/SQL

ALLBASE/SQL Configuration Guidelines

ALLBASE/SQL is HP's relational database management system (RDBMS) on the HP 3000 Series 900 family of systems. It offers OLTP customers the best performing RDBMS on PA-RISC for mission critical applications, interoperability with other vendors' database and tools offerings, and superior data integrity and supportability.

ALLBASE/SQL on the HP 3000 requires the MPE/XL operating system.



HP ALLBASE/SQL Database on HP 3000 Series 900 Systems

The components of a complete ALLBASE/SQL solution are shown in the figure above.

Beyond MPE/XL, the software requirements for ALLBASE/SQL depend on the extensions used to interoperate with other software components in a heterogeneous environment. Table 1 outlines these requirements for the following products: ALLBASE/NET, ALLBASE/Turbo CONNECT, and ALLBASE/DB2 CONNECT.

Software Requirements for Extensions to ALLBASE/SQL

Product	Software Requirements on HP 3000	Other Software Requirements
ALLBASE/NET 30604A	ALLBASE/SQL NS Services	
ALLBASE/Turbo CONNECT	ALLBASE/SQL TurboIMAGE	
ALLBASE/DB2 CONNECT	ALLBASE/SQL LU 6.2 SNA Link (includes PSI card)	IBM software on IBM Mainframe: MVS, DB2, CICS, VTAM Gupta Technologies, Inc. software on IBM mainframe: SQL Host (Hardware: IBM 37x5/37x0 SNA communications hardware; modem)

Note



ALLBASE/SQL requires 3-4 Mbytes of RAM and 8 Mbytes of disk space. See the ALLBASE/SQL Database Administration Guide (36217-90005) for additional requirements based on the particular applications being run.

For guidance on selecting terminals, disks, magnetic tape units and printers, see Chapter 6 on Peripherals.

Site Preparation Data

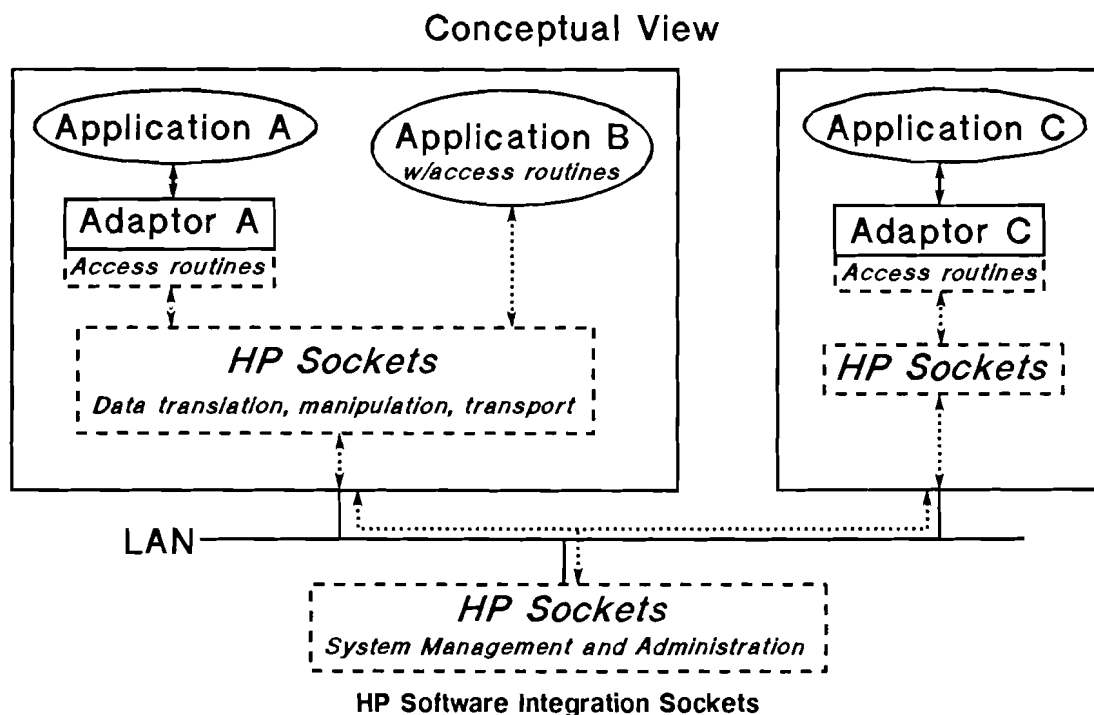
The site preparation information for the 900 Series family of business computers can be found in the following manuals:

	Manual	Part Number
Series 920, 922LX, 922RX, 932, 948, 958	Site Planning and Preparation Guide for the HP 3000 Series 920 Family	A1027-90001 E1290
Series 950, 955, 960, 980/100, 980/200	Site Preparation and Requirements Guide for the HP 3000 Series 950 Family	30190-90007 E1090
Disk drives	Disk Product Specification and Site Environmental Requirements	5955-3456 E0290
Series 9x7	CE Installation and Configuration Guide	A1707-90008 E1091

HP Software Integration Sockets/XL

HP Sockets is a software tool that enables the seamless integration of existing or new applications. This integration is accomplished with little-to-no modification of the applications. It resolves differences in applications at the data level by providing data manipulation, translation, and record reformatting. It also provides for location transparency of the applications. HP Sockets Access Routine Library helps resolve the problems of data access. Data access adaptors may be written in Cobol, C, Pascal, or Fortran.

HP Sockets is supported on MPE/XL and HP-UX. A gateway to IBM/MVS via TCP/IP is also available with the HP Sockets/UX product.



The conceptual view of HP Sockets showing its components is shown in the figure above.

Required products for HP Sockets/XL:

- HP 3000 900 Series running MPE/XL 2.2 or later
- Minimum 24 Mbytes main memory
- 92616A HP Software Integration Sockets (no options required)
- 36923A ThinLAN 3000/XL Link
- 36920A NS 3000/XL Network Services
- 31506A HP C Compiler (needed for compilation and adaptor development; minimum one per LAN environment)

- 30026A LIB C (minimum one per LAN environment)

- System Management and Administration Console -

The current version of HP Sockets/XL requires an HP 9000 on a LAN with the HP 3000 for system management and administration. Future releases of HP Sockets/XL will support this functionality on the HP 3000 900 Series. The System Management and Administration Console consists of:

- HP 9000 Series 300, 400, or 800 running HP-UX 7.0 or later**
- 8 Mbytes of main memory minimum
- 7 Mbytes of disk space for /usr directory minimum (if HP 9000 applications will also be integrated with HP 3000 applications, 7 Mbytes will also be needed for each /usr node).
- 92568A HP Software Integration Sockets/UX with Option UAU License to use on one HP 9000 *and* Option AA0 Cartridge tape media option *or* Option AA1 1600 bpi tape media option *or* Option AAH DAT/DDS cartridge media option
- 36967A LAN for Series 800 *or* 98171A LAN/9000 for Series 300/400 not already equipped with a LAN port

*** HP-UX 8.0 systems also require B2412A C Compiler for Series 800 or B2371A C Compiler for Series 300/400.*

Note that HP Sockets has no relation to UNIX network ARPA sockets.

SPU Switchover/XL

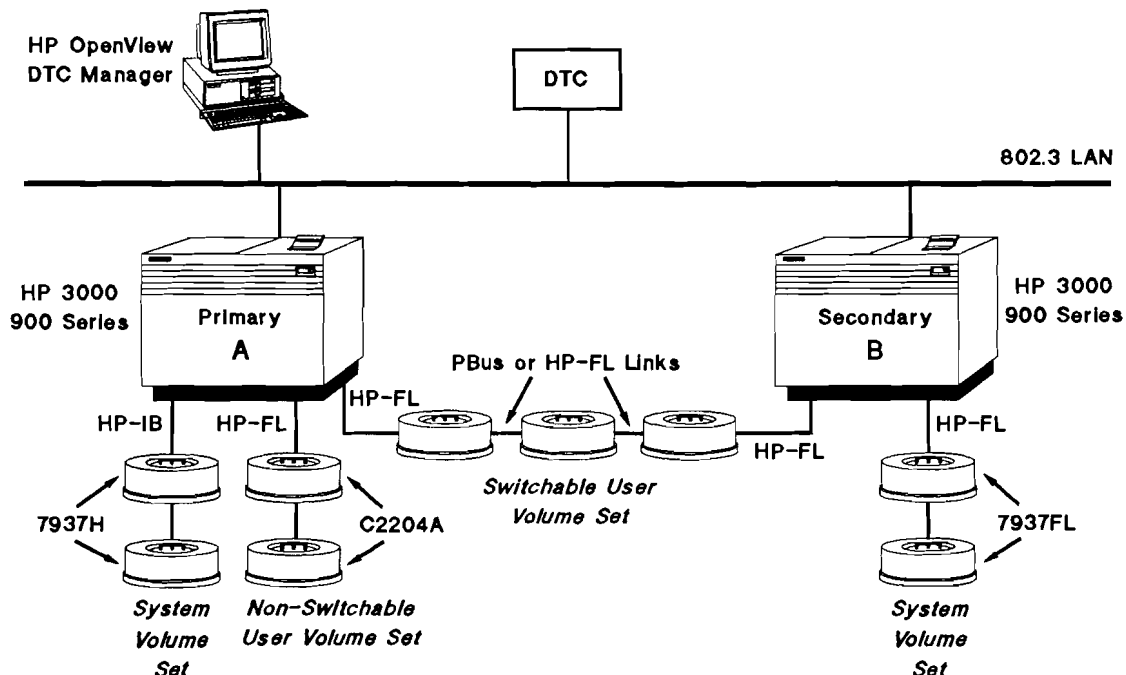
Product Overview

SPU Switchover/XL automatically detects system failures and allows the system operator to initiate switchover between a pair of processors. A key part of the switchover process is the full recovery of user data (including flat files, TurboIMAGE, ALLBASE/SQL and third party databases). In typical situations, this switchover can be accomplished in less than 30 minutes. In this manner, the product enables customers to avoid down time due to scheduled system maintenance or hardware failures.

Hardware Configuration

SPU Switchover/XL is configured to run on a pair of HP 3000 Series 9xx processors. Any combination of Series 9xx processors can be used. When configuring a switchover pair, special consideration must be given to balancing the processing load between the two systems. In a switchover configuration, applications can be running on both the primary and secondary systems. After switchover, applications on the primary are switched over onto the secondary. In this situation, the increased workload on the secondary system can result in degraded system performance.

Hardware configuration for SPU Switchover/XL is shown in the following figure. In the configuration shown one processor (shown here as system "A") is designated as the primary and the other (system "B") is designated as the secondary. Both machines must have system volume sets. In a switchover configuration, there must be at least one user volume set which is connected to both the primary and secondary systems. In addition, either system can have non-switchable user volume sets. Note that for the purpose of determining maximum disk configurations, drives in switchable user volume sets must be considered as belonging to both the primary and secondary systems.



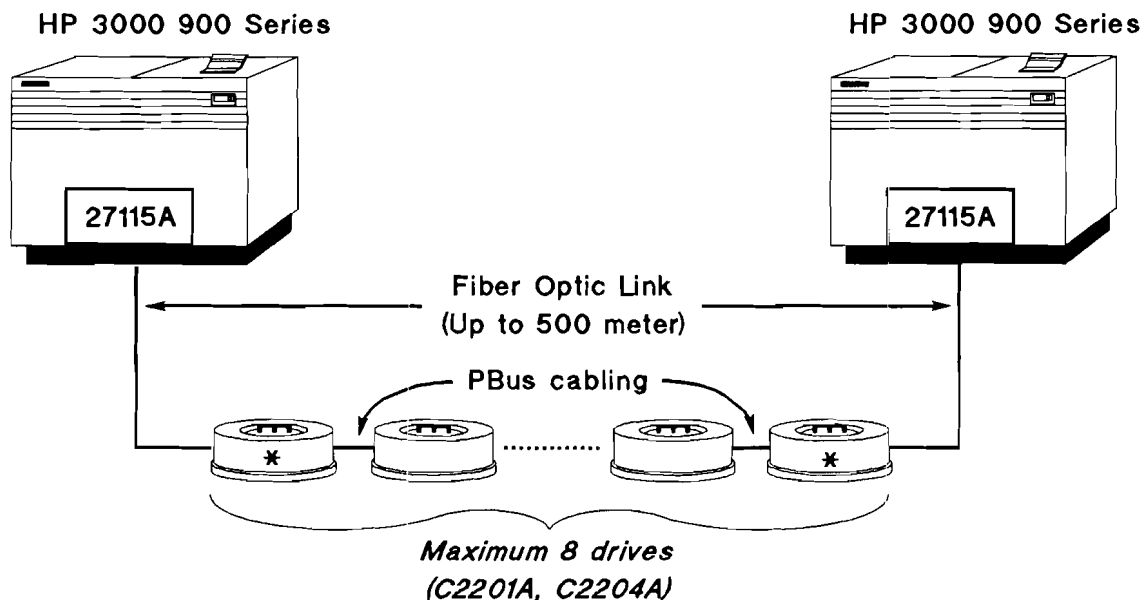
An additional restriction is that all the disk drives in the chain connected between the two systems must be configured as members of a switchable volume set. In the example shown, all three disk drives must be part of a switchable set. Because of this restriction, disk drives in switchable user volume set(s) must be connected to separate HP-FL adapter cards. Disk drives for switchable and non-switchable user volume sets cannot be connected to the same HP-FL adapter card.

The use of the HP Openview DTC Manager product (P/N D2355A) is required in the hardware configuration. The Openview DTC Manager facilitates the re-establishment of terminal and serial printer connections from the primary to the secondary system after switchover.

In a switchover configuration, only the switchable user volume set(s) can be switched between systems. Disk drives in the switchable volume set(s) must contain all the critical user data and applications that are intended to be switched between the two systems. It is not possible to switch data contained in system volumes or non-switchable user volumes between the two systems.

System volume disk drives for each processor can be connected via either HP-IB or HP-FL. Similarly, non-switchable user volume sets (those that are local to a single system) can be connected via either HP-IB or HP-FL. As noted above, disk drives in switchable user volume sets must be connected via HP-FL.

All switchable volume sets must consist of at least one chain made up of 2-8 fiber optic based disk drives (either 7937FL, C2201A, or C2204A). Disk drives in a chain need not all be of the same type. Both ends of the chain for a switchable volume set must be connected via a fiber optic link to a HP-FL device adapter card in the primary and secondary systems. Disk drives that are not at the ends of a chain can be connected by P-bus or HP-FL links.



* Must be standard C2201A, C2204A

Note

Care must be taken when ordering C220x drives for a switchover configuration. C220x drives can be ordered with option 1BG which deletes fiber optic circuitry. Drives ordered with this option cannot be field upgradeable to the fiber optic interface. At a minimum, the two C220x drives at the end of a chain must be installed with the fiber optic interface. Detailed information is provided in Chapter 5.

Software Configuration

Only one software license is needed for SPU Switchover/XL to run on a pair of HP 3000 900 Series systems. The SPU Switchover product requires MPE/XL 3.0 or a subsequent release. Note that both processors in a pair must have the same operating system software release revision. Additional information on software setup and configuration is provided in the SPU Switchover/XL User's Guide (P/N 36378-90001).

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