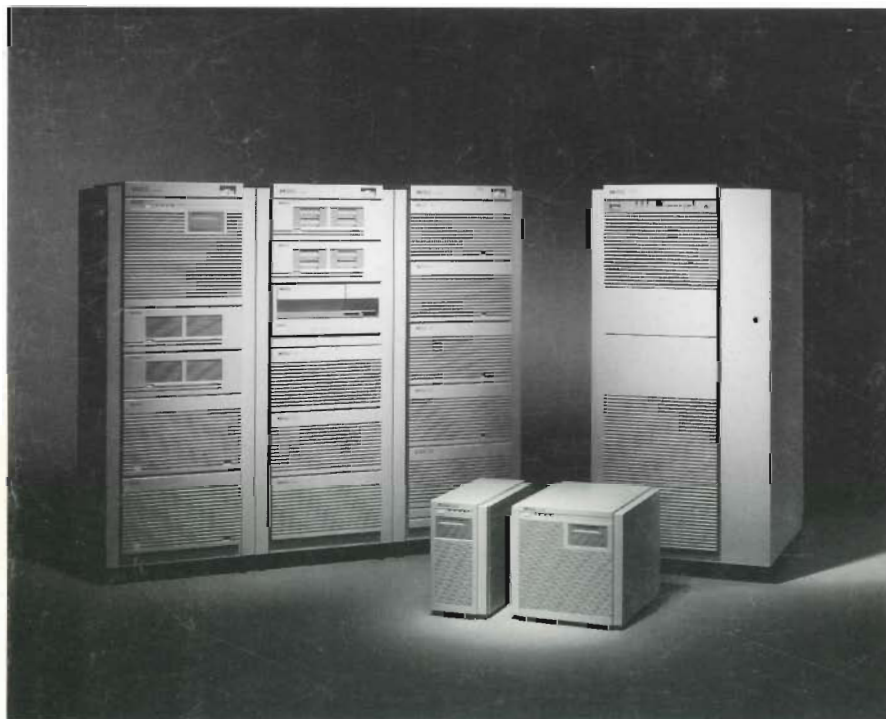

HP 9000 Series 800 Business Servers

Configuration Guide

January 1994



INSIDE

Introduction
Configuration Process
Computer System Information
Cabinets, Racking, and
Uninterruptible Power Supplies
I/O Interfaces
Peripherals
Software
Customer Support Services
Reference Sources
Index

Internal and
Channel Partner
Use Only

HP 9000
**OPEN FOR
BUSINESS**

HP Computer Museum
www.hpmuseum.net

For research and education purposes only.

Table of Contents

**Section
No.**

- 1. Introduction
- 2. Configuration Process
- 3. Computer System Information
- 4. Cabinets, Racking, and Uninterruptible Power Supplies
- 5. I/O Interfaces
- 6. Peripherals
- 7. Software
- 8. Customer Support Services
- 9. Reference Sources
- 10. Index

Introduction	1	I/O Interfaces	5	Reference Sources	9
Configuration Process	2	Peripherals	6	Index	10
Computer System Information	3	Software	7		
Cabinets, Racking, and Uninterruptible Power Supplies	4	Customer Support Services	8		





DO NOT DISCARD YOUR PREVIOUS HP 9000 SERIES 800 CONFIGURATION GUIDES (P/N 5960-7318, 5091-4367E, 5091-5739E, and 5091-7228E)

They contain information on older Series 800 servers that have been deleted from this version.

How To Use This Guide

This Guide is intended to assist Sales and Technical people who will be configuring HP 9000 Series 800 Servers. It begins by directing the user through the logical steps necessary to configure a system, starting with the need to understand the customer's intended operating environment. Next, the system requirements are determined and a system SPU can be selected.

References are made to other sections of the Guide during the configuration process, in order to select, for example, the appropriate disk drives for different operating environments.

Technical information on SPUs, peripherals, etc., is included to help with responses to RFQs, etc. You will probably also use material described in "Additional Information Sources," below.

What's New In This Guide?

Configuration Process Section

New Products (all of the following products require HP-UX 9.04)

SPUs

E-Class Business Servers	SSP # A2959AW
E25 Business Server	A2937AW
E35 Business Server	A2938AW
E45 Business Server	A3130AW
T500 Corporate Business Server	SSP # A3032A
T500 SPU	A2339A

System (Internal) Peripherals

535 Mbyte 3.5" Single-Ended SCSI Disk	A2958A
2 Gbyte 3.5" Single-Ended SCSI Disk	A3087A
8mm Tape Drive	A3024A
1.44 Mbyte 3.5" MicroFloppy Disk Drive	A2942A
1 Gbyte Quarter-Inch Cartridge Drive (QIC)	A2944A
High-Performance CD-ROM Drive	C3086A

External Peripherals and I/O

Single-Ended SCSI-2 2 Gbyte 3.5" Disk Drive	C3040R/T, C3041R/T
Fast/Wide SCSI-2 HP-PB I/O Card	28696A
Fast/Wide SCSI-2 Disk Array	C2437/39/40HZ
Fast/Wide SCSI-2 1 Gbyte 3.5" Disk Drive	C3032R/T, C3035R/T, C3036T
Fast/Wide SCSI-2 2 Gbyte 3.5" Disk Drive	C3550R/T, C3551R/T
8mm Tape Drive	A3024A
3480-Compatible Tape Drive	StorageTek Models 4220/4280
DTC72MX DTC	J2070AZ
PowerTrust Uninterruptible Power Systems	A2941A, A2998A
Instant Ignition for Software	Option 0D1

Additional Tools and Sources of Information

1. CONRAD On-line Configuration Tool

CONRAD is a knowledge-based system that helps users identify the necessary, optional, and compatible components of HP system solutions. It is currently available in sales offices in the U.S. and in many countries throughout the world.

For information about or assistance with CONRAD, a support service is available from 5:30 AM to 5:30 PM PST. Anyone can call CONRAD Support if they have a CONRAD template and an advice file.

CONRAD Support has moved from Palo Alto to Cupertino, California. New numbers and addresses to contact CONRAD Support are:
 Support Hotline: Telnet or 408-447-3233
 HPDesk: Conrad SUPPORT / HP4700
 UNIX Mail: conrad_support@cup.hp.com
 Configuration Support Fax: Telnet or 408-447-5929
 Mailing Address: 19447 Pruneridge Avenue, MS 47UI Cupertino, CA 95014-0683

2. Data Sheets on Individual Products (see Section 9)

3. Configuration Centers

4. Sales Response Center (Telnet or (408) 447-4444)

5. SE Support

Pricing Information

For U.S. list prices on Series 800 Business Servers, interfaces, peripherals, software, and support check the HP 9000 Series 800 Business Servers Price Guide for reference only. For most current pricing for quotes, use the HP Corporate Price List. Outside the U.S., consult your local country's Price Guide for this information.

Configuration Guide Available Via Power Tools

This configuration guide is available electronically via Power Tools, and can be accessed on-line through Internet or on CD-ROM. For Power Tools access instructions, send an HPDesk message to PowerTools/HP6650/AF.

Series 800 Business Servers at-a-Glance

SPU Model No.	SPU Product No.	S/W Tier	Single High Slots	I/O Bus	Clk Spd MHz	Instr/Data Cache (KB)	Relative OLTP Performance to F10*	Ports Included On LAN-based Multifunction I/O Card				SPU Model No.
								SCSI	RS-232	Centronics	LAN	
E25	A2937AW	1	2-4	HP-PB	48	64†	1.6	1	8	1	1	E25
E35	A2938AW	1	2-4	HP-PB	64	256†	2.5	1	8	1	1	E35
E45	A3130AW	1	2-4	HP-PB	80	256†	3.1	1	8	1	1	E45
F10	A2367A	1	2	HP-PB	32	32/64	1.0	1	2	0	1	F10
F20	A2432A	1	2	HP-PB	48	64/64	1.7	1	2	0	1	F20
F30	A2433A	1	2	HP-PB	48	256/256	2.5	1	2	0	1	F30
G30	A2434A	1	4	HP-PB	48	256/256	2.5	1	2	0	1	G30
G40	A2435A	1	4	HP-PB	64	256/256	3.0	1	2	0	1	G40
G50	A2436A	1	4	HP-PB	96	256/256	3.9	1	2	0	1	G50
G60	A2980A	1	4	HP-PB	96	1024/1024	5.7	1	2	0	1	G60
G70	A2971A	1	4	HP-PB	2 × 96	2048/2048	8.3	1	2	0	1	G70
H20	A2366A	2	8	HP-PB	48	64/64	1.7	1	2	0	1	H20
H30	A2437A	2	8	HP-PB	48	256/256	2.5	1	2	0	1	H30
H40	A2438A	2	8	HP-PB	64	256/256	3.0	1	2	0	1	H40
H50	A2439A	2	8	HP-PB	96	256/256	3.9	1	2	0	1	H50
H60	A2981A	2	8	HP-PB	96	1024/1024	5.7	1	2	0	1	H60
H70	A2970A	2	8	HP-PB	2 × 96	2048/2048	8.3	1	2	0	1	H70
I30	A2365A	2	12	HP-PB	48	256/256	2.5	1	2	0	1	I30
I40	A2364A	2	12	HP-PB	64	256/256	3.0	1	2	0	1	I40
I50	A2363A	2	12	HP-PB	96	256/256	3.9	1	2	0	1	I50
I60	A2982A	2	12	HP-PB	96	1024/1024	5.7	1	2	0	1	I60
I70	A2362A	2	12	HP-PB	2 × 96	2048/2048	8.3	1	2	0	1	I70
T500/1-CPU	A2339A	3	14-112	HP-PB	90	2048/CPU	6.0	1	16	1	1	T500/1-CPU
T500/2-CPU	A2339A	3	14-112	HP-PB	90	2048/CPU	10.7	1	16	1	1	T500/2-CPU
T500/3-CPU	A2339A	3	14-112	HP-PB	90	2048/CPU	15.0	1	16	1	1	T500/3-CPU
T500/4-CPU	A2339A	3	14-112	HP-PB	90	2048/CPU	19.3	1	16	1	1	T500/4-CPU
T500/5-CPU	A2339A	3	14-112	HP-PB	90	2048/CPU	23.2	1	16	1	1	T500/5-CPU
T500/6-CPU	A2339A	3	14-112	HP-PB	90	2048/CPU	26.8	1	16	1	1	T500/6-CPU
T500/7-CPU	A2339A	3	14-112	HP-PB	90	2048/CPU	30.0	1	16	1	1	T500/7-CPU
T500/8-CPU	A2339A	3	14-112	HP-PB	90	2048/CPU	32.8	1	16	1	1	T500/8-CPU
T500/9-CPU	A2339A	3	14-112	HP-PB	90	2048/CPU	34.6	1	16	1	1	T500/9-CPU
T500/10-CPU	A2339A	3	14-112	HP-PB	90	2048/CPU	36.4	1	16	1	1	T500/10-CPU
T500/11-CPU	A2339A	3	14-112	HP-PB	90	2048/CPU	38.3	1	16	1	1	T500/11-CPU
T500/12-CPU	A2339A	3	14-112	HP-PB	90	2048/CPU	40.1	1	16	1	1	T500/12-CPU

Product numbers for E/F/G/H/I and T500 servers must be ordered with appropriate Structured Solution Product (SSP) part number: E-Class, A2959AW; F-Class, A2428A; G-Class, A2429A; H-Class, A2430A; I-Class, A2431A; T500, A3032A.

* Note: Relative OLTP performance is a general guideline since factors influencing performance of applications vary widely. T500 performance beyond 4 CPUs is based on HP-UX 10.0.

† Combined instruction and data cache

Series 800 Business Servers at-a-Glance (cont'd)

Series 800 Business Servers at-a-Glance (cont'd)

SPU Model No.	SPU Product No.	S/W Tier	Single High Slots	I/O Bus	Clk Spd MHz	Instr/Data Cache (KB)	Relative OLTP Performance to F10*	Ports Included On LAN-based Multifunction I/O Card or Included With SPU					SPU Model No.
								SCSI	RS-232	Centronics	LAN	HP-FL	
These products are listed for reference only													
807S	A1751B	1	2	HP-PB	32	32/64	1	Internal only	8	0	0	0	807S
817S	A1703A	1	2	HP-PB	48	64/64	1.7	1	8	1	0	0	817S
827S	A1765A	1	6	HP-PB	48	64/64	1.7	1	8	1	0	0	827S
837S	A1704B	1	2	HP-PB	48	256/256	2.5	1	8	1	0	0	837S
847S	A1766A	2	6	HP-PB	48	256/256	2.5	1	8	1	0	0	847S
857S	A1706A	2	12	HP-PB	48	256/256	2.5	1	8	1	0	0	857S
867S	A1768A	2	6	HP-PB	64	256/256	3.0	1	8	1	0	0	867S
877S	A1769A	2	12	HP-PB	64	256/256	3.0	1	8	1	0	0	877S
887S	A2307A	2	6	HP-PB	96	256/256	3.9	1	8	1	0	0	887S
897S	A2306A	2	12	HP-PB	96	256/256	3.9	1	8	1	0	0	897S
808S	A1625A	1	6	HP-PB	16	64	0.17	0	8+2	0	0	0	808S
815S	A1071A	1	12	HP-PB	16	64	0.17	0	8+2	0	0	0	815S
822S	A1716A	1	16	HP-PB	25	32	0.35	0	8	0	0	0	822S
832S	A1044A	2	16	HP-PB	30	128	0.6	0	8	0	0	0	832S
842S	A1154A	2	16	HP-PB	32	1024	1.5	0	8	0	0	0	842S
852S	A1155A	2	16	HP-PB	50	1024	2.17	0	8	0	0	0	852S
825S	A1004A	2	7	CIO	25	16	0.28	0	6	0	0	0	825S
835S/635S	A1035A	2	7	CIO	30	128	0.64	0	6	0	0	0	835S/635S
840S	9741A	5	30	CIO	8	128	0.41	0	0	0	0	0	840S
845S/645S	A1608A	2	6	CIO	30	256	0.96	0	6	0	0	0	845S/645S
850S	9742A	3	10	CIO	27.5	128	0.71	0	6	0	0	0	850S
855S	A1114A	3	10	CIO	27.5	256	1.17	0	6	0	0	0	855S
860S	A1843A	3	10	CIO	27.5	1024	1.46	0	6	0	0	0	860S
865S	A1845A	3	10	CIO	50	768	2.14	0	6	0	0	0	865S
870S/100	A1135A	3	10	CIO	50	1024	2.82	0	6	0	0	0	870S/100
870S/200	A1146A	3	10	CIO	50/CPU	2 × 1024	4.2	0	6	0	0	0	870S/200
870S/300	A1147A	3	10	CIO	50/CPU	3 × 1024	5.6	0	6	0	0	0	870S/300
870S/400	A1148A	3	10	CIO	50/CPU	4 × 1024	6.8	0	6	0	0	0	870S/400
890	A1826A	3	14-112	HP-PB	60	4096/CPU	4.8-15.4	1	16	1	1	1	890

* Note: Relative OLTP performance is a general guideline since factors influencing performance of applications vary widely. T500 performance beyond 4 CPUs is based on HP-UX 10.0.

FK - 1
L35 - 2-5

Series 800 Business Servers at-a-Glance (cont'd)

SPU Model No.	Base Memory (MB)	Max. Memory (MB)	Base Internal Disk (MB)	Max. Disk Storage							Max. Total Suppt'd Disk (GB)	Max. Internal Tape Capacity (GB)	SPU Model No.
				Internal Single-Ended SCSI (GB)	Total Single-Ended SCSI (GB)	Total F/W SCSI (Disks & Arrays) (GB)	F/W SCSI Array (GB)	HP-IB (GB)	FL (GB)	FL Disk Array (GB)			
E25	0††	512†	0	4‡	70	144	112	n/a	n/a	n/a	156	8-16DDS	E25
E35	0††	512†	0	4‡	70	144	112	n/a	n/a	n/a	156	8-16DDS	E35
E45	0††	512†	0	4‡	70	144	112	n/a	n/a	n/a	156	8-16DDS	E45
F10	16	384*	535	4	42	72	56	2.7	n/a	n/a	84	4-8DDS	F10
F20	16	384*	535	4	42	72	56	2.7	n/a	n/a	84	4-8DDS	F20
F30	16	384*	535	4	42	72	56	2.7	n/a	n/a	84	4-8DDS	F30
G30	32	768**	1 GB	10	70	144	112	5.4	21	86	156	4-8DDS	G30
G40	32	768**	1 GB	10	70	144	112	5.4	21	86	156	4-8DDS	G40
G50	32	768**	1 GB	10	70	144	112	5.4	21	86	156	4-8DDS	G50
G60	32	768**	1 GB	10	70	144	112	5.4	21	86	156	4-8DDS	G60
G70	32	768**	1 GB	10	70	144	112	5.4	21	86	156	4-8DDS	G70
H20	64	768**	1 GB	10	120	288	224	5.4	43	173	300	4-8DDS	H20
H30	64	768**	1 GB	10	120	288	224	5.4	43	173	300	4-8DDS	H30
H40	64	768**	1 GB	10	120	288	224	5.4	43	173	300	4-8DDS	H40
H50	64	768**	1 GB	10	120	288	224	5.4	43	173	300	4-8DDS	H50
H60	64	768**	1 GB	10	120	288	224	5.4	43	173	300	4-8DDS	H60
H70	64	768**	1 GB	10	120	288	224	5.4	43	173	300	4-8DDS	H70
I30	64	768**	2 x 2 GB	10	120	330	280	5.4	43	173	330	4-8DDS	I30
I40	64	768**	2 x 2 GB	10	120	330	280	5.4	43	173	330	4-8DDS	I40
I50	64	768**	2 x 2 GB	10	120	330	280	5.4	43	173	330	4-8DDS	I50
I60	64	768**	2 x 2 GB	10	120	330	280	5.4	43	173	330	4-8DDS	I60
I70	64	768**	2 x 2 GB	10	120	330	280	5.4	43	173	330	4-8DDS	I70
T500	256	2048	n/a	n/a	168	1900	1900	8.0	330	1300	1900	n/a	T500

These products are listed for reference only

807S	16	128	328	1.36	42	72	56	2.7	n/a	n/a	72	4-8/DDS	807S
817S	16	192	328	1.36	42	72	56	2.7	n/a	n/a	72	4-8/DDS	817S
827S	16	384	328	4.08	70	196	168	5.4	21.4	129.6	196	4-8/DDS	827S
837S	32	192	677	1.36	42	72	56	2.7	n/a	n/a	72	4-8/DDS	837S
847S	32	384	677	4.08	70	196	168	5.4	21.4	129.6	196	4-8/DDS	847S
857S	64	384	677	4.08	70	330	280	5.4	42.8	172.8	330	4-8/DDS	857S
867S	64	384	1380	4.08	70	196	168	5.4	32.1	129.6	196	4-8/DDS	867S
877S	64	384	1360	4.08	70	330	280	5.4	42.8	172.8	330	4-8/DDS	877S
887S	64	768	1360	4.08	70	196	168	5.4	32.1	129.6	196	4-8/DDS	887S
897S	64	768	1360	4.08	70	330	280	5.4	42.8	172.8	330	4-8/DDS	897S
808S	8	32	152	n/a	8.0	n/a	n/a	8.0	n/a	n/a	8.0	CTD	808S
815S	8	56	335	n/a	8.0	n/a	n/a	8.0	n/a	n/a	8.0	CTD	815S
822S	8	128	335	n/a	10.6	n/a	n/a	8.0	21.4	82.3	82.3	DDS	822S
832S	16	128	335	n/a	10.6	n/a	n/a	8.0	21.4	82.3	82.3	DDS	832S
842S	28	256	670	n/a	21.2	n/a	n/a	8.0	42.8	168.7	168.7	DDS	842S
852S	64	256	670	n/a	21.2	n/a	n/a	8.0	42.8	168.7	168.7	DDS	852S
825S	8	192	n/a	n/a	10.6	n/a	n/a	8.0	21.4	82.3	82.3	n/a	825S
835S/635S	8	192	n/a	n/a	10.6	n/a	n/a	8.0	21.4	82.3	82.3	n/a	835S/635S
840S	8	96	n/a	n/a	n/a	n/a	n/a	8.0	n/a	n/a	6.9	n/a	840S
845S/645	32	192	n/a	n/a	10.6	n/a	n/a	8.0	21.4	82.3	82.3	n/a	845S/645
850S	48	256	n/a	n/a	21.2	n/a	n/a	8.0	42.8	168.7	168.7	n/a	850S
855S	48	256	n/a	n/a	21.2	n/a	n/a	8.0	42.8	168.7	168.7	n/a	855S
860S	48	256	n/a	n/a	21.2	n/a	n/a	8.0	42.8	168.7	168.7	n/a	860S
865S	64	512	n/a	n/a	21.2	n/a	n/a	8.0	85.8	341.5	341.5	n/a	865S
870S/100	96	768	n/a	n/a	21.2	n/a	n/a	8.0	85.8	341.5	341.5	n/a	870S/100
870S/200	128	768	n/a	n/a	21.2	n/a	n/a	8.0	128	514.3	514.3	n/a	870S/200
870S/300	160	768	n/a	n/a	21.2	n/a	n/a	8.0	128	514.3	514.3	n/a	870S/300
870S/400	192	768	n/a	n/a	21.2	n/a	n/a	8.0	128	514.3	514.3	n/a	870S/400
890	128	2048	n/a	n/a	168	1900	1900	8.0	330	1300	1900	n/a	890

* 384 MB with HP-UX 9.0x or greater, 192 MB with HP-UX 8.02

** 768 MB with HP-UX 9.0x or greater, 384 MB with HP-UX 8.02

† Using 128 MB memory modules orderable March 1, 1994

†† Minimum supported/orderable configuration = 16 MB

‡ 2 GB drive orderable after March 1, 1994

Series 800 Business Servers at-a-Glance (cont'd)

Max. I/O and Networking Cards (cont'd on next page)

SPU Model No.	Max. SCSI Tape Drives	Max. HP-IB Tape Drives	Max. Centronics Printers	Max. [†] Serial Printers	Max. HP-IB Printers	Max. HP-IB Plotters	Max. SCSI-2 [‡] Parallel Centronics	Max. Fast/Wide SCSI-2	Max. HP-IB	Max. HP-PB FL (28615A)/ PBA-FL (A1749A)	Max. MUX Ports	Max. # of Users (via DTC & MUX)	SPU Model No.
E25	8	n/a	5	50	n/a	n/a	4	2	0	0	144	1120	E25
E35	8	n/a	5	70	n/a	n/a	4	2	0	0	144	1850	E35
E45	8	n/a	5	90	n/a	n/a	4	2	0	0	144	1850	E45
F10	8	4	3	20	n/a	4	2	1	1	0	80	1120	F10
F20	8	4	3	40	n/a	4	2	1	1	0	80	1120	F20
F30	8	4	3	40	n/a	4	2	1	1	0	80	1120	F30
G30	8	8**	5	40	n/a	8**	4	2	2	2/2	144	1120	G30
G40	8	8**	5	40	n/a	8**	4	2	2	2/2	144	1850	G40
G50	8	8**	5	40	n/a	8**	4	2	2	2/2	144	1850	G50
G60	8	8**	5	40	n/a	8**	4	2	2	2/2	144	2500	G60
G70	8	8**	5	40	n/a	8**	4	2	2	2/2	144	3500††	G70
H20	8	8**	9	40	n/a	8**	8	4	2	4/2	272	1120	H20
H30	8	8**	9	40	n/a	8**	8	4	2	4/2	272	1120	H30
H40	8	8**	9	40	n/a	8**	8	4	2	4/2	272	1850	H40
H50	8	8**	9	40	n/a	8**	8	4	2	4/2	272	1850	H50
H60	8	8**	9	40	n/a	8**	8	4	2	4/2	272	2500	H60
H70	8	8**	9	40	n/a	8**	8	4	2	4/2	272	3500††	H70
I30	8	8**	13	50	n/a	8**	12	5††	2	4/2	400	1120	I30
I40	8	8**	13	50	n/a	8**	12	5††	2	4/2	400	1850	I40
I50	8	8**	13	50	n/a	8**	12	5††	2	4/2	400	1850	I50
I60	8	8**	13	50	n/a	8**	12	5††	2	4/2	400	2500	I60
I70	8	8**	13	50	n/a	8**	12	5††	2	4/2	400	3500††	I70
T500	16***	8**	16	250	n/a	8**	20	40	9	40	2048	4500††	T500

These products are listed for reference only

807S	8	4	3	20	n/a	8**	2	1	1	0	40	336	807S
817S	8	4	3	40	n/a	8**	2	1	1	0	48	528	817S
827S	8	8**	7	40	n/a	8**	6	3	2	2	112	528	827S
837S	8	4	3	40	n/a	8**	2	1	1	0	48	624	837S
847S	8	8**	7	40	n/a	8**	6	3	2	2	112	624	847S
857S	8	8**	13	50	n/a	8**	12	5	2	2	208	624	857S
867S	8	8**	7	40	n/a	8**	6	3	2	2	112	896	867S
877S	8	8**	13	50	n/a	8**	12	5	2	2	208	896	877S
887S	8	8**	7	50	n/a	8**	6	3	2	3	12	1120	887S
897S	8	8**	13	50	n/a	8**	12	5	2	3	208	1120	897S
808S	8*	12	3	8	n/a	8**	1	n/a	3	0	16	16	808S
815S	8*	12	3	8	n/a	8**	3	n/a	3	0	48	96	815S
822S	4	12	4	20	n/a	8**	6	n/a	3	2	48	96	822S
832S	4	12	4	20	n/a	8**	6	n/a	3	2	80	160	832S
842S	8*	12	6	20	n/a	8**	6	n/a	3	4	80	400	842S
852S	8*	12	6	20	n/a	8**	6	n/a	3	4	80	400	852S
825S	8*	8	n/a	20	8	8**	5	n/a	6	2	198	230	825S
835S/635S	8*	8	n/a	20	8	8**	5	n/a	6	2	86	214	835S/635S
840S	n/a	8	n/a	20	8	8**	n/a	n/a	28	0	128	123	840S
845S/645S	8*	8	n/a	20	8	8**	5	n/a	6	2	70	196	845S/645S
850S	8*	8	n/a	20	8	8**	10	n/a	4	4	300	300	850S
855S	8*	8	n/a	20	8	8**	10	n/a	4	4	400	400	855S
860S	8*	8	n/a	20	8	8**	10	n/a	4	4	400	400	860S
865S	8*	8	n/a	20	8	8**	10	n/a	4	8	512	600	865S
870S/100	8*	8	n/a	20	8	8**	10	n/a	4	8	600	300	870S/100
870S/200	8*	8	n/a	20	8	8**	10	n/a	4	12	600	1200	870S/200
870S/300	8*	8	n/a	20	8	8**	10	n/a	4	12	600	1650	870S/300
870S/400	8*	8	n/a	20	8	8**	10	n/a	4	12	600	2000	870S/400
890	16***	8**	16	250	n/a	8**	20	40	9	40	2048	4500††	890

* with 2 SCSI interface cards

** with 2 HP-IB interface cards

*** For configurations requiring up to 32 tape drives (total number of SCSI plus HP-IB tape drives) on T500 or model 890 Corporate Business Servers, contact the Response Center for a patch to HP-LUX 9.0 (PHKL-2922) which allows up to 32 tape drives to be configured per system.

† Contact the factory if support for more printers is required

†† Limited by chassis power supply constraints

‡ Not including multifunction I/O card

‡‡ Contact the factory if customer requires more than 3000 terminal connections

Series 800 Business Servers at-a-Glance (cont'd)

Max. I/O and Networking Cards (cont'd)									
SPU Model No.	Max.† 802.3 LAN	Max. 802.5 Token Ring LAN	Max. 8-Channel MUX	Max. 16-Channel MUX	Max. 32-Channel MUX	Max. FDDI	Max. X.25	Max. SNAplusLink	SPU Model No.
E25	4	4	2	4	4	2	4	4	E25
E35	4	4	2	4	4	2	4	4	E35
E45	4	4	2	4	4	2	4	4	E45
F10	2	2	2	2	2	1	2	2	F10
F20	2	2	2	2	2	1	2	2	F20
F30	2	2	2	2	2	1	2	2	F30
G30	4	4	4	4	4	2	4	4	G30
G40	4	4	4	4	4	2	4	4	G40
G50	4	4	4	4	4	2	4	4	G50
G60	4	4	4	4	4	2	4	4	G60
G70	4	4	4	4	4	2	4	4	G70
H20	7	5	8	8	8	2	8	8	H20
H30	7	5	8	8	8	2	8	8	H30
H40	7	5	8	8	8	2	8	8	H40
H50	7	5	8	8	8	2	8	8	H50
H60	7	5	8	8	8	2	8	8	H60
H70	7	5	8	8	8	2	8	8	H70
I30	7	5	12	12	12	2	10	10	I30
I40	7	5	12	12	12	2	10	10	I40
I50	7	5	12	12	12	2	10	10	I50
I60	7	5	12	12	12	2	10	10	I60
I70	7	5	12	12	12	2	10	10	I70
T500	9	5	64	64	64	3	12	12	T500
These products are listed for reference only									
807S	2	2	2	2	2	1	2	2	807S
817S	2	2	2	2	2	1	2	2	817S
827S	5	5	6	6	6	2	6	6	827S
837S	2	2	2	2	2	1	2	2	837S
847S	5	5	6	6	6	2	6	6	847S
857S	7	5	12	12	12	2	10	10	857S
867S	5	5	6	6	6	2	6	6	867S
877S	7	5	12	12	12	2	10	10	877S
887S	5	5	6	6	6	2	6	6	887S
897S	5	5	12	12	12	2	10	10	897S
808S	5	0	n/a	n/a	n/a	0	2	2	808S
815S	5	0	n/a	n/a	n/a	0	4	4	815S
822S	5	0	4	4	4	0	4	4	822S
832S	5	0	8	8	8	0	4	4	832S
842S	5	0	8	8	8	0	5	5	842S
852S	5	0	8	8	8	0	7	7	852S
825S	5	0	n/a	n/a	n/a	0	4	4	825S
835S/635S	5	0	n/a	n/a	n/a	0	4	4	835S/635S
840S	5	0	n/a	n/a	n/a	0	5	5	840S
845S/645S	5	0	n/a	n/a	n/a	0	3	3	845S/645S
850S	5	0	n/a	n/a	n/a	0	7	7	850S
855S	5	0	n/a	n/a	n/a	0	7	7	855S
860S	5	0	n/a	n/a	n/a	0	7	7	860S
865S	5	0	n/a	n/a	n/a	0	7	7	865S
870S/100	5	0	n/a	n/a	n/a	0	7	7	870S/100
870S/200	5	0	n/a	n/a	n/a	0	7	7	870S/200
870S/300	5	0	n/a	n/a	n/a	0	7	7	870S/300
870S/400	5	0	n/a	n/a	n/a	0	7	7	870S/400
890	9	5	64	64	64	3	12	12	890

† Not including multifunction I/O card

Series 800 Business Servers at-a-Glance (cont'd)

Series 800 Business Servers at-a-Glance (cont'd)

SPU Model Number	Depth in mm	Width in mm	Height in mm	Weight in Kg	Power Reqmnt. Watts	VA Rating for UPS Loading	Heat Diss BTUs Per Hr.	First CPL Date	First Ship Date	Site Prep Included	SPU Model Number
E25	533	222	430	32	400	550	1385	1/94	1/94	no	E25
E35	533	222	430	32	400	550	1385	1/94	1/94	no	E35
E45	533	222	430	32	400	550	1385	2/94	2/94	no	E45
F10	533	222	430	32	400	550	1385	12/92	1/93	no	F10
F20	533	222	430	32	400	550	1385	12/92	1/93	no	F20
F30	533	222	430	32	400	550	1385	12/92	1/93	no	F30
G30	533	424	430	50	800	750	2770	12/92	1/93	yes	G30
G40	533	424	430	50	800	750	2770	12/92	1/93	yes	G40
G50	533	424	430	50	800	750	2770	12/92	1/93	yes	G50
G60	533	424	430	50	800	750	2770	7/93	9/93	yes	G60
G70	533	424	430	50	800	750	2770	7/93	9/93	yes	G70
H20	533	424	430	50	800	750	2770	12/92	1/93	yes	H20
H30	533	424	430	50	800	750	2770	12/92	1/93	yes	H30
H40	533	424	430	50	800	750	2770	12/92	1/93	yes	H40
H50	533	424	430	50	800	750	2770	12/92	1/93	yes	H50
H60	533	424	430	50	800	750	2770	7/93	9/93	yes	H60
H70	533	424	430	50	800	750	2770	7/93	9/93	yes	H70
I30	533	424	430	50	800	750	2770	12/92	1/93	yes	I30
I40	533	424	430	50	800	750	2770	12/92	1/93	yes	I40
I50	533	424	430	50	800	750	2770	12/92	1/93	yes	I50
I60	533	424	430	50	800	750	2770	7/93	9/93	yes	I60
I70	533	424	430	50	800	750	2770	7/93	9/93	yes	I70
T500	905	750	1620	375	2434	1081-2621*	8300	11/93	12/93	yes	T500
These products are listed for reference only											
807S	533	222	430	32	400	550	1385	6/91	8/91	no	807S
817S	533	222	430	32	400	550	1385	6/91	8/91	no	817S
827S	533	444	430	50	800	750	2770	6/91	9/91	yes	827S
837S	533	222	430	32	400	550	1385	6/91	8/91	no	837S
847S	533	444	430	50	800	750	2770	6/91	9/91	yes	847S
857S	533	444	430	50	800	750	2770	6/91	9/91	yes	857S
867S	533	444	430	50	800	750	2770	12/91	12/91	yes	867S
877S	533	444	430	50	800	750	2770	12/91	12/91	yes	877S
887S	533	444	430	50	800	750	2770	6/92	10/92	yes	887S
897S	533	444	430	50	800	750	2770	6/92	10/92	yes	897S
808S	435	325	312	27	400	—	1364	11/89	11/89	yes	808S
815S	401	325	312	20	400	—	1364	7/89	11/89	yes	815S
822S	710	375	750	110	1000	—	3410	5/90	5/90	yes	822S
832S	710	375	750	110	1000	—	3410	1/90	4/90	yes	832S
842S	710	375	750	110	1000	—	3410	12/90	1/91	yes	842S
852S	710	375	750	110	1000	—	3410	12/90	1/91	yes	852S
825S	500	325	234	23	600	—	2000	5/87	8/87	yes	825S
835S/635S	500	325	234	23	600	—	2000	4/88	8/88	yes	835S/635S
840S	965	600	1000	160	1350	—	4600	5/86	11/86	yes	840S
845S/645S	500	325	234	23	600	—	2000	1/90	1/90	yes	845S/645S
850S	710	1300	1000	400	1783	—	6086	5/87	12/87	yes	850S
855S	710	1300	1000	400	2056	—	7016	8/88	3/89	yes	855S
860S	710	1300	1000	400	2056	—	7016	10/90	10/90	yes	860S
865S	710	1300	1000	400	2569	—	8768	12/90	4/91	yes	865S
870S/100	710	1300	1000	400	2569	—	8768	1/90	9/90	yes	870S/100
870S/200	710	1300	1000	400	2569	—	8768	1/90	6/91	yes	870S/200
870S/300	710	1300	1000	400	2569	—	8768	12/91	12/91	yes	870S/300
870S/400	710	1300	1000	400	2569	—	8768	12/91	12/91	yes	870S/400
890	905	750	1620	375	2434	1166-2469*	8300	5/92	10/92	yes	890

* VA rating varies with SPU configuration. Refer to T500 and 890 configuration sections for details.

Series 800 Business Servers at-a-Glance (cont'd)

SPU Model No.	SPEC int92	SPEC fp92	SPEC rate_int92	SPEC rate_fp92
E25	44*	66*	1050*	1575*
E35	65*	98*	1563*	2328*
E45	80*	120*	1900*	2850*
F10	22.0	36.7	523	876
F20	33.6	56.1	816	1335
F30	37.8	62.4	890	1483
G30	37.8	62.4	890	1483
G40	50.5	81.6	1201	1949
G50	78.3	141.6	1854	3374
G60	107.7	195.2**	1944	4074
G70	n/a	n/a	3757	7325
H20	33.6	56.1	816	1335
H30	37.8	62.4	890	1483
H40	50.5	81.6	1201	1949
H50	78.3	141.6	1854	3374
H60	107.7	195.2**	1944	4074
H70	n/a	n/a	3757	7325
I30	37.8	62.4	890	1483
I40	50.5	81.6	1201	1949
I50	78.3	141.6	1854	3374
I60	107.7	195.2**	1944	4074
I70	n/a	n/a	3757	7325
T500/1	98.3	170.2	2310	4019
T500/2	n/a	n/a	4609	7963
T500/4	n/a	n/a	9017	15341
T500/8	n/a	n/a	17114	28341
T500/12	n/a	n/a	23717	38780

These products are listed for reference only

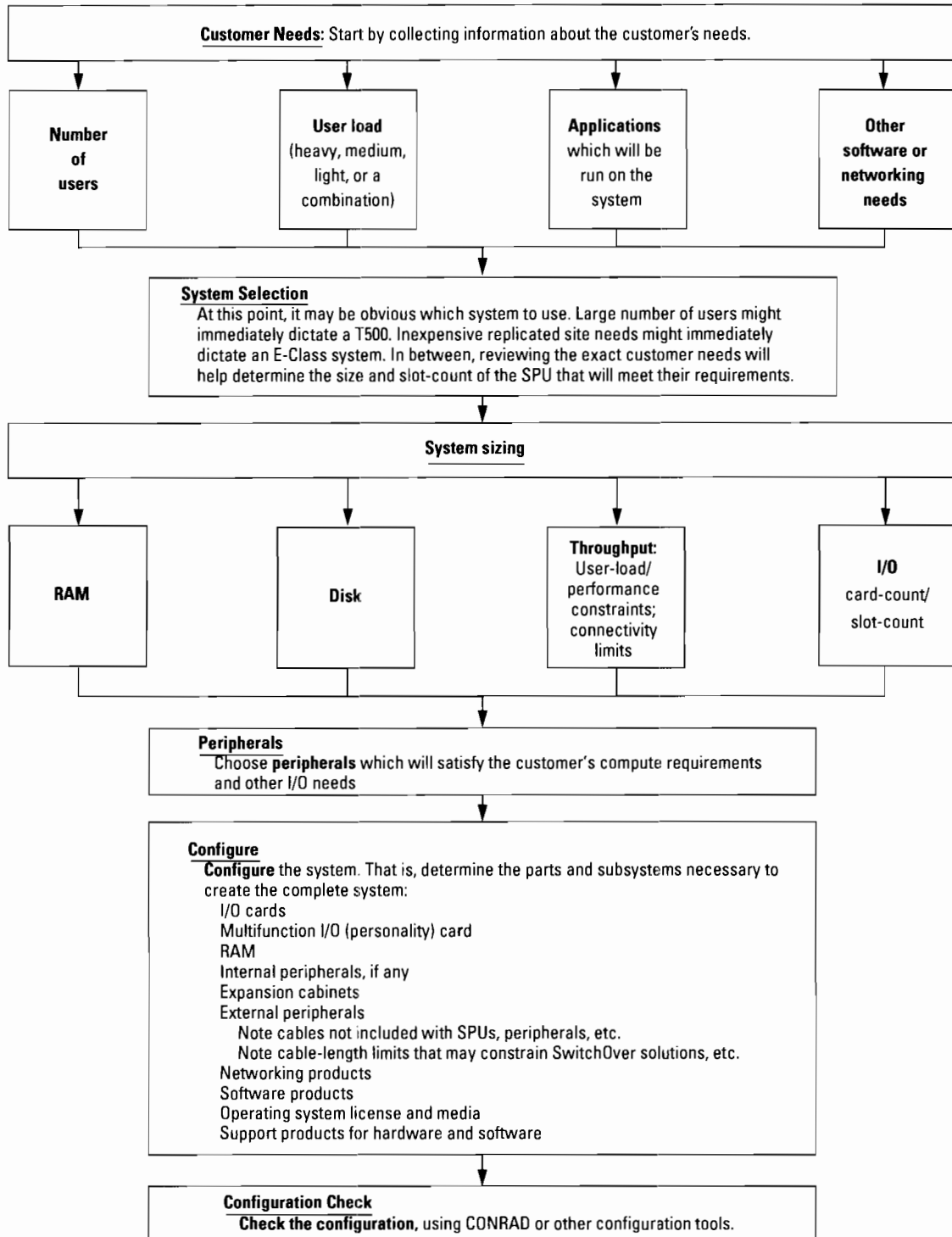
807S	22.0	36.7	523	876
817S	34.1	56.1	816	1335
827S	34.1	56.1	816	1335
837S	37.8	62.4	890	1483
847S	37.8	62.4	890	1483
857S	37.8	62.4	890	1483
867S	50.5	81.6	1201	1949
877S	50.5	81.6	1201	1949
887S	78.3	141.6	1854	3374
897S	78.3	141.6	1854	3374
808S	n/a	n/a	n/a	n/a
815S	n/a	n/a	n/a	n/a
822S	n/a	n/a	n/a	n/a
832S	n/a	n/a	n/a	n/a
842S	n/a	n/a	n/a	n/a
852S	n/a	n/a	n/a	n/a
825S	n/a	n/a	n/a	n/a
835S/635S	n/a	n/a	n/a	n/a
840S	n/a	n/a	n/a	n/a
845S/645S	n/a	n/a	n/a	n/a
850S	n/a	n/a	n/a	n/a
855S	n/a	n/a	n/a	n/a
860S	n/a	n/a	n/a	n/a
865S	n/a	n/a	n/a	n/a
870S/100	n/a	n/a	n/a	n/a
870S/200	n/a	n/a	n/a	n/a
870S/300	n/a	n/a	n/a	n/a
870S/400	n/a	n/a	n/a	n/a
890/1	51.0	49.6	1215	1180
890/2	n/a	n/a	2253	2360
890/3	n/a	n/a	3306	3529
890/4	n/a	n/a	4301	4685

* Preliminary; subject to change. Check PowerTools for final numbers

** Using compiler available April 1994.

Section 2 Configuration Process

Figure 2.1 Configuration Process Flow Chart



Choosing the Right Series 800 Server

Commercial User Workload Characterization

The following information is a guide to assist you in proposing the right system based on number of users and upgrade potential.

Customers will typically fall into one of the three following types of multiuser environments (see **Table 2.1**).

There are two types of users to consider when sizing a system: logged-on users and concurrent users. Definitions for these different types of users follow.

Logged-On Users—Real users who take breaks and experience interruptions in their work. Logged-on users are the type of users that a manager of a workgroup is referring to when

they mention that “There are 30 people in my department who need to access the computer for OLTP-type work.”

Concurrent Users—Heads down continuously working users who have no interruptions and take no breaks. Concurrent range of user numbers tend to be too conservative because in reality, users take breaks.

As a guideline, experience has shown in a typical commercial environment:

Logged-On Users = 2× the maximum number of Concurrent Users a system can support.

The information shown in **Table 2.2** describes maximum possible terminal connects for each SPU as well as ranges of typical concurrent users for each of the three commercial environments. Remember to size the system based upon how many users will be actively working at peak periods instead of how many users the customer needs to connect to the system. The range of user numbers is only a guideline since each individual customer’s environment is different.

Table 2.1 Types of Multiuser Environments

Environment Type	Workload
Software development or commercial applications with a relational database and a high rate of data entry (e.g. Oracle Forms, Metaphor)	Heavy
Commercial applications with a relational database and a low to medium level of data entry or non-relational database application with a high rate of data entry (e.g. Account database query, Pick-based applications, Universe, NFS applications)	Medium
Commercial application without a relational database and a medium to low level of data entry or query activity. (e.g. Asset management system using ISM files, OpenMail)	Light

Table 2.2 Range of Concurrent Users

Product	Concurrent Users (see definition on previous page)		
	Heavy Workload	Medium Workload	Light Workload
E25	1-40	1-80	1-120
E35	1-56	1-120	1-160
E45	1-70	1-200	1-250
F10*	1-24	1-48	1-48
F20	1-40	1-80	1-120
F30	1-56	1-120	1-160
G30	1-56	1-160	1-200
G40	1-70	1-200	1-250
G50	1-90	1-260	1-330
G60	1-120	1-350	1-445
G70	1-165	1-475	1-600
H20	1-40	1-80	1-150
H30	1-56	1-160	1-200
H40	1-70	1-200	1-250
H50	1-90	1-260	1-330
H60	1-120	1-350	1-445
H70	1-165	1-475	1-600
I30	1-56	1-160	1-200
I40	1-70	1-200	1-250
I50	1-90	1-260	1-330
I60	1-120	1-350	1-445
I70	1-165	1-475	1-600
T500/1-CPU	1-120	1-360	1-460
T500/2-CPU	1-210	1-640	1-810
T500/3-CPU	1-300	1-900	1-1150
T500/4-CPU	1-380	1-1150	1-1470
T500/5-CPU	1-450	1-1370	1-1750
T500/6-CPU	1-530	1-1580	1-2020
T500/7-CPU	1-590	1-1760	1-2250
T500/8-CPU	1-650	1-1940	1-2480
T500/9-CPU	1-690	1-2070	1-2640
T500/10-CPU	1-720	1-2170	1-2780
T500/11-CPU	1-760	1-2280	1-2920
T500/12-CPU	1-800	1-2390	1-3050
890/1-CPU	1-100	1-300	1-380
890/2-CPU	1-170	1-510	1-650
890/3-CPU	1-250	1-750	1-950
890/4-CPU	1-310	1-930	1-1180

Note: Ranges shown are concurrent users as observed in typical customer environments and from benchmarks. Greater numbers of logged-on users may be connected to the system. These ranges represent terminal connectivity only. PC, workstation, X Station connectivity will vary. See the following X Station section for details. T500/5 and beyond are based on HP-UX 10.0.

*Memory will be the restricting factor in connecting large numbers of users to an F10 (48 concurrent users is typical maximum).

When to Choose a G-Class Server

The E-class servers will have some performance overlap with the G-class servers. Specifically, the E35 has comparable performance to the G30, and the E45 has comparable performance to the G40. For equivalent configurations, the G30 and G40 are priced at a small premium (approximately 20%–25%) over the model E35 and E45, respectively.

Sell the G30 and G40 when customers anticipate a need for:

1. Future I/O expandability beyond 4 slots.
2. Future performance growth of a G50 or higher.
3. More than 512 MB of memory (256 MB before April).
4. More than 4 GB internal disk capacity.
5. A simpler upgrade path.

Note: Due to different implementations of memory technology, a configuration of 128 MB or higher will be more cost-effective with a G-class server. If support is not included, a configuration of 80 MB will be more cost-effective in a G30 system versus an E35.

Memory and Disk Configuration

The following guidelines will aid in determining typical memory and disk requirements for commercial applications. However, the amount of memory and disk required by a particular application environment varies widely. Hence, these are **guidelines** only. An exact determination of disk and memory requirements can only be made by understanding specific application requirements. Software suppliers, VABs and end-user technical personnel can provide the type of information necessary to make exact memory and disk space determinations.

These rules apply to a production environment commercial system. These guidelines are reasonably conservative. Systems may be configured with less memory or disk than shown here if time is spent optimizing the environment. E, F, G, H, and I model CPUs are much more powerful than the previous low and mid-range products. Thus, more RAM and disk is required than on some earlier systems, like the 815S or 822S, to maintain a properly balanced system.

<p>Disk Memory Requirements</p> <ul style="list-style-type: none"> • HP-UX "Fixed": _____ <ul style="list-style-type: none"> - Without LAN software, 79 MB, or - With LAN software, 130 MB • Language compilers, OmniBack/Turbo, other system software _____ • Application: _____ • Individual users space: _____ <ul style="list-style-type: none"> typ. 15 MB/user × # of users • "Swap" space <ul style="list-style-type: none"> Minimum: = Total RAM; _____ typical: 2 × RAM 	<p>RAM Memory Requirements</p> <ul style="list-style-type: none"> • HP-UX Fixed RAM Requirements _____ <ul style="list-style-type: none"> - LAN, X/Windows, NFS, etc. • RAM per user <ul style="list-style-type: none"> - Non-RDB application: _____ <ul style="list-style-type: none"> 0.5 MB/user × # of users - Informix, Ingres, Sybase: 1 MB/user × # of users _____ - Oracle: 1.5 MB/user × # of users _____ • Application overhead* _____ <ul style="list-style-type: none"> - Varies with application and system tuning 	<ul style="list-style-type: none"> • HP-UX Fixed RAM Requirements: <ul style="list-style-type: none"> - HP-UX alone requires 8 MB of RAM. Typically configure a total of 10–15 MB of RAM, depending on other products loaded (e.g., LAN S/W, X/Windows, NFS, etc.) • RAM per User Requirements for a Typical Commercial Application: <ul style="list-style-type: none"> - 1/2 MB per user with a non-RDB application - 1 MB per user with Informix, INGRES, or Sybase - 1.5 MB per user with Oracle (this is a conservative amount) • Application Overhead: <ul style="list-style-type: none"> - This varies widely depending upon the application and can increase dramatically as a result of tuning to bring larger tables into memory. A good starting point is 8 MB.
--	---	--

Note: The fixed disk space requirement shown is just for HP-UX. Language compilers, OmniBack/Turbo and other HP system software will require additional space. A good guideline is to use a 400–700 MB disk drive for a typical system. See Section 7 for Disk and RAM Requirements for Software.

EXAMPLE:

- Series 800
- 12 concurrent Informix users
- LAN software

HP-UX Fixed RAM →		10 MB			
+ (RAM/User ×	→	+ (1 MB ×			
Concurrent Users) →		12 Concurrent Users)			
+ Application Overhead	→	+ 8 MB			
= RAM Required	→	= 30 MB of RAM Required			

* Adding RAM to bring larger tables, etc., into memory may increase system throughput. Typical number = 8 MB.

Optimal Number of Disks per Single-Ended or Fast/Wide Differential SCSI-2 Interface Card

Disk I/O performance is governed by two factors: (1) the data throughput rate of the I/O channel and disks, and (2) the way the application(s) access data on the disks. The following information are meant to be guidelines rather than rules.

Table 2.3 Disk Interface Technologies

	Peak Throughput	Sustained Throughput
28655A Single-Ended SCSI-2	5 MB/s	2.5 MB/s
28696A Fast-Wide Differential SCSI	20 MB/s	7-10 MB/s

Table 2.4 I/O Performance Matrix

I/O Type	Single-Ended SCSI Disks	Fast/Wide Differential SCSI Disks*	Fast/Wide Differential SCSI Disk Array**
Heavy Sequential	3	10	7 with RAID 3
Heavy Random	5	10	7 with RAID 5
Light	7	15	7

* Assume read/write ratio = 3/1. Please see page 5-4 for more information.

** The new half-height Fast/Wide Differential SCSI-2 2 GB disk can not be mixed with F/W disk array running independent mode on the same channel.

Table 2.5 Two Small Disks Versus One Large Disk

"Two Small Disks"	"One Large Disk"
<ul style="list-style-type: none"> Concurrent application access to many files which are spread over multiple disks Customer can afford higher prices of multiple disks 	<ul style="list-style-type: none"> I/O slot limit of SPU is constraint Price sensitivity outweighs performance needs Sequential access of file larger than 2 small disks (no benefit to splitting file over 2 disks)

RDBMs Guidelines

1. Each of the following should be placed on separate spindles for optimal performance (high to low priority order):

- indices (especially indices which are accessed concurrently)
- logfiles
- tables which are accessed concurrently
- table area used by the RDB during sorts
- HP-UX commands and swap place
- rollback segments, where applicable

2. Configure a 677 MB or 1.0-Gbyte disk drive as the root spindle and home of the typically 566 MB user file system instead of a 1.35-Gbyte or 2.0-Gbyte disk. This will avoid wasting space and keep customers from placing their files on the same spindle which is not optimal for performance.

SCSI vs. HP-FL

Table 2.7 shows the sustainable file system disk performance measured with various SCSI and HP-FL drives connected to an I30. All measurements were made using the DISKBENCH4 benchmark developed by Hewlett-Packard. File system rotational delay was set to 1 ms. to provide balanced sequential read and write performance. An 8K/1K file system was used with a 16 Mbyte file except in the case of the C2254HA, which requires a minimum 2K block size. DISKBENCH4 measures actual physical disk I/O rates. Applications generally see much greater throughput rates due to HP-UX software disk caching.

*Note: When comparing the results in **Table 2.7** with other disk performance numbers, be sure to determine whether the other values represent true sustainable physical disk I/O and are not distorted by memory caching.*

Buffercache "Disk" Performance

HP-UX maintains a pool of disk buffers known as the buffercache. Application performance improves dramatically when disk reads and writes can be satisfied by the in memory buffercache instead of doing an actually physical disk I/O. **Table 2.8** shows the typical F/G/H/I buffercache throughput using the DISKBENCH3 benchmark.

Table 2.6 Comparing Disk Drives

	Single-Ended SCSI-2	Fast/Wide SCSI-2	HP-FL
Maximum Cable Length	6 m	25 m	500 m
Disk Arrays Available	No	Yes	Yes

Table 2.7 I30 Sustained HP-UX File System Disk Throughput (No Caching)

Disk Model	Disk Type	Storage Mbytes	Seq. Read KB/Sec.	Seq. Write KB/Sec.	Ran. Read KB/Sec.	Ran. Write KB/Sec.
C225XB	HP-FL	1355	680	410	529	626
C2254HA	HP-FL	5420	1140	468	591	661
C2474S	S.E. SCSI	1355	(Performance not measured, similar to C2473S)			
C3010	S.E. SCSI	2003	2560	1460	706	681*
C2445A	S.E. SCSI	1052	2500	1440	617	714*

*Results based on preliminary measurement w/prototype disk mechanisms.

Table 2.8 Typical Buffercache Performance with HP-UX 9.0

SPU Model	8K Read MB/Sec.	80K Read MB/Sec.	512K Read MB/Sec.	80K Write MB/Sec.
F10	25	17	15	16
F20, H20	37	29	24	25
F30, G30, H30, I30	40	38	30	29
G40, H40, I40	66	59	36	56
G50, H50, I50	110	77	48	72
G60, H60, I60	110	110	72	100
G70, H70, I70	110	110	72	100

Improving Disk Performance With Immediate Reporting

The C247x Single-Ended SCSI disk drives have a feature called immediate reporting which can significantly improve overall system performance in some applications. Immediate reporting allows the software application to continue processing without waiting for the actual physical disk I/O to complete.

Systems are typically configured for balanced sequential disk read and write performance. Without immediate reporting, the layout of sequential data on the disk skips one or more blocks. This provides the best sequential write performance but doesn't use the full disk bandwidth. The tunable parameter *rotational delay* determines the number of blocks to skip and thus the effective sequential disk performance.

Immediate reporting allows the system to concurrently process the next sequential block of data to be written while the current one is still being put on the physical disk media. This allows the layout of data on the disk to use contiguous blocks or a rotational delay of zero. The full bandwidth of the disk drive can now be utilized for both sequential reads and writes. Immediate reporting gives no performance improvement for random disk reads and a small improvement for random writes.

Immediate reporting does have a drawback in that it introduces some risk to data integrity in the event of a system failure. An

Uninterruptable Power Supply (UPS) is recommended for the disk drives when using immediate reporting.

X Stations

When configuring a system with X stations, it is important to include enough host memory for all the X windows applications that are being run on each X terminal. To estimate the number of logged-on users possible on each HP 9000 Series 800, you must first determine how many copies of each X application that will be running. On average, each X station will run about three X window applications on each X terminal, and each application will take about 2–4 MB of host memory. If the HP 9000 Series 800 can support 768 MB of memory, then the system can support approximately 64–128 logged-on users. The number of concurrent users is limited by the workload demands but is generally in the 30–40% range of the number of logged-on users.

For more information, a series of application performance briefs are available. To request a complete listing of these, send an HPDESK message to PANACOM HOTLINE with a subject code of "INDEX."

Disk Performance Considerations

Performance Considerations

- These guidelines can be used as a starting point; they are not hard-and-fast rules

- Your configuration may require more stringent limits or less-demanding limits, depending on the specific workload to be supported

- Use **Tables 2.9** and **2.10** to meet the needs of the type of workload which will be the most performance-critical for your customer

Table 2.9: Guidelines to help determine the maximum recommended number of disks per I/O card and maximum number of I/O cards per HP-PB card cage.

- OLTP Using Relational Database:
 - Typical multiuser, online application
 - Many simultaneous, small updates and inquiries
 - I/O mostly random
 - Block size averages 2 Kbytes
- Networked Online File Server
 - SPU used as central file server
 - Multiple local or remote clients connected via LAN or WAN
 - Random workload
 - Block size averages 8 Kbytes
 - Workload uses file system, not a database for data access
- Batch Processing with Relational Database
 - I/O-intensive part of batch
 - Highly sequential access
 - Uses relational database for data access
 - Block size averages 2 Kbytes
 - Batch performance is key measure of system throughput

As shown in **Table 2.9**, each of the different disk types has a different sustainable I/O speed for any given workload. This is due to differences in disk design and performance trade-offs made for array functionality (independent mode or RAID 3). Because of these differences in I/O speed, you will need a different number of disks (or arrays) for one application vs. another in order to achieve roughly the same level of I/O concurrency. Use **Table 2.9** to determine the maximum number of disks to configure to each interface card and the maximum number of interface cards per I/O card cage. Note: maximum number of I/O cards per card cage assumes application of 890 or T500 card cage.

Disk and I/O Channel Requirements for Models 890 and T500

If you have an estimate of the total disk I/O requirements for an 890 or T500 server, you can determine the right combination of disks, interface cards and I/O channels to ensure that no bottlenecks will occur. Use the formulas below to calculate your disk, I/O card, and card cage needs. You will need to select the type of disk you want to use, and the example I/O workload type that most closely matches the I/O workload of your application. Based on your chosen disk type and example I/O workload type use the figures for maximum disks per I/O card and maximum I/O cards per HP-PB card cage from the Disk Configuration Guidelines (**Table 2.9**).

$$\text{Number of Disks (or Arrays)} = \frac{\text{Estimated I/O Workload (I/Os per sec)}}{\text{I/O Speed for the chosen disk type}}$$

$$\text{Number of I/O Cards} = \frac{\text{Number of Disks}}{\text{Maximum Number of Disks (or Arrays) per I/O Card}}$$

$$\text{Number of HP-PB Card Cages} = \frac{\text{Number of I/O Cards}}{\text{Maximum Number of I/O Cards per HP-PB}}$$

Example:

1. Your application will generate an estimated I/O rate of 1,500 I/Os per second.
2. You choose to use HP-FL Independent Mode Disk Arrays with 5 disks in each array.
3. Your workload is most like I/O Workload #2, the Networked Online File Server.

$$\text{Number of Arrays} = \frac{1500 \text{ I/Os per sec}}{75 \text{ I/Os per sec per Array}} = 20 \text{ Arrays}$$

$$\begin{aligned} \text{Number of I/O Cards} &= \frac{\text{Number of Disks}}{\text{Maximum Number of Disks (or Arrays) per I/O Card}} = \frac{20 \text{ Arrays}}{3 \text{ Arrays/HP-FL}} \\ &= 6.67 \text{ HP-FL cards} \Rightarrow 7 \text{ HP-FL cards} \end{aligned}$$

$$\begin{aligned} \text{Number of HP-PB Card Cages} &= \frac{\text{Number of I/O Cards}}{\text{Maximum Number of I/O Cards per HP-PB}} = \frac{7 \text{ HP-FL cards}}{5 \text{ HP-FL/HP-PB}} \\ &= 1.4 \text{ HP-PB} \Rightarrow 2 \text{ HP-PB Card Cages} \end{aligned}$$

Table 2.9 Guidelines for Maximum Disks per I/O Card and Maximum I/O Cards per HP-PB Card Cage

Choose Disks According to the I/O Workload that Most Closely Matches the Predominant Workload of Your System Configuration	Disk Characteristics	Predominant System I/O Workload			
		OLTP Using Relational DB • 100% random • 2 Kbyte avg. block size	Networked Online File Server • 90% random • 10% sequential • 8 Kbyte avg. block size	Batch Processing Using Relational DB • 90% sequential • 10% random • 2 Kbyte avg. block size	
<ul style="list-style-type: none"> • High disk performance • Low CPU overhead • 19.5 GB max per FL card • Up to 500m distance • Large total system capacity 	Max arrays per FL card*	3	3	3	HP-FL Array Independent Mode (C2254B+C2251A) 5 disk array 5 x 1.3 GB 5 disk addresses/array
	Max FL cards per HP-PB*	6	5	6	
	I/Os per sec per array	100	75	110	
	I/Os per sec per disk	20	15	22	
<ul style="list-style-type: none"> • Moderate disk performance • Low CPU overhead • 43 GB max per FL card (C2254HA) • Up to 500m distance • Largest total system capacity (C2254HA) • Built-in high availability • Hot swap disk capability 	Max arrays per FL card*	8	8	4	HP-FL Array High Availability RAID3 Striped (C2252HA or C2254HA) 2 or 4 disk array plus parity disk 2.7 or 5.4 GB 1 disk address/array
	Max FL cards per HP-PB*	6	5	6	
	I/Os per sec per array	25	20	75	
<ul style="list-style-type: none"> • Highest disk performance • 20% higher CPU overhead vs. HP-FL • 12 GB max per SCSI card • 6m distance limitation • Low total system capacity 	Max disks per SCSI card*	6	4	3	SCSI Disk (C3023R) Single disk 2 GB 1 disk address/mech
	Max SCSI cards per HP-PB*	9	5	4	
	I/Os per sec per disk	45	35	300	
<ul style="list-style-type: none"> • Good disk performance • 20% higher CPU overhead vs. HP-FL • 9 GB max per SCSI card • 6m distance limitation • Lowest total system capacity 	Max disks per SCSI card	7	5	3	SCSI Disk (C2474R) Single disk 1.3 GB 1 disk address/mech
	Max SCSI cards per HP-PB	10	6	6	
	I/Os per sec per disk	25	20	200	
<ul style="list-style-type: none"> • Highest disk performance • 20% higher CPU overhead vs. HP-FL • 12 GB max per SCSI card • 6m distance limitation • Low total system capacity 	Max disks per SCSI card	6	4	3	SCSI Disk (C3023R) Single disk 1.3 GB 1 disk address/mech
	Max SCSI cards per HP-PB	9	5	4	
	I/Os per sec per disk	45	35	300	
<ul style="list-style-type: none"> • Highest disk performance • Up to 50% lower CPU overhead vs. S.E. SCSI • Max seven arrays per F/W SCSI card • Built-in high availability • Hot swap disk capability • 25m distance limitation 	Max disks per F/W card	7	6	3	Fast/Wide SCSI RAID 5 Array (C2437HZ Opt. 005) (C2439HZ Opt. 005) (C2440HZ Opt. 005)
	Max F/W cards per HP-PB*	5	2	3	
	I/Os per sec per disk	TBD	TBD	TBD	
<ul style="list-style-type: none"> • Built-in high availability • Hot swap disk capability • 25m distance limitation 	Max disks per F/W card	7	6	3	Fast/Wide SCSI RAID 3 Array (C2437HZ Opt. 003) (C2439HZ Opt. 003) (C2440HZ Opt. 003)
	Max F/W cards per HP-PB*	5	2	3	
	I/Os per sec per disk	TBD	TBD	TBD	

*For Models T500 and 890. Note specific limits for E/F/G/H/I-class.

Table 2.10 Model 890 Corporate Business Server Performance Configuration Guidelines

Required Performance		Recommended Disk Configuration for Optimal I/O Throughput											
OLTP Performance (TPS)	Number of Logged-on * Users	Number of CPUs		I/O Workload #1 OLTP using Relational DB			I/O Workload #2 Networked Online File Server			I/O Workload #3 Batch Processing with Relational DB			
		Medium Load	Heavy Load	HP-FL Indep. Mode 5-disk Array C2254B + C2251B	HP-FL RAID 3 High-Avail. Array C2252HA or C2254HA	SCSI Disk C3023R	HP-FL Indep. Mode 5-disk Array C2254B + C2251B	HP-FL RAID 3 High-Avail. Array C2252HA or C2254HA	SCSI Disk C3023R	HP-FL Indep. Mode 5-disk Array C2254B + C2251B	HP-FL RAID 3 High-Avail. Array C2252HA or C2254HA	SCSI Disk C3023R	
480 to 600 Client/Server 400 to 500 Host-based	500 to 620	1500 to 1850	Max I/Os per sec	247 GB 38 Arrays (190 Disks) 13 I/O Cards 2 HP-PB	410 or 820 GB 152 Arrays (152 "Disks") 19 I/O Cards 4 HP-PB	168 GB 84 Disks 14 I/O Cards 2 HP-PB	325 GB 50 Arrays (250 Disks) 17 I/O Cards 4 HP-PB	513 or 1026 GB 190 Arrays (190 "Disks") 24 I/O Cards 5 HP-PB	Disk-limited	228 GB 35 Arrays (175 Disks) 12 I/O Cards 2 HP-PB	138 or 276 GB 51 Arrays (51 "Disks") 13 I/O Cards 2 HP-PB	26 GB 13 Disks 5 I/O Cards 2 HP-PB	
375 to 480 Client/Server 270 to 400 Host-based	340 to 500	1020 to 1500	3	189 GB 29 Arrays (145 Disks) 10 I/O Cards 2 HP-PB	313 or 626 GB 116 Arrays (116 "Disks") 15 I/O Cards 3 HP-PB	128 GB 64 Disks 11 I/O Cards 2 HP-PB	247 GB 38 Arrays (190 Disks) 13 I/O Cards 3 HP-PB	392 or 783 GB 145 Arrays (145 "Disks") 19 I/O Cards 4 HP-PB	166 GB 83 Disks 20 I/O Cards 4 HP-PB	169 GB 26 Arrays (130 Disks) 9 I/O Cards 2 HP-PB	105 or 210 GB 39 Arrays (39 "Disks") 10 I/O Cards 2 HP-PB	20 GB 10 Disks 4 I/O Cards 1 HP-PB	
190 to 325 Client/Server 160 to 270 Host-based	200 to 340	600 to 1020	2	130 GB 20 Arrays (100 Disks) 7 I/O Cards 2 HP-PB	213 or 426 GB 79 Arrays (79 "Disks") 10 I/O Cards 2 HP-PB	88 GB 44 Disks 8 I/O Cards 1 HP-PB	169 GB 26 Arrays (130 Disks) 9 I/O Cards 2 HP-PB	265 or 530 GB 98 Arrays (98 "Disks") 13 I/O Cards 3 HP-PB	112 GB 56 Disks 8 I/O Cards 3 HP-PB	117 GB 18 Arrays (90 Disks) 6 I/O Cards 1 HP-PB	73 or 146 GB 27 Arrays (27 "Disks") 7 I/O Cards 2 HP-PB	14 GB 7 Disks 3 I/O Cards 1 HP-PB	
Up to 190 Client/Server Up to 160 Host-based	Up to 200	Up to 600	1	72 GB 11 Arrays (55 Disks) 4 I/O Cards 1 HP-PB	124 or 248 GB 46 Arrays (46 "Disks") 6 I/O Cards 1 HP-PB	50 GB 25 Disks 5 I/O Cards 1 HP-PB	98 GB 15 Arrays (75 Disks) 5 I/O Cards 1 HP-PB	157 or 314 GB 58 Arrays (58 "Disks") 8 I/O Cards 2 HP-PB	66 GB 33 Disks 5 I/O Cards 2 HP-PB	72 GB 11 Arrays (55 Disks) 4 I/O Cards 1 HP-PB	43 or 86 GB 16 Arrays (16 "Disks") 4 I/O Cards 1 HP-PB	8 GB 4 Disks 2 I/O Cards 1 HP-PB	

* The workload generated by two "logged-on" users is roughly equal to one "concurrent" user.

A "concurrent" user represents the workload generated by a person continuously performing terminal transactions with no interruptions or breaks.

How to Use This Table

1. Determine the required number of CPUs based on expected user load or TPS requirements for your system.
2. Choose the disk type that you plan to use. Make the choice based on needs for distance, capacity, and features such as high-availability.
3. Select which of the three example I/O workloads that most closely represents the expected workload of your system.
4. Locate the cell in the Recommended Disk Configuration section of the table for the combination of CPUs, Disk, and I/O Workload that you have chosen.
5. Read the recommended combination of disks (or arrays), I/O cards, and HP-PB card cages.

Note: These recommendations indicate the MINIMUM number of disks (or arrays) required to achieve optimal I/O throughput when the application(s) are driving the CPU(s) to their maximum I/O rate capability. You may reduce the number of recommended disks if your workload is less, or you may increase the number of disks (or arrays) to increase total capacity.

When increasing or decreasing the number of disks, make sure that you adjust the number of I/O cards and/or HP-PB card cages as required to maintain balanced distribution of the I/O.

Caution: This chart should be used only as a guide. Your configuration requirements will be different as determined by actual workload characteristics of your application(s).

Note: Figures shown in this table represent limits to keep CPU utilization at approximately 50%.

Single-Ended SCSI-2 Internal/External Cable Length Considerations

The Multi-Function I/O Cards (“Personality Cards”) used in the E/F/G/H- and I-class SPUs have both internal and external connections for hooking up Single-Ended SCSI-2 peripherals.

All peripherals which are installed inside the SPU cabinet (whether factory-integrated or field-installed) are cabled to an internal SCSI-2 bus.

The length of the internal cables must be considered as part of the maximum cable lengths connected to this Single-Ended SCSI-2 port.

Table 2.11 shows the internal single-ended SCSI-2 cable lengths and the maximum external SCSI-2 cable length which can be connected.

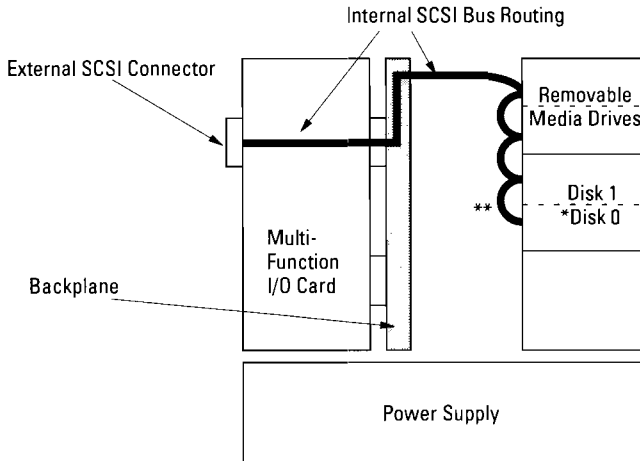
Figure 2.2 shows how the internal cabling is connected from the Multifunction I/O card to the internal peripherals in an E- or F-Class SPU. In a G/H/I-Class SPU, additional cables add another 1.5 meters of internal cable length.

Figure 2.3 shows examples of external Single-Ended SCSI-2 cabling and configuration.

Table 2.11 Single-Ended SCSI-2 Cable Lengths

System	Internal Single-Ended SCSI-2 Cable Length Equivalent Load	Maximum External Single-Ended SCSI-2 Cable Length
E/F-Class SPUs	1.5 meters	4.5 meters
G/H/I-Class SPUs	3.0 meters	3.0 meters

Figure 2.2 E/F-Class Internal SCSI Cabling

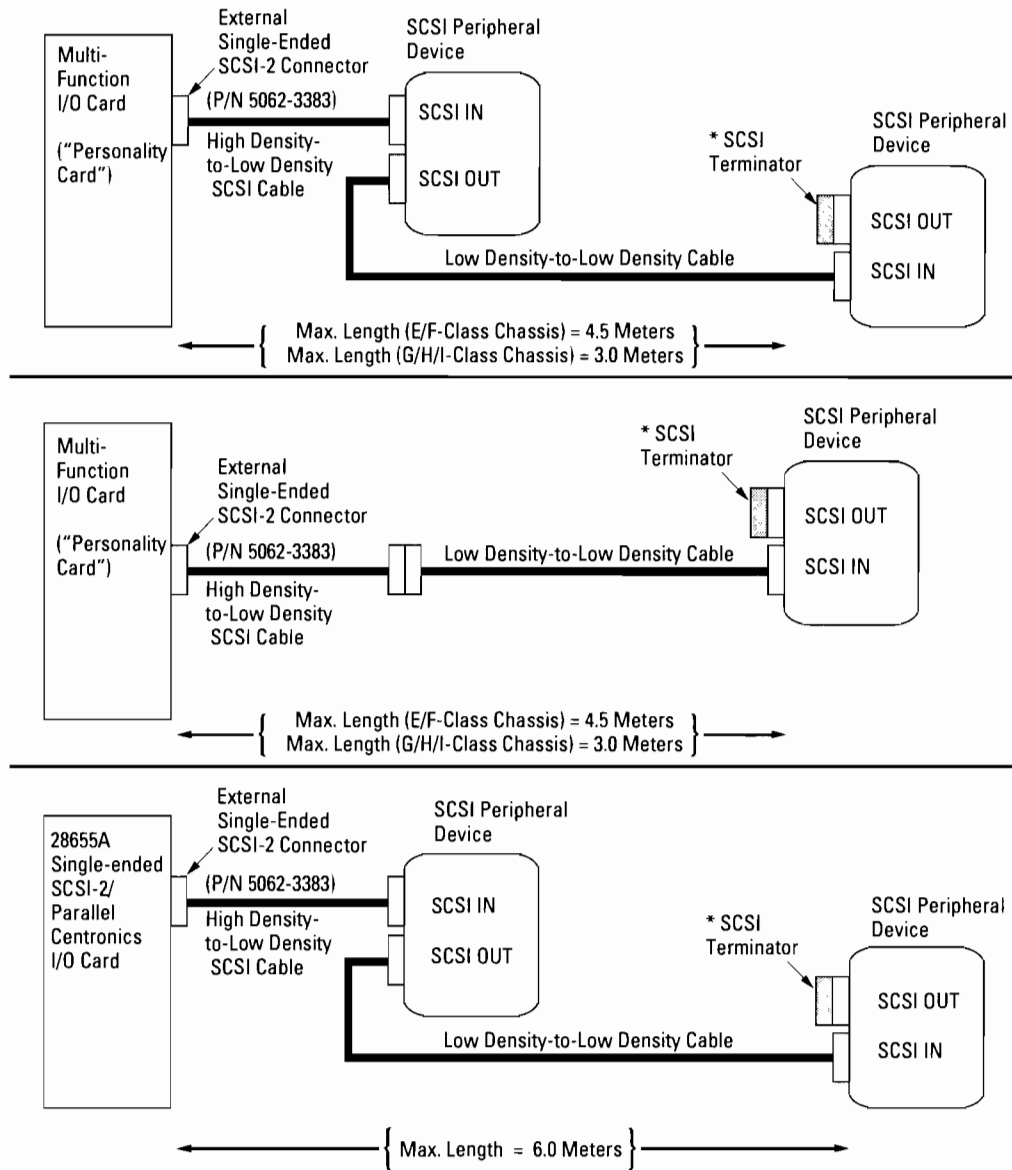


Internal SCSI Bus Layout (E/F-Class Chassis Only)

*NOTE: In a diskless system, the terminator is installed on the cable.

**NOTE: Maximum number of internal drives:
 E-Class: 4
 F-Class: 3
 G/H/I-Class: 6
 (3 on left side
 3 on right side)

Figure 2.3 Single-Ended SCSI-2 Cable Length Limits



*NOTE 1: The last device on the SCSI cable must have an external SCSI terminator.

*NOTE 2: If no devices are attached to the external SCSI connector, the 50-pin high-density terminator is required.

Configuration Verification

1. Ensure you have configured enough system memory and disk space.
–Refer to the “Memory and Disk Configuration” section for guidance.

*Note: The recommendations made in the “Memory and Disk Configuration” section are **guidelines**. Actual memory and disk requirements will vary depending on database, application software, and activity level of connected users. More memory and disk may be required beyond the recommended amount.*

2. Check to make sure you have not exceeded the maximum memory and disk capacity of the Business Server (see **Table 2.1**).
3. Check to make sure the Business Server you are ordering has enough available HP-PB slots for the I/O and Networking cards you have configured (see **Table 2.1**).
4. If ordering the G, H, I, or T500 Business Servers, make sure you have not exceeded the power supply capabilities of the HP-PB I/O card cage.
–Refer to the “Power Supply Current Budgeting Table” in the G, H, I, or T500 Class Business Server sections for details.
5. Make sure you have ordered cables for the peripherals which do not include them. Refer to the peripherals section for cable information.
6. The SCSI-2 cable length limit is 6 meters. Make sure your configuration topology will not exceed 6 meters for SCSI-2 cabling. For lengths greater than 6 meters a SCSI-2 repeater is required.
7. The Fast/Wide Differential SCSI cable length limit is 25 meters. Make sure your configuration topology will not exceed 25 meters for Fast/Wide Differential SCSI cabling.
8. Check to make sure you have ordered the appropriate localization options (or products) for the Business Server, HP-UX, and peripherals (if necessary).
9. Verify your final configuration using the CONRAD on-line configuration advisor tool. Access to CONRAD is available in each U.S. sales office and in many others worldwide.



Section 3 Computer System Information

Model E25/E35/E45 Integrated Business Servers

SPU Model No.	SPU Product No.	S/W Tier	Single High Slots	I/O Bus	Cik Spd MHz	Instr/Data Cache (KB)	Relative OLTP Performance to F10*	Ports Included On LAN-based Multifunction I/O Card				SPU Model No.
								SCSI	RS-232	Centronics	LAN	
E25	A2937AW	1	2/4	HP-PB	48	64†	1.5	1	8/16	1	1	E25
E35	A2938AW	1	2/4	HP-PB	64	256†	2.5	1	8/16	1	1	E35
E45	A3130AW	1	2/4	HP-PB	80	256†	3.2	1	8/16	1	1	E45

Product numbers for E/F/G/H/I and T500 servers must be ordered with appropriate Structured Solution Product (SSP) part number: E-class, A2959AW.

* Note: Relative OLTP performance is a general guideline since factors influencing performance of applications vary widely.

† Combined instruction and data cache

Max. Disk Storage

SPU Model No.	Base Memory (MB)	Max. Memory (MB)	Base Internal Disk (MB)	Internal Single-Ended SCSI (GB)	Total Single-Ended SCSI (GB)	Total F/W SCSI (Disks & Arrays) (GB)	F/W SCSI Array (GB)	HP-IB (GB)	FL (GB)	FL Disk Array (GB)	Max. Total Suppt'd Disk (GB)	Max. Internal Tape Capacity (GB)	SPU Model No.
E25	0††	512†	0	4‡	70	144	112	n/a	n/a	n/a	156	8-16DDS	E25
E35	0††	512†	0	4‡	70	144	112	n/a	n/a	n/a	156	8-16DDS	E35
E45	0††	512†	0	4‡	70	144	112	n/a	n/a	n/a	156	8-16DDS	E45

† Using 128 MB memory modules orderable March 1, 1994

†† Minimum supported/orderable configuration = 16 MB

‡ Using 2 GB drive orderable after March 1, 1994

Max. I/O and Networking Cards

SPU Model No.	Max. SCSI Tape Drives	Max. HP-IB Tape Drives	Max. Centronics Printers	Max. Serial Printers	Max. HP-IB Printers	Max. HP-IB Plotters	Max. SCSI-2 Parallel Centronics	Max. Fast/Wide SCSI-2	Max. HP-IB	Max. HP-PB FL (28615A)/ PBA-FL (A1749A)	Max. MUX Ports	Max. # of Users (via DTC & MUX)	SPU Model No.
E25	8	n/a	5	50	n/a	n/a	4	2	0	0	144	1120	E25
E35	8	n/a	5	70	n/a	n/a	4	2	0	0	144	1850	E35
E45	8	n/a	5	90	n/a	n/a	4	2	0	0	144	1850	E45

† Contact the factory if support for more printers is required

‡ Not including multifunction I/O card

Max. I/O and Networking Cards (cont'd)

SPU Model No.	Max. 802.3 LAN	Max. 802.5 Token Ring LAN	Max. 8-Channel MUX	Max. 16-Channel MUX	Max. 32-Channel MUX	Max. FDDI	Max. X.25	Max. SNAplusLink	SPU Model No.
E25	4	4	2	4	4	2	4	4	E25
E35	4	4	2	4	4	2	4	4	E35
E45	4	4	2	4	4	2	4	4	E45

‡ Not including multifunction I/O card

Computer System Information (cont'd)

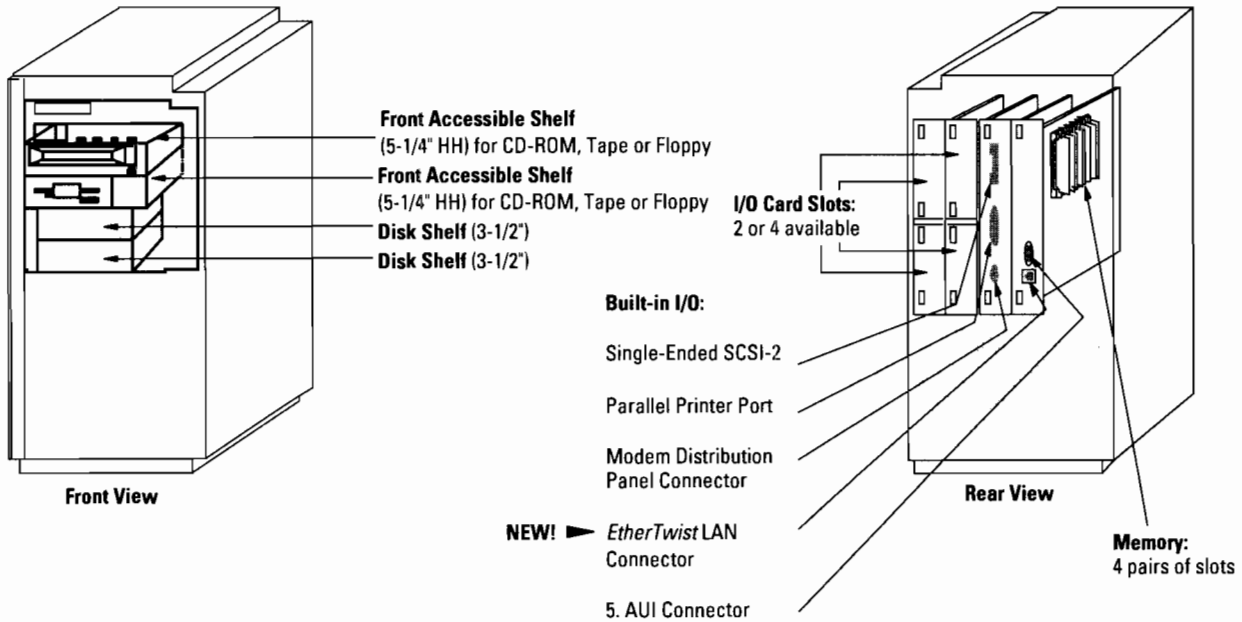
SPU Model Number	Depth in mm	Width in mm	Height in mm	Weight in Kg	Power Reqmnt. Watts	Heat Diss BTUs Per Hr.	First CPL Date	First Ship Date	Site Prep Included	SPU Model Number
E25	533	222	430	32	400	1385	1/94	1/94	no	E25
E35	533	222	430	32	400	1385	1/94	1/94	no	E35
E45	533	222	430	32	400	1385	2/94	2/94	no	E45

SPU Model No.	SPEC int92	SPEC fp92	SPEC rate_int92	SPEC rate_fp92	SPU Model No.
E25	44*	66*	1050*	1575*	E25
E35	65*	98*	1563*	2328*	E35
E45	80*	120*	1900*	2850*	E45

* Preliminary; subject to minor change. Check PowerTools for final numbers.

E-Class Business Servers: E25, E35, and E45

Figure 3.1 Model E25/E35/E45 System Overview



NOTE: If ThinLAN is required, order ThinLAN transceiver P/N 28641B. Second I/O card still provides BNC and AUI. If EtherTwist is required on second LAN, order EtherTwist transceiver P/N 28685B.

NOTE: Cabling and 8- or 16-port distribution panel are included with #2442A, option ODU or ODV.

Includes:	Maximum SPU Capacities	Features
<ul style="list-style-type: none"> • CPU • 2-slot chassis • Single-ended SCSI-2 I/F • Parallel Centronics I/F • 802.3 LAN I/F • Console port • HP support port • One-year on-site warranty • Factory installation of memory modules, disk drives, removable-media drives and I/O cards 	<ul style="list-style-type: none"> • 4 GB internal disk* • 512 MB RAM • 4 I/O cards, via I/O slot upgrade: <ul style="list-style-type: none"> - 2 or 4 single-high I/F cards - 1 or 2 double-high I/F cards • 2 removable-media drives 	<ul style="list-style-type: none"> • 2- to 4-slot chassis • 32 MB/s peak, 21 MB/s sustained I/O throughput • 19" rackmountable

*2 GB prior to March 1, 1994.
4 GB after March 1, 1994, with availability of 2 GB half-height disk drives.

Figure 3.2 How to Order E-Class Business Servers

How to order E-Class Business Servers

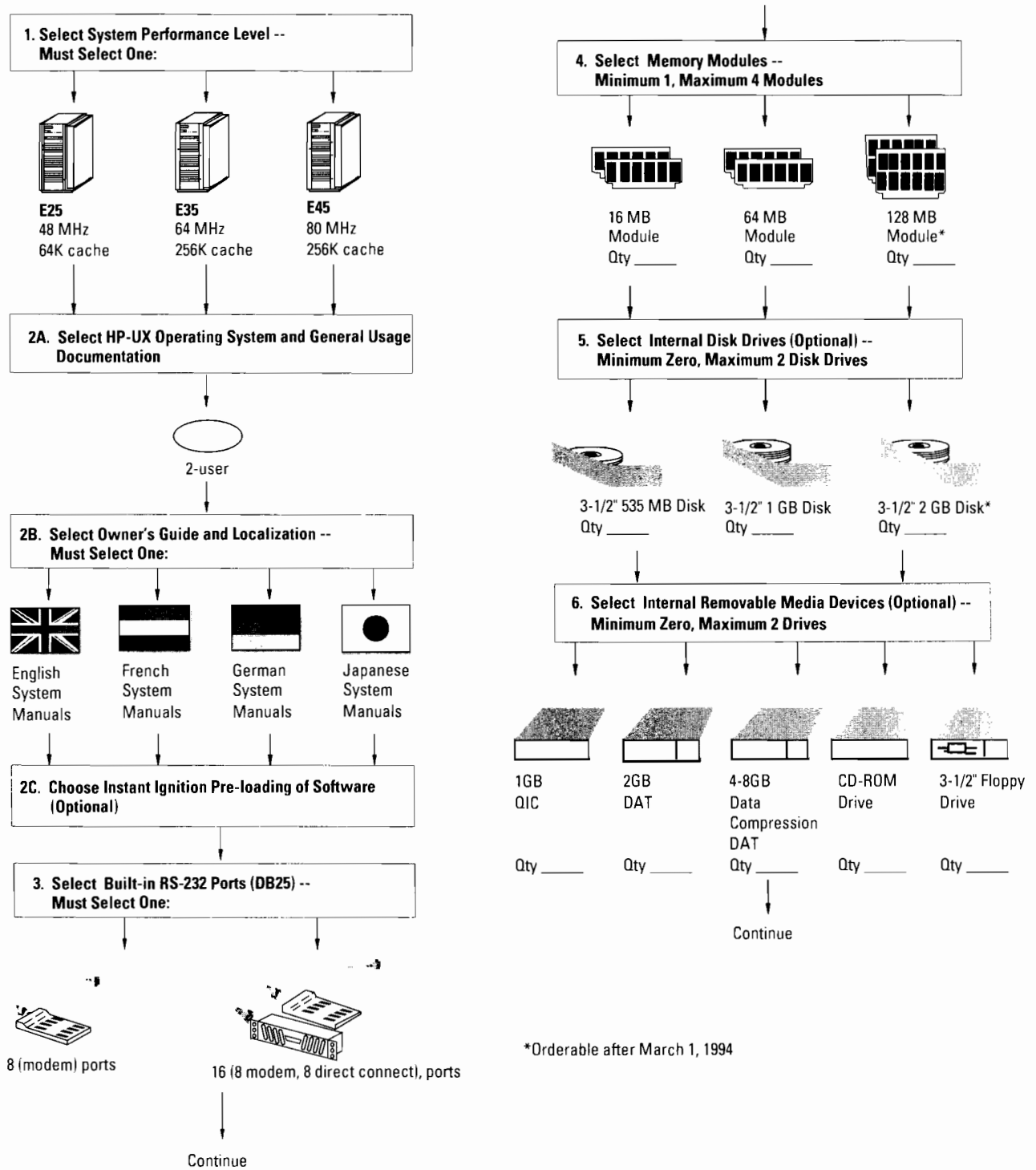
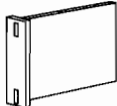
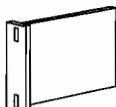
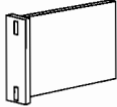
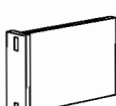
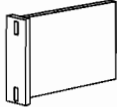
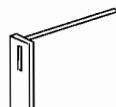
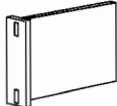
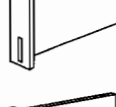

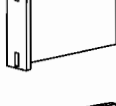
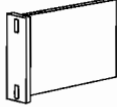
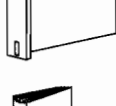
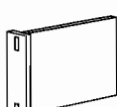
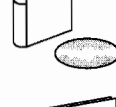

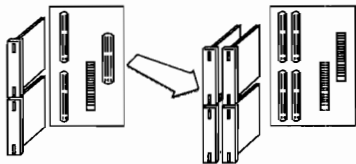


Figure 3.2 How to Order E-Class Business Servers (cont'd)
How to order (cont'd)

**7A. Select I/O and Networking Cards (Optional)* --
Minimum Zero, Maximum 4 HP-PB Slots:**

 16 Port MUX (RJ45 Connector) Qty _____	 16 Port MUX (DB25 Connector) Qty _____
 32 Port MUX (RJ45 Connector) Qty _____	 32 Port MUX (DB25 Connector) Qty _____
 5 MB/s Single-Ended SCSI-2 Qty _____	 20 MB/s Fast/wide differential SCSI-2 Qty _____
 802.3 LAN w/BNC, AUI Qty _____	 Token Ring LAN 802.5 (Preset to 4 Mb/s) Qty _____
 Token Ring Media, Documentation Qty _____	 X.25 - RS-232 I/F Qty _____
 X.25 - V.35 I/F Qty _____	 X.25 Media, Documentation Qty _____
 SNAPplusLink - RS-232 I/F Qty _____	 SNAPplusLink - V.35 I/F Qty _____
 SNAPplusLink Media, Documentation Qty _____	

7B. Select I/O Slot Upgrade (Optional) --
Minimum Zero, Maximum 1:**



Upgrade from 2 to 4 HP-PB I/O Slots

*NOTE: Backup media and documentation for I/O cards is included in the HP-UX media and documentation product unless specifically listed in the menu.

**Must select one if 3 or 4 I/O slots used in 7A
HP 9000 Series 800 Business Servers Configuration Guide

**8. Select Uninterruptible Power Supply (Optional) --
Minimum Zero, No Maximum:**



**9. Select System Console (Optional) --
Minimum Zero, Maximum 1:**



System Console Terminal -- Green
System Console Terminal -- White

**10. Select Rack Mount Kit for Integration into an EIA Rack (Optional) --
Minimum Zero, Maximum 1:**



Rack Mount Kit

11. Order external peripherals, networking hardware, systems management products, high availability products, networking products, programming languages, and software development -- (Optional)

12. Order HP-UX User License Upgrades and Backup Media (B3108L) and Documentation (B3108M) -- (Optional)

13. Choose a Support Level for System, Integrated Peripherals, Standalone Peripherals, Standalone Software, and Networking -- (Optional)
See pages 8-2 to 8-6.

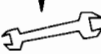
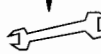

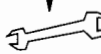
			
Installation/ Network Configuration	Less Urgent Response	Urgent Response	Highly Critical Response

Figure 3.3 Model E25/E35/E45 RS-232 Configuration

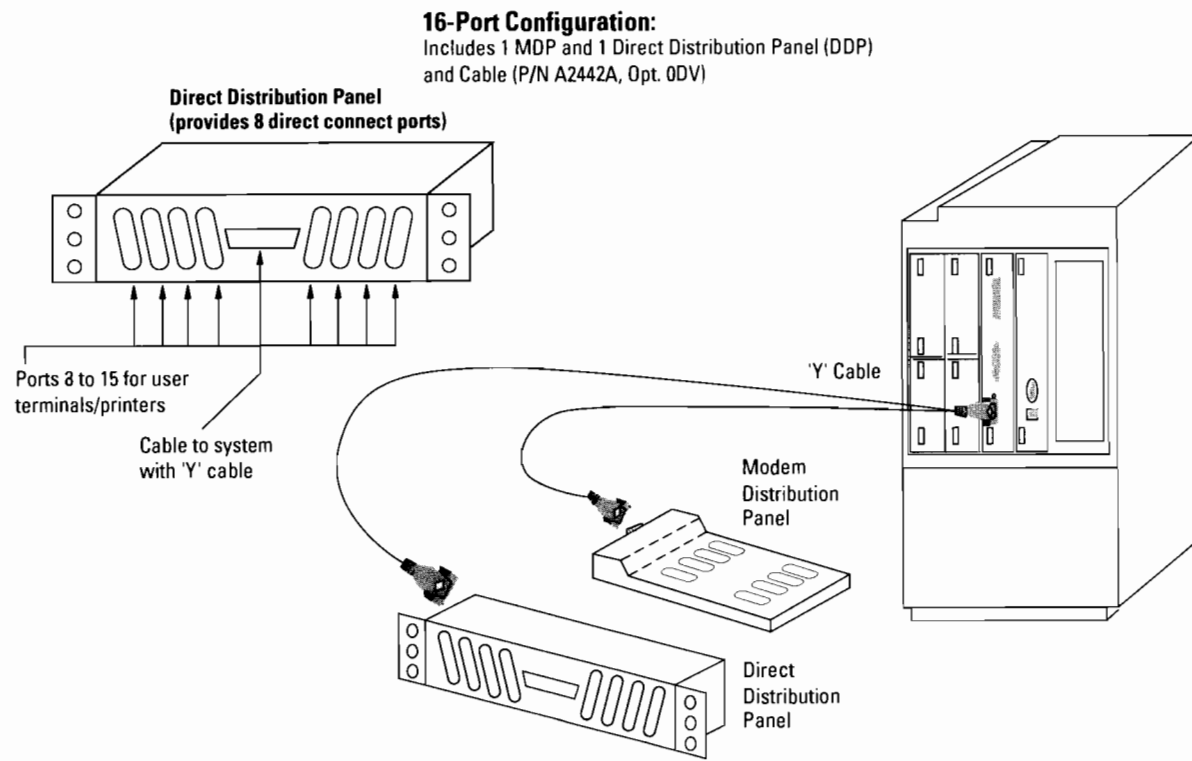
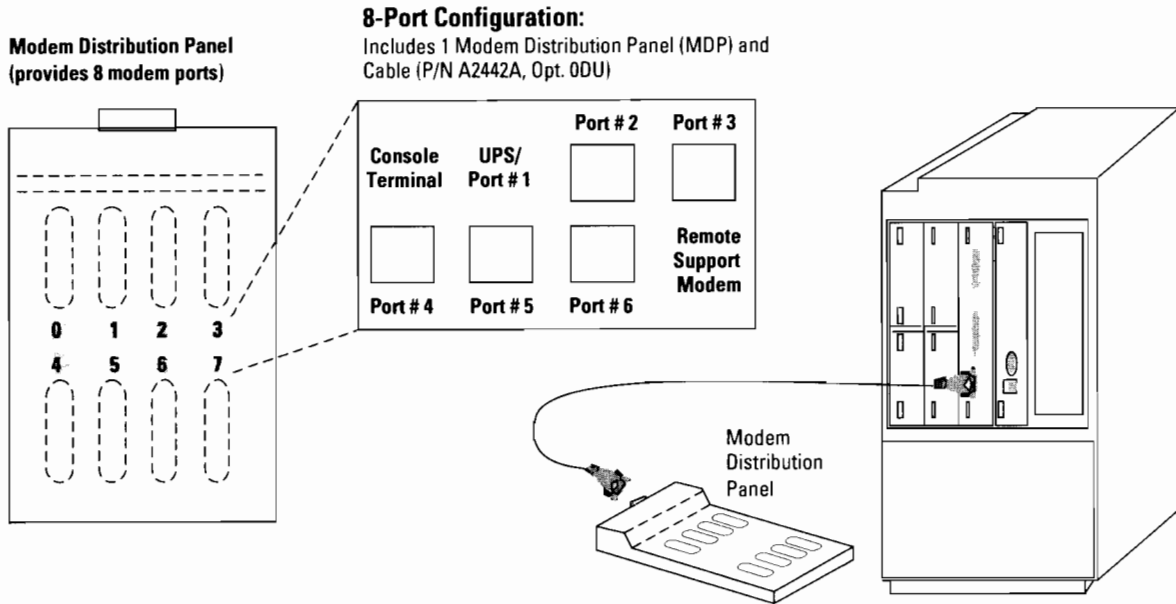


Figure 3.4 Model E25/E35/E45 Memory Configuration

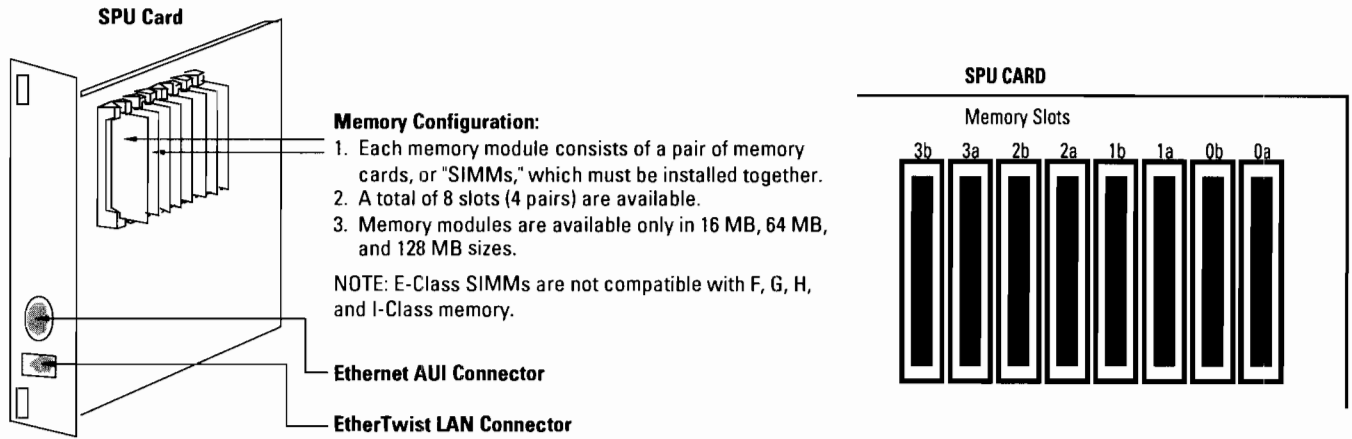


Table 3.1 Sample Module Configurations

RAM (MB)	16 MB Module A2946A	64 MB Module A2948A	128 MB* Module A3131A	Memory Slots Consumed	Memory Slots Remaining
16	1			2	6
32	2			4	4
48	3			6	2
64		1		2	6
96	2	1		6	2
128		2		4	4
192		1	1	4	4
256			2	4	4
384			3	6	2
512			4	8	0

*Orderable after March 1, 1994

NOTE: E-Class SIMMs are **not** compatible with F, G, H, and I class memory

Example field installation of additional memory:

- Existing (factory-installed) RAM = 64 MB; slots occupied: 3B, 3A
- Additional memory to install: 128 MB, via 2 x A2948A (64 MB modules, 4 SIMMs)
 - Insert first SIMM into 2B
 - Insert second SIMM into 2A
 - Insert third SIMM into 1B
 - Insert fourth SIMM into 1A
- Remaining slots available: 0B, 0A

Note: SIMMs may be inserted into any slot, but inserting the SIMMs in this order will make future RAM upgrades easier because SIMMs are inserted at an angle.

Table 3.2 Model E25/E35/E45 I/O Configuration

Maximum Single-High I/O Cards:	2-slot systems = 2 4-slot systems = 4			
Maximum Double-High I/O Cards:	2-slot systems = 1 4-slot systems = 2			
Double-High I/O Cards Supported:	Fast/Wide Differential SCSI-2 (20 MB/s) — P/N 28696A FDDI LAN — P/N J2157A			
I/O Configuration Rule Exceptions:	Description	Product Number	Size	Maximum Supported
	8 port MUX	40299B	Single-high	2-slot systems: 2 4-slot systems: 2

Table 3.3 Model E25/E35/E45 Disk and Memory Configuration Guidelines

System RAM Requirements:	
HP-UX fixed RAM requirements	10 MB to 15 MB depending upon what additional applications are loaded (e.g., LAN, X.25, X-windows, NFS, etc.)
RAM per user	Non-RDB application (0.5 MB/user × number of users) Informix, Ingres, Sybase (1.0 MB/user × number of users) Oracle (up to 1.5 MB/user × number of users)
Application overhead	Varies with application, system tuning (8 MB may be a good estimate)
System Disk Requirements:	
HP-UX fixed disk requirements	Without LAN software—79 MB With LAN software and X-windows—130 MB
Language compilers, OmniBack/Turbo, other sys. s/w	Typical guideline is to use a 535 MB for a typical system
Application disk space	No guidelines: completely application dependent
Individual user's space	A good guideline is 15 MB/user × number of users
Swap space	Minimum = total RAM; a good guideline is 2 × total RAM

E-Class Configuration Worksheet

System RAM Requirements:

- HP-UX Fixed RAM Requirements
 - 10 MB to 15 MB depending upon additional applications loaded (e.g., LAN, X.25, X-Windows, NFS, etc.):
- RAM per user
 - Non-RDB application (0.5 MB/user × number of users):
 - Informix, Ingres, Sybase (1.0 MB/user × number of users):
 - Oracle (up to 1.5 MB/user × number of users):
- Application Overhead
 - Varies with application, system tuning (8 MB is a good starting point):

Total RAM Required:

System Disk Requirements

- HP-UX Fixed Disk Requirements
 - Without LAN software: 79 MB;
 - With LAN software and X-Windows: 130 MB
- Language compilers, OmniBack/Turbo, other system software
 - See Software Section 7
- Application Disk Space
 - No general guidelines, completely application dependent:
- Individual users' space
 - Good guideline is 15 MB/user × number of users:
- Swap space
 - Minimum = total RAM; good guideline is 2 × total RAM:

Total Disk Space Required:

Figure 3.5 Model E25/E35/E45 Upgrades

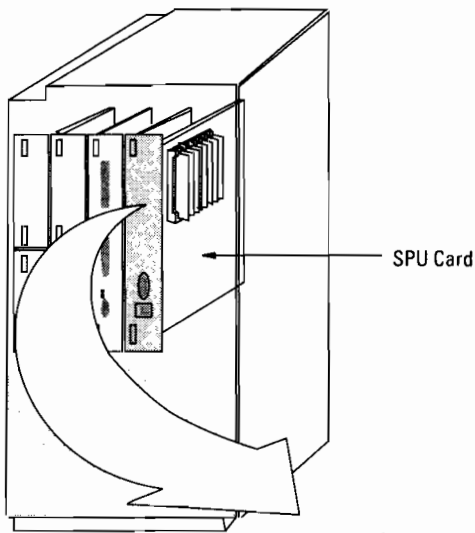
CPU Upgrades

From	To	Return to HP	Product No.
E25	E35	A2937A	A3132A, Opt. 850
E25	E45	A2937A	A3133A, Opt. 850
E35	E45	A2938A	A3133A, Opt. 851

Backplane Upgrades

From	To	Discard	Product No.
2 slot	4 Slot	Replaced backplane	A2943A

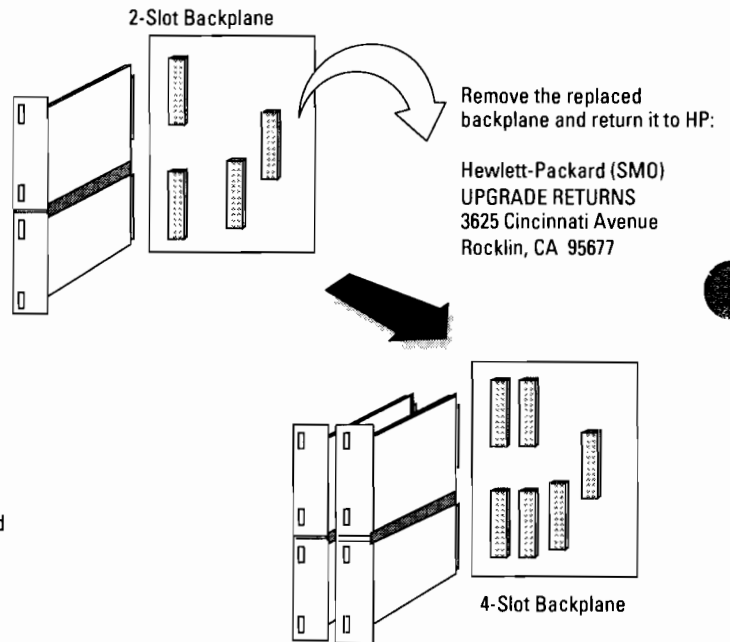
CPU Upgrade



Remove the replaced CPU board and return it to HP:

Hewlett-Packard (SMO)
UPGRADE RETURNS
3625 Cincinnati Avenue
Rocklin, CA 95677

Backplane Upgrade



Remove the replaced backplane and return it to HP:

Hewlett-Packard (SMO)
UPGRADE RETURNS
3625 Cincinnati Avenue
Rocklin, CA 95677

Table 3.4 Model E25/E35/E45 Product Summary

Description	Product No./ Option No.
HP 9000 E-Class Business Server	A2959AW
<i>Base system includes:</i>	
Chassis with 2 HP-PB slots	
Integrated floating point unit	
Integrated 802.3 LAN interface, Single-Ended SCSI interface, and parallel Centronics port.	
Factory installation of processors, memory modules, disk drives, removable media drives, and I/O and networking cards	
One-year onsite warranty	
1. Processor.	Required—Select one
a. Model E25	Qty. [] A2937AW
b. Model E35	Qty. [] A2938AW
c. Model E45	Qty. [] A3130AW
2A. HP-UX operating system version and general usage documentation.	Required—Select one
a. 2-user license for HP-UX release 9.04 and TCP/IP, ARPA, and NFS services†	Qty. [1] A2440A, Opt. APH
2B. Owner's guide and localization.	Required—Select one
a. System manuals in English	Qty. [] A2440A, Opt. ABA
b. System manuals in French	Qty. [] A2440A, Opt. ABC
c. System manuals in German	Qty. [] A2440A, Opt. ABD
d. System manuals in Japanese	Qty. [] A2440A, Opt. ABJ
2C. Factory-integrated pre-loaded, pre-configured HP-UX 9.04 operating system and additional software products.	Optional—Minimum zero, maximum 1
a. Instant Ignition*	Qty. [] A2440A, Opt. 0D1
3. Built-in RS-232 ports.	Required—Select one
a. 8 RS-232 modem ports (DB25 connector)	Qty. [] A2442A, Opt. 0DU
b. 8 RS-232 modem ports and 8 RS-232 direct connect ports (DB25 connector)	Qty. [] A2442A, Opt. 0DV
4. Memory modules.	Required—Minimum one, maximum 4
a. 16 MB memory module	Qty. [] A2946A, Opt. 0DZ
b. 64 MB memory module	Qty. [] A2948A, Opt. 0DZ
c. 128 MB memory module**	Qty. [] A3131A, Opt. 0DZ
5. Internal disk drives.	Optional—Minimum zero, maximum 2
a. 535 MB disk drive	Qty. [] A2958A, Opt. 0DZ
b. 1 GB disk drive	Qty. [] A2445A, Opt. 0DZ
c. 2 GB disk drive**	Qty. [] A3087A, Opt. 0DZ*
6. Internal removable media drives.	Optional—Minimum zero, maximum 2
a. 1 GB QIC tape drive	Qty. [] A2944A, Opt. 0DZ
b. 2 GB DAT/DDS tape drive	Qty. [] C2477SZ, Opt. 0DZ
c. 4–8 GB DAT/DDS tape drive	Qty. [] C2478SZ, Opt. 0DZ
d. High-performance CD-ROM drive	Qty. [] A3086A, Opt. 0DZ
e. 3-1/2" floppy disk drive for system cabinet	Qty. [] A2942A, Opt. 0DZ

* See Section 7 for details.

** Orderable March 1, 1994.

† HP-UX media must be ordered separately (media P/N B3108A). One media copy is required per customer site.

To order support, refer to System Support Options on pages 8-2 to 8-6.

Table 3.4 Model E25/E35/E45 Product Summary (cont'd)

Description	I/O Slots Used	Product No./ Option No.
7A. I/O and networking cards.		Minimum zero, maximum 2 HP-PB slots can be used if Qty. 0 is selected in section 7B. Minimum zero, maximum 4 HP-PB slots can be used if Qty. 1 is selected in section 7B.
a. 16 port RS-232 direct connect MUX (RJ45 connector)	1	Qty. [] J2092AZ
b. 16 port RS-232 direct connect MUX (DB25 connector)	1	Qty. [] J2092AZ, Opt. 010
c. 32 port RS-232 direct connect MUX (RJ45 connector)	1	Qty. [] J2096AZ
d. 32 port RS-232 direct connect MUX (DB25 connector)	1	Qty. [] J2096AZ, Opt. 010
e. 5 MB/s Single-Ended SCSI interface (with parallel port)	1	Qty. [] 28655A, Opt. 0DZ
f. 20 MB/s Fast/Wide Differential SCSI-2 interface	2	Qty. [] 28696A, Opt. 0DZ
g. 802.3 ThinLAN/9000 interface	1	Qty. [] J2146A, Opt. 0DM
h. 802.5 Token Ring interface (preset to 4 Mb/s speed)	1	Qty. [] J2166A, Opt. AU2
i. Token Ring/9000 documentation, backup media for HP-UX 9.04	n/a	Qty. [] J2250A
j. X.25 link with RS-232 interface	1	Qty. [] 36960A, Opt. 0DN
k. X.25 link with V.35 interface	1	Qty. [] 36960A, Opt. 0DP
l. X.25/9000 documentation, backup media for HP-UX 9.04	n/a	Qty. [] A2321A
m. HP-UX SNAplusLink with RS-232 interface	1	Qty. [] J2220A, Opt. 020
n. HP-UX SNAplusLink with V.35 interface	1	Qty. [] J2220A, Opt. 021
o. SNAplusLink documentation, backup media for HP-UX 9.04	n/a	Qty. [] J2391AA
7B. HP-PB slot upgrade.		Minimum zero, maximum 1 Must select Qty. 1 if three or four HP-PB slots are used in section 7A.
a. Upgrade from base two HP-PB slots to four HP-PB slots		Qty. [] A2943A, Opt. 0DZ
8. Uninterruptible power supply.		Optional—Minimum zero, no maximum
a. 600 VA uninterruptible power supply*		Qty. [] A2941A
9. System console.		Optional—Minimum zero, maximum 1 If Qty. 1 is selected, must order appropriate localization option.
a. System Console Terminal**—Green Screen		Qty. [] C1064GX, Opt. ABA**
b. System Console Terminal**—White Screen		Qty. [] C1064WX, Opt. ABA**
10. Rackmount kit.		Optional—Minimum zero, maximum 1 Must order Qty. 1 A1896A or A1897A rack in same order section if Qty. 1 rack mount kit is selected.
a. Rackmount kit		Qty. [] A2962AZ

* VA rating for the E-Class systems is 400 VA. The console terminal's rating is 30 VA. The 600 VA UPS provides ample power to support both the system and the console for at least 15 minutes.

** For console localization options other than English, consult the Corporate Price List.

To order support, refer to System Support Options on pages 8-2 to 8-6.

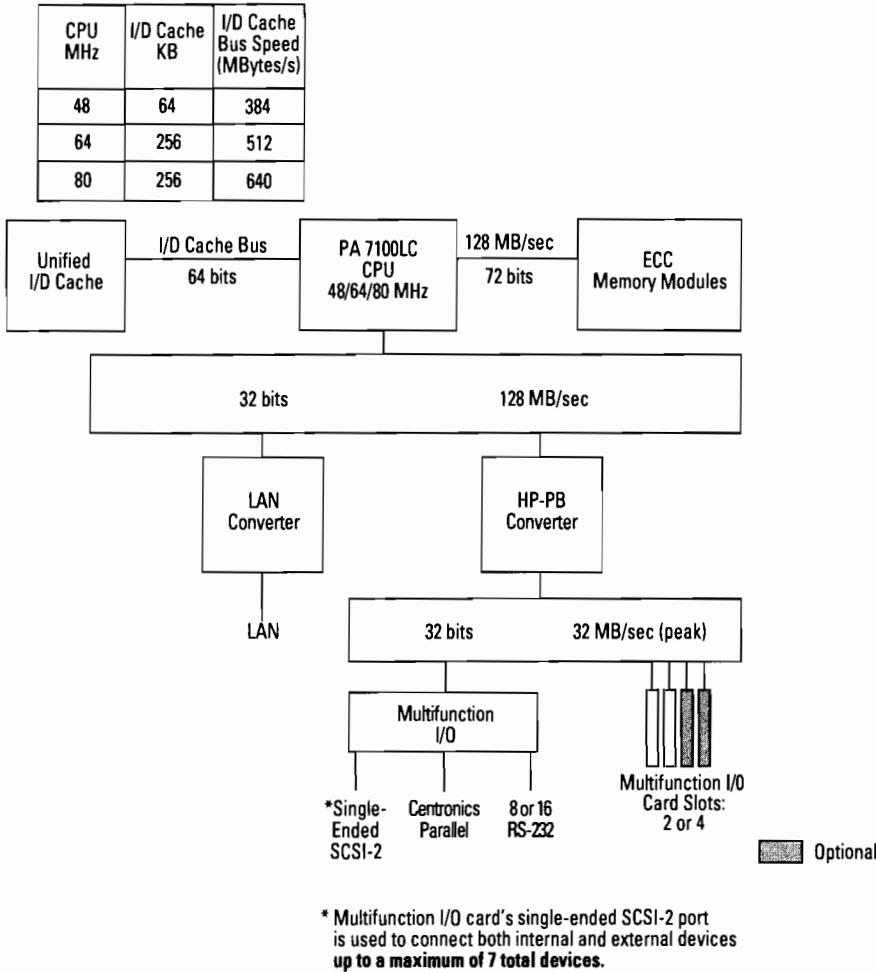
Table 3.5 Model E25/E35/E45 Technical Specifications

Physical Characteristics	E25	E35	E45*
Height	430 mm	430 mm	430 mm
Width	222 mm	222 mm	222 mm
Depth	533 mm	533 mm	533 mm
Weight	32 kg (70 lbs.)	32 kg (70 lbs.)	32 kg (70 lbs.)
Electrical Characteristics			
AC power input	100–120V and 200–240V Autorange 50–60 Hz		
Current requirements			
120V	6.5 A @ 100V		
240V	3.5 A @ 220V		
Power dissipation			
Typical	375 Watts		
Maximum	400 Watts		
Environmental Characteristics			
Acoustics	<4.7 Bel <31C <5.1 Bel >31C	<4.7 Bel <31C <5.1 Bel >31C	<4.7 Bel <31C <5.1 Bel >31C
Racking cabinet acoustics	<5.5 Bel <31C <6.0 Bel >31C	<5.5 Bel <31C <6.0 Bel >31C	<5.5 Bel <31C <6.0 Bel >31C
Electrostatic discharge, power transients and vibration	Designed for office and data center environments		
Temperature			
Operating	+5C to +40C		
Non-operating	–40C to +65C (system); –40C to +45C (tape media)		
Max rate of temperature change	<20C/hr without DDS DAT; <10C/hr with DDS DAT		
Relative humidity			
Operating	20% to 80%, non-condensing (max 26C wet bulb temp.)		
Non-operating	5% to 80%, non-condensing		
Max rate of humidity change	<30%/hr		
Altitude			
Operating	to 3,000 meters (10,000 ft.)		
Non-operating	to 4,500 meters (15,000 ft.)		
Regulatory Compliance			
Electromagnetic interference	Complies with FCC rules and regulations, Part 15, Subpart J, as a Class A computing device. Manufacturers Declaration to EN55022, Class A Registered with Japanese VCCI, Class 1		
Safety	UL Listed, ETL Listed, CSA Certified, Compliant with EN60950		

* Available after March 1, 1994

Figure 3.6 Model E25/E35/E45 System Architecture

System Architecture – E25, E35, E45



Model F10/F20/F30 Integrated Business Servers



SPU Model No.	SPU Product No.	S/W Tier	Single High Slots	I/O Bus	Clk Spd MHz	Instr/Data Cache (KB)	Relative OLTP Performance to F10*	Ports Included On LAN-based Multifunction I/O Card				SPU Model No.
								SCSI	RS-232	Centronics	LAN	
F10	A2367A	1	2	HP-PB	32	32/64	1	1	2	0	1	F10
F20	A2432A	1	2	HP-PB	48	64/64	1.7	1	2	0	1	F20
F30	A2433A	1	2	HP-PB	48	256/256	2.5	1	2	0	1	F30

Product numbers for E/F/G/H/I servers must be ordered with appropriate Structured Solution Product (SSP) part number: F-Class, A2428A.

* Note: Relative OLTP performance is a general guideline since factors influencing performance of applications vary widely. T500 performance beyond 4 CPUs is based on HP-UX 10.0.

Max. Disk Storage													
SPU Model No.	Base Memory (MB)	Max. Memory (MB)	Base Internal Disk (MB)	Internal Single-Ended SCSI (GB)	Total Single-Ended SCSI (GB)	Total F/W SCSI (Disks & Arrays) (GB)	F/W SCSI Array (GB)	HP-IB (GB)	FL (GB)	FL Disk Array (GB)	Max. Total Suppt'd Disk (GB)	Max. Internal Tape Capacity (GB)	SPU Model No.
F10	16	384*	535	4**	42	72	56	2.7	n/a	n/a	184	4-8DDS	F10
F20	16	384*	535	4**	42	72	56	2.7	n/a	n/a	184	4-8DDS	F20
F30	16	384*	535	4**	42	72	56	2.7	n/a	n/a	184	4-8DDS	F30

* 384 MB with HP-UX 9.0x or greater, 192 MB with HP-UX 8.02

** 2 x 2 GB disk drives orderable March 1, 1994

Max. I/O and Networking Cards													
SPU Model No.	Max. SCSI Tape Drives	Max. HP-IB Tape Drives	Max. Centronics Printers	Max. Serial Printers	Max. HP-IB Printers	Max. HP-IB Plotters	Max. SCSI-2 Parallel Centronics	Max. Fast/Wide SCSI-2	Max. HP-IB	Max. HP-PB FL (28615A)/ PBA-FL (A1749A)	Max. MUX Ports	Max. # of User (via DTC & MUX)	SPU Model No.
F10	8	4	3	20	n/a	4	2	1	1	0	80	1120	F10
F20	8	4	3	40	n/a	4	2	1	1	0	80	1120	F20
F30	8	4	3	40	n/a	4	2	1	1	0	80	1120	F30

† Contact the factory if support for more printers is required

‡ Not including multifunction I/O card

Max. I/O and Networking Cards (cont'd)										
SPU Model No.	Max. 802.3 LAN	Max. 802.5 Token Ring LAN	Max. 8-Channel MUX	Max. 16-Channel MUX	Max. 32-Channel MUX	Max. FDDI	Max. X.25	Max. SNAplusLink	SPU Model No.	
F10	2	2	2	2	2	1	2	2	F10	
F20	2	2	2	2	2	1	2	2	F20	
F30	2	2	2	2	2	1	2	2	F30	

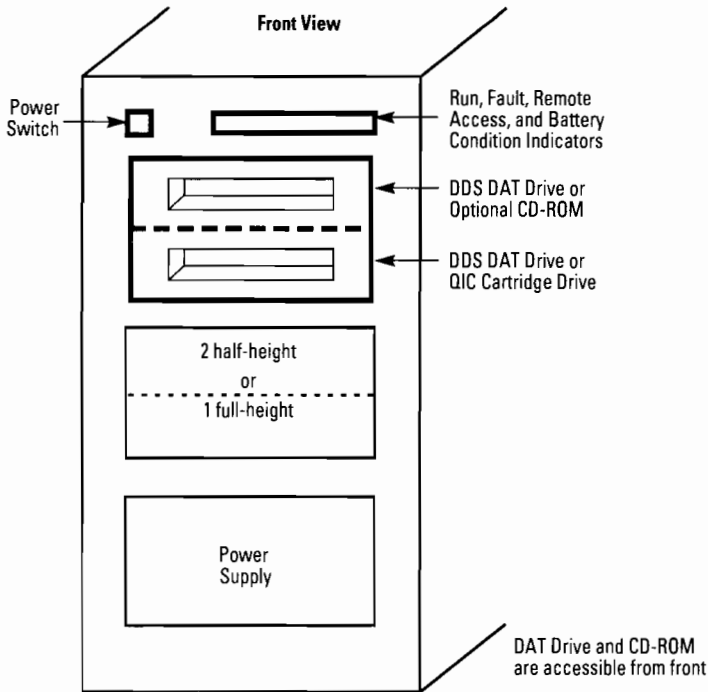
‡ Not including multifunction I/O card

Model F10/F20/F30 Integrated Business Servers (cont'd)

SPU Model Number	Depth in mm	Width in mm	Height in mm	Weight in Kg	Power Reqmnt. Watts	Heat Diss BTUs Per Hr.	First CPL Date	First Ship Date	Site Prep Included	SPU Model Number
F10	533	222	430	32	400	1385	12/92	1/93	no	F10
F20	533	222	430	32	400	1385	12/92	1/93	no	F20
F30	533	222	430	32	400	1385	12/92	1/93	no	F30

SPU Model No.	SPEC int92	SPEC fp92	SPEC rate_int92	SPEC rate_fp92	SPU Model No.
F10	22.0	36.7	523	876	F10
F20	33.6	56.1	816	1335	F20
F30	37.8	62.4	890	1483	F30

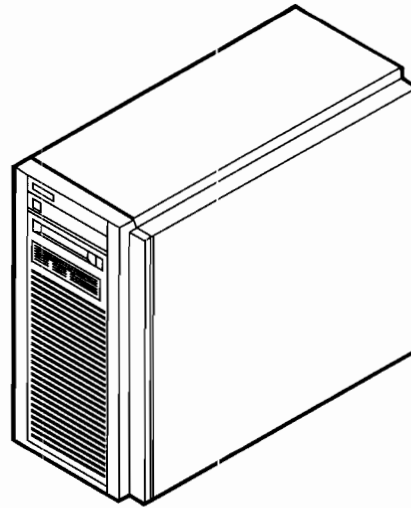
Figure 3.7 Model F10/F20/F30 Business Server Layout



Notes:

1. Combination of two half-height disks plus the optional CD-ROM is **NOT** supported unless the tape drive is deleted.
2. Maximum of three half-height or two half-height plus one full-height peripherals allowed in the package, due to number of internal power connections available.
3. Combinations of two DATs, or a DAT and QIC cannot be integrated at the factory. To order either combination (2 DATs or DAT + QIC), factory installation of the first backup device and field installation of the second backup device is required.
4. Systems require at least one internal peripheral (disk, DAT or QIC).

Figure 3.8 Model F10/F20/F30 Business Server



Capacity	Form Factory
1.3 GB 2.0 GB	Full-height
535 MB 1 GB 2 GB*	Half-height

* Orderable March 1, 1994.

Includes:	Maximum SPU Capacities	Features
<ul style="list-style-type: none"> • CPU • Memory Extender Board • 2-slot chassis • 535 MB base disk • 16 MB RAM • Single-Ended SCSI-2 I/F • Parallel Centronics I/F • 802.3 LAN I/F • Console port • HP support access port 	<ul style="list-style-type: none"> • 4 GB internal disk* • 384 MB RAM (192 MB with HP-UX 8.02) • 2 single-high I/F cards • 1 double-high I/F card • 2 removable-media drives 	<ul style="list-style-type: none"> • 2-slot chassis • 32 MB/s peak, 21 MB/s sustained I/O throughput • 19" rackmountable

*2 GB prior to March 1, 1994.
4 GB after March 1, 1994, with availability of 2 GB half-height disk drives.

Figure 3.9 F-Class SPU: Rear View with Standard LAN Multifunction I/O Card (A2441A, Option 0DS)

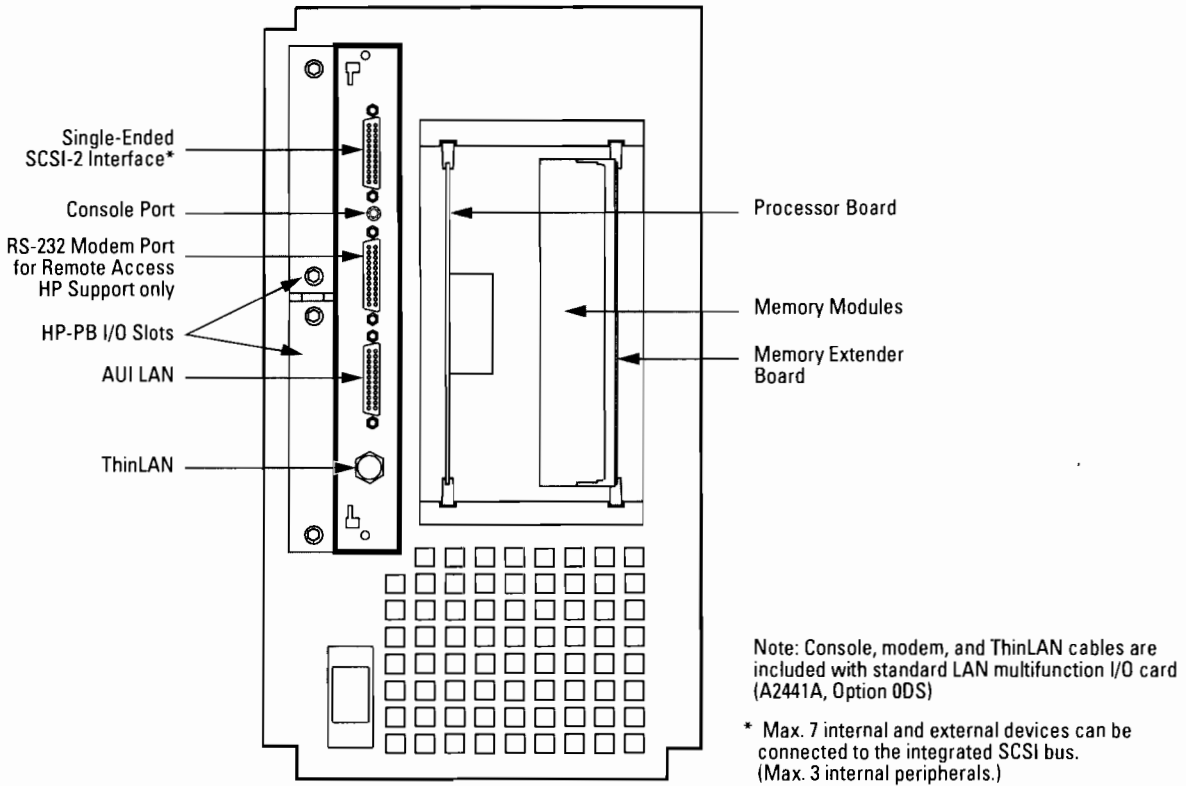
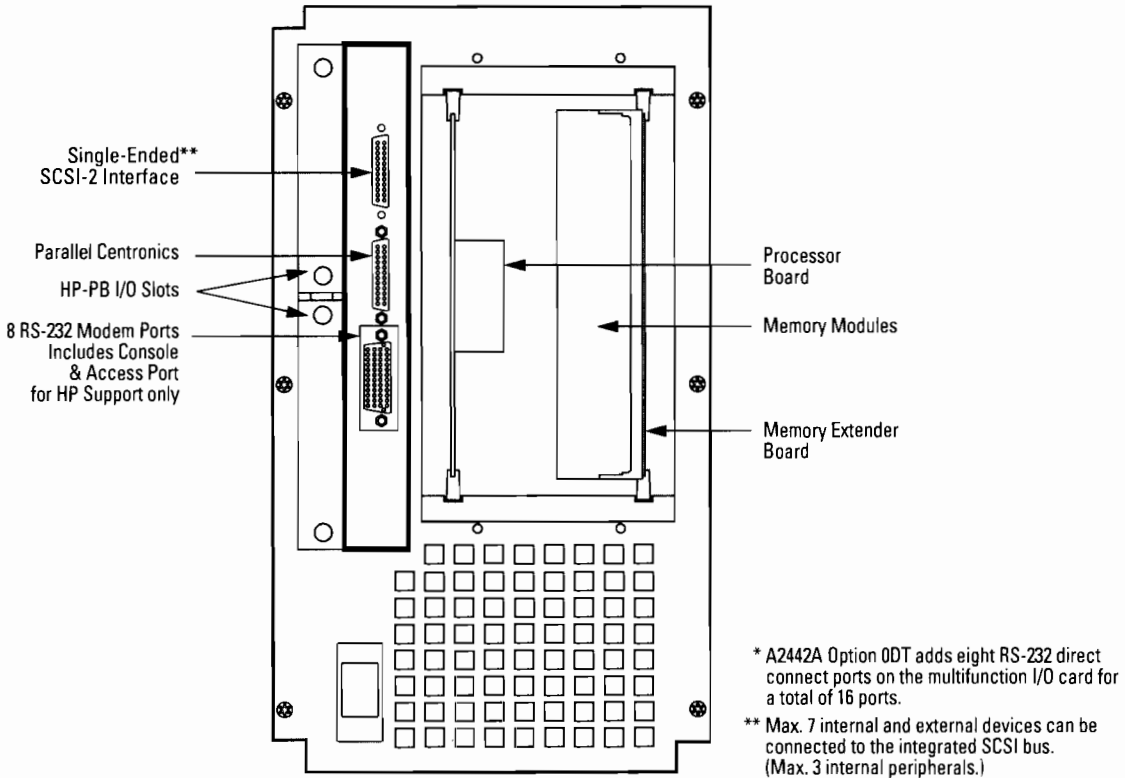
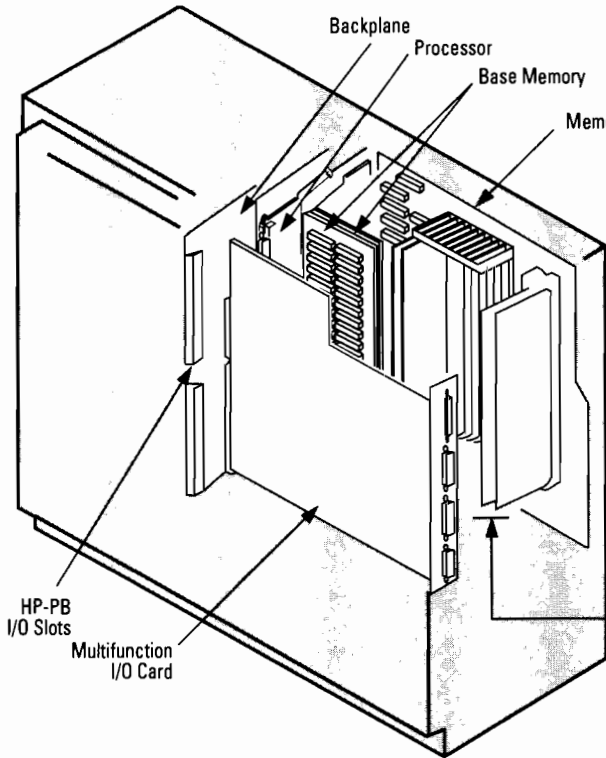


Figure 3.10 F-Class SPU: Rear View with Optional MUX Multifunction I/O Card (A2442A, Option 0DS)*



Model F10/F20/F30 Memory Array

Figure 3.11 Model F10/F20/F30 Memory Array



Notes:

1. Each memory module consists of 2 memory cards.
2. Memory cards must be installed in pairs.
3. Each memory module fills 2 of the 12 memory slots.
4. The last pair of memory cards is installed on the backplane.
5. Up to 5 memory modules (10 cards) can be installed on the memory extender.
6. Maximum memory when only 64 MB modules (A2511A) are used is 192 MB.
7. Maximum memory when only 128 MB modules (A2516A) are used is 384 MB.
8. For other memory combinations, use the following rules:

Memory module	8 MB	16 MB	32 MB	64 MB	128 MB
	(A2230A)	(A2231A)	(A2232A)	(A2511A)	(A2516A)
Power Units Per Memory Module	1	2	4	8	8

Maximum Power Unit Capacity = 24 Total

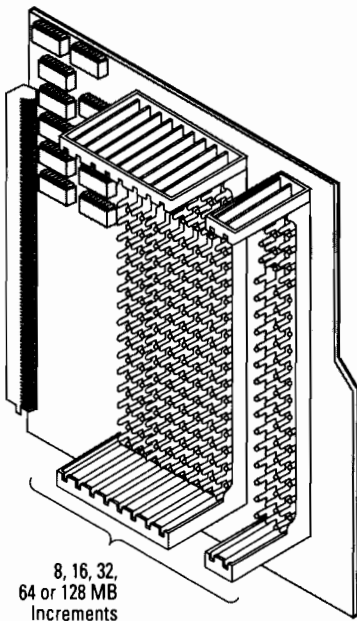
9. Memory extender is included in all F class systems.

Memory Modules

- A2230A – 8 MB (2 × 4 MB SIMMS)
- A2231A – 16 MB (2 × 8 MB SIMMS)
- A2232A – 32 MB (2 × 16 MB SIMMS)
- A2511A – 64 MB (2 × 32 MB SIMMS)
- A2516A – 128 MB (2 × 64 MB SIMMS)

Figure 3.12 Model F10/F20/F30 System

Model F10/F20/F30 Memory Extender Board



Notes:

1. Each memory module occupies two slots.
2. One memory module is on backplane, placed there after filling the extender with five modules.
3. Memory extender board is included with all F-Class Business Servers.

Model F10/F20/F30 Integrated Business Servers (cont'd)

Table 3.6 Model F10/F20/F30 Product Summary

Description	Required	Product No./ Option No.
<p>HP 9000 Series 800 F Class Business Servers</p> <p>Standard server includes: (must order p/n A2428A) Integrated chassis with two (2) single high I/O slots Factory integration of memory, disks, back-up media and I/O cards ordered from product menu One year on-site warranty</p> <p>Order desired SPU option from Sec. 1. The following standard items can be included w/SPU price at no extra charge: 535 MB embedded disk drive (requires HP-UX 9.04) 16 MB ECC memory (memory extender card included) 2.0 GB DDS drive LAN/SCSI/RS-232 personality card (requires HP-UX 9.04) with: -802.3 ThinLan interface (BNC and AUI connectors included) -Single-ended (S.E.) SCSI-2 interface -Two RS-232 ports for console terminal and remote access Pre-loaded HP-UX operating system with 2-user license plus, TCP/IP, ARPA and NFS services Owner's Guide and General Usage documentation set HP 700/96 console terminal (No charge optional item.)</p>		A2428A
Refer to sections 1-14 to select standard or alternate items.		
1. Select SPU	Required—Select one	
<ul style="list-style-type: none"> a. Model F10 32 Mhz PA-RISC SPU with 96 KB cache b. Model F20 48 Mhz PA-RISC SPU with 128 KB cache c. Model F30 48 Mhz PA-RISC SPU with 512 KB cache 	<ul style="list-style-type: none"> Qty. [] A2367A Qty. [] A2432A Qty. [] A2433A 	
2. Select floating point coprocessor	Optional—Minimum zero, maximum 1	
<ul style="list-style-type: none"> a. Floating point coprocessor for Model F10 b. Floating point coprocessor for Model F20 c. Floating point coprocessor for Model F30 	<ul style="list-style-type: none"> Qty. [] A2293A, Opt. 0DT Qty. [] A2293A, Opt. 0DU Qty. [] A2293A, Opt. 0DV 	
3. Select HP-UX OS version	Required—Select one	
<ul style="list-style-type: none"> a. HP-UX 9.04 with 2-user license (media p/n B3108A) b. HP-UX 8.02 with 2-user license (media p/n B2459A) <p>Media must be ordered separately. One media copy required per customer site.</p>	<ul style="list-style-type: none"> Qty. [] A2440A, Opt. APH Qty. [] A2440A, Opt. APC 	
Factory integrated, pre-loaded HP-UX 9.04 and layered product software	Optional—Minimum zero, maximum 1	
c. Instant Ignition*	Qty. [] A2440A, Opt. 0D1	
4. Select localization of system documentation	Required—Select one	
<ul style="list-style-type: none"> a. System manuals in English b. System manuals in French/Canadian c. System manuals in German d. System manuals in Japanese 	<ul style="list-style-type: none"> Qty. [] A2440A, Opt. ABA Qty. [] A2440A, Opt. ABC Qty. [] A2440A, Opt. ABD Qty. [] A2440A, Opt. ABJ 	
5. Select power failure back-up solution	Optional—Minimum zero, maximum 1	
<ul style="list-style-type: none"> a. Add powerfail battery back-up b. Add HP PowerTrust 600 VA UPS** 	<ul style="list-style-type: none"> Qty. [] A2369A, Opt. 0E1 Qty. [] A2941A 	
6. Select rackmount kit for installation into factory integrated 1.6m or 1.1m racks. (Integrated racks must be ordered on the same order/section.)	Optional—Minimum zero, maximum 1	
a. Add rackmount kit	Qty. [] C2797AZ	
7. Select personality card	Required—Select one	
<ul style="list-style-type: none"> a. Standard—LAN personality card: 802.3 ThinLAN, two RS-232 ports for console and remote access and S.E. SCSI-2. (Requires HP-UX 9.0x) b. Replace std. w/8-port MUX personality card: 8 modem RS-232 ports, S.E. SCSI-2 and parallel centronics port c. Replace std. w/16-port MUX pers. card: 8 modem & 8 DC RS-232 ports, S.E. SCSI-2 and parallel centronics port 	<ul style="list-style-type: none"> Qty. [] A2441A, Opt. 0DS Qty. [] A2442A, Opt. 0DS Qty. [] A2442A, Opt. 0DT 	
Note: For items 7b and 7c: RS-232 ports include console and access ports.		
* See Section 7 for details.		
** Requires HP-UX 9.04.		
To order support, refer to System Support Options on pages 8-2 to 8-6.		

Table 3.6 Model F10/F20/F30 Product Summary (cont'd)

Description	Product No./ Option No.
HP 9000 Series 800 F Class Business Servers	
8. Select base memory configuration (select either standard memory or ONE replacement module only)	
	Required
a. Standard—16 MB ECC base memory	Qty. [] A2231AZ, Opt. 0DS
b. Replace base memory with 32 MB ECC module	Qty. [] A2232AZ, Opt. 0DT
c. Replace base memory with 64 MB ECC module	Qty. [] A2511AZ, Opt. 0DT
d. Replace base memory with 128 MB ECC high density module (requires HP-UX 9.0x)	Qty. [] A2516AZ, Opt. 0DT
9. Additional memory configuration (Select up to five additional modules)	
Maximum memory (base + additional): 384 MB (HP-UX 9.0x) or 192 MB (HP-UX 8.02)	
	Optional
a. 8 MB ECC memory module	Qty. [] A2230AZ, Opt. 0DZ
b. 16 MB ECC memory module	Qty. [] A2231AZ, Opt. 0DZ
c. 32 MB ECC memory module	Qty. [] A2232AZ, Opt. 0DZ
d. 64 MB ECC memory module	Qty. [] A2511AZ, Opt. 0DZ
e. 128 MB ECC high density memory module (requires HP-UX 9.0x)	Qty. [] A2516AZ, Opt. 0DZ
10. Select base disk configuration (Maximum of two half-height or one full-height internal device.)	
	Required—Select one
a. Standard—Base 535 MB half-height disk (requires HP-UX 9.04)	Qty. [] A2958A, Opt. 0DS
b. Delete base 535 MB disk (alternate disk or back-up storage device required)	Qty. [] A2443A, Opt. 705
Select alternate/additional internal disks	
	Optional
c. Add 535 MB half-height disk (requires HP-UX 9.04)	Qty. [] A2958A, Opt. 0DZ
d. Add 1 GB half-height disk (requires HP-UX 9.0x)	Qty. [] A2445A, Opt. 0DZ
e. Add 2 GB half-height disk (requires HP-UX 9.04)*	Qty. [] A3087A, Opt. 0DZ*
f. Add 1.3 GB full-height disk	Qty. [] C2474SZ, Opt. 0DZ
g. Add 2 GB full-height disk (Requires HP-UX 9.0x)	Qty. [] A2446A, Opt. 0DZ
11. Select back-up storage configuration (Maximum of DAT and CD-ROM; or QIC and CD-ROM)	
	Required
a. Standard—2 GB DDS DAT (half-height)	Qty. [] C2477SZ, Opt. 0DS
b. Delete standard 2 GB DDS DAT drive (alternate back-up storage device or internal disk required.)	Qty. [] A2443A, Opt. 700
c. Add 4-8 GB DDS DAT drive (half-height). Requires HP-UX 9.04.	Qty. [] C2478SZ, Opt. 0DZ
d. Add 1 GB Quarter Inch Cartridge (QIC) drive (half-height)	Qty. [] A2944A, Opt. 0DZ
Select additional storage device	
	Optional
e. Add CD-ROM (half-height)	Qty. [] C2476SZ, Opt. 0DZ
f. High-performance CD-ROM (half-height, requires HP-UX 9.04)	Qty. [] A3086A, Opt. 0DZ
12. Select system console terminal	
	Optional—Select one
a. HP 700/96 console terminal with Green screen	Qty. [] C1064GZ, Opt. ABA**
b. HP 700/96 console terminal with Amber screen	Qty. [] C1064AZ, Opt. ABA**
c. HP 700/96 console terminal with Soft-white screen	Qty. [] C1064WZ, Opt. ABA**
13. Select I/O and networking cards	
	Optional
a. 16 port RS-232 direct connect MUX (RJ45 connector)	Qty. [] J2092AZ
b. 16 port RS-232 direct connect MUX (DB25 connector)	Qty. [] J2092AZ, Opt. 010
c. 32 port RS-232 direct connect MUX (RJ45 connector)	Qty. [] J2096AZ
d. 32 port RS-232 direct connect MUX (DB25 connector)	Qty. [] J2096AZ, Opt. 010
e. 5 MB/s Single-Ended SCSI-2 interface card with parallel port (uses 1-slot)	Qty. [] 28655A, Opt. 0DZ
f. 20 MB/s Fast/Wide Differential SCSI-2 interface card	Qty. [] 28696A, Opt. 0DZ
g. 802.3 ThinLAN/9000 interface card (uses 1-slot)	Qty. [] J2146A, Opt. 0DM
h. 802.5 Token Ring interface card (preset to 4 Mb/s speed) (uses 1-slot)	Qty. [] J2166A, Opt. AU2
i. Token Ring back-up media and documentation	Qty. [] J2250A
j. HP-IB interface card (uses 1-slot)	Qty. [] 28650B, Opt. 0DZ
k. X.25 link with RS-232-C interface card (uses 1-slot)	Qty. [] 36960A, Opt. 0DN
l. X.25 link with V.35 interface card (uses 1-slot)	Qty. [] 36960A, Opt. 0DP
m. X.25 back-up media and documentation	Qty. [] A2321A
14. Select end-user terminal (support must be ordered separately)	
	Optional
a. HP 700/60 Ergonomic terminal with Amber screen	Qty. [] C1080A, Opt. ABA**
b. HP 700/60 Ergonomic terminal with Green screen	Qty. [] C1080G, Opt. ABA**
c. HP 700/60 Ergonomic terminal with Soft-white screen	Qty. [] C1080W, Opt. ABA**
d. HP 700/60ES Ergonomic terminal with Soft-white screen	Qty. [] C1083W, Opt. ABA**

* Orderable March 1, 1994.

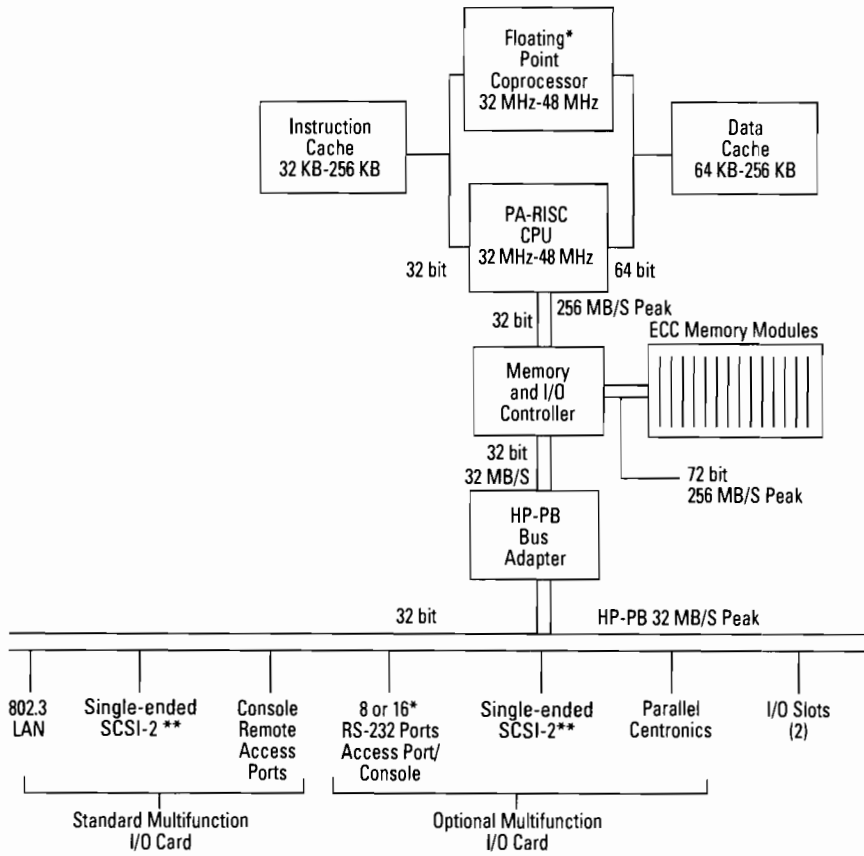
** U.S./English option shown, refer to CPL for localization options.

To order support, refer to System Support Options on pages 8-2 to 8-6.

Table 3.7 Model F10/F20/F30 Technical Specifications

Physical Characteristics	
Height	43.0 cm
Width	22.2 cm
Depth	53.3 cm
Weight	31.8 kg/70 lbs
Electrical Characteristics	
AC input power	100V-120V and 200V-240V autoranging, 50 Hz-60 Hz
Rated current	6.5 amps @ 120V; 3.5 amps @ 240V
Maximum heat dissipation	400 watts
Environmental Characteristics	
Acoustics	<5.5 bels (A) sound power below 30C
Electrostatic discharge, power transients and vibration	Designed for office and data center environments
Temperature	
Operating	+5C to +40C
Non-operating	-40C to +65C (system); -40C to +45C (tape media)
Max rate of temperature change	<20C/hr without DDS DAT; <10C/hr with DDS DAT
Relative humidity	
Operating	20% to 80%, non-condensing (max 26C wet bulb temp.)
Non-operating	5% to 80%, non-condensing
Max rate of humidity change	<30%/hr
Altitude	
Operating	to 3,000 meters (10,000 ft.)
Non-operating	to 4,500 meters (15,000 ft.)
Regulatory Compliance	
Electromagnetic interference	Complies with FCC rules and regulations, Part 15, Subpart J, as a Class A computing device. Manufacturers Declaration to EN55022, Class A Registered with Japanese VCCI, Class 1
Safety	UL Listed, ETL Listed, CSA Certified, Compliant with EN60950

Figure 3.13 Model F10/F20/F30 System Architecture



*Optional

**Single-ended SCSI-2 adapter is used to connect both internal and external devices (up to a maximum of 7 total devices).

Model G30/G40/G50/G60/G70 Integrated Business Servers

SPU Model No.	SPU Product No.	S/W Tier	Single High Slots	I/O Bus	Clk Spd MHz	Instr/Data Cache (KB)	Relative OLTP Performance to F10*	Ports Included On LAN-based Multifunction I/O Card				SPU Model No.
								SCSI	RS-232	Centronics	LAN	
G30	A2434A	1	4	HP-PB	48	256/256	2.5	1	2	0	1	G30
G40	A2435A	1	4	HP-PB	64	256/256	3.0	1	2	0	1	G40
G50	A2436A	1	4	HP-PB	96	256/256	3.9	1	2	0	1	G50
G60	A2980A	1	4	HP-PB	96	1024/1024	5.7	1	2	0	1	G60
G70	A2971A	1	4	HP-PB	2 x 96	2048/2048	8.3	1	2	0	1	G70

Product numbers for E/F/G/H/I servers must be ordered with appropriate Structured Solution Product (SSP) part number: G-Class, A2429A.

Max. Disk Storage

SPU Model No.	Base Memory (MB)	Max. Memory (MB)	Base Internal Disk (MB)	Internal Single-Ended SCSI (GB)	Total Single-Ended SCSI (GB)	Total F/W SCSI (Disks & Arrays) (GB)	F/W SCSI Array (GB)	FL Disk Array (GB)			Max. Total Suppt'd Disk (GB)	Max. Internal Tape Capacity (GB)	SPU Model No.
								HP-IB (GB)	FL (GB)	FL (GB)			
G30	32	768*	1 GB	10**	70	144	112	5.4	21	86	156	4-8DDS	G30
G40	32	768*	1 GB	10**	70	144	112	5.4	21	86	156	4-8DDS	G40
G50	32	768*	1 GB	10**	70	144	112	5.4	21	86	156	4-8DDS	G50
G60	32	768*	1 GB	10**	70	144	112	5.4	21	86	156	4-8DDS	G60
G70	32	768*	1 GB	10**	70	144	112	5.4	21	86	156	4-8DDS	G70

* 768 MB with HP-UX 9.0x or greater, 384 MB with HP-UX 8.02

** Using 4 x 2 GB disk drives orderable March 1, 1994.

Max. I/O and Networking Cards

SPU Model No.	Max. SCSI Tape Drives	Max. HP-IB Tape Drives	Max. Centronics Printers	Max. Serial Printers	Max. HP-IB Printers	Max. HP-IB Plotters	Max. SCSI-2 Parallel Centronics	Max. Fast/Wide SCSI-2	Max. HP-IB	Max. HP-PB FL (28615A)/ PBA-FL (A1749A)		Max. # of User (via DTC & MUX)	SPU Model No.
										Max. MUX Ports	Max. HP-IB		
G30	8	8*	5	40	n/a	8*	4	2	2	2/2	144	1120	G30
G40	8	8*	5	40	n/a	8*	4	2	2	2/2	144	1850	G40
G50	8	8*	5	40	n/a	8*	4	2	2	2/2	144	1850	G50
G60	8	8*	5	40	n/a	8*	4	2	2	2/2	144	2500	G60
G70	8	8*	5	40	n/a	8*	4	2	2	2/2	144	3500†‡	G70

* With HP-IB interface cards

† Contact the factory if support for more printers is required

‡ Not including multifunction I/O card

†† Contact the factory if customer requires support for more than 3000 terminal connections

Max. I/O and Networking Cards (cont'd)

SPU Model No.	Max. 802.3 LAN	Max. 802.5 Token Ring LAN	Max. 8-Channel MUX	Max. 16-Channel MUX	Max. 32-Channel MUX	Max. FDDI	Max. X.25	Max. SNAPplusLink	SPU Model No.
G40	4	4	4	4	4	2	4	4	G40
G50	4	4	4	4	4	2	4	4	G50
G60	4	4	4	4	4	2	4	4	G60
G70	4	4	4	4	4	2	4	4	G70

‡ Not including multifunction I/O card

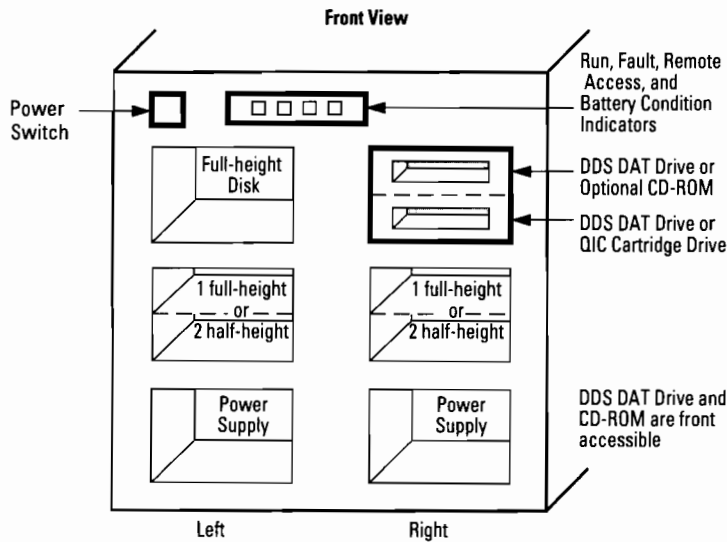
Model G30/G40/G50/G60/G70 Integrated Business Servers (cont'd)

SPU Model Number	Depth in mm	Width in mm	Height in mm	Weight in Kg	Power Reqmnt. Watts	Heat Diss BTUs Per Hr.	First CPL Date	First Ship Date	Site Prep Included	SPU Model Number
G30	533	424	430	50	800	2770	12/92	1/93	yes	G30
G40	533	424	430	50	800	2770	12/92	1/93	yes	G40
G50	533	424	430	50	800	2770	12/92	1/93	yes	G50
G60	533	424	430	50	800	2770	7/93	TBD	yes	G60
G70	533	424	430	50	800	2770	7/93	TBD	yes	G70

SPU Model No.	SPEC int92	SPEC fp92	SPEC rate_int92	SPEC rate_fp92	SPU Model No.
G30	37.8	62.4	890	1483	G30
G40	50.5	81.6	1201	1949	G40
G50	78.3	141.6	1854	3374	G50
G60	107.7	195.2*	1944	4074	G60
G70	n/a	n/a	3757	7325	G70

* Using compiler available April 1994.

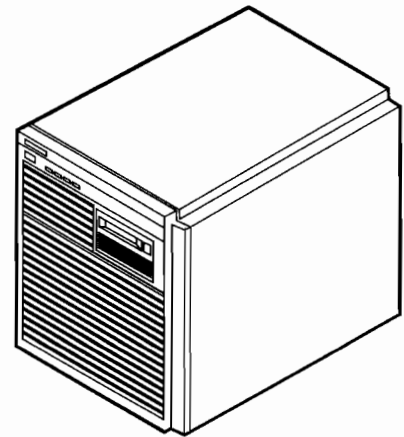
Figure 3.14 Model G30/G40/G50/G60/G70 Business Server Layout



NOTES:

1. Combination of two half-height disks plus the optional CD-ROM is NOT supported on the right side peripheral bays, unless the tape drive is deleted.
2. Maximum of three peripherals on each side of package, due to number of internal power connections available.
3. Combinations of two DATs or a DAT and QIC cannot be integrated at the factory but are supported. To order either combination (2 DATs or DAT + QIC), factory installation of the first backup device and field installation of the second backup device is required.
4. Systems require at least one internal peripheral (disk, DAT or QIC).

Figure 3.15 Model G30/G40/G50/G60/G70 Business Server



Internal Disks

Capacity	Form Factor
1.3 GB 2.0 GB	Full-height
535 MB 1 GB 2 GB*	Half-height

* Orderable March 1, 1994.

Includes:	Maximum SPU Capacities	Features
<ul style="list-style-type: none"> • CPU • Memory Extender/Carrier Board • 4-slot chassis • 1 GB base disk • 32 MB RAM • Single-Ended SCSI-2 • Parallel Centronics I/F • 802.3 LAN I/F • Console port • HP support access port 	<ul style="list-style-type: none"> • 10 GB internal disk* • 768 MB RAM (384 MB with HP-UX 8.02) • 4 single-high I/F cards • 2 double-high I/F cards • 2 removable-media drives 	<ul style="list-style-type: none"> • 4-slot chassis • 32 MB/s peak, 21 MB/s sustained I/O throughput • 19" rackmountable

*6 GB prior to March 1, 1994.

10 GB after March 1, 1994, with availability of 2 GB half-height disk drives.

Figure 3.16 G-Class SPU: Rear View with Standard LAN Multifunction I/O Card (A2441A, Option 0DS)

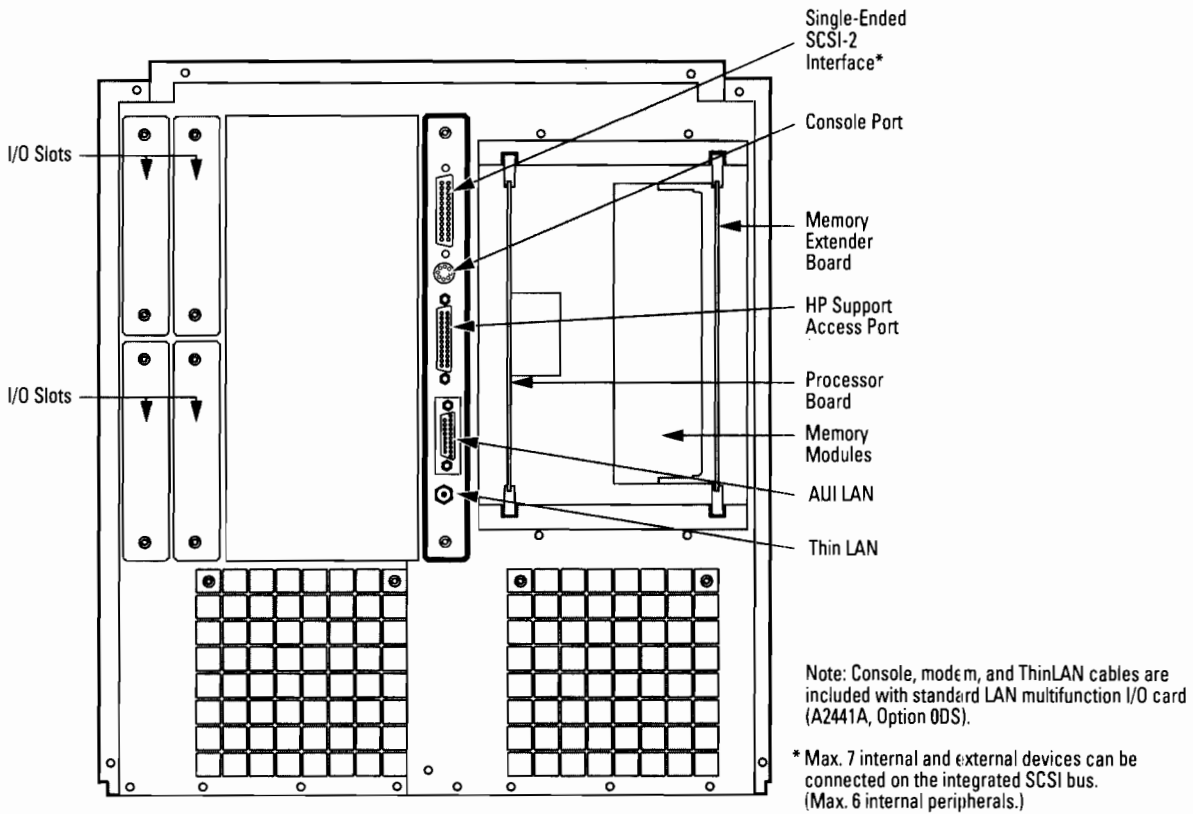
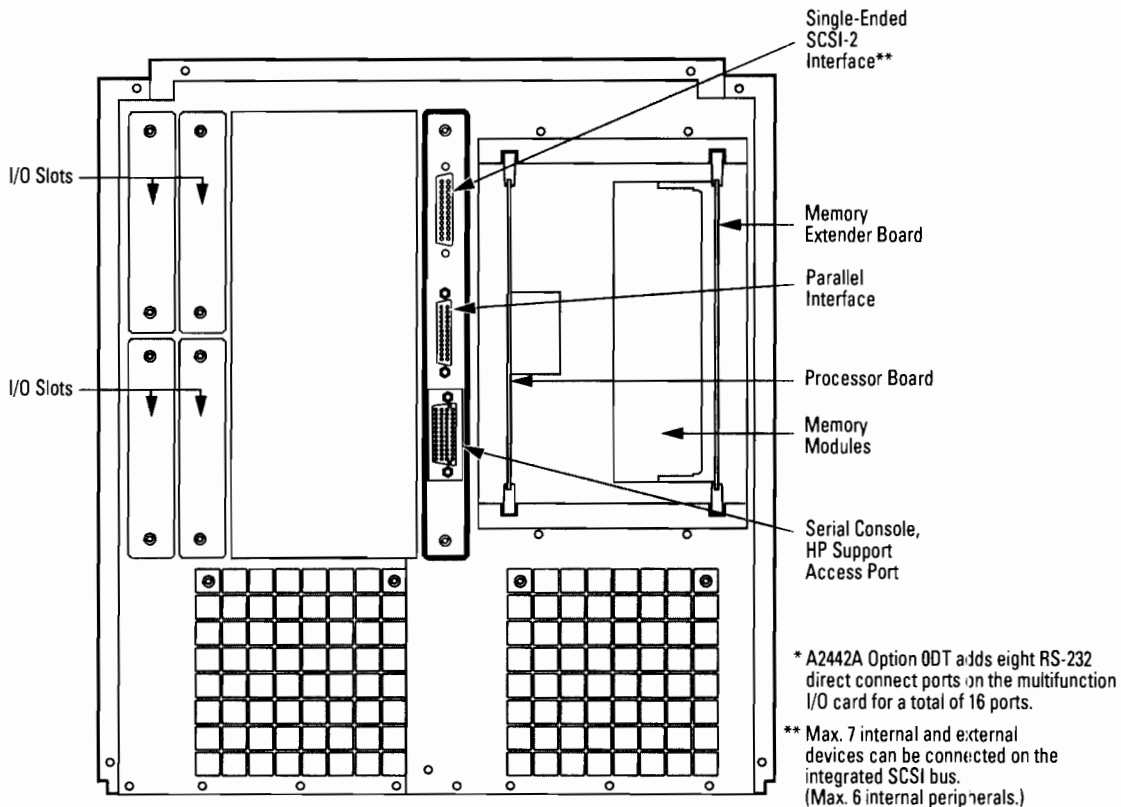
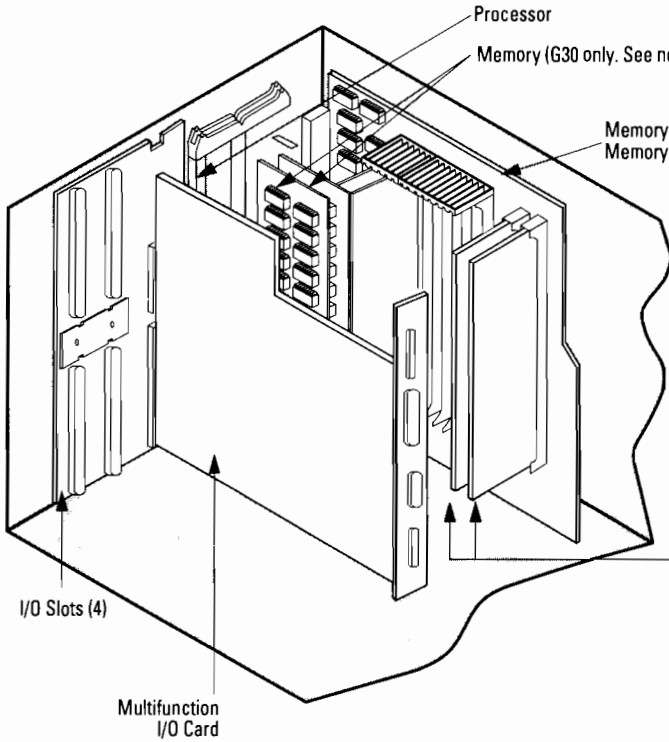


Figure 3.17 G-Class SPU: Rear View with Optional MUX Multifunction I/O Card (A2442A, Option 0DS)*



Model G30/G40/G50/G60/G70 Memory Array

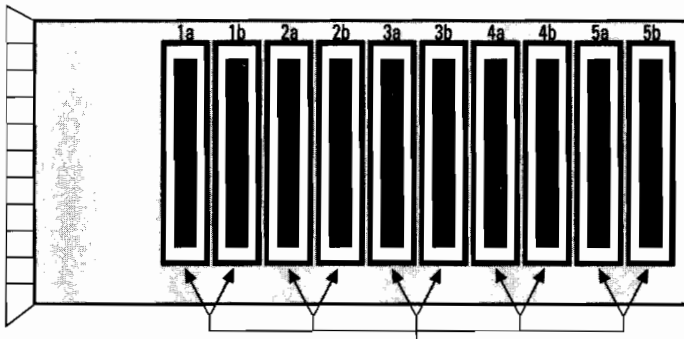
Figure 3.18 Model G30/G40/G50/G60/G70 Memory and I/O Configuration



- Notes:**
1. Each memory module consists of 2 memory cards.
 2. Memory cards must be installed in pairs.
 3. Each memory module fills 2 of the 12 memory slots.
 4. The last pair of memory cards is installed on the backplane after the extender is filled.
 5. All memory is installed on the memory carrier of Models G40, G50, G60, and G70.
 6. Memory extender is standard on Model G30.

- Memory Modules**
- A2230A – 8 MB (2 × 4 MB)
 - A2231A – 16 MB (2 × 8 MB)
 - A2232A – 32 MB (2 × 16 MB)
 - A2511A – 64 MB (2 × 32 MB)
 - A2516A – 128 MB (2 × 64 MB)
(High Density Memory)

Figure 3.19 Model G30/G40/G50 Memory Extender Board Layout

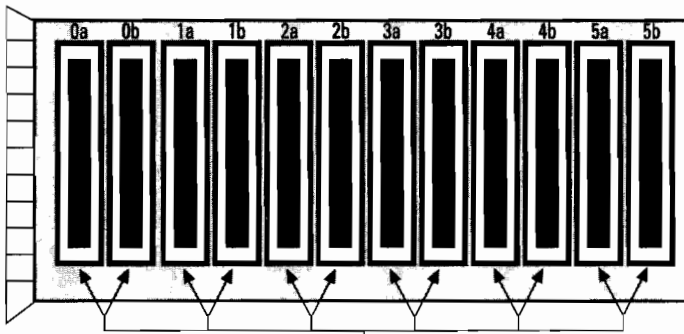


Each Memory Module Occupies Two Slots

G30 Memory Extender Board

Last Memory Module Is on Backplane

8 MB, 16 MB, 32 MB, 64 MB, and 128 MB Memory Modules



Each Memory Module Occupies Two Slots

G40/G50/G60/G70 Memory Carrier Board

Note: Memory extender or carrier boards are included with all G-Class Business Servers.

8 MB, 16 MB, 32 MB, 64 MB, and 128 MB Memory Modules

Model G30/G40/G50/G60/ G70 Memory Configuration

1. **Common rules for all G30/G40/
G50/G60/G70 systems:**
 - a. Memory array cards **MUST** be installed in pairs.
 - b. Each memory card installed in a slot pair must be the same size (e.g., 4 MB and 4 MB, 8 MB and 8 MB, 16 MB and 16 MB, 32 MB and 32 MB, or 64 MB and 64 MB).
 - c. The first memory card pair must be installed in the memory extender.
2. Rules that apply to G30 computers:
 - a. All common rules.
 - b. Memory pairs can be installed in any paired slot (e.g., 0A and 0B, 4A and 4B, etc.)
3. Rules that apply to G40, G50, G60, and G70 computers. When installing memory (any type) follow this specific insertion order:
 - a. First memory pair into extender slot 5A/5B
 - b. Second memory pair into extender slot 0A/0B
 - c. Third memory pair into extender slot 4A/4B
 - d. Fourth memory pair into extender slot 1A/1B
 - e. Fifth memory pair into extender slot 3A/3B
 - f. Sixth memory pair into extender slot 2A/2B
 - g. If the memory configuration contains any 8 MB pairs (A2231A 16 MB), they must be the last pair(s) installed.

Note: Models G50, G60, and G70 will not boot unless memory is configured as described above.

Model G30/G40/G50/ G60/G70 Configuration Guidelines

Some configurations exist which exceed the available power of the systems. The following configuration rules must be checked to verify the system is supported and that it will operate reliably:

If the system includes a QIC tape drive, or two devices, such as a CD-ROM drive and a DAT drive or two DAT drives, the power table and worksheet (Tables 3.8 and 3.9) must be checked. If a QIC drive, two DAT drives or a DAT and a CD-ROM drive are NOT present, all combinations of disk and I/O cards are supported and the worksheet can be ignored.

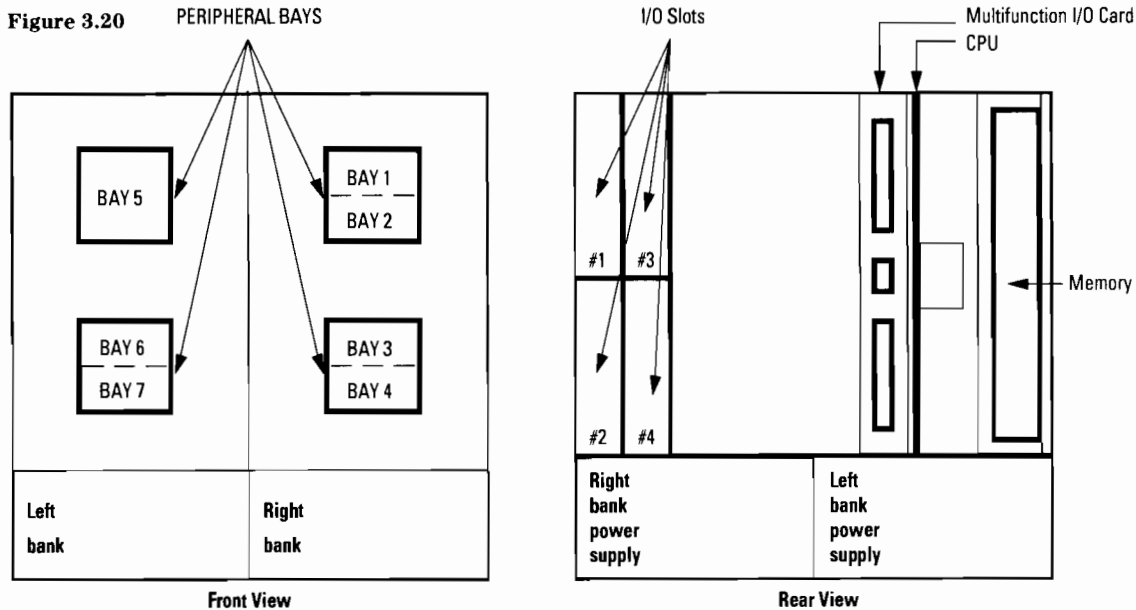
To use the power table and worksheet:

- a. Confirm the configuration does not exceed the maximum number of peripherals and I/O cards supported in the system.
- b. Note the current required by the configuration's multifunction I/O card, removable media devices, disk drives, and I/O cards provided in the power table (Table 3.8).
- c. Insert the +12V, +5V, and -12V current required by the selected multifunction I/O card into the worksheet row titled "multifunction I/O card."
- d. If a tape backup device is present, insert the +12V, +5V, and -12V current required by the selected DAT or QIC tape drive into the worksheet row titled "Internal Peripherals Bay 1."

- e. If a CD-ROM or a second DAT drive is present, insert the +12V, +5V, and -12V current required by the drive into the worksheet row titled "Internal Peripherals Bay 2."
- f. If half-height disk drives are present, insert the +12V, +5V, and -12V current required by the drives into the worksheet rows titled "Internal Peripherals Bay 3, Bay 4, Bay 6, and Bay 7."
- g. When full-height disk drives are used, insert the +12V, +5V, and -12V current required by the drives into the worksheet rows titled "Internal Peripherals Bay 3, Bay 5 and Bay 6." Do not use the row titled "Internal Peripherals Bay 4 or Bay 7" for a full-height drive.
- h. Insert the +12V, +5V, and -12V current required by the selected I/O cards into the worksheet row titled "I/O cards Slots 1 through 4." If double-high cards (FDDI and HP-FL) are used, insert the current values in odd numbered slots and leave the following even numbered slot empty.
- i. Sum the total amount of +12V, +5V, and -12V current required for the configuration.
- j. Compare the total amount of +12V, +5V, and -12V current required for the configuration to the available current.

Table 3.8 Power Table

	Multifunction I/O Card, I/O Card, and Peripheral Current Requirements (Amps)			Maximum Supported Number of Multifunction I/O Cards, I/O Cards, and Peripherals	
	+12V	+5V	-12V	G Class	
Multifunction I/O card				1 max	
LAN/SCSI	0.55	3.38	0.03	1	
MUX/SCSI	0.50	1.70	0.02	1	
Internal peripherals				6 max (3 max per bank)	
8mm tape	0.50	1.70	0.00	2	
2 GB DAT	0.75	1.00	0.00	2	
4-8 GB DAT	0.75	1.00	0.00	2	
1 GB QIC	1.50	0.50	0.00	1	
CD-ROM	0.85	0.90	0.00	1	
535 MB half-height disk	1.50	0.80	0.00	4	
1 GB half-height disk	0.82	1.00	0.00	4	
2 GB half-height disk	1.02	1.06	0.00	4	
1.3 GB full-height disk	2.30	1.90	0.00	3	
2 GB full-height disk	2.70	1.30	0.00	3	
I/O cards				4 single-high max	Form Factor
8 channel MUX (40299B)	0.16	1.40	0.13	4	Single-high
16 channel RS-232 direct connect MUX (J2092A)	0.08	1.10	0.08	4	Single-high
16 channel RS-423 direct connect MUX (J2093A)	0.20	1.10	0.15	4	Single-high
16 channel RS-232 modem connect MUX (J2094A)	0.30	1.70	0.15	4	Single-high
32 channel RS-232 direct connect MUX (J2096A)	0.125	1.60	0.125	4	Single-high
802.3 LAN (J2146A)	0.50	2.13	0.00	4	Single-high
802.5 LAN (J2166A)	0.00	1.66	0.00	4	Single-high
FDDI (J2157A)	0.00	3.70	0.00	2	Double-high
SCSI-2 (28655A)	0.00	0.90	0.00	4	Single-high
Fast/Wide SCSI-2 (28696A)	0.12	5.10	0.00	2	Double-high
HP-IB (28650B)	0.00	2.10	0.00	2	Single-high
PBA-FL (A1749A)	0.08	6.77	0.07	2	Double-high
HP-PB FL (28615A)	0.04	3.93	0.05	2	Double-high
X.25 (36960A)	0.08	2.36	0.09	4	Single-high
SNA (J2220A, 98173A, and 98174A)	0.08	2.36	0.09	4	Single-high



If the current used by the configuration is less than the current available, the system is supported. Also, if the configuration exceeds the available current by less than 5%, it is supported. (Worst-case current usage is assumed for all cards and drives—the 5% exposure factor is allowed since the typical current values for cards and drives will be lower than their worst-case values).

If the configuration exceeds the available current by more than 5%, it must be modified to be supported.

All combinations of I/O cards can be supported by taking the following steps to:

- a. If possible, move the full-height disk drive from Bay 3 to Bay 5 or 6 to reduce the load on the right bank power supply. Recalculate the configuration with Peripheral Bays 3 and 4 empty.

- b. If moving drives from Peripheral Bay 3 is not viable, an external mass storage system must be used to reduce the peripheral load in the system. By moving one or more peripherals from the internal peripheral bays 1 through 4, the peripheral current load on the right bank power supply will be reduced below the available level and the configuration will be supported.

Table 3.9 Configuration Worksheet—HP 9000 Series 800 Models G30, G40, G50, G60, and G70

	Left Bank			Right Bank			
	+12V	+5V	-12V	+12V	+5V	-12V	
Multifunction I/O card							LAN/SCSI or MUX/SCSI card
Internal peripherals							
Bay 1							DAT, CIC tape drive, or 8mm tape drive
Bay 2							DAT, CD-ROM drive, or 8mm tape drive
Bay 3							1 full-height disk or 1 half-height disk
Bay 4							1 half-height disk
Bay 5							1 full-height disk
Bay 6							1 full-height disk or 1 half-height disk
Bay 7							1 half-height disk
I/O cards							
Slot 1							Any supported I/O card
Slot 2							Any supported I/O card
Slot 3							Any supported I/O card
Slot 4							Any supported I/O card
Total current used							
Available current	6.27	6.80	1.50	6.27	27.00	1.50	

Note: Do not use shaded areas

Example 1

Since the configuration is below the maximums supported for each component, note the current each component requires.

Configuration requires the following:

- LAN/SCSI multifunction I/O card
- 1 GB QIC tape drive
- CD-ROM drive
- Two 2 GB full-height disk drives
- Three 802.3 LAN cards
- One Single-Ended SCSI-2 card

	+12V	+5V	-12V
LAN/SCSI Multifunction I/O card	.55A	3.38A	.03A
1 GB QIC tape drive	1.50A	0.50A	.00A
CD-ROM drive	.85A	.90A	.00A
2 GB full-height disk drive	2.70A	1.30A	.00A
802.3 LAN cards	.50A	2.13A	.00A
One Single-Ended SCSI-2 card	.00A	.90A	.00A

Insert the current values into the worksheet as shown. Note that the +12V current on the right bank power is over the available current by more than 5%. Therefore, this configuration is NOT supported.



Table 3.10 Example Configuration Worksheet—HP 9000 Series 800 Models G30, G40, G50, G60, and G70

	Left Bank			Right Bank			
	+12V	+5V	-12V	+12V	+5V	-12V	
Multifunction I/O card				0.55	3.38	0.03	LAN/SCSI card
Internal peripherals							
Bay 1				1.50	0.50	0.00	1 GB QIC tape drive
Bay 2				0.85	0.90	0.00	CD-ROM drive
Bay 3				2.70	1.30	0.00	1 full-height 2 GB disk
Bay 4							
Bay 5	2.70	1.30	0.00				1 full-height 2 GB disk
Bay 6							
Bay 7							
I/O cards							
Slot 1				0.50	2.13	0.00	802.3 LAN card
Slot 2				0.50	2.13	0.00	802.3 LAN card
Slot 3				0.50	2.13	0.00	802.3 LAN card
Slot 4				0.00	0.90	0.00	SCSI card
Total current used	2.70	1.30	0.00	7.10	13.37	0.03	
Available current	6.27	6.80	1.50	6.27	27.00	1.50	

Note: Do not use shaded areas

Note that the left bank power still has available current and that peripheral bay 6 is unused. Move the disk drive from bay 3 to bay 6 and recalculate power. All current values are now below the available current limits. Simply by moving the disk drive, the configuration is supported.

Table 3.11 Example Configuration Worksheet—HP 9000 Series 800 Models G30, G40, G50, G60, and G70

	Left Bank			Right Bank			
	+12V	+5V	-12V	+12V	+5V	-12V	
Multifunction I/O card				0.55	3.38	0.03	LAN/SCSI card
Internal peripherals							
Bay 1				1.50	0.50	0.00	1 GB QIC tape drive
Bay 2				0.85	0.90	0.00	CD-ROM drive
Bay 3							(Moved to Bay 6) 
Bay 4							
Bay 5	2.70	1.30	0.00				1 full-height 2 GB disk
Bay 6	2.70	1.30	0.00				1 full-height 2 GB disk 
Bay 7							
I/O cards							
Slot 1				0.50	2.13	0.00	802.3 LAN card
Slot 2				0.50	2.13	0.00	802.3 LAN card
Slot 3				0.50	2.13	0.00	802.3 LAN card
Slot 4				0.00	0.90	0.00	Single-Ended SCSI-2 card
Total current used	5.40	2.60	0.00	4.40	12.07	0.03	
Available current	6.27	6.80	1.50	6.27	27.00	1.50	

Note: Do not use shaded areas

Table 3.12 Model G30/G40/G50/G60/G70 Product Summary

Description	Product No./ Option No.
HP 9000 Series 800 G Class Business Servers	Required
Standard server includes (must order p/n A2429A): Integrated chassis with four (4) single high HP-PB slots Factory integration of memory, disks, back-up media and I/O cards ordered from product menu One year on-site warranty	A2429A
<i>Order desired SPU option from Sec. 1. The following standard items can be included w/SPU price at no extra charge:</i> 1 GB embedded disk drive (requires HP-UX 9.0x) 32 MB ECC memory (memory extender card included) 2.0 GB DDS drive LAN/SCSI/RS-232 personality card (requires HP-UX 9.04) with: –802.3 ThinLAN interface (BNC and AUI connectors included) –Single-ended (S.E.) SCSI-2 interface –Two RS-232 ports for console terminal and remote access Pre-loaded HP-UX operating system with 2-user license plus, TCP/IP, ARPA and NFS services Owner's Guide and General Usage documentation set HP 700/96 console terminal (No charge optional item.)	
Refer to sections 1–14 to select standard or alternate items.	
1. Select SPU	Required—Select one
a. Model G30 48 Mhz PA-RISC SPU with 512 KB cache	Qty. [] A2434A*
b. Model G40 64 Mhz PA-RISC SPU with 512 KB cache	Qty. [] A2435A*
c. Model G50 96 Mhz PA-RISC SPU with 512 KB cache and integrated floating point unit (Requires HP-UX 9.0x)	Qty. [] A2436A*
d. Model G60 96 Mhz PA-RISC SPU with 2 MB cache and integrated floating point unit (Requires HP-UX 9.0x)	Qty. [] A2980A*
e. Model G70 Dual 96 Mhz PA-RISC SMP SPU w/4 MB cache & integrated floating point unit (Requires HP-UX 9.0x)	Qty. [] A2971A*
2. Select floating point coprocessor	Optional—Minimum zero, maximum 1
a. Floating point coprocessor for Model G30	Qty. [] A2293A, Opt. 0DV
b. Floating point coprocessor for Model G40	Qty. [] A2293A, Opt. 0DV
3. Select HP-UX OS version	Required—Select one
a. HP-UX 9.04 with 2-user license (media p/n B3108A)	Qty. [] A2440A, Opt. APH
b. HP-UX 8.02 with 2-user license (media p/n B2459A) Media must be ordered separately. One media copy required per customer site.	Qty. [] A2440A, Opt. APC
Factory integrated, pre-loaded HP-UX 9.04 and layered product software	Optional—Minimum zero, maximum 1
c. Instant Ignition**	Qty. [] A2440A, Opt. 0D1
4. Select localization of system documentation	Required—Select one
a. System manuals in English	Qty. [] A2440A, Opt. ABA
b. System manuals in French/Canadian	Qty. [] A2440A, Opt. ABC
c. System manuals in German	Qty. [] A2440A, Opt. ABD
d. System manuals in Japanese	Qty. [] A2440A, Opt. ABJ
5. Select power failure back-up solution	Optional
a. Add powerfail battery back-up	Qty. [] A2368A, Opt. 0E1
b. Add HP PowerTrust 600 VA UPS***	Qty. [] A2941A
6. Select rack mount kit for installation into factory integrated 1.6m or 1.1m racks. (Integrated racks must be ordered on the same order/section.)	Optional—Minimum zero, maximum 1
a. Add rack mount kit	Qty. [] C2798AZ
7. Select personality card	Required—Select one
a. Standard—LAN personality card: 802.3 ThinLAN, two RS-232 ports for console and HP remote access and S.E. SCSI-2. (Requires HP-UX 9.0x)	Qty. [] A2441A, Opt. 0DS
b. Replace std. w/8-port MUX personality card: 8 modem RS-232 ports, S.E. SCSI-2 and parallel centronics port	Qty. [] A2442A, Opt. 0DS
c. Replace std. w/16-port MUX pers. card: 8 modem & 8 DC RS-232 ports, S.E. SCSI-2 and parallel centronics port	Qty. [] A2442A, Opt. 0DT

Note: For items 7b and 7c: RS-232 ports include console port and HP access ports.

* HP Site Planning and installation included.

** See Section 7 for details.

*** Requires HP-UX 9.04.

To order support, refer to System Support Options, pages 8-2 to 8-6.

Table 3.12 Model G30/G40/G50/G60/G70 Product Summary (cont'd)

Description		Product No./ Option No.
HP 9000 Series 800 G Class Business Servers		
A2429A (cont'd)		
8. Select base memory configuration (select either standard memory or ONE replacement module only)	Required	
a. Standard—32 MB ECC base memory	Qty. []	A2232AZ, Opt. 0DS
b. Replace base memory with 64 MB ECC module	Qty. []	A2511AZ, Opt. 0DU
c. Replace base memory with 128 MB ECC high density module (requires HP-UX 9.04)	Qty. []	A2516AZ, Opt. 0DU
9. Additional memory configuration (Select up to five additional modules.)	Optional	
Maximum memory (base + additional): 768 MB (HP-UX 9.04) or 384 MB (HP-UX 8.02)		
a. 16 MB ECC memory module	Qty. []	A2231AZ, Opt. 0DZ
b. 32 MB ECC memory module	Qty. []	A2232AZ, Opt. 0DZ
c. 64 MB ECC memory module	Qty. []	A2511AZ, Opt. 0DZ
d. 128 MB ECC high density memory module (requires HP-UX 9.04)	Qty. []	A2516AZ, Opt. 0DZ
10. Select base disk configuration (Maximum of 4 half-height and 1 full-height, 2 half-height and 2 full-height, or 3 full-height internal disks.) §	Required—Select one	
a. Standard—Base 1 GB half-height disk (requires HP-UX 9.0x)	Qty. []	A2445A, Opt. 0DS
b. Delete base 1 GB disk (alternate disk or back-up storage device required)	Qty. []	A2443A, Opt. 702
Select alternate/additional internal disks		
c. Add 535 MB half-height disk (requires HP-UX 9.04)	Qty. []	A2958A, Opt. 0DZ
d. Add 1 GB half-height disk (requires HP-UX 9.0x)	Qty. []	A2445A, Opt. 0DZ
e. Add 2 GB half-height disk (requires HP-UX 9.04)*	Qty. []	A3087A, Opt. 0DZ*
f. Add 1.3 GB full-height disk	Qty. []	C2474SZ, Opt. 0DZ
g. Add 2 GB full-height disk (requires HP-UX 9.0x)	Qty. []	A2446A, Opt. 0DZ
11. Select back-up storage configuration (Maximum of DAT and CD-ROM; or QIC and CD-ROM)	Required	
a. Standard—2 GB DDS DAT (half-height)	Qty. []	C2477SZ, Opt. 0DS
b. Delete standard 2 GB DDS DAT drive (alternate back-up storage device or internal disk require	Qty. []	A2443A, Opt. 700
c. Add 4-8 GB DDS DAT drive (half-height). Requires HP-UX 9.0x.	Qty. []	C2478SZ, Opt. 0DZ
d. Add 1 GB Quarter Inch Cartridge (QIC) drive (half-height)	Qty. []	A2944A, Opt. 0DZ
Select additional storage device		
e. Add CD-RDM (half-height)	Qty. []	C2476SZ, Opt. 0DZ
f. High-performance CD-ROM (half-height, requires HP-UX 9.04)	Qty. []	A3086A, Opt. 0DZ
12. Select system console terminal	Optional—Select one	
a. HP 700/96 console terminal with Green screen	Qty. []	C1064GZ, Opt. ABA**
b. HP 700/96 console terminal with Amber screen	Qty. []	C1064AZ, Opt. ABA**
c. HP 700/96 console terminal with Soft-white screen	Qty. []	C1064WZ, Opt. ABA**
13. Select I/O and networking cards	Optional	
a. 16 port RS-232 direct connect MUX (RJ45 connector)	Qty. []	J2092AZ
b. 16 port RS-232 direct connect MUX (DB25 connector)	Qty. []	J2092AZ, Opt. 010
c. 32 port RS-232 direct connect MUX (RJ45 connector)	Qty. []	J2096AZ
d. 32 port RS-232 direct connect MUX (DB25 connector)	Qty. []	J2096AZ, Opt. 010
e. 5 MB/s Single-Ended SCSI-2 interface card with parallel port (uses 1-slot)	Qty. []	28655A, Opt. 0DZ
f. 20 MB/s Fast/Wide Differential SCSI-2 interface card	Qty. []	28696A, Opt. 0DZ
g. 802.3 ThinLAN/9000 interface card (uses 1-slot)	Qty. []	J2146A, Opt. 0DM
h. 802.5 Token Ring interface card (preset to 4 Mb/s speed) (uses 1-slot)	Qty. []	J2166A, Opt. AU2
i. Token Ring back-up media and documentation	Qty. []	J2250A
j. HP-IB interface card (uses 1-slot)	Qty. []	28650B, Opt. 0DZ
k. HP-FL interface card (native card, requires HP-UX 9.04; uses 2-slots)	Qty. []	28615A, Opt. 0DZ
l. HP-FL interface card (Chanspan card, for HP-UX 8.02 or 9.04; uses 2-slots)	Qty. []	A1749A, Opt. 0DZ
m. X.25 link with RS-232-C interface card (uses 1-slot)	Qty. []	36960A, Opt. 0DN
n. X.25 link with V.35 interface card (uses 1-slot)	Qty. []	36960A, Opt. 0DP
o. X.25 back-up media and documentation	Qty. []	A2321A
14. Select end-user terminal (support must be ordered separately)	Optional	
a. HP 700/60 Ergonomic terminal with Amber screen	Qty. []	C1080A, Opt. ABA**
b. HP 700/60 Ergonomic terminal with Green screen	Qty. []	C1080G, Opt. ABA**
c. HP 700/60 Ergonomic terminal with Soft-white screen	Qty. []	C1080W, Opt. ABA**
d. HP 700/60ES Ergonomic terminal with Soft-white screen	Qty. []	C1083W, Opt. ABA**

* Orderable March 1, 1994.

** U.S./English option shown, refer to CPL for localization options.

§ Other disk products may be ordered from price list but will not include factory integration into the SPU chassis.

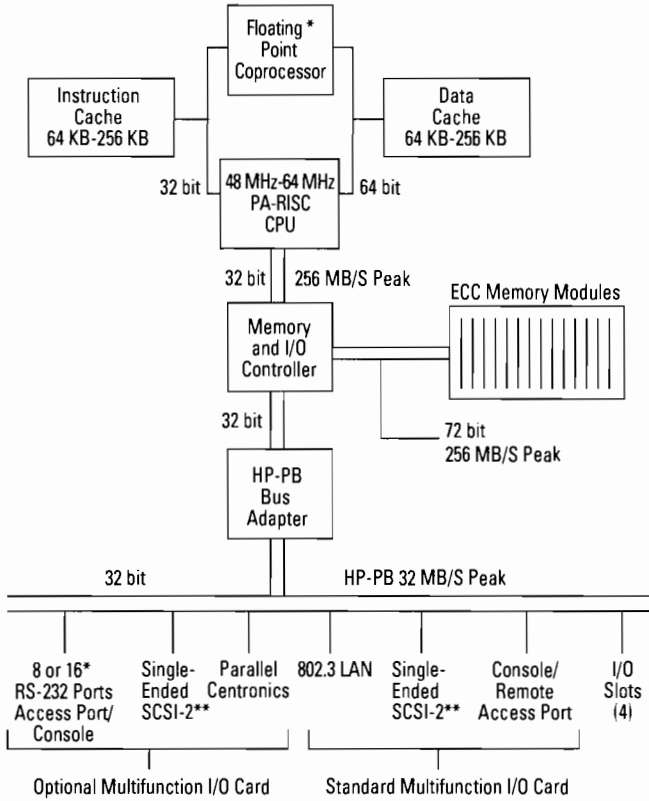
To order support, refer to System Support Options on pages 8-2 to 8-6.

Table 3.13 Model G30/G40/G50/G60/G70 Technical Specifications

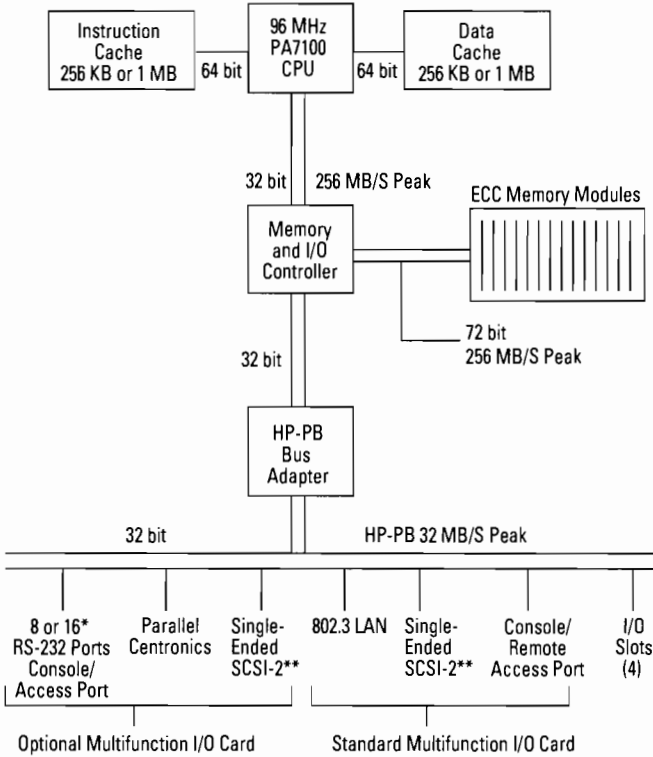
Physical Characteristics	
Height	43.0 cm
Width	42.4 cm
Depth	53.3 cm
Weight	50 kg/110 lbs
Electrical Characteristics	
AC input power	100V-120V and 200V-240V autoranging, 50 Hz-60 Hz
Rated current	12 amps @ 120V; 6 amps @ 240V
Maximum heat dissipation	800 watts
Environmental Characteristics	
Acoustics	<5.8 bels (A) sound power below 30C
Electrostatic discharge, power transients and vibration	Designed for office and data center environments
Temperature	
Operating	+5C to +40C
Non-operating	-40C to +65C (system); -40C to +45C (tape media)
Max rate of temperature change	<20C/hr without DDS DAT; <10C/hr with DDS DAT
Relative humidity	
Operating	20% to 80%, non-condensing (max 26C wet bulb temp.)
Non-operating	5% to 80%, non-condensing
Max rate of humidity change	<30%/hr
Altitude	
Operating	to 3,000 meters (10,000 ft.)
Non-operating	to 4,500 meters (15,000 ft.)
Regulatory Compliance	
Electromagnetic interference	Complies with FCC rules and regulations, Part 15, Subpart J, as a Class A computing device. Manufacturers Declaration to EN55022, Class A Registered with Japanese VCCI, Class 1
Safety	UL Listed, ETL Listed, CSA Certified, Compliant with EN60950

Figure 3.21 Model G30/G40/G50/G60/G70 System Architectures

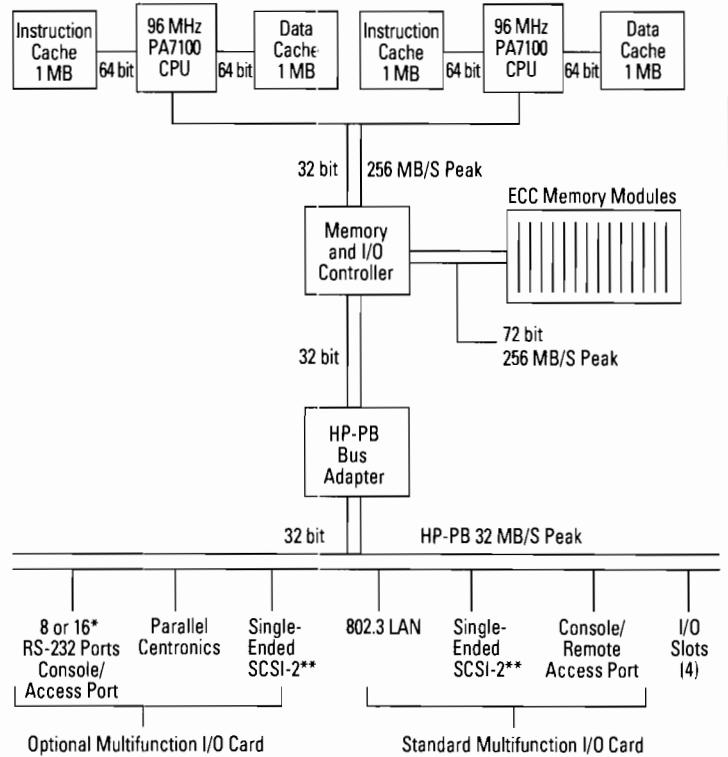
System Architecture – Models G30 and G40



System Architecture – Models G50 and G60



System Architecture – Model G70



* Optional

** Single-ended SCSI-2 adapter is used to connect both internal and external devices (up to a maximum of 7 total devices)

Model H20/H30/H40/H50/H60/H70 Integrated Business Servers

SPU Model No.	SPU Product No.	S/W Tier	Single High Slots	I/O Bus	Clk Spd MHz	Instr/ Data Cache (KB)	Relative OLTP Performance to F10*	Ports Included On LAN-based Multifunction I/O Card				SPU Model No.
								SCSI	RS-232	Centronics	LAN	
H20	A2366A	2	8	HP-PB	48	64/64	1.7	1	2	0	1	H20
H30	A2437A	2	8	HP-PB	48	256/256	2.5	1	2	0	1	H30
H40	A2438A	2	8	HP-PB	64	256/256	3.0	1	2	0	1	H40
H50	A2439A	2	8	HP-PB	96	256/256	3.9	1	2	0	1	H50
H60	A2981A	2	8	HP-PB	96	1024/1024	5.7	1	2	0	1	H60
H70	A2970A	2	8	HP-PB	2 x 96	2048/2048	8.3	1	2	0	1	H70

Product numbers for E/F/G/H/I servers must be ordered with appropriate Structured Solution Product (SSP) part number: H-Class, A2430A.

* Note: Relative OLTP performance is a general guideline since factors influencing performance for applications vary widely.

Max. Disk Storage

SPU Model No.	Base Memory (MB)	Max. Memory (MB)	Base Internal Disk (MB)	Internal Single-Ended SCSI (GB)	Total Single-Ended SCSI (GB)	Total F/W SCSI (Disks & Arrays) (GB)	F/W SCSI Array (GB)	HP-IB (GB)	FL (GB)	FL Disk Array (GB)	Max. Total Suppt'd Disk (GB)	Max. Internal Tape Capacity (GB)	SPU Model No.
H20	64	768*	1 GB	10**	120	288	224	5.4	43	173	300	4-8DDS	H20
H30	64	768*	1 GB	10**	120	288	224	5.4	43	173	300	4-8DDS	H30
H40	64	768*	1 GB	10**	120	288	224	5.4	43	173	300	4-8DDS	H40
H50	64	768*	1 GB	10**	120	288	224	5.4	43	173	300	4-8DDS	H50
H60	64	768*	1 GB	10**	120	288	224	5.4	43	173	300	4-8DDS	H60
H70	64	768*	1 GB	10**	120	288	224	5.4	43	173	300	4-8DDS	H70

* 768 MB with HP-UX 9.0x or greater, 384 MB with HP-UX 8.02.

** Using 4 x 2 GB disk drives, orderable March 1, 1994.

Max. I/O and Networking Cards

SPU Model No.	Max. SCSI Tape Drives	Max. HP-IB Tape Drives	Max. Centronics Printers	Max. Serial Printers	Max. HP-IB Printers	Max. HP-IB Plotters	Max. SCSI-2 Parallel Centronics	Max. SCSI-2 Fast/Wide	Max. HP-IB	Max. HP-PB FL (28615A)/ PBA-FL (A1749A)	Max. MUX Ports	Max. # of User (via DTC & MUX)	SPU Model No.
H20	8	8*	9	40	n/a	8*	8	4	2	4/2	272	1120	H20
H30	8	8*	9	40	n/a	8*	8	4	2	4/2	272	1120	H30
H40	8	8*	9	40	n/a	8*	8	4	2	4/2	272	1850	H40
H50	8	8*	9	40	n/a	8*	8	4	2	4/2	272	1850	H50
H60	8	8*	9	40	n/a	8*	8	4	2	4/2	272	2500	H60
H70	8	8*	9	40	n/a	8*	8	4	2	4/2	272	3500††	H70

* With 2 HP-IB interface cards.

† Contact factory if support for more printers is required.

‡ Not including multifunction I/O card.

†† Contact the factory if customer requires more than 3000 terminal connections.

Max. I/O and Networking Cards (cont'd)

SPU Model No.	Max. 802.3 LAN	Max. 802.5 Token Ring LAN	Max. 8-Channel MUX	Max. 16-Channel MUX	Max. 32-Channel MUX	Max. FDDI	Max. X.25	Max. SNAplusLink	SPU Model No.
H20	7	5	8	8	8	2	8	8	H20
H30	7	5	8	8	8	2	8	8	H30
H40	7	5	8	8	8	2	8	8	H40
H50	7	5	8	8	8	2	8	8	H50
H60	7	5	8	8	8	2	8	8	H60
H70	7	5	8	8	8	2	8	8	H70

‡ Not including multifunction I/O card.

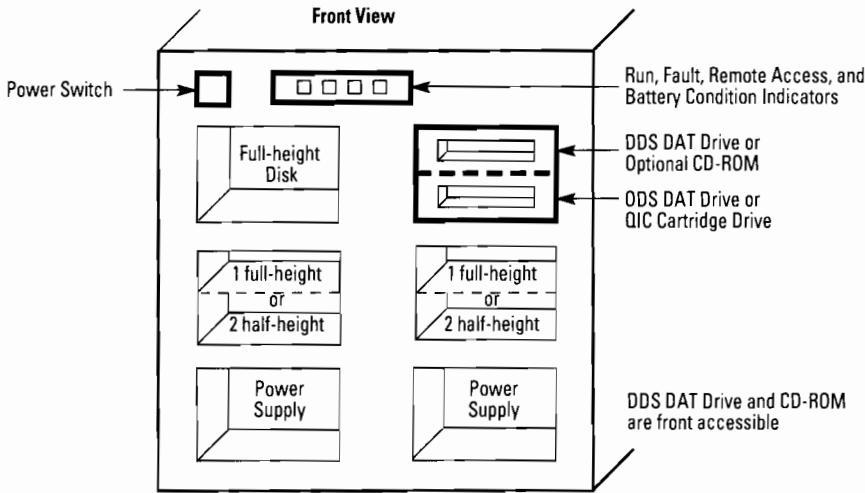
Model H20/H30/H40/H50/H60/H70 Integrated Business Servers (cont'd)

SPU Model Number	Depth in mm	Width in mm	Height in mm	Weight in Kg	Power Reqmnt. Watts	Heat Diss BTUs Per Hr.	First CPL Date	First Ship Date	Site Prep Included	SPU Model Number
H20	533	424	430	50	800	2770	12/92	1/93	yes	H20
H30	533	424	430	50	800	2770	12/92	1/93	yes	H30
H40	533	424	430	50	800	2770	12/92	1/93	yes	H40
H50	533	424	430	50	800	2770	12/92	1/93	yes	H50
H60	533	424	430	50	800	2770	7/93	TBD	yes	H60
H70	533	424	430	50	800	2770	7/93	TBD	yes	H70

SPU Model No.	SPEC int92	SPEC fp92	SPEC rate_int92	SPEC rate_fp92	SPU Model No.
H20	33.6	56.1	816	1335	H20
H30	37.8	62.4	890	1483	H30
H40	50.5	81.6	1201	1949	H40
H50	78.3	141.6	1854	3374	H50
H60	107.7	195.2*	1944	4074	H60
H70	n/a	n/a	3757	7325	H70

* Using compiler available April 1994.

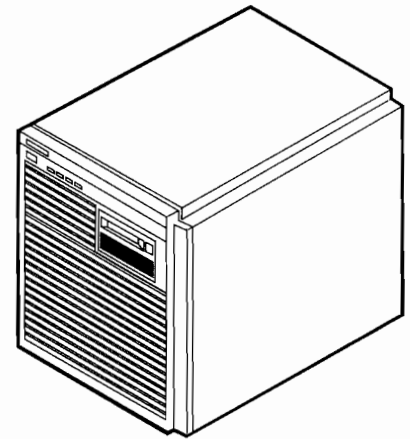
Figure 3.22 Model H20/H30/H40/H50/H60/H70 Business Server Layout



NOTES:

1. Combination of two half-height disks plus the optional CD-ROM is NOT supported in the right side peripheral bay, unless the tape drive is deleted.
2. Maximum of three peripherals on each side of package, due to number of internal power connections available.
3. Combinations of two DATs or a DAT and QIC cannot be integrated at the factory but are supported. To order either combination (2 DATs or DAT + QIC), factory installation of the first backup device and field installation of the second backup device is required.
4. Systems require at least one internal peripheral (disk, DAT or QIC).

Figure 3.23 Model H20/H30/H40/H50/H60/H70 Business Server



Internal Disks

Capacity	Form Factory
1.3 GB 2.0 GB	Full-height
535 MB 1 GB 2 GB*	Half-height

* Orderable March 1, 1994.

Includes:	Maximum SPU Capacities	Features
<ul style="list-style-type: none"> • CPU • Memory Extender/Carrier Board • 8-slot chassis • 1 GB base disk • 64 MB RAM • Single-Ended SCSI-2 • Parallel Centronics I/F • 802.3 LAN I/F • Console port • HP support access port 	<ul style="list-style-type: none"> • 10 GB internal disk* • 768 MB RAM (384 MB with HP-UX 8.02) • 8 single-high I/F cards • 4 double-high I/F cards • 2 removable-media drives 	<ul style="list-style-type: none"> • 8-slot chassis • 32 MB/s peak, 21 MB/s sustained I/O throughput • 19" rackmountable

*6 GB prior to March 1, 1994.
10 GB after March 1, 1994, with availability of 2 GB half-height disk drives.

Figure 3.24 H-Class SPU: Rear View with Standard LAN Multifunction I/O card (A2441A, Option 0DS)

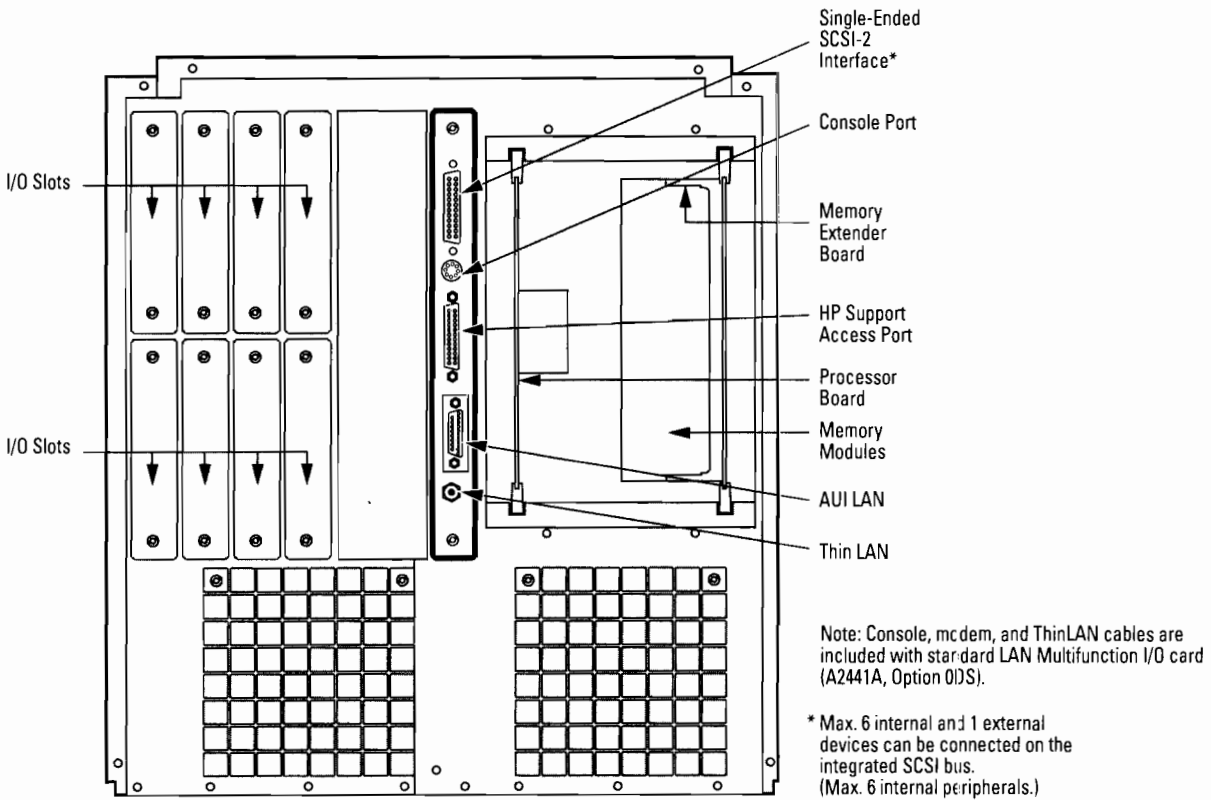
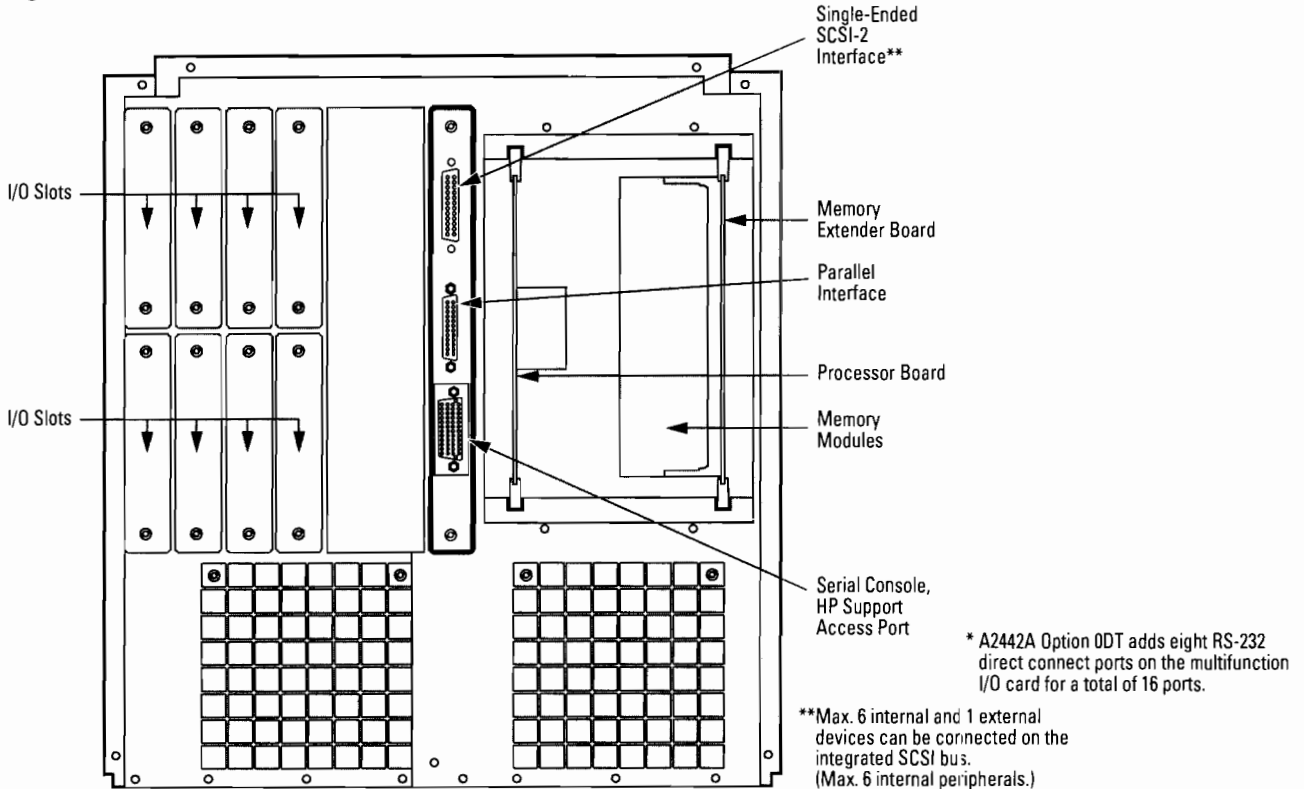
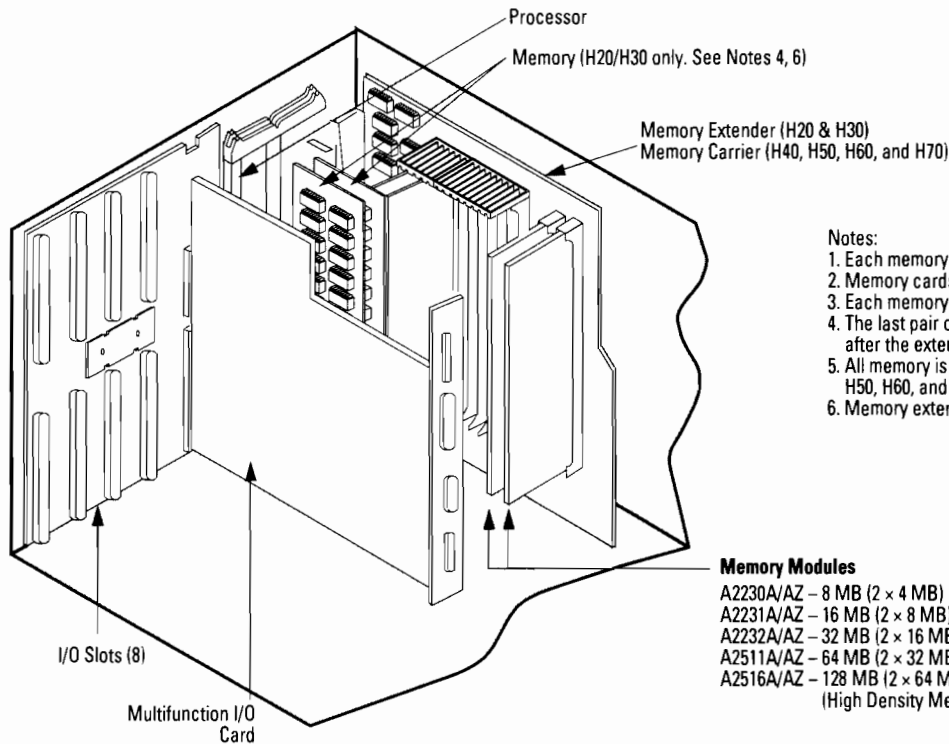


Figure 3.25 H-Class SPU: Rear View with Optional MUX Multifunction I/O card (A2442A, Option 0DS)*



Model H20/H30/H40/H50/H60/H70 Memory Array

Figure 3.26 Model H20/H30/H40/H50/H60/H70 Memory and I/O Configuration

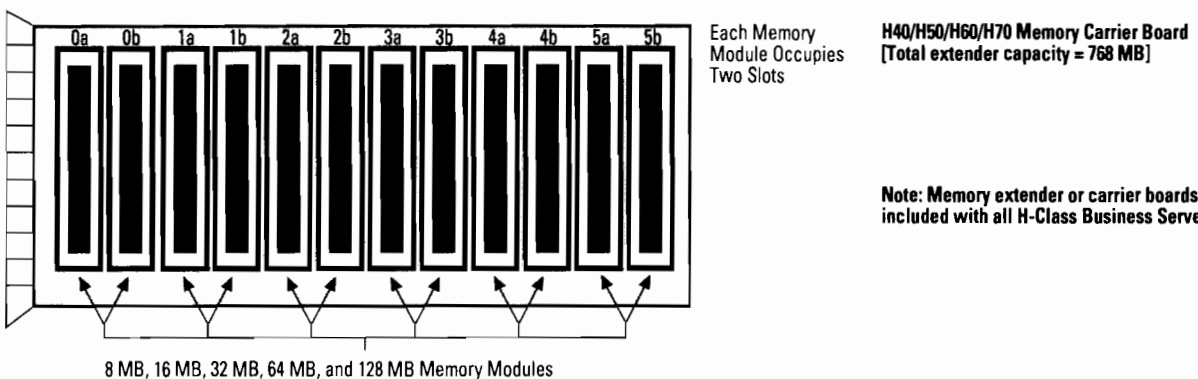
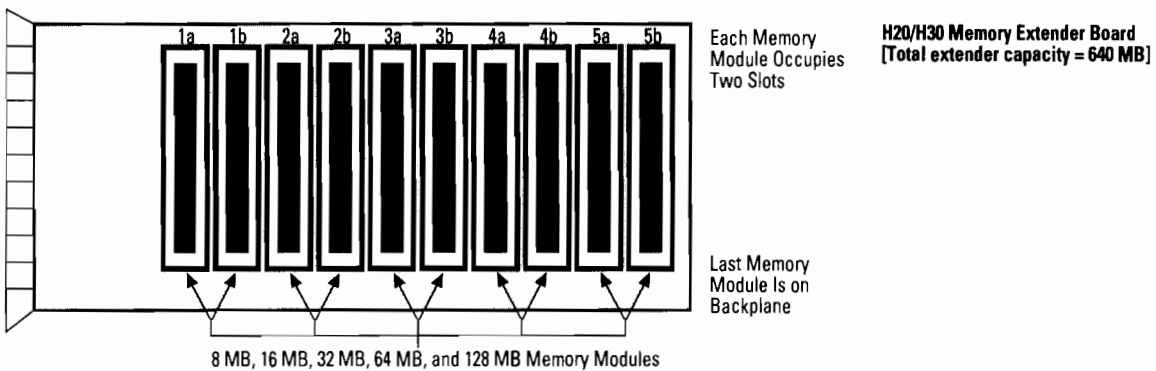


- Notes:
1. Each memory module consists of 2 memory cards.
 2. Memory cards must be installed in pairs.
 3. Each memory module fills 2 of the 12 memory slots.
 4. The last pair of memory cards is installed on the backplane after the extender is filled.
 5. All memory is installed on the memory carrier of Models H40, H50, H60, and H70.
 6. Memory extender is standard on H20 and H30.

Memory Modules

- A2230A/AZ – 8 MB (2 × 4 MB)
- A2231A/AZ – 16 MB (2 × 8 MB)
- A2232A/AZ – 32 MB (2 × 16 MB)
- A2511A/AZ – 64 MB (2 × 32 MB)
- A2516A/AZ – 128 MB (2 × 64 MB)
(High Density Memory)

Figure 3.27 Model H20/H30/H40/H50/H60/H70 Memory Extender Board Layout



Model H20/H30/H40/H50/H60/H70 Memory Configuration

1. **Common rules for all H20/H30/H40/H50/H60/H70 systems:**
 - a. Memory array cards **MUST** be installed in pairs.
 - b. Each memory card installed in a slot pair must be the same size (e.g., 4 MB and 4 MB, 8 MB and 8 MB, 16 MB and 16 MB, 32 MB and 32 MB, or 64 MB and 64 MB).
 - c. The first memory card pairs must be installed in the memory extender.
2. Rules that apply to H20 and H30 computers:
 - a. All common rules.
 - b. Memory pairs can be installed in any paired slot (e.g., 0A and 0B, 4A and 4B, etc.)
3. Rules that apply to H40, H50, H60, and H70 computers. When installing memory (any type) follow this specific insertion order:
 - a. First memory pair into extender slot 5A/5B
 - b. Second memory pair into extender slot 0A/0B
 - c. Third memory pair into extender slot 4A/4B
 - d. Fourth memory pair into extender slot 1A/1B
 - e. Fifth memory pair into extender slot 3A/3B
 - f. Sixth memory pair into extender slot 2A/2B
 - g. If the memory configuration pairs contain any 8 MB pairs (A2231A 16 MB), they must be the last pair(s) installed.

Note: Models H50, H60, and H70 will not boot unless memory is configured as described above.

Model H20/H30/H40/H50/H60/H70 Configuration Guidelines

While most customers will find their configurations can be supported without modification, some configurations exist which exceed the available power of the systems. The following configuration rules must be checked to verify the system is supported and that it will operate reliably.

To use the power table and worksheet:

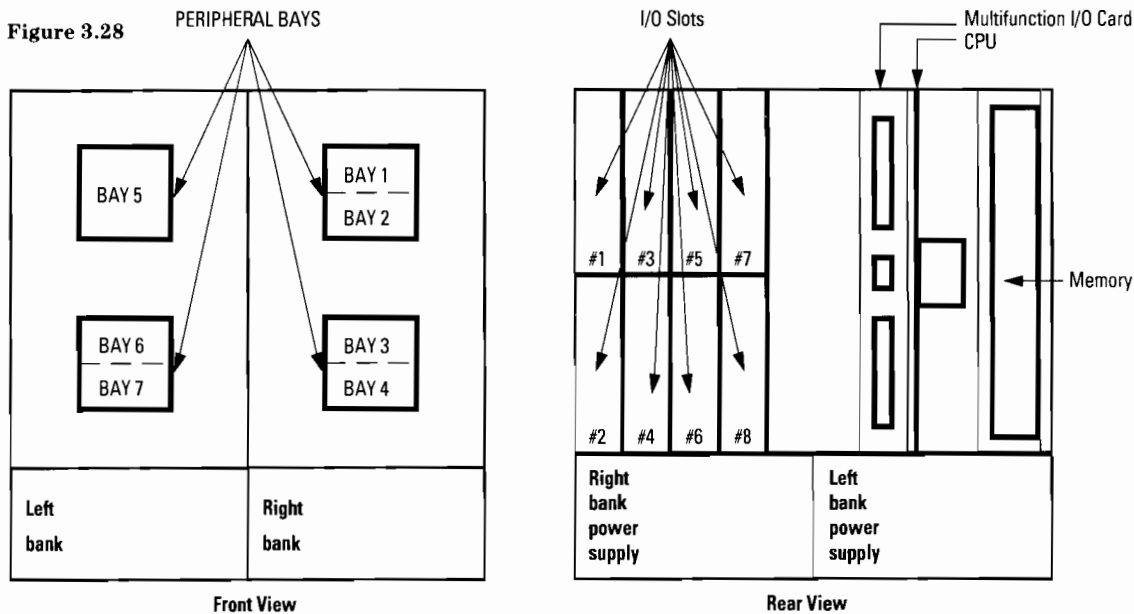
- a. Confirm the configuration does not exceed the maximum number of peripherals and I/O cards supported in the system.
- b. Note the current required by the configuration's multifunction I/O card, removable media devices, disk drives, and I/O cards provided in the power table.
- c. Insert the +12V, +5V, and -12V current required by the selected multifunction I/O card into the worksheet row titled "multifunction I/O card."
- d. If a tape backup device is present, insert the +12V, +5V, and -12V current required by the selected DAT or QIC tape drive into the worksheet row titled "Internal Peripherals Bay 1."
- e. If a CD-ROM or a second DAT drive is present, insert the +12V, +5V, and -12V current required by the drive into the worksheet row titled "Internal Peripherals Bay 2."

- f. If half-height disk drives are present, insert the +12V, +5V, and -12V current required by the drives into the worksheet rows titled "Internal Peripherals Bay 3, Bay 4, Bay 6, and Bay 7."
- g. When full-height disk drives are used, insert the +12V, +5V, and -12V current required by the drives into the worksheet rows titled "Internal Peripherals Bay 3, Bay 5 and Bay 6." Do not use the row titled "Internal Peripherals Bay 4 or Bay 7" for a full-height drive.
- h. Insert the +12V, +5V, and -12V current required by the selected I/O cards into the worksheet row titled "I/O cards Slots 1 through 8." If double-high cards (FDDI and HP-FL) are used, insert the current values in odd numbered slots and leave the following even numbered slot empty.
- i. Sum the total amount of +12V, +5V, and -12V current required for the configuration.
- j. Compare the total amount of +12V, +5V, and -12V current required for the configuration to the available current.

If the current used by the configuration is less than the current available, the system is supported. Also, if the configuration exceeds the available current by less than 5%, it is supported. (Worst-case current usage is assumed for all cards and drives—the 5% exposure factor is allowed since the typical current values for cards and drives will be lower than their worst-case values).

Model H20/H30/H40/H50/H60/H70 Integrated Business Servers (cont'd)
 Table 3.14 Power Table

	Multifunction I/O Card, I/O Card, and Peripheral Current Requirements (Amps)			Maximum Supported Number of Multifunction I/O Cards, I/O Cards, and Peripherals	
	+12V	+5V	-12V	H Class	
Multifunction I/O card				1 max	
LAN/SCSI	0.55	3.38	0.03	1	
MUX/SCSI	0.50	1.70	0.02	1	
Internal peripherals				6 max (3 max per bank)	
8mm Tape	0.50	1.70	0.00	2	
2 GB DAT	0.75	1.00	0.00	2	
4-8 GB DAT	0.75	1.00	0.00	2	
1 GB QIC	1.50	0.50	0.00	1	
CD-ROM	0.85	0.90	0.00	1	
422 MB half-height disk	0.65	1.25	0.00	4	
535 MB half-height disk	1.50	0.80	0.00	4	
1 GB half-height disk	0.82	1.00	0.00	4	
2 GB half-height disk	1.02	1.06	0.00	4	
1.3 GB full-height disk	2.30	1.90	0.00	3	
2 GB full-height disk	2.70	1.30	0.00	3	
I/O cards				8 single-high max	Form Factor
8 channel MUX (40299B)	0.16	1.40	0.13	8	Single-high
16 channel RS-232 direct connect MUX (J2092A)	0.08	1.10	0.08	8	Single-high
16 channel RS-423 direct connect MUX (J2093A)	0.20	1.10	0.15	8	Single-high
16 channel RS-232 modem connect MUX (J2094A)	0.30	1.70	0.15	8	Single-high
32 channel RS-232 direct connect MUX (J2096A)	0.125	1.60	0.125	8	Single-high
802.3 LAN (J2146A)	0.50	2.13	0.00	7	Single-high
802.5 LAN (J2166A)	0.00	1.66	0.00	5	Single-high
FDDI (J2157A)	0.00	3.70	0.00	2	Double-high
SCSI-2 (28655A)	0.00	0.90	0.00	8	Single-high
Fast/Wide SCSI-2 (28696A)	0.12	5.10	0.00	4	Double-high
HP-IB (28650B)	0.00	2.10	0.00	2	Single-high
PBA-FL (A1749A)	0.08	6.77	0.07	2	Double-high
HP-PB FL (28615A)	0.04	3.93	0.05	4	Double-high
X.25 (36960A)	0.08	2.36	0.09	8	Single-high
SNA (J2220A, 98173A, and 98174A)	0.08	2.36	0.09	8	Single-high



If the configuration exceeds the available current by more than 5%, it must be modified to be supported.

All combinations of I/O cards can be supported by taking the following steps to:

- a. If possible, move the full-height disk drive from Bay 3 to Bay 5 or 6 to reduce the load on the right bank power supply. Recalculate the configuration with Peripheral Bays 3 and 4 empty.

- b. If moving drives from Peripheral Bay 3 is not viable, an external mass storage system must be used to reduce the peripheral load in the system. By moving one or more peripherals from the internal peripheral bays 1 through 4, the peripheral current load on the right bank power supply will be reduced below the available level and the configuration will be supported.

Table 3.15 Configuration Worksheet—HP 9000 Series 800 Models H20, H30, H40, H50, H60, and H70

	Left Bank			Right Bank			
	+12V	+5V	-12V	+12V	+5V	-12V	
Multifunction I/O card							LAN/SCSI or MUX/SCSI card
Internal peripherals							
Bay 1							DAT, QIC tape drive, or 8mm tape drive
Bay 2							DAT, CD-ROM drive, or 8mm tape drive
Bay 3							1 full-height disk or 1 half-height disk
Bay 4							1 half-height disk
Bay 5							1 full-height disk
Bay 6							1 full-height disk or 1 half-height disk
Bay 7							1 half-height disk
I/O cards							
Slot 1							Any supported I/O card
Slot 2							Any supported I/O card
Slot 3							Any supported I/O card
Slot 4							Any supported I/O card
Slot 5							Any supported I/O card
Slot 6							Any supported I/O card
Slot 7							Any supported I/O card
Slot 8							Any supported I/O card
Total current used							
Available current	6.27	6.80	1.50	6.27	27.00	1.50	

Note: Do not use shaded areas

Example 1

Since the configuration is below the maximums supported for each component, note the current each component requires.

Configuration requires the following:

		+12V	+5V	-12V
• LAN/SCSI multifunction I/O card	LAN/SCSI Multifunction I/O card	.55A	3.38A	.03A
• 1 GB QIC tape drive	1 GB QIC tape drive	1.50A	0.50A	.00A
• CD-ROM drive	CD-ROM drive	.85A	.90A	.00A
• Two 2 GB disk drives	2 GB full-height disk drive	2.70A	1.30A	.00A
• Three 802.3 LAN cards	802.3 LAN cards	.50A	2.13A	.00A
• One Single-Ended SCSI-2 card	Single-Ended SCSI-2 card	.00A	.90A	.00A
• One FDDI card	FDDI card	.00A	3.70A	.00A
• Two J2094A MUXes	J2094A MUX	.30A	1.70A	.15A

Insert the current values into the worksheet as shown. Note that the +12V current on the right bank power is over the available current by more than 5%. Therefore, this configuration is NOT supported.

Table 3.16 Example Configuration Worksheet—HP 9000 Series 800 Models H20, H30, H40, and H50

	Left Bank			Right Bank			
	+12V	+5V	-12V	+12V	+5V	-12V	
Multifunction I/O card				0.55	3.38	0.03	LAN/SCSI card
Internal peripherals							
Bay 1				1.50	0.50	0.00	1 GB QIC tape drive
Bay 2				0.85	0.90	0.00	CD-ROM drive
Bay 3				2.70	1.30	0.00	1 full-height 2 GB disk
Bay 4							
Bay 5	2.70	1.30	0.00				1 full-height 2 GB disk
Bay 6							
Bay 7							
I/O cards							
Slot 1				0.00	3.70	0.00	FDDI
Slot 2							
Slot 3				0.50	2.13	0.00	802.3 LAN
Slot 4				0.50	2.13	0.00	802.3 LAN
Slot 5				0.50	2.13		802.3
Slot 6				0.00	0.90		SCSI
Slot 7				0.30	1.70		J2094A MUX
Slot 8				0.30	1.70		J2094A MUX
Total current used	2.70	1.30	0.30	7.70	20.47	0.03	
Available current	6.27	6.80	1.50	6.27	27.00	1.50	

Note: Do not use shaded areas

Note that the left bank power still has available current and that peripheral bay 6 is unused. Move the disk drive from bay 3 to bay 6 and recalculate power results in all current values below the available current. Therefore, simply by moving the disk drive, the configuration is supported.

Table 3.17 Example Configuration Worksheet—HP 9000 Series 800 Models H20, H30, H40, H50, H60, and H70

	Left Bank			Right Bank			
	+12V	+5V	-12V	+12V	+5V	-12V	
Multifunction I/O card				0.55	3.38	0.03	LAN/SCSI card
Internal peripherals							
Bay 1				1.50	0.50	0.00	1 GB QIC tape drive
Bay 2				0.85	0.90	0.00	CD-ROM drive
Bay 3							(Moved to Bay 6)
Bay 4							
Bay 5	2.70	1.30	0.00				1 full-height 2 GB disk
Bay 6	2.70	1.30	0.00				1 full-height 2 GB disk
Bay 7							
I/O cards							
Slot 1				0.00	3.70	0.00	FDDI
Slot 2							
Slot 3				0.50	2.13	0.00	802.3 LAN
Slot 4				0.50	2.13	0.00	802.3 LAN
Slot 5			0.00	0.50	2.13		802.3
Slot 6			0.00	0.00	0.90		SCSI
Slot 7			0.15	0.30	1.70		J2094A MUX
Slot 8			0.15	0.30	1.70		J2094A MUX
Total current used	5.40	2.60	0.30	5.00	19.17	0.03	
Available current	6.27	6.80	1.50	6.27	27.00	1.50	

Note: Do not use shaded areas

Table 3.18 Model H20/H30/H40/H50/H60/H70 Product Summary

Description	Required	Product No./ Option No.
HP 9000 Series 800 H Class Business Servers		
Standard server includes (must order p/n A2430A): Integrated chassis with eight (8) single high HP-PB slots Factory integration of memory, disks, back-up media and I/O cards ordered from product menu One year on-site warranty	Required	A2430A
Order desired SPU option from Sec. 1. The following standard items can be included w/SPU price at no extra charge: 1 GB embedded disk drive (requires HP-UX 9.04) 64 MB ECC memory (memory extender card included) 2.0 GB DDS drive LAN/SCSI/RS-232 personality card (requires HP-UX 9.04) with: –802.3 ThinLAN interface (BNC and AUI connectors included) –Single-ended (S.E.) SCSI-2 interface –Two RS-232 ports for console terminal and remote access Pre-loaded HP-UX operating system with 2-user license plus, TCP/IP, ARPA and NFS services Owner's Guide and General Usage documentation set HP 700/96 console terminal (No charge optional item.)		
Refer to sections 1–14 to select standard or alternate items.		
1. Select SPU	Required—Select one	
a. Model H20 48 Mhz PA-RISC SPU with 128 KB cache	Qty. []	A2366A*
b. Model H30 48 Mhz PA-RISC SPU with 512 KB cache	Qty. []	A2437A*
c. Model H40 64 Mhz PA-RISC SPU with 512 KB cache	Qty. []	A2438A*
d. Model H50 96 Mhz PA-RISC SPU with 512 KB cache and integrated floating point unit (Requires HP-UX 9.04)	Qty. []	A2439A*
e. Model H60 96 Mhz PA-RISC SPU with 2 MB cache and integrated floating point unit (Requires HP-UX 9.04)	Qty. []	A2981A*
f. Model H70 Dual 96 Mhz PA-RISC SMP SPU w/4 MB cache & integrated floating point unit (Req. HP-UX 9.04)	Qty. []	A2970A*
2. Select floating point coprocessor	Optional—Minimum zero, maximum 1	
a. Floating point coprocessor for Model H20	Qty. []	A2293A, Opt. 0DU
b. Floating point coprocessor for Model H30	Qty. []	A2293A, Opt. 0DV
c. Floating point coprocessor for Model H40	Qty. []	A2293A, Opt. 0DW
3. Select HP-UX OS version	Required—Select one	
a. HP-UX 9.04 with 2-user license (media p/n B3108A)	Qty. []	A2440A, Opt. APH
b. HP-UX 8.02 with 2-user license (media p/n B2459A)	Qty. []	A2440A, Opt. APC
Media must be ordered separately. One media copy required per customer site. Factory integrated, pre-loaded HP-UX 9.04 and layered product software	Optional—Minimum zero, maximum 1	
c. Instant Ignition**	Qty. []	A2440A, Opt. 0D1
4. Select localization of system documentation	Required—Select one	
a. System manuals in English	Qty. []	A2440A, Opt. ABA
b. System manuals in French/Canadian	Qty. []	A2440A, Opt. ABC
c. System manuals in German	Qty. []	A2440A, Opt. ABD
d. System manuals in Japanese	Qty. []	A2440A, Opt. ABJ
5. Select power failure back-up solution	Optional—Minimum zero, maximum 1	
a. Add powerfail battery back-up	Qty. []	A2368A, Opt. 0E1
b. Add HP PowerTrust 600 VA UPS***	Qty. []	A2941A
6. Select rack mount kit for installation into factory integrated 1.6m or 1.1m racks. (Integrated racks must be ordered on the same order/section.)	Optional—Minimum zero, maximum 1	
a. Add rack mount kit	Qty. []	C2798AZ
7. Select personality card	Required—Select one only	
a. Standard—LAN personality card: 802.3 ThinLAN, two RS-232 ports for console and HP remote access and S.E. SCSI-2. (Requires HP-UX 9.04)	Qty. []	A2441A, Opt. 0DS
b. Replace std. w/8-port MUX personality card: 8 modem RS-232 ports, S.E. SCSI-2 and parallel centronics port	Qty. []	A2442A, Opt. 0DS
c. Replace std. w/16-port MUX pers. card: 8 modem & 8 DC RS-232 ports, S.E. SCSI-2 and parallel centronics port	Qty. []	A2442A, Opt. 0DT
Note: For items 7b and 7c: RS-232 ports include console port and HP access ports.		
* HP Site Planning and installation included		
** See Section 7 for details.		
*** Requires HP-UX 9.04.		

To order support, refer to System Support Options, pages 8-2 to 8-6.



Table 3.18 Model H20/H30/H40/H50/H60/H70 Product Summary (cont'd)

Description		Product No./ Option No.
HP 9000 Series 800 H Class Business Servers		
8. Select base memory configuration (select either standard memory or ONE replacement module only)		A2430A (cont'd)
	Required	
a. Standard—64 MB ECC base memory	Qty. []	A2511AZ, Opt. ODS
b. Replace base memory with 128 MB ECC high density module (requires HP-UX 9.0x)	Qty. []	A2516AZ, Opt. ODV
9. Additional memory configuration (Select up to five additional modules)		
Maximum memory (base + additional): 768 MB (HP-UX 9.0x) or 384 MB (HP-UX 8.02)		
	Optional	
a. 16 MB ECC memory module	Qty. []	A2231AZ, Opt. ODZ
b. 32 MB ECC memory module	Qty. []	A2232AZ, Opt. ODZ
c. 64 MB ECC memory module	Qty. []	A2511AZ, Opt. ODZ
d. 128 MB ECC high density memory module (requires HP-UX 9.0x)	Qty. []	A2516AZ, Opt. ODZ
10. Select base disk configuration (Maximum of 4 half-height and 1 full-height, 2 half-height and 2 full-height, or 3 full-height internal disks) §		
	Required—Select one only	
a. Standard—Base 1 GB half-height disk (requires HP-UX 9.04)	Qty. []	A2445A, Opt. ODS
b. Delete base 1 GB disk (alternate disk or back-up storage device required)	Qty. []	A2443A, Opt. 702
Select alternate/additional internal disks		
	Optional	
c. Add 535 MB half-height disk (requires HP-UX 9.04)	Qty. []	A2958A, Opt. ODZ
d. Add 1 GB half-height disk (requires HP-UX 9.0x)	Qty. []	A2445A, Opt. ODZ
e. Add 2 GB half-height disk (requires HP-UX 9.04)*	Qty. []	A3087A, Opt. ODZ*
f. Add 1.3 GB full-height disk	Qty. []	C2474SZ, Opt. ODZ
g. Add 2 GB full-height disk (requires HP-UX 9.0x)	Qty. []	A2446A, Opt. ODZ
11. Select back-up storage configuration (Maximum of DAT and CD-ROM; or QIC and CD-ROM)		
	Required	
a. Standard—2 GB DDS DAT (half-height)	Qty. []	C2477SZ, Opt. ODS
b. Delete standard 2 GB DDS DAT drive (alternate back-up storage device or internal disk required.)	Qty. []	A2443A, Opt. 700
c. Add 4-8 GB DDS DAT drive (half-height). Requires HP-UX 9.04.	Qty. []	C2478SZ, Opt. ODZ
d. Add 1 GB Quarter Inch Cartridge (QIC) drive (half-height)	Qty. []	A2944A, Opt. ODZ
Select additional storage device		
	Optional	
e. Add CD-ROM (half-height)	Qty. []	C2476SZ, Opt. ODZ
f. High-performance CD-ROM (half-height, requires HP-UX 9.04)	Qty. []	A3086A, Opt. ODZ
12. Select system console terminal		
	Optional—Select one only	
a. HP 700/96 console terminal with Green screen	Qty. []	C1064GZ, Opt. ABA**
b. HP 700/96 console terminal with Amber screen	Qty. []	C1064AZ, Opt. ABA**
c. HP 700/96 console terminal with Soft-white screen	Qty. []	C1064WZ, Opt. ABA**
13. Select I/O and networking cards		
	Optional	
a. 16 port RS-232 direct connect MUX (RJ45 connector)	Qty. []	J2092AZ
b. 16 port RS-232 direct connect MUX (DB25 connector)	Qty. []	J2092AZ, Opt. 010
c. 32 port RS-232 direct connect MUX (RJ45 connector)	Qty. []	J2096AZ
d. 32 port RS-232 direct connect MUX (DB25 connector)	Qty. []	J2096AZ, Opt. 010
e. 5 MB/s Single-Ended SCSI-2 interface card with parallel port (uses 1-slot)	Qty. []	28655A, Opt. ODZ
f. 20 MB/s Fast/Wide Differential SCSI-2 interface card	Qty. []	28696A, Opt. ODZ
g. 802.3 ThinLAN/9000 interface card (uses 1-slot)	Qty. []	J2146A, Opt. ODM
h. 802.5 Token Ring interface card (preset to 4 Mb/s speed) (uses 1-slot)	Qty. []	J2166A, Opt. AU3
i. Token Ring back-up media and documentation	Qty. []	J2250A
j. HP-IB interface card (uses 1 slot)	Qty. []	28650B, Opt. ODZ
k. HP-FL interface card (native card, requires HP-UX 9.04; uses 2-slots)	Qty. []	28615A, Opt. ODZ
l. HP-FL intrfc crd (Chanspan card, for HP-UX 8.02 or 9.04; uses 2-slots)	Qty. []	A1749A, Opt. ODZ
m. X.25 link with RS-232-C interface card (uses 1-slot)	Qty. []	36960A, Opt. ODD
n. X.25 link with V.35 interface card (uses 1-slot)	Qty. []	36960A, Opt. ODR
o. X.25 back-up media and documentation	Qty. []	A2321A
14. Select end-user terminal (support must be ordered separately)		
	Optional	
a. HP 700/60 Ergonomic terminal with Amber screen	Qty. []	C1080A, Opt. ABA**
b. HP 700/60 Ergonomic terminal with Green screen	Qty. []	C1080G, Opt. ABA**
c. HP 700/60 Ergonomic terminal with Soft-white screen	Qty. []	C1080W, Opt. ABA**
d. HP 700/60ES Ergonomic terminal with Soft-white screen	Qty. []	C1083W, Opt. ABA**

§ Other disk products may be ordered from price list but will not include factory integration into the SPU chassis.

* Orderable March 1, 1994.

** U.S./English option shown, refer to CPL for localization options.

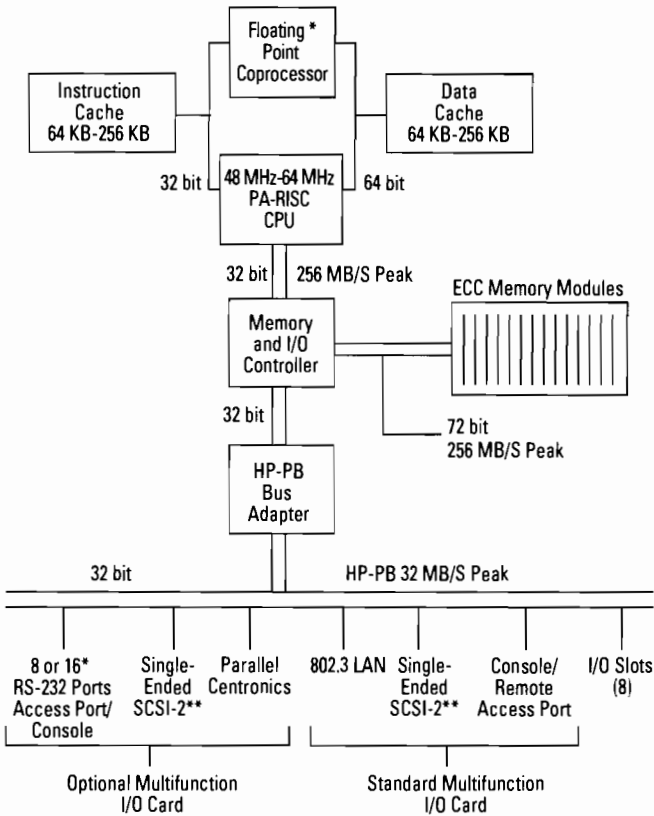
To order support, refer to System Support Options on pages 8-2 to 8-6.

Table 3.19 Model H20/H30/H40/H50/H60/H70 Technical Specifications

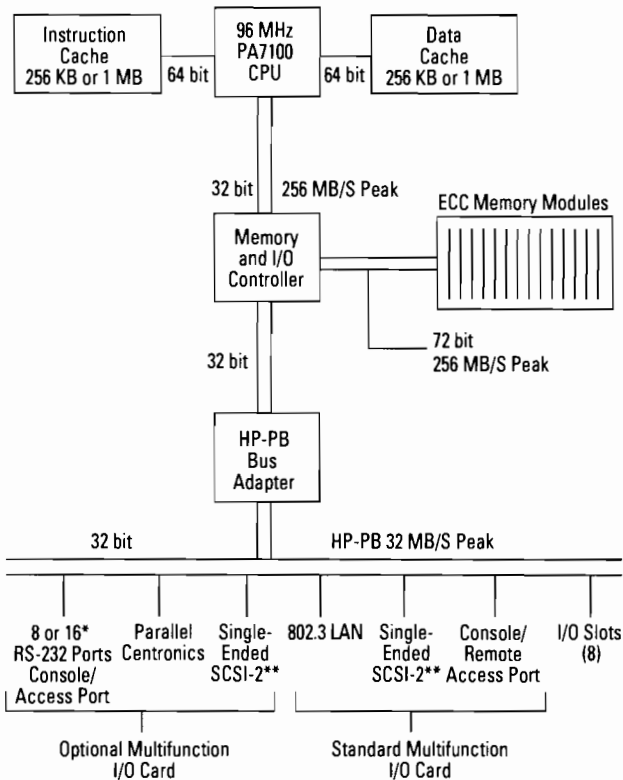
Physical Characteristics	
Height	43.0 cm
Width	42.4 cm
Depth	53.3 cm
Weight	50 kg/110 lbs
Electrical Characteristics	
AC input power	100V-120V and 200V-240V autoranging, 50 Hz-60 Hz
Rated current	12 amps @ 120V; 6 amps @ 240V
Maximum heat dissipation	800 watts
Environmental Characteristics	
Acoustics	<5.8 bels (A) sound power below 30C
Electrostatic discharge, power transients and vibration	Designed for office and data center environments
Temperature	
Operating	+5C to +40C
Non-operating	-40C to +65C (system); -40C to +45C (tape media)
Max rate of temperature change	<20C/hr without DDS DAT; <10C/hr with DDS DAT
Relative humidity	
Operating	20% to 80%, non-condensing (max 26C wet bulb temp.)
Non-operating	5% to 80%, non-condensing
Max rate of humidity change	<30%/hr
Altitude	
Operating	to 3,000 meters (10,000 ft.)
Non-operating	to 4,500 meters (15,000 ft.)
Regulatory Compliance	
Electromagnetic interference	Complies with FCC rules and regulations, Part 15, Subpart J, as a Class A computing device. Manufacturers Declaration to EN55022, Class A Registered with Japanese VCCI, Class 1
Safety	UL Listed, ETL Listed, CSA Certified, Compliant with EN60950

Figure 3.29 Model H20/H30/H40/H50/H60/H70 System Architectures

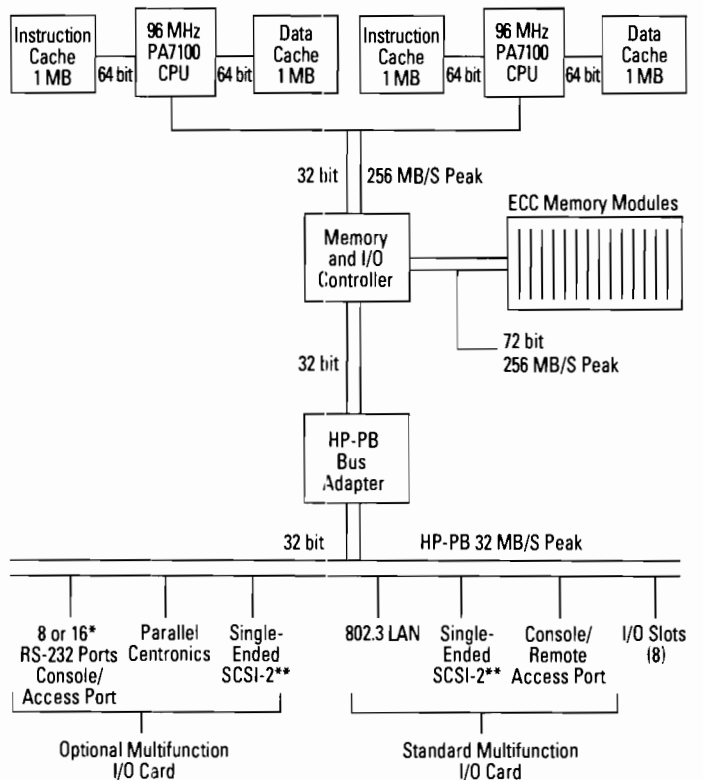
System Architecture – Models H20, H30, and H40



System Architecture – Models H50 and H60



System Architecture – Model H70



* Optional

** Single-ended SCSI-2 adapter is used to connect both internal and external devices (up to a maximum of 7 total devices).

Model I30/I40/I50/I60/I70 Integrated Business Servers

SPU Model No.	SPU Product No.	S/W Tier	Single High Slots	I/O Bus	Cik Spd MHz	Instr/ Data Cache (KB)	Relative OLTP Performance to F10*	Ports Included On LAN-based Multifunction I/O Card				SPU Model No.
								SCSI	RS-232	Centronics	LAN	
I30	A2365A	2	12	HP-PB	48	256/256	2.5	1	2	0	1	I30
I40	A2364A	2	12	HP-PB	64	256/256	3.0	1	2	0	1	I40
I50	A2363A	2	12	HP-PB	96	256/256	3.9	1	2	0	1	I50
I60	A2982A	2	12	HP-PB	96	1024/1024	5.7	1	2	0	1	I60
I70	A2362A	2	12	HP-PB	2 x 96	2048/2048	8.3	1	2	0	1	I70

* Note: Relative OLTP performance is a general guideline since factors influencing performance of applications vary widely.
Product numbers for E/F/G/H/I servers must be ordered with appropriate Structured Solution Product (SSP) part number: I-Class, A2431A.

Max. Disk Storage

SPU Model No.	Base Memory (MB)	Max. Memory (MB)	Base Internal Disk (MB)	Internal Single-Ended SCSI (GB)	Total Single-Ended SCSI (GB)	Total F/W SCSI (Disks & Arrays) (GB)	F/W SCSI Array (GB)	HP-IB (GB)	FL (GB)	FL Disk Array (GB)	Max. Total Suppt'd Disk (GB)	Max. Internal Tape Capacity (GB)	SPU Model No.
I30	64	768*	2 x 2 GB	10**	120	330	280	5.4	43	173	330	4-8DDS	I30
I40	64	768*	2 x 2 GB	10**	120	330	280	5.4	43	173	330	4-8DDS	I40
I50	64	768*	2 x 2 GB	10**	120	330	280	5.4	43	173	330	4-8DDS	I50
I60	64	768*	2 x 2 GB	10**	120	330	280	5.4	43	173	330	4-8DDS	I60
I70	64	768*	2 x 2 GB	10**	120	330	280	5.4	43	173	330	4-8DDS	I70

* 768 MB with HP-UX 9.0 or greater, 384 MB with HP-UX 8.02.

** Using 2 GB disk drives orderable March 1, 1994.

Max. I/O and Networking Cards

SPU Model No.	Max. SCSI Tape Drives	Max. HP-IB Tape Drives	Max. Centronics Printers	Max. Serial Printers	Max. HP-IB Printers	Max. HP-IB Plotters	Max. SCSI-2 [†] Parallel Centronics	Max. Fast/Wide SCSI-2	Max. HP-IB	Max. HP-PB FL (28615A)/ PBA-FL (A1749A)	Max. MUX Ports	Max. # of User (via DTC & MUX)	SPU Model No.
I30	8	8*	13	50	n/a	8*	12	5	2	4/2	400	1120	I30
I40	8	8*	13	50	n/a	8*	12	5	2	4/2	400	1850	I40
I50	8	8*	13	50	n/a	8*	12	5	2	4/2	400	1850	I50
I60	8	8*	13	50	n/a	8*	12	5	2	4/2	400	2500	I60
I70	8	8*	13	50	n/a	8*	12	5	2	4/2	400	3500‡	I70

* With 2 HP-IB interface cards.

† Contact factory if support for more printers is required.

‡ Not including multifunction I/O card.

‡‡ Contact the factory if customer requires more than 3000 terminal connections.

Max. I/O and Networking Cards (cont'd)

SPU Model No.	Max. [‡] 802.3 LAN	Max. 802.5 Token Ring LAN	Max. 8-Channel MUX	Max. 16-Channel MUX	Max. 32-Channel MUX	Max. FDDI	Max. X.25	Max. SNAplusLink	SPU Model No.
I30	7	5	12	12	12	2	10	10	I30
I40	7	5	12	12	12	2	10	10	I40
I50	7	5	12	12	12	2	10	10	I50
I60	7	5	12	12	12	2	10	10	I60
I70	7	5	12	12	12	2	10	10	I70

‡ Not including multifunction I/O card.

Model I30/I40/I50/I60/I70 Integrated Business Servers (cont'd)

SPU Model Number	Depth in mm	Width in mm	Height in mm	Weight in Kg	Power Reqmnt. Watts	Heat Diss BTUs Per Hr.	First CPL Date	First Ship Date	Site Prep Included	SPU Model Number
I30	533	424	430	50	800	2770	12/92	1/93	yes	I30
I40	533	424	430	50	800	2770	12/92	1/93	yes	I40
I50	533	424	430	50	800	2770	12/92	1/93	yes	I50
I60	533	424	430	50	800	2770	7/93	9/93	yes	I60
I70	533	424	430	50	800	2770	7/93	9/93	yes	I70

SPU Model No.	SPEC int92	SPEC fp92	SPEC rate_int92	SPEC rate_fp92	SPU Model No.
I30	37.8	62.4	890	1483	I30
I40	50.5	81.6	1201	1949	I40
I50	78.3	141.6	1854	3374	I50
I60	107.7	195.2*	1944	4074	I60
I70	n/a	n/a	3757	7325	I70

* Using compiler available April 1994.

Figure 3.30 Model I30/I40/I50/I60/I70 Business Server Layout

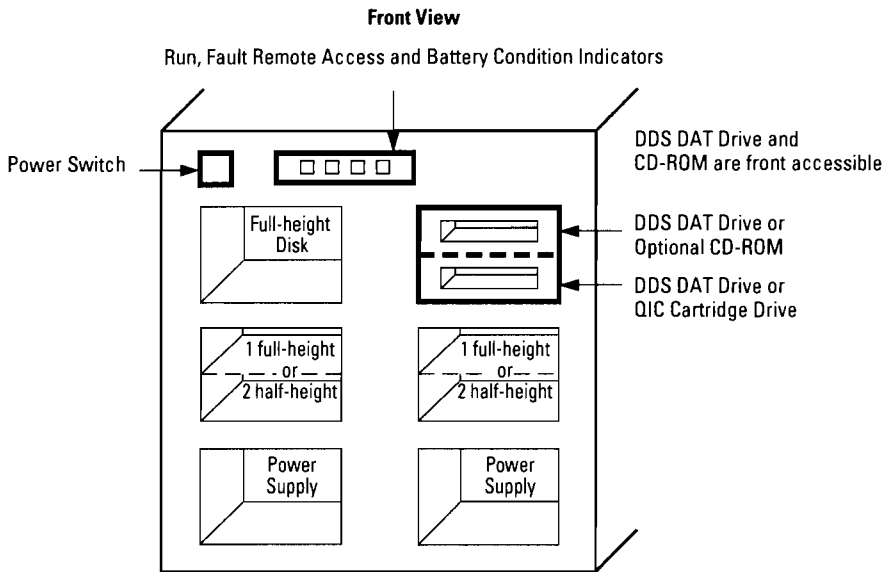
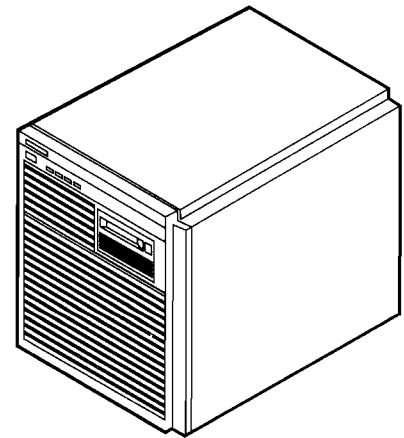


Figure 3.31 Model I30/I40/I50/I60/I70 Business Servers



NOTES:

1. Combination of two half-height disks plus the optional CD-ROM is NOT supported in the right side peripheral bay, unless the tape drive is deleted.
2. Maximum of three peripherals on each side of package, due to number of internal power connections available.
3. Combinations of two DATs or a DAT and QIC cannot be integrated at the factory but are supported. To order either combination (2 DATs or DAT + QIC), factory installation of the first backup device and field installation of the second backup device is required.
4. Systems require at least one internal peripheral (disk, DAT or QIC).

Internal Disks

Capacity	Form Factor
1.3 GB 2.0 GB	Full-height
535 MB 1 GB 2 GB*	Half-height

* Orderable March 1, 1994.

Includes:	Maximum SPU Capacities	Features
<ul style="list-style-type: none"> • CPU • Memory Extender/Carrier Board • 12-slot chassis • 2 x 2 GB base disk • 64 MB RAM • Single-Ended SCSI-2 • Parallel Centronics I/F • 802.3 LAN I/F • Console port • HP support access port 	<ul style="list-style-type: none"> • 10 GB internal disk* • 768 MB RAM (384 MB with HP-UX 8.02) • 12 single-high I/F cards • 6 double-high I/F cards • 2 removable-media drives 	<ul style="list-style-type: none"> • 12-slot chassis • 32 MB/s peak, 21 MB/s sustained I/O throughput • 19" rackmountable

*6 GB prior to March 1, 1994.
10 GB after March 1, 1994, with availability of 2 GB half-height disk drives.

Figure 3.32 I-Class SPU: Rear View with Standard LAN Multifunction I/O Card (A2441A, Option ODS)

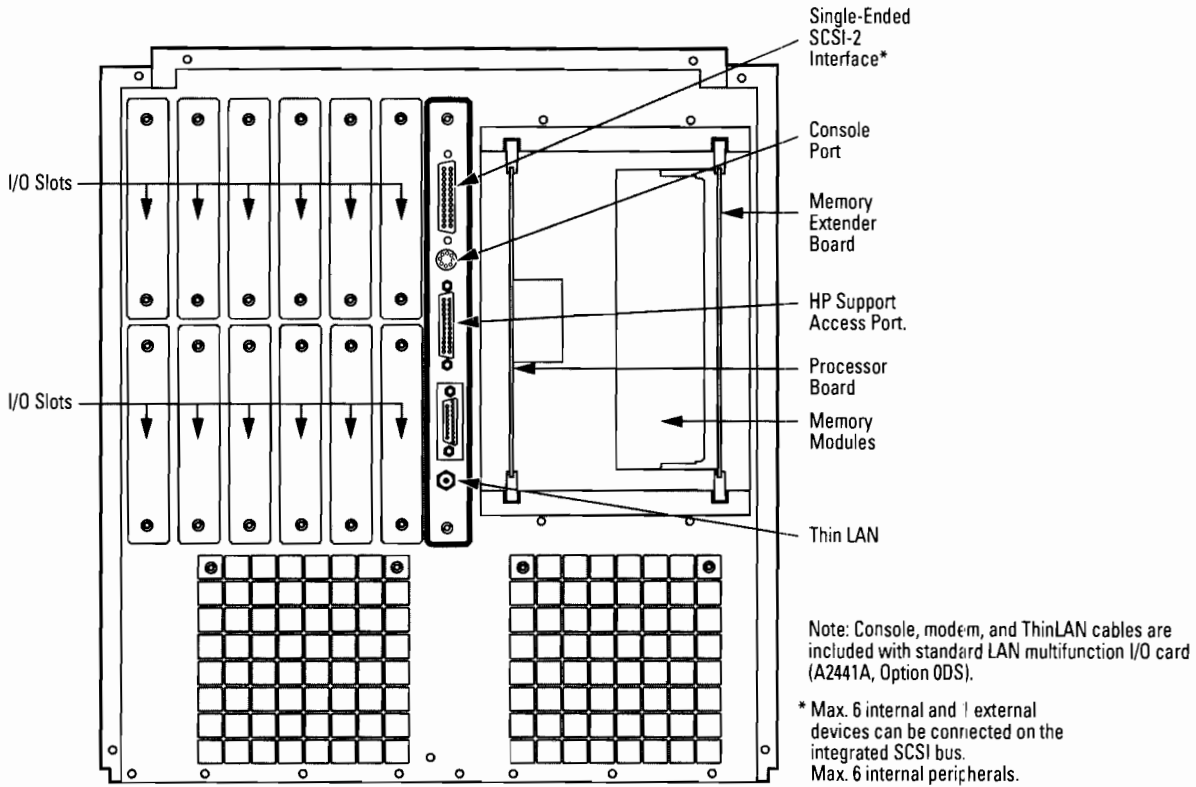
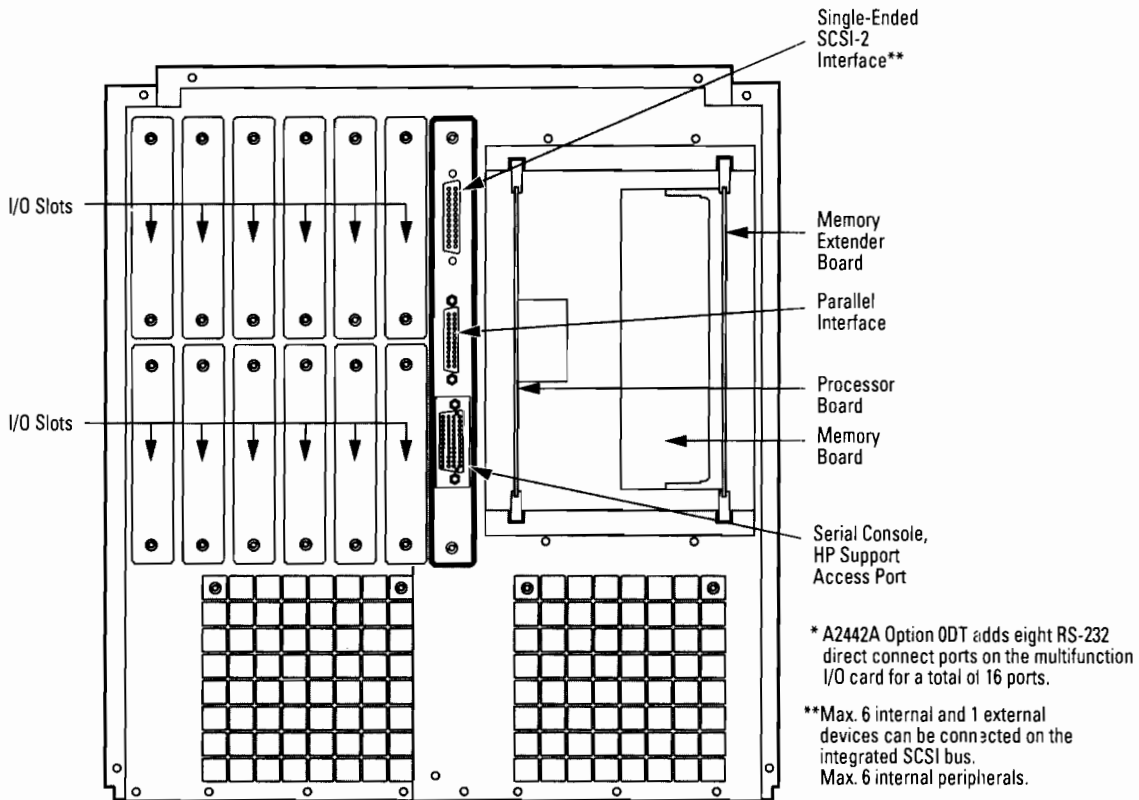
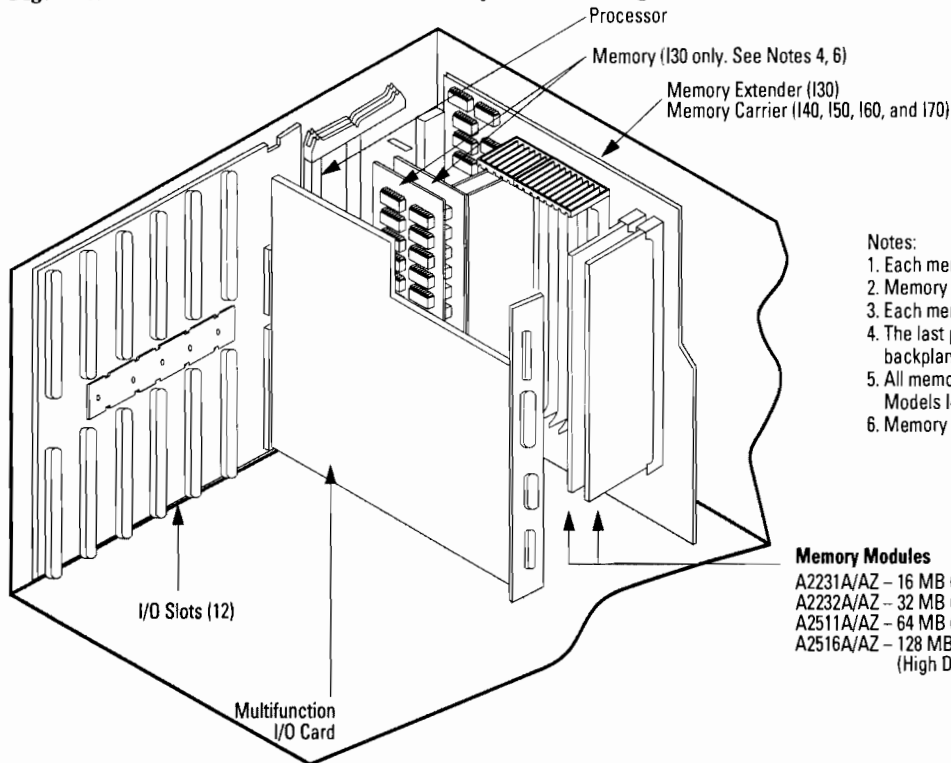


Figure 3.33 I-Class SPU: Rear View with Optional MUX Multifunction I/O Card (A2442A, Option ODS)*



Model I30/I40/I50/I60/I70 Memory Array

Figure 3.34 Model I30/I40/I50/I60/I70 Memory and I/O Configuration

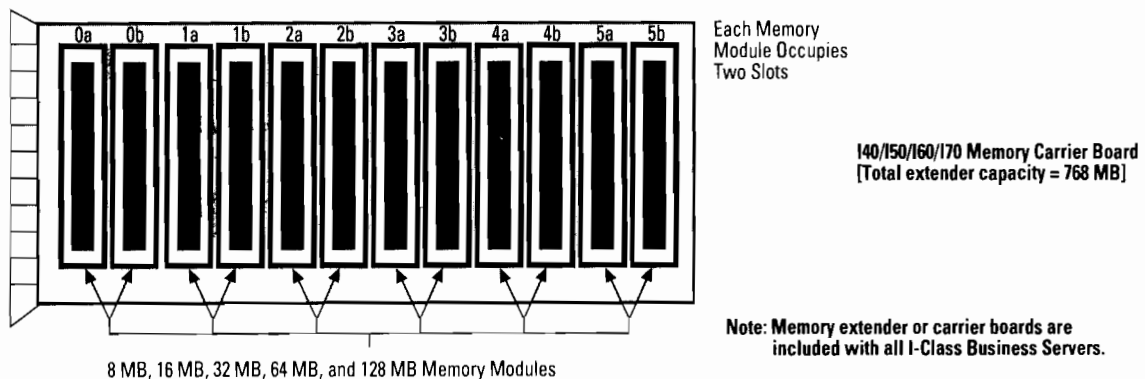
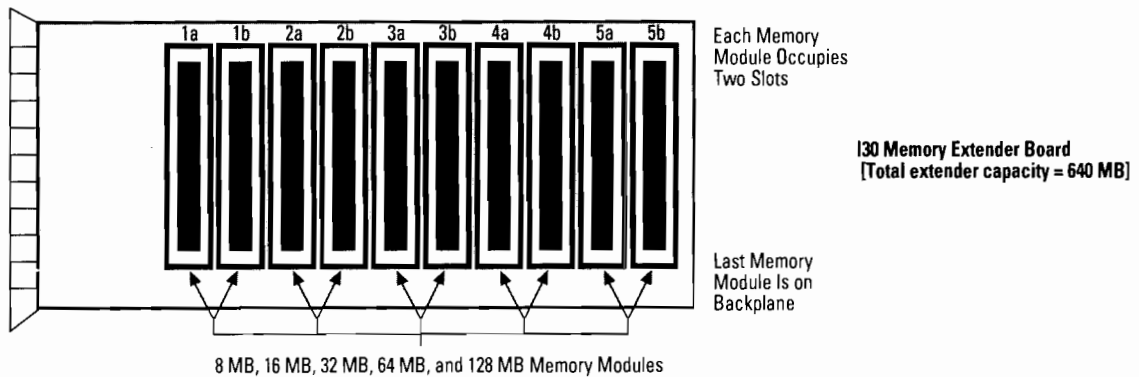


- Notes:**
1. Each memory module consists of 2 memory cards.
 2. Memory cards must be installed in pairs.
 3. Each memory module fills 2 of the 12 memory slots.
 4. The last pair of memory cards is installed on the backplane after the extender is filled.
 5. All memory is installed on the memory carrier of Models I40, I50, I60, and I70.
 6. Memory extender is standard on Model I30.

Memory Modules

- A2231A/AZ – 16 MB (2 × 8 MB)
- A2232A/AZ – 32 MB (2 × 16 MB)
- A2511A/AZ – 64 MB (2 × 32 MB)
- A2516A/AZ – 128 MB (2 × 64 MB)
(High Density Memory)

Figure 3.35 Model I30/I40/I50/I60/I70 Memory Extender Board Layout



Note: Memory extender or carrier boards are included with all I-Class Business Servers.

Model I30/I40/I50/I60/I70 Memory Configuration

1. **Common rules for all I30/I40/I50/I60/I70 systems:**
 - a. Memory array cards **MUST** be installed in pairs.
 - b. Each memory card installed in a slot pair must be the same size (e.g., 4 MB and 4 MB, 8 MB and 8 MB, 16 MB and 16 MB, 32 MB and 32 MB, or 64 MB and 64 MB).
 - c. The first memory card pair must be installed in the memory extender.
2. Rules that apply to I30 computers:
 - a. All common rules.
 - b. Memory pairs can be installed in any paired slot (e.g., 0A and 0B, 4A and 4B, etc.)
3. Rules that apply to I40, I50, I60, and I70 computers. When installing memory (any type) follow this specific insertion order:
 - a. First memory pair into extender slot 5A/5B
 - b. Second memory pair into extender slot 0A/0B
 - c. Third memory pair into extender slot 4A/4B
 - d. Fourth memory pair into extender slot 1A/1B
 - e. Fifth memory pair into extender slot 3A/3B
 - f. Sixth memory pair into extender slot 2A/2B
 - g. If the memory configuration contains any 8 MB pairs (A2231A 16 MB), they must be the last pair(s) installed.

Note: Models I50, I60, and I70 will not boot unless memory is configured as described above.

Model I30/I40/I50/I60/I70 Configuration Guidelines

While most customers will find their configurations can be supported without modification, some configurations exist which exceed the available power of the systems. The following configuration rules must be checked to verify the system is supported and that it will operate reliably.

To use the power table and worksheet:

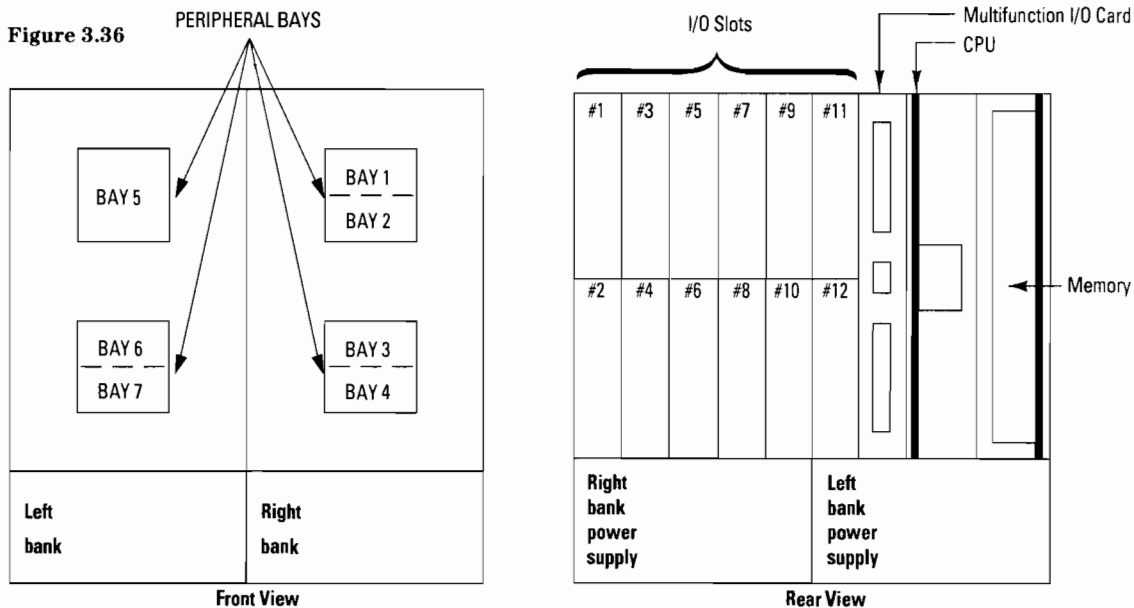
- a. Confirm the configuration does not exceed the maximum number of peripherals and I/O cards supported in the system.
- b. Note the current required by the configuration's multifunction I/O card, removable media devices, disk drives, and I/O cards provided in the power table.
- c. Choose the appropriate worksheet for either Models I30, I40, I50, and I60 or for Model I70.
- d. Insert the +12V, +5V, and -12V current required by the selected multifunction I/O card into the worksheet row titled "multifunction I/O card."
- e. If a tape backup device is present, insert the +12V, +5V, and -12V current required by the selected DAT or QIC tape drive into the worksheet row titled "Internal Peripherals Bay 1."
- f. If a CD-ROM or a second DAT drive is present, insert the +12V, +5V, and -12V current required by the drive into the worksheet row titled "Internal Peripherals Bay 2."

- g. If half-height disk drives are present, insert the +12V, +5V, and -12V current required by the drives into the worksheet rows titled "Internal Peripherals Bay 3, Bay 4, Bay 6, or Bay 7."
- h. When full-height disk drives are used, insert the +12V, +5V, and -12V current required by the drives into the worksheet rows titled "Internal Peripherals Bay 3, Bay 5 and Bay 6." Do not use the row titled "Internal Peripherals Bay 4" for a full-height drive.
- i. Insert the +12V, +5V, and -12V current required by the selected I/O cards into the worksheet row titled "I/O cards Slots 1 through 12." If double-high cards (FDDI and HP-FL) are used, insert the current values in odd numbered slots and leave the following even numbered slot empty.
- j. Sum the total amount of +12V, +5V, and -12V current required for the configuration.
- k. Compare the total amount of +12V, +5V, and -12V current required for the configuration to the available current.

If the current used by the configuration is less than the current available, the system is supported. Also, if the configuration exceeds the available current by less than 5%, it is supported. (Worst-case current usage is assumed for all cards and drives—the 5% exposure factor is allowed since the typical current values for cards and drives will be lower than their worst-case values).

Table 3.20 Power Table

	Multifunction I/O Card, I/O Card, and Peripheral Current Requirements (Amps)			Maximum Supported Number of Multifunction I/O Cards, I/O Cards, and Peripherals	
	+12V	+5V	-12V	I Class	
Multifunction I/O card				1 max	
LAN/SCSI	0.55	3.38	0.03	1	
MUX/SCSI	0.50	1.70	0.02	1	
Internal peripherals				6 max (3 max per bank)	
8 mm tape	0.50	1.70	0.00	2	
2 GB DAT	0.75	1.00	0.00	2	
4-8 GB DAT	0.75	1.00	0.00	2	
1 GB QIC	1.50	0.50	0.00	1	
CD-ROM	0.85	0.90	0.00	1	
422 MB half-height disk	0.65	1.25	0.00	4	
535 MB half-height disk	1.50	0.80	0.00	4	
1 GB half-height disk	0.82	1.00	0.00	4	
2 GB half-height disk	1.02	1.06	0.00	4	
1.3 GB full-height disk	2.30	1.90	0.00	3	
2 GB full-height disk	2.70	1.30	0.00	3	
I/O cards				12 single-high max	Form Factor
8 channel MUX (40299B)	0.16	1.40	0.13	12	Single-high
16 channel RS-232 direct connect MUX (J2092A)	0.08	1.10	0.08	12	Single-high
16 channel RS-423 direct connect MUX (J2093A)	0.20	1.10	0.15	12	Single-high
16 channel RS-232 modem connect MUX (J2094A)	0.30	1.70	0.15	12	Single-high
32 channel RS-232 direct connect MUX (J2096A)	0.125	1.60	0.125	12	Single-high
802.3 LAN (J2146A)	0.50	2.13	0.00	7	Single-high
802.5 LAN (J2166A)	0.00	1.66	0.00	5	Single-high
FDDI (J2157A)	0.00	3.70	0.00	2	Double-high
SCSI-2 (28655A)	0.00	0.90	0.00	12	Single-high
Fast/Wide SCSI-2 (28696A)	0.12	5.10	0.00	5	Double-high
HP-IB (28650B)	0.00	2.10	0.00	2	Single-high
PBA-FL (A1749A)	0.08	6.77	0.07	2	Double-high
HP-PB FL (28615A)	0.04	3.93	0.05	4	Double-high
X.25 (36960A)	0.08	2.36	0.09	10	Single-high
SNA (J2220A, 98173A, and 98174A)	0.08	2.36	0.09	10	Single-high



If the configuration exceeds the available current by more than 5%, it must be modified to be supported.

All combinations of I/O cards can be supported by taking the following steps to:

- a. If possible, move the full-height disk drive from Bay 3 to Bay 5 or 6 to reduce the load on the right bank power supply. Recalculate the configuration with Peripheral Bays 3 and 4 empty.

- b. If moving drives from Peripheral Bay 3 is not viable, an external mass storage system must be used to reduce the peripheral load in the system. By moving one or more peripherals from the internal peripheral bays 1 through 4, the peripheral current load on the right bank power supply will be reduced below the available level and the configuration will be supported.

Table 3.21 Configuration Worksheet—HP 9000 Series 800 Models I30, I40, I50, and I60

	Left Bank			Right Bank			
	+12V	+5V	-12V	+12V	+5V	-12V	
Multifunction I/O card							LAN/SCSI or MUX/SCSI card
Internal peripherals							
Bay 1							DAT, QIC tape drive, or 8mm tape drive
Bay 2							DAT, CD-ROM drive, or 8mm tape drive
Bay 3							1 full-height disk or 1 half-height disk
Bay 4							1 half-height disk
Bay 5							1 full-height disk
Bay 6							1 full-height disk or 1 half-height disk
Bay 7							1 half-height disk
I/O cards							
Slot 1							Any supported I/O card
Slot 2							Any supported I/O card
Slot 3							Any supported I/O card
Slot 4							Any supported I/O card
Slot 5							Any supported I/O card
Slot 6							Any supported I/O card
Slot 7							Any supported I/O card
Slot 8							Any supported I/O card
Slot 9							Any supported I/O card
Slot 10							Any supported I/O card
Slot 11							Any supported I/O card
Slot 12							Any supported I/O card
Total current used	0.00	0.00	0.00	0.00	0.00	0.00	
Available current	6.27	6.80	1.50	6.27	27.00	1.50	

Note: Do not use shaded areas

Table 3.22 Configuration Worksheet—HP 9000 Series 800 Model I70

	Left Bank			Right Bank			
	+12V	+5V	-12V	+12V	+5V	-12V	
Multifunction I/O card							LAN/SCSI or MUX/SCSI card
Internal peripherals							
Bay 1							DAT, QIC tape drive, or 8mm tape drive
Bay 2							DAT, CD-ROM drive, or 8mm tape drive
Bay 3							1 full-height disk or 1 half-height disk
Bay 4							1 half-height disk
Bay 5							1 full-height disk
Bay 6							1 full-height disk or 1 half-height disk
Bay 7							1 half-height disk
I/O cards							
Slot 1							Any supported I/O card
Slot 2							Any supported I/O card
Slot 3							Any supported I/O card
Slot 4							Any supported I/O card
Slot 5							Any supported I/O card
Slot 6							Any supported I/O card
Slot 7							Any supported I/O card
Slot 8							Any supported I/O card
Slot 9							Any supported I/O card
Slot 10							Any supported I/O card
Slot 11							Any supported I/O card
Slot 12							Any supported I/O card
Total current used	0.00	0.00	0.00	0.00	0.00	0.00	
Available current	6.27	6.80	1.50	6.27	27.00	1.50	

Note: Do not use shaded areas

Example 1

Configuration requires the following:

- MUX/SCSI multifunction I/O card
- 1 GB QIC tape drive
- 2 GB DAT drive
- One 2 GB full-height disk drive
- Six J2094A MUXes
- Two J2092A MUXes
- Two HP-PB FL cards

Since the configuration is below the maximums supported for each component, note the current each component requires.

	+12V	+5V	-12V
MUX/SCSI Multifunction I/O card	.50A	1.70A	.02A
1 GB QIC tape drive	1.50A	.50A	.00A
2 GB DAT drive	.75A	1.00A	.00A
2 GB disk drive	2.70A	1.30A	.00A
J2094A MUX	.30A	1.70A	.15A
J2092A MUX	.08A	1.10A	.08A
HP-PB FL card	.04A	3.93A	.05A

Insert the current values into the worksheet as shown. Note that the +12V current on the right bank power is over the available current by more than 5%. Therefore, this configuration is NOT supported.



Table 3.23 Example Configuration Worksheet—HP 9000 Series 800 Models I30, I40, I50, and I60

	Left Bank			Right Bank			
	+12V	+5V	-12V	+12V	+5V	-12V	
Multifunction I/O card				0.50	1.70	0.02	MUX/SCSI card
Internal peripherals							
Bay 1				1.50	0.50	0.00	1 GB QIC tape drive
Bay 2				0.75	1.00	0.00	DAT drive
Bay 3				2.70	1.30	0.00	2 GB full-height disk
Bay 4							
Bay 5							
Bay 6							
Bay 7							
I/O cards							
Slot 1				0.30	1.70	0.15	J2094A MUX
Slot 2				0.30	1.70	0.15	J2094A MUX
Slot 3				0.30	1.70	0.15	J2094A MUX
Slot 4				0.30	1.70	0.15	J2094A MUX
Slot 5			0.15	0.30	1.70		J2094A MUX
Slot 6			0.15	0.30	1.70		J2094A MUX
Slot 7			0.08	0.08	1.10		J2092A MUX
Slot 8			0.08	0.08	1.10		J2092A MUX
Slot 9	0.04		0.05		3.93		HP-PB FL
Slot 10							
Slot 11	0.04	3.93	0.05				HP-PB FL
Slot 12							
Total current used	0.08	3.93	0.56	7.41	20.83	0.62	
Available current	6.27	6.80	1.50	6.27	27.00	1.50	

Note: Do not use shaded areas

Note that the left bank power still has available current and that peripheral bay 6 is unused. Move the disk drive from bay 3 to bay 6 and recalculating power results in all current values below the available current. Therefore, simply by moving the disk drive, the configuration is supported.

Table 3.24 Example Configuration Worksheet—HP 9000 Series 800 Models I30, I40, I50, and I60

	Left Bank			Right Bank			
	+12V	+5V	-12V	+12V	+5V	-12V	
Multifunction I/O card				0.50	1.70	0.02	MUX/SCSI card
Internal peripherals							
Bay 1				1.50	0.50	0.00	1 GB QIC tape drive
Bay 2				0.75	1.00	0.00	DAT drive
Bay 3							(Moved to Bay 5) 
Bay 4							
Bay 5	2.70	1.30	0.0				2 GB full-height disk 
Bay 6							
Bay 7							
I/O cards							
Slot 1				0.30	1.70	0.15	J2094A MUX
Slot 2				0.30	1.70	0.15	J2094A MUX
Slot 3				0.30	1.70	0.15	J2094A MUX
Slot 4				0.30	1.70	0.15	J2094A MUX
Slot 5				0.30	1.70	0.15	J2094A MUX
Slot 6				0.30	1.70	0.15	J2094A MUX
Slot 7				0.08	1.10	0.08	J2092A MUX
Slot 8				0.08	1.10	0.08	J2092A MUX
Slot 9	0.04					3.93	HP-PB FL
Slot 10							
Slot 11	0.04	3.93	0.05				HP-PB FL
Slot 12							
Total current used	2.78	5.23	0.56	4.71	19.53	0.62	
Available current	6.27	6.80	1.50	6.27	27.00	1.50	

Note: Do not use shaded areas

Table 3.25 Model I30/I40/I50/I60/I70 Product Summary

Description	Product No./ Option No.
HP 9000 Series 800 I Class Business Servers	Required A2431A
<i>Standard server includes (must order p/n A2431A):</i>	
Integrated chassis with twelve (12) single high HP-PB I/O slots	
Factory integration of memory, disks, back-up media and I/O cards ordered from product menu	
One year on-site warranty	
<i>Order desired SPU option from Sec. 1. The following standard items can be included w/SPU price at no extra charge:</i>	
4 GB embedded disk drive (2 x 2 GB full-height drives) (requires HP-UX 9.0x)	
64 MB ECC memory (memory extender card included)	
2.0 GB DDS drive	
LAN/SCSI/RS-232 personality card (requires HP-UX 9.0x) with:	
–802.3 ThinLAN interface (BNC and AUI connectors included)	
–Single-ended (S.E.) SCSI-2 interface	
–Two RS-232 ports for console terminal and remote access	
Pre-loaded HP-UX operating system with 2-user license plus, TCP/IP, ARPA and NFS services	
Owner's Guide and General Usage documentation set	
HP 700/96 console terminal (No charge optional item.)	
Refer to sections 1–14 to select standard or alternate items.	
1. Select SPU	Required—Select one
a. Model I30 48 Mhz PA-RISC SPU with 512 KB cache	Qty. [] A2365A*
b. Model I40 64 Mhz PA-RISC SPU with 512 KB cache	Qty. [] A2364A*
c. Model I50 96 Mhz PA-RISC SPU with 512 KB cache and integrated floating point unit (Requires HP-UX 9.0x)	Qty. [] A2363A*
d. Model I60 96 Mhz PA-RISC SPU with 2 MB cache and integrated floating point unit (Requires HP-UX 9.0x)	Qty. [] A2982A*
e. Model I70 Dual 96 Mhz PA-RISC SMP SPU w/4 MB cache & integrated floating point unit (Requires HP-UX 9.0x)	Qty. [] A2362A*
2. Select floating point coprocessor	Optional—Minimum zero, maximum 1
a. Floating point coprocessor for Model I30	Qty. [] A2293A, Opt. 0DV
b. Floating point coprocessor for Model I40	Qty. [] A2293A, Opt. 0DW
3. Select HP-UX OS version	Required—Select one
a. HP-UX 9.04 with 2-user license (media p/n B3108A)	Qty. [] A2440A, Opt. APH
b. HP-UX 8.02 with 2-user license (media p/n B2459A)	Qty. [] A2440A, Opt. APC
Media must be ordered separately. One media copy required per customer site.	
Factory integrated, pre-loaded HP-UX 9.04 and layered product software	
c. Instant Ignition**	Optional—Minimum zero, maximum 1
	Qty. [] A2440A, Opt. 0D1
4. Select localization of system documentation	Required—Select one
a. System manuals in English	Qty. [] A2440A, Opt. ABA
b. System manuals in French/Canadian	Qty. [] A2440A, Opt. ABC
c. System manuals in German	Qty. [] A2440A, Opt. ABD
d. System manuals in Japanese	Qty. [] A2440A, Opt. ABJ
5. Select power failure back-up solution	Optional—Minimum zero, maximum 1
a. Add powerfail battery back-up	Qty. [] A2368A, Opt. 0E1
b. Add HP PowerTrust 600 VA UPS***	Qty. [] A2941A
6. Select rackmount kit for installation into factory integrated 1.6m or 1.1m racks. (Integrated racks must be ordered on the same order/section.)	Optional—Minimum zero, maximum 1
a. Add rackmount kit	Qty. [] C2798AZ
7. Select personality card	Required—Select one only
a. Standard—LAN personality card: 802.3 ThinLAN, two RS-232 ports for console and HP remote access and S.E. SCSI-2. (Requires HP-UX 9.0x)	Qty. [] A2441A, Opt. 0DS
b. Replace std. w/8-port MUX personality card: 8 modem RS-232 ports, S.E. SCSI-2 and parallel centronics port	Qty. [] A2442A, Opt. 0DS
c. Replace std. w/16-port MUX pers. card: 8 modem & 8 DC RS-232 ports, S.E. SCSI-2 and parallel centronics port	Qty. [] A2442A, Opt. 0DT

Note: For items 7b and 7c: RS-232 ports include console port and HP access ports.

* HP Site Planning and installation included.

** See Section 7 for details.

*** Requires HP-UX 9.04

To order support, refer to System Support Options on pages 8-2 to 8-6.

Table 3.25 Model I30/I40/I50/I60/I70 Product Summary

Description		Product No./ Option No.
HP 9000 Series 800 I Class Business Servers		A2431A (cont'd)
8. Select base memory configuration (select either standard memory or ONE replacement module only)	Required	
a. Standard—64 MB ECC base memory	Qty. []	A2511AZ, Opt. 0DS
b. Replace base memory with 128 MB ECC high density module (requires HP-UX 9.0x)	Qty. []	A2516AZ, Opt. 0DV
9. Additional memory configuration (Select up to five additional modules.)	Optional	
Maximum memory (base + additional): 768 MB (HP-UX 9.0x) or 384 MB (HP-UX 8.02)		
a. 16 MB ECC memory module	Qty. []	A2231AZ, Opt. 0DZ
b. 32 MB ECC memory module	Qty. []	A2232AZ, Opt. 0DZ
c. 64 MB ECC memory module	Qty. []	A2511AZ, Opt. 0DZ
d. 128 MB ECC high density memory module (requires HP-UX 9.0x)	Qty. []	A2516AZ, Opt. 0DZ
10. Select base disk configuration (Maximum of 4 half-height and 1 full-height, 2 half-height and 2 full-height, or 3 full-height internal disks.)[§]	Required—Select one only	
a. Standard—Base 4 GB disk (2 × 2 GB full-height disk requires HP-UX 9.0x)***	Qty. []	A3025A, Opt. 0DS
b. Delete base 4 GB disk (alternate disk or back-up storage device required)	Qty. []	A2443A, Opt. 704
Select alternate/additional internal disks		
c. Add 535 MB half-height disk (requires HP-UX 9.04)	Qty. []	A2958A, Opt. 0DZ
d. Add 1 GB half-height disk (requires HP-UX 9.0x)	Qty. []	A2445A, Opt. 0DZ
e. Add 2 GB half-height disk (requires HP-UX 9.04)*	Qty. []	A3087A, Opt. 0DZ*
f. Add 1.3 GB full-height disk	Qty. []	C2474SZ, Opt. 0DZ
g. Add 2 GB full-height disk (requires HP-UX 9.0x)	Qty. []	A2446A, Opt. 0DZ
11. Select back-up storage configuration (Maximum of DAT and CD-ROM; or QIC and CD-ROM)	Required	
a. Standard—2 GB DDS DAT (half-height)	Qty. []	C2477SZ, Opt. 0DS
b. Delete standard 2 GB DDS DAT drive (alternate back-up storage device or internal disk required.)	Qty. []	A2443A, Opt. 700
c. Add 4-8 GB DDS DAT drive (half-height). Requires HP-UX 9.04.	Qty. []	C2478SZ, Opt. 0DZ
d. Add 1 GB Quarter Inch Cartridge (QIC) drive (half-height)	Qty. []	A2944A, Opt. 0DZ
Select additional storage device		
e. Add CD-ROM (half-height)	Qty. []	C2476SZ, Opt. 0DZ
f. High-performance CD-ROM (half-height, requires HP-UX 9.04)	Qty. []	A3086A, Opt. 0DZ
12. Select system console terminal	Optional—Select one only	
a. HP 700/96 console terminal with Green screen	Qty. []	C1064GZ, Opt. ABA**
b. HP 700/96 console terminal with Amber screen	Qty. []	C1064AZ, Opt. ABA**
c. HP 700/96 console terminal with Soft-white screen	Qty. []	C1064WZ, Opt. ABA**
13. Select I/O and networking cards	Optional	
a. 16 port RS-232 direct connect MUX (RJ45 connector)	Qty. []	J2092AZ
b. 16 port RS-232 direct connect MUX (DB25 connector)	Qty. []	J2092AZ, Opt. 010
c. 32 port RS-232 direct connect MUX (RJ45 connector)	Qty. []	J2096AZ
d. 32 port RS-232 direct connect MUX (DB25 connector)	Qty. []	J2096AZ, Opt. 010
e. 5 MB/s Single-Ended SCSI-2 interface card with parallel port (uses 1-slot)	Qty. []	28655A, Opt. 0DZ
f. 20 MB/s Fast/Wide Differential SCSI-2 interface card	Qty. []	28696A, Opt. 0DZ
g. 802.3 ThinLAN/9000 interface card (uses 1-slot)	Qty. []	J2146A, Opt. 0DM
h. 802.5 Token Ring interface card (preset to 4 Mb/s speed) (uses 1-slot)	Qty. []	J2166A, Opt. AU3
i. Token Ring back-up media and documentation	Qty. []	J2250A
j. HP-IB interface card (uses 1-slot)	Qty. []	28650B, Opt. 0DZ
k. HP-FL interface card (native card, requires HP-UX 9.04; uses 2-slots)	Qty. []	28615A, Opt. 0DZ
l. HP-FL interface card (Chanspan card, for HP-UX 8.02 or 9.04; uses 2-slots)	Qty. []	A1749A, Opt. 0DZ
m. X.25 link with RS-232-C interface card (uses 1-slot)	Qty. []	36960A, Opt. 0DQ
n. X.25 link with V.35 interface card (uses 1-slot)	Qty. []	36960A, Opt. 0DR
o. X.25 back-up media and documentation	Qty. []	A2321A
14. Select end-user terminal (support must be ordered separately)	Optional	
a. HP 700/60 Ergonomic terminal with Amber screen	Qty. []	C1080A, Opt. ABA**
b. HP 700/60 Ergonomic terminal with Green screen	Qty. []	C1080G, Opt. ABA**
c. HP 700/60 Ergonomic terminal with Soft-white screen	Qty. []	C1080W, Opt. ABA**
d. HP 700/60ES Ergonomic terminal with Soft-white screen	Qty. []	C1083W, Opt. ABA**

§ Other disk products may be ordered from price list but will not include factory integration into the SPU chassis.

* Orderable March 1, 1994.

** U.S./English option shown, refer to CPL for localization options.

*** 2 × 2 GB half-height after March 1, 1994 (P/N A3025B, Opt. 0DZ).

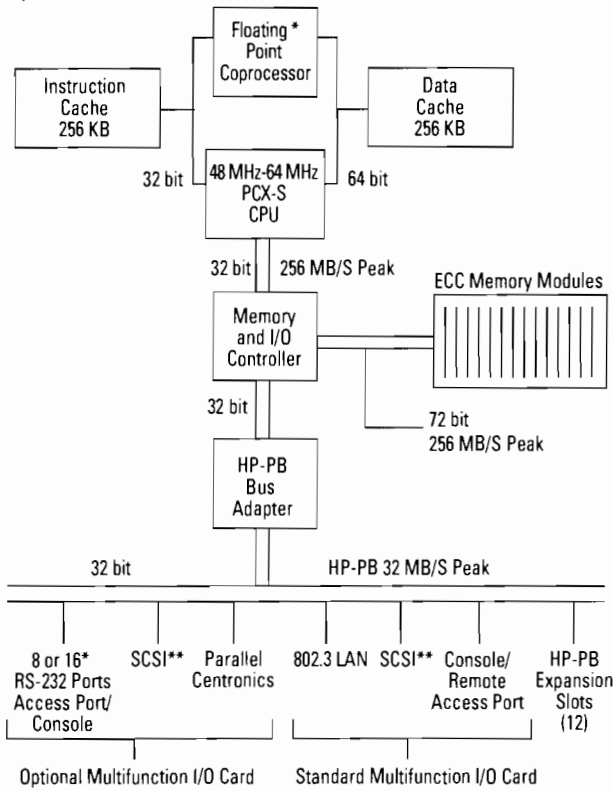
To order support, refer to System Support Options on pages 8-2 to 8-6.

Table 3.26 Model I30/I40/I50/I60/I70 Technical Specifications

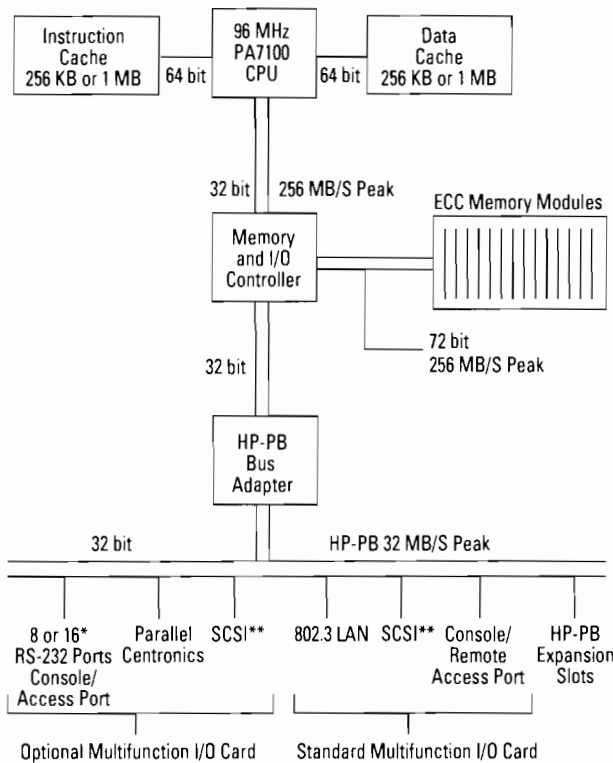
Physical Characteristics	
Height	43.0 cm
Width	42.4 cm
Depth	53.3 cm
Weight	50 kg/110 lbs
Electrical Characteristics	
AC input power	100V-120V and 200V-240V autoranging, 50 Hz-60 Hz
Rated current	12 amps @ 120V; 6 amps @ 240V
Maximum heat dissipation	800 watts
Environmental Characteristics	
Acoustics	<5.8 bels (A) sound power below 30C
Electrostatic discharge, power transients and vibration	Designed for office and data center environments
Temperature	
Operating	+5C to +40C
Non-operating	-40C to +65C (system); -40C to +45C (tape media)
Max rate of temperature change	<20C/hr without DDS DAT; <10C/hr with DDS DAT
Relative humidity	
Operating	20% to 80%, non-condensing (max 26C wet bulb temp.)
Non-operating	5% to 80%, non-condensing
Max rate of humidity change	<30%/hr
Altitude	
Operating	to 3,000 meters (10,000 ft.)
Non-operating	to 4,500 meters (15,000 ft.)
Regulatory Compliance	
Electromagnetic interference	Complies with FCC rules and regulations, Part 15, Subpart J, as a Class A computing device. Manufacturers Declaration to EN55022, Class A Registered with Japanese VCCI, Class 1
Safety	UL Listed, ETL Listed, CSA Certified, Compliant with EN60950

Figure 3.37 Model 130/140/150/160/170 System Architectures

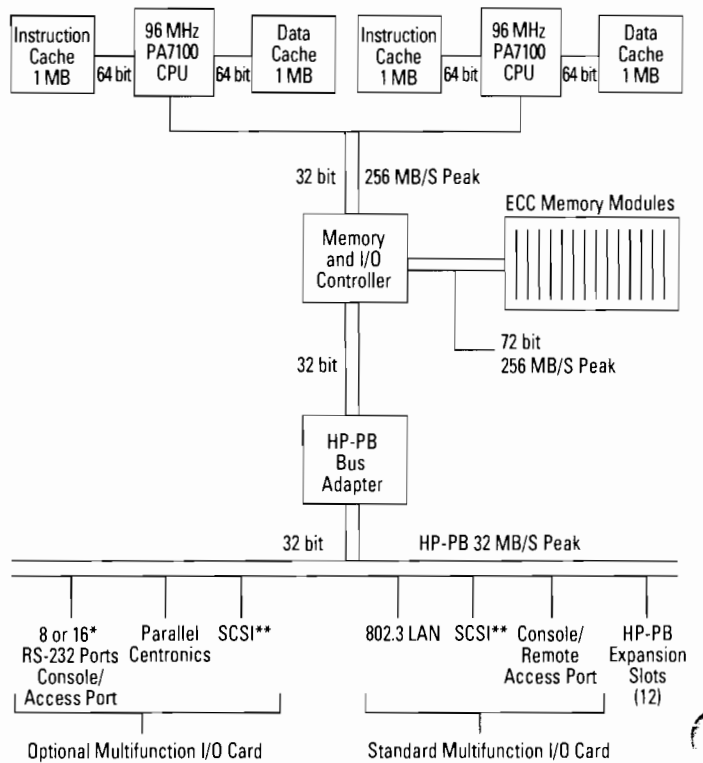
System Architecture – Models 130 and 140



System Architecture – Models 150 and 160



System Architecture – Model 170



* Optional

** Single-ended SCSI-2 adapter is used to connect both internal and external devices (up to a maximum of 7 total devices).

HP Corporate Business Server Model T500

Model T500 Description

The HP 9000 Corporate Business Server T500 is a high performance server designed for use in computing environments where capacity, performance, and growth potential are of prime importance. The Model T500 is a technology upgrade to the Corporate Business Server Model 890.

- Highly-scalable architecture
- Symmetrical multiprocessing
- Up to 12 90-MHz PA-RISC processors
- Up to 2 processors (CPUs) on each of up to 6 carrier boards
- Up to 2 GB main memory (RAM) on up to 8 memory boards
- Up to 1900 GB primary online disk storage using RAID
- Supports up to 4500 connected OLTP users
- Expandable to 8 HP-PB card cages and 112 I/O slots

Base Configuration:

- One CPU
- 256 MB ECC memory (RAM)
- 14 HP-Precision Bus slots for I/O interfaces
- 10 of the 14 slots are open in the base configuration
- One 1.6m high system cabinet
- One dual-bus converter
- No internal peripherals

Figure 3.38 HP 9000 Corporate Business Server Model T500

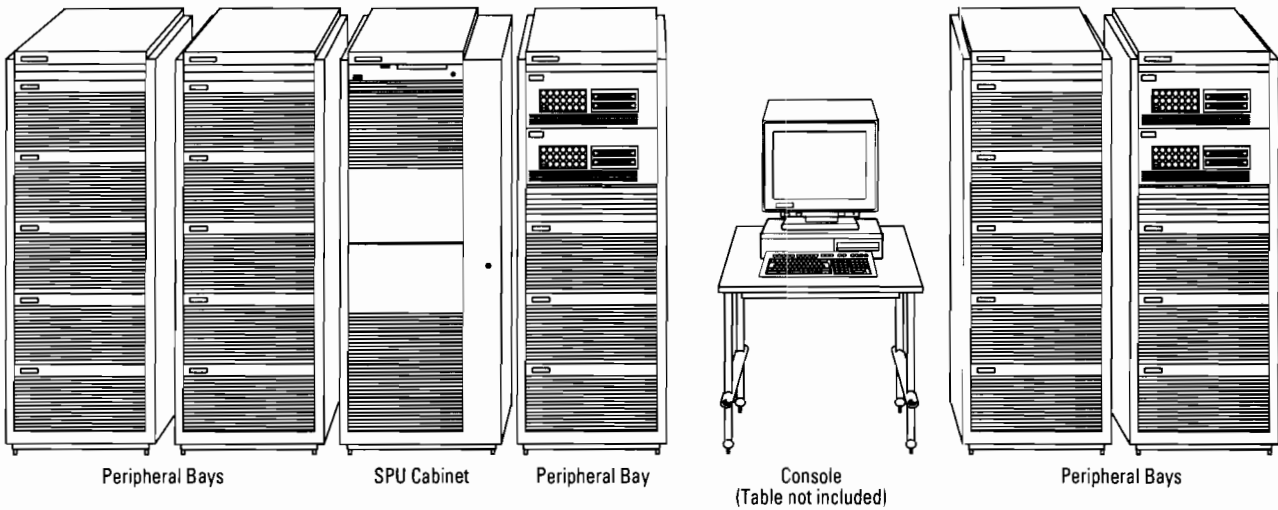
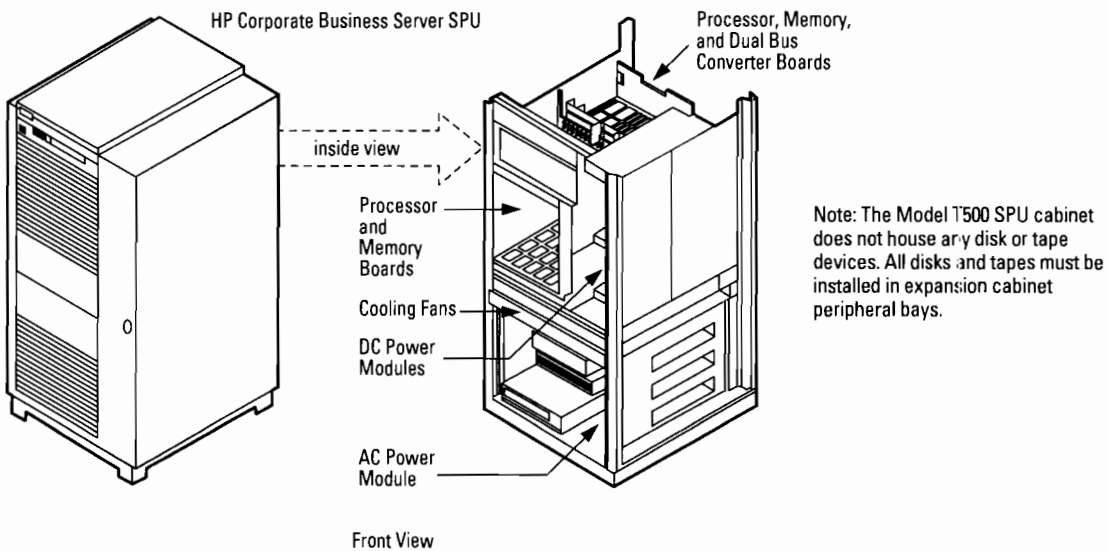


Figure 3.39



HP Corporate Business Server Model T500 Configuration

Figure 3.40 Model T500 Configuration Flow Chart

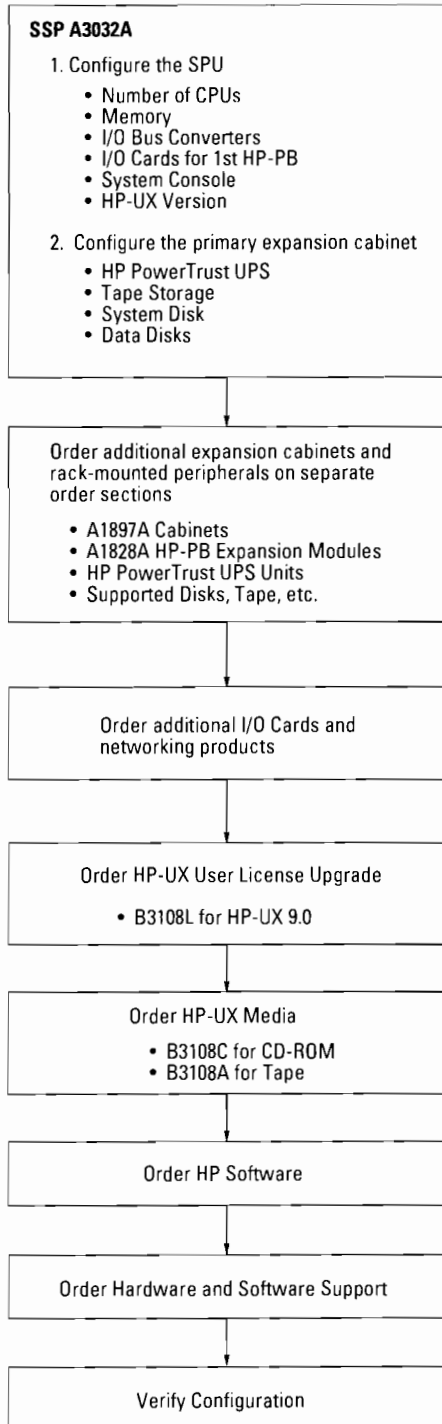
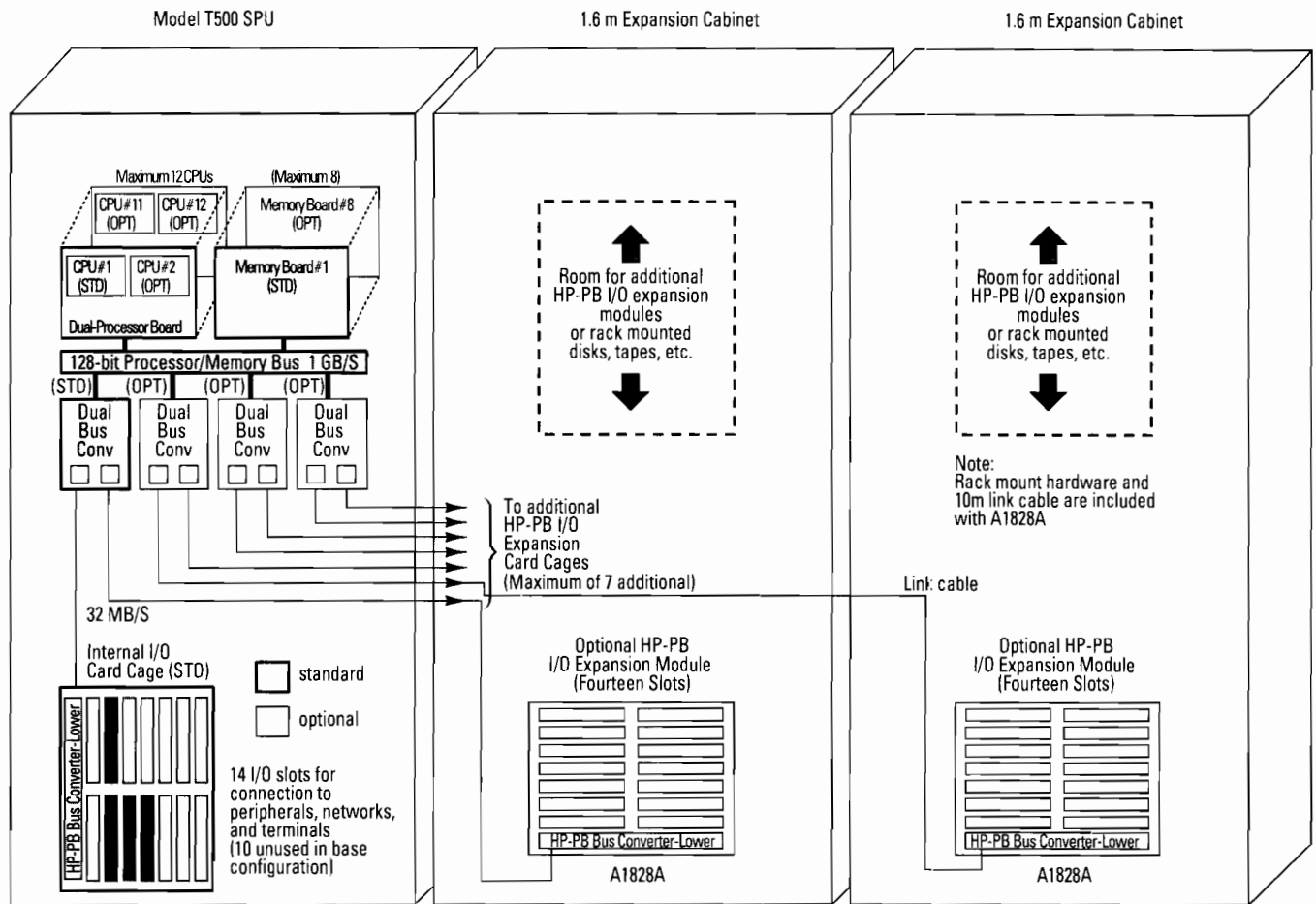


Figure 3.41



Note: The T500 uses up to two processors (CPUs) on a single physical (dual-processor) carrier board.

All tapes, CD-ROMs, and other rackmounted peripherals may be separately installed in one or more of the available 1.6 meter expansion cabinet units. The expansion cabinets for the Model T500 are the same as those used to rack Model 8x7S and E/F/G/H/I class Business Servers and peripherals.

Adding I/O Capacity

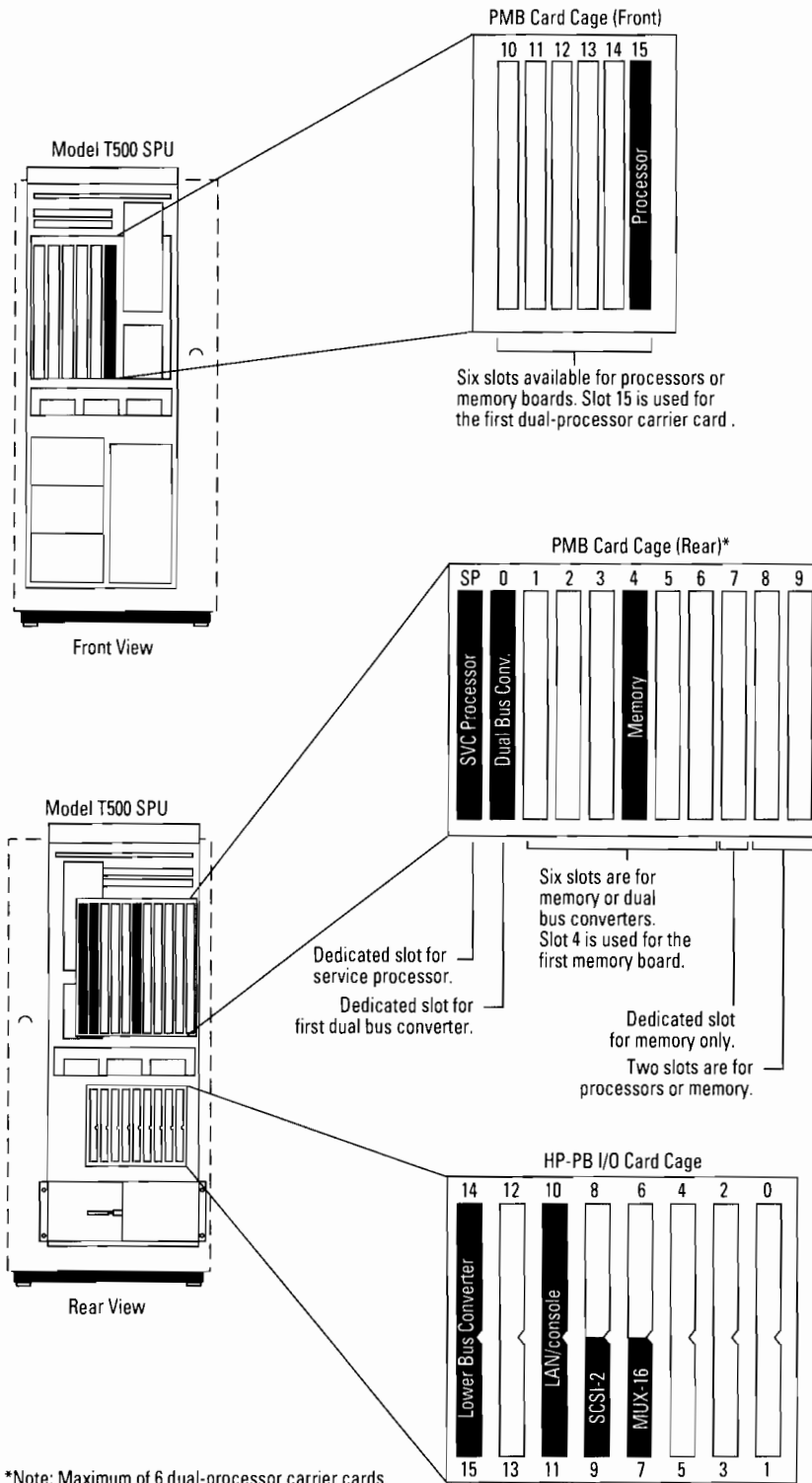
I/O communications are achieved through HP-PB cards which are installed into slots in an HP-PB I/O Card Cage. The base configuration for the Model T500 includes one I/O Card Cage which is mounted inside the base of the SPU cabinet. This internal I/O Card Cage has fourteen slots. Four of these slots are utilized by I/O cards supplied in the base configuration, leaving ten open

slots for expansion. Refer to **Figure 3.5**. The I/O Card Cage is connected via its integrated Lower Bus Converter and interconnect cable to a Dual Bus Converter board for communication with processors and memory. This dual Bus-Converter board can connect to two I/O Card Cages, although only one I/O Card Cage is supplied in the base configuration. **Figure 3.42** illustrates the connection of I/O Card Cages to dual bus converter boards.

Table 3.27

Total I/O Card Cages	Required Dual Bus Converters	Note
1	1	First Dual Bus Converter supplied in the base system
2	1	
3	2	Order second Dual Bus Converter
4	2	
5	3	Order third Dual Bus Converter
6	3	
7	4	Order fourth Dual Bus Converter
8	4	

Figure 3.42 Processor/Memory Bus (PMB) Card Cage



Expansion Capabilities

Processor, memory or dual bus converter boards must be added in a specified slot priority sequence to comply with power balancing and board cooling requirements. These installation rules are listed in the HP 9000 Corporate Business Server T500 Installation Manual.

T500 Memory

- Base memory included with SPU: 256 MB
- Memory boards available: 64 MB, 128 MB, and 256 MB
- Maximum total number of memory boards: 8
- Mixing of memory board sizes: Any combination is supported
- Maximum memory supported: 2 GB (**ONLY with 8 × 256 MB boards**). Note this when initially ordering the system.
- T500 memory is **only** compatible with 890 memory.

Adding Processors

- Mixing of 890 processor boards and T500 processor boards is **not** supported
- Base configurations for T500 includes 1 dual-processor carrier board and 1 CPU module
- Eleven additional CPU modules may be added (up to total of 12) as part of initial system order or as upgrades
- Additional dual-processor boards are automatically included when third, fifth, etc., CPU modules are ordered
- **Software support for greater than 8 CPUs must be verified before ordering**

*Note: If more than 8 CPUs are configured, the number of dual I/O bus converter boards must be reduced due to PMB bus mastering limitations. Refer to **Table 3.28** for achievable configuration combinations.*

Memory Considerations

Minimum Memory

The recommended minimum memory for each CPU configuration is shown in **Table 3.29**. The recommended minimum is the least amount of memory necessary to achieve satisfactory performance under normal workloads. It may be necessary or desirable to increase the actual

Table 3.28 Model T500 Maximum Number of CPUs, based on the number of memory boards and dual-I/O Bus Converters installed

Number of Dual I/O Bus Converters	Number of Memory Boards							
	1	2	3	4	5	6	7	8
1	12 CPUs	12 CPUs	12 CPUs	12 CPUs	12 CPUs	12 CPUs	12 CPUs	12 CPUs
2	12 CPUs	12 CPUs	12 CPUs	12 CPUs	12 CPUs	12 CPUs	12 CPUs	12 CPUs
3	10 CPUs	10 CPUs	10 CPUs	10 CPUs	10 CPUs	10 CPUs	10 CPUs	10 CPUs
4	8 CPUs	8 CPUs	8 CPUs	8 CPUs	8 CPUs	8 CPUs	8 CPUs	8 CPUs

memory of your configuration to achieve optimum performance for your specific application workload.

Recommended Minimum Memory (**Table 3.29**):

- Recommended minimum is the least memory for satisfactory system performance under “normal” workloads
- Larger memory configurations may be required to achieve desired system performance for specific applications and workloads

Table 3.29 Recommended Minimum Memory*

Number of CPUs	T500 (Mbytes)	S/890 (Mbytes)
1	256	128
2	384	128
3	512	192**
4	640	256**
5	768	n/a
6	896	n/a
7	1024	n/a
8	1152	n/a
9	1280	n/a
10	1408	n/a
11	1536	n/a
12	1664	n/a

* For satisfactory performance under “normal” workloads

** Required for powerfail/battery-backup operation

HP-PB I/O Card Cage Power and Space Budgeting

When adding I/O cards to the HP-PB I/O Card Cage, care must be taken to make sure that the total power consumption of all boards within the I/O Card Cage does not exceed the total power available and that the available slots have not been exceeded. Use **Table 3.30** as a worksheet to verify that your configuration is within the available power and slot limits.

The total power draw of the cards within the I/O Card Cage must meet two criteria:

1. The total power draw on each voltage (+12, +5, -12) must be below the listed limit for that voltage.
2. The total power draw of all three voltages combined must be below the listed total available for the entire power supply (222.82 W).

Table 3.30 HP-PB I/O Card Cage Power and Space Budgeting

I/O Card	Qty	Power Requirements per I/O Card (watts)			Total Power Required (watts)			Slots Per Card	Total Slots Used
		+12V	+5V	-12V	+12V	+5V	-12V		
LAN/Console w/ int. MAU (ThinLAN)	*	0.40	14.20	0.40				2	
LAN/Console w/ ext. MAU (EtherTwist)		6.60	14.20	0.40				2	
8 Port MUX 40299B		1.92	7.00	1.56				1	
16 Port MUX J2092A, J2093A, J2094A	*	3.60	8.50	1.80				1	
32 Port MUX J2096A		1.50	8.00	1.50				1	
802.3 LAN J2146A		6.00	10.65	0.00				1	
802.5 Token Ring J2166A		0.00	8.30	0.00				1	
SCSI/Cent. Interface 28655A	*	0.00	4.50	0.00				1	
SCSI Interface Fast/Wide/Differential 28696A		1.44	25.5	0.00				2	
FDDI J2157A		0.00	18.50	0.00				2	
X.25 36960A		0.96	9.55	0.96				1	
SNAlus Link J2220A		0.96	9.55	0.96				1	
HP-FL Interface 28615A		0.48	19.65	0.60				2	
HP-IB Interface 28650B		0.00	10.50	0.00				1	
Total Power Required per Voltage: (Must not exceed total below)								Total slots used (Must not exceed 14) <input type="text"/>	
Total Power Available per Voltage In HP-PB Expansion Module:					71.64	161.58	23.64		
Total Power Used [(+12 V watts) + (+5 V watts) + (-12 V watts)] Must be less than or equal to 222.82 watts									

*1 card included in base configuration

The 16-port MUX card that is supplied with the base SPU is configured with DB-25 style connectors on the distribution panel.

This second test is necessary because it may be possible to configure a combination of cards that is within the limits for individual voltage rails, yet exceeds the total power available from the card cage power supply.

The LAN/Console card that is supplied with the base SPU is a required card for the HP-PB I/O Card Cage within the SPU only. It

is not used in any other slots or HP-PB Expansion Modules. If additional 802.3 LAN interfaces are required, the dedicated use LAN card (product J2146A) must be used. The supplied LAN/Console card is configured for use with its internal MAU for ThinLAN connections. If EtherTwist connections are required, an external MAU must be purchased, and the power

consumption figures for the EtherTwist version of the LAN/Console card must be used for power budgeting.

Table 3.31 Model T500 Product Summary

Description	Product No./ Option No.
<p>HP 9000 Corporate Business Server Model T500 (Must order P/N A3032A)</p> <p>Base system includes:</p> <ul style="list-style-type: none"> System Cabinet and Modular Power Supply Processing Module Chassis with capacity for 12 CPUs, 8 memory arrays, 4 Dual I/O Channel Adapters One 90 Mhz PA-RISC CPU One Dual I/O Channel Adapter One 256 MB ECC memory array Internal 14-slot HP-PB I/O interface channel with 10 available slots Single-Ended SCSI/parallel host adapter card (SCSI 2) 16-channel Direct Connect Asynchronous Multiplexer Local and remote RS232 console access ports HP 700/96 console terminal with interconnect cable HP LAN/9000 (Ethernet) network interface controller w/right to use for TCP/IP, ARPA, and NFS services HP-UX 2-user license and general usage doc. set (Operating sys. S/W media must be ordered separately) Hardware installation One-year onsite warranty Owners Guide and General Usage documentation set <p>Select required and optional elements in sections below to configure the Model T500 Server.</p> <p>1. Configure base system. Required—Select one only</p> <ul style="list-style-type: none"> a. Base Configuration: Single Processor system (pre-selected) Qty. [1] A2339A b. 200–240 VAC 50/60 Hz Single-Phase Power (w/o power cord for European installations) Qty. [] A2339A, Opt. 017 c. 200–240 VAC 50/60 Hz Single-Phase Power Qty. [] A2339A, Opt. 018 (with power cord and connector for North American and Asian installations) <p>2. Specify quantity of additional CPUs. (Maximum quantity = 11) Optional</p> <ul style="list-style-type: none"> a. Additional 90 Mhz PA-RISC CPU with 2 MB cache Qty. [] A3062A <p>3. Select HP-UX OS version to be used in this system. Software can be pre-loaded if an expansion rack and boot disk are selected in section 8 below.</p> <ul style="list-style-type: none"> a. HP-UX 9.04 with 2-user license (pre-selected) Qty. [1] A2440A, Opt. APH Media must be ordered separately, P/N B3108A. One media copy required per customer site. <p>Factory integrated, pre-loaded HP-UX 9.04 and layered product software Optional—May select one</p> <ul style="list-style-type: none"> b. Instant Ignition** Qty. [] A2440A, Opt. 0D1 <p>4. Select system console. Required—Select one only</p> <p>Specify appropriate keyboard localization option.</p> <ul style="list-style-type: none"> a. HP 700/96 terminal with Amber screen Qty. [] C1064AZ, Opt. ABA* b. HP 700/96 terminal with Green screen Qty. [] C1064GZ, Opt. ABA* c. HP 700/96 terminal with Soft-White screen Qty. [] C1064WZ, Opt. ABA* <p>5. Select Dual I/O Bus Converter quantity.</p> <ul style="list-style-type: none"> a. Standard—One Dual I/O Channel Adapter (pre-selected) Required Qty. [1] A1829AZ, Opt. 0DS b. Add Dual I/O Channel Adapter (maximum 3 additional) Optional Qty. [] A1829AZ, Opt. 0DZ <p>6. Select memory boards. Maximum 8 boards or 2048 MB total memory. Required—Select a or b</p> <ul style="list-style-type: none"> a. Standard—One 256 MB ECC memory board (pre-selected) Qty. [] A2234AZ, Opt. 0DS b. Replace 256 MB memory board with 128 MB memory board Qty. [] A2233AZ, Opt. 0D4 <p style="text-align: right;">Optional</p> <ul style="list-style-type: none"> c. Add 64 MB ECC memory board Qty. [] A2570AZ, Opt. 0DZ d. Add 128 MB ECC memory board Qty. [] A2233AZ, Opt. 0DZ e. Add 256 MB ECC memory board Qty. [] A2234AZ, Opt. 0DZ <p>* For console other than English, consult the Corporate Price List for appropriate console option. ** See Section 7 for details.</p> <p>To order support, refer to System Support Options on pages 8-2 to 8-6. Please obtain the latest menus from the SSP Hotline before ordering T500 systems.</p>	<p>SSP# A3032A</p>

Table 3.31 Model T500 Product Summary (cont'd)

Description	Product No./ Option No.
7. Select additional I/O and networking interface cards for HP-PB card cage within the SPU cabinet.	
Refer to the Series 800 Configuration Guide for HP-PB card cage power and slot budgeting guidelines.	
Note: The following I/O cards are provided in the base configuration and are pre-installed:	
–Multipurpose LAN/console card including 802.3 ThinLAN plus two RS232 serial ports (one direct, one modem) for local and remote console connection.	
–16 Channel RS232C Direct Connect Asynchronous Multiplexer w/DB25 connector panel. (Note: One MUX port used per HP PowerTrust UPS if UPS units are configured into the system)	
–HP-PB Single-Ended SCSI/Parallel Host Adapter. 2.0 m and 2.5 m cables included.	
DO NOT ORDER THE ABOVE THREE I/O CARDS IN YOUR SELECTIONS BELOW.	
Choose additional cards for pre-installation into HP-PB card cage:	
a. Single-Ended SCSI/Parallel (Centronics) interface card w/1.0m cable with factory integration	Qty. [] 28655A, Opt. 0DZ
Replace 1.0 m cable with 2.0 m cable	Qty. [] 28655A, Opt. AFJ
Replace 1.0 m cable with 2.5 m cable	Qty. [] 28655A, Opt. ALX
b. Fast/Wide Differential SCSI-2 interface card w/2.5 m cable with factory integration	Qty. [] 28696A, Opt. 0DZ
Delete 2.5 m cable	Qty. [] 28696A, Opt. 001
Add 0.9 m cable (Interface Card --> Device)	Qty. [] 28696A, Opt. 002
Add 5.0 m cable (Interface Card --> Device)	Qty. [] 28696A, Opt. AF1
Add 10.0 m cable (Interface Card --> Device)	Qty. [] 28696A, Opt. AF8
Add 2.0 m extension cable (F-M)	Qty. [] 28696A, Opt. 003
Add 5.0 m extension cable (F-M)	Qty. [] 28696A, Opt. 004
Add 10.0 m extension cable (F-M)	Qty. [] 28696A, Opt. 005
Add 2.0 m V-cable (M-M-M)	Qty. [] 28696A, Opt. 006
c. Fiber-Optic (HP-FL) interface card with factory integration	Qty. [] 28615A, Opt. 0DZ
d. 16-channel RS-232C Direct Connect Asynchronous Multiplexer with factory integration	Qty. [] J2092AZ, Opt. 0DZ
Replace RJ-45 connector panel with DB25 connector panel	Qty. [] J2092AZ, Opt. 010
e. 32-channel RS-232C Direct Connect Asynchronous Multiplexer	Qty. [] J2096AZ
Replace RJ-45 connector panel with DB25 connector panel	Qty. [] J2096AZ, Opt. 010
f. LAN/9000 Link (802.3 Ethernet Controller); manuals deleted	Qty. [] J2146A, Opt. 0DM
g. 802.5 Token Ring interface card (preset to 4 Mb/s speed) and pre-loaded software	Qty. [] J2166A, Opt. AU4
h. Token Ring back-up media (DAT) and documentation	Qty. [] J2250A, Opt. AAH
i. Token Ring back-up media (1/2" tape) and documentation	Qty. [] J2250A, Opt. AA1
j. X.25 link with RS-232C interface card and pre-loaded software	Qty. [] 36960A, Opt. AU5
k. X.25 link with V.35 interface card and pre-loaded software	Qty. [] 36960A, Opt. AU6
l. X.25 back-up media (DAT) and documentation	Qty. [] A2321A, Opt. AAH
m. X.25 back-up media (1/2" tape) and documentation	Qty. [] A2321A, Opt. AA1

To order support, refer to System Support Options on pages 8-2 to 8-6.

Table 3.31 Model T500 Product Summary (cont'd)

Description	Product No./ Option No.
8. Add Primary Expansion Rack and Integrated Devices.	
Optional	
Notes: 1. Use this menu item only to order the first expansion rack for the Corporate Business Server.	
2. Order additional 1600 mm expansion racks and peripherals separately.	
3. Refer to configuration guide for rack space utilization specifications.	
4. Add at least one boot disk to enable HP-UX software pre-load.	
Expansion Rack	
a. 1600mm Primary Expansion Rack (one only)	Qty. [] A1897A
200–240V U.S. power; for connection to facility power source	Qty. [] A1897A, Opt. ABA
200–240V European power, without power cord; for connection to facility power source	Qty. [] A1897A, Opt. ABB
200–240V Universal, for connection to HP PowerTrust UPS in this cabinet as power source	Qty. [] A1897A, Opt. 021
200–240V U.S. power, for connection to UPS in adjacent cabinet	Qty. [] A1897A, Opt. 022
200–240V European power, for connection to UPS in adjacent cabinet	Qty. [] A1897A, Opt. 023
Power Protection	
b. 3.0 KVA Rackmounted HP PowerTrust Uninterruptible Power System (UPS) including Right to Use for HP PowerTrust UPS control software	Qty. [] A2998A, Opt. 0DZ
200–240V European power; hardwired connection	Qty. [] A2998A, Opt. 017
200–240V U.S. power, with cord and connector	Qty. [] A2998A, Opt. 018
Offline Storage	
c. 8–16 GB Rackmount DAT Storage System (Two 2-8 GB DAT drives)	Qty. [] C2467RZ
Disks and Disk Arrays	
d. 2.0 GB Rackmount SCSI Storage System (One 2.0 GB full-height disk drive)	Qty. [] C3023RZ
e. 4.0 GB Rackmount SCSI Storage System (Two 2.0 GB full-height disk drives)	Qty. [] C3024RZ
f. 6.0 GB Rackmount SCSI Storage System (Three 2.0 GB full-height disk drives)	Qty. [] C3025RZ
g. 2.72 GB High Availability (RAID 3) HP-FL Disk Array (Three 1.36 GB disk drives)	Qty. [] C2252HZ
h. 2.72 GB Independent Mode HP-FL Disk Array (Two 1.36 GB disk drives)	Qty. [] C2252BZ, Opt. 001
i. 2.72 GB Striped Mode HP-FL Disk Array (Two 1.36 GB disk drives)	Qty. [] C2252BZ
j. 5.44 GB High Availability (RAID 3) HP-FL Disk Array (Five 1.36 GB disk drives)	Qty. [] C2254HZ
k. 5.44 GB Independent Mode HP-FL Disk Array (Four 1.36 GB disk drives)	Qty. [] C2254BZ, Opt. 001
l. 5.44 GB Striped Mode HP-FL Disk Array (Four 1.36 GB disk drives)	Qty. [] C2254BZ
m. F/W/D SCSI Disk Array (Three 1 GB disks) Must specify one option only per main product.	Qty. [] C2436HZ
n. F/W/D SCSI Disk Array (Five 1 GB disks) Must specify one option per main product.	Qty. [] C2437HZ
o. F/W/D SCSI Disk Array (Three 2 GB disks) Must specify one option per main product.	Qty. [] C2439HZ
p. F/W/D SCSI Disk Array (Five 2 GB disks) Must specify one option per main product.	Qty. [] C2440HZ
q. 2.0 GB Rackmount SCSI Storage System (One 2 GB half-height disk drive)*	Qty. [] C3040RZ
r. 4.0 GB Rackmount SCSI Storage System (Two 2 GB half-height disk drives)*	Qty. [] C3041RZ
s. 6.0 GB Rackmount SCSI Storage System (Three 2 GB half-height disk drives)*	Qty. [] C3042RZ
t. 4.0 GB Rackmount F/W/D SCSI Storage System (Two 2 GB F/W/D SCSI disk drives)*	Qty. [] C3551RZ
u. 8.0 GB Rackmount F/W/D SCSI Storage System (Four 2 GB F/W/D SCSI disk drives)*	Qty. [] C3553RZ

* Orderable after March 1, 1994.

To order support, refer to System Support Options on pages 8-2 to 8-6.

Table 3.31 Model T500 Product Summary (cont'd)

HP 9000 Model T500 Upgrade SSP Product Structure

Description	Product No./ Option No.
Corporate Business Server T500 Symmetrical Multi-Processing (SMP) Upgrades (Must order P/N A3034A)	SSP# A3034A
1. Select processor upgrade(s).	Required—Select at least one
Order multiple sequential options to add more than one CPU.	
a. Upgrade from 1 CPU to 2 CPU SMP system	Qty. [] A3036A, Opt. 102
b. Upgrade from 2 CPU to 3 CPU SMP system	Qty. [] A3036A, Opt. 103
c. Upgrade from 3 CPU to 4 CPU SMP system	Qty. [] A3036A, Opt. 104
d. Upgrade from 4 CPU to 5 CPU SMP system	Qty. [] A3036A, Opt. 105
e. Upgrade from 5 CPU to 6 CPU SMP system	Qty. [] A3036A, Opt. 106
f. Upgrade from 6 CPU to 7 CPU SMP system	Qty. [] A3036A, Opt. 107
g. Upgrade from 7 CPU to 8 CPU SMP system	Qty. [] A3036A, Opt. 108
h. Upgrade from 8 CPU to 9 CPU SMP system	Qty. [] A3036A, Opt. 109*
i. Upgrade from 9 CPU to 10 CPU SMP system	Qty. [] A3036A, Opt. 110*
j. Upgrade from 10 CPU to 11 CPU SMP system	Qty. [] A3036A, Opt. 111*
k. Upgrade from 11 CPU to 12 CPU SMP system	Qty. [] A3036A, Opt. 112*
2. Select additional memory boards. Maximum 8 boards or 2048 MB total memory for the Model T500 system.	Optional
a. Add 64 MB ECC memory board	Qty. [] A2570A
b. Add 128 MB ECC memory board	Qty. [] A2233A
c. Add 256 MB ECC memory board	Qty. [] A2234A
* Orderable March 1, 1994.	

HP 9000 Model 890 to HP 9000 Model T500 Upgrade SSP Product Structure

NOTE: PowerFail/Battery Backup functionality that was present in the Model 890 is no longer available once the system has been upgraded to a T500.

Description	Product No./ Option No.
Corporate Business Server Model 890 to Model T500 Upgrades (Must order P/N A3033A)	SSP# A3033A
1. Select processor upgrade.	Required—Select one only
Choose the upgrade level based on the number of CPUs currently in the Model 890. Order the Model T500 Upgrade product A3034A for additional T500 CPUs. Customer MUST return current 890 CPU boards to HP to receive this upgrade.	
a. Upgrade from 1 CPU Model 890 to 1 CPU Model T500 Uniprocessor system	Qty. [] A3035A, Opt. 101
b. Upgrade from 2 CPU Model 890 to 2 CPU Model T500 SMP system	Qty. [] A3035A, Opt. 102
c. Upgrade from 3 CPU Model 890 to 3 CPU Model T500 SMP system	Qty. [] A3035A, Opt. 103
d. Upgrade from 4 CPU Model 890 to 4 CPU Model T500 SMP system	Qty. [] A3035A, Opt. 104
2. Add HP PowerTrust UPS for SPU power fail protection	Optional
Note: Order power distribution strip upgrade kit (below) for use of HP PowerTrust UPS in an existing 1600 mm expansion rack. Order new rack separately, if desired.	
a. Standalone 3.0 KVA Rackmounted HP PowerTrust Uninterruptible Power System (UPS) including Right To Use for HP PowerTrust UPS control software for field add-on	Qty. [] A2998A, Opt. 002
200–240V European power; hardwired connection	Qty. [] A2998A, Opt. 017
200–240V U.S. power, with cord and connector	Qty. [] A2998A, Opt. 018
b. HP PowerTrust compatible Power Distribution Strip for existing 1600mm expansion rack.	Qty. [] A3085A, Opt. 001
200–240V Universal; power cord and IEC 320-C20 connector for connection to HP PowerTrust UPS in the same cabinet.	
3. Select additional memory boards. Maximum 8 boards or 2048 MB total memory for the Model T500 system.	Optional
a. Add 64 MB ECC memory board	Qty. [] A2570A
b. Add 128 MB ECC memory board	Qty. [] A2233A
c. Add 256 MB ECC memory board	Qty. [] A2234A

To order support, refer to System Support Options on pages 8-2 to 8-6.

Configuring for HP SwitchOver/UX

Switchover configurations utilizing the Model T500 have three basic guidelines:

1. Each SPU in the switchover configuration must be a Model T500 or a Model 890. It is not currently possible to configure a Model T500 as the primary system and have a different model Series 800 server (e.g., I50) as the hot standby machine. It is possible, however, to configure a different model server as a "cold" standby if you are not using HP Switchover/UX.

2. The "backup" system in an HP Switchover/UX configuration may be a Model T500 that is configured with fewer CPUs and less memory. As an example, a 4 CPU "primary" T500 with 1 GB of memory can be backed up by a 1 CPU T500 with 512 MB of memory as long as the backup system is also configured with enough I/O connectivity to support the disks of the primary system.

Note: For more detailed information, see System Availability, section 7.

SCSI Tapes

- Up to 7 magnetic tape units per SCSI-2 interface card
- Do not mix disk drives and mag tapes on one SCSI-2 card

SCSI Printers

- Only one printer per interface card for medium to heavy printing loads
- Do not mix SCSI-2-interface printers with other peripherals on one card

Expansion Cabinets and Peripherals

- Install peripherals in 1.6m expansion cabinets
- Order A1897A cabinet with factory integration of many popular peripherals
- Order C2786A or other cabinets and rack peripherals separately

1.6 m Integrated Cabinet—A1897A

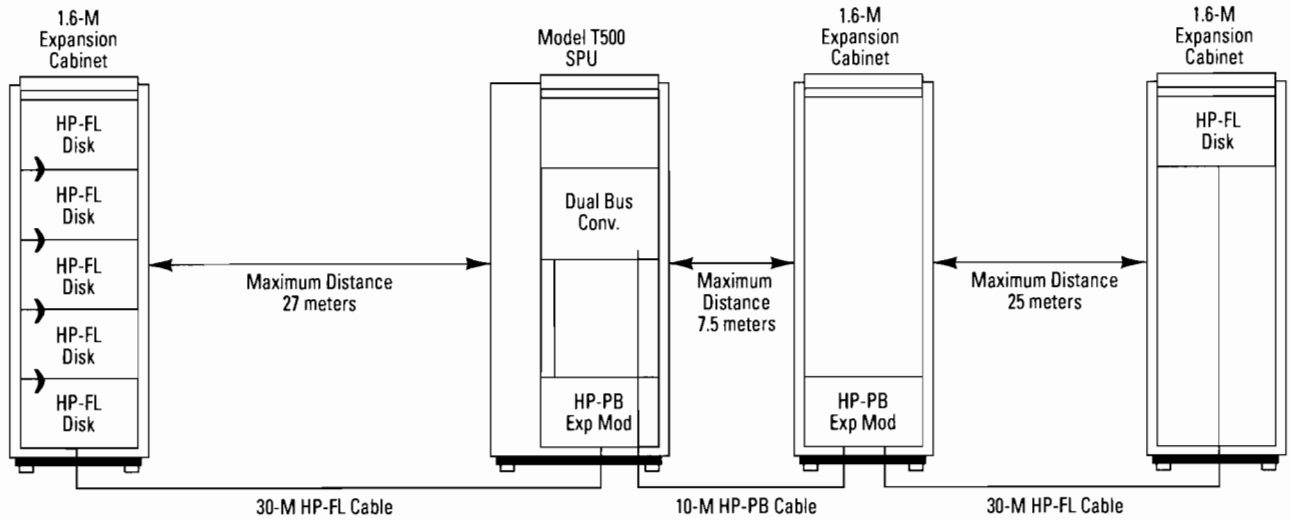
- Order first A1897A as part of SPU SSP, A3032A
 - One disk in first expansion cabinet will be preloaded as boot disk, with HP-UX OS
- Order additional expansion cabinets on separate sections of the order
- Order "Z"-suffix peripherals for factory integration
- Order other peripherals for assembly in the field
- Be sure that all of the peripherals will fit in the cabinet
- Account for "EIA Units" of racking space used by all peripherals

- Factory will fill unused space with filler panels in integrated cabinets
- Cabling for integrated peripherals will be installed in the field
- Configuration of peripherals into the system will be done in the field
- No limit to number of integrated cabinets, within overall configuration limits of system and within cabling limits
- See Configuration Guide sections on Peripherals and Cabinets for further information on racking limitations

1.6 m Standalone Cabinet—C2786A

- Order option ABA for 208–220V North American power
- Order option ABB for 200–240V European power
- Order rackable peripherals (see Peripherals Section of this Guide) as separate products
- Note rack space requirements of peripherals so sufficient rack mounting space is available
- Plan for field installation of all peripherals
- No limit to number of standalone expansion cabinets, within overall configuration limits of system and within cabling limits

Figure 3.43 HP-FL Sample Configuration



Cabling and Racking Considerations

HP-PB Expansion Modules

- Linked to Dual Upper-Bus Converter card by a pair of 10m link cables
- Maximum distance from SPU to cabinet with Expansion Module is approximately 7.5m (allows for cable routing under raised floor)
- Potential for up to 12 1.6m cabinets between SPU and the cabinet holding the Expansion Module

Fast/Wide SCSI Interface Connections (28696A)

- Total cable length is maximum of 25m per interface card
- Include all applicable cable lengths in this maximum:
 - Interface cables (0.9m, 2.5m, 5m, 10m)
 - Extender cables (2m, 5m, 10m)
 - “Daisy-chain” cables (0.9m)
 - SwitchOver “V-Cables” (2m)
 - Cable-length equivalents internal to Fast/Wide disks and arrays

- Fast/Wide SCSI Array (0.7m)
- Fast/Wide SCSI Disk Drive
- R-suffix “Rackmount” products (1.75m)

Single-Ended SCSI Interface Connections (28655A)

- Total length of cabling is 6m per interface card

Single-Ended SCSI Disk as System Disk

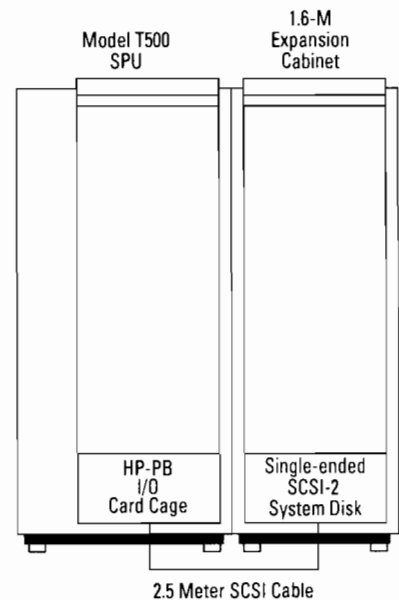
- Must be housed in 1.6m expansion cabinet immediately adjacent to SPU (Figure 3.44)
- Must be connected to SCSI interface card in card cage within SPU due to “autoconfig” considerations
- Interconnection cable must be 2.0 or 2.5m (both included with SPU card)

Series 6000 Mass Storage Enclosures

- Maximum of one Series 6000 connected to SCSI interface via 2.5m cable

- Maximum of two Series 6000s connected to SCSI interface via 2.0m cable
- Internal cable equivalent of Series 6000 unit is 1.75m
- 6m maximum total cable length applies to internal and external cable

Figure 3.44 SCSI System Disk Configuration



HP-FL Connections

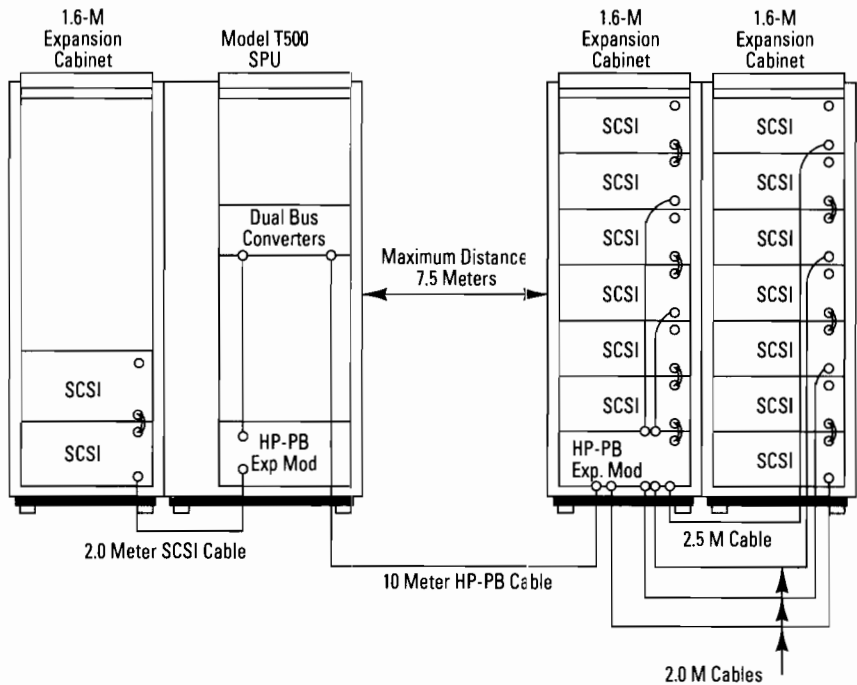
- Total length of fiber-link cable from interface to first HP-FL disk drive is 500m
- HP-FL cables are immune to electromagnetic interference (EMI) and are recommended for applications where SPU-to-disk cables must pass through strong EMI areas or disk drives are to be located remote to the SPU(s) in the configuration
- HP-FL interface card includes 30m HP-FL cable
- Longer cables must be custom-ordered
- With standard 30m cable, expansion racks must be within approximately 25–27m of the SPU or expansion rack housing the expansion card cage

Fiber-Optic SCSI Extender (28643A)

- Not for use with the Fast/Wide SCSI devices

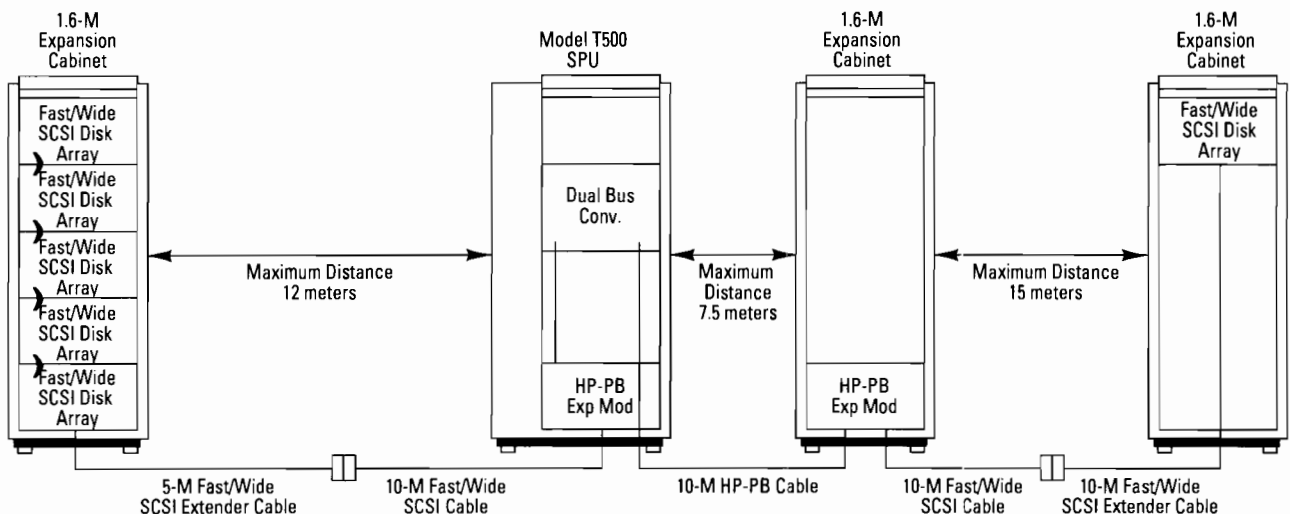
- Appropriate for:
 - Printers
 - Optical Libraries
 - Magnetic Tape units
- Not appropriate for:
 - Disk Drives
- Not supported in SwitchOver/UX configurations
- Bandwidth is lower than Single-Ended SCSI-2's 5 MB/sec:
 - 3.8 MB/sec for SCSI Extender and 50m fiber-link cable
 - 2.8 MB/sec for SCSI Extender and 100m fiber-link cable

Figure 3.45 Sample SCSI Disk Configuration



Note: Allow for extra cable length needed in raised-floor installations.

Figure 3.46 Fast/Wide SCSI Sample Configuration



Power Protection for the Model T500

Beginning with the Model T500, Corporate Business Server systems no longer incorporate the HP PowerFail/Battery Backup functionality.

In its place, the Model T500 offers integrated support for rack-mounted HP PowerTrust Uninterruptible Power Systems (UPS) to provide protection against data or transaction loss due to computer room power outages. UPS units are orderable as an option to the Model T500 at the time of initial order, or as options to the Model 890 to T500 upgrade. The HP PowerTrust UPS units are designed to provide at least 15 minutes of continued power in the event of a power loss. In addition, they have been engineered to interoperate with the HP-UX software modules for UPS Monitoring and Control and Timed Power On/Off beginning with HP-UX version 9.04.

Minimum Protection Requirements

Data in CPU cache and in I/O buffers of the T500 is protected against potential loss or corruption as a result of power failure as long as UPS protection is provided for:

1. The Model T500 SPU cabinet.
2. All external HP-PB I/O Expansion Modules (card cages).
3. Disks and arrays such as the C2436/37/39/40HZ, which require UPS protection.

This minimum level of protection is available when any qualified UPS is used to protect the system elements listed above. With this

level of protection, data will be protected, but transaction activity will pause until power resumes to the disks.

Requirements for Continued Operation

Transaction activity on the Model T500 can continue during power outage periods as long as qualified UPS units are used to provide backup power to the T500 SPU cabinet, all HP-PB "Expansion Modules," and all active disks. With this configuration, the Model T500 can continue to operate until the UPS batteries are depleted or until the applications and the system can be gracefully shut down. With HP PowerTrust UPS units, this minimum period of continued operation is a full 15 minutes.

HP PowerTrust UPS Configuration Guidelines

Initially, the only HP PowerTrust UPS available for use with the Model T500 is the 3.0 kVA rack-mount unit. **This 3.0 kVA unit is the only HP UPS unit supported for use with the Model T500 SPU.** In addition, this 3.0 kVA unit can be used to provide power for peripheral devices mounted in the HP expansion cabinets. Later, additional HP PowerTrust UPS units of smaller capacity will be available to provide backup power for rackmounted peripherals.

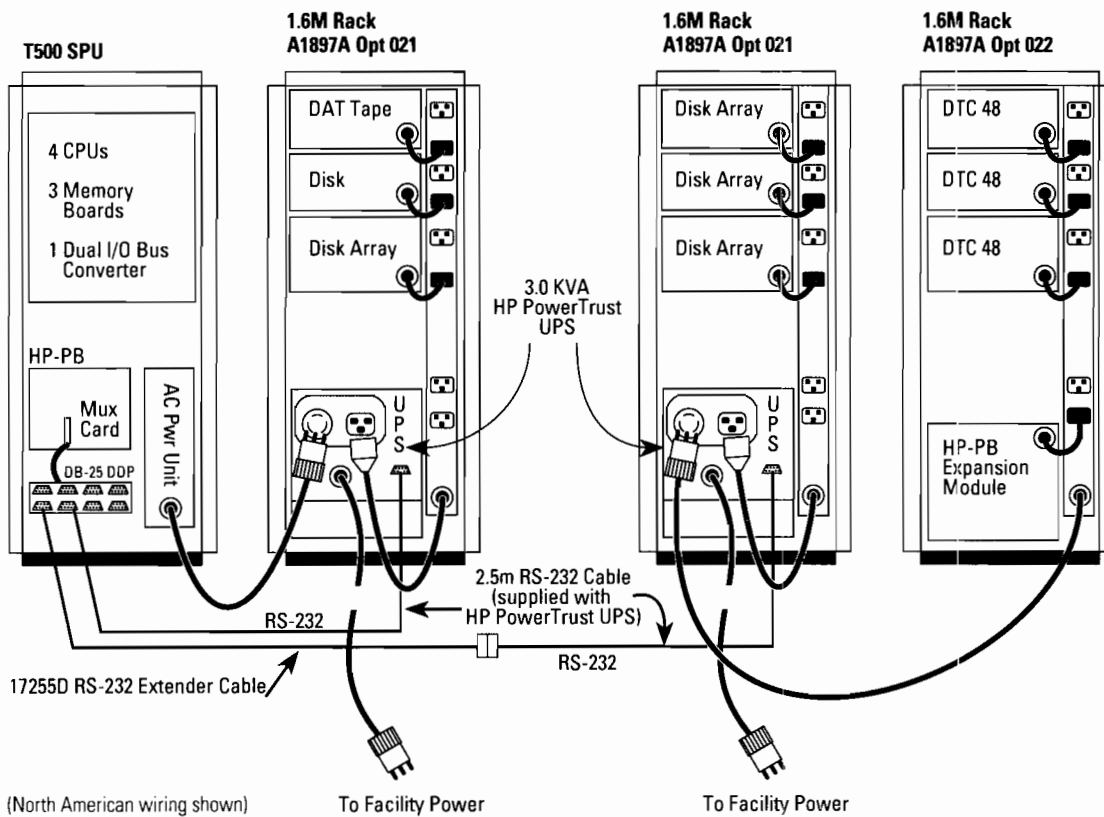
Figure 3.47 shows an example T500 configuration utilizing the 3.0 kVA HP PowerTrust UPS units. The 3.0 kVA UPS unit mounted in the first 1.6 m expansion rack is used to provide power for the entire SPU and (potentially) the peripherals in the rack where the

UPS is mounted. Note that the UPS has two output power connectors; one for an external device such as the SPU, and one for the power distribution unit (PDU) of the expansion rack that the UPS is mounted in. For Model T500 configurations, the external device connected to the 3.0 kVA UPS can be either the T500 SPU or an adjacent 1.6 m (240V) expansion rack. This connector is a 240V L6-30 connector for North America and Asia installations, and a hardwire connection for Europe. When ordering an adjacent 1.6 m rack to connect to the external power connector on the 3.0 kVA UPS, order A1897A option 022 for North America and Asia, and A1897A option 023 for Europe.

For a 1.6 m rack to plug into the 3.0 kVA HP PowerTrust UPS that it houses, order A1897A option 021. This provides a rack with a PDU that can plug directly into the IEC style connector that is included with every 3.0 kVA UPS. This same rack is used worldwide.

The total power demanded by the combination of the Model T500 SPU and/or the rackmounted peripherals connected to each HP PowerTrust UPS must not exceed the stated capacity of the UPS. For the UPS powering the Model T500 SPU, the amount of UPS capacity remaining to power peripherals will vary depending on how much power the T500 SPU demands. Model T500 power demands vary depending on how many CPUs, memory boards, and Dual I/O Bus Converter boards are installed. **Table 3.32** shows the power consumption for each combination of CPU, memory, and Dual Bus Converter boards that can be configured in the Model

Figure 3.47 Example T500 HP PowerTrust UPS Configuration



T500. Use **Table 3.32** to determine the power demands of your Model T500 configuration.

As an example, a Model T500 with 4 CPUs, 3 memory boards, and 1 Dual I/O Bus Converter would draw 1,478 VA (Volt-Amperes) of power. This would leave $3,000 - 1,478 = 1,522$ VA of power available for disks, tapes, etc. in the rack where the UPS is mounted. Note: the VA figures provided in **Table 3.32** have already been adjusted for the power factor that is present in the T500 power supply subsystem. They *do not* need to be adjusted any further for UPS power budgeting purposes. The number of peripheral devices that can be supported by the remaining UPS power is determined by using the UPS power budgeting rules that

are outlined in the HP PowerTrust section of this configuration guide. UPS units used to support only rackmounted peripheral devices (see **Figure 3.47**) are configured using those same power budgeting rules.

UPS Monitoring and Control and Timed On/Off Software

Software modules are provided with HP-UX (as of release 9.04) to perform two different functions involving HP PowerTrust UPS units: (These capabilities do not work with UPS units other than HP PowerTrust.)

1. Monitoring and Control of the UPS to provide graceful shutdown capabilities in the event of an extended power outage.

2. Automatic power-up and power-down of an SPU (and peripherals) at pre-set days and times.

Each of these capabilities requires an RS-232 communication link **between each HP PowerTrust UPS and the SPU**. The 2.5-meter long RS-232 cable that is provided with each HP PowerTrust UPS connects to a port on the T500's 16-port MUX to satisfy this communication link requirement. The cable has a male DB-9 connector on the UPS end, and a male DB-25 connector on the SPU end. If a link greater than 2.5 meters long is required, a male-female RS-232 extender cable with DB-25 connectors can be used to achieve the additional distance.

Table 3.32 Model T500 Power Consumption Values for UPS Load Budgeting

How to Use This Table

Locate the cell that corresponds to the number of Dual I/O Bus Converters, memory boards, and CPUs that are configured in the T500 SPU. The value in that cell is the total Volt-Amperes (VA) of power that the SPU will draw from the UPS. Subtract this total from the quantity 3000 to obtain the remaining VA available in the 3.0 kVA HP PowerTrust UPS that can be budgeted for other peripheral devices in the UPS cabinet. These figures are already adjusted for the T500 power supply power-factor.

	Number of Memory Boards	Number of CPUs											
		1 CPU	2 CPUs	3 CPUs	4 CPUs	5 CPUs	6 CPUs	7 CPUs	8 CPUs	9 CPUs	10 CPUs	11 CPUs	12 CPUs
One Dual I/O Bus Converters	1	1081	1153	1254	1326	1427	1499	1600	1672	1773	1845	1946	2018
	2	1157	1229	1330	1402	1503	1575	1676	1748	1849	1921	2022	2094
	3	1233	1305	1406	1478	1579	1651	1752	1824	1925	1997	2098	2170
	4	1309	1381	1482	1554	1655	1727	1828	1900	2001	2073	2174	2246
	5	1385	1457	1558	1630	1731	1803	1904	1976	2077	2149	2250	2322
	6	1461	1533	1634	1706	1807	1879	1980	2052	2153	2225	2326	2398
	7	1537	1609	1710	1782	1883	1955	2056	2128	2229	2301	2402	2474
	8	1613	1685	1786	1858	1959	2031	2132	2204	2305	2377	2478	2550
Two Dual I/O Bus Converters	1	1152	1224	1325	1397	1498	1570	1671	1743	1844	1916	2017	2089
	2	1228	1300	1401	1473	1574	1646	1747	1819	1920	1992	2093	2165
	3	1304	1376	1477	1549	1650	1722	1823	1895	1996	2068	2169	2241
	4	1380	1452	1553	1625	1726	1798	1899	1971	2072	2144	2245	2317
	5	1456	1528	1629	1701	1802	1874	1975	2047	2148	2220	2321	2393
	6	1532	1604	1705	1777	1878	1950	2051	2123	2224	2296	2397	2469
	7	1608	1680	1781	1853	1954	2026	2127	2199	2300	2372	2473	2545
	8	1684	1756	1857	1929	2030	2102	2203	2275	2376	2448	2549	2621
Three Dual I/O Bus Converters	1	1223	1295	1396	1468	1569	1641	1742	1814	1915	1987		
	2	1299	1371	1472	1544	1645	1717	1818	1890	1991	2063		
	3	1375	1447	1548	1620	1721	1793	1894	1966	2067	2139		
	4	1451	1523	1624	1696	1797	1869	1970	2042	2143	2215		
	5	1527	1599	1700	1772	1873	1945	2046	2118	2219	2291		
	6	1603	1675	1776	1848	1949	2021	2122	2194	2295	2367		
	7	1679	1751	1852	1924	2025	2097	2198	2270	2371	2443		
	8	1755	1827	1928	2000	2101	2173	2274	2346	2447	2519		
Four Dual I/O Bus Converters	1	1294	1366	1467	1539	1640	1712	1813	1885				
	2	1370	1442	1543	1615	1716	1788	1889	1961				
	3	1446	1518	1619	1691	1792	1864	1965	2037				
	4	1522	1594	1695	1767	1868	1940	2041	2113				
	5	1598	1670	1771	1843	1944	2016	2117	2189				
	6	1674	1746	1847	1919	2020	2092	2193	2265				
	7	1750	1822	1923	1995	2096	2168	2269	2341				
	8	1826	1898	1999	2071	2172	2244	2345	2417				

NOT CONFIGURABLE

Model T500 Ordering

Software Pre-Loading

When ordering the Corporate Business Server T500, you have the option of having the HP-UX Operating System and Networking software preloaded at the factory, by using the Instant Ignition service. (See Section 7 for details.) Utilization of this option provides the benefit of reduced field installation time, and reduces implementation risk for the customer. Note: although the software can be preloaded, it is still a requirement for the HP-UX software media to be ordered in addition to the SPU. Only the current supported version of HP-UX will be available for pre-loading. Initially HP-UX 9.0 (and the latest available PCO) will be the supported operating system version. As future versions are released for support on the Corporate Business Server, they will be made available for Instant Ignition software pre-loading.

Ordering and Configuration Requirements for Model T500

To get the software preloaded, the following configuration and ordering requirements must be met:

1. A single 1.6 meter Integrated Cabinet, product A1897A, must be ordered as part of the Corporate Business Server T500 SSP, P/N A3032A. Any additional Integrated Cabinets must be ordered in a separate order section. If multiple Integrated Cabinets are ordered in the same order section along with the SPU, no software will be preloaded.

2. The Integrated Cabinet must include at least one disk device, either F/W SCSI, Single-Ended SCSI, or HP-FL, selected from the disks available on the T500 SSP. Software pre-load cannot be done on disks that are separately ordered.

System Disk Configuration

HP-UX will be loaded onto a disk under the following guidelines:

1. HP-FL, Fast/Wide Differential SCSI-2, or Single-Ended SCSI-2 disk(s) may be included in the integrated cabinet as the system disk. HP-FL disk arrays are supported as system disks. **F/W SCSI Disk Arrays are supported as system disks in RAID-5 only until further notice. (Check Sales Response Center for updates.)**
2. If Single-Ended SCSI-2 disks are included in the same cabinet with HP-FL or Fast/Wide Differential SCSI-2 disks, HP-UX will be loaded on the Single-Ended SCSI-2 disk.
3. If multiple disks of different capacities are included in the cabinet, HP-UX will be loaded onto the smallest capacity disk.
4. The system disk will be installed as the lowest disk in the rack. In the case of multiple disks, the boot disk will be configured as the first disk in the chain. This allows the factory to set the I/O address of the boot disk in the system configuration.

5. The primary swap space will be preset to a size of 500 Mbytes. This should be more than sufficient for initial system operations. If the customer needs to adjust the swap space to more closely meet the needs of their specific configuration, the swap space can be easily increased or decreased at a later time using the facilities of the Logical Volume Manager (LVM).

Manuals

The following manuals ship with each Model T500 SPU:

- Model T500 Operator's Guide (A1809-90009)
- Model T500 Installation Guide (A1809-90001)

The following manual ships with the HP PowerTrust UPS:

- PowerTrust Rackmount Guide (5262-3669)

The following manual ships with expansion cabinets:

- Expansion Cabinet Installation/ Configuration Guide (A1809-90006)

The following manual ships with T500 system upgrades:

- System Upgrade and Installation Guide (A1820-90001)

Model T500 Upgrades

Corporate Business Server T500 upgrades are achieved by simply adding one or more processor boards to the SPU. Additional memory may be necessary to meet the minimum supported memory configuration, or to increase memory to maintain balance with the additional processing power. If that is the case, the memory is ordered separately by ordering either the A2570A 64 Mbyte ECC memory board, the A2233A 128 Mbyte ECC memory board, or the A2234A 256 Mbyte ECC memory board. Processor board upgrades are obtained by ordering product A3036A on SSP A3034A, and choosing the appropriate option or options to indicate the number of additional processors desired. For example, choose option 102 if you are upgrading from a single-CPU Model T500 to a 2-CPU Model T500. Choose options 102 and 103 if you are upgrading from a single-CPU Model T500 to a 3-CPU Model T500.

Model 890 to T500 Upgrades

A Model 890 Corporate Business Server can be upgraded to a Model T500 through replacement of the processor boards. Use SSP A3033A to indicate whether you are upgrading from a 1-, 2-, 3-, or 4-CPU Model 890 system. If additional T500 CPUs are desired, order those via the T500 Upgrade SSP, P/N A3034A and its component product, A3036A. See the example shown in **Figure 3.48** for upgrade of a 4 CPU Model 890 to a 5 CPU Model T500. **890 processor boards and T500 processor boards can not be mixed in the same system. At**

the same time, you may optionally order an HP PowerTrust UPS and additional memory. Remember: the **HP PowerFail/Battery Backup functionality that was present in the Model 890 is no longer available once the system has been upgraded to a T500**. Protection from power failures should be provided by HP PowerTrust or some other form of UPS. If you are going to add an HP PowerTrust UPS to an existing 1.6 meter rack, you should also order a replacement Power Distribution Strip (P/N A3085A, Opt. 001) to enable the rack (and its peripheral devices) to be protected by the UPS as well.

Figure 3.48 Example: Upgrade 4-CPU Model 890 to 5-CPU Model T500

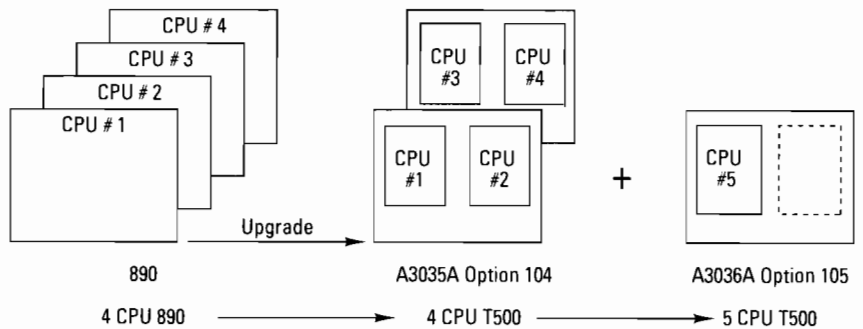


Table 3.33 Model T500 Technical Specifications

Physical Characteristics	
Height	1620 mm
Width	750 mm
Depth	905 mm
Weight	375 kg
Electrical Characteristics	
AC input power	200–240 VAC, Single Phase, 50/60 Hz
Maximum current	12.0 amps @ 200 VAC; 10.1 amps @ 240 VAC
Rated current	24A max
Maximum heat dissipation	8,300 BTU/hour
Environmental Characteristics	
Acoustics	7.5 bels (A) sound power below 30C
Electrostatic discharge, power transients and vibration	Designed for data center environments
Temperature	
Operating	+5C to +40C
Recommended	+20 to +25C
Non-operating	–40C to +70C
Relative humidity	
Operating	15% to 80% @ 40C, non-condensing
Recommended	40% to 60%
Altitude	
Operating	3.0 km (10,000 ft)
Non-operating	4.6 km (15,000 ft.)
Cooling	Air cooled; top to bottom air flow
Regulatory Compliance	
Electromagnetic interference	Complies with FCC rules and regulations, Part 15, Subpart B, as a Class A computing device. Complies with CISPR 22 Class A and EN55022 Class A Registered with Japanese VCCI, Class 1
Immunity	Complies with pr EN55024-2 (pr EN55101-2) (ESD) Complies with pr EN55024-3 (pr EN55101-3) (Radiated Immunity)
Safety	UL Listed to UL1950 CSA Certified to CSA C22.2 No. 950 Complies with IEC 950, EN60950

Figure 3.49 Corporate Business Server Model T500 Architecture

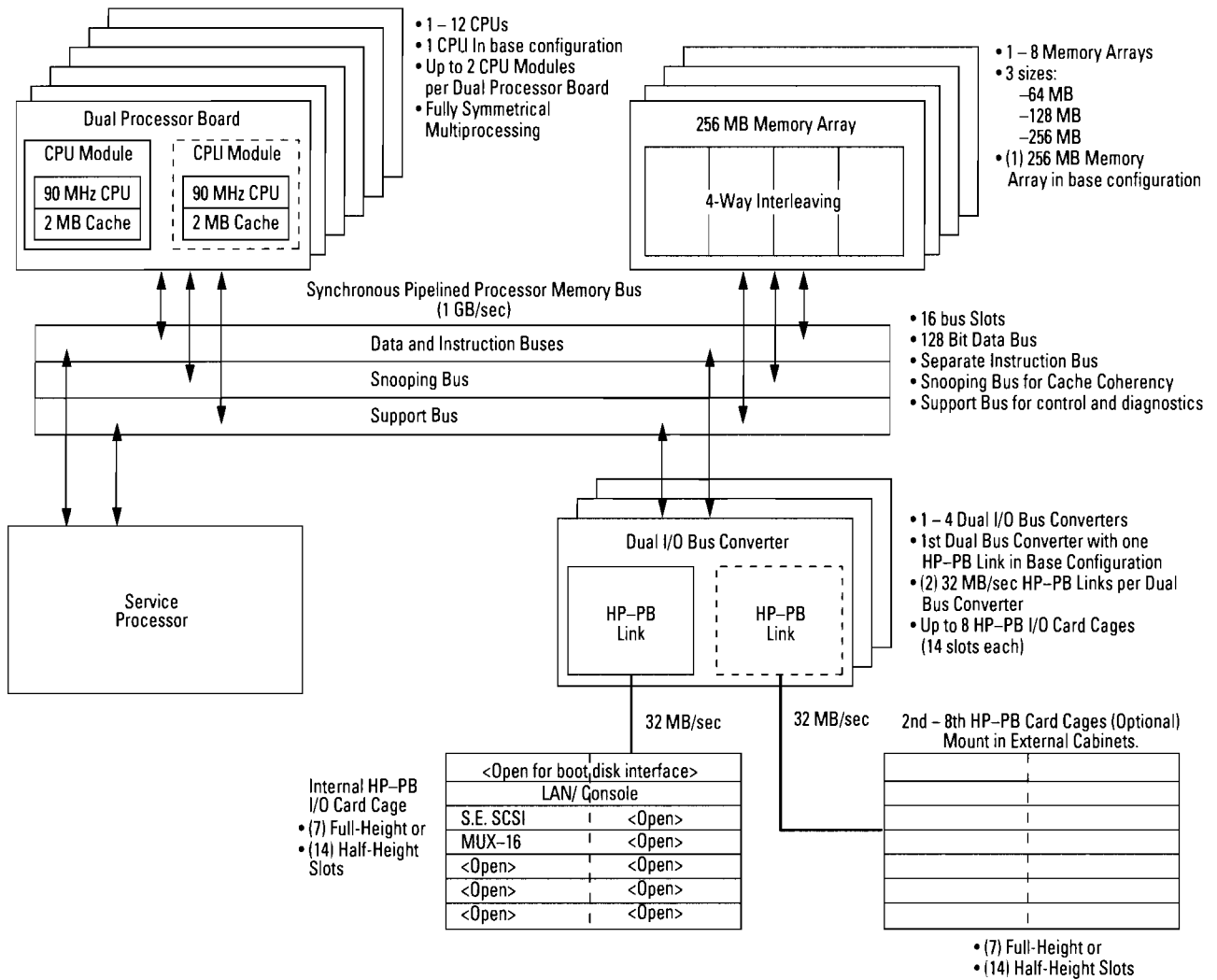


Table 3.34 Model T500 Corporate Business Server Configuration Reference Table

Item	Maximum Limits	Specifications	Notes
Processor Modules (CPUs)	12 per SPU**	90 MHz	One processor in base configuration
Memory Capacity	2 GB		256 MB board in base configuration
Memory Boards	8 per SPU**	64, 128, 256 MB	Use (8) 256 MB boards to reach 2 GB max configuration
Dual Bus-Converters	4 per SPU**		One included in base config; 2 HP-PB I/O Card Cages per Dual BC
HP-PB I/O Slots Internal to SPU In Expansion Modules	112 Total 14 (see note) 98 slots		All slots are HP-PB 8 single-high slots unused in base configuration 14 single-high slots per HP-PB Expansion I/O Card Cage Module
HP-PB I/O Card Cages Internal to SPU External Maximum	1 7	32 MB/s	21 MB/s sustained. Maximum 256 peak with 8 card cages Linked to SPU via 10 meter cable-pair
Disk Capacity Fast/Wide SCSI Array HP-FL Disk Array HP-FL Independent Mode Single-Ended SCSI HP-IB	1900 GB Total 1900 GB 1300 GB 326 GB 168 GB 8 GB		Max 1900 GB using 8 GB RAID Arrays 2.7 GB or 5.4 GB increments This limit includes disk arrays in independent mode 12 disks, 3 interfaces
Disk Devices Fast/Wide SCSI Arrays Fast/Wide SCSI Independent Mode Array HP-FL HA Arrays HP-FL Independent Mode Arrays Single-Ended SCSI HP-IB	250 Total* 240 48 240 48 84 12	Up to 5 disks/array Up to 5 disks/array	1 F/W SCSI "disk device" used for each RAID Array 1 F/W SCSI "disk device" used for each disk in the array 1 HP-FL "disk device" used for each High Availability (HA) array 1 HP-FL "disk device" used for each disk in the array Includes CD-ROM and optical disks
Optical Libraries	20 Library Units		2000 GB Max capacity w/ C1705A 100 GB Libraries 4 SCSI addresses (disk devices) per C1750A
Printers LAN Connected SCSI Serial Centronics	250 8 250 20		Connected via MUX or DTC port
Tape Drives SCSI HP-IB	24 16 8		
Terminal Connections MUX Connections DTC Connections DTC Units	4500 Total 2048 4500 150		Contact the Sales Center if the customer requires more than 3000 terminal connections. Available with 16 or 72 Ports
Network Links LAN (802.3) Token Ring (802.5) X.25 SNaplus Link FDDI	10 5 12 12 3	10 Mbit/s 4 or 16 Mb/s 64 Kb/s 256 LU 100 Mbit/s	LAN/Console card plus 9 additional J2146A cards Single-high size card Single-high size card; 256 virtual circuits/card; 1024 VCs/SPU Single-high size card; max 256 LU per SPU Double-high size card
I/O Cards Fast/Wide Differential SCSI-2 HP-FL Single-Ended SCSI HP-IB 8 Channel MUX 16 Channel MUX 32 Channel MUX	40 40 20 9 64 64 64	20 MB/s 5 MB/s 5 MB/s 1.5 MB/s	Double-high size card Double-high size card Single-high size card Single-high size card Single-high size card Single-high size card Single-high size card

* Contact the Sales Center if customer requires more than 130 disk addresses.

** Maximum CPUs, memory, and dual bus-converters can not all be achieved at the same time. See Table 3.1 for achievable combinations.

HP 9000 Corporate Business Server Model 890

Configuration Guide Updates

The Model 890 will support full use of the new HP PowerTrust UPS units as well as the Fast/Wide Differential SCSI host adapter cards and Disk Array products. The following sections of the Model 890 configuration guide are updated to reflect that support.

Power Consumption Values for UPS Load Budgeting

Listed below is a table showing the amount of power that must be supplied by the HP PowerTrust UPS to effectively support various configurations of the Model 890 SPU. Use this table to determine how much unused power remains in the 3.0 kVA HP PowerTrust UPS after allowing for full support of the 890 SPU. See **Table 3.35**.

Fast/Wide Differential SCSI Interface and Disk Support

The Model 890 supports the new Fast/Wide Differential SCSI interface cards in both the internal I/O card cage as well as in the external HP-PB I/O Expansion Modules. The new interface card and its corresponding power consumption figures are added to **Table 3.30**, HP-PB I/O Card Cage Power and Space Budgeting.

The 890 also supports the use of up to 40 Fast/Wide Differential SCSI cards and up to 240 individual disk arrays (RAID3 or RAID5 mode). With a full 240 F/W/D SCSI arrays (RAID3 or RAID5) at 8 GB each, the maximum disk support for the 890 is raised to 1,900 GB. These support levels for the 890 are included in the updated **Table 3.37**, Model 890 Configuration Reference.

Table 3.35 Model 890 Power Consumption Values for UPS Load Budgeting

How to use this table:

Locate the cell that corresponds to the number of Dual I/O Bus Converters, memory boards, and CPUs that are configured in the 890 SPU. The value in that cell is the total Volt-Amperes (VA) of power that the SPU will draw from the UPS. Subtract this total from the quantity 3000 to obtain the remaining VA available in the 3.0 kVA HP PowerTrust UPS that can be budgeted for other peripheral devices in the UPS cabinet. These figures are already adjusted for the 890 power supply power-factor.

	Number of Memory Boards	Number of CPUs			
		1 CPU	2 CPUs	3 CPUs	4 CPUs
One Dual I/O Bus Converter	1	1166	1352	1538	1724
	2	1242	1428	1614	1800
	3	1318	1504	1690	1876
	4	1394	1580	1766	1952
	5	1470	1656	1842	2028
	6	1546	1732	1918	2104
	7	1622	1808	1994	2180
	8	1698	1884	2070	2256
Two Dual I/O Bus Converter	1	1237	1423	1609	1795
	2	1313	1499	1685	1871
	3	1389	1575	1761	1947
	4	1465	1651	1837	2023
	5	1541	1727	1913	2099
	6	1617	1803	1989	2175
	7	1693	1879	2065	2251
	8	1769	1955	2141	2327
Three Dual I/O Bus Converter	1	1308	1494	1680	1866
	2	1384	1570	1756	1942
	3	1460	1646	1832	2018
	4	1536	1722	1908	2094
	5	1612	1798	1984	2170
	6	1688	1874	2060	2246
	7	1764	1950	2136	2322
	8	1840	2026	2212	2398
Four Dual I/O Bus Converter	1	1379	1565	1751	1937
	2	1455	1641	1827	2013
	3	1531	1717	1903	2089
	4	1607	1793	1979	2165
	5	1683	1869	2055	2241
	6	1759	1945	2131	2317
	7	1835	2021	2207	2393
	8	1911	2097	2283	2469

Table 3.36 Model 890S Corporate Business Server Configuration Reference Table

Item	Maximum Limits	Specifications	Notes
Processor Boards	4 per SPU	60 MHz	One processor in base configuration
Memory Capacity		2 GB	128 MB board in base configuration. Powerfail minimum: 128 MB for 1 or 2 CPUs; 192 MB for 3 CPUs; 256 MB for 4 CPUs.
Memory Boards	8 per SPU	64, 128, 256 MB	Use (8) 256 MB boards to reach 2 GB max configuration
Dual Bus-Converters	4 per SPU		One included in base config; 2 HP-PB I/O Card Cages per Dual BC
HP-PB I/O Slots	112 Total		All slots are HP-PB
Internal to SPU	14 (see note)		8 single-high slots unused in base configuration
In Expansion Modules	98 slots		14 single-high slots per HP-PB Expansion I/O Card Cage Module
HP-PB I/O Card Cages		32 MB/s	21 MB/S sustained. Maximum 256 peak with 8 card cages
Internal to SPU	1		
External Maximum	7		Linked to SPU via 10 meter cable-pair
Disk Capacity	1900 GB Total		
HP-FL Disk Array	1300 GB w/RAID		2.7 GB or 5.4 GB increments
HP-FL Independent Mode	326 GB		This limit includes disk arrays in independent mode
SCSI	168 GB		
HP-IB	8 GB		12 disks, 3 interfaces
Fast/Wide Differential SCSI	1900 GB w/RAID		Max 1900 GB, using 8 GB arrays
Disk Devices	250 Total*		
Fast/Wide SCSI Arrays	240		1 F/W SCSI "disk device" used for each RAID Array
Fast/Wide SCSI Independent Mode Array	48	Up to 5 disks/array	1 F/W SCSI "disk device" used for each disk in the array
HP-FL HA Arrays	240		1 HP-FL "disk device" used for each High Availability (HA) array
HP-FL Independent Mode Arrays	48	Up to 5 disks/array	1 HP-FL "disk device" used for each disk in the array
SCSI	84		Includes CD-ROM and optical disks
HP-IB	12		
Optical Libraries	20 Library Units		2000 GB Max capacity w/ C1705A 100 GB Libraries 4 SCSI addresses (disk devices) per C1750A
Printers			
LAN Connected	250		
SCSI	8		
Serial	250		Connected via MUX or DTC port
Centronics	20		
Tape Drives	24		
SCSI	16		
HP-IB	8		
Terminal Connections	4500 Total		Contact the Sales Center if the customer requires more than 3000 terminal connections.
MUX Connections	2048		
DTC Connections	4500		
DTC Units	150		Available with 16 or 72 Ports
Network Links			
LAN (802.3)	10	10 Mbit/s	LAN/Console card plus 9 additional J2146A cards; J2146A single-high
Token Ring (802.5)	5	4 or 16 Mb/s	Single-high size card
X.25	12	64 Kb/s	Single-high size card; 256 virtual circuits/card; 1024 VCs/SPU
SNAlplus Link	12	256 LU	Single-high size card; max 256 LU per SPU
FDDI	4	100 Mbit/s	Double-high size card
I/O Cards			
Fast/Wide Differential SCSI-2	40	20 MB/s	Double-high size card
HP-FL	40	5 MB/s	Double-high size card
SCSI	20	5 MB/s	Single-high size card
HP-IB	9	1.5 MB/s	Single-high size card
8 Channel MUX	64		Single-high size card
16 Channel MUX	64		Single-high size card
32 Channel MUX	64		Single-high size card

*Contact the Sales Center if customer requires more than 130 disk addresses.



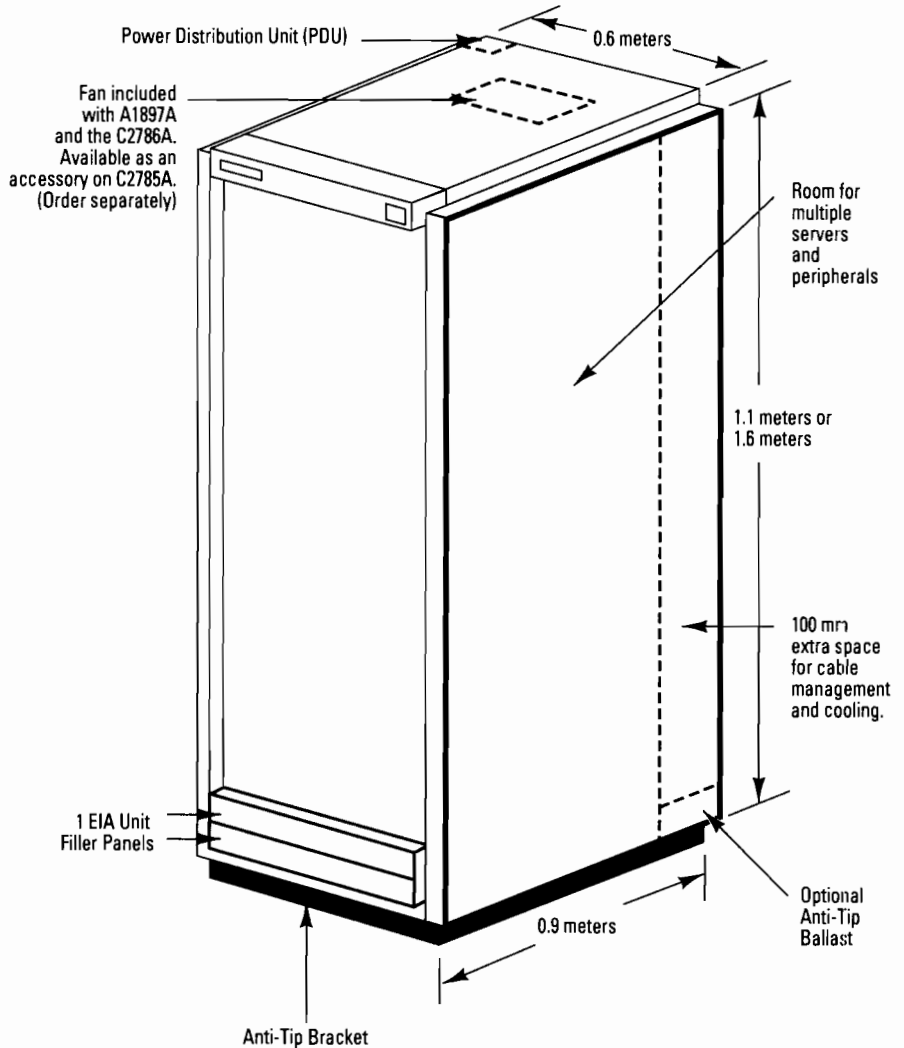
Section 4 Cabinets, Racking, and Uninterruptible Power Supplies

Product Overview

System Design

- Designed for E, F, G, H, I, 8x7S, T500, and 890 systems only.
- Available in both 1.1 meter and 1.6 meter-high configurations.
- Meets 19" industry-standard package.
- Divided into EIA (Electronic Industries Association) units of internal space (1 EIA unit = 1.75", or 44.5 mm).
- 1.6m cabinet includes cooling fan
- Front to rear air flow
- 100 mm of space is available in the rear of cabinet for cable management and cooling
- Anti-tip bracket and large casters included for added safety and mobility in all racks.
- Mounting design allows optional shipment of the cabinet with factory installed servers and peripherals. The integrated rack permits multiple combinations of servers and peripherals in a single cabinet.

Figure 4.1



* Note: Casters included as standard.

Part #	Description	Capacity
A1896A	1.1 meter factory-integrated	} 21 EIA Units
C2785A	1.1 meter standalone	
A1897A	1.6 meter factory-integrated	} 32 EIA Units
C2786A	1.6 meter standalone	

Standalone Cabinets

Customers who order standalone cabinets will need to order rack-mount kits for each component they plan to install in the cabinet unless otherwise indicated. They also need to order filler panels for the empty space remaining in the cabinet. See **Table 4.2** to determine how much space (in EIA units) will be filled by servers and peripherals. The remaining empty space will require filler panels. Each filler panel covers one EIA unit of space. (1.75 inches, 44.45 mm)

Note: The 1.1 meter standalone cabinet comes with 3 filler panels, and the 1.6 meter standalone cabinet comes with 2 filler panels.

Racks with 1/2" tape drives are unstable without anti-tip ballasts (counter-weights). Three ballasts (C2790A) are required when installing one or more 1/2" tape drive. Ballasts are installed in the bottom of the cabinet and do not consume any EIA units.

The 1.6 meter cabinet comes standard with an extractor fan compatible with the selected power.

To Order Standalone Cabinets

1. Place order for either 1.1 m cabinet (C2785A) or 1.6 m cabinet (C2786A) with correct power option.
2. Place order for E, F, G, H, I, 890, or T500 Business Server and required peripherals. Order rack-mount kits for each component requiring a kit that you intend to mount in the cabinet, including servers and peripherals.

3. Calculate the number of empty EIA units in cabinet and order filler panels (Opt. 1F9—includes six panels) to cover empty space in front of cabinet. The 1.6 m cabinet includes 2 filler panels, and the 1.1 m cabinet ships with 3 filler panels. These filler panels are the minimum required after installation of servers and peripherals.

Integrated Cabinets

When ordering factory-integrated cabinets, the factory will install rack-mount kits, filler panels, and cables automatically.

When placing your order, ensure that the cabinet is placed on the same section of the order as the SPU. The server and peripherals will then be installed in the cabinet at the factory. Operating system software will be loaded on the server's internal SCSI disk. If internal disk is deleted, software will not be loaded at the factory. *Only one 8x7S, E, F, G, H, or I server may be integrated into the cabinet at the factory; however, multiple disk and tape options may be ordered.*

The Corporate Business Server 890 or T500 is packaged in its own cabinet. Peripherals for the 890 or T500 may be integrated into the A1897A 1.6 meter cabinets. When ordered at the same time as the 890 or T500, only one A1897A cabinet (containing the intended system disk, additional disks and options) may be placed in the same order section as the SPU. When this is done, the basic HP-UX OS and networking software will be pre-loaded, and all options in the cabinet will be factory integrated. Refer to the

890 or T500 configuration section for notes regarding where the OS will be pre-loaded when the cabinet contains multiple disks.

To Order Integrated Cabinets

1. Place order for a Series 800 Business Server.
2. Order server product C2797AZ or C2798AZ and C2962AZ for E/F/G/H/I rackmount kit.
3. Determine customer's integrated peripheral requirements and total EIA space needed.
4. Order either 1.1 m cabinet (A1896A) or 1.6 m cabinet (A1897A) on same order-section as server (A1897A only for HP 9000 890 or T500 Server).
5. Order cabinet options for additional disks and/or tape (rackmount kits are included).

Note:

- *Standalone peripherals which are not available as cabinet options should be ordered separately with corresponding rack mount kits. See the Supported Components list in this section.*
- *Interface cards are not included when disk or tape options are ordered. Interface card requirements beyond what is provided in the base system configuration must be ordered separately.*

Table 4.1 Integrated Cabinet Configurations

Description	Product Number
1.1 meter Integrated Cabinet	A1896A
120 V North American Power	Opt. ABA
230 V European Power	Opt. ABB
100-240 V Universal; for connection to HP PowerTrust UPS in this cabinet as power source	Opt. 021
Add 1.3 Gbyte disk Series 6000 SCSI Mass Storage System (C2462R)	C2461AZ
Add 2.7 Gbyte disk in Series 6000 SCSI Mass Storage System (C2462R + C2474R)	C2462AZ
Add 4.0 Gbyte disk in Series 6000 SCSI Mass Storage System (C2462R + (2) C2474R)	C2463AZ
Add 2.7 Gbyte disk and 2.0 Gbyte DDS DAT drive in Series 6000 SCSI Mass Storage System	C2464AZ
Add 2.0 Gbyte disk (full height)	C3023RZ
Add 4.0 Gbyte disk (full height)	C3024RZ
Add 6.0 Gbyte disk (full height)	C3025RZ
Add 2.0 Gbyte disk (half-height)*	C3040RZ
Add 4.0 Gbyte disk (half-height)*	C3041RZ
Add 6.0 Gbyte disk (half-height)*	C3042RZ
Add 4.0 F/W/D SCSI disk*	C3551RZ
Add 8.0 F/W/D SCSI disk*	C3553RZ
Add two 2–8 GB DATs	C2467RZ
Add DTC 16 TN Telnet terminal server	J2060AZ
Replace 8 RJ-45 direct ports with 8 DB-25 modem ports	Opt. UG5
Add DTC 64 port bundle Telnet terminal server	J2957AZ
Replace 8 RJ-45 direct ports with 8 DB-25 modem ports	Opt. UG5
Add DTC 72 MX communication server with three available slots	J2070AZ
Configure with 24 RS-232 direct connect ports with RJ-45 connectors	Opt. 001
Configure with 48 RS-232 direct connect ports with RJ-45 connectors	Opt. 002
Configure with 72 RS-232 direct connect ports with RJ-45 connectors	Opt. 003
Configure with 24 RS-423 direct ports with RJ-45 connectors	Opt. UG4
Configure 8 RJ-45 direct ports with 8 DB-25 modem ports	Opt. UG5
Add X.25 board with RS-232 interface	Opt. 1CW
Add X.25 board with V.35 interface	Opt. 1CX
Telnet Access Board	Opt. 004
1.6 meter Integrated Cabinet	A1897A
208-240 V North American Power	Opt. ABA
230 V European Power	Opt. ABB
100-240 V Universal; for connection to HP PowerTrust UPS in this cabinet as power source	Opt. 021
200-240 V U.S. Power; for connection to HP PowerTrust UPS in adjacent cabinet as power source	Opt. 022
200-240 V European Power; for connection to HP PowerTrust UPS in adjacent cabinet as power source	Opt. 023
Add 1.3 Gbyte disk in Series 6000 SCSI Mass Storage System (C2462R)	C2461AZ
Add 2.7 Gbyte disk in Series 6000 SCSI Mass Storage System (C2462R + C2474R)	C2462AZ
Add 4.0 Gbyte disk in Series 6000 SCSI Mass Storage System (C2462R + (2) C2474R)	C2463AZ
Add 2.7 Gbyte disk and 2.0 Gbyte DDS DAT drive in Series 6000 SCSI Mass Storage System (C2462R + C2474R + C2477U)	C2464AZ
Add 2.0 Gbyte disk (full height)	C3023RZ
Add 4.0 Gbyte disk (full height)	C3024RZ
Add 6.0 Gbyte disk (full height)	C3025RZ
Add 2.0 Gbyte disk (half-height)*	C3040RZ
Add 4.0 Gbyte disk (half-height)*	C3041RZ
Add 6.0 Gbyte disk (half-height)*	C3042RZ
Add 4.0 Gbyte F/W/D SCSI-2 disk*	C3551RZ
Add 8.0 Gbyte F/W/D SCSI-2 disk*	C3553RZ
Add 8.0 Gbyte F/W/D SCSI disk array (5 × 2 GB)**	C2440HZ
Add 4.0 Gbyte F/W/D SCSI disk array (3 × 2 GB)**	C2439HZ
Add 4.0 Gbyte F/W/D SCSI disk array (5 × 1 GB)**	C2437HZ
Add 2.0 Gbyte F/W/D SCSI disk array (3 × 1 GB)**	C2436HZ

* Orderable March 1, 1994

** Not supported in A1896A or C2785A 1.1m EIA racks

*** Requires HP-UX 9.04

Table 4.1 Integrated Cabinet Configurations (cont'd)

Description	Product Number
1.6 meter Integrated Cabinet (cont'd)	A1897A
Add two 2–8 GB DDS DAT	C2467RZ
Add DTC 16 TN Telnet terminal server	J2060AZ
Replace 8 RJ-45 direct ports with 8 DB-25 modem ports	Opt. UG5
Add DTC 64 port bundle Telnet terminal server	J2957AZ
Replace 8 RJ-45 direct ports with 8 DB-25 modem ports	Opt. UG5
Add DTC 72 MX communication server with three available slots	J2070AZ
Configure with 24 RS-232 direct connect ports with RJ-45 connectors	Opt. 001
Configure with 48 RS-232 direct connect ports with RJ-45 connectors	Opt. 002
Configure with 72 RS-232 direct connect ports with RJ-45 connectors	Opt. 003
Configure with 24 RS-423 direct ports with RJ-45 connectors	Opt. UG4
Configure 8 RJ-45 direct ports with 8 DB-25 modem ports	Opt. UG5
Add X.25 board with RS-232 interface	Opt. 1CW
Add X.25 board with V.35 interface	Opt. 1CX
Telnet Access Board	Opt. 004
HP-FL Disk Options	
Add 5.44 GB 4-way Striped Disk Array; with Parity disk (C2254HA)	C2254HZ
Add 5.44 GB 4-way Striped Disk Array; no Parity disk (C2254B, striped mode)	C2254BZ
Add 2.72 GB Independent Mode Disk Array with 2 disks (C2252B, independent mode)*	Opt. 001
Add 2.72 GB 2-way Striped Disk Array; with Parity disk (C2252HA)	C2252HZ
Add 2.72 GB 2-way Striped Disk Array; no Parity disk (C2252B, striped mode)	C2252BZ
Add 5.44 GB Independent Mode Disk Array with 4 disks (C2254B, independent mode)*	Opt. 001
I/O Expansion Option (Available only with Corporate Business Server 890 or T500) (A1828A or A2339A)	
Add HP-PB Expansion Module with 14 HP-PB expansion slots, Lower Bus Converter, and 6 Meter Interconnect Cable	A1828AZ
Fast/Wide SCSI Disk Array Options**	
Add 8 GB F/W SCSI Array; consists of five 2-GB 5.25" disk modules	C2440HZ
Add 4 GB F/W SCSI Array; consists of three 2-GB 5.25" disk modules	C2439HZ
Add 4 GB F/W SCSI Array; consists of five 1-GB 3.5" disk modules	C2437HZ
Add 2 GB F/W SCSI Array; consists of three 1-GB 3.5" disk modules	C2436HZ
Single-Ended Half-Height SCSI Disk Options	
Add 2 GB Single-Ended SCSI Disk Drive (1 × 2 GB disk)*	C3040RZ
Add 4 GB Single-Ended SCSI Disk Drive (2 × 2 GB disk)*	C3041RZ
Add 6 GB Single-Ended SCSI Disk Drive (3 × 2 GB disk)*	C3042RZ
Fast/Wide SCSI Disk Options	
Add 4 GB Fast/Wide SCSI Disk Drive (2 × 2 GB disk)*	C3551RZ
Add 8 GB Fast/Wide SCSI Disk Drive (4 × 2 GB disk)*	C3553RZ
HP PowerTrust UPS Options (1.6m cabinets only)	
Add 3.0 KVA HP PowerTrust UPS	A2998A, Opt 0DZ
200-240 V European power, hardwire receptacle only	Opt. 017
200-240 V U.S. power, NEMA L6-30 connector	Opt. 018

* Independent mode only available with 9.0 and native HP-PB card (P/N 28615A).

** Independent mode and RAID-3 not supported for boot until further notice. Check with the Sales Response Center for updates.

Configuration Detail

Space Allocation

The 1.1 meter and 1.6 meter rack mount cabinets, Series 800 servers and peripherals are measured in EIA unit (1 EIA unit = 1.75 in. or 44.45 mm). The 1.1 meter cabinet provides 21 EIA units of usable rack height, and the 1.6 meter cabinet provides 32 EIA units of rack space.

Power Information

When ordering standalone cabinets, customers have options for 120V to 240V power distribution in North America and 230V in

Europe. When ordering integrated cabinets for use in North America, customers may order only the 120V power distribution with the 1.1 meter cabinet and 208V-240V with the 1.6 meter cabinet. The 240V option is highly recommended in the U.S. for the 1.6 meter cabinet to prevent current overloads. This is based on the common 20 amp limit of most U.S. building codes. Equipment uses half the current at 240V that it would use at 120V, so a 240V PDU allows more equipment to be run off a single PDU and off a single wiring circuit in the customer's building.

Auto-ranging equipment like the HP 9000 models E, F, G, H, I, 890, T500 and the Series 6000 mass storage products will automatically work at either 120V or 240V. Other equipment that is not auto-ranging must be ordered with the corresponding cabinets.

European cabinets all have 230V power distribution units. Customers in Asia Pacific and South America should order the power option which is appropriate for the power supply in their country.

Note: Each cabinet requires a dedicated 20 amp circuit.

Table 4.2 Cabinet Measurement Details

Product Number	Description	Available EIA Units	Cabinet Height	Cabinet Width	Cabinet Depth
A1896A	Integrated 1.1 m cabinet	21	1.1 m	.6 m	.9 m
C2785A	Standalone 1.1 m cabinet	21	1.1 m	.6 m	.9 m
A1897A	Integrated 1.6 m cabinet	32	1.6 m	.6 m	.9 m
C2786A	Standalone 1.6 m cabinet	32	1.6 m	.6 m	.9 m

Table 4.3 Cabinet Power Details

Product Number	Power Option	Cabinet Height	Power Dist.	Max. Current	Phase	Plug Style
A1896A	ABA (U.S.)	1.1 m	100V-120V	16 A	Single	5-20 P
	ABB (European)	1.1 m	230V	16 A	Single	No Plug
	021*	1.1 m	100V-240V	16 A	Single	IEC 320-C20
C2785A	AW3 (U.S.)	1.1 m	100V-120V	16 A	Single	5-20 P
	AW4 (U.S.)	1.1 m	208V-240V	16 A	Single	L6-20 P
	AW5 (European)	1.1 m	230V	16 A	Single	No Plug
A1897A	ABA (U.S.)	1.6 m	208V-240V	16 A	Single	L6-20 P
	ABB (European)	1.6 m	230V	16 A	Single	No Plug
	021*	1.6 m	200V-240V	16 A	Single	IEC 320-C20
	022 (U.S.)*	1.6 m	200V-240V	16 A	Single	L6-30 P
	023 (European)*	1.6 m	200V-240V	16 A	Single	No Plug
C2786A	AW3 (U.S.)	1.6 m	100V-120V	16 A	Single	L5-20 P
	AW4 (U.S.)	1.6 m	208V-240V	16 A	Single	L6-20 P
	AW5 (European)	1.6 m	230V	16 A	Single	No Plug

Note: To check that the servers and peripherals do not exceed the 16 amp capacity of the cabinets:

1. Sum the currents required by each system.
2. If sum is less than 16 amps, the configuration meets power requirements.

*For use with HP PowerTrust UPS units.

Supported Components

The Series 800 cabinets support HP 9000 models E, F, G, H, I, 890, and T500 servers, and a variety of disk drives, tape drives, and DTCs. Combinations of supported products are limited only by space inside the cabinet and the 16-amp maximum current limit.

When ordering integrated cabinets from the factory, you simply need to order the server and cabinet options you require. When ordering standalone cabinets, you need to order a rackmount kit for each component you intend to rack in the cabinet. A rackmount kit

consists of rails, bezels, and a power cord. Kits are orderable in the form of server and peripheral options listed in the "Required Mounting Hardware" column in **Table 4.4**.

Table 4.4 Components Supported in Series 800 Cabinets

Product Number	Description	EIA Units	Required Mounting Hardware	Current Consumption		VA Rating (for UPS sizing)
				120V AC	208-240V AC	
Business Servers†						
A2959AW	E Class Business Servers	6	C2797A for standalone racks. A2962AZ for integrated racks.	6.5 A	3.5 A	550 VA
A2428A	F Class Business Servers	6	C2797A for standalone racks. C2297AZ for integrated racks.	6.5 A	3.5 A	550 VA
A2429A	G Class Business Servers	10	C2798A for standalone racks. C2298AZ for integrated racks.	12 A	6 A	750 VA
A2430A	H Class Business Servers	10	C2798A for standalone racks. C2298AZ for integrated racks.	12 A	6 A	750 VA
A2431A	I Class Business Servers	10	C2798A for standalone racks. C2298AZ for integrated racks.	12 A	6 A	750 VA
HP PowerTrust Uninterruptible Power Systems						
A2998A, Opt. 0DZ	3.0 kVA UPS	12	Included	N/A	N/A	N/A
Tape Drives						
7979A**	1/2" Tape Drive	5 + 1*	Option 1A4 and three C2790A ballasts	2.81 A	1.46 A	350 VA
7980A**	1/2" Tape Drive	5 + 1*	Option 1A4 and three C2790A ballasts	2.81 A	1.46 A	350 VA
7980XC**	1/2" Tape Drive	5 + 1*	Option 1A4 and three C2790A ballasts	2.81 A	1.46 A	350 VA
7980S**	1/2" Tape Drive	5 + 1*	Option 1A4 and three C2790A ballasts	2.81 A	1.46 A	350 VA
7980SX**	1/2" Tape Drive	5 + 1*	Option 1A4 and three C2790A ballasts	2.81 A	1.46 A	350 VA
A3024A, Opt. 004	8 mm Tape Drive	N/A	Included	N/A	N/A	N/A
Single-Ended SCSI Disks†						
C2465R	2 × 2.0 GB DAT Drives Rackmount Storage System	4	Included	2.6 A	1.5 A	360 VA
C2466R	Up to 8 GB data compression DAT Rackmount Storage System	4	Included	2.6 A	1.5 A	360 VA
C2467R/RZ	Rackmount Storage System containing 2 units of the data compression DAT (up to 8 GB per drive)	4	Included	2.6 A	1.5 A	360 VA
C3022R	1 GB Storage System Rackmount	4	Included	3.0 A	1.8 A	432 VA
C3023R/RZ	2 GB Disk Storage System Rackmount	4	Included	3.0 A	1.8 A	432 VA
C3024R/RZ	2 × 2 GB Disk Storage System Rackmount	4	Included	3.0 A	1.8 A	432 VA
C3025RZ	3 × 2 GB Disk Storage System Rackmount	4	Included	3.0 A	1.8 A	432 VA

* 1/2" tape drives require 5 EIA units for the mechanism plus 1 EIA unit for access to the tape drive handle for a total of 6 EIA units.

** Three anti tip ballasts (C2790A) are required for one or more 1/2" tape drive mechanisms. For 208V-240V power, order power cord (8120-1860).

† Series 6000 SCSI Storage Systems support up to 2.7 GB disk, and 2.7 GB DAT. See products C246xR in your Price Guide for expansion disks and DAT.

‡ The Corporate Business Server 890 is packaged in its own cabinet.

Table 4.4 Components Supported in Series 800 Cabinets (cont'd)

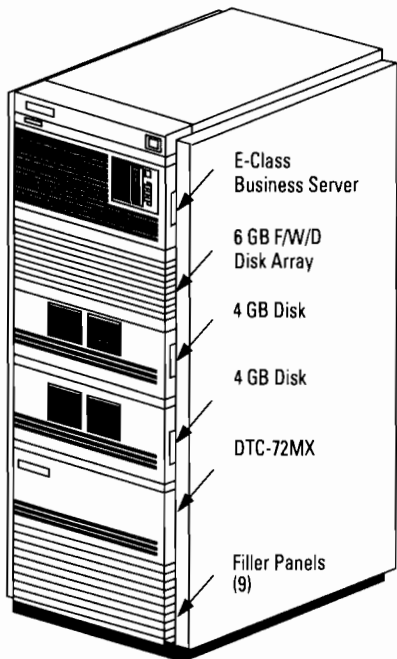
Product Number	Description	EIA Units	Required Mounting Hardware	Current Consumption		VA Rating (for UPS sizing)
				120V AC	208-240V AC	
Single-Ended SCSI Disks (cont'd)						
C3040R/RZ*	2 GB Half-Height Disk Storage System Rackmount	4	Included	3.0 A	1.8 A	432 VA
C3041R/RZ*	2 × 2 GB Half-Height Disk Storage System Rackmount	4	Included	3.0 A	1.8 A	432 VA
C3042RZ*	3 × 2 GB Half-Height Disk Storage System Rackmount	4	Included	3.0 A	1.8 A	432 VA
HP-FL Disk Array Options						
C2252HA/HZ	2.72 GB High Availability Disk Array	6	Included	5.2 A (max)	3.0 A (max)	600 VA
C2254HA/HZ	5.44 GB High Availability Disk Array	6	Included	5.2 A (max)	3.0 A (max)	600 VA
C2252B/BZ	2.72 GB Disk Array with 2 disks	6	Included	5.2 A (max)	3.0 A (max)	600 VA
C2254B/BZ	5.44 GB Disk Array with 4 disks	6	Included	5.2 A (max)	3.0 A (max)	600 VA
Data Terminal Connects						
J2060AZ	DTC 16TN	1	Included (or optional kit E3664A)	.5 A	.25 A	60 VA
J2070AZ	DTC 72MX	3	Opt. 1AC (or optional kit C2788A)	2.2 A	1.1 A	264 VA
2340A	DTC 16	6	Kit # 35199E	2 A	1 A	240 VA
2345A	DTC 48	6	Kit # C2799A	2 A	1 A	240 VA
Expansion Modules						
A1828A	HP-PB I/O Expansion Module (for 890 and T500 only)	7	Included	N/A	3 A	720 VA
Rackmounting Hardware						
C2788A	Generic Rail Kit for Non-standard 19" Peripherals	1	Included	N/A	N/A	N/A
C2792A	ADP Rack-mount Kit for Rear of Cabinet	None	Included	N/A	N/A	N/A
Anti-Tip Ballast						
C2790A	Anti-Tip Ballast 14 Kg (30 lbs.)	None	Included	N/A	N/A	N/A
Fast/Wide SCSI Options						
C2440HZ**	8 GB F/W SCSI High Availability Disk Array	6	Included	5.2 A (max)	3.0 A (max)	600 VA
C2439HZ**	4 GB F/W SCSI High Availability Disk Array	6	Included	5.2 A	3.0 A	600 VA
C2437HZ**	4 GB F/W SCSI High Availability Disk Array	6	Included	2.9 A	1.7 A	310 VA
C2436HZ**	2 GB F/W SCSI High Availability Disk Array	6	Included	2.9 A	1.7 A	310 VA
C3551R/RZ**	4 GB F/W SCSI Storage Subsystem	4	Included	1.0 A	0.7 A	168 VA
C3553R/RZ**	8 GB F/W SCSI Storage Subsystem	4	Included	2.3 A	1.2 A	288 VA

* Orderable March 1, 1994

** Not supported in A1896A or C2785A 1.1m EIA racks

Figure 4.2 Sample Racking Configuration for E/F/G/H/I-Series Business Servers

Sample racking configuration E-Class Business Server
in 1.6-m Factory-Integrated Cabinet (A1897A)



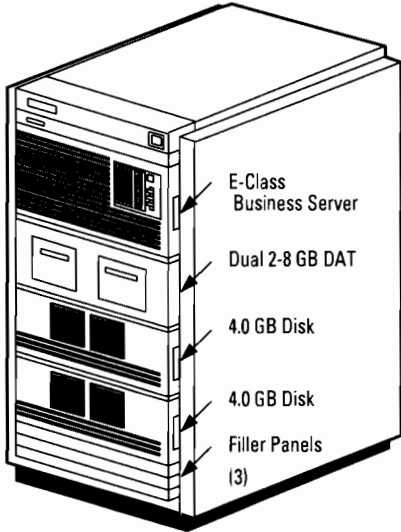
- E-Class Business Server 6 EIA Units
- 6 GB F/W/D Disk Array 6 EIA Units
- 4 GB Disk 4 EIA Units
- 4 GB Disk 4 EIA Units
- DTC-72MX 3 EIA Units
- Filler Panels (9) 9 EIA Units (installed at factory)
- 32 Total EIA Units

Qty.	P/N	Description
1	A2959AW	E-Class Business Server
1	C2962AZ	Add Rack Mount Hardware Kit
1	C1897A	1.6-m Integrated Cabinet
2	C3041RZ*	Add 4.0 GB Disk
1	C2439HZ	Add 6.0 GB F/W/D Disk Array
1	J2060AC	Add DTC16TN Communication

*Orderable March 1, 1994

Figure 4.3 Sample Cabinet Diagrams

Sample Racking Configuration—E-Class Business Server in 1.1-m Factory Integrated Cabinet (A1896A)



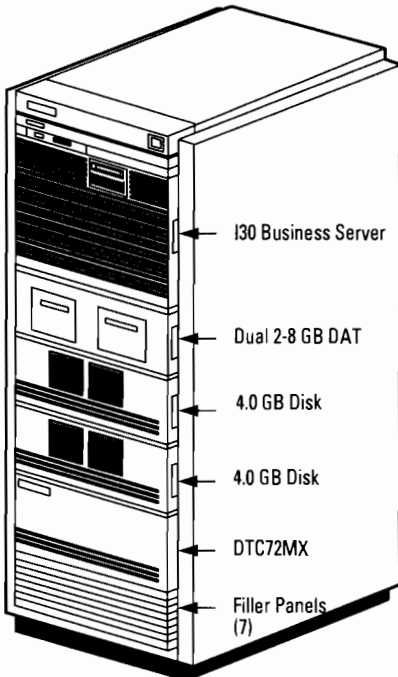
E-Class Business Server	6 EIA Units
Dual 2-8 GB DAT	4 EIA Units
4.0 GB Disk	4 EIA Units
4.0 GB Disk	4 EIA Units
Filler Panels (3)	3 EIA Units
<hr/>	
	21 Total EIA Units

Qty.	P/N	Description
1	A2959AW	E-Class Business Server
1	A2962AZ	Add Rack Mount Hardware Kit
1	A1896A	1.1-m Integrated Cabinet
2	C3041RZ*	Add 4.0 GB Disk
1	C2467RZ	Add two 2-8 GB GB DAT

*Orderable March 1, 1994

Figure 4.4 Sample Cabinet Diagrams

Sample Racking Configuration—I-Class Business Server in 1.6-m Factory Integrated Cabinet (A1897A)



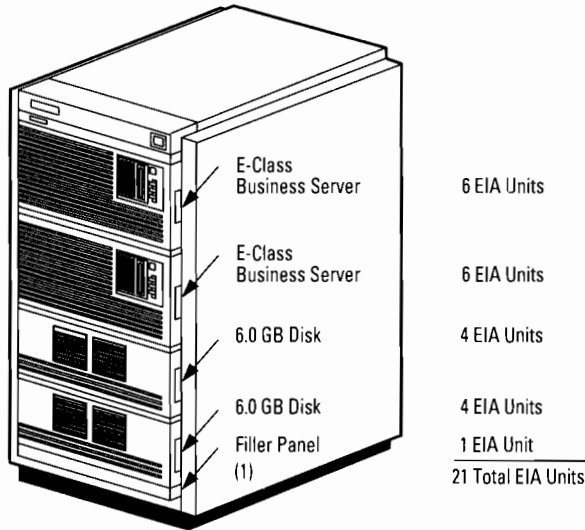
I30 Business Server	10 EIA Units
Dual 2-8 GB DAT	4 EIA Units
4.0 GB Disk	4 EIA Units
4.0 GB Disk	4 EIA Units
DTC72MX	3 EIA Units
Filler Panels (7)	7 EIA Units (installed at factory)
<hr/>	
	32 Total EIA Units

Qty.	P/N	Description
1	A2431A	Model I30 Business Server
1	C2798AZ	Add Rack Mount Hardware Kit
1	A1897A	1.6-m Integrated Cabinet
2	C3041RZ*	Add 4.0 GB Disk
1	C2467RZ	Add two 2-8 GB DAT
1	J2070AZ Opt.003	DTC72MX Communication Server Configure with 72 RS-232 direct ports with RJ-45 connector

* Orderable March 1, 1994

Figure 4.5 Sample Cabinet Diagrams

Sample Racking Configuration—Two F-Class Business Servers in 1.1-m Field Integrated Cabinet (C2785A)

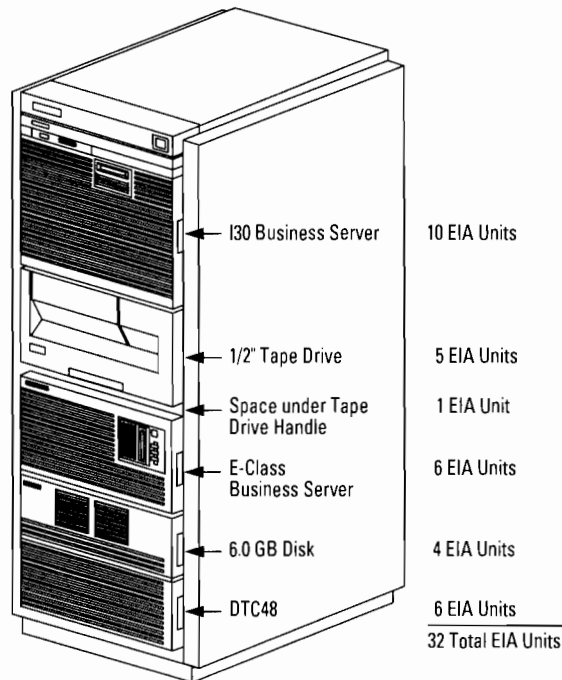


Qty.	P/N	Description
1	C2785A Opt. AW4	1.1-m Standalone Cabinet (Three EIA Unit Filler Panels Included) 208V-240V
2	A2959AW	E-Class Business Server
2	C2962AZ	Rack-Mount Kit for E-Class Business Servers
2	C3042R*	3 x 2 GB Disk Storage Subsystem (Rack-Mount Kit included)

*Orderable March 1, 1994

Figure 4.6 Sample Cabinet Diagrams

Sample Racking Configuration—F-Class and I-Class Business Servers in 1.1-m Field Integrated Cabinet (C2786A)



Qty.	P/N	Description
1	C2786A Opt. AW4	1.6-m Standalone Cabinet (two EIA unit Filler Panels Included) 208V-240V
1	A2959AW	E-Class Business Server
1	A2962AZ	Rack-Mount Kit for E-Class Business Server
1	A2431A	Model I30 Business Server
1	C2798A	Rack-Mount Kit for I30 Business Server
1	7980SX Opt. 1A4	1/2" Tape Drive Rack-Mount Kit
1	8120-1860	208V-240V power cord for 7980SX Tape Drive
1	C3042R*	3 · 2.0 GB Rack-Mount Storage System (Rack-Mount Kit included)
3	C2790A	14 KG (30 lb.) each anti-tip ballasts (for 1/2" tape drive)
1	J2070AZ Opt. 003	DTC72MX Communication Server Configure with 72 RS-232 direct ports with RJ-45 connectors
1	C2788A	Rack-Mount kit for DTC72

*Orderable March 1, 1994

Sample Racking Configurations for the Corporate Business Server T500

A sample configuration for a reasonably large Corporate Business Server T500 system is shown in **Figure 4.9**. As shown on the figure, this configuration uses one additional HP-PB Expansion Module (I/O Card Cage) to provide the additional slots and I/O bandwidth necessary to support this configuration. Depending on the system workload, it may even be advisable to add a third HP-PB Expansion Module into the configuration

to increase the aggregate system I/O bandwidth, allowing the disk, LAN and X.25 traffic to be divided across three HP-PB channels.

NOTE: If the additional HP-PB Expansion Module is added, an additional Dual Bus-Converter (A1829A) would need to be added to the SPU. An additional 1.6 meter expansion cabinet would also be required to house the HP-PB Expansion Module.

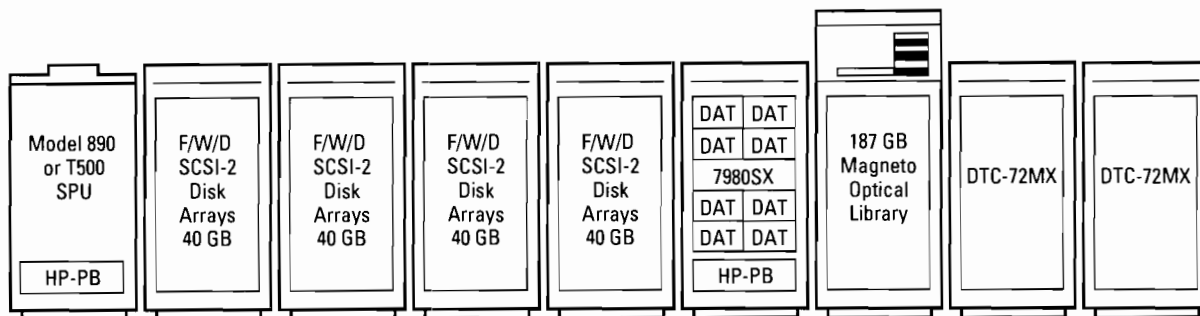
Several examples of 1.6 meter expansion cabinet configurations for the Corporate Business Server are shown on the following pages.

All sample configurations illustrate the use of the A1897A Integrated Cabinet as a base unit. In some examples additional components must be ordered separately. Only the components ordered as associated products to the A1897A cabinet are factory integrated.

Note: Factory integration is only available for disk and tape devices that are offered as associated products to the A1897A Integrated Cabinet. All other devices which are ordered separately require field installation.



Figure 4.7 Corporate Business Server 890 Sample Configuration

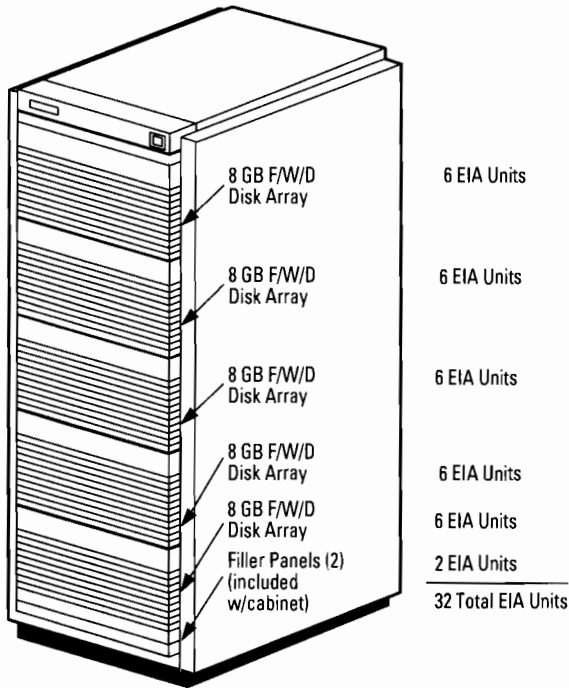


Sample Configuration Shown

- 160 GB Fast/Wide Differential SCSI-2 Disk Arrays
- 8 DATs for Backup
- 1 7980SX 1/2" Tape Drive
- 480 DTC Ports
- 187 GB Optical Library
- 4 802.3 LANs
- 2 FDDI Links
- 2 SNA Links
- 5 X.25 Links
- 1 High-Speed SCSI Printer Link

Figure 4.8 Maximum High-Availability Disk Array Configuration for Use with Corporate Business Server 890 or T500

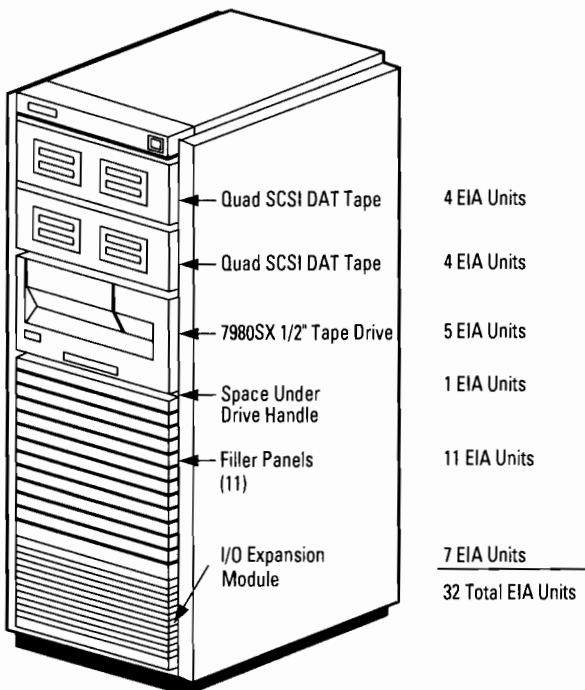
Sample Racking Configuration
1.6-m Factory Integrated Cabinet (A1897A)



Qty.	P/N	Description
1	A1897A	1.6-m Integrated Cabinet
5	C2440HZ	8 GB F/W/D SCSI-2 Disk Array

Figure 4.9 SCSI Backup Sub-System Configuration for Use with Corporate Business Server 890 or T500

Sample Racking Configuration—DATs and 7980 tape drive in
1.6-m Factory Integrated Cabinet (A1897A)

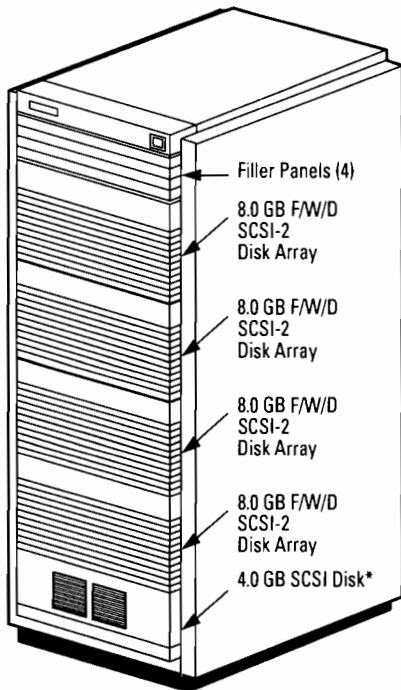


Qty.	P/N	Description
1	A1897A	1.6-m Integrated Cabinet
1	A1828AZ	Add HP-PB I/O Expansion Module
2	C2467RZ	4-16 GB Dual DAT tape unit
4	C2478U*	2-8 GB Add-on DAT tape Opt. OS4
1	7980SX*	1/2" tape drive with SCSI interface
	Opt. 1A4	Rackmount Kit
2	28655A*	HP-PB SCSI/parallel host adapter card with 1.0-m Cable

* Field Integration

Figure 4.10 SCSI System Disk Configuration with Fast/Wide Differential SCSI-2 Add-On Disk Arrays for Use with Corporate Business Server 890 or T500

Sample Racking Configuration



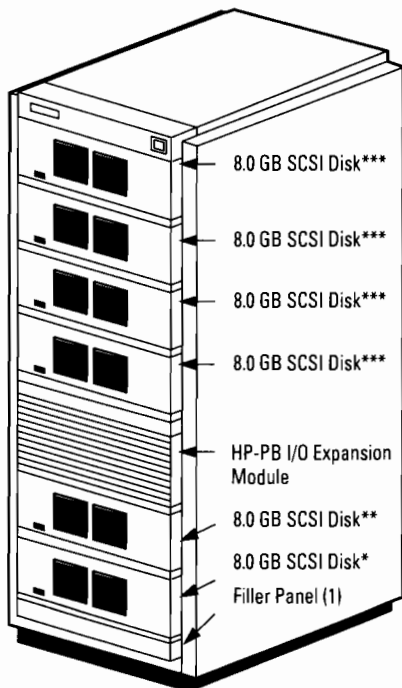
- 4 EIA Units
- 6 EIA Units
- 6 EIA Units
- 6 EIA Units
- 6 EIA Units
- 4 EIA Units
- 32 Total EIA Units**

Qty.	P/N	Description
1	A1897A	1.6-m Integrated Cabinet
1	C3041RZ	Add 4 GB SCSI disk
4	C2440HZ	Add 8 GB F/W/D SCSI-2 disk array

*System disk must be connected to SCSI card in SPU cabinet.

Figure 4.11 Fast/Wide Differential SCSI-2 System Disk Configuration with SCSI Add-On Disk for Use with Corporate Business Server 890 or T500

Sample Racking Configuration



- 4 EIA Units
- 4 EIA Units
- 4 EIA Units
- 4 EIA Units
- 7 EIA Units
- 4 EIA Units
- 4 EIA Units
- 1 EIA Unit
- 32 Total EIA Units**

Qty.	P/N	Description
1	A1897A	1.6-m Integrated Cabinet
1	A1828AZ	Add HP-PB Expansion Module
6	C3553RZ†	4 × 2 GB Fast/Wide Differential SCSI-2 Disk Storage Subsystem for Rackmount

†Orderable March 1, 1994

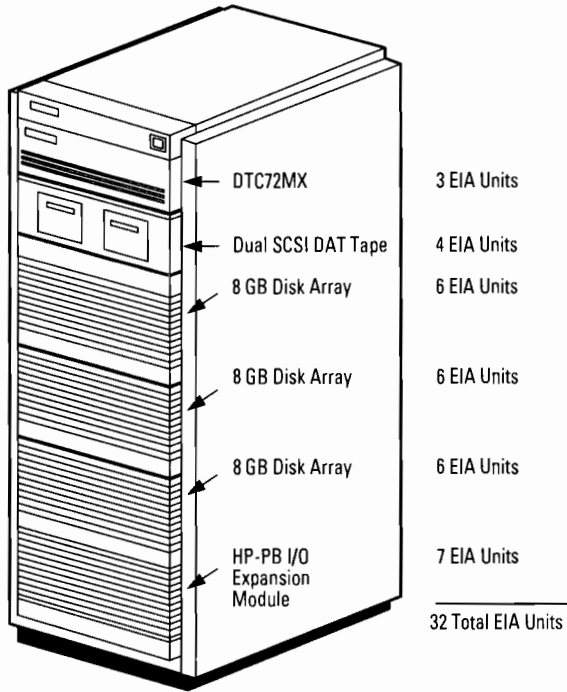
*System disk must be connected to SCSI card in SPU cabinet.

**May be chained to system disk or connected to a separate SCSI card.

***May be connected to SCSI cards in this cabinet.

Figure 4.12 Multi-Purpose Combination Configuration for Use with Corporate Business Server 890 or T500

Sample Racking Configuration
1.6-m Factory Integrated Cabinet (A1897A)



Qty.	P/N	Description
1	A1897A	1.6-m Integrated Cabinet
3	C2440HZ	Add 8 GB F/W SCSI disk array with parity disk
1	C1828AZ	Add HP-PB Expansion Module
1	C2467RZ	2 x 8 GB DDS DAT Tape Storage System Rackmount
1	C2070A	DTC72MX Communication Server
1	Opt. 003	Configure with 72 RS-232 direct ports with RJ-45 connectors
6	C2788AC	Rackmount Kit for J2070A

Questions and Answers

1. Are the new cabinets backward compatible with older Series 800 Business Servers?

The Series 800 cabinets are compatible *only* with 8x7S, E, F, G, H, I, 890, and T500 servers. They can, however, store 19" peripherals from older systems such as 1/2-inch tape drives.

2. Are fans included with the Series 800 cabinets?

A fan is included with the 1.6 m racks but is not included with the 1.1 m racks. A fan may be added to the standalone 1.1 m rack (C2785A) by ordering option 1FA.

3. When do fans get added to the standalone 1.1 m rack (C2785A), when ordering option 1FA?

As a general guideline, whenever more than 1000 VA of power are dissipated in the rack you may want to consider use of option 1FA. Several factors (i.e., maximum allowable internal temperature rise, system reliability, average ambient temperature, etc.) need to be considered. Contact your account CE for assistance.

4. When do I need to order an anti-tip ballast?

An anti-tip ballast is designed to provide added stability when slide rail peripherals such as 1/2-inch tape drives are mounted high in the cabinet. Three anti-tip ballasts

should be ordered when installing one or more 1/2-inch tape drives in the cabinet. They are designed to provide added stability when tape drives are pulled out for cleaning. The ballasts add 14 kg of weight to the bottom-rear of the cabinet for added stability and do not consume any EIA units of space.

5. Why is there no plug provided for the European power options?

Plugs are not provided for European power options because the plug types are different in each country. Plugs will be installed by the local CEs.

6. When do I buy integrated cabinets versus standalone racks?

Integrated cabinets are the preferred option when you are ordering Series 800 servers, supported disk drives, or DDS tape drives, to take advantage of factory installation.

Standalone cabinets should be ordered only when unusual configurations are required or if a customer decides to purchase a cabinet after taking delivery of an Series 800 server.

7. In North America, why does the 1.1 m integrated cabinet come with 120 V power while the 1.6 m cabinet comes with 240 V power?

This is to prevent current overloads when the cabinets are fully loaded with equipment. The

current capacity of the power distribution unit is 16 amps. A 240 V PDU allows twice as much equipment to be run off a single PDU and off a single wiring circuit in the customer's building than a 120 V PDU.

8. Is installation included with all racked systems?

Factory integrated cabinets include installation; standalone cabinet configurations do not include installation.

9. Are there any peripherals that are not supported in the Series 800 racks?

All peripherals which have 19" rackmount kits are supported in the Series 800 racks.

10. When do I order a front door on my cabinet?

A front door with lock is available to customers who require greater security. A front door also provides a uniform look to cabinets which contain older peripherals that do not have bezels. Refer to the following section for details on how to order a front door.

11. Can I rack more than one E, F, G, H, I SPU into a cabinet?

Yes, as long as they do not exceed power voltage and EIA space limitations. For factory integrated cabinet, only one SPU can be integrated at the factory.

Table 4.5 Ordering Information

1.1 Meter Standalone Cabinet

Part Number	Description
C2785A*	1.1 meter standalone cabinet
AW3	100–120 V North American power
AW4	200–240 V North American power
AW5	200–240 V International power
C2791A	Adds filler panel kit (6 panels)
E4470A	Extractor fan (100–200 V)
E4471A	Extractor fan (200–240 V)
E4464A	Lockable front door
E4466A	1.1 meter rack tie-together kit * Comes with 2 one-unit filler panels

1.6 Meter Standalone Cabinet

Part Number	Description
C2786A*	1.6 meter standalone cabinet
AW3	100–120 V North American power
AW4	200–240 V North American power
AW5	200–240 V International power
C2791A	Adds filler panel kit (6 panels)
E4465A	Lockable front door
E4468A	1.6 meter rack tie-together kit * Comes with 2 one-unit filler panels

Power Distribution Units

Available for customers that need a second PDU for their cabinet.

Part Number	Description
C2785-63000	2nd Option AW3 100–120 volt PDU for C2785A
E4452A	2nd Option AW4 200–240 volt North American PDU for C2785A
E4453A	2nd Option AW5 200–240 volt International PDU for C2785A
C2786-63004	2nd Option AW3 100–120 volt PDU for C2786A
E4456A	2nd Option AW4 200–240 volt North American PDU for C2786A
E4457A	2nd Option AW5 200–240 volt International PDU for C2786A

Kits and Accessories

Part Number	Description
A2962A	Rackmount kit for HP 9000 E-Series
C2788A	Generic rail kit for non-standard 19-inch peripherals
C2797A	Rackmount kit for HP 9000 Models 807S, 817S, 837S, and F-Series
C2798A*	Rackmount kit for HP 9000 Models 827S, 847S, 857S, and G/H/I-Series
C2799A*	Rackmount kit for HP 2345A DTC48
C2790A**	14 kg (30 lbs) anti-tip ballast
C2791A	Filler panel kit. Contains 6 one EIA-unit panels
C2792A	ADP Rackmount kit for rear of cabinet
35199E***	Rackmount kit for HP 2340A DTC16
19508A***	Rackmount kit for HP Series 6000 SCSI drive Models C220XA and C221XA
8120-1900	IEC-320 power cord, 762 mm (30 in)
8120-1860	IEC-320 power cord, 1524 mm (60 in)

- * Includes bezel, rails, and IEC-power cord
- ** Order 3 ballast with 1 or more 1/2-inch tape drives
- *** Rackmount kit does not include an IEC-320 power cord

Receptacle Types

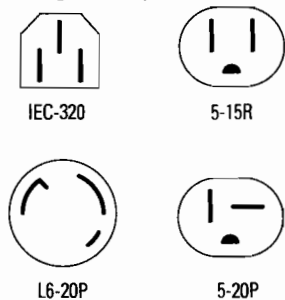
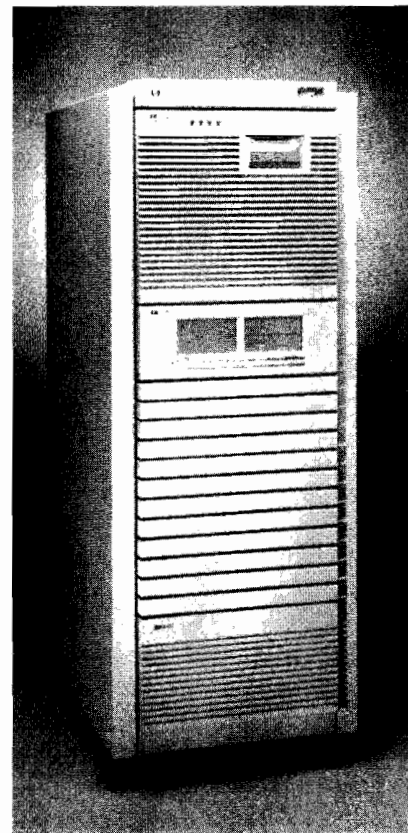


Table 4.6 Cabinet Power Details

Product Number	Power Option	Power Dist. Unit (PDU)	Max. Current	IEC-320 Receptacles	PDU Plug Style
C2785A—1.1 Meter Standalone Cabinet					
No. American	AW3	100–120 V	16A	6	5-20P
No. American	AW4	200–240 V	16A	6	L6-20P
International	AW5	200–240 V	16A	6	no plug
C2786A—1.6 Meter Standalone Cabinet					
No. American	AW3	100–120 V	16A	10	5-20P
No. American	AW4	200–240 V	16A	10	L6-20P
International	AW5	200–240 V	16A	10	no plug



HP C2786A cabinet with G/H/I-series server, HP Series 6000 SCSI disk drive, two HP C2791A filler panel kits and an HP 2345A

Front Door

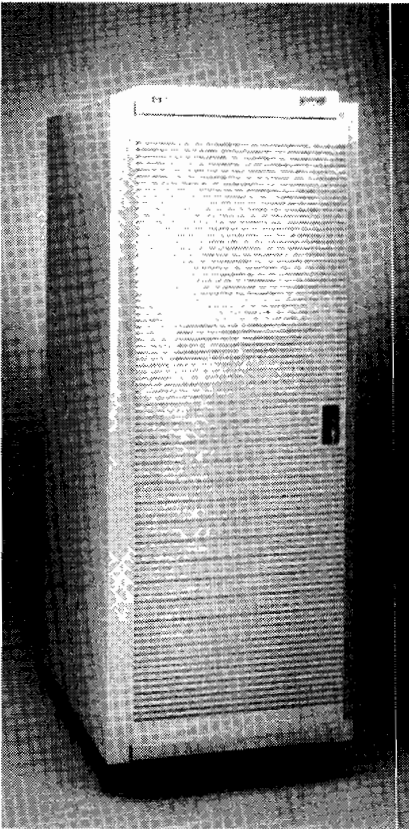
The perforated design of the front door accessory gives a consistent appearance to mixed product configurations, and allows air flow for front to back cooling of computer products and peripherals. While the front door is lockable to limit unauthorized access, the master power switch is still readily accessible.

Table 4.7

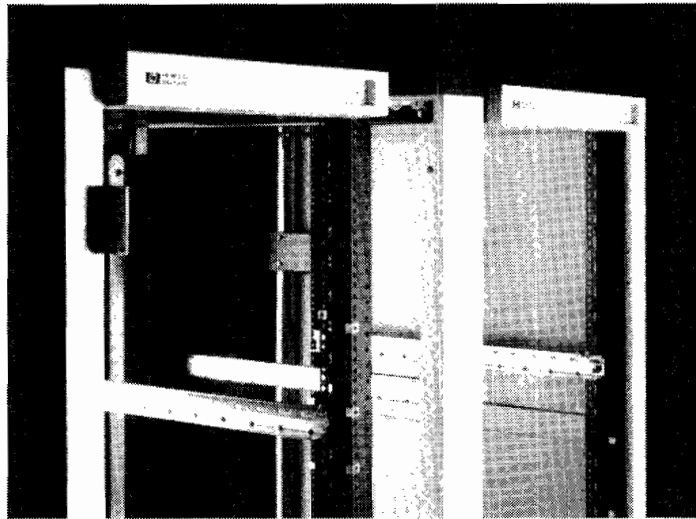
Rack Front Doors
To order a customer installed front door specify the rack model number and a door model number.
E4464A: 1.1 m front door for C2785A rack
E4465A: 1.6m front door for C2786A rack
<ul style="list-style-type: none"> • Provide a vented, locking, left or right mounting plexiglas front door • Includes mounting hardware • Requires minor customer installation

Table 4.8

Rack Tie-Together Kit
To order a customer installed tie-together kit specify the rack model number and rack tie-together kit model number.
E4466A: 1.1 m rack tie-together kit for C2785A
E4468A: 1.6 m rack tie-together kit for C2786A
<ul style="list-style-type: none"> • Provides hardware to create multi-bay systems • Racks are shipped with side in place for shipping integrity • One panel will be left over for each rack tied • Minor customer installation required



HP C2786A cabinet with optional front door



Tie-Together Kit, E4466A-E4469A

The tie-together kit creates a multiple bay solution for large systems. A system that bolts the columns of adjacent racks together completes the cosmetic finish of the multi-bay solution.

If the extractor fan option is chosen for the multi-bay system, be sure to order a fan with *each* rack to ensure proper ventilation.

Power Distribution Units

- Number of receptacles per PDU:
 - C2785A (1.1 m rack) 6
 - C2786A (1.6 m rack) 10
- All PDUs are single-phase



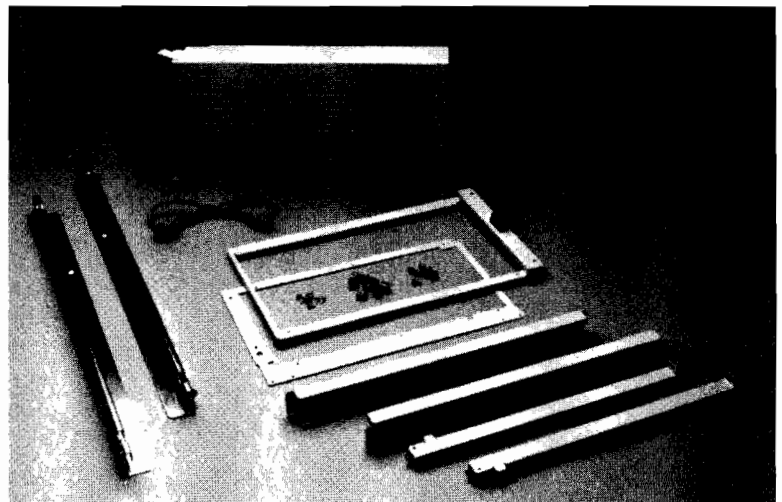
Table 4.9 Power Distribution Units (PDU) for Standalone Rack Cabinets

Power distribution units for 1.6 meter and 1.1 meter cabinets

North American Localization Options	Detail	Operating Voltage	Maximum Current	Receptable Style	Power Cord Plug Style
AW3	Meets UL/CSA standards	100–120V	16A	NEMA 5-15 with one IEC-320 (reserved for extractor fan)	NEMA 5-20P
E4472A and E4452A/E4456A	Meets UL/CSA standards	200–240V	16A	IEC-320	NEMA L6-20P
International Localization Options					
AW5	Meets IEC-950 and VDE standards	200–240V	16A	IEC-320	Unterminated

Rackmount Kits

Typical rackmount kits consist of rails, front bezel, IEC-320 power cord, and other hardware needed for each component to be racked in the cabinet. The front bezel design conforms to the style of HP products and contributes to the uniform appearance of the mounted components.



HP C2799A Rackmount Kit

HP PowerTrust Uninterruptible Power Systems

- Protects against facility power interruption
- Worldwide support for use with Series 800 systems
- Supplies (at least) 15 minutes of continuous backup power
- Two capacities
 - 600 VA (volt-amperes), deskside
 - 3.0 KVA, rackmount
- Includes 2.5 m RS-232 cable to communicate from UPS to SPU
- UPS can send messages to system console
- UPS can communicate to HP-UX modules to initiate system shutdown and timed power on/off
- Cables connectors are male DB-9 at UPS and male DB-25 at SPU mux end

Figure 4.13 Example 3.0 kVA HP PowerTrust UPS Configuration

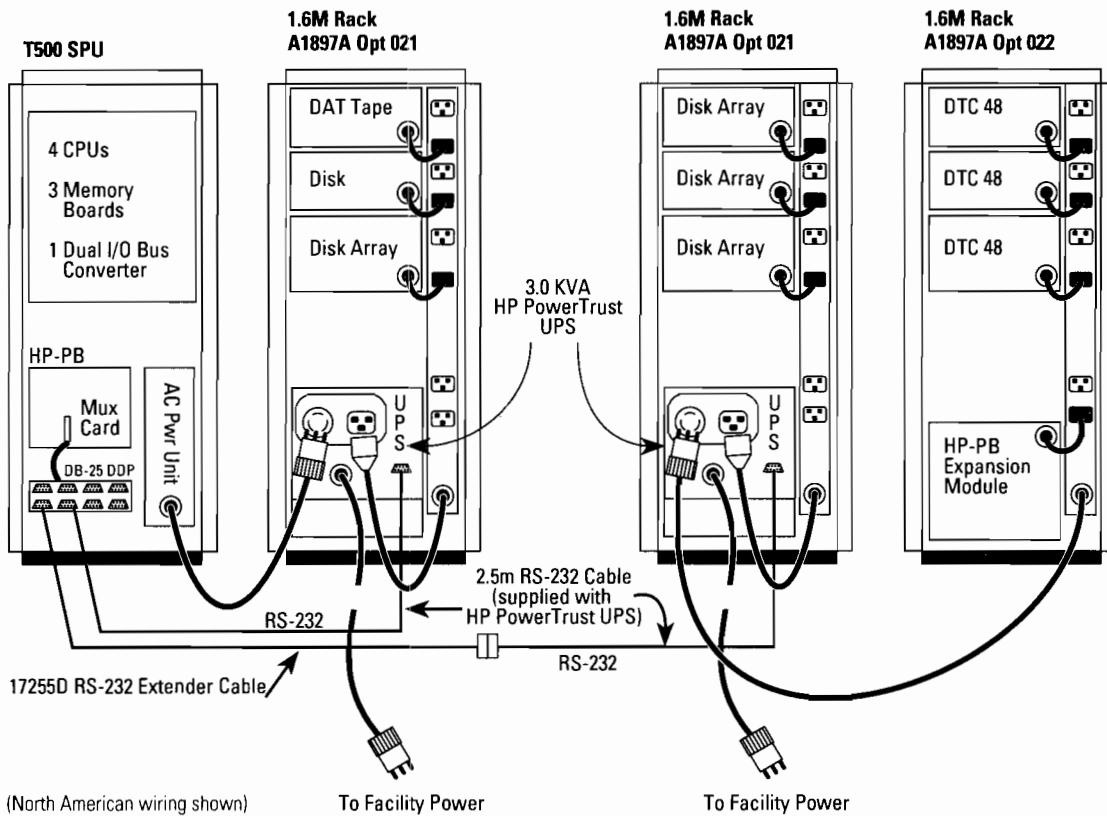
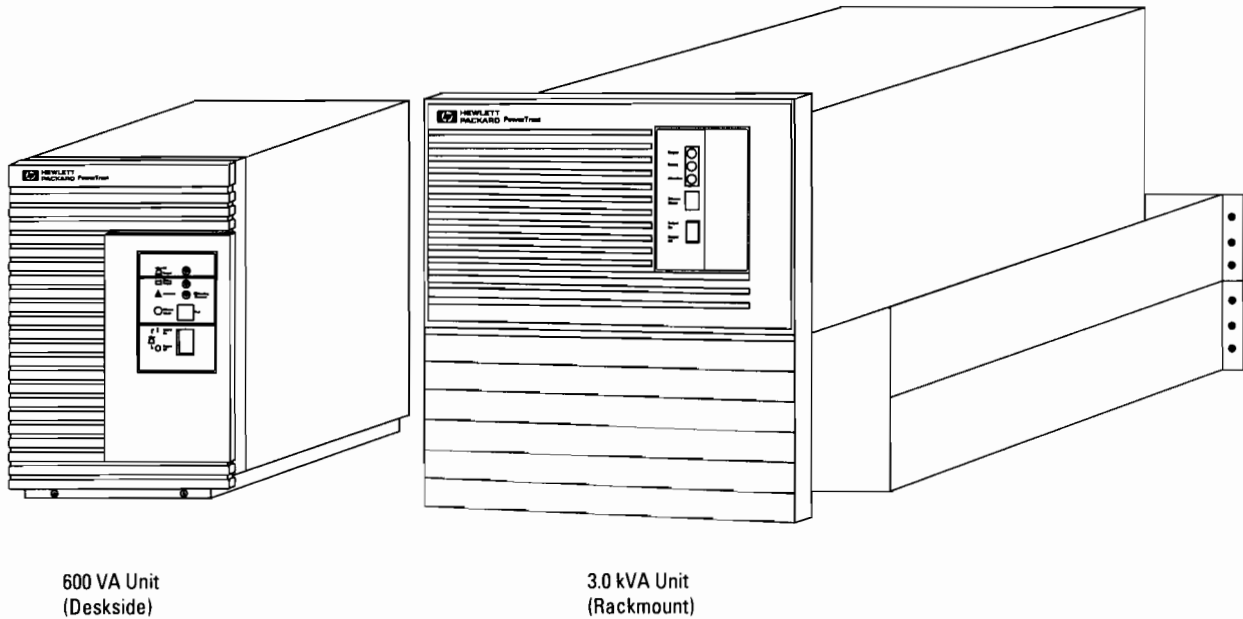


Table 4.10 HP PowerTrust UPS Product Summary

Product	Capacity	Configuration	Input Power	Output Power Connections	Dimensions (W×H×D)	Weight
A2941A	600 VA	Deskside	North America/Asia: 100–120V/15A Europe: 200–240V/15A	Worldwide (4) IEC 320-C13	22.9 cm × 34.9 cm × 39.0 cm	20.9 kg 46 lbs
A2998A	3.0 kVA	Rackmount (12 EIA Units)	North America/Asia: 200–240V/30A; L6-30 Europe: 200–240V/30A; hardwire	North America/Asia: (1) 240V NEMA L6-30 (1) IEC 320-C19 Europe: (1) 240V/30A hardwire receptacle (1) IEC 320-C19	42.4 cm × 50.9 cm × 71.6 cm	197 kg 434.5 lbs

Figure 4.14 HP PowerTrust UPS Units



600 VA Unit
(Deskside)

3.0 kVA Unit
(Rackmount)

UPS Monitoring and Control and Timed on/off Software

Software modules are provided with HP-UX (as of release 9.04) to perform two different functions involving HP PowerTrust UPS units: (These capabilities do not work with UPS units other than HP PowerTrust.)

1. Monitoring and control of the UPS to provide graceful shutdown capabilities in the event of an extended power outage.

2. Automatic power-up and power-down of an SPU (and peripherals at pre-set days and times. Automatic power-up will cause the SPU to auto-boot.

Each of these capabilities requires an RS-232 communication link **between each HP PowerTrust UPS and the SPU**. The 2.5-meter long RS-232 cable that is provided with each HP PowerTrust UPS connects to a port on the Series 800 to satisfy this communication link

requirement. The cable has a male DB-9 connector on the UPS end, and a male DB-25 connector on the SPU end. If a link greater than 2.5 meters long is required, a male-female RS-232 extender cable with DB-25 connectors can be used to achieve the additional distance.

600 VA Unit

The 600 VA unit is designed to supply power for an E-Class or F-Class SPU and its console. The UPS can support up to 4 individual devices. Each device plugs into the back of the UPS unit with IEC 320 style jumper cords. All HP desktop and deskside devices can utilize this style of removable power cord. Two cords are included with each UPS unit for use with such devices as the SPU and the console terminal. Cords for additional devices may be purchased separately (P/N 8120-1625).

3.0 kVA Unit

The 3.0 kVA unit is designed to provide power for two separate devices.

The first power outlet on the back of the 3.0 kVA HP PowerTrust UPS is designed to provide power for the 1.6-meter expansion cabinet that the UPS is mounted in. With this configuration, all devices plugged into this expansion cabinet's power distribution strip will be protected by the UPS. See **Figure 4.13**. To order a cabinet with this power strip configuration, specify cabinet A1897A, Opt. 021. This same

cabinet is used for both North America/Asia as well as Europe. Existing 1.6-meter cabinets may be upgraded to this configuration by ordering cabinet upgrade product, A3085A Opt. 001.

The second power outlet on the back of the 3.0 kVA uses a 240V L6-30 style connector (hardwire for Europe). This is designed to provide power for a large SPU (e.g., Corporate Business Server) or a specially configured 1.6 meter expansion cabinet. See **Figure 4.13**. Connecting a separate expansion cabinet to this outlet provides UPS power protection for all devices that are installed in that cabinet. To plug an expansion cabinet into this outlet, specify cabinet P/N A1897A Opt. 022 for North America and Asia, and A1897A Opt. 023 for Europe. This specifies that the power distribution strip in the cabinet is configured with the proper cord and connector to plug into the 3.0 kVA UPS which is in an adjacent rack. The European version is designed for hardwire connection to the UPS. Existing 1.6 meter cabinets may be upgraded to this configuration by ordering cabinet upgrade product A3085A Opt. 002 for North America/Asia, or Opt. 003 for Europe.

How to calculate how many systems and/or devices can be powered by an HP PowerTrust UPS:

Each HP PowerTrust UPS is capable of supplying power to one or more systems or peripheral devices as long as the total volt-ampere (VA) capacity of the UPS is not exceeded. Perform the following steps to determine the total VA capacity required for the combination of systems and devices that you want to have protected. If the total VA requirement exceeds the capacity of a single UPS, spread the load across more than one UPS.

Step 1.

Calculate the VA demand of each component.

- If the VA rating for a device is specifically stated, use that value as-is. The power consumption values provided for most Series 800s fall into this category. The VA requirement for Series 800 servers and most other HP rackmount devices is shown in **Table 4.13**. These values are already adjusted for power-factor correction.

VA = VA as listed

- If the power rating for a device is specified in "Power-Factor Corrected" (PFC) Watts, use that value as-is. These values are already adjusted for power-factor correction.

VA = PFC Watts

Note: The 600 VA UPS is intended for use with small integrated servers, PCs, workstations, and terminals only. It is not suitable for ac-motorized devices such as standalone disks, disk arrays, and laser printers.

Table 4.11 Example for the 600 VA HP PowerTrust UPS

	System or Device	Maximum Current	Voltage	Power Requirement (If Known)	Component's Required VA	
Step 1 →	Model E35 SPU (including internal disks and tape drive)	—	120V	550 VA* (PFC-adjusted)	—	= 550 VA
	HP 700/60 Console Terminal	—	120V	50 VA* (PFC-adjusted)	—	= 50 VA
Step 2 →	Total VA Requirement					600 VA
Step 3 →	HP PowerTrust UPS capacity = 600 VA; Total VA requirement for the system = 600 VA. A single 600 VA HP PowerTrust UPS will provide sufficient power for the entire system.					

* See Table 4.13

Table 4.12 Example for the 3.0 kVA (3,000 VA) HP PowerTrust UPS

	System or Device	Maximum Current	Voltage	Power Requirement (If Known)	Component's Required VA	
Step 1 →	Model T500 SPU (4 CPUs, 3 memory boards, 1 Dual I/O Bus Converter)	—	240V	1478 VA** (PFC adjusted)	—	1478 VA
	DAT Storage System	—	240V	360 VA*	—	= 360 VA
	3 × 2 GB Disk Storage System	—	240V	432 VA*	—	= 432 VA
	HP-FL Disk Array	—	240V	600 VA*	—	= 600 VA
Step 2 →	Total VA Requirement					2870 VA
Step 3 →	HP PowerTrust UPS capacity = 3,000 VA; Total VA requirement for the system = 2,870 VA. A single 3.0 kVA HP PowerTrust UPS will provide sufficient power for this subset of the system's components.					

* See Table 4.13

** See Table 3.32 in the T500 Configuration section

- If the power rating for a device is specified in Watts, but there is no reference to power-factor correction, multiply the listed Watts by 1.4 to obtain the adjusted VA rating.

$$VA = Watts \times 1.4$$

- If the *power* rating for a device is not available, multiply the current requirement for the device by the voltage used (e.g., 120V or 240V) to obtain the VA rating. For HP

devices, use the current rating supplied in the racking section of the Series 800 Configuration Guide. For other devices, use the **maximum** current rating listed on the back label of the device.

$$VA = Current\ Rating \times Voltage$$

- Step 2.** Add the VA requirements for all the systems and devices to determine the total VA figure needed.

Step 3.

Compare the total VA requirement against the capacity of the HP PowerTrust UPS intended for use. The total must not exceed the VA capacity of the HP PowerTrust UPS being used. If the total *does* exceed the capacity of a single UPS, redistribute the load across multiple UPS units to keep the load for each UPS under its maximum capacity.

Table 4.13 Cabinet Mounting Information for Selected Components

Product Number	Description	EIA Units (Height)	Maximum Current (Amps)		VA Rating for UPS Sizing	Required Rackmount Kit
			100-120 V	200-240 V		
SPUs						
HP 9000 Series 800						
A2428AW	E Class	6	6.5	3.5	550	P/N A2902A
A2428A	F Class	6	6.5	3.5	550	P/N C2797A
A2429A	G Class	10	12	6	750	P/N C2798A
A2430A	H Class	10	12	6	750	P/N C2798A
A2431A	I Class	10	12	6	750	P/N C2798A
A1751A/B	807S	6	6.5	3.5	550	P/N C2797A
A1703A	817S	6	6.5	3.5	550	P/N C2797A
A1765A	827S	10	12	6	750	P/N C2798A
A1704A/B	837S	6	6.5	3.5	550	P/N C2797A
A1766A	847S	10	12	6	750	P/N C2798A
A1706A	857S	10	12	6	750	P/N C2798A
A1768A	867S	10	12	6	750	P/N C2798A
A1769A	877S	10	12	6	750	P/N C2798A
A2307A	887	10	12	6	750	P/N C2798A
A2306A	897	10	12	6	750	P/N C2798A
HP-FL Disk Arrays						
C2252HA/HZ	2.72-Gbyte High Availability Disk Array	6	4	2	600	Included
C2254HA/HZ	5.44-Gbyte High Availability Disk Array	6	4	2	600	Included
C2252B	2.72-Gbyte Disk Array with 2 Disks	6	4	2	600	Included
C2254B	5.44-Gbyte Disk Array with 4 Disks	6	4	2	600	Included
Fast/Wide Differential SCSI-2 Disk Arrays						
C2440HA	8 Gbyte SCSI Disk Array (5 × 2 Gbyte)	6	5.2	3	600	Included
C2439HA	4 Gbyte SCSI Disk Array (3 × 2 Gbyte)	6	5.2	3	600	Included
C2437HA	4 Gbyte SCSI Disk Array (5 × 1 Gbyte)	6	2.9	1.7	310	Included
C2436HA	2 Gbyte SCSI Disk Array (3 × 1 Gbyte)	6	2.9	1.7	310	Included
Series 6000 SCSI Storage System						
C2462R	1.35-Gbyte Rackmount Disk Storage System	4	2.6	1.5	360	Included
C2463R	2.0-Gbyte Rackmount DDS Storage System	4	2.6	1.5	360	Included
C3022R	1.0-Gbyte Disk	4	3	1.8	432	Included
C3023R	2.0-Gbyte Disk	4	3	1.8	432	Included
C3024R	Two SCSI 2.0-Gbyte Disks	4	3	1.8	432	Included
C3025R	Three SCSI 2.0-Gbyte Disks	4	3	1.8	432	Included
C2464R	2.0-Gbyte DDS	4	2.6	1.5	360	Included
C2465R	Two 2.0-Gbyte DDS	4	2.6	1.5	360	Included
C2466R	UP to 8.0-Gbyte DDS-DC	4	2.6	1.5	360	Included
C2476R	600-Mbyte CD-ROM Drive	4	N/A	N/A		Included
C2467R	Two 2-8 Gbyte DDS	4	2.6	1.5	360	Included
C3040R	One 2.0 Gbyte Half-height Disks	4	3	1.8	432	Included
C3041R	Two 2.0 Gbyte Half-height Disks	4	3	1.8	432	Included
C3042R	Three 2.0 Gbyte Half-height Disks	4	3	1.8	432	Included
C3551R	Two 2.0 Gbyte F/W/D Disk	4	3	1.8	432	Included
C3553R	Three 2.0 Gbyte F/W/D SCSI Disk	4	3	1.8	432	Included



Section 5 I/O Interfaces

HP-Precision Bus Interfaces

Input/output interfaces are the crucial connecting link between

the system and external peripheral devices and other computer systems. **Table 5.1** lists the HP 9000 Series 800 HP Precision

Bus (HP-PB) interfaces by category and size (single-high or double high).

Table 5.1 HP 9000 Series 800 HP-PB Interfaces

Category	Product Number and Name	Use	Interface Card Size
Peripheral Interfaces			
Multi-Device	28655A Single-Ended SCSI-2/Parallel Centronics Interface	Interfacing disks, DDS tape devices, optional disk devices, magnetic tape devices, integrated peripheral packages via the SCSI-2 connection. Centronics printers can be connected via the parallel internal port.	Single high
	28696A Fast/Wide Differential SCSI-2 Interface	Interfacing F/W/D SCSI-2 disks or disk arrays. Not compatible with single-end SCSI peripherals.	Double high
	A1749A HP-FL Interface PBA-FL Interface	PBA-FL fiber optic peripheral interface for 8x2, 8x7, G, H, and I servers. Supported on HP-UX 8.02 and 9.0.	Double high
	28615A HP-PB HP-FL Interface	HP-PB fiber optic peripheral interface for 8x7, G, H, I, and 890 servers. Supported on HP-UX 9.0 only.	Double high
	28650B HP-IB Interface	Interfacing disks, cartridge tape subsystems, magnetic tape units, plotters, and other HP-IB devices to the 8x7, E, F, G, H, I, and 890 systems.	Single high
	40299B 8-Channel Multiplexer	Interfacing terminals, RS-232 or RS-422, printers, plotters, and other serial devices to the system, plus system console for 8X2S servers.	Single high
	J2092A 16 RS-232-C Direct Connect Multiplexer	Interface RS-232 peripherals in direct connect mode (using data signals only)	Single high
	J2093A 16 RS-423 Direct Connect Multiplexer	Interface RS-423 or RS-422 peripherals in direct connect mode (using data signals only) on long distance.	Single high
	J2094A 16 RS-232-C Modem Connect Multiplexer	Interface RS-232 peripherals locally with full modem control, or through asynchronous modem.	Single high
	J2096A 32 RS-232-C Direct Connect Multiplexer	Interface RS-232 peripherals in direct connect mode	Single high
	J2060A DTC 16TN	Datacommunications and Terminal Controller for connecting up to 16 devices via a LAN	Not applicable
	J2070A DTC 72MX	Datacommunications and Terminal Controller for connecting up to 72 devices via a LAN	Not applicable
	Networking Interfaces		
System to System Comm.	J2146A LAN Link Interface (E, F, G, H, I, and 890 servers only)	Communication with other HP and non-HP systems via IEEE 802.3 or Ethernet Local Area Network connection. Communication with Data communication and Terminal Controllers (DTC) Terminal Access/9000.	Single high
	36967A LAN Link Interface (8x2S servers only)	Communication with other HP and non-HP systems via IEEE 802.3 or Ethernet Local Area Network connection. Communication with Data communication and Terminal Controllers (DTC) Terminal Access/9000.	Single high
	36960A X.25 Link Interface	Communication with other systems conforming to CCITT via public or private packet switching network.	Single high
	J2220A SNAPplus Link Interface	Communication with IBM 370 or plug-compatible systems.	Single high
	J2166A Token Ring Interface (E, F, G, H, I, T500, and 890 servers only)	Communication with HP and non-HP systems via the IEEE 802.5 or Token Ring connection.	Single high
	J2157A FDDI/9000	High speed fiber LAN communication (100 Mbps max.)	Double high

Single-Ended SCSI-2 Interfaces

SCSI is an ANSI standard bus which allows connection of peripherals such as disks and tapes to a computer system. There is a single-ended SCSI Host Adapter HP 28655A for HP-PB systems (Model 8x7S, E, F, G, H, I, T500 and 890). The HP 28655A SCSI/Parallel Adapter includes both a SCSI port and a Centronics port. The Centronics port is a parallel port used for connecting printers.

- There are seven available SCSI device addresses on each Host Adapter Card. Most SCSI peripheral devices use one SCSI address. The Optical Disk Library System (HP C1700A) uses three SCSI addresses (two for the M/O drives and one for the AutoChanger picker).
- Even if two C1700A/C/Ts are racked on the same cabinet (using options 1AC and 111), they still count as 4 disks and 2 auto-changers, requiring 6 SCSI devices addresses.
- SCSI peripherals (disks and tapes) can be mixed and matched in any combination on the same SCSI bus as long as the total number of SCSI devices does not exceed seven.
- Total disk drive support is limited to 32 devices. The HP C17xxA/C/T optical jukeboxes counts as three disk drives.
- Use of third-party peripherals is at user's risk and is not supported by HP's standard support process.
- One optical jukebox per I/F

Table 5.2 Specifications

HP 28655A	HP-PB Single-Ended SCSI/Parallel Adapter (single-high)
SCSI	Fully compatible with ANSI X3.131-1990 (SCSI-2) Specification 8 bit SCSI bus 3.0 Mb/sec asynchronous transfer rate 5.0 Mb/sec synchronous transfer rate Parity support (SCSI Data only) Connects up to 7 devices per adapter Alternative-2 Termination Maximum cable length is 6 meters
Centronics	64-byte FIFO 330 Kb/s burst transfer rate Connects one peripheral per adapter Support for output devices (printers and plotters) only Maximum cable length is 2 meters
HP 27147A	CIO SCSI Host Adapter (single-high)
SCSI	Fully compatible with ANSI X3.131-1990 (SCSI-2) Specification 8 bit SCSI bus 1.5 Mb/sec asynchronous transfer rate 5.0 Mb/sec synchronous transfer rate Parity support (SCSI Data only) Connects up to 7 devices per adapter Maximum cable length is 6 meters

SCSI Powerfail Recovery Guidelines for HP-UX 8.02 and 9.0x

HP-UX 8.02 was the first release to support powerfail recovery with SCSI devices. Powerfail recovery is disabled on HP-UX 8.0 when a SCSI host adapter card is attached to the system. HP-UX 9.0 supports SCSI powerfail on the 8x7, E, F, G, H, I, and 890 Business Servers. E-class servers require a PowerTrust UPS for powerfail protection. Graceful O/S shutdown is included. In order to support powerfail recovery on 8.02 with SCSI devices, certain guidelines apply:

1. HP-UX 8.02 is only supported on HP 9000 Models 8x7, F, G, H, and I (except the 887S, 897S, G50, H50, I50, I60, and I70).
2. Embedded (internal to F, G, H, and I systems) SCSI peripherals fully support powerfail recovery.

3. The C2212A and C2213A SCSI disks do not support powerfail recovery. These devices do not have "sector atomicity," which means that they cannot guarantee that a write operation will complete during a powerfail. The system may experience data loss/corruption on these devices after a power failure. These devices require a dedicated host adapter (P/N 28655A). Multiple C2212A and C2213A can share the same host adapter. In order to ensure data integrity, it is recommended that the C2212A and C2213A drives NOT be used in environments where power fail recovery is required.

4. All systems employing HP PowerTrust UPS-based power failure protection **must** have **all external peripherals** that are connected to the **internal (MultiFunction I/O) Single-Ended SCSI-2 bus** also connected to a UPS for powerfail protection

support. External peripherals connected to add-on SCSI-2 interface cards do not require a UPS.

Powerfail Recovery Support

In addition to the E-Class SPU, all external peripherals which are connected to the internal (built-in) SCSI bus must be on a UPS for system powerfail recovery support. External peripherals connected to **add-on** SCSI buses do not require a UPS for this function to be enabled.

Fast/Wide Differential SCSI-2

Description

- 28696A, HP Precision Bus card
- Double-high card
- 20 MB/second burst speed
- 7–10 MB/second maximum sustained throughput
- Supports up to 15 peripherals
- Supports up to 7 disk arrays

Note that for disk arrays, each Fast/Wide card supports only 7 arrays, connected to addresses 0 through 7 only. Disk arrays cannot be connected to addresses 8 through 15.

- F/W SCSI disks and F/W Disk Arrays* may be mixed on the same card

- Fast/Wide Differential SCSI-2 interface cards and Single-Ended SCSI-2 cards may coexist in the same system
- Single-Ended SCSI-2 peripherals may not be connected to a Fast/Wide Differential SCSI-2 card
- **Fast/Wide disk arrays (C2436/37/39/40HZ) in independent mode can not be mixed on the same bus with 2 GB Fast/Wide disks (C3550R/T, C3551R/T, C3553RZ).**

The SCSI address of a device dictates the device's priority when arbitrating for the SCSI bus. SCSI address '7' is the address for the highest priority device (and is usually reserved for the host). Address '7' is followed in priority (from highest to lowest) by the subsequent addresses 6, 5, 4, 3, 2, 1, 0, 15, 14, 13, 12, 11, 10, 9, and 8. Fast/Wide SCSI disk arrays and Fast/Wide SCSI disks can be mixed on the same card.

Under extreme I/O workload conditions, it is possible for lower priority devices on a Fast/Wide bus to be "starved" for data throughput and time out. A retry will be automatic.

The Fast/Wide card ships standard with a 2.5 meter 68-pin P-connector cable which supports 16-bit devices. The F/W card uses differential transceivers that are able to support distances up to 25 meters (see further details on cabling, [page 5-6](#)).

Similar to Single-Ended (S.E.) SCSI, devices on the Fast/Wide SCSI bus are connected to each other in a "daisy-chain." The first

and last devices on the SCSI bus must provide proper termination on the bus. A terminator, which fits on a SCSI connector, is shipped with the adapter card and can be used to terminate the last device on the SCSI bus.

The Fast/Wide SCSI card is customer installable. The average installation time for the card is 15 minutes.

Other functionality features for Fast/Wide SCSI include support of disk mirroring, and switchover. Full boot, swap, install support is available for all Fast/Wide devices with HP-UX release 9.04.**

Series 800 Support for Fast/Wide Differential SCSI

Fast/Wide Differential SCSI is supported on all (HP 9000 8x7s, E, F, G, H, I, 890, and T500) packages with HP-UX 9.04. Fast/Wide SCSI is not supported on the HP 9000 8x2, 808, 815 or any CIO based Series 800 platforms.

Table 5.3 summarizes the number of Fast/Wide cards supported on the various Series 800 CPUs.

Comparing Fast/Wide Differential SCSI and Single-Ended SCSI

The introduction of Fast/Wide SCSI now gives Series 800 users the ability to choose between two industry-standard I/O interfaces on the Series 800. Although Fast/Wide SCSI and Single-Ended SCSI are both SCSI-2 compliant, S.E. devices may not be connected to F/W SCSI bus. **Table 5.4** summarizes the key characteristics of Fast/Wide and Single-Ended SCSI.

*Disk Array requires UPS for powerfail protection.

**No boot support from RAID Level 3.

Table 5.3 Number of Fast/Wide Cards Supported on Series 800 CPUs

	E-Class	F-Class	G-Class	H-Class	I-Class	Series 807, 817 837	Series 827, 847 867, 887	Series 857, 877, 897	Models 890, T500
Single-high HP-PB slots	2-4	2	4	8	12	2	6	12	14-112
Number of F/W cards supported	2	1	2	4	5	1	3	5	40

Table 5.4 Summary of Fast/Wide and Single-Ended SCSI Characteristics

Characteristic	Single-Ended SCSI	Fast/Wide SCSI
Other names bus is known by	"Standard SCSI" "SCSI" "SCSI-2" "SE-SCSI"	"Differential-Wide" "F/W-SCSI" "Fast and Wide"
Compatibility with the other SCSI bus types	No	No
Maximum bus transfer rate	5 Mbytes/second	20 Mbytes/second
Data bus width	8 bits	16 bits
Number of connector pins	50 pins	68 pins
Maximum cable length	6 meters	25 meters
Maximum connectivity	7 devices	15 devices

Powerfail Protection and Fast/Wide SCSI Disk Arrays

To ensure 100% powerfail protection with the Fast/Wide SCSI disk arrays (P/Ns C2440HA, C2439HA, C2437HA, and C2436HA) an uninterruptible power supply (UPS) is recommended. This is particularly important if the disk array is being used as a boot device. The Fast/Wide SCSI array (with 2 Gbyte drives) has a maximum current rating of 3.0 amps at 230 V. See **Table 4.4 and 4.13*** for power consumption values (VA) for UPS budgeting for the Fast/Wide SCSI disk arrays. In addition to the UPS's listed, there are a number of UPS's available from CPS which are supported on the HP 9000 Series 800.

*The 600 VA HP PowerTrust UPS (A2941A) does not support Disk Arrays

Fast/Wide SCSI Disk Array Performance

The primary value proposition of a disk array is high availability. Consider a disk array performance tradeoffs in providing high availability benefits. **Figure 5.1** depicts relative raw performance of the Fast/Wide SCSI disk array connected to a lab test system. Raw performance means that the file system is bypassed in the transmission of commands to the disk array. However, the data can be useful to provide a relative performance measure of the various modes of operation. All tests were run on a Model 735 with a single C2440HA attached to a Fast/Wide port.

Fast/Wide SCSI-2 Disk Array Support and 8MB Systems

Series 800 SPUs with only 8MB of memory must upgrade to a minimum of 16 MB if a Fast/Wide SCSI Disk Array is added and is intended to be used as the root volume (boot device). If the array is strictly to be used as a non-boot (data) device and the root drive is one of the SPU's internal drives, no upgrade from 8MB to 16MB is necessary for array support.

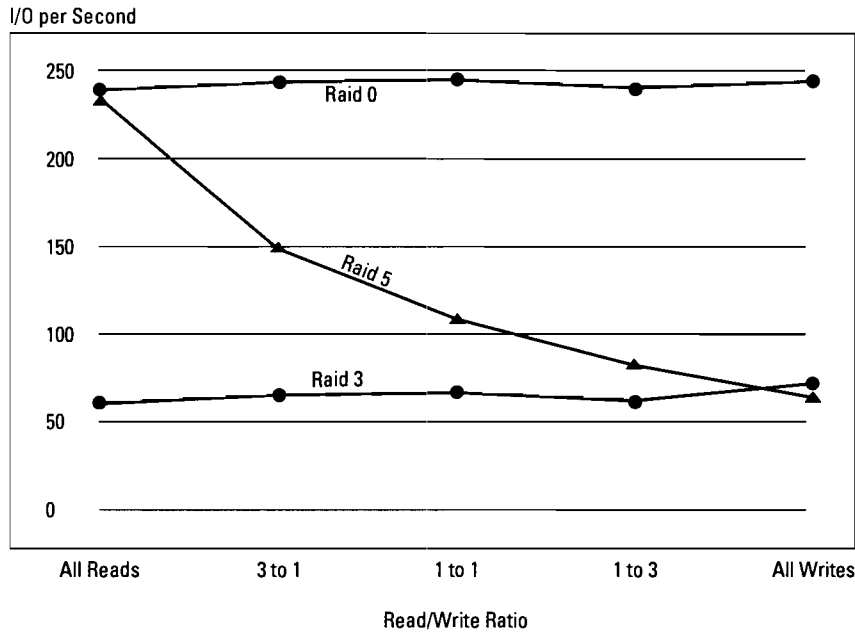
Cabling Fast/Wide SCSI

The Fast/Wide card (P/N 28698A) uses differential transceivers that support cable distances up to 25 meters. When considering cable distances, however, all cable distances must be added, including cable from the host to the first storage device, cable consumed within the storage enclosure, and cable from storage device to storage device.

A Fast/Wide SCSI tower enclosure consumes 1.3 meters of Fast/Wide SCSI cable internally. A rackmount Fast/Wide SCSI storage enclosure consumes 1.75 meters. A Fast/Wide SCSI disk array consumes 0.7 meters of cable. Be sure to include these values in your calculations.

Figure 5.1 HP Fast/Wide Disk Array I/O Rates

Random Transfer, 8KB, 100MB Average Seek



Here are the test parameters used for the Benchmark #1 for Random Transfers:

1. Series 9000 Model 735 with one C2440HA attached to the fast wide port
2. Random 100 Mbyte seeks
3. 8 Kbyte transfers
4. Read cache on
5. Write cache off
6. Spindle synch on
7. Queue depth = 8 commands at all times

There are three types of Fast/Wide SCSI cables:

1. Standard male-male 68-pin high-density cable which can be used to cable from the host adapter to the first peripheral, and from peripheral to peripheral. These cables are available in 0.9, 2.5, 5, and 10 meter lengths.
2. An extender cable which is also 68-pin high-density with one

male and one female connector. This cable can be used to extend the cable from the adapter to a peripheral or to extend the peripheral to peripheral cable. Extender cable lengths available are 2, 5, and 10 meters.

3. V-cable, 68-pin high-density, male/male/male.

Table 5.6 summarizes the various Fast/Wide SCSI cables which are available.

Table 5.5 When to Choose Fast/Wide SCSI, Single-Ended SCSI, or HP-FL

Need	Choose:
Industry-standard connection	<ul style="list-style-type: none"> • Single-Ended SCSI-2 • Fast/Wide SCSI-2
Low cost	<ul style="list-style-type: none"> • Single-Ended SCSI-2
High performance	<ul style="list-style-type: none"> • Fast/Wide SCSI-2
High number of device connects	<ul style="list-style-type: none"> • Single-Ended SCSI-2: 7 • HP Fiber-Link: 8 • Fast/Wide SCSI-2: 15
Long cable length from SPU to first peripheral	<ul style="list-style-type: none"> • HP Fiber-Link 500 m

Table 5.6 F/W SCSI Cables

Type of Cable	Standard Cable		Extender Cable		V-Cable	
Connectors	male-male		female-male		male-male-male	
Purpose	– adapter to peripheral – peripheral to peripheral		– extends standard cable – extends V-cable		– for Switchover configurations, allows multiple hosts to be connected within daisy-chain	
Distances and Product Numbers Available	0.9 m	#28696A opt 002 or C2911A	2.0 m	#28696A opt 003	2.0 m	#28696A opt 006
	2.5 m	Comes standard with #28696A card or C2924A	5.0 m	#28696A opt 004		
	5.0 m	#28696A opt AF1	10.0 m	#28696A opt 005		
	10.0 m	#28696A opt AF8 or C2925A				
	20.0 m	C2926A				

Single-Ended SCSI-2

Table 5.7 Maximum Single-Ended SCSI-2 Peripheral Support Matrix

SPU	Maximum # Cards Supported*	# Single-Ended SCSI Disks Supported	Max. # Single-Ended SCSI Gb Supported	Total # of tapes Supported (DDS, Mag, CT)	Total # of Optical Libraries Supported	Total # of Centronics Printers Supported (1 per card)**
E25, E35, E45	2/4	35	70	8	4	5
F10, F20, F30	2	21	42	8	4	3
G30, G40, G50, G60, G70	4	35	70	8	4	5
H20, H30, H40, H50, H60, H70	8	60	120	8	4	9
I30, I40, I50, I60, I70	12	60	120	8	4	13
T500	20	84	168	16	20	16
890	20	84	168	16	20	16

*Not including SCSI adapter on multi-function I/O card.
**Plus one on RS-232/SCSI-2/Centronics Multi-function I/O Card.

SCSI Cabling Guidelines

- Ensure that the total cable length (including external and internal cables) does not exceed 6 meters.
- The length of the SCSI bus cable should be kept as short as possible. However, do not use cables shorter than 0.5 meters.
- Make sure that all cables are attached to a device at both ends, except for the Host Adapter of course.
- SCSI cable impedance and construction can have significant effect on signal quality. For this reason, we recommend that only HP cables be used.

SCSI Cables for 28655A HP-PB SCSI Adapter

Adapter-to-Peripheral SCSI Cables: For the 28655A HP-PB SCSI adapter; an adapter-to-peripheral, 1 meter shielded SCSI cable is included with the adapter. This cable has a 50 pin high-density thumb-screw connector for the adapter side and a 50-pin low-density bail-lock connector for the peripheral connect. (K2296 and K2297, listed in Table 5.8, are replacement cables for this adapter-to-peripheral cable. These and other cables listed in Table 5.8 can be ordered from Complimentary Products Sunnyvale—CPS previously DMK).

Table 5.8

Product Number	Length	Description
Adapter-to-Peripheral SCSI Cables		
K2296	1 m	High-density (HD) screw to low-density (LD) bail-lock male-male connectors
K2297	1.5 m	High-density (HD) screw to low-density (LD) bail-lock male-male connectors
Peripheral-to-Peripheral SCSI Cables		
92222A	0.5 m	LD bail-lock male-male connectors
92222B	1 m	LD bail-lock male-male connectors
92222C	2 m	LD bail-lock male-male connectors
SCSI Extender Cables		
92222D	1 m	LD bail-lock extension cable with 1 male and 1 female connectors
C2900A	3 m	LD bail-lock extension cable with 1 male and 1 female connectors

Termination Power

- Termination power is supplied by the host adapter. Any or all of the devices on the bus may supply termination power. The first two devices that supply termination power should be located at each end of the SCSI bus. Other devices supplying termination power can be placed anywhere along the bus.

Termination Resistors

- The Host bus Adapter will supply termination to one end of the bus if it is not part of the multifunction I/O card.
- Each end of the SCSI bus must be terminated.
- Use active terminators as supplied with the product.

Usage Guidelines

- Power on all SCSI peripherals and make sure they have time to complete their selftest before powering on the SPU (System Processor Unit).

Note: Some devices require termination power to pass the selftest. These devices may fail selftest if they are powered on before the Host. If this occurs, the

system will still boot up successfully AND clear the error on the device.

- Power on all SCSI peripherals that provide termination power first.
- Keep all devices powered on during and after system boot-up.
- Do not add or remove SCSI devices while the system or any SCSI peripheral providing Term Power is powered on.

Fiber-Optic SCSI Extender

The HP 28643A Fiber-Optic Extender overcomes the 6-meter SCSI distance limitation by allowing the addition of up to 100 meters to the SCSI bus as shown in **Figure 5.2**. The device can transfer data synchronously and asynchronously, is independent of the computer backplane, supports powerfail recovery, and is 19" rack-mountable. Utilization of the extender is recommended only for non-disk SCSI devices due to performance implications. Typical performance rates:

	50 meters	100 meters
Asynchronous	300 Kbytes per sec	225 Kbytes per sec
Synchronous	4.0 Mbytes per sec	3.25 Mbytes per sec

HP 28643A includes 2 extender units, 2 mounting bracket kits, an installation/reference manual, and a loopback test coupler. Option AFB and AFD add 50 meters and 100 meters of 62.5/125 mm fiber-optic duplex cable, respectively.

HP-FL Interface

Disks and disk arrays can connect to Series 800 Business Servers via HP-FL interfaces, as shown in **Figure 5.3**, (the E-class servers, F10, F20, F30, 807, 817, and 837 do not support HP-FL). HP-FL is the recommended disk interface for those customers requiring either disk array functionality or extra configuration flexibility (HP-FL can connect to disks up to 500 meters from the SPU). HP-FL is particularly suited for large disk configurations.

As shown in **Figure 5.3**, the fiber optic link connects from the system to one or a group of disk drives or disk arrays. A 30 meter fiber optic cable is included with the 28615A interface. The 30 meter cable can be replaced by a custom fiber optic cable, up to 500m long, which is ordered from Hewlett-Packard as HFBR-AWDxxx, where xxx is length in meters.

Figure 5.2 Fiber-Optic SCSI Extender Configuration Example

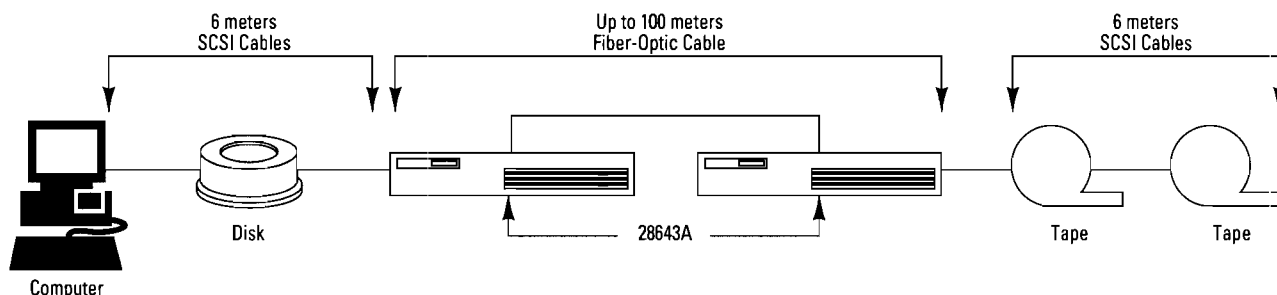
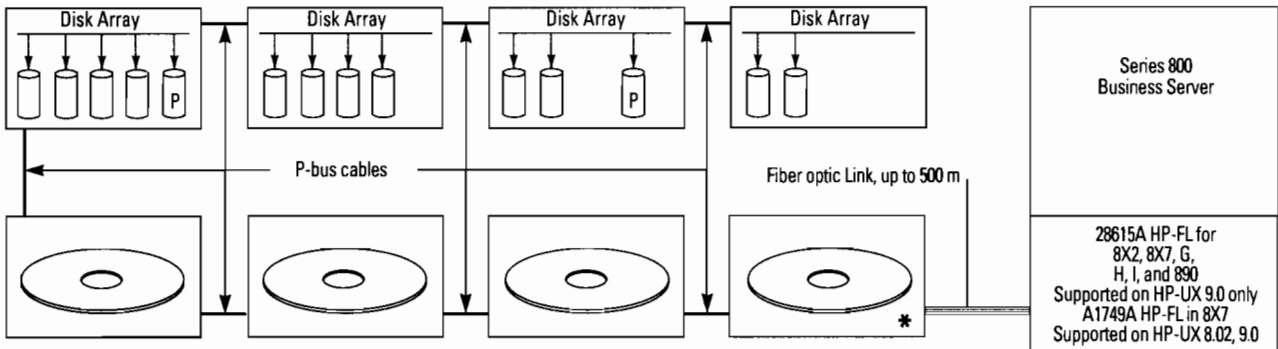


Figure 5.3 Connection of HP-FL Disks and Disk Arrays to Series 800 Business Servers



HP C2201A, or C2204A Disks or C2254HA, C2254B, or C2252B Disk Arrays (Up to 8 drives/arrays)

* Must be standard HP C2201A or C2204A Disk Drive or C225XHA/B Disk Array

Note: Due to firmware change, the PBA-FL ChanSpan adapter (A1749A) in 8X2S systems is not compatible with 8X7, G, H, I. A new HP-FL card (28615A for HP-UX 9.0) must be installed.

The HP-FL disk drives and disk arrays in a group are connected to each other via electrical PBus cables (included when purchasing the HP-FL disk product). Eight drives are supportable on an HP-FL Bus when installed in a single cabinet. Eight disk arrays are also supportable on a single HP-FL bus. The HP 92211Y, 325 mm cabinet can hold up to four HP C2201A and/or HP C2204A disk drives. The HP 46299Y is a 19-inch EIA cabinet, 1.6 m tall. It can hold up to eight HP C2201A and/or C2204A disk drives. The HP C2786A is a 19" EIA cabinet, 1.6 m tall. It can hold up to five HP **C225XHA/B** disk arrays.

PBus 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 or one HP 46299A cabinet. Up to six HP-FL disks can be supported in three HP 19511A cabinets. Up to

eight HP C225XHA/B disk arrays are supported in two adjacent HP 2786A cabinets. Disks in adjacent cabinets are connected using a long HP PBus cable.

HP 19572A is a long PBus cable that interconnects two C225XHA/B arrays in two different cabinets. HP 19573A is a long PBus cable that interconnects C225XHA/B to other HP-FL disks in an adjacent cabinet. The C220XA product PBus cables are backward compatible. The older PBus 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 PBus, but not directly to the system via the fiber optic cable. At least two disk drives on the channels should have fiber optic circuits (the standard drive).

Multiplexers and User Communications Devices

Multi-Device Interface Connections

Multiple devices connect to the HP 28650B HP-IB interface, the HP 40299B 8-Channel Multiplexer and the HP J209XA family of 16- and 32-channel multiplexers. The acronym HP-IB represents the full name "Hewlett-Packard Interface Bus," which is a bus cable whose connection should daisy-chain from one device to the next. The system console for 8x7s, E/F/G/H and I-Class servers is connected to port 0 of the multifunction I/O card MUX. A remote console can be connected (through modems) to port 7 of the multiplexer.

16- and 32-Channel Asynchronous Multiplexers

The 16- and 32-channel multiplexers are the means to connect terminals, printers, and other asynchronous peripherals in either direct connect mode (RS-232-C or RS-423), or modem connect mode (RS-232-C) to the HP 9000 Series 800 servers that uses the HP-PB backplane. (See **Figure 5.4**) The 16- and 32-channel multiplexers are supported with HP-UX 8.0 or later.

Three products address four connection needs:

1. J2092A product: 16 RS-232-C peripherals in direct connect mode using data signals only (up to 15 meters). Provides up to 38.4 kbps throughput.

2. J2093A product: 16 RS-423 or RS-422 peripherals in direct connect mode for long distance purpose (up to 1200 meters). Provides up to 38.4 kbps throughput.

3. J2094A product: 16 RS-232-C peripherals connected locally but using data AND modem signals (up to 15 meters) or remotely through the use of asynchronous modems. Provides up to 19.2 kbps throughput.

4. J2096A product: 32 RS-232-C compatible ports for direct connection. The J2096A product is functionally identical to the J2092A product, but with 32 ports. Provides up to 38.4 kbps throughput.

Each 16-channel product comprises one single high HP-PB card and 1 distribution panel (16 ports each) with standard RJ-45 connectors for peripherals attachment. The 32-channel multiplexer includes 2 distribution panels (16 ports each). If customer requires DB-25 connector, order option 010.

The distribution panels are linked to the MUX card through the use of a 4 meter cable.

Ordering Information

For ease of ordering, the 16-channel multiplexer with RS-232-C direct connect ports and DB-25 connectors is integrated in the HP 9000 Model F/G/H, and I-Class servers when ordered with A2442A option 0DT or 0DV for E-Class. To accomplish the same on the 8x7 servers, order option 601 which includes one ADP and one DDP distribution panel. (Option 025 is also required.)

For add-on cards or other configurations, use the following:

J2092A	HP-PB 16-channel RS-232-C Direct Connect Asynchronous Multiplexer
J2093A	HP-PB 16-channel RS-423 Direct Connect Asynchronous Multiplexer
J2094A	HP-PB 16-channel RS-232-C Modem Connect Asynchronous Multiplexer
J2096A	HP-PB 32-channel RS-232-C Direct Connect Asynchronous Multiplexer

Software media options

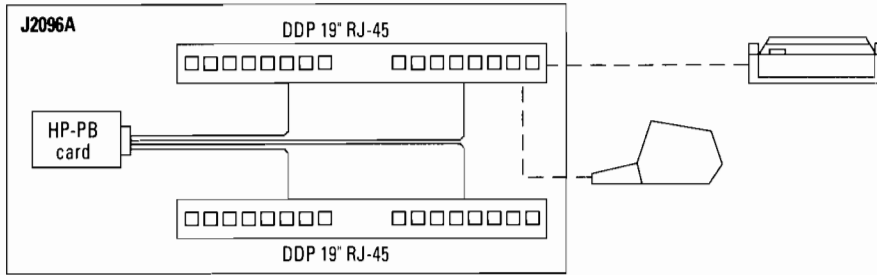
For use with J2092A, J2093A, J2094A products (MUST add one of them for use on systems running HP-UX 8.0) and J2096A on HP-UX 8.0 or 8.02.

Opt. AA0	software on 1/4" cartridge tape
Opt. AA1	software on 1/2" magnetic tape
Opt. AAH	software on DDS cartridge
Opt. AA4	software on QIC cartridge for J2096A only

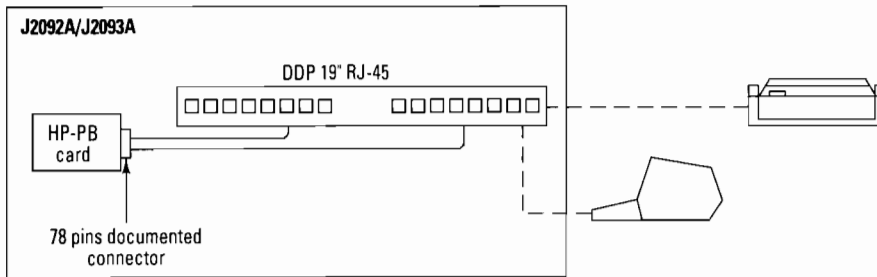
Figure 5.4 Asynchronous Devices Connection via 8-, 16-, or 32-Channel Multiplexers

HP-PB Asynchronous Multiplexers

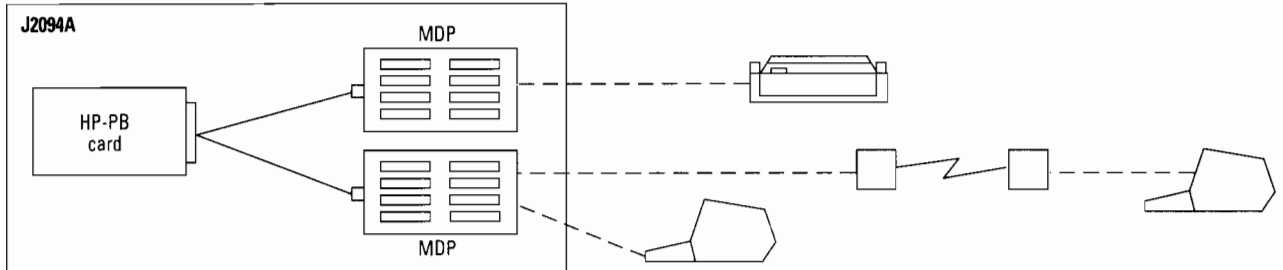
32-Channel Multiplexers – Direct Connect (RS232C)



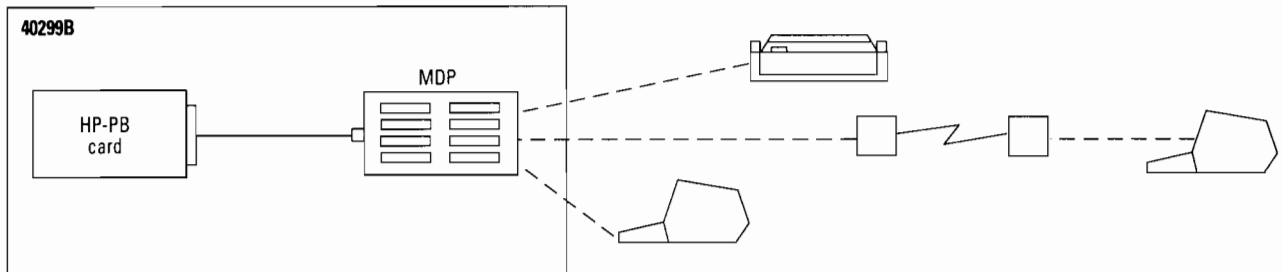
16-Channel Multiplexers – Direct Connect (RS232-C or RS423)



Modem Connect (RS232-C)



8-Channel Multiplexer
Direct (RS232-C or RS422)/Modem Connect (RS232-C)



- The HP-PB card is installed in the system.
- DDP (Direct Connect Distribution Panel)
 - Provides 16 standard RJ-45 female connectors.
 - Can be rack mounted in 19" cabinets using the C279xA products.
 - Can connect to a terminal only.
- MDP (Modem connect Distribution Panel).
 - Provides 8 standard DB-25 female connectors.
 - MDP can connect to either terminal or modem.
 - Up to 5 MDPs can be rack mounted in 19" cabinet using the J2084A product.

DTC (Datacommunication and Terminal Controller)

The DTC solution consists of a family of LAN-based Communication and Terminal Servers as well as a scalable family of network management products.

It is HP's solution for providing asynchronous connectivity to HP and non-HP systems for local and remote devices (terminals or PCs in terminal emulation mode, printers, modems).

The DTC 16TN is a high-performance Telnet Terminal Server for HP 9000 systems and any system running the standard Telnet-TCP/IP protocols.

The DTC 72MX is a modular high-performance communication server for HP 9000 Series 800 servers and for multivendor environments including HP 3000/900, or any system running the Telnet-TCP/IP protocol.

Each Series 800 system can support multiple DTCs on the LAN. The number of active connections supported will be determined by the application load on the system.

Also available is Telnet/OLTP (P/N J2123A), a standard-based High Performance Telnet (running concurrently with the standard Telnet) which significantly reduces the HP 9000 CPU usage and network traffic thus delivering unsurpassed performance for HP 9000 Series 800 transaction-oriented applications in networked environments.

DTC Management

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

- HP DTC Manager/UX (P/N J2120A).

With the DTC host-based management, a simple terminal connected locally or remotely to an HP 9000 Series 800 system is used to manage DTCs. It provides a user interface similar to other system administration tools and provides a means to configure DTCs in HP 9000 standalone or multisystem Telnet-TCP/IP environments.

- PC running HP OpenView DTC Manager Software (P/N D2355A)

The HP OpenView (PC-based) DTC Manager software provides an easy-to-use graphical user interface to manage DTCs. It is possible to integrate other management applications of network elements (such as HP X.25 Switches & PADs) on the same OpenView Windows workstation.

HP DTC Manager provides a means to configure DTCs for use to connect to HP 3000 Series 900 or HP 9000 Series 800 systems and to other systems in multivendor environments. It provides powerful network management features for complex network topologies.

In both host-based and PC based environments, the DTC software is downloaded from the management platform, allowing easy distribution and control of the DTC software.

For a detailed management features list, refer to the DTC Management Datasheet located in the Networking Communications Specification Guide (P/N 5091-3821E).

Customers can use the same PC to manage:

- **X.25 Switches and PADs** using HP OpenView Switch/PAD Manager Software (P/N J2017A)

A fully configured, turn-key HP OpenView Workstation is also available to ease ordering and installation — the HP OpenView Windows Workstation (P/N 32054D, opt. 201).

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 9000 Series 700/300/400/800, HP 1000 and for 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 hooked to the DTC can access systems connected to the same DTC (local switching) or to any other DTC (extended switching).

PAD support is provided through the use of an X.25 Network Access Card. As stated above, this functionality requires a configured PC with HP OpenView DTC Manager software.

Table 5.9 DTC Product and DTC Management Platform Selection

An "X" in the table indicates that the DTC product or Management platform can be chosen for the environment listed.	DTC 16TN J2060A	DTC 72MX J2070A	HP OpenView DTC Manager/UX J2120A	HP OpenView PC based 32054D Opt. 201 D2355A
Need access to system(s)				
Single HP 9000 Series 800	X	X	X	X
Systems without LAN or Telnet-TCP/IP (back-to-back)	X	X	—	X
Multiple systems running Telnet-TCP/IP: Includes HP 9000 systems (Series 800, 300, 400, 700, HP 1000 and non-HP systems)	X	X	X	X
Multiple systems: Includes HP systems (800, 300, 400, 700, HP 1000, HP 3000 and non-HP systems (running Telnet-TCP/IP)	X*	X	X	X
X.25 PADSupport to multiple systems (HP or non-HP running Telnet-TCP/IP)	—	X	—	X
Specific capabilities				
Max line speed	38.4 Kb/s	38.4 Kb/s		
RJ-45 connectors (direct connect only)	X	X		
Hardware handshake on direct ports	X	X		
Long distance cabling	RS-423	RS-423		
Full modem support	X	X		
X.25 board	—	256 VC/board 19.2/64 Kb/s		
Binary mode transfer	X	X	—	X
Telnet Access Board for HP 3000 Series 900	—	X	—	X
SNMP agent (expected Mid 93)	X	X		

* Requires the HP 3000 Telnet Access Board in one DTC 72MX for the HP 3000 Series 900 access. For specific management features, refer to the DTC management datasheet.

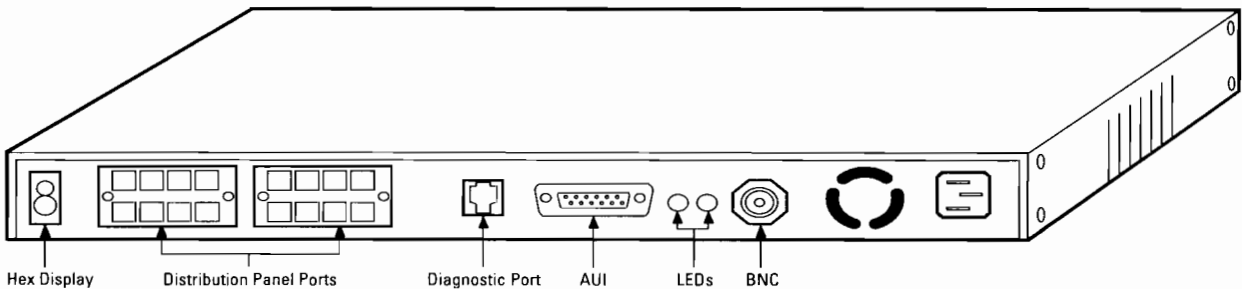
Configuring the DTC 16TN

The DTC 16TN uses a compact standard 19-inch chassis identical to other HP products such as HP EtherTwist products and is very easy to install in tabletop, wall-mounted or in rack-mounted

configurations. It comes with a compact RJ-45 breakout box for use with simple and low-cost cabling. The RJ-45 pin-out is ATT356 compliant to allow future migration from asynchronous devices to 10-Base-T LAN devices without change of cabling. For more details and configuration

examples, refer to the DTC racking and cabling guide available with the DTC 16TN installation guide (P/N 5959-4986). The racking and cabling guide can be ordered separately as well (P/N 5961-0373).

Figure 5.5 DTC 16TN



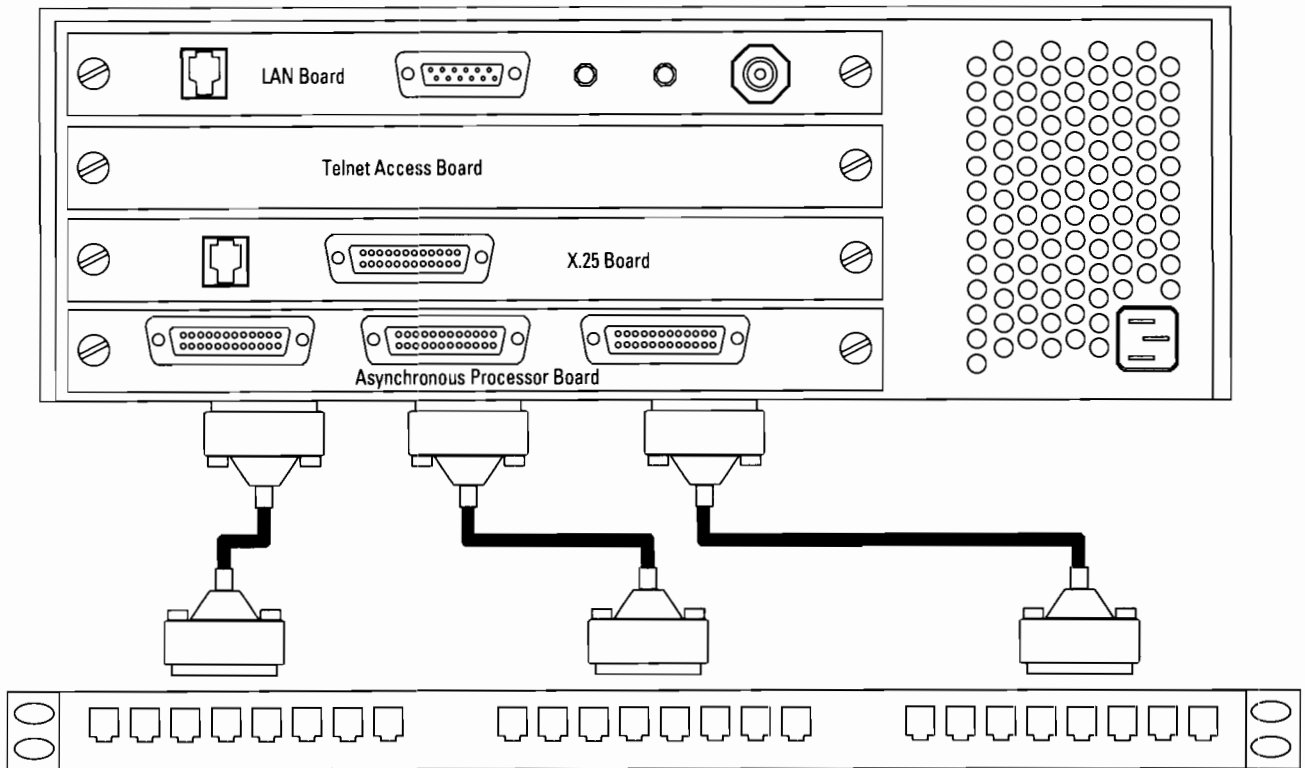
Configuring the DTC 72MX

The DTC 72MX has a 4-slot chassis compliant with the industry-standard EIA 19-inch form factor (3 EIA height units). One slot is always used for the

LAN interface. The three other slots are available for installing a combination of asynchronous, X.25 (up to three) and a Telnet Access (one only) Board for communication with an HP 3000 system.

The following picture shows a DTC 72MX configured with one asynchronous processor board (24-ports), one X.25 board, and the HP 3000 Telnet access card.

Figure 5.6 DTC 72MX



Racking the DTC16TN, 64 Port Bundle, and DTC72MX

The DTC16TN, 64 Port Bundle, and DTC72MX are rackable in EIA standard 19-inch computer racks.

Table 5.10 DTCs Supported in 1.1 Meter and 1.6 Meter Computer Racks

Product Number	Description	EIA Units	Current Consumption (VAC)	
			120	208–240
J2060AZ	DTC16TN (RJ-45)	2	0.5 A	0.25 A
Opt. UG5	Replace 8 RJ-45 Direct ports with 8 DB-25 modem ports	‡		
J2070AZ	DTC72MX	3	1.8 A	0.9 A
Opt. 001	24 RS-232 Direct ports with RJ-45 Connections	1		
Opt. 002	48 RS-232 Direct ports with RJ-45 Connections	2		
Opt. 003	72 RS-232 Direct ports with RJ-45 Connections	3		
Opt. UG5	Replace 8 Direct ports with 8 modem ports (max 2)	‡		
Opt. UG6	Replace 24 Direct ports with 24 modem ports (max 3)	‡		
A2957AZ	DTC 64 port bundle (RJ-45)	8	0.5 A*	0.25 A*
Opt. UG5	Replace 8 Direct ports with 8 modem ports (max 8)	‡		

* Each 16 port DTC

‡ Number of EIA units will depend on Modem Distribution Panel kit ordered:

C2792AZ will rack up to 5 MDPs (total 40 modem ports) with 6 EIAs.

J2084AZ will rack up to 5 MDPs (total 40 modem ports) with 7 EIAs.

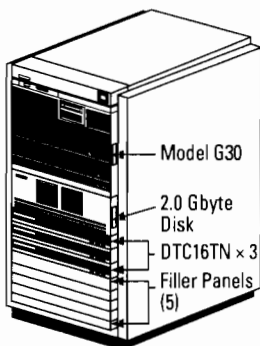
J2087AZ will rack up to 10 MDPs (total 80 modem ports) with 7 EIAs.

Note: Only one MDP racking kit is needed and must be ordered separately.

Note: LAN cables must be ordered separately due to wide range of types and lengths.

Figure 5.7 1.1 Meter Cabinet (A1896A)

Example 1: Model G30 with 2.5 Gbyte disk, 48 ports



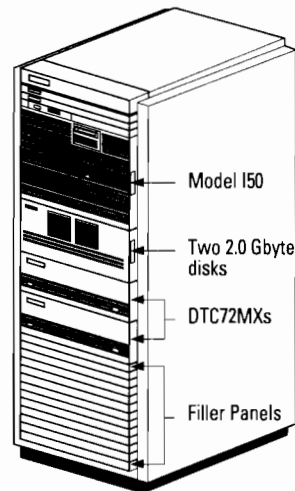
Qty.	P/N	Description
1	A2429A	HP 9000 G Class Server
1	A2434A	Model G30 SPU with 566 MB disk, 32 MB memory
1	B3108L Opt. UA9	64 user license
1	C2798AZ	Add racking hardware
1	A1896A	1.1 meter cabinet
1	C3023RZ	2.0 GB Disk
3	J2060AZ	DTC16TN with 16 ports

Refer to Section 4 for general system racking information.

Note: For additional details on racking the DTCs, see "DTC Cabling and Racking Guide" (P/N 5961-0373).

Figure 5.8 1.6 Meter Cabinet (A1897A)

Example 2: Model I50 with 5 Gbyte disk, 144 ports



Qty.	P/N	Description
1	A2431A	HP 9000 I Class Server
1	A2363A	Model I50 SPU with 2.0 GB disk, 64 MB memory
1	B3108L Opt. UAD	256 user license
1	C2798AZ	Add racking hardware
1	A1897A	1.6 meter cabinet
1	C3024RZ	Two 2.0 GB disk
2	J2070AZ Opt. 003	DTC72MX with 72 ports

Table 5.11 Product Summary

Description	Product/Opt. No.
Datcommunications and Terminal Controller with 16 ports (DTC 16TN).	J2060A
LAN access with BNC connector and standard 15-pin AUI 16 RS-232-C direct connect ports and RJ-45 connectors	
Replace 8 direct ports with 8 modem ports (can order one or two)	Opt. UG5
Replace 16 RS-232-C ports with 16 RS-423 ports (can order one)	Opt. UG4
Datcommunications and Terminal Controller with 72 ports (DTC 72MX).	J2070A
Includes: – a LAN access with BNC connector and standard 15 pin AUI – 3 available slots – a “table-top” front panel	
Replaces the table-top front panel by an HP system cabinet front-panel	Opt. 1AC
24 RS-232-C direct connect ports (uses one slot)	Opt. 001
48 RS-232-C direct connect ports (uses two slots)	Opt. 002
72 RS-232-C direct connect ports (uses three slots)	Opt. 003
Replaces 8 RJ-45 direct ports with 8 MODEM (DB-25) ports (it comes with 8-port female DB-25 distribution panels) (can order two)	Opt. UG5
Replaces 24 RJ-45 direct ports with 24 MODEM (DB-25) ports (can order max three)	Opt. UG8
24 RS-423 direct connect ports (uses one slot) (comes standard with 19-inch RJ-45 distribution panel, 1 EIA UNIT)	Opt. UG4
X.25 board with RS-232 interface (uses one slot)	Opt. 1CW
X.25 board with V.35 interface (uses one slot)	Opt. 1CX
TCP/IP-Telnet access board for HP 3000 (uses one slot)	Opt. 004
24-RS-282 direct connect ports for DTC 72MX (uses one slot)	J2076A
Replaces 8 direct ports with 8 modem ports	Opt. UG5
24 RS-423 direct connect ports for DTC 72MX (uses one slot)	J2077A
X.25 board for DTC 72MX (uses one slot)	J2079A
RS-232 interface	Opt. 1CW
v.35 interface	Opt. 1CX
HP 3000 Telnet Access Board (uses one slot)	J2080A
Connection Accessory Products	J2085A
8-port MODEM distribution panel includes – one panel with DB-25 connectors – a link cable for DTC connection	Opt. 101
8-port Direct connect distribution panel includes – one 19" (1 EIA-rack-mountable) panel with DB-25 connectors – a link cable for DTC connection	Opt. 102
24-port Direct Connect Distribution panel includes – one 19" (1 EIA-rack-mountable) panel with RJ-45 connectors – link cables for DTC connection	Opt. 103
8-port multiport cable (3-pin connectors)	Opt. 104

Table 5.11 Product Summary (cont'd)

Description	Product/Opt. No.
DTCs integrated in HP 9000 Series 800 1100 mm (A1896A) and 1600 mm (A1897A) computer racks	
DTC16TN Telnet Terminal Server	J2060AZ
Replace 8 direct ports with 8 MODEM ports (can order one or two)	Opt. UG5
DTC 64 Port Bundle Telnet Terminal Server	A2957AZ
Replace 8 direct ports with 8 MODEM ports (can order up to five)	Opt. UG5
DTC72MX Telnet Terminal Server	J2070AZ
24 RS-232 direct connect ports	Opt. 001
48 RS-232 direct connect ports	Opt. 002
72 RS-232 direct connect ports	Opt. 003
Replace 8 RJ-45 direct ports with 8 MODEM (DB-25) ports (can order one or two)	Opt. UG5
Replaces 24 RJ-45 direct ports with 24 MODEM (DB-25) ports (can order max three)	Opt. UG8
Add X.25 board with RS-232 interface	Opt. 1CW
Add X.25 board with V.35 interface	Opt. 1CX
Add Telnet Access board	Opt. 004
ARPA Extensions—Telnet/OLTP	J2123A
High Performance Telnet/OLTP for HP 9000 server Tier 1	Opt. 002
High Performance Telnet/OLTP for HP 9000 server Tier 2	Opt. 003
High Performance Telnet/OLTP for HP 9000 server Tier 3 (Model 890 only)	Opt. 004
Software on 1/2" MAGTAPE 1600 BPI	Opt. AA1
Software on DAT cartridge tape	Opt. AAH
Software on QIC cartridge tape	Opt. AA4
Software on CD-ROM	Opt. AAU
DTC manager running on an HP 9000 Series 800	
HP DTC Manager/UX	J2120A
Software on 1/4" cartridge	Opt. AA0
Software on 1/2" MAGTAPE 1600 BPI	Opt. AA1
Software on DAT cartridge tape	Opt. AAH
Software on QIC cartridge tape	Opt. AA4
Software on CD-ROM	Opt. AAU
Update to latest version	Opt. OCC
DTC manager running on the HP OpenView Windows platform	
HP OpenView Windows workstation (PC) preconfigured with the DTC Manager application software	HP 32054D Opt. 201
Localization options (must order one)	Opt. ABA Opt. AB2
Network connection options (must order one)	Opt. 101 Opt. 102 Opt. 103
The HP OpenView Windows workstation (HP 32054D) is a specially configured HP Vectra, with PC software already installed. It includes 2 Mb of additional memory, HP ThinkJet printer, and MS-DOS, MS-Windows, HP-ARPA & Network Services/DOS, HP OpenView Windows, HP AdvanceLink for Windows.	
DTC manager application software for an HP OpenView Windows (PC) workstation	D2355A
Update an existing HP OpenView Windows workstation with the latest revision of the software and DTC manager application.	D1824D Opt. 201

Table 5.12 Supported DTC Devices and Cabling

Device	DTC 16TN, DTC 72MX	
	RS232/DB25 Modem	RS232/DB25 Direct
HP2392A/93A/94A/97A	40234A	40234A
HP700/22/32/43/45	40234A	40234A
HP700/92/94/96/98	40234A	40234A
HP150X	40234A	40234A
HP3081A, 3082A/B	40234A	40234A
HP2622A/23A/24B/27A	N/A	13222Y
HP2625A/24B (port2)	40234A	40242Y
Portable+	92221M	92221M
HP Vectra (9pins)		
24540B /ptA	24542M	24542M
24541B /ptA	24542M	24542M
C2401A	40234A	20234A
C2402A	40234A	40234A
C1010J	40234A	40234A
C1010T	40234A	40234A
Printers and Plotters		
HP7550A	17355D	17355D
HP2227A, 28A, 76A, 77A	40234A	40234A
HP2562A, 63A/B/C, 64A/B/C	42034A	40234A
HP2932A, 33A, 34A	40234A	402234A
HP2684A/P, 86A/D	40234A	40234A
HP33440A/F, 47A/F, 49A, 59A	40234A	40234A
41063A	40234A	40234A
C1200A	40234A	40234A
C1202A	40234A	40234A
Modems	30062B	N/A
Extended switching		
HP2334A, 35 PADs to		
–terminal	40221A	40221A
–printer	40220A	40220A
HP2342A, HP TS830062B	30062B	

Note: The DTC 16TN and DTC 72MX provide RJ-45 connectors for direct connect. The RJ-45 pin-out is AT&T 356 compliant.

Table 5.12 Supported DTC Devices and Cabling (cont'd)

	DTC 16TN, DTC 72MX	
	RS232/DB25 Modem	RS232/DB25 Direct
DTC Cables		
For ThinLAN (10base2)		
C2227A/B/C/D/E/F/G/H Cables	92227A/B/C/D/E/F/G/H	92227A/B/C/D/E/F/G/H
Bulk cable (no end attachment)	92227S	92227S
Pair of connectors for bulk cable	92227L	92227L
Tee connector	92227N	92227N
Pair of terminators	92227P	92227P
For Ethertwist (10baseT)		
Ethertwist Transceiver	28685B	28685B
Cables	92268A/B/C/D	92268A/B/C/D
For ThickLAN		
ThickLAN MAU and coax cable	30241A	30241A
Cables	92254A/B/C/D/E/F/G/H	92254A/B/C/D/E/F/G/H
Cables	92253A/B/C/D/E/F/G/H	92253A/B/C/D/E/F/G/H

Note: These are potential cable options to connect the system to a DTC or both to a customer's internal LAN.

Section 6 Peripherals

Mass Storage Drive Functions

Disks (disk storage systems) provide high-capacity, non-volatile, fast-access mass storage for programs and data for the system. The key functions performed by disk drives are discussed below.

Support of System Boot-up

The most cost-effective way of supporting system boot-up is from a mass storage device that is capable of fast transfers, such as a disk drive. The boot-up device is usually a locally connected disk drive. When the boot-up device is a local drive, it is called the system disk. For this function, fast transfer shortens the time required to boot up the system.

Fast-Access Storage and Retrieval

Applications in all but the harshest environments typically use local disk drives for storing programs and data not currently in use, from which these are retrieved when and as needed. For this function, hard drives are preferred because of the greater capacity and faster storage and retrieval rates available with hard disk drives.

HP-UX Swap Space

Under HP-UX, when the total size of executing processes and their data exceeds the capacity of installed RAM, process data is written to disk temporarily when needed to make room for other processes or data. It is also possible for individual programs to exceed the capacity of installed RAM. The capability of shifting code and data from RAM to a disk drive, which thus becomes “virtual” memory (VM), is managed by the virtual memory system.

Each process has a virtual memory space of 4 Gbytes, which is in practice limited by available disk space. Whenever a process is dispatched (run), a space equal to its “total” size is allocated in swap space. Swap space must therefore at least equal the installed RAM and should, in fact, equal the total size of all the processes to be run in a maximum simultaneous mix.

Each CPU may have up to 8 disk drives with swap space on them, on separate or shared buses.

Series 800 Disk Drive Requirements and Performance

HP-UX commands and utilities are usually read in from disk each time they are executed. Disk drive performance is, therefore, key to providing adequately fast response to user’s requests. In multiuser systems and in certain single-user applications, multiple system disk drives provide an aggregate performance which exceeds that of a single drive. The I/O capacity (I/Os per second) of two similar drives is at least 1.5 times that of one drive alone, provided that the system and user demands are well distributed between the two disk drives.

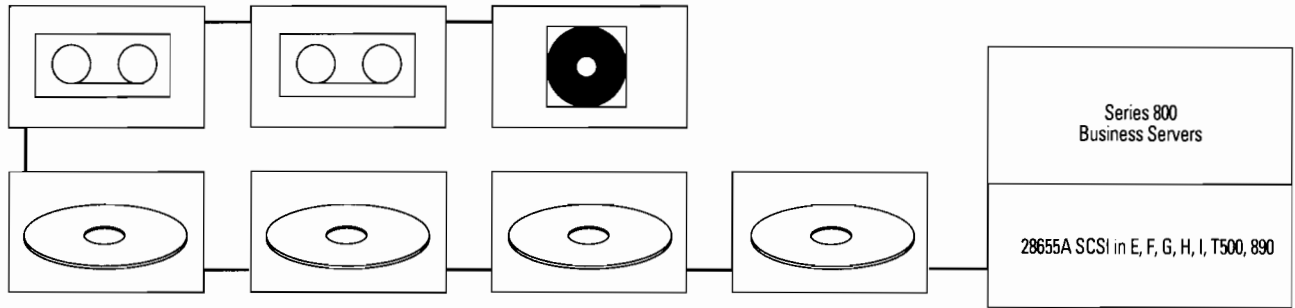
A slight performance increase can be gained in a multi-disk system by connecting the drives via multiple host adapters.

WARNING: Simple HP-IB devices (such as printers) cannot be connected to the same HP-IB interface as a mounted file system or swap disk drive.

Maximum Number of Disks

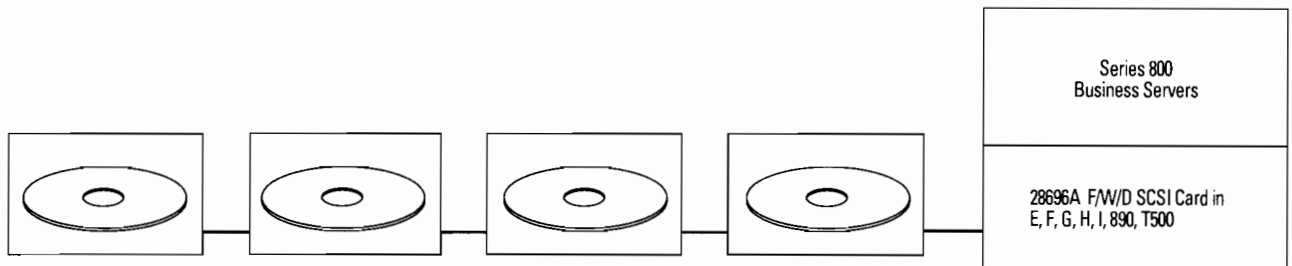
Refer to the “Series 800 Business Servers at-a-Glance” section for information on maximum disk support.

Figure 6.1 Connection of Single-Ended SCSI Devices to Series 800 Business Servers



- C2460F/R, C2461F/R, C2462F/R, C2472F/R, C2473F/R, C2474F/R, C3022T/R, C3023T/R, C3024T/R SCSI Disk Drives.
 C2464F/R, C2477F/R, C1512A, C1520A, C2464T/R, C2465T/R, C2466T/R, C2467T/R SCSI DAT/DDS Drives.
 C2476F/R, C2293U SCSI CD-ROM Drives.
- Up to 7 disk drives per interface card.

Figure 6.2 Connection of Fast/Wide Differential SCSI Devices to Series 800 Business Servers



- 1 GB F/W/D SCSI Disk Drives C3032R/T, C3035R/T, AND C3036T
 2 GB F/W/D SCSI Disk Drives C3550R/T, C3551R/T, AND C3553RZ
 F/W/D SCSI Disk Arrays:
 C2436HA/HZ, C2437HA/HZ
 C2439HA/HZ, C2440HA/HZ
- Up to 15 disk drives per interface card.
 - Up to 7 Fast/Wide Differential Disk Arrays per interface card.

Table 6.1 Product Summary

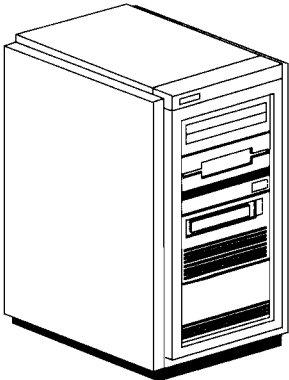
Description	Capacity	Product No./ Option No.
MINI-TOWER SCSI STORAGE SYSTEMS		
 <p>Mini Tower Floor Model</p> <p>SCSI Disks 3½" half-height SCSI Disks 5¼" full-height SCSI DDS 3½" half-height</p> <p>7 half-height equivalents or 3 full-height equivalents (any combination of mechanisms)</p>		
Mini-Tower SCSI Storage System With one 1 GB disk and one 2 GB DAT	1.0 GB Disk and 2.0 GB DAT	C3020T, Opt. 002
Mini-Tower SCSI Storage System With 1 GB disk.	1.0 GB Disk	C3022T, Opt. 002
Mini-Tower SCSI Storage System With one 2 GB half-height disk.	2.0 GB Disk	C3040T, Opt. 002
Mini-Tower SCSI Storage System With two 2 GB half-height disks.	4.0 GB Disk	C3041T, Opt. 002
Mini-Tower Fast/Wide SCSI Storage System With one 1 GB fast/wide disk.	1.0 GB Disk	C3032T, Opt. 002
Mini-Tower Fast/Wide SCSI Storage System With one 2 GB fast/wide disk.	2.0 GB Disk	C3550T, Opt. 002
Mini-Tower Fast/Wide SCSI Storage System With two 2 GB fast/wide disks.	4.0 GB Disk	C3551T, Opt. 002
Mini-Tower Fast/Wide SCSI Storage System With four 1 GB F/W/D SCSI disks.	4.0 GB Disk	C3035T, Opt. 002
Mini-Tower Fast/Wide SCSI Storage System	7.0 GB Disk	C3036T, Opt. 002
EXPANSION KITS FOR RACKMOUNTED AND MINI-TOWER SYSTEMS (For C302x R/T, C303x, C304x, and C355x R/T Storage Systems)		
SCSI-2 Expansion Disk For SCSI Storage System (C3023R-C3024R/T). Must order field service installation into rackmount.	1.0 GB Disk	C3027U, Opt. 002
SCSI-2 Expansion Disk For SCSI Storage System (C3040-C3041 R/T). Must order field service installation into rackmount.	2.0 GB Disk	C3044U, Opt. 002
Fast/Wide Expansion Disk For SCSI Storage System (C303x R/T). Must order Opt. 002.	1.0 GB Disk	C3037U, Opt. 002
Fast/Wide Expansion Disk For SCSI Storage System (C355x R/T). Must order Opt. 002.	2.0 GB Disk	C3554U, Opt. 002
2 GB DAT Expansion Kit	2.0 GB DAT	C2477U
2-8 DAT Expansion Kit	2-8 GB DAT	C2478U
600 MB CD-ROM Expansion Kit	600 MB CD-ROM	C3560U

Table 6.1 Product Summary (cont'd)

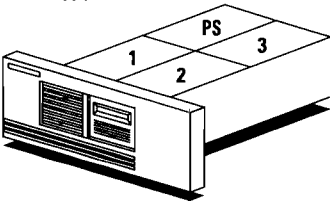
Description	Capacity	Product No./ Option No.
RACKMOUNT SCSI STORAGE SYSTEM (For C2785A 1.1 m and C2786A 1.6 m Cabinets)		
 <p>Model "R"</p>	<p>Maximum four half-height equivalents -- Slot 1 and 2 (Disk, DAT, 8mm or CD-ROM)</p> <p>Maximum one disk -- Slot 3 (3.5-inch or 5.25-inch disk only)</p> <p>Maximum of 7 peripheral devices on a single SCSI Bus</p> <p>Maximum of 6 meters (internal and external) SCSI Bus</p> <p>Maximum of 15 peripheral devices on a single F/W/D SCSI Bus</p> <p>Maximum of 25 meters (internal and external) F/W SCSI Bus</p>	
<p>Rackmount SCSI Storage System* With 1 GB disk.</p>	1.0 GB Disk	C3022R, Opt. 002
<p>Rackmount SCSI Storage System* With one 2 GB half-height disk.</p>	2.0 GB Disk	C3040R, Opt. 002
<p>Rackmount SCSI Storage System* With two 2 GB half-height disks.</p>	4.0 GB Disk	C3041R, Opt. 002
<p>Rackmount Fast/Wide SCSI Storage System* With one 1 GB fast/wide disk.</p>	1.0 GB Disk	C3032R, Opt. 002
<p>Rackmount Fast/Wide SCSI Storage System* With one 2 GB fast/wide disk.</p>	2.0 GB Disk	C3550R, Opt. 002
<p>Rackmount Fast/Wide SCSI Storage System* With two 2 GB fast/wide disks.</p>	4.0 GB Disk	C3551R, Opt. 002
<p>Rackmount Fast/Wide SCSI Storage System With four 1 GB fast/wide disks</p>	4.0 GB Disk	C3035R, Opt. 002
<p>Rackmount SCSI Tape Storage System With one 2 GB DAT</p>	2.0 GB Tape	C2464R
<p>Rackmount SCSI Tape Storage System With two 2 GB DAT</p>	4.0 GB Tape	C2465R
<p>Rackmount SCSI Tape Storage System With one 2-8 GB DAT</p>	2-8 GB Tape	C2466R
<p>Rackmount SCSI Tape Storage System With two 2-8 GB DAT</p>	4-16 GB Tape	C2467R
8 MM TAPE DRIVE		
<p>5 GB 8 mm SCSI Tape Drive Installation kit for F/ G/ H/ I SPU Installation kit for C302XR and C304XR Rackmount Installation kit for C302XT and C303XT Mini-Tower</p>		<p>A3024A Opt. 002 Opt. 004 Opt. 003</p>

Table 6.2 Series 6000 External Standalone SCSI Disk Storage Systems

Product Number	C3022T/R	C3023T/R	C3024T/R
Interface	Single-ended SCSI 2 →		
Capacity	1 GB	2 GB	4 GB
Average Seek Time (ms)	10.5	11.5	11.5
Avg. Latency (ms)	5.6	5.6	5.6
Transfer Rate [†] Mbytes/sec. (burst)	3.1-5.3	3.1-5.3	3.1-5.3
Expansion Kits	C3027U—1 GB Expansion Kit C3028U—2 GB Expansion Kit (full-height) C2477U—2 GB DAT Expansion Kit C2478U—Up to 8 GB DAT Expansion Kit C2293U—600 Mbyte CD-ROM Expansion Kit		

T = Tower package supports up to 7 half-height devices (1 full-height device takes 2 half-height slots).

R = 19" EIA rack mounted, supports up to 3 full-height devices or 5 half-height devices.

† The average transfer rates listed here indicate the capability of the disk hardware; they are not system achievable transfer rates.

Table 6.3 Series 6000 External Standalone SCSI Disk Storage Systems for CIO Systems

Model*	1350F	1350R
Product Number*	C2462F	C2462R
Interface	Single Ended SCSI 2 →	
Capacity	1355 MB	1355 MB
Average Seek Time (ms)	13.5	13.5
Avg. Latency (ms)	7.5	7.5
Transfer Rate [†] Mbytes/sec. (burst)	2.88	2.88
Expansion Kits	C2474F, C2474R—1355 Mbyte kit (5.25 inch disk) C2477F, C2477R—2000 Mbyte DAT kit (full-height) C2476F, C2476R—600 Mbyte CD-ROM kit (half-height)	

* F = Floor standing, supports 3 full or 7 half-height devices (disk, DDS, or CD-ROM).

R = 19" EIA rack mounted, supports 2 full or 4 half-height front loading (disk, DDS, or CD-ROM).

† The average transfer rates listed here indicate the capability of the disk hardware; they are not system achievable transfer rates.

Fast/Wide SCSI Disks and Disk Arrays

A new 1-Gbyte 3.5-inch Fast/Wide SCSI disk drive and a Fast/Wide SCSI disk array (up to 8 Gbytes) capacity are now available on the Series 800. All devices support boot/swap at first release (HP-UX 9.04). Characteristics of the 1-Gbyte Fast/Wide disk drive are summarized in **Table 6.4**.

In addition to the Fast/Wide SCSI disk drive support, the Series 800 now also supports a Fast/Wide SCSI disk array. This device has four base configurations with a maximum protected capacity of 8 Gbytes. In addition, RAID modes 3, 5, and Independent are now supported. **Table 6.5** summarizes some key characteristics of the new Fast/Wide SCSI disk arrays.

The Fast/Wide SCSI arrays described in **Table 6.5** are configurable in RAID modes 3, 5, and Independent. **Table 6.7** summarizes the key characteristics of these RAID modes.

Note: Only seven disk arrays are supported per Fast/Wide SCSI card (28696A). Also if hard partitions are used in lieu of LVM with the F/W SCSI array, the array cannot be a root, boot, dump, or swap device. With hard partitioning, the array is limited to a configured capacity of 2 Gbytes total.

Table 6.4 Summary of 1-Gbyte Fast/Wide Disk Drive Characteristics

	Product Numbers			
	C3032R Opt. 002 C3032T Opt. 002	C3035R Opt. 002 C3035T Opt. 002	C3036U, Opt. 002	C3037U Opt. 002
Description	Rack and tower storage enclosures containing one 1-GB Fast/Wide disk drive	Rack and tower storage enclosures containing four 1-GB Fast/Wide disk drives	Tower storage enclosure containing 7 1-GB Fast/Wide disk drives	1-GB Fast/Wide disk upgrade kit for storage enclosure
Capacity	1 GB	4 GB	7 GB	1 GB
Interface	Fast/Wide SCSI	Fast/Wide SCSI	Fast/Wide SCSI	Fast/Wide SCSI
Avg. random seek	10.5 ms	10.5 ms	10.5 ms	10.5 ms
Device latency	5.6 ms	5.6 ms	5.6 ms	5.6 ms
Controller overhead	<.5 ms	<.5 ms	<.5 ms	<.5 ms
Drive burst transfer rate	2.9–5.3 MB/s	2.9–5.3 MB/s	2.9–5.3 MB/s	2.9–5.3 MB/s
Drive sustained transfer rate	2.2–3.8 MB/s	2.2–3.8 MB/s	2.2–3.8 MB/s	2.2–3.8 MB/s
HP-UX release support	HP-UX 9.04	HP-UX 9.04	HP-UX 9.04	HP-UX 9.04
(Boot, root, dump, swap) support on Series 800	Yes, requires HP-UX 9.04	Yes, requires HP-UX 9.04	Yes, requires HP-UX 9.04	Yes, requires HP-UX 9.04

Table 6.5 Summary of Fast/Wide SCSI Disk Array Characteristics

	Product Numbers			
	C2440HA**	C2439HA**	C2437HA**	C2436HA**
Capacity	8 GB	4 GB	4 GB	2 GB
Disk type	2 GB 5.25"	2 GB 5.25"	1 GB 3.5"	1 GB 3.5"
Average seek	11.5 ms	11.5 ms	10.5 ms	10.5 ms
Average latency	5.5 ms	5.5 ms	5.5 ms	5.5 ms
Disk drive MTBF	300,000 hours	300,000 hours	300,000 hours	300,000 hours
Usage	Large capacity systems	Large capacity systems	Small performance-sensitive systems, requiring as many disks as possible	Small performance-sensitive systems, requiring as many disks as possible
Support on Series 800	HP-UX 9.04	HP-UX 9.04	HP-UX 9.04	HP-UX 9.04
Boot support*	Yes, requires HP-UX 9.04	Yes, requires HP-UX 9.04	Yes, requires HP-UX 9.04	Yes, requires HP-UX 9.04
Number of devices per F/W adapter card 28696A	7 total, addresses 0–7 only	7 total, addresses 0–7 only	7 total, addresses 0–7 only	7 total, addresses 0–7 only

* No boot support for RAID Level 3 or independent mode until further notice.

** UPS needed to ensure powerfail protection.

Table 6.6 Summary of 2 GB Fast/Wide Differential Disk Drive Characteristics¹

	Product Numbers			
	C3550R Opt. 002 C3550T Opt. 002	C3551R Opt. 002 C3553T Opt. 002	C3553RZ Opt. 002	C3554U Opt. 002
Description	Rack & tower storage enclosures containing one 2-GB F/W/D disk drive	Rack & tower storage enclosures containing two 2-GB F/W/D disk drive	Rack storage enclosure containing four 2-GB F/W/D disk drive	2 GB F/W disk upgrade kit for storage enclosure
Capacity	2 GB	4 GB	8 GB	2 GB
Disk Type	2 GB 5.25"	2 GB 5.25"	1 GB 3.5"	1 GB 3.5"
Average seek	11.5 ms	11.5 ms	10.5 ms	10.5 ms
Average latency	5.5 ms	5.5 ms	5.5 ms	5.5 ms
Disk drive MTBF	300,000 hours	300,000 hours	300,000 hours	300,000 hours
Usage	Large capacity systems	Large capacity systems	Small performance-sensitive systems, requiring as many disks as possible	Small performance-sensitive systems, requiring as many disks as possible
Support on Series 800	HP-UX 9.04	HP-UX 9.04	HP-UX 9.04	HP-UX 9.04
Boot support*	Yes, requires HP-UX 9.04	Yes, requires HP-UX 9.04	Yes, requires HP-UX 9.04	Yes, requires HP-UX 9.04
Number of devices per F/W adapter card 28696A	7 total, addresses 0-7 only	7 total, addresses 0-7 only	7 total, addresses 0-7 only	7 total, addresses 0-7 only
HP-UX Release Support	HP-UX 9.04	HP-UX 9.04	HP-UX 9.04	HP-UX 9.04
Boot, dump, swap on S800	Yes, requires HP-UX 9.04	Yes, requires HP-UX 9.04	Yes, requires HP-UX 9.04	Yes, requires HP-UX 9.04

Table 6.7 Summary of RAID Mode Characteristics

	RAID Independent Mode*	RAID Mode 3**	RAID Mode 5
Data protection from disk failure	No	Yes	Yes
Type of data striping	None	Byte	Block
Automatic load balancing	No	Yes	Yes
Random I/O rate for small blocks <16 kb	High (if load balanced)	Medium	High for 'Reads,' medium for 'Writes'
Sequential transfer rate for large blocks >32 kb	Low	High	Low
Usable data storage capacity	100%	80%—5 Disk Array 67%—3 Disk Array	80%—5 Disk Array 67%—3 Disk Array

* A Fast/Wide SCSI Disk Array configured in independent mode (P/Ns C2240HA, C2439HA, C2437HA, C2436HA) cannot be mixed on the same Fast/Wide SCSI bus as a 2 GB Fast/Wide Disk Drive (P/Ns C3550R/T, C3551R/T, C3553R).

** No boot support for RAID Level 3, or independent mode until further notice.

‡ Orderable March 1, 1994.

HP-FL Disk Storage

HP Disk Arrays

Disk storage products available on HP-FL are the C2254HA, C2254B, C2252HA, and C2252B disk arrays. Refer to **Figure 6.8** for supported server models and features.

The HP-FL disk arrays offer a variety of different configurations. Some of these offer less data protection than others. In short, Hewlett-Packard recommends that customers interested in data security choose striped mode with parity over striped mode without parity (unless the later is used in a mirrored configuration). The C2254B and C2252B offer “striped” modes, where data is striped across 2 (C2252B) or 4 (C2254B) mechanisms so that a single sector from the hosts’ point of view resides on both or all 4 mechanisms.

The C2254HA and C2252HA offer a RAID 3 “striped with parity” mode, where the data is striped, but an extra disk mechanism preserves a parity checksum of the others, so that the array can survive a mechanism failure invisibly. In the case of such a failure, the controller uses the parity disk to reconstruct the data on the failed drive.

The distinction between striped with and without parity is important. First, a striped disk array without parity cannot survive a mechanism failure. Second, such a disk has a lower mean time between failure, because of this inability to survive a mechanism failure. And third, such a disk is subject to a new type of failure (new with disk arrays) which, though rare, could conceivably cause data loss, depending on the application. This new type of disk failure occurs when:

- A power failure occurs, AND
- The power remains off beyond the period safe-guarded by the battery backup, AND
- The disk was doing a write, AND
- Power loss occurred in such a way as to cause the write to get to some mechanisms and not to others, AND

- The application relies on the resulting data mix without recognizing it as an error.

We estimate that, *if* the first two conditions are met, then the chances of the last three also being met are less than 1 in 1,000. This type of error is essentially impossible with a parity disk, since the mix of old and new data should corrupt the checksum, causing the disk to return a read error for that sector.

For applications where performance is a key consideration, choose the independent mode C2254B and C2252B models (require HP-UX 9.0 and native HP-PB card P/N 28615A).

For applications where both performance and high availability are key, choose the C2252HA model.

Table 6.8 HP-FL Disk Array Support Matrix

HP-UX Release	8.0	8.02	8.06	9.0	9.0
Server Models Supported	832, 842, 852, 850, 865, 870/100	827, 847, 857, 867, 877, G30, G40, H20, H30, H40, 130, 140	870/200, 870/300, 870/400	850, 855, 860, 865, 870/100, 870/200, 870/300, 870/400	832, 842, 852, 827, 847, 857, 867, 877, 887, 897, 890, G30, G40, G50, H20, H30, H40, H50, 130, 140, 150, 160, 170, T500
2-way Striped with Parity Disk	X	X	X	X	X
2-way Striped, no Parity Disk	X	X	X	X	X
4-way Striped with Parity Disk	X	X	X	X	X
4-way Striped, no Parity Disk	X	X	X	X	X
Independent Mode, 3 disks*					X
Independent Mode, 5 disks*					X
Hot Plug Support	X	X	X	X	X
Powerfail	X	X	X	X	X
Supported as Boot Device					X

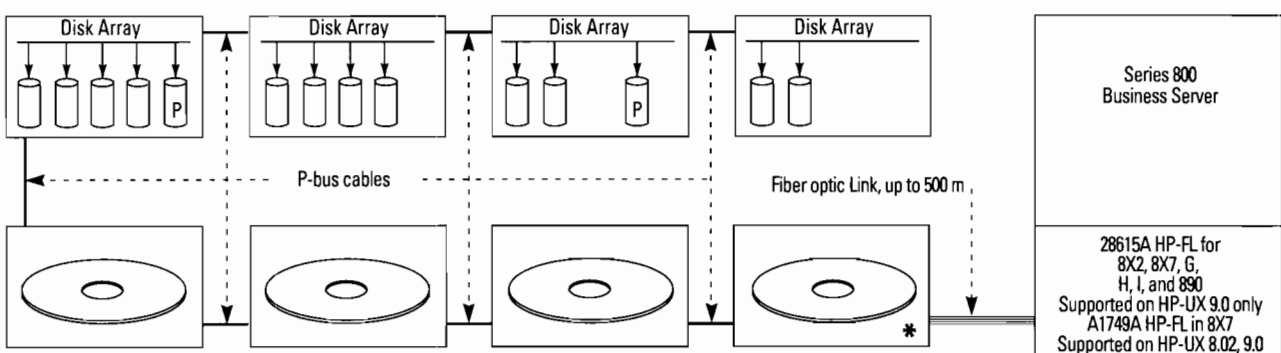
Note: Striped, no parity configurations are not recommended where high availability is required.
 *Independent mode requires HP-PB FL card, P/N 28615A.

The following disk array systems are supported on Series 800 Business Servers.

Table 6.9 External Standalone HP-FL Disk Array Systems

Product Number	C2254HA	C2254B	C2252HA	C2252B
Expansion Kit/Replacement Module (1.35 GB)	C2251A	C2251A	C2251A	C2251A
Interface	HP-FL	HP-FL	HP-FL	HP-FL
Capacity	5.4 GB + Parity Disk	5.4 GB	2.7 GB + Parity Disk	2.7 GB
Average Seek Time (ms)	13.5	13.5	13.5	13.5
Average Latency (ms)	7.5	7.5	7.5	7.5

Figure 6.3 Connection of HP-FL Disks and Disk Arrays to Series 800 Business Servers

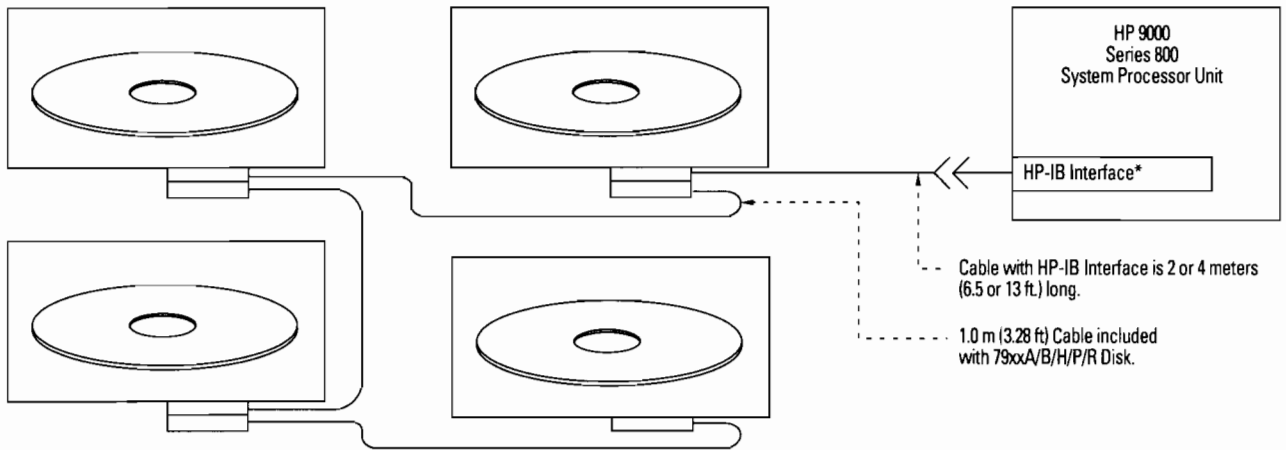


HP C2201A, or C2204A Disks or C2254HA, C2254B, or C2252B Disk Arrays (Up to 8 drives/arrays)
 * Must be standard HP C2201A or C2204A Disk Drive, C2252HA/B or C2254HA/B Disk Array
 Note: Due to firmware change, the ChanSpan adapter used to place HP-FL cards into 8X2S is not compatible with 8X7, G, H, I. A new HP-FL card (28615A for HP-UX 9.0) must be placed in G, H, I servers.

HP-FL Disks and HP-FL Disk Array Support and 8 MB Systems

Series 800 SPUs with only 8 MB of memory must upgrade to a minimum of 16 MB if HP-FL disk storage is added and is intended to be used as the root volume (boot device). This applies primarily to 8 MB systems prior to 8x7s (8x7 and F-Class systems supported 8 MB minimum memory, but not HP-FL disk drives).

Figure 6.4 HP-IB Disk Memory Connections to HP 9000 Series 800 Servers



Up to four disks per HP-IB interface

* HP 28650B HP-IB Interface in Models E, F, G, H, I,
HP 27110B HP-IB Interface in Models 855, 860, 865, and 870.

HP-IB Disk Storage

Disk drives may be connected to HP 9000 Series 800 Servers via an HP-IB interface, the HP 28650B interface, for Model E, F, G, H, I, 8x7s, and 890 Servers. **Figure 6.4** shows disk connections via HP-IB interface. Note that a maximum of four disks are supported by each HP-IB interface. HP-IB is not recommended for new systems as HP-FL and SCSI offer better performance at a lower cost.

Rewritable Optical Disk Libraries and Drives

A variety of optical disk storage products are available on the Series 800 via the HP 27147A SCSI interface (for Models 850S, 855S, 860S, 865S, and 870S) or the HP 28655A SCSI interface (for Models E, F, G, H, I, 8x7s, T500 and 890). With HP-UX 9.04, rewritable optical drives whose product numbers end with a "T" support Powerfail.

Rewritable optical disk libraries provide low cost, random access data storage in capacities from 10 GB to 187 GB. These libraries are best suited for on-line archival storage of infrequently accessed data, unattended backup, and storage of large data files such as

electronic images. HP's Direct Access Secondary Storage (DASS) products fill the price performance gap between online hard disks and offline tape storage.

HP Rewritable optical disk products are now available with the new HP designed and manufactured high-performance optical drive. The new drive is available in the new Model 20LT deskside library, and models 40LT, 120LT, and 200LT libraries. The new drives are faster and more reliable. Specific differences between the old and new drives are listed in **Table 6.10**.

See **Table 6.11** for a complete support matrix of our current peripherals offering.

ECMA vs ISO

The rewriteable optical disks used in HP's optical products conform to ANSI (ANSIX3B11) and ISO (ISO/IEC 10098A) specifications for continuous composite format. In keeping with emerging industry standards, the libraries implement the Small Computer System Interface (SCSI) in asynchronous mode with the flexibility of separate bus IDs for each drive and the autochanger.

HP-UX has implemented the software drivers in such a way as to make each surface of an optical cartridge appear as a mountable file system in the operating system. In this manner, each cartridge surface is equivalent to

Table 6.10 Improvements in Optical Drives

Description	Sony Drive	HP drive	Improvement
Access time, ms	104	35	3x
Maximum transfer rate, KB/s, write/read	340/680	600/1200	
Read	340	500	1.5x
Write	680	1,000	1.5x
Load/unload time, seconds	10	4.5	2x
MTBF, hours	25,000	40,000	1.5x



Table 6.11 Rewritable Optical Disk Libraries and Drives

Description	Capacity	Average Access Time	Powerfail Support	First Release Supported On	Product Number
Model 650C Optical Disk Drive	650.0 MB	35 ms	HP-UX 9.0	HP-UX 9.0	C1701C
Model 10LC Optical Library System	10.0 GB	35 ms	HP-UX 9.0	HP-UX 9.0	C1708C
Model 20C Optical Disk Library System	20.8 GB	35 ms	HP-UX 9.0	HP-UX 9.0	C1700C
Model 60C Optical Disk Library System	57.2 GB	35 ms	HP-UX 9.0	HP-UX 9.0	C1704C
Model 100C Optical Disk Library	93.6 GB	35 ms	HP-UX 9.0	HP-UX 9.0	C1705C
Model 20T Optical Library	20.8 GB	35 ms	HP-UX 9.0	HP-UX 9.0	C1708T
Model 40T Optical Library	41.6 GB	35 ms	HP-UX 9.0	HP-UX 9.0	C1700T
Model 120T Optical Library	114.4 GB	35 ms	HP-UX 9.0	HP-UX 9.0	C1704T
Model 200T Optical Library	187.2 GB	35 ms	HP-UX 9.0	HP-UX 9.0	C1705T

Table 6.12 Other Specifications

	Model 20LT (in deskside cabinet)	Model 40T	Model 120T	Model 200T
Physical Characteristics				
Height	493.8 mm (19.5 in)	720 mm (28.4 in)	1847 mm (72.7 in)	1847 mm (72.8 in)
Width	220 mm (8.7 in)	375 mm (14.8 in)	651 mm (25.6 in)	651 mm (25.6 in)
Depth	691.3 mm (27.3 in)	800 mm (31.5 in)	971 mm (38.2 in)	971 mm (38.3 in)
Weight (Net)	34.9 Kg (76.9 lbs)	86 Kg (189.6 lb)	347 Kg (765 lb)	360 kg (793.7 lbs)
Power Requirements				
Line Voltage	100-127 Vac, 200-240 Vac, 50-60 Hz	100-127 Vac, 200-240 Vac, 50-60 Hz	100-127 Vac, 200-240 Vac, 50-60 Hz	100-127 Vac, 200-240 Vac, 50-60 Hz
Power Consumption	100 W Maximum, 70 W Typical	250 W Maximum, 118 W Typical	457 W Maximum, 200 W Typical	250 W Maximum, 110 W Typical

an on-line disk of 650 MB (performance is slower than a Winchester disk). Any or all of the cartridges in a library may be mounted and on-line. Those cartridges that are not physically in a library drive will have their I/O requests queued until their turn for access to a drive comes up.

The HP-UX software drivers also support raw access to each optical cartridge. HP-UX utility commands such as *cpio* and *dd* can also function on the optical cartridges in raw or block mode.

Application Support

Application Transparent Driver

HP has developed a special integration of optical libraries with the HP-UX environment which is included in every copy of HP-UX (beginning with HP-UX 8.0) to give optical storage access to applications, without burdening users or application programs with media management. This driver is useful for VABs and end-users who develop

their own applications. Each surface in the Jukebox is virtually mounted into the file system through a "mount" command. Once this is accomplished, the surfaces become logically attached to the file system and respond to any HP-UX command. The driver takes care of mounting each platter as it is required by the application. Data can be written to the disks in "raw mode" or as files.

Note: The "AUTOCH" driver can not be used simultaneously with SAM or Remote Watch utilities.

Unattended Network Backup

HP Omniback is a distributed network backup solution HP-UX or Domain networks. It supports single or multiple optical libraries. It centralizes and orchestrates network backups while offering full HP service and support.

HiComp HIBACK/HIBARS is a network backup management product that can back up a heterogeneous network of HP-UX systems, PCs, and MPE systems. It has software data compression and parallel writes to several devices for high capacity and performance. It also has simple administration of the entire network backup through HIBACK, and individual user recovery of files. It supports HP libraries connected to HP-UX hosts.

Host System Backup

HP Omniback/Turbo is a high-speed direct connect backup solution for Series 800 systems. It makes an image copy of the hard disk on file servers or multi-user systems. It minimizes backup downtime by writing to one or more optical libraries in parallel. This form of backup is especially useful in making database backups. Omniback/Turbo also includes the network component for a comprehensive system backup facility.

Fbackup/Frecover also support the optical library as a backup device.

Third-Party Network Backup/Archival Solution for Optical Library System

Archival Management and Storage System by Advanced Archival Products.
6595 S. Dayton St., Suite 1200
Greenwood Village, CO 80111
Phone: (303) 792-9727

- Single file system allows a jukebox to logically appear as a single hard disk drive
- Allows transparent access to applications
- Allows high-speed access to frequently used data through magnetic disk cache
- Provides complete volume management including tracking of media in and out of the jukebox
- Support popular network protocols

NetArchive by Advanced Software Concepts
2430 Vineyard Ave.
Escondido, CA 92029
Phone: (619) 737-9544

- Distributed hierarchical storage management system (DHSM)
- Based on client/server model
- Allows any number of mass storage systems to be distributed across the network
 - automated file migration and retrieval
 - user-transparent functionality
 - supported special file system features of each platform
- Manage networks of HP-UX, Domain/OS, SunOS, and other UNIX

Tape Drives

Types of Software Installation and Backup Capabilities

CD-ROM

HP-UX and associated software products are available on CD-ROM for software installation. Using an HP provided codeword, the software ordered is “unlocked” from the CD-ROM and loaded onto the system.

Note: CD-ROM software is available for HP-UX releases 8.02 and 9.0 and updates only.

QIC

QIC provides a low cost installation and back-up solution for low-end systems. The QIC drive is available as an integrated mechanism only for 8x7S, E, F, G, H, and I Business Servers.

DDS Tape Units

High capacity 4 mm DDS-Format Digital Audio Tape provides low-cost, unattended back-up.

With HP-UX 8.0 and later, fast search is supported. This capability allows the access of any file in an average of 20 seconds. Software is now available via DAT for all Series 800 servers.

Magnetic Tape Drive

Magnetic Tape Drives are an alternative for software installation and backup. They can not be connected to the same HP-IB interface as the disk drives in the Series 800 CIO servers.

In addition, it is recommended that when using a SCSI Magnetic Tape Drive, the device be connected to its own separate SCSI host adapter in the SPU. In some instances when the Magnetic Tape Drive is powered down, the bus “glitches” and other peripherals on the bus may cease functioning properly, increasing the possibility of data corruption. Once this event has occurred, the only way to reset the bus is to power down the SPU, then bring it back up.

Cable Pin-Outs

Cable pin-outs can be referenced in the HP Peripheral Configuration Guide, P/N 5959-2479.

8 mm

The 8 mm tape drive is a popular choice for backup of Sun/IBM/NCR UNIX systems. 8 mm has large capacity and fast transfer rate, suitable for the 10–30 GB range of capacity. No software media or factory integration is available in 8 mm format from HP. 8 mm is supported on E/F/G/H/I and 8x7 Business Servers as internal and external devices. Requires 9.04.

3480

3480 is the de facto standard for IBM mainframe backup. HP supports selected StorageTek tape autochangers. These high-speed tape drives are suitable for data interchange with mainframes or low-range backup of 2–6 GB. No software media available in 3480 format. Requires 9.04.

Floppy Disk Drive

The SCSI-based industry-standard 1.44 MB micro floppy drive is available for E class servers as an internal device only. It is suitable for data interchange with PCs and workstations. No software media is available from HP in floppy disk format. Requires 9.04.

Table 6.13 External SCSI Tape Drives Supported in Series 800 Business Servers

Product Number	Name/Description	Interface Used	Recording Density	Native Transfer Rate (KB/sec)	Native Capacity [†]
7980S [‡]	Autoloading Magnetic Tape Unit	SCSI	6250/1600 cpi	781/200	140/40 Mbytes in 2400 feet
7980SX [‡]	Autoloading Magnetic Tape Unit with Data Compression	SCSI	CPR*/6250/1600 cpi	C*/781/200	280-420/140/40 Mbytes in 2400 feet
C2477S	DDS Format Tape Drive Mechanism	SCSI Internal Mech. Only (Model 8x7 only)	61,000 bpi	183	2000 Mbytes per Cassette
C1512A [†]	DDS Format Tape Drive Standalone Mechanism	SCSI	61,000 bpi	183	1300 Mbytes per Cassette
C2477U	DDS Format Tape Drive Mechanism for Series 6000 Storage Enclosure	SCSI	61,000 bpi	183	2000 Mbytes per Cassette
C2478U	DC-DDS Format Tape Drive Mechanism for Series 6000 Storage Enclosure	SCSI	61,000 bpi	183	2000 Mbytes per Cassette
C1520B	DDS Format Tape Drive Standalone**	SCSI	61,000 bpi	183	2000 Mbytes per Cassette
C1521B	DC-DDS Format Tape Drive Standalone**	SCSI	61,000 bpi	183	2000 Mbytes per Cassette
A3024A	8 mm tape drive	SCSI	N/A	500	5 GB per Cassette

* CPR (compression) gives 2 to 3 times tape data capacity and transfer rate of 6250 cpi recording density without compression.

** For use on HP-UX 8.02 order C1521B option 800.

† Typical DDS compression ratios are 2:1.

† Obsolete, listed for reference only.

‡ For 208V–240V power, order power cord (8120-1860).

Installation and Backup Selection Criteria

Transfer Rate and Capacity

See **Table 6.13** for relative transfer rates and capacities of the DDS Tape Drives, Cartridge Tape Subsystems, 8 mm tape, and Magnetic Tape Drives that are supported for use in HP 9000 Series 800 servers.

Table 6.14 Data Compression DDS DAT Drive Specifications

Capacity	2 to 8 Gbytes (90 meter tape)
Transfer rate (sustained)	183 to 732 Kbytes/sec
Transfer rate (burst)	
Asynchronous	1.5 Mbytes/sec maximum
Synchronous	5.0 Mbytes/sec maximum
Search speed	An average of 30 seconds access for any part of a 90 meter tape
Reliability (MTBF)	50,000 power-on hours
Power Requirements	+5V dc: ± 5%, 0.6 amps typical +12C dc: ± 10%, 0.1 amps typical, 0.6 amps maximum (<< 1 sec)
Power Consumption	5 watts typical

Digital Audio Tape Drives

Second Generation

The second generation DAT/DDS drives (C1520A, C1521B, C2464R, C2477R, C2477U, C2478U) all accommodate 90 meter DAT/DDS media. In addition, these drives support 60 meter media. However, use of 90 meter media in any first generation devices (C1511A, C1512A, C2292A) risks premature failure of the drive, and is not supported.

Hardware Data Compression

Features:

- Typical 2:1 compression ratio (max 4:1)
- Typical 366 Kbytes per second transfer rate (max 732)
- 3-1/2 inch form factor
- 50,000 MTBF
- Standard DDS recording format extended to support data compression (DDS-DC)
- Standard method of data compression—DCLZ (Data Compression Lempel Ziv)
- SCSI II, single-ended
- Full plug-compatibility with all DAT drives from HP and other DDS manufacturers
- Fastsearch
- HP-UX Boot support with Release 9.0

The drive supports up to 8 Gbytes of data storage on a single cassette through the use of data compression and a 90 meter tape. It also continues to support existing 60 meter tapes.

The DCLZ data compression algorithm provides a typical data compression ratio of approximately 2:1, and sometimes up to 4:1 over the capacity of a standard 2 GB DDS tape. The algorithm can achieve a compression factor of two for files such as object code which do not have much repetition, and a compression factor of four for text or databases.

The DCLZ algorithm is implemented in the electronics of the tape drive and occurs in real time. The entire compression process is resident in the tape drive and is transparent to the host.

The DDS-DC format allows compressed data to be stored in a way that maintains the full functionality of the DDS format and ensures backward compatibility with existing DDS drives. The drive/HP-UX:

- Supports the DDS-DC format to allow interchange of compressed data between HP and other DDS vendors
- Can read any DDS and DDS-DC tape whether data compression is switched on or off
- Automatically de-compresses DCLZ data whether data compression is switched on or off
- The data compression feature is selectable through either SCSI commands or the setting of hardware switches

Digital Audio Tape Storage Subsystems

For the HP 9000 Model E, F, G, H, I, and 890, several DAT storage subsystems are available in both tower and rackmountable housing. These devices are single ended SCSI and are available in the base configurations found in **Table 6.15**.

Table 6.15

Product Number	Base Configuration
C2464R	2 Gbyte DAT
C2465R	2x 2Gbyte DAT
C2466R	Up to 8 Gbyte Data Compression DAT
C2467R	2x Up to 8 Gbyte Data Compression DAT

Table 6.16

Expansion Kit Product Number	Description
C2477U	2 Gbyte DAT expansion kit; half-height
C2478U	Up to 8 Gbyte DAT expansion kit; half-height

Each of the DAT drives is half-height. Each tower package can hold a total of 7 half-height devices. Each rackmountable package can hold for half-height devices plus one additional half or full-height device. The upgrade kits found in **Table 6.16** can be integrated into these packages.

Quarter-Inch Cartridge (QIC1000)

The QIC1000 drives supported on the HP 9000 E, F, G, H, and I servers are available as an internal mechanism only, attaching to the system via the internal SCSI bus. The device offers up to 1 GB of data storage on a single tape. It is a bootable device, and a variety of HP-UX software products are available on the QIC media.

The QIC drive uses the industry-standard QIC320/525/1000* format. It is also compatible with a number of other QIC formats (see **Table 6.17**).

Table 6.17 Drive Specifications

Transfer Rate (sustained)	240 Kb/sec
Media Capacity (using DC6525)	525 MB or 1 GB*
Write Compatibility	QIC120, QIC150, QIC525/1000*
Read Compatibility	QIC24, QIC120, QIC150, QIC525/1000*
Recording Density (bpi)	16,000
Error rate (max)	10 ⁻¹⁴
MTBF (15% Duty Cycle)	50,000 power-on hours
Input Voltage Range	85-264 V ac
Input Frequency Range	47-440 Hz
Power Consumption	25 W

*Supported with A2944A only. Requires HP-UX 9.0 update.

There are a number of QIC media types available in the industry. **Table 6.18** indicates the media type along with the read/write compatibility supported by this QIC drive.

The recommended format for writing to QIC media with HP's supported drive is the 320/525/1000* format. Although other formats are supported, the device and driver have been specifically tuned for the QIC320/525 format.

Note: The QIC525 and QIC1000 drive and media are not compatible with HP's proprietary HP-IB quarter-inch cartridge drives (9144A, 9145A) and cartridges.

Note: QIC1000 (A2944A) can read and write QIC525 format but A2311AZ (QIC525) cannot read or write QIC1000 format.

Table 6.18 QIC Media Support

Media/Cartridge Type	Write Compatibility	Read Compatibility
DC 6525	QIC320/525, QIC150, QIC120	QIC320/525, QIC150, QIC120, QIC24
DC 6320	QIC320/525, QIC150, QIC120	QIC320/525, QIC150, QIC120, QIC24
DC 6250	QIC150, QIC120	QIC150, QIC120, QIC24
DC 6150	QIC150, QIC120	QIC150, QIC120, QIC24
DC 600A	QIC120	QIC120, QIC24
DC 300XL/P	—	QIC24

New Backup Devices: 3480-Compatible and 8mm

With HP-UX 9.04, 3480-compatible and 8mm tape are now supported on the HP 9000 Series 800.

For full IBM 3480 compatibility, HP supports the StorageTek model 4220 and 4280 tape drives. These products are referenced for use on the HP 9000 Series 800 but are fully supported by HP (both software and hardware support).

The StorageTek 4220 and 4280 are high-performance, half-inch 18-track tape cartridge subsystems. The 4280 offers high-speed backup and data interchange with 3480 half-inch cartridge tape. It consists of one controller and two tape drives that are used primarily in multi-processing environments requiring a robust high-speed backup solution with a heavy demand on throughput. Its rack mount integrates cleanly into an HP 19" rack cabinet. The 4220 is a smaller, one-drive tabletop version of the 4280. Its dedicated drive and controller are used primarily with entry-level computer systems that do not need high-performance 1 x 2 (one controller and two drive) capabilities. Both the STK 4220 and 4280 models can be used with a front-mountable autoloader that holds 10-tape removable magazines.

A single 3480 compatible drive can transfer data at transfer rates up to 2.5 MB/sec or 9 GB per hour. Performance can vary significantly depending on the environment.

The HP 9000 Series 800 supports data compression on these 3480-compatible drives. The compression algorithm is ICRC which is fully compliant with the industry-standard IDRC.

These 3480-compatible drives are fully supported by HP OmniBack and OmniBack Turbo on the Series 800. The Series 800 supports manual mode and automode usage of these drives. These drives are supported on the S800 in manual and auto modes only.

The STK drives are supported on all HP 9000 S8x7, E, F, G, H, I, 890, and T500. 3480-compatible tape is not supported on the HP 9000 8x2 or any CIO-based Series 800 platforms. A STK 3480-compatible drive requires a dedicated S. E. SCSI card (P/N 28655A), and up to two 4220 or two 4280 model drives are supported per interface card. Greater than two tape drives is not recommended due to performance limitations of Single-Ended SCSI.

These 3480 compatible devices cannot be used as boot devices. In addition, HP-UX software is not available on the 3480 half-inch cartridge format.

For interchange with IBM label tapes (EBCDIC format), a third party utility is recommended: REELexchange from StorageTek/Sceptre. For ordering information contact Software Clearing House at (513) 579-0455.

For further information or to purchase an STK drive, contact STK in your area at:

Northeastern U.S. 1-800-288-3475
Southern and Southcentral U.S.
1-800-842-6333
Midwest 1-800-448-6314
Western U.S. 1-800-433-6699
International 1-303-673-5151

Exabyte 8mm tape drives are now supported on the HP 9000 Series 800 with HP-UX 9.04. The A3024A is an Exabyte 8505 drive which is a half-high 5.25" form factor with a 5 GB native capacity and a 500 KB/sec transfer rate.

The A3024A is sold as a kit which can be integrated either into a CPU enclosure or into an external storage enclosure. It is supported on the HP 9000 8x7, E, F, G, H, I, 890, and T500, but not on the HP 9000 8x2 or any CIO-based platforms.

The A3024A requires a Single-Ended SCSI card (P/N 28655A). Other tape drives (other than 3480-compatible) can be mixed on the same Single-Ended SCSI adapter. Mixing disk and tape on the same adapter card is not recommended.

The A3024A is fully supported by HP OmniBack and OmniBack Turbo. The A3024A supports the IDRC data compression algorithm which achieves typical compression ratios of 2:1. This EXB-8505 drive maintains data interchange with the EXB-8200, EXB 8200SX, EXB-8205, EXB-8500, and EXB-8500C through full read and write compatibility.

The A3024A cannot be used as a boot/install device. In addition, HP-UX software is not distributed on the 8mm tape format.

Table 6.19 offers a full comparison of all tape technologies currently supported on the HP 9000 Series 800.

Table 6.19 Comparison of Backup Technologies Supported on the Series 800

	Unattended Capacity	Transfer Rate (KB/sec)	Average Access Time (sec)	GB/hour Backup	GB/hour with 2:1 Data Compression	Media Cost Per MB**	Data Bit Error Rate
QIC 525	525 MB	240	30	.86	N/A	\$.067	10 ⁻¹⁴
1 GB QIC	1 GB	240	30	.86	N/A	\$.067	10 ⁻¹⁴
DDS 4mm	2 GB	183	30	.66	1.32	\$.014	10 ⁻¹⁴
8mm	5.0 GB	500	90	1.8	3.6	\$.0036	10 ⁻¹³
Optical‡	1.3 GB	1.0 MB/s read and .5 MB/s write	36 msec	1.8	N/A	\$.12	10 ⁻¹⁴
3480-Compatible†	200 MB	2.5 MB/s	17	9.0	18.0	\$.03	10 ⁻¹⁷

* Unless otherwise stated, all number are without data compression.

** Based upon quantity one media pricing.

† Note that a 3480-compatible drive with a stacker has an unattended capacity of 2 GB.

‡ Note that optical libraries are available with unattended capacities up to 187 MB.

Printers

Printer Selection

The four types of printers supported on Series 800 Business Servers are compared in **Table 6.20** with respect to relative cost, print speed, noise level, and estimated print quality.

Inkjet Printers

Inkjet (ThinkJet, QuietJet, DeskJet, and PaintJet) printers offer low price, reasonably fast print speed, and the quietest operation of all printers. Of these printers, the DeskJet offers Laser printer print quality. The PaintJet has the added advantage of being able to make full-color overhead transparencies. This type of printer is useful mainly as a low-cost, light-workload, workstation printer. It should never be considered for use as the only printer in a system.

Dot-Matrix Serial Impact Printers

Dot-matrix serial impact printers combine versatility at reasonable cost with good print speed. Versatility can include graphics image and bar code printing and the ability to trade print speed for better print quality. Good print speed means that a dot-matrix serial impact printer can be used as the only printer on a system with modest-to-average printing requirements.

Laser Printers

Laser printers combine excellent print quality with print speed faster than the fastest dot-matrix serial printers at higher cost. Laser printers are recommended for systems with average printing workload in which high print quality is important.

Table 6.20 Types of Printers Available for Series 800 Business Servers

Printer Type	Print Speed	Noise Level (dBA)	Print Quality
Monochrome Inkjet	150-240 cps	50	NLQ
Color Inkjet	167 cps	50	NLQ
Dot-Matrix Impact Serial	40-480 cps	56-63	NLQ
Laser	8-20 ppm	50	LQ
Dot-Matrix Impact Line	300-1800 ppm	48-64	NLQ

Table 6.21 Interfacing of System-Connected Printers to HP 9000 Series 800 Business Servers

Multiplexer Connected Printers		HP-IB Connected Printers*	
Each printer uses one multiplexer channel, connected via the indicated multiplexer-to-printer cable.		Each printer is connected via a 10833B/C cable.	
Printer	Connects via	Printer	Comments
2562C Serial/Parallel ¹ and LAN ² Options 2563C Serial/Parallel ¹ and LAN ² Options C2354A Serial/Parallel ¹ and LAN ² Options C2356A Serial/Parallel ¹ and LAN ² Options 2566C Serial/Parallel ¹ and LAN ² Options 2567C Serial/Parallel ¹ and LAN ² Options	92218A (15 m) Cable or 40242M (5 m) Cable	2562C with Option 046 2563C with Option 046 C2354A with Option 1A8 C2356A with option 1A8 2566C with option 046 2567C with option 046	HP-IB printers are not supported on HP-PB systems.
2235B 2932A** and 2934A 2225D 2227A and 2228A 3630A with Option 001 2684A 33440A 41063A C1200A C1202A with Option 1A9 C1602A with Option 1AX C2106A	92218A (15 m) Cable or 40242M (5 m) Cable	2235B 2932A** with Option 046 2934A with Option 046 2227B C1202A with Option 1A8 C1602A with Option 1A8	HP-IB printers are not supported on HP-PB systems.
2686A** 2686A** with Option 300	92218A (15 m) Cable922 or 13242N (5 m) Cable		

* The Model 808S, 815S, 822S, 832S, 842S, and 852S support only RS-232C Printers; HP-IB printers are not supported on the Model 808S, 815S, 8x2s, 8x7s, E, F, G, H, I, 890, and T500.

** Discontinued product, listed here for reference only.

† Centronics interface are supported on HP-PB systems at HP-UX 8.0. Maximum cable length is 6 feet. Due to this cable length restriction, racked 8x7s Business Servers should be mounted in the lower half of the 1.6 meter cabinet.

¹ Options #1AX (RS-232 and Centronix †) or ALZ (RS-422 and Centronix †)

² You may order either option #UGN (TCP/IP LAN JetDirect EX Interface), requires HP JetDirect Interface P/N J2382B; or option #ALY (TCP/IP for HP-UX adapter box). Option #ALY will be discontinued by March 1994; requires HP JetDirect Card P/N C2071S or C2071T.

Line Impact Printers

Line Impact printers combine print speed (from 7 to 27 pages per minute), flexibility, lowest print cost for volume range (average \$1.21 per 1K printed pages¹ and great reliability even for heavy duty cycles and burst throughputs (unattended operation.) Flexibility includes resolution from sparse to NLQ, raster and industrial graphics as well as electronic forms creation ability², multiple-part forms (up to 6 parts), noise ranges starting from 48 DBa, bar-codes, postnet and many font sizes and languages.

There are Line Impact printers for office and for industrial harsh environments. Line Impact printers provide a wide range of connectivity from serial (now up to 38.4 Kbps), parallel, HP-IB to LAN, including the new JetDirect Ex interface. Line Impact printers are ideal for data processing centers, accounting, checks, invoices, reports, distribution, circulation or where bar codes and automated identification processes is needed.

In one word, Line Impact printers are for any application where good print quality and very low printing cost is required.

Network Printer Support

The HP LaserJet 4 family of printers is supported on HP-UX 9.04 with 600 dpi resolution.

Note: The bidirectional-message feature is not supported on HP-UX.

¹ For 60% print density and 30% character density.

² Requires the HP LABEL GRAPHICS card by QMS

Centronics Connected Printers

Maximum cable length is 6 feet. Due to this cable length restriction, racked E/F/G/H/I Business Servers should be mounted in the lower half of the 1.6 meter cabinet.

Refer to **Table 6.22** for a complete list of Centronics printers supported on the Series 800 Business Servers.

High Capacity Printers

The HP 5000 Model F100

The HP 5000 Model production capacity printers consist of four fully compatible printers which offer from 100 to 210 pages per minute (ppm) print speed. It is based on HP Printer Control Language (PCL), the printer language used by the HP LaserJet printer family.

The HP 5000 Model printers are supported on all Series 800 systems running HP-UX 9.0 using the 27147A (CIO) or the 28655A HP-PB SCSI interface. The printer may be placed up to 100 meters away from the SPU with a fiber optic SCSI connection (P/N 28643A). Distance can be even further with the use of LANs and routers in a print server configuration.

Because it is based on PCL 4, the F100 can utilize many off-the-shelf, PC-based LaserJet Series III formatting tools that can be uploaded to the Series 800. This allows printing of 2-up and 4-up formats, electronic forms, bar codes, logos, and merged text and sophisticated graphics all at 300 dpi, at production speeds and in production volumes.

Table 6.22 Table of Specifications

	F100	F100XP	F135	F135XP
Print speed ¹	100 ppm	100/154 ppm	135 ppm	135/210 ppm
Paper speed	14.2"/sec (360 mm/sec)	14.2"/sec (360 mm/sec)	19.2"/sec (487 mm/sec)	19.2"/sec (487 mm/sec)
Print line (maximum)	13.875" (357 mm)	17" (432 mm)	13.875" (357 mm)	17" (432 mm)
Turbo controller	Optional	Standard	Standard	Standard
Resolution	300 dpi	300 dpi	300 dpi	300 dpi
Maximum duty cycle				
• Linear feet per month	2 million	2 million	2 million	2 million
• 8 1/2" x 11" pages	2.8 million	4 million ²	2.8 million	4 million ²
Graphics memory				
• Standard	16 MB	16 MB	16 MB	16 MB
• Maximum	64 MB	64 MB	64 MB	64 MB
Paper handling ³				
• Input capacity	3600 pages	3600 pages	3600 pages	3600 pages
• Output capacity	4000 pages	4000 pages	4000 pages	4000 pages
Interface	SCSI	SCSI	SCSI	SCSI
Printer language	HP PCL 4	HP PCL 4	HP PCL 4	HP PCL 4

¹ Print speed for 8 1/2" x 11" pages with paper joined on 11" edge. May be application dependent.

² Duty cycle maximum require two-up printing operation.

³ Maximum paper handling capacities with 18 lb. paper.

High quality continuous feed paper is required for the HP 5000 printers. For best results, 18 to 28 lb paper is recommended. Because high speed printer reliability and performance are highly depended on paper quality, it is strongly recommended that all media be tested before purchasing. Refer to the HP 5000 Paper Specifications Guide (P/N C2750-90101).

Physical paper width ranges from 6.5 inches (165 mm) to 18 inches (457.2 mm) including perforation. Form height, fold-to-fold, ranges from 6 inches (152.4 mm) to 16 inches (406.4 mm).

All points are addressable with edge to edge printing in all directions up to a maximum 13.875" image width. For best results, the paper feed sprocket holes must be kept free from print.

Table 6.23 Font Summary

Internal Printer Fonts	
Typeface*	Size (points)
Courier	10, 12
Prestige Elite (medium only)	7
Prestige Elite	10
Line Printer (medium only)	8.5, 10
Univers (bold only)	14
CG Times (medium only)	8
CG Times	10, 12

* Includes Medium, Bold, and Italic treatments except where noted.

Symbol Sets

- Roman 8*
- ECMA-94 Latin 1 (ISO 8859/1)
- PC-8
- PC-8 D/N
- PC-850
- Legal
- ISO 6 ASCII
- ISO 4 United Kingdom
- ISO 69 French
- ISO 21 German
- ISO 11 Swedish names
- ISO 17 Spanish
- ISO 60 Norwegian v1
- ISO 15 Italian

* Includes ASCII and Roman Extension and all ISO characters.

Table 6.24 Ordering Information

Model F100—Fanfold, 100 ppm	
C2753A	HP 5000 Model F100, 60 Hz, 14" Print Line
C2754A	HP 5000 Model F100, 50 Hz, 14" Print Line
C2753B	HP 5000 Model F100, 60 Hz, 14" Print Line and Turbo Controller
C2754B	HP 5000 Model F100, 50 Hz, 14" Print Line and Turbo Controller
Model F135—Fanfold, 135 ppm	
C2776A	HP 5000 Model F135, 60 Hz, 14" Print Line and Turbo Controller
C2777A	HP 5000 Model F135, 50 Hz, 14" Print Line and Turbo Controller
Model F100XP—Fanfold, 154 ppm	
C2772A	HP 5000 Model F100XP, 60 Hz, 17" Print Line and Turbo Controller
C2773A	HP 5000 Model F100XP, 50 Hz, 17" Print Line and Turbo Controller
Model F135XP—Fanfold, 210 ppm	
C2755B	HP 5000 Model F135XP, 60 Hz, 17" Print Line and Turbo Controller
C2756B	HP 5000 Model F135XP, 50 Hz, 17" Print Line and Turbo Controller
Upgrade Products	
C2768A	135 PPM upgrade kit; 60 Hz, increases paper speed from 14.2 inches/sec to 19.2 inches/sec
C2769A	135 PPM upgrade kit; 50 Hz, increases paper speed from 14.2 inches/sec to 19.2 inches/sec
C2774A	17" wide upgrade kit; increases print line from 14" to 17"
C2779A	Turbo Controller field upgrade (for C2753A or C2754A only)
Printer Accessories	
C2763A	Voltage selectable transformer kit for 200V, 50 or 60 Hz, and 415/240V, 50 Hz
C2758A	16 MB graphics memory expansion module
C2775A	Floor feed external paper input
C2760A	Center feed external paper input
C2761A	Splicing station
C2762A	Center paper cutter
C2270A	Output decurler

Terminals

System Console/Terminal Selection

A locally interfaced display terminal must be provided for operator communication in any HP 9000 Series 800 server.

However, where special circumstances dictate the need for "console-less" systems (e.g., Japan,) the E-Class servers can be supported without a local system console if the following items are purchased with the SPU Support Contract (modem):

- 92205E Switch box
- 17355M Cable (quantity 2)
- 92219Q Cable

A "non-dedicated system" console is also supported on E-Class servers. This is a cost-effective way to have a local system console yet also allow a local user to utilize it as their input terminal during normal operation. The system administrator can route all kernel console messages (that would have appeared on the

system console) to any file or even to another host, using `syslogd`. The user can disable output to the console device by invoking `syslogd` with a `-D` option. Catastrophic error messages will still appear on the system console.

Except where otherwise noted, any of the display terminals listed in **Table 6.25**, next page, can be used as a system console. These include previously purchased terminals that have been discontinued. However, it is most cost effective to specify a minimum-capability terminal for the system console, because extra capability, such as graphics, usually cannot be put to good use on a system console. The other main consideration in selecting a system console is to specify one that uses the same type of cable as most of the other terminals in the system to facilitate connection of another terminal as system console if the original system console terminal fails.

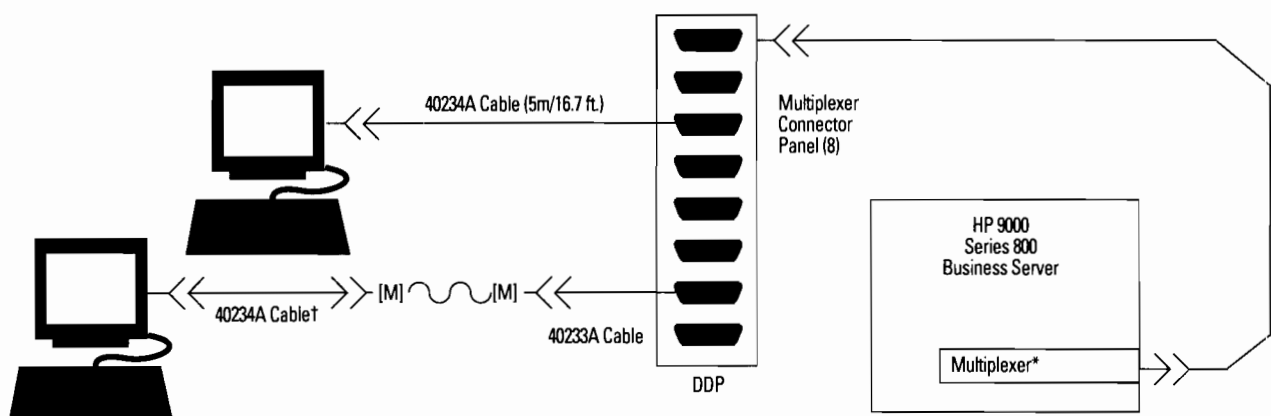
Console/Display Terminal Interfacing

Via RS-232C Ports

The interfaces used for connection of the system console and other display terminals to the system differ with the HP 9000 Series 800 Models, as follows:

In HP 9000 Models 8x2S, 8x7s, E, F, G, H, and I, the system console and additional terminals are connected via the HP 40299B Asynchronous 8-channel Multiplexer interface, which is included in the System Processor Unit. In the HP 9000 Models E, F, G, H, and I, the system console and additional terminals are connected via the integrated 8-channel multiplexer interface, which is on the system multi-function I/O card. Connections are shown in **Figure 6.5**.

Figure 6.5 Terminal Connection via 8-Channel Multiplexer



* HP 40299B or J209XA Multiplexer for HP-PB systems.
 HP 98196A or 90190A Multiplexer for CIO systems.
 † See the Terminal Cables Selection section, to confirm cable product number to order.

Table 6.25 Display Terminals and PCs Supported on HP 9000 Series 800 Business Servers

Name/Description	Supported as System Console	Connects to Model 815S via RS-232-C Port A or B or 98196A, 98190A, 40299B, or J209XA Multiplexer	Power Consumption for UPS Sizing (VA)	Product Number
HP 700/96ES Display Terminal , White background display, 80/132 col., meets Swedish MPR 1990:10 guidelines.	Y	40242M/40234A Cable	50	C1084W
HP 700/98ES Display Terminal , White background display, 80/132 col., meets Swedish MPR 1990:10 guidelines.	Y	40242M/40234A Cable		C1085W
HP 700/43 Full-Featured ASCII Terminal , available with Amber (A), Green (G), or White (W) background display, 80/132 col.	N	40242M/40234A Cable		C1006A/G/W
HP 700/44 PC Systems Terminal , available with Amber (A), Green (G), or White (W) background display, 80/132 col.	N	40242M/40234A Cable		C1007A/G/W
HP 700/32 DEC VT 320 Compatible Terminal , available with amber (A), Terminal, available with amber (A), green (G), or white (W).	N	40242M/40234A Cable		C1017A/G/W
HP 700/60 the HP Multiprocessing Terminal , available with amber (A), green (G), or white (W) background display 80/32 col.	Y**	40242M/40234A Cable	50	C1080A/G/W
HP 700/60ES HP Multiprocessing Terminal , White background display, 80/132 col., meets Swedish MPR 1990:10 guidelines.	Y**	40242M/40234A Cable	50	C1083W
Note: The following are discontinued products, listed here for reference only.				
HP 700/RX X Window Terminal base unit	N	Connection by LAN only		C2301B
HP 700/RX X Window VGA color terminal	N	Connection by LAN only		C2303B
HP 700/RX X Window 1024 x 768 color terminal	N	Connection by LAN only		C2304B
HP 700/RX X Window grayscale terminal	N	Connection by LAN only		C2305B
Display Terminal , 80 column system console requires option S12.	Y	40242M Cable		2392A
Alphanumeric Terminal with forms capability, 80 column.	N	40242M Cable		2394A
Industrial Workstation Terminal , 80 columns.	N	40242C Cable		3081A
Industrial Touch Terminal , 80 columns.	N	40242C Cable		3082B
Touchscreen PC/Terminal , 80 columns. May require upgrade with the latest HP 150-II ROMs. Emulates 2623A.	N	40242M or 92218A Cable		45610A/B
Portable Plus PC/Terminal , 80 columns. Requires 82863K Option 400 software, which emulates the 2392A Terminal.	N	92221M Cable		45711A..D
Vectra Model 25 PC , 80 columns. Emulates the 2392A Terminal.	N	24542M or 40242M Cable		72425A*
Vectra Model 45 PC , 80 columns. Emulates the 2392A Terminal.	N	24542M or 40242M Cable		72445A*

* HP Vectra Model 25 and 45 PCs also require a monitor, graphics adapter, HP AdvanceLink software, the Vectra Disk Operating System, and a Serial/Parallel or Dual Serial Interface card for operation as an HP 9000 Series 800 Terminal.

** Supported as a console on E Class only.

In the HP 9000 Corporate Business Server 890, the system console and additional terminals are connected via an Asynchronous 16-channel Multiplexer interface, which is included in the System Processor Unit. The system console uses one of the 16 multiplexer channels, and the access port uses another, leaving 14 channels available in the first multiplexer for additional terminals or other RS-232C devices.

Terminal Cable Selection

RS-232 terminals are connected to the HP 9000 asynchronous multiplexers via direct cables or via asynchronous modems.

The following cables are recommended:

- 40234A for direct connection to a peripheral
- 40233A for connection to a modem

HP Windows Client

The HP Windows Client

- LAN-connected diskless 486 PCs
- Runs PC Applications
- Includes Software Licenses (see below)
- Bundled with choice of monitors
- Supports 9000 sessions via terminal emulation
- Requires NetWare boot/file server (HP 9000/800 or other NetWare server)

- No additional HP 9000/800 software required for session support
- Each site requires one Server Kit for the System Administrator

The Server Kit includes:

- Media and complete documentation for all included software
- HP, Microsoft, and WRQ software on 3-1/2 inch diskettes
- Installation and reference documentation
- HP Assist Installation Utility which includes preconfigured boot images
- Licenses to install software on one or more servers per site
- Licenses to use bundled software on an unlimited number of HP Windows Clients
- License to use WRQ software on a system administrator's PC
- Telephone support for the system administrator

Table 6.26

Product Characteristics	
CPU	32-bit Intel 486 SX microprocessor
CPU Speed	33 MHz (Model 433SX) and 25 MHz (Model 425SX)
Cache	8k internal cache memory
Integrated I/O	Parallel Port—Centronics (25-pin) for printer or plotter Serial Port—RS-232C (9-pin) for modem or printer Serial/Parallel ports can be disabled for additional security Mini-DIN keyboard and mouse ports 15-pin VGA connector
Keyboard	Industry-standard 101-key layout with mini-DIN interface
Mouse	2-button mouse with mini-DIN interface
Clock/Calendar	With battery backup
LAN Connection	10Base-T (RJ45) port AUI port for COAX or fibre optic network connection
Video	Integrated local-bus Ultra VGA Model 425SX has text acceleration, 512k video RAM Model 433SX has graphics acceleration, 1024k video RAM
Memory	4 MB standard, expandable to 36 MB
Included Software Licenses with each Windows Client	
OS and GUI	Microsoft DOS 6.0 and Microsoft Windows 3.1
Terminal Emulation	WRQ Reflection 1 for Windows (HP 700/9x and HP 2392 Terminal Emulation) WRQ Reflection 2 for Windows (VT320/220/102/52 Terminal Emulation)
Networking Services	WRQ Reflection Network Series (TCP/IP, NS/VT, Telnet, LAT, SPX/IPX, NDIS, ODI, and FTP)

HP Assist Installation Utility

- Automates installation process
- Assists the System Administrator in installing MS-DOS, MS Windows, and the WRQ products onto the server
- Includes preconfigured boot images
- Helps create new boot images

Cabling

- Included cables:
- Power cord
 - Keyboard and Mouse cables (Monitor cable comes with monitor)

LAN Connector

Table 6.27

If your LAN Cabling is:	Connect the Windows Client using:
Twisted Pair	Integrated RJ45 connector on the Windows Client back panel
ThinLAN	P/N 28641B AUI-to-BNC Transceiver (ordered separately)
Fiber Optic	P/N 28683A AUI-to-ST Transceiver (ordered separately)

Product Manuals

Table 6.28

Windows Client	HP Windows Client User Manual Microsoft MS-DOA 6.1 and Windows 3.1 Concise Guide WRQ Reflection R1, R2 for Windows Quick Start Guides
Server Kit	HP Windows Client System Administration Guide Microsoft 6.0 and Windows 3.1 manuals WRQ Reflection 1 and 2 for Windows technical Reference Manuals and Quick Start Guides WRQ Reflection Network Series Reference Manual; User's Guide and Reference Card; WRQ Reflection Command Language Manual

Installation Process

- Requires PC on LAN with 3-1/2 inch floppy to install Server Kit software
- Once software is on the server, disked PC is not required

System Sizing for HP 9000 Series 800 Servers

Table 6.29

HP 9000/800 System	Maximum Supported NetWare Clients
F10	NetWare Not Available
F20, H20	16
E/G/H/I 25-50	32

Ordering Information

Choose the desired SPU and corresponding monitor.

Table 6.30

Part Number	Description
C3401A	Model 425SX with No Monitor
C3402A	Model 425SX with 14" Monochrome VGA
C3403A	Model 425SX with 14" Color VGA
C3404A	Model 425SX with 14" Super VGA
C3405A	Model 425SX with 14" Ergonomic Super VGA
C3406A	Model 425SX with 15" Ergonomic Ultra VGA
C3407A	Model 425SX with 17" Ergonomic Ultra VGA
C3410A	Windows Client 425SX to 433SX SPU Upgrade
C3411A	Model 433SX with No Monitor
C3412A	Model 433SX with 14" Monochrome VGA
C3413A	Model 433SX with 14" Color VGA
C3414A	Model 433SX with 14" Super VGA
C3415A	Model 433SX with 14" Ergonomic Super VGA
C3416A	Model 433SX with 14" Ergonomic Super VGA
C3417A	Model 433SX with 17" Ergonomic Ultra VGA

Chose the appropriate country/language option (required, except for C3410A processor upgrade). This determines country-specific power cord, local language keyboard, and local language documentation (as available).

Table 6.31

Option	Description
ABA	U.S. English
ABB	U.S. English (Europe)
ABD	German
ABE	Spanish
ABF	French
ABG	Australian
ABM	Latin-Spanish
ABN	Norwegian
ABP	Swiss-German
ABQ	Swiss-French
ABR	Rep. of S. Africa
ABS	Swedish/Finnish
ABU	U.K. English
ABW	Dutch/Flemish
ABY	Danish
ABZ	Italian
AC4	Brazil
AC8	Argentina
AKH	Chile
702	U.S. English (Europe)—delete keyboard
703	U.S. English—delete Keyboard

Choose the desired memory configuration. Two SIMM sockets are available for expansion up to 36 MB. Supported memory configurations are 4, 6, 8, 10, 12, 16, 20, 24, 28, and 36 MB. Configurations of 20 MB or greater require **at least one 16 MB SIMM**. Memory can be ordered with the Windows Client by using the option number or it can be added later by ordering the memory product number.

General Guidelines for Memory

- The standard 4 MB is sufficient for one or two concurrent applications
- 8 MB (standard 4 MB plus 4 MB option) is sufficient for up to 4 concurrent applications
- Depends on application and data file size

Table 6.32

Option	SIMM	
	Description	Number
001	2 MB	C3490A
002	4 MB	C3491A
003	8 MB	C3492A
004	16 MB	C3493A

For each SITE, order **one** Server Kit by ordering the appropriate option with one of the Windows Client SPUs.

- Complete media and documentation for all included software
- Server setup guidelines/hints for Windows Client configuration
- HP Assist Interactive Installation and Configuration Tool
- Sample Boot Images

Table 6.33

Option	Description
100	English
101	German
102	French
103	Spanish
104	Italian
105	Swedish
106	Dutch

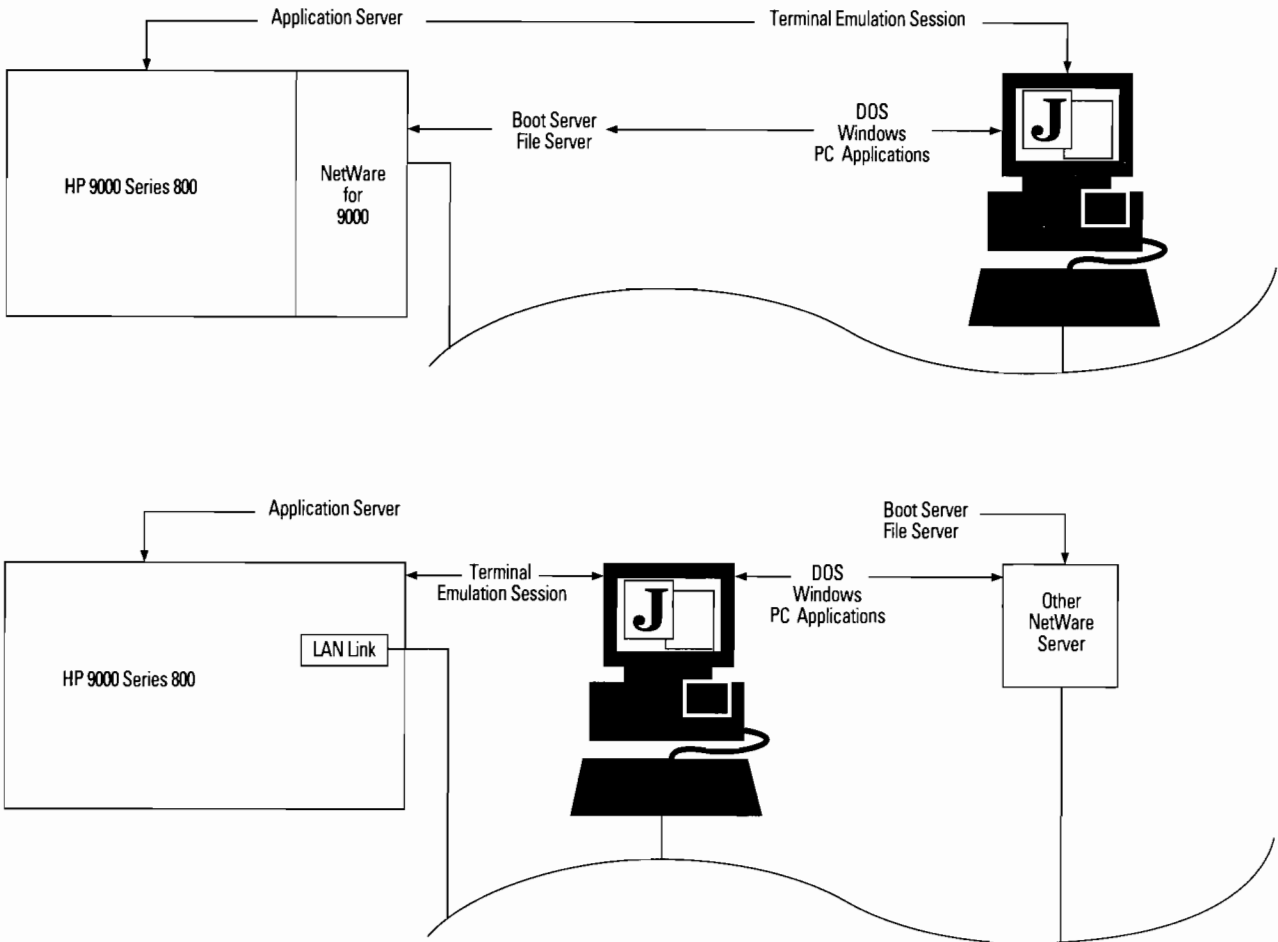
Select the appropriate (optional) option for additional hardware support during the warranty period.

Table 6.34

Option	Description
OS0	One year, next day, onsite
OS1	One year, 4 hour, onsite

For ThinLAN cabling, order one transceiver P/N 28641B per Windows Client.

Figure 6.6



X Stations

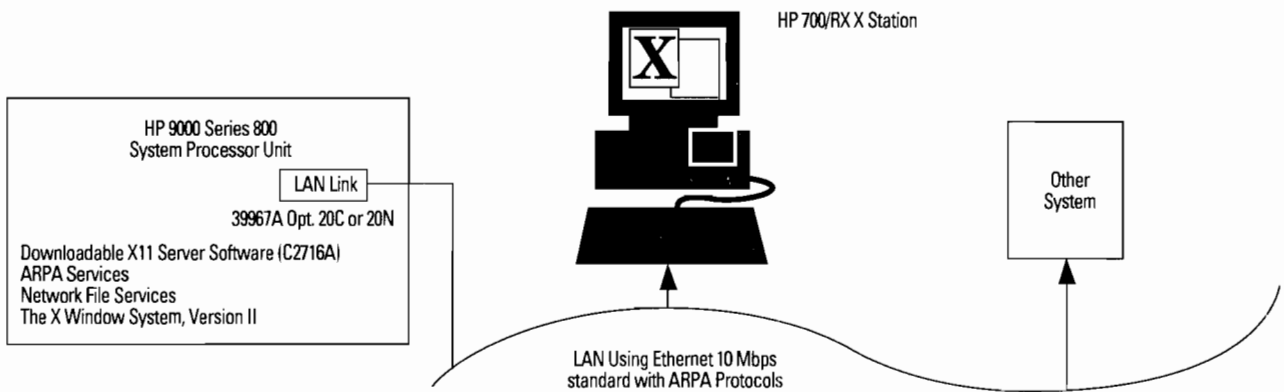
HP 700/RX X Stations via LAN Link

The HP 700/RX family of color, monochrome, and grayscale X Window graphics terminals, when connected to an EtherNet LAN as shown in **Figure 6.7**, provide the user with interactive access and simultaneous display of multiple applications. The number of stations that can access a specific application is limited by the amount of RAM and by the available performance on the HP 9000 Series 800 Business Server. HP 700/RX X Stations operate well on systems where LAN loading is below 25% of capacity.

Table 6.35 HP X Stations Supported on the Series 800 (LAN Required)

Part Number	Description
C2701B	HP 700RX Monochrome X Station Base Unit (no monitor included)
C2702B	HP 700/RX 19-inch Monochrome X Station (monitor included)
C2704A	HP 700/RX Color X Station Base Unit (no monitor included)
C2705A	HP 700/RX 14-inch Color X Station (monitor included)
C2706B	HP 700/RX 17-inch Color X Station (Sony monitor included)
C2709A	HP 700/RX Hi-Res Color X Station Base Unit (no monitor included)
C2710B	HP 700/RX 17-inch Color X Station (Sony monitor included)
C2711A	HP 700/RX 19-inch Color X Station (monitor included)
C2749A	HP 700/RX 19-inch Grayscale X Station (monitor included)
C3226A	HP 700/RX 19-inch Color X Station (Sony monitor included)
C3227A	HP 700/RX 15-inch Color X Station (Sony monitor included)
C3228A	HP 700/RX 17-inch Color X Station (Sony monitor included)

Figure 6.7 HP 700/RX X Station Connection Via LAN Link



Configuring the Host Computer

HP ENVIZEX stations make it simple and cost-effective to share valuable computing resources. When the host computer is properly configured with sufficient networked resources, HP ENVIZEX stations deliver exceptional desktop performance. Here are some helpful definitions and guidelines for installing HP ENVIZEX stations in a network computing environment. For additional information about specific situations, ask your HP contact for the series of performance and configuration guides HP has published.

Table 6.36 HP ENVIZEX Station System Resource Requirements

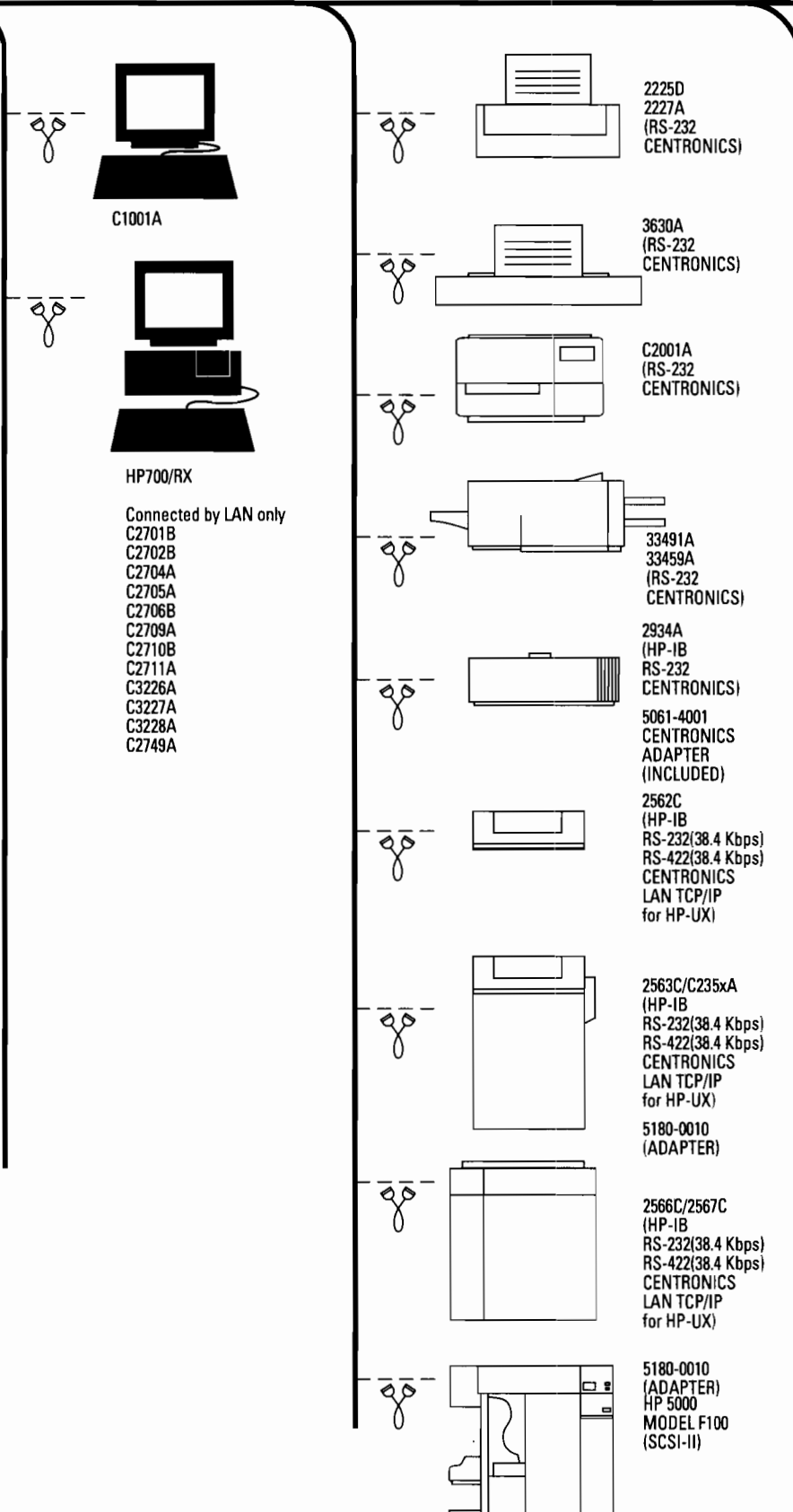
Network Resource	Measure	HP ENVIZEX "Rule of Thumb"
Computer Power	Shared by all X terminal users, but rarely used all at once. With HP ENVIZEX stations, you'll need much less total computing power than in stand-alone desktop environments.	2 to 4 MIPS per X station, depending on the application.
Host Memory	Enough memory to avoid excessive swapping and thereby maximize performance of users' everyday tasks.	4 to 6 MB of host memory per X station. Consider more if all users typically run multiple applications simultaneously (few do).
Host Disk Space	Centralizing resources in a network computing environment reduces need for disk space. As memory needs grow, disk space can be added when economically advantageous.	20 to 60 MB per user, depending on the application.
Network Implications	Try to keep network traffic below 45 percent of total capacity.	Typically this is not a problem. Subnetting is usually the best solution for high network traffic environments.

Recommended Series 800 Peripherals

Series 800
Business
Server

Terminals

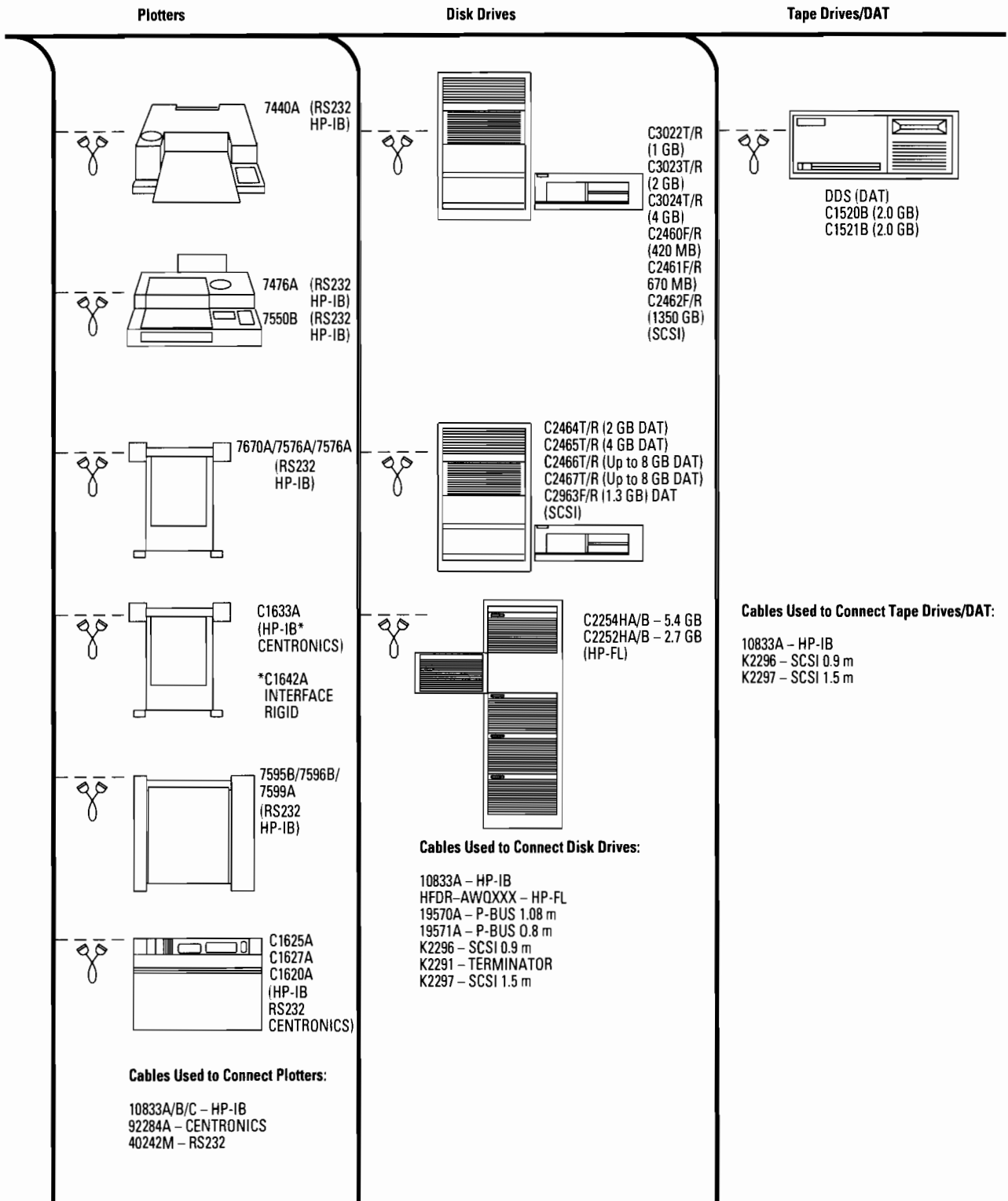
Printers

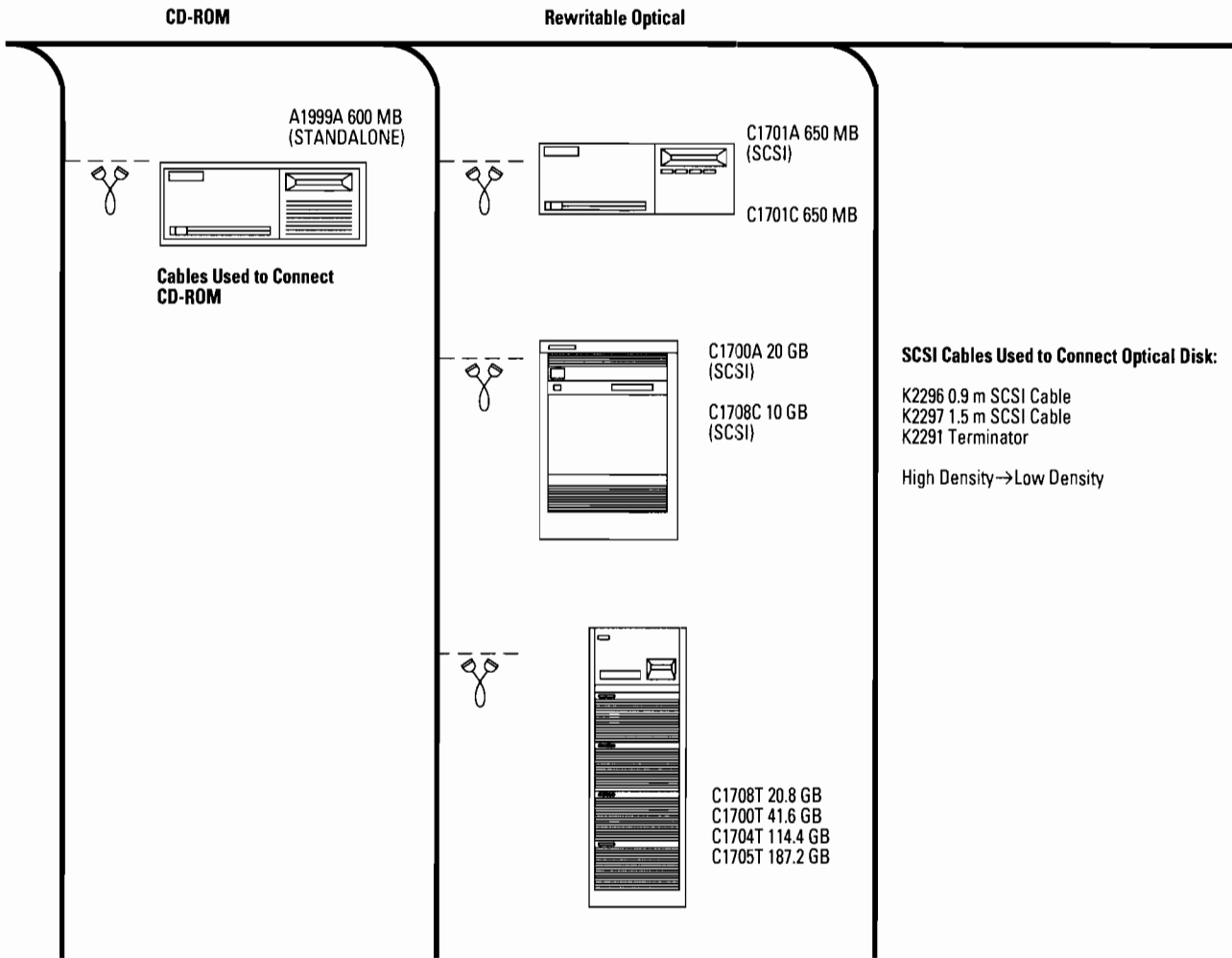


Cables Used to Connect Terminals and Printers:

40242M – RS-232
92284A – CENTRONICS
10833A/B/C – HP-IB

Peripherals





NOTE: Use K22967 SCSI cable when connecting to internal SCSI bus in 8x7S Business Servers (to connect to internal disks and DAT). Additional SCSI interfaces come without a cable, so the 92222x cables are needed to daisy chain peripherals.
92222A 0.5 m
92222B 1.0 m
92222C 2.0 m

Table 6.37 Single-Ended SCSI-2 Cables

Product Number	Length	Description
Adapter-to-Peripheral SCSI Cables		
K2296	1 m	High-density (HD) screw to low-density (LD) bail-lock male-male connectors
K2297	1.5 m	High-density (HD) screw to low-density (LD) bail-lock male-male connectors
Peripheral-to-Peripheral SCSI Cables		
92222A	0.5 m	LD bail-lock male-male connectors
92222B	1 m	LD bail-lock male-male connectors
92222C	2 m	LD bail-lock male-male connectors
SCSI Extender Cables		
92222D	1 m	LD bail-lock extension cable with 1 male and 1 female connectors
C2900A	3 m	LD bail-lock extension cable with 1 male and 1 female connectors

Peripherals Supported on the Series 800

Table 6.38 DATACOMM Devices

Part No.	Notes	Description	Interface	1st HP-UX Rel. Support	CIO	HP-PB
37204A		High Speed Mult-pt HP-IB Extender	HP-IB	7.0	Y	Y
92205A		Hayes 1200 Modem	RS-232	Pre-7.0	Y	Y
92205B		Smartmodem 2400	RS-232	Pre-7.0	Y	Y
BELL212A	@	Modem, Dial-In	RS-232	Pre-7.0	Y	Y
BELL103J	@	Dial-up, Auto-Answer	RS-232	Pre-7.0	Y	Y
BELL202T	@	4-Wire Leased Line	RS-232	Pre-7.0	Y	Y
Telebit	@	PEP/V.32 Modem	RS-232	8.0	Y	Y
Trailblazer V.32	@	Telebit 19.2 Modem	RS-232	7.0	Y	Y
USR HST	@	HST/V.32 Modem	RS-232	7.0	Y	Y
USR2400	@	Courier HST Modem	RS-232	7.0	Y	Y
USR9600	@	Courier HST Modem	RS-232	7.0	Y	Y

@ Third party devices will be certified with 8.0 software only. HP does not support third party software.
 Note: Datacomm devices are not supported in powerfail recovery.

Table 6.39 Series 800 Supported Disk Drive List

Part No.	Opt.	Description	Interface	1st HP-UX Rel. Support	CIO**	HP-PB**	Boot Device	Notes
7907A		41 MB Fixed; Removable Disk Drive	HP-IB (fast)	Pre-7.0	Y	Y		0
7914CT		132 MB Disk/Tape	HP-IB (fast)	Pre-7.0	Y	Y	Yes	0, S
7914P/R		132 MB Disk/Tape Drive	HP-IB (fast)	Pre-7.0	Y	Y	Yes	0, S
7933H		404 MB Disk Drive	HP-IB (fast)	Pre-7.0	Y	Y	Yes	0, S
7936FL		307 MB Fixed Disk Drive	HP-FL	Pre-7.0	Y	N	Yes	0, S, [^]
7936H		307 MB Formatted Fixed Disk Drive	HP-IB (fast)	Pre-7.0	Y	Y	Yes	0, S
7937FL		571 MB FL Disk Drive	HP-FL	Pre-7.0	Y	N	Yes	0, S, [^]
7937H		571 MB Formatted Fixed Disk Drive	HP-IB (fast)	Pre-7.0	Y	Y	Yes	0, S
7957A		81 MB Fixed Disk Drive	HP-IB (fast)	Pre-7.0	Y	Y		0, S
7957B		81 MB Fixed Disk Drive in Desktop Package	HP-IB (fast)	Pre-7.0	Y	Y		0
7957S		107 MB SCSI Fixed Disk Drive	SCSI	8.0	Y	Y	Yes	0
7958A		130 MB Fixed Disk Drive	HP-IB (fast)	Pre-7.0	Y	Y	Yes	0, S
7958B		152 MB Fixed Disk In a Desktop Package	HP-IB (fast)	Pre-7.0	Y	Y	Yes	0, S
7958S		161 MB SCSI Fixed Disk Drive	SCSI	8.0	Y	Y	Yes	0, S
7959B		304 MB Fixed Disk Drive	HP-IB (fast)	Pre-7.0	Y	Y		0, S
7959S		323 MB SCSI Fixed Disk	SCSI	8.0	Y	Y	Yes	0, S
7962B		152 MB Fixed Disk w/Upgrade Capability	HP-IB (fast)	Pre-7.0	Y	Y	Yes	0, S
7963B		304 MB Fixed Disk w/Upgrade Capability	HP-IB (fast)	Pre-7.0	Y	Y	Yes	0, S
9122C		2 MB 3 1/2" Micro-floppy Disk Drive	HP-IB (slow)	Pre-7.0	Y	Y		
9127A		Single 5 1/4" Flexible Disk Drive	HP-IB (slow)	Pre-7.0	Y	Y		0
9153C	040	40 MB Winchester + 2 MB 3 1/2" Floppy	HP-IB (slow)	Pre-7.0	Y	Y		
97902B		152 MB Removable Disk Drive Kit	HP-IB	3.1	Y	Y	Yes	0, S
97903B		304 MB Removable Disk Drv Kit for HP926XB	HP-IB	3.1	Y	Y	Yes	0, S
97962B		152 MB Upgrade Kit	HP-IB	Pre-7.0	Y	Y		0, S
97963B		304 MB Upgrade Kit	HP-IB	Pre-7.0	Y	Y		0, S
A2942A		Internal (E-Class only) 3 1/2", 1.44 MB Micro-floppy Disk Drive	SCSI	9.0 Update	N	Y ¹	No	
C1700C		20 GB Optical Library	SCSI	9.0	Y	Y		
C1700T		416 GB Optical Library	SCSI	9.0	N	Y		
C1701A		Rewritable Optical Disk Drive	SCSI	9.0	Y	Y	Yes	S, *
C1701C		650 GB Standalone Drive	SCSI	9.0	Y	Y	Yes	S
C1704A		57 GB Rewritable Optical Disk Library	SCSI	8.02	Y	Y		
C1704C		60 GB Optical Library	SCSI	9.0	Y	Y		
C1704T		114.4 GB Optical Library	SCSI	9.0	N	Y		
C1705A		93 GB Rewritable Optical Disk Library	SCSI	8.02	Y	Y		
C1705C		100 GB Optical Library	SCSI	9.0	Y	Y		
C1705T		187.2 GB Optical Library	SCSI	9.0	N	Y		
C1708T		20.8 GB Optical Library	SCSI	9.0	N	Y		
C2200A		Model 335H Formatted Fixed Disk Drive	HP-IB (fast)	7.0	Y	Y	Yes	S
C2201A		Model 670FL Formatted Fixed Disk Drive	HP-FL	7.0	Y	Y	Yes	S
C2203A		Model 670H Formatted Fixed Disk Drive	HP-IB (fast)	7.0	Y	Y	Yes	S
C2204A		Model 1.34FL Formatted Fixed Disk	HP-FL	7.0	Y	Y	Yes	S

Notes:

0 Obsolete; listed for reference only.

S Supported as System Disk.

[^] Not supported on 815 (no HP-FL support).

@@ CIO Support on 9.0 only.

* C1701A has been tested for use as a system disk. Such usage is normally limited to recovery after a system-disk crash, when an image of the system disk is available on a C1701A medium (on the Series 300 only).

¹ E-Class SPU's only

** Current HP-UX version = 9.0

Table 6.39 Series 800 Supported Disk Drive List (cont'd)

Part No.	Opt.	Description	Interface	1st HP-UX Rel. Support	CIO**	HP-PB**	Boot Device	Notes
C2212A*		332 MB SCSI Disk Mass Storage System	SCSI	8.0	Y	Y	Yes	S, +
C2212A*	001	Add-On 332 MB SCSI 5 1/4" Disk Drive	SCSI	8.0	Y	Y		S
C2212A*	003	Add-On 1.3 GB Digital Audio Tape Drive	SCSI	8.0	Y	Y		S
C2212A*	004	Add-On CD-ROM Drive	SCSI	8.0	Y	Y		S
C2212A*	005	Add-On 650 MB Rewritable Optical Disk Drive	SCSI	8.0	Y	Y		
C2212A*	024	Two Add-On CD-ROM Drives	SCSI	8.0	Y	Y		
C2213A*		664 MB SCSI Disk Mass Storage System	SCSI	8.0	Y	Y	Yes	
C2213A*	001	Add-On 332 MB SCSI 5 1/4" Disk Drive	SCSI	8.0	Y	Y		S
C2213A*	002	Add-On 664 MB SCSI 5 1/4" Disk Drive	SCSI	8.0	Y	Y		S
C2213A*	003	Add-On 1.3 GB Digital Audio Tape Drive	SCSI	8.0	Y	Y		S
C2213A*	004	Add-On CD-ROM Drive	SCSI	8.0	Y	Y		
C2213A*	005	Add-On 650 MB Rewritable Optical Disk Drive	SCSI	8.0	Y	Y		S
C2213A*	022	Two Add-On 664 MB SCSI 5 1/4" Disk Drives	SCSI	8.0	Y	Y		S
C2213A*	024	Two Add-On CD-ROM Drives	SCSI	8.0	Y	Y		
C2213A*		664 MB SCSI Disk Mass Storage System	SCSI	8.0	Y	Y		S
C2252B/BZ		2.72 GB Disk Array	HP-FL	8.0	Y	Y	Yes	T, R
C2252HA/HZ		2.72 GB High Availability Disk Array	HP-FL	8.0	Y	Y	Yes	T, R
C2254B/BZ		5.44 GB Disk Array	HP-FL	8.0	Y	Y	Yes	T, R
C2254HA/HZ		5.44 GB High Availability Disk Array	HP-FL	8.0	Y	Y	Yes	T, R
C2281A		Integrated 335 MB Mechanism/Controller	HP-IB	7.02	N	Y		
C2282A		Integrated 670 MB Mechanism/Controller	HP-IB	8.02	N	Y		
C2290A*		332 MB SCSI Disk Upgrade Kit/C2212A/C2213A	SCSI	8.0	Y	Y		S
C2291A*		664 MB SCSI Disk Upgrade Kit/C2212A/C2213A	SCSI	8.0	Y	Y		S
C2294A*		650 MB Rewritable Optical Disk Upgrade/ C2212A/C2213A	SCSI	8.0	Y	Y	Yes	S
C2460F		Model 420F Formatted SCSI-2 Disk Drive	SCSI	8.02	Y	Y	Yes	S, §
C2460R		Model 420R Formatted SCSI-2 Disk Drive	SCSI	8.02	Y	Y	Yes	S, §
C2461F		Model 670F Formatted SCSI-2 Disk Drive	SCSI	8.02	Y	Y	Yes	S, §
C2461R		Model 670R Formatted SCSI-2 Disk Drive	SCSI	8.02	Y	Y	Yes	S, §
C2462F		Model 1350F Formatted SCSI-2 Disk Drive	SCSI	8.02	Y	Y		S, §, †
C2462R		Model 1350R Formatted SCSI-2 Disk Drive	SCSI	8.02	Y	Y		S, §, †
C2470S		234 MB Single-Ended SCSI Expansion	SCSI	8.02	Y	Y	Yes	S, §
C2471S		328 MB Single-Ended SCSI Expansion	SCSI	8.02	Y	Y	Yes	S, §
C2472F		422 MB Single-Ended SCSI Expansion	SCSI	8.02	Y	Y	Yes	S, §
C2472R		422 MB Single-Ended SCSI Expansion	SCSI	8.02	Y	Y	Yes	S, §
C2472S		422 MB Single-Ended SCSI Expansion	SCSI	8.02	Y	Y	Yes	S, §
C2473F		677 MB Single-Ended SCSI Expansion	SCSI	8.02	Y	Y	Yes	S, §
C2473R		677 MB Single-Ended SCSI Expansion	SCSI	8.02	Y	Y	Yes	S, §
C2473S		677 MB Single-Ended SCSI Expansion	SCSI	8.02	Y	Y	Yes	S, §
C2474F		1.35 GB Single-Ended SCSI Expansion	SCSI	8.02	Y	Y	Yes	S, §, †
C2474R		1.35 GB Single-Ended SCSI Expansion	SCSI	8.02	Y	Y	Yes	S, §, †
C2474S		1.35 GB Single-Ended SCSI Expansion	SCSI	8.02	Y	Y	Yes	S, §, †
C3022T		1 GB Disk Minitower	SCSI	9.0	N	Y	Yes	S, #
C3022R		1 GB Disk Rackmount	SCSI	9.0	N	Y	Yes	S, #
C3023T		2 GB Disk Minitower	SCSI	9.0	N	Y	Yes	S, #
C3023R/RZ		2 GB Disk Rackmount	SCSI	9.0	N	Y	Yes	R, S, #
C3024T		4 GB Disk Minitower	SCSI	9.0	N	Y	Yes	S, #
C3024R/RZ		4 GB Disk Rackmount	SCSI	9.0	N	Y	Yes	R, S, #
C3025R/RZ		3 × 2 GB Rackmount for Factory Integration	SCSI	9.0	N	Y	Yes	S, #

Notes:

- S Supported as System Disk.
- + Not tested in 8.0, but supports glitchless transceivers.
- T Support of boot/install and independent mode with HP-UX release 9.0 native NIO FL card (P/N 28615A) and independent mode functionality.
- R Rack Mountable.
- # 8.02 and 8.07 patch available (C3301A). Data disk only.
- * Does not support powerfail.
- ** Current HP-UX version = 9.04
- § CIO support at 9.0 only.
- † Required down-rev disk mechanism firmware revision B02 for successful install with HP-UX 9.0 or greater.

Table 6.39 Series 800 Supported Disk Drive List (cont'd)

Part No.	Opt.	Description	Interface	1st HP-UX Rel. Support	CIO**	HP-PB**	Boot Device	Notes
C3027U		1 GB Disk Drive Expansion Kit	SCSI	9.0	N	Y	Yes	S, #
C3028U		2 GB Disk Drive Expansion Kit	SCSI	9.0	N	Y	Yes	S, #
C3032R/T		One 1 GB F/W Drive for Tower and Rack	F/W SCSI	9.04	N	Y	Yes	S
C3035R/T		Four 1 GB F/W Drive for Tower and Rack	F/W SCSI	9.04	N	Y	Yes	S
C3036T		Seven 1 GB F/W Drive for Tower	F/W SCSI	9.04	N	Y	Yes	S
C3037U		One 1 GB F/W Drive Expansion Kit	F/W SCSI	9.04	N	Y	Yes	S
C3040R/T/RZ		One 2 GB Drive for Tower and Rack	SE-SCSI	9.04	N	Y	Yes	S
C3041R/T/RZ		Two 2 GB Drive for Tower and Rack	SE-SCSI	9.04	N	Y	Yes	S
C3042RZ		One 2 GB Drive for Rack	SE-SCSI	9.04	N	Y	Yes	S
C3044U		One 2 GB Drive Expansion Unit	SE-SCSI	9.04	N	Y	Yes	S
C3550R/T		One 2 GB F/W Drive for Tower and Rack	F/W SCSI	9.04	N	Y	Yes	S
C3551R/T		Two 2 GB F/W Drive for Tower and Rack	F/W SCSI	9.04	N	Y	Yes	S
C3553RZ		One 2 GB F/W Drive for Rack	F/W SCSI	9.04	N	Y	Yes	S
C3554U		One 2 GB F/W Drive Expansion Kit	F/W SCSI	9.04	N	Y	Yes	S
A2958A		Internal 535 MB Disk	SE-SCSI	9.04	N	Y	Yes	S
A3087A		Internal 2 GB Disk	SE-SCSI	9.04	N	Y	Yes	S
C2440HA/HZ		8 GB F/W/D SCSI Disk Array	F/W SCSI	9.04	N	Y	Yes	S
C2439HA/HZ		4 GB F/W/D SCSI Disk Array	F/W SCSI	9.04	N	Y	Yes	S
C2437HA/HZ		4 GB F/W/D SCSI Disk Array	F/W SCSI	9.04	N	Y	Yes	S
C2436HA/HZ		2 GB F/W/D SCSI Disk Array	F/W SCSI	9.04	N	Y	Yes	S

Notes:

- S Supported as System Disk.
- + Not tested in 8.0, but supports glitchless transceivers.
- T Support of boot/install and independent mode with HP-UX release 9.0 native NIO FL card (P/N 28615A) and independent mode functionality.
- R Rack Mountable.
- # 8.02 and 8.07 patch available (C3301A). Data disk only.
- * Does not support powerfail.
- ** Current HP-UX version = 9.04
- § CIO support at 9.0 only.
- ‡ Required down-rev disk mechanism firmware revision B02 for successful install with HP-UX 9.0 or greater.

Table 6.40 Series 800 Plotter List

Part No.	Description	Interface	1st HP-UX Rel. Support	CIO**	HP-PB**
17440A	Graphics Enhancement Cartridge	7440A	7.0	Y	Y
7440A	Color-Pro Graphics Plotter	HP-IB	Pre-7.0	Y	Y
		RS-232	Pre-7.0	Y	Y
7475A	6-Pen Graphics Plotter	HP-IB	Pre-7.0	Y	Y
		RS-232	Pre-7.0	Y	Y
7550A*	8-Pen Graphics Plotter	HP-IB	Pre-7.0	Y	Y
		RS-232	Pre-7.0	Y	Y
7550B	7550 Plus 4 Color Desktop Plotter	HP-IB	8.0	Y	Y
		RS-232	8.0	Y	Y
		Centronics	8.0	Y	Y
7586B*	Roll Feed Drafting Plotter	HP-IB	Pre-7.0	Y	Y
		RS-232	Pre-7.0	Y	Y
7595A*	HP7595A A4 through A0 Plotter	HP-IB	Pre-7.0	Y	Y
		RS-232	Pre-7.0	Y	Y
		RS-422	Pre-7.0	Y	Y
7595B*	HP7595B A4 through A0 Plotter	HP-IB	8.0	Y	Y
		RS-232	8.0	Y	Y
7596A*	HP7596A A4 through A0 Plotter	HP-IB	Pre-7.0	Y	Y
		RS-232	Pre-7.0	Y	Y
		RS-422	Pre-7.0	Y	Y
7596B*	HP7596B A4 through A0 Plotter	HP-IB	8.0	Y	Y
		RS-232	8.0	Y	Y
7599A*	HP7599A, A0/E Rollfeed, 4 user	HP-IB	8.0	Y	Y
		RS-232	8.0	Y	Y
C1600A*	HP7600 Series/240D	HP-IB	Pre-7.0	Y	Y
		Centronics	8.0	N	Y
C1601A*	HP7600 Series/240E	HP-IB	Pre-7.0	Y	Y
		Centronics	8.0	N	Y
C1620A	HP7600 Series/355 Electrostatic	HP-IB	8.0	Y	Y
		RS-232	8.0	Y	Y
		Centronics	8.0	N	Y
C1625A	HP7600 Series Model 250	HP-IB	8.0	Y	Y
		RS-232	8.0	Y	Y
		Centronics	8.0	N	Y
C1627A	HP7600 Series Model 255	HP-IB	8.0	Y	Y
		RS-232	8.0	Y	Y
		Centronics	8.0	N	Y

* Obsolete; listed for reference only

** Current support status for HP-UX version 9.0.

Table 6.41 Series 800 Printer List

Part Number	Description	Interface	Print Speed	Paper Type	Print Quality	Bar Codes	1st HP-UX Rel. Support	CIO (*)	HP-PB (*)	Notes
2225C	ThinkJet Printer for USA	Centronics	150 cps	Std fanfold/ cut sheets	Draft	No	8.0	N	Y	
2225D	ThinkJet Printer for USA	RS-232	150 cps	Std fanfold/ cut sheets	Draft	No	Pre-7.0	Y	Y	
2225P	Thinkjet battery powered printer	Centronics	150 cps	Std fanfold/ cut sheets	Draft	No	8.0	N	Y	
2227A	QuietJet Plus Printer	Centronics	160/192 cps	Wide fanfold/ cut sheets	NLQ/Draft	No	8.0	N	Y	
2227A	QuietJet Plus Printer	RS-232	160/192 cps	Wide fanfold/ cut sheets	NLQ/Draft	No	Pre-7.0	N	Y	
2227B	U.S. Version of QuietJet	HP-IB (slow) Plus Printer	160/192 cps	Wide fanfold/ cut sheets	NLQ/Draft	No	Pre-7.0	Y	N	
2228A	QuietJet Printer	Centronics	160/192 cps	Std fanfold/ cut sheets	NLQ/Draft	No	8.0	N	Y	
2228A	QuietJet Printer	RS-232C	160/192 cps	Std fanfold/ cut sheets	NLQ/Draft	No	Pre-7.0	Y	Y	
2235A	RuggedWriter 480 Printer/ U.S. Version	Centronics	240/480 cps	Wide fanfold/ cut sheets	LQ/Draft	No	8.0	N	Y	
2235A	RuggedWriter 480 Printer/ U.S. Version	RS-232	240/480 cps	Wide fanfold/ cut sheets	LQ/Draft	No	Pre-7.0	Y	Y	
2235B	RuggedWriter 480 Printer/ U.S. Version	HP-IB (slow)	240/480 cps	Wide fanfold/ cut sheets	LQ/Draft	No	Pre-7.0	Y	N	
2235B	RuggedWriter 480 Printer/ U.S. Version	RS-232	240/480 cps	Wide fanfold/ cut sheets	LQ/Draft	No	Pre-7.0	Y	Y	
2235C	RuggedWriter 480 Printer/ U.S. Version	Centronics	240/480 cps	Wide fanfold/ cut sheets	LQ/Draft	No	8.0	N	Y	
2235C	RuggedWriter 480 Printer/ U.S. Version	RS-232	240/480 cps	Wide fanfold/ cut sheets	LQ/Draft	No	Pre-7.0	Y	Y	
2235D	RuggedWriter 480 Printer/ U.S. Version	HP-IB (slow)	240/480 cps	Wide fanfold/ cut sheets	LQ/Draft	No	Pre-7.0	Y	N	
2235D	RuggedWriter 480 Printer/ U.S. Version	RS232C	240/480 cps	Wide fanfold/ cut sheets	LQ/Draft	No	Pre-7.0	Y	N	
2276A	DeskJet Printer/ U.S. Version	Centronics	120/240 cps	Single sheet/ envelopes	LQ/Draft	No	8.0	N	Y	0
2276A	DeskJet Printer/ U.S. Version	RS-232	120/240 cps	Single sheet/ envelopes	LQ/Draft	No	Pre-7.0	Y	Y	0
2277A	DeskJet Plus Printer/ U.S. Version	Centronics	120/240 cps	Single sheet/ envelopes	LQ/Draft	No	8.0	N	Y	0
2277A	DeskJet Plus Printer/ U.S. Version	RS-232	120/240 cps	Single sheet/ envelopes	LQ/Draft	No	7.0	Y	Y	0
2562C	Industrial Line Impact Printer	RS-232	150/420 lpm (3/7 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	7.0	Y	Y	@
2562C	Industrial Line Impact Printer	RS-422	150/420 lpm (3/7 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	7.0	Y	Y	@
2562C	Industrial Line Impact Printer	Centronics	150/420 lpm (3/7 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	8.0	N	Y	@
2562C	Industrial Line Impact Printer	HP-IB	150/420 lpm (3/7 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	7.0	Y	N	@
2562C	Industrial Line Impact Printer	LAN	150/420 lpm (3/7 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	8.0	Y	Y	@

Notes:

- RS-232 printers are not supported in powerfail recovery.
 - 815 (NIO) only supports RS-232 printers.
- 0 Obsolete, listed for reference only.
 * Current support status HP-UX 9.0.
 @ U.S. Postnet, OCR A/B and European Set-up are some of the options available.

Print Quality Legend

NLQ = Near Letter Quality
 LQ = Letter Quality

Table 6.41 Series 800 Printer List (cont'd)

Part Number	Description	Interface	Print Speed	Paper Type	Print Quality	Bar Codes	1st HP-UX Ref. Support	CIO (*)	HP-PB (*)	Notes
2563C	48 dba Line Impact Printer	RS-232	150/420 lpm (3/7 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	7.0	Y	Y	@
2563C	48 dba Line Impact Printer	RS-422	150/420 lpm (3/7 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	7.0	Y	Y	@
2563C	48 dba Line Impact Printer	Centronics	150/420 lpm (3/7 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	8.0	N	Y	@
2563C	48 dba Line Impact Printer	HP-IB	150/420 lpm (3/7 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	7.0	Y	N	@
2563C	48 dba Line Impact Printer	LAN	150/420 lpm (3/7 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	8.0	Y	Y	@
2354A	54 dba Line Impact Printer	RS-232	145/840 lpm (2/14 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	7.0	Y	Y	@
2354A	54 dba Line Impact Printer	RS-422	145/840 lpm (2/14 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	7.0	Y	Y	@
2354A	54 dba Line Impact Printer	Centronics	145/840 lpm (2/14 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	8.0	N	Y	@
2354A	54 dba Line Impact Printer	HP-IB	145/840 lpm (2/14 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	7.0	Y	N	@
2354A	54 dba Line Impact Printer	LAN	145/840 lpm (2/14 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	8.0	Y	Y	@
2356A	55 dba Line Impact Printer	RS-232	194/1120 lpm (3/19 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	7.0	Y	Y	@
2356A	55 dba Line Impact Printer	RS-422	194/1120 lpm (3/19 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	7.0	Y	Y	@
2356A	55 dba Line Impact Printer	Centronics	194/1120 lpm (3/19 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	8.0	N	Y	@
2356A	55 dba Line Impact Printer	HP-IB	194/1120 lpm (3/19 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	7.0	Y	N	@
2356A	55 dba Line Impact Printer	LAN	194/1120 lpm (3/19 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	8.0	Y	Y	@
2566A	Line Impact Printer	RS-232	248/1200 lpm (4/20 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	7.0	Y	Y	@
2566A	Line Impact Printer	RS-422	248/1200 lpm (4/20 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	7.0	Y	Y	@
2566A	Line Impact Printer	Centronics	248/1200 lpm (4/20 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	8.0	N	Y	@
2566A	Line Impact Printer	HP-IB	248/1200 lpm (4/20 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	7.0	Y	N	@
2566A	Line Impact Printer	LAN	248/1200 lpm	Wide fanfold/ 6-part form	NLQ/Draft	Yes	8.0	Y	Y	@
2567A	Line Impact Printer	RS-232	320/1600 lpm (5/27 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	7.0	Y	Y	@
2567A	Line Impact Printer	RS-422	320/1600 lpm (5/27 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	7.0	Y	Y	@
2567A	Line Impact Printer	Centronics	320/1600 lpm (5/27 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	8.0	N	Y	@
2567A	Line Impact Printer	HP-IB	320/1600 lpm (5/27 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	7.0	Y	N	@
2567A	Line Impact Printer	LAN	320/1600 lpm (5/27 ppm)	Wide fanfold/ 6-part form	NLQ/Draft	Yes	8.0	Y	Y	@

Notes:

- RS-232 printers are not supported in powerfail recovery.
- 815 (NIO) only supports RS-232 printers.
- 0 Obsolete, listed for reference only.
- * Current support status HP-UX 9.0.
- @ U.S. Postnet, OCR A/B and European Set-up are some of the options available.

Print Quality Legend
 NLQ = Near Letter Quality
 LQ = Letter Quality

Table 6.41 Series 800 Printer List (cont'd)

Part Number	Description	Interface	Print Speed	Paper Type	Print Quality	Bar Codes	1st HP-UX Rel. Support	CIO (*)	HP-PB (*)	Notes
2684A	LaserJet 2000 Printer; 115 Vac 60 Hz	RS-232	20 ppm	Single sheet/ no forms	LQ	Std	Pre-7.0	Y	Y	0
2684P	LaserJet 2000 Printer with Paper Deck	Centronics	20 ppm	Single sheet/ no forms	LQ	Std	8.0	N	Y	0
2686A	LaserJet Printer; 115 VAC 60 Hz; 8 ppm	Centronics	8 ppm	Single sheet/ no forms	LQ	Std	8.0	N	Y	0
2686A	LaserJet Printer; 115 VAC 60 Hz; 8 ppm	RS-232	8 ppm	Single sheet/ no forms	LQ	Std	Pre-7.0	N	Y	0
2686D	LaserJet 500+; 115 VAC 50 Hz	Centronics	8 ppm	Single sheet/ no forms	LQ	Std	8.0	N	Y	0
2686D	LaserJet 500+	RS-232	8 ppm	Single sheet/ no forms	LQ	Std	7.0	Y	Y	0
C2354A	Dot Matrix Line Printer	HP-IB	840 lpm	Wide fanfold/ 6-part forms	NLQ/Draft	Opt	9.0	Y	N	
C2354A	Dot Matrix Line Printer	RS-232	840 lpm	Wide fanfold/ 6-part forms	NLQ/Draft	Opt	9.0	Y	Y	
2932A	Dot Matrix Impact Printer	HP-IB (slow)	200 cps	Wide fanfold/ 6-part forms	Draft	No	Pre-7.0	Y	N	0
2932A	Dot Matrix Impact Printer	Centronics	200 cps	Wide fanfold/ 6-part forms	Draft	No	8.0	N	Y	0
2932A	Dot Matrix Impact Printer	RS-232	200 cps	Wide fanfold/ 6-part forms	Draft	No	Pre-7.0	Y	Y	0
2932A	Dot Matrix Impact Printer	HP-IB	200 cps	Wide fanfold/ 6-part forms	Draft	No	Pre-7.0	Y	N	0
2934A	Dot Matrix Office Quality Impact Printer	Centronics	40/67/200 cps	Wide fanfold/ 6-part forms	LQ/Draft	Yes	8.0	N	Y	
2934A	Dot Matrix Office Quality Impact Printer	HP-IB (slow)	40/67/200 cps	Wide fanfold/ 6-part forms	LQ/Draft	Yes	Pre-7.0	Y	N	
2934A	Dot Matrix Office Quality Impact Printer	RS-232	40/67/200 cps	Wide fanfold/ 6-part forms	LQ/Draft	Yes	Pre-7.0	Y	Y	
33440A	LaserJet Series II 115V 8 ppm printer	Centronics	8 pages/min	Single sheets	LQ	Yes	8.0	N	Y	0
33440A	LaserJet Series II 115V 8 ppm printer	RS-232	8 pages/min	Single sheets	LQ	Yes	Pre-7.0	Y	Y	0
33447A	LaserJet IID Dual Tray, Duplex Printer	Centronics	8 pages/min	Single sheets and Duplex	LQ	Yes	8.0	N	Y	0
33447A	LaserJet IID Dual Tray, Duplex Printer	RS-232	8 pages/min	Single sheets and Duplex	LQ	Yes	7.0	Y	Y	0
33459A	LaserJet IIID Printer Dual Tray, Duplex	Centronics	8 pages/min	Single sheets and Duplex	LQ	Yes	8.0	N	Y	0
33459A	LaserJet IIID Printer Dual Tray, Duplex	RS-232	8 pages/min	Single sheets and Duplex	LQ	Yes	8.0	Y	Y	0
33471A	LaserJet IIP 4 ppm Laser Printer	Centronics	4 pages/min	Single sheets	LQ	Yes	8.0	N	Y	
33471A	LaserJet IIP 4 ppm Laser Printer	RS-232	4 pages/min	Single sheets	LQ	Yes	8.0	Y	Y	

Notes:

- RS-232 printers are not supported in powerfail recovery.
- 815 (NIO) only supports RS-232 printers.
- 0 Obsolete, listed for reference only.
- * Current support status HP-UX 9.04.

Print Quality Legend

NLQ = Near Letter Quality
LQ = Letter Quality

Table 6.41 Series 800 Printer List (cont'd)

Part Number	Description	Interface	Print Speed	Paper Type	Print Quality	Bar Codes	1st HP-UX Rel. Support	CIO (*)	HP-PB (*)	Notes
23491A	LaserJet III Si Laser Printer	LAN	17 pages/min	Single sheets and Duplex	LQ	Yes	7.0	Y	Y	0
3630A	PaintJet Color Graphics Printer for A/A4	Centronics	167 cps	Std fanfold/cut sheets	NLQ	No	8.0	N	Y	
3630A	PaintJet Color Graphics Printer for A/A4	RS-232	167 cps	Std fanfold/cut sheets	NLQ	No	Pre-7.0	Y	Y	
41063A	Asian WS Printer	RS-232	40/80 cps	Wide fanfold/cut sheets	NLQ/Draft	No	Pre-7.0	Y	Y	0
C1200A	300 lpm Dot Matrix Asian Line Printer	RS-232	270/330 lpm	Wide fanfold/6-part forms	NLQ/Draft	No	Pre-7.0	Y	Y	
C1602A	PaintJet XL Color Graphics Printer	Centronics	167 cps	Wide cut sheets/autofeed	NLQ	No	8.0	N	Y	0
C1602A	PaintJet XL Color Graphics Printer	HP-IB	167 cps	Wide cut sheets/autofeed	NLQ	No	7.0	Y	N	0
C1602A	PaintJet XL Color Graphics Printer	RS-232	167 cps	Wide cut sheets/autofeed	NLQ	No	7.0	Y	Y	0
C2106A	DeskJet 500 Printer	Centronics	120/240 cps	cut sheets/envelopes	LQ/Draft	No	8.0	N	Y	
C2106A	DeskJet 500 Printer	RS-232	120/240cps	cut sheets/envelopes	LQ/Draft	No	8.0	Y	Y	
C2753A	HP 5000 Model F100 Pg Printer—60 Hz	SCSI	100 pages/min	Std fanfold	LQ	Std	9.0	Y	Y	
C2753B	HP 5000 Model F100/Turbo Printer—60 Hz	SCSI	100 pages/min	Std fanfold	LQ	Std	9.0	Y	Y	*
C2754A	HP 5000 Model F100 Pg Printer—50 Hz	SCSI	100 pages/min	Std fanfold	LQ	Std	9.0	Y	Y	
C2754B	HP 5000 Model F100/Turbo Printer—50 Hz	SCSI	100 pages/min	Std fanfold	LQ	Std	9.0	Y	Y	*
C2755A	HP 5000 Model 135XP Pg Printer—60 Hz	SCSI	135/210 PPM	Std/wide fanfold	LQ	Std	9.0	Y	Y	*
C2756A	HP 5000 Model 135XP Pg Printer—50 Hz	SCSI	135/210 PPM	Std/wide fanfold	LQ	Std	9.0	Y	Y	*
C2772A	HP 5000 Model 100XP Pg Printer—60 Hz	SCSI	100/154 PPM	Std/wide fanfold	LQ	Std	9.0	Y	Y	*
C2773A	HP 5000 Model 100XP Pg Printer—50 Hz	SCSI	100/154 PPM	Std/wide fanfold	LQ	Std	9.0	Y	Y	*
C2776A	HP 5000 Model 135 Pg Printer—60 Hz	SCSI	135 pages/min	Std fanfold	LQ	Std	9.0	Y	Y	*
C2777A	HP 5000 Model 135 Pg Printer—50 Hz	SCSI	135 pages/min	Std fanfold	LQ	Std	9.0	Y	Y	*
C2001A	LaserJet 4	RS-232	8	Cut sheets	LQ	Yes	9.04	N	Y	
C2001A	LaserJet 4	Centronics	8	Cut sheets	LQ	Yes	9.04	N	Y	
C2003A	LaserJet 4L	RS-232	4	Cut sheets	LQ	Yes	9.04	N	Y	
C2003A	LaserJet 4L	Centronics	4	Cut sheets	LQ	Yes	9.04	N	Y	
C2114A	DeskJet 500C Printer	RS-232		Cut sheets	LQ	Yes	9.04	N	Y	
C2114A	DeskJet 500C Printer	Centronics		Cut sheets	LQ	Yes	9.04	N	Y	
C2121A	DeskJet 550C Printer	RS-232		Cut sheets	LQ	Yes	9.04	N	Y	
C2121A	DeskJet 550C Printer	Centronics		Cut sheets	LQ	Yes	9.04	N	Y	
C1645A	PaintJet XL300 Graphics Printer	RS-232		Cut sheets	NLQ	Yes	9.04	N	Y	

Notes:

- RS-232 printers are not supported in powerfail recovery.
 - 815 (NIO) only supports RS-232 printers.
- 0 Obsolete, listed for reference only.
 * CIO support on HP-UX 9.04 only.

Print Quality Legend

NLQ = Near Letter Quality
 LQ = Letter Quality



Table 6.42 Series 800 Terminal List

Part No.	Description	Interface	1st HP-UX Rel. Support	CIO*	HP-PB*	Notes
2323A	40 Channel Seq	RS-232	None	N	N	O
2382A	Office Display Terminal	RS-232	None	N	N	O
2392A	Display Terminal	RS-232	Pre-7.0	Y	Y	O, C
2393A	Monochrome Graphics Terminal	RS-232	Pre-7.0	Y	Y	O, C
2394A	Data Entry Terminal	RS-232	Pre-7.0	Y	Y	O
2397A	Color Raster Terminal	RS-232	Pre-7.0	Y	Y	O, @
2622A	Display Terminal	RS-232	None	N	N	O
3081A	Workstation Terminal	RS-232	Pre-7.0	Y	Y	O
3082B	Industrial Terminal	RS-232	7.0	Y	Y	O
45850A	HP150-II Terminal	RS-232	None	N	N	O
45970C	Vectra ES/12 Model 20 SPU	RS-232	8.0	Y	Y	O, C
C1001A/G/W	HP700/92 Terminal	RS-232	Pre-7.0	Y	Y	C
C1002A/G/W	HP700/94 Terminal	RS-232	Pre-7.0	Y	Y	C
C1003A/G	HP700/41 Terminal	RS-232	Pre-7.0	Y	Y	O
C1004A/G/W	HP700/22 Terminal	RS-232	Pre-7.0	Y	Y	O
C1006A/G/W	HP700/43 Terminal	RS-232	Pre-7.0	Y	Y	
C1007A/G/W	HP700/44 Terminal	RS-232	Pre-7.0	Y	Y	
C1010C	Simplified Chinese HP700/92A Keyboard	RS-232	3.1	Y	Y	O, ^, C
C1010J	Japanese HP700/92A Keyboard	RS-232	8.0	Y	Y	O, C
C1010K	Korean HP700/92A Keyboard Kit	RS-232	7.0	Y	Y	O, ^, C
C1010T	Traditional Chinese HP700/92A Keyboard	RS-232	3.1	Y	Y	O, ^, C
C1017A/G/W	HP700/32 Terminal	RS-232	7.0	Y	Y	
C1064A/G/W	HP700/96 Terminal	RS-232	9.0	Y	Y	C
C1065A/G/W	HP700/98 Terminal	RS-232	9.0	Y	Y	C
C1080A/G/W	HP700/60 Terminal	RS-232	9.0	Y	Y	
C1083W	HP700/60 ES (Reduced Emission)	RS-232	9.0	Y	Y	
C1084W	HP700/96 ES (Reduced Emission)	RS-232	9.0	Y	Y	C
C1085W	HP700/98 ES (Reduced Emission)	RS-232	9.0	Y	Y	C
C2300A	XWindow Graphic Terminal (700/X)	LAN	8.0	Y	Y	O

Notes:

- ^ For use in certain Asian countries only.
- O Obsolete: Listed for reference only.
- N Not supported with HP-UX Release 9.04.
- C Supported as System Console.
- @ Can be used as a system console on the 815 only.
- * Current support status HP-UX 9.04.

Table 6.43 Series 800 Tape Drive and CD-ROM List

Part No.	Opt. No.	Description	Interface	1st HP-UX Rel. Support	CIO*	HP-PB*	Notes
35401A		1/4" Cartridge Autochanger Tape Drive	HP-IB (fast)	Pre-7.0	Y	Y	O
7979A		1600 CPI Autoload 1/2" Tape Drive	HP-IB (fast)	Pre-7.0	Y	Y	
7979A	Opt. 800	Add 800 cpi	HP-IB (fast)	Pre-7.0	Y	Y	
7980A		6250/1600 cpi Autoload 1/2" Tape Drive	HP-IB (fast)	Pre-7.0	Y	Y	
7980A	Opt. 800	Add 800 cpi	HP-IB (fast)	Pre-7.0	Y	Y	
7980S		1600/6250 bpi 1/2" Tape Drive	SCSI	8.0	Y	Y	G
7980S	Opt. 800	Adds 800 bpi density	SCSI	8.0	Y	Y	G
7980SX		1600/6250/6250XC bpi 1/2" Tape Drive	SCSI	8.0	Y	Y	G
7980SX	Opt. 800	Adds 800 cpi NRZI	SCSI	8.0	Y	Y	G
7980XC		6250XC/6250/1600 Extra Capacity Tape Drive	HP-IB (fast)	Pre-7.0	Y	Y	
9144A		67 MB 1/4" Tape Cartridge	HP-IB (fast)	Pre-7.0	Y	Y	O
9145A		133 MB 1/4" Tape Cartridge	HP-IB (fast)	Pre-7.0	Y	Y	O
A1999A		Standalone 660 MB SCSI CD-ROM	SCSI	8.02	Y	Y	@@
A2311A		QIC Upgrade Kit	SCSI	8.02	N	Y	Nova Only
A2312A	Opt. AM7	2 GB DAT in Peripheral Upgrade Kit	SCSI	8.02	N	Y	R
A2312A	Opt. AM8	CD-ROM in Peripheral Upgrade Kit	SCSI	8.02	N	Y	R
A2312A	Opt. AM9	QIC in Peripheral Upgrade Kit	SCSI	8.02	N	Y	R
C1501A		Embedded Digital Data Storage	HP-IB (fast)	8.0	Y	Y	O, @, T
C1502A		1.3 GB DAT	SCSI	8.0	Y	Y	O, @, G, T, Z
C1511A		1.3 GB HP-IB DDS Format Tape Drive	HP-IB (fast)	8.0	Y	Y	O, T, Z
C1512A		1.3 GB SCSI DDS Format Tape Drive	SCSI	8.0	Y	Y	O, T, Z
C1520B		Standalone 2.0 GB DAT Drive	SCSI	8.02	Y	Y	@@
C1521B		Standalone 2-8 GB Datacompression DAT Drive	SCSI	8.02	Y	Y	D, @@
C2226A/U		1.3 GB Digital Audio Tape Upgrade Kit	SCSI	8.0	Y	Y	Z
C2292A		600 MB CD-ROM Upgrade Kit	SCSI	9.0	Y	Y	
C2293A							
C2293T							
C2293U		600 MB CD-ROM Expansion Kit	SCSI	9.0	Y	Y	
C2463F		1.3 GB DAT MiniTower Storage Subsystem	SCSI	8.02	Y	Y	O, R, G, T, Z
C2463R		1.3 GB DAT Rack Storage Subsystem	SCSI	8.02	Y	Y	O, R, G, T, Z
C2464F		2 GB DAT MiniTower Storage Subsystem	SCSI	8.02	Y	Y	@@, R
C2465F							
C2464R		2 GB DAT Rack Storage Subsystem	SCSI	8.02	Y	Y	@@, R
C2465R							
C2477F/R		2 GB DAT Add-on to C246X	SCSI	8.02	Y	Y	
C2466F		2-8 GB Datacompression DAT— MiniTower Storage Subsystem	SCSI	8.02	Y	Y	D
C2466R		2-8 GB Datacompression DAT— Rack Storage Subsystem	SCSI	9.0	Y	Y	#
C2476F/R/S		Up to 8 GB DAT Expansion Kit for Rackmount or MiniTower	SCSI	8.02	Y	Y	R, D
C2467F		Two 2-8 GB Datacompression DATs— MiniTower Storage Subsystem	SCSI	8.02	Y	Y	D
C2467R		Two 2-8 GB Datacompression DATs— Rack Storage Subsystem	SCSI	8.02	Y	Y	#
C2476S		600 MB Half-height CD-ROM—CPU Expansion Kit	SCSI	8.02	Y	Y	§
C2477S		2 GB DAT Expansion Kit—CPU	SCSI	8.02	Y	Y	§
C2477U		2 GB DAT Expansion Kit—MiniTower or Rack	SCSI	8.02	Y	Y	§
C2478U		Up to 8 GB DAT Expan. Kit—MiniTower or Rack	SCSI	9.0	Y	Y	#, §
A3086A		2x speed CD-ROM	SCSI	9.04	N	Y	S
A2942A		1.44 MB microfloppy drive	SCSI	9.04	N	Y	
A2944A		1 GB QIC	SCSI	9.04	N	Y	S
A3024A		8 mm 5 GB tape drive	SCSI	9.04	N	Y	

Notes:

- O Obsolete: Listed for reference only.
- @ Product not currently sold by HP. For support purposes only.
(used to structure H/W support prices per CPL Database).
- * Current support status HP-UX 9.04.
- @@ Qualified on CIO at 9.0, supported on 8.02 order option 800 to get patch tape.
- R Rack Mountable
- Z Not supported on 50, 60, and 70 class machines.

- G Glitchy controllers. These devices require a dedicated SCSI bus.
- D Data compression DAT allows for storage of up to 8 GB of compressed data per 90 m tape.
- # 8.02 support available without boot/install support.
- T Product not supported by A2306A, A2307A, A2319A, and A2320A.
- § Supported on CIO at 9.04.

Section 7 Software

HP-UX 9.04 Operating System

HP-UX 9.04 is the current operating system for the Series 800 Business Servers. All servers are bundled with:

- HP-UX 9.04 2-user license (except the 890 which has an 8-user license)
- VUE 3.0 (Visual User Environment) single-user license
- Motif 1.2 single-user license
- X.11 Release 5 single-user license
- LAN/9000 license-to-use
- ARPA/9000 license-to-use
- NFS/9000 license-to-use
- NCS 1.5.1 Runtime license-to-use
- NetLS Runtime license-to-use
- General Programming Tools
- Minimum System Administration Documentation

To order Series 800 HP-UX software, follow these steps:

Step 1: Order HP-UX Operating System Media .

(Though Series 800 Business Servers can have HP-UX pre-loaded through the Instant Ignition products, always recommend that at least one copy of

HP-UX media is purchased per site/workgroup, primarily for recovery, installation, and administration needs.)

See **Table 7.3**.

- B3108A HP-UX 9.04 operating system media
 - Select DDS, QIC-525 cartridge, or 1/2-inch magnetic tape
- or
- B3108C HP-UX 9.04 on CD-ROM
- or
- B3108D Reduced HP-UX 9.04 for 8 MB systems
 - Does not provide networking subsystems, X.11, Motif, or VUE
 - Select DDS, QIC-525 cartridge, or 1/2-inch magnetic tape

Step 2: Order increased HP-UX user license level (if more than 2 users will be connected to the Series 800 system, see **Table 7.4**).

- Order the B3108L HP-UX user license product (See **Table 7.3**)
 - Select the desired user license level with options UAx
 - Select the same user level software with options AGx (Exception: No option is required for an 8-user upgrade since the B3108A/C/D HP-UX media support system access at both 2 and 8 user levels)
 - Select an HP-UX 9.04 user upgrade credit with options UBx. The 2-user credit should at least be ordered since all Series 800 systems include a minimum of a 2-user license

- Select the desired media with options AAx
- For pre-load of user level software select option 0D1 (See Instant Ignition rules)

An HP-UX 9.04 license upgrade must be purchased for each E, F, G, H, I, and T500 running above the base 2-user level and similarly for Model 890 servers above the base 8-user level. As with the HP-UX operating system media product, order one set of license media for each desired user level per site/workgroup.

Step 3: Order additional software products (one media copy per site/workgroup recommended)

Most additional HP software products follow either a 3-tier or user based pricing structure. With the tier structure, customers must order the appropriate tier license for the target Series 800 model. A software license must be ordered for each Series 800 server on which the software will run. The desired media for each product should also be ordered.

A few HP software products have HP release options as well. These release options ensure that the correct version of the software is provided for the equivalent HP-UX release.

- Opt. APB—HP-UX 8.0
- Opt. APC—HP-UX 8.02
- Opt. APD—HP-UX 8.06
- Opt. APH—HP-UX 9.0, 9.04

Instant Ignition

HP Instant Ignition provides software pre-loading and hard disk pre-configuration for the HP-UX 9.04 operating system for all user license levels along with selected other HP software products. Pre-installation saves the customer time and guarantees compatibility between all the Instantly Ignited software.

When ordering Instant Ignition for HP-UX 9.04 in combination with any one of the HP network link cards, the following products are also pre-installed along with the HP-UX software:

- VUE 3.0 (Visual User Environment) single-user license
- Motif 1.2 single-user license
- X.11 Release 5 single-user license
- LAN/9000 license-to-use
- ARPA/9000 license-to-use
- NFS/9000 license-to-use
- NCS 1.5.1 Runtime license-to-use
- NetLS Runtime license-to-use

Pre-loaded software

The Instant Ignition option (option 0D1) is available for the following selected HP software in **Table 7.1**.

Table 7.1

Product Name	Product/Opt. No.
HP-UX 2-user license	A2440A, Opt. 0D1
HP-UX License Product	B3108L, Opt. 0D1
MirrorDisk/UX	B2491A, Opt. 0D1
SwitchOver/UX	92668A, Opt. 0D1
SNApius3270	J2221A, Opt. 0D1
SNApius RJE	J2222A, Opt. 0D1
SNApius API	J2223A, Opt. 0D1
Streams/UX	J2237A, Opt. 0D1
C/ANSI-C Compiler	B2412A, Opt. 0D1
COBOL Developer	B2433AA, Opt. 0D1
COBOL Compiler	B2434AA, Opt. 0D1
COBOL Runtime System	B2435AA, Opt. 0D1
C++ Compiler	B2405A, Opt. 0D1
GlancePlus	B3693AA, Opt. 0D1 (Est. avail. Feb. 1994)
GlancePlus Pak	B3701AA, Opt. 0D1 (Est. avail. Feb. 1994)

For one fixed fee, one or all of this software can be pre-loaded and the system disk pre-configured.

Ordering Instructions

To order, follow these simple steps:

1. Select A2440A option 0D1 (Instant Ignition of the 2-user HP-UX license) in the server ordering menus.
2. From the list of available Instant Ignition pre-loadable software, select option 0D1 for each additional software product to be pre-loaded at no additional charge.

Note: The HP-UX 8.02 and 9.04 2-user license software will continue to be pre-loaded at no charge (as has been done in the past). However, with Instant Ignition of the HP-UX 9.04 2-user license software (A2440A, Opt. 0D1), additional software can also be pre-loaded and flexible system disk pre-configurations are available.

Default Configurations

To confirm your system disk's pre-installed swap space and directory size configuration, please review **Table 7.2** on the following page. The configuration defaults that are listed were designed and tested to work well for the majority of HP's customers.

Custom Configurations

If the default configurations listed do not fit the customer's particular needs, request custom configuration to be pre-installed at no additional charge. To request a pre-installed custom configuration, please do the following:

1. Order the following: A3142A Special Configuration; A3142A, opt. 001 Root Volume Configuration (which provides for custom configuration of your system's swap space and directory sizes at the factory).
2. Work with your customer to complete the Instant Ignition Custom Configuration form (see **Figure 7.1**). (This form is available on HP FIRST, on e-mail address config-001@dollar.rose.hp.com, or on HP DESK address ai_admin/HP5200.)
3. Send the completed form to the factory at e-mail address ai_admin@dollar.rose.hp.com or HP DESK address ai_admin/HP5200, or fax it to the telephone number that will be printed at the bottom of the form.

Table 7.2 Instant Ignition Default Configurations

Disk: 535 MB					
Memory (MB)	root	SWAP	/usr	/tmp	
16	109	33	260	50	
32	109	62	260	50	
48	109	62	260	50	
64	109	62	260	50	
96	109	62	260	50	
128	109	62	260	50	
256	109	62	260	50	
512	109	62	260	50	
1024	109	62	260	50	
2048	109	62	260	50	

Disk: 1 GB					
Memory (MB)	root	SWAP	/usr	/tmp	
16	109	67	310	79	
32	109	67	310	79	
48	109	100	310	79	
64	109	134	310	79	
96	109	201	310	79	
128	109	268	310	79	
256	109	473	310	79	
512	109	473	310	79	
1024	109	473	310	79	
2048	109	473	310	79	

Disk: 2 GB					
Memory (MB)	root	SWAP	/usr	/tmp	
16	109	67	415	130	
32	109	67	415	130	
48	109	100	415	130	
64	109	134	415	130	
96	109	201	415	130	
128	109	268	415	130	
256	109	536	415	130	
512	109	939	415	130	
1024	109	1317	415	130	
2048	109	1317	415	130	

Note: Remainder of disk space will be allocated to /users and to file system overhead.

Figure 7.1 Instant Ignition Custom Configuration Form

**Please send this sheet when you
order A3142A, option #001
Series 800 Instant Ignition Custom Configuration**

Customer Order Number: _____
 Customer Company Name: _____

Technical Contact at customer site: _____
 Name: _____
 Phone: _____

HP Sales Representative Name: _____

Root Volume Group:

Logical volume	size	usage
(vol1)	_____ Mb	swap
(vol2)	_____ Mb	/
(vol3)	_____ Mb	/usr
(vol4)	_____ Mb	/tmp

Sample form. See instructions on page 7-2 to order a copy of the actual form.

Table 7.3 HP-UX 9.04 Operating System

Description	Product No./ Option No.
HP-UX 9.04 Server Operating System Media Provides HP-UX 9.04 operating system at a 2- and 8-user level. Functionality includes ARPA, NFS, LAN, and runtime support for NCS, NetLS, VUE, and X11 applications. For upgrades to higher user levels, please order the B3108L User License Product. A minimal set of System Administration documentation is included; the full System Administration documentation is available with B3108M, Opt. 0BE. 1/2-inch media QIC-525 cartridge tape DDS cartridge	B3108A Opt. AA1 Opt. AA4 Opt. AAH
HP-UX 9.04 Server Operating System on CD-ROM Provides HP-UX 9.04 operating system at a 2- and 8-user level. Functionality includes ARPA, NFS, LAN; and runtime support for NCS, NetLS, VUE, and X11 applications. For upgrades to higher user levels, please order the B3108L User License Product with Opt. AAU. Other HP software products are also available on the B3108C CD-ROM set; please look for the Opt. AAU with the desired software product. Hard copy manuals delivered with the B3108C are the "Installing and Updating HP-UX" and the "Installing Peripherals" manuals.	B3108C
HP-UX 9.04 Reduced HP-UX for 8 MB Systems Provides a reduced version HP-UX 9.04 operating system. Does not include ARPA, NFS, LAN, NCS, NetLS, VUE and X11. (Order B3108L, below, for upgrades to higher user levels.) 1/2-inch media QIC-525 media DAT media	B3108D Opt. AA1 Opt. AA4 Opt. AAH
HP-UX 9.04 User Licenses for the Series 800 Provides HP-UX 9.04 user licenses and user upgrade software for Series 800. HP-UX User License Level (must order one) Provides HP-UX 9.04 license-to-use certificate at desired user level. 2-user license 8-user license 16-user license 32-user license 64-user license Unlimited user license HP-UX User Upgrade Credit (may order one) May also be used for inter-processor license transfers for existing HP-UX 9.0 based systems. Credit for 9.0 2-user license when upgrading to higher user level Credit for 9.0 8-user license when upgrading to higher user level Credit for 9.0 16-user license when upgrading to higher user level Credit for 9.0 32-user license when upgrading to higher user level Credit for 9.0 64-user license when upgrading to higher user level Credit for 9.0 128-user license when upgrading to higher user level Credit for 9.0 256-user license when upgrading to higher user level HP-UX user level specification [No specification option necessary for 8-user level. Software for both the 2 and the 8-user level is included with core HP-UX 9.04 media (B3108A)]. Must order one if media option (AA1, AA4, AAH, or AAU) is ordered. 16-user software 32-user software 64-user software Unlimited user software Media Options (may order one) Must also order one of options AGx. In combination with Opt. AGx, provides only HP-UX 9.04 user upgrade file on desired media (does not include entire operating systems). 1/2-inch magnetic tape (1600 cpi) QIC-525 cartridge tape Digital Audio Tape (DAT) CD-ROM Instant Ignition option	B3108L Opt. UA1 Opt. UA3 Opt. UA5 Opt. UA7 Opt. UA9 Opt. UAT Opt. UB1 Opt. UB3 Opt. UB5 Opt. UB7 Opt. UB9 Opt. UBA Opt. UBV Opt. AGM Opt. AGN Opt. AGP Opt. AGS Opt. AA1 Opt. AA4 Opt. AAH Opt. AAU Opt. 0D1

Transferring HP-UX Licenses to a New Series 800

When a customer upgrades through a box-swap from an existing Series 800 (e.g., 808, 8x5, 8x2, 87x, 8x7, etc.) to a new Series 800, they may transfer the existing HP-UX License to the new system, providing either:

1. The customer will be using the same version of HP-UX on the new system as on the old, or
2. The customer has a Support Contract covering HP-UX.

If the customer is moving to a newer version of HP-UX and does **not** have a software support contract covering the operating system, the new version of HP-UX must be purchased. The Sales Response Center may authorize a 60% return credit in these cases.

If the customer wishes to **increase** the HP-UX User License level when moving to the new system, they must order the B3108L HP-UX User License:

- Select the new user level with option UAx
- Select the same user level specification with option AGx
- Select the user upgrade credit with option UBx, representing the **old** user license level
- Select the desired media with option AAx

If the customer does not qualify under 1) or 2), above, then only 60% of the return credit above will be authorized by the Sales Response Center.

An Explanation of CD-ROM Software Distribution

HP-UX 9.04 is also available on CD-ROM with the B3108C. Only 2 hardcopy manuals are provided with CD-ROM: Installing and Updating HP-UX and Installing Peripherals. Some other HP software products are also available on the HP-UX 9.04 CD-ROM.

HP-UX 9.04 at the basic 2-user level is unlocked and is immediately available on the CD set when it is delivered. All HP software on the CD-ROM comes loaded on the CD disks and can only be accessed using a special codeword which “unlocks” it. HP software products that are on the CD set will have option AAU available and if desired must be ordered on the same section. A CD-ROM entitlement certificate will then be provided for the additional HP software that has been ordered. Instructions are provided with the certificate on how to contact HP for the necessary codeword. The codeword is made up of elements specific to the CD-ROM disk, additional software ordered and a “hardware ID” for the targeted Series 800 system. The codeword process requires the customer to provide the “hardware ID,” CD-ROM disk part numbers, and information from the CD-ROM entitlement certificates. This process is repeated if a customer later on wants to order additional software on the CD-ROM. HP will provide a codeword within eight hours of a completed request.

Ordering HP-UX Documentation for the Series 800

HP-UX 9.0x media only includes a minimal set of System Administration Documentation. Refer to the Series 800 Price Guide for a listing of documentation. To obtain the full set, the complete System Administration set should be ordered as specified below.

Documentation may be ordered in two formats: paper hardcopy or CD-ROM.

To order HP-UX Series 800 documents on CD-ROM, order the HP-UX Series 800 Documentation base product (B3108M) and select option 0BC. Option 0BC delivers the documentation on CD-ROM and access software with a 1-user license-to-use. Additional user licenses are available in multiples of 4 by ordering the 4-user add-on option UA2.

Paper hardcopy documentation can be ordered in 2 ways:

1. Four documentation sets are available as options to the base HP-UX Series 800 Documentation product (B3108M). Refer to Series 800 Price Guide for a complete list of available documentation.
2. Individual manuals can be ordered from HP DMO (Direct Marketing Operation).

HP-UX localized documentation can also be ordered for French, German and Japanese. They are available under separate documentation product numbers that deliver a combination of English and translated HP-UX manuals.

Table 7.4 Counting "Users" for HP-UX Licenses

Device	User Count
ASCII Terminals: • Hardwired/Direct Connect via terminal multiplexer • via DTC • via Terminal Server	• Each terminal logged in counts as one user
Personal Computers with terminal emulator	• Each PC logged in via terminal emulator counts as one user, whether hardwired, via DTC or LAN
X-Terminals and PCs using X-Terminal emulation over a LAN HP and other vendors' workstations	• Limited only by capacity of system to support number of logged-in users • Not counted as individual users
System Console	• Counts as one user
LAN	• Counts as one user
PCs utilizing file- and print-sharing networking services such as NFS or LAN Manager	• Not counted as individual users

Localization for HP-UX consists of two parts, HP-UX user interface and NLIO (Native Language I/O).

HP-UX can be localized for several languages. HP-UX user interface products for German, French, Japanese, Korean, and Chinese are included with HP-UX 9.0 media. With these products, HP-UX will output system and error messages in the local language. For the Japanese HP-UX user interface, the Japanese NLIO product must also be installed on the Series 800 so that HP-UX can output its messages in the Japanese character set.

NLIO allows the Series 800 to input and output characters in different character sets, instead of the standard ROMAN character set. NLIO is available for several Asian languages. The NLIO products do not use the 3-tier product and pricing model, but instead are offered with user-based pricing that is similar to HP-UX licenses for the Series 800.

Ordering the Previous HP-UX 9.0 Version

HP-UX 9.04 is designed to be fully backwards compatible with HP-UX 9.0. As such, applications are expected to run without recertification on HP-UX 9.04. HP-UX 9.0 may be ordered until March 1, 1994.

Only the FULL HP-UX 9.0 release will be available. The minimum 8 MB Reduced HP-UX version will not be purchasable. The media types offered will be DAT/DDS, QIC, and Magnetic Tape. CD-ROM will not be supported.

The following ordering procedure must be used:

Step 1: HP-UX Licenses will be purchased through either the standard 2-user license bundled with new Series 800 Servers or the B3108L license product. The media option (not including CD or cartridge) on B3108L should be purchased where appropriate to get the user level license upgrade tape. This tape will work on both HP-UX 9.0 and 9.04.

Table 7.5 HP-UX Support Matrix

Model Number	HP-UX Revisions Supported			
	7.X	8.X	9.0	9.04
807S-877S	—	8.02	9.0	9.04
887S, 897S	—	—	9.0	9.04
E25, E35, E45	—	—	—	9.04
F10, F20, F30, G30, G40, H20, H30, H40, I30, I40	—	8.02	9.0	9.04
G50, H50, I50	—	—	9.0	9.04
G60, G70, H60, H70, I60, I70	—	—	9.0*	9.04
T500	—	—	—	9.04
890S	—	—	9.0	9.04
850S, 855S	7.0	8.0	9.0	9.04**
865S	—	8.0	9.0	9.04**
860S, 870S/100	7.06	8.0	9.0	9.04**
870S/200, 870S/300, 870S/400	—	8.06	9.0	9.04**
822S, 832S	7.02, 7.08	8.0	9.0	9.04**
842S, 852S	7.08	8.0	9.0	9.04**
825S, 835S, 845S	7.0	8.0	9.0	9.04**
808S, 815S	7.0	8.0	9.0	9.04**

* Supported under 9.0 Release after September 1993.
** Will not support Fast/Wide Differential SCSI-2 8mm tape and 3480 tape devices.

Step 2: The appropriate part number should be purchased to receive the HP-UX 9.0 media and documentation:

Media Type	Part Number
Magnetic Tape	B3108-60070
QIC Tape	B3108-60071
DAT/DDS Tape	B3108-60072
Documentation	B3108-60047

Table 7.6

Description	Product No./ Option No.
Series 800 HP-UX Version 9.04 Documentation	D3108M
General Usage Documentation. Covers general usage of HP-UX, text editing, and shell programming.	Opt. 0BD
Users Guides Documentation. Covers advanced usage of shells, text editors, and formatters.	Opt. 0BG
System Administration Documentation. Covers aspects of system administration for Series 800 HP-UX Version 9.04 including ARPA, LAN, and NFS.	Opt. 0BE
Programming Documentation. Covers aspects of assembly programming for Series 800 systems.	Opt. 0BF
Documentation on CD-ROM. Includes 1-user license-to-use (includes manuals from Opt. 00B, 0BG, 0BE, and 0BF).	Opt. 0BC
4-User add-on for CD-ROM Documentation. Provides license-to-use for four additional users of CD-ROM documentation access software.	Opt. UA2
Japanese Documentation (see options below)	B3135A
French Documentation (see options below) (HP-UX 8.0 documentation)	B2447A
German Documentation (see options below) (HP-UX 8.0 documentation)	B2449A
Simplified Chinese Documentation (see options below)	B3136A
Traditional Chinese Documentation (see options below)	B3134A
Korean Documentation (see options below)	B3133A
General Usage Documentation	Opt. 0BD
Users Guides Documentation	Opt. 0BG
System Administration Documentation	Opt. 0BE
Programming Documentation	Opt. 0BF
NLIO Software for Series 800	
Japanese NLIO Font (see options below)	B2202A
Korean NLIO Font (see options below)	B2206A
Traditional Chinese NLIO Font (see options below)	B2210A
Simplified Chinese NLIO Font (see options below)	B2214A
8-user license	Opt. UA3
16-user license	Opt. UA5
32-user license	Opt. UA7
64-user license	Opt. UA9
128-user license	Opt. UAB
256-user license	Opt. UAD
Unlimited user license	Opt. UAT
Credit for 8-user license	Opt. UB3
Credit for 16-user license	Opt. UB5
Credit for 32-user license	Opt. UB7
Credit for 64-user license	Opt. UB9
Credit for 128-user license	Opt. UBC
Credit for 256-user license	Opt. UBD
1/4-inch media	Opt. AA0
1/2-inch media	Opt. AA1
DAT media	Opt. AAH

Database Software

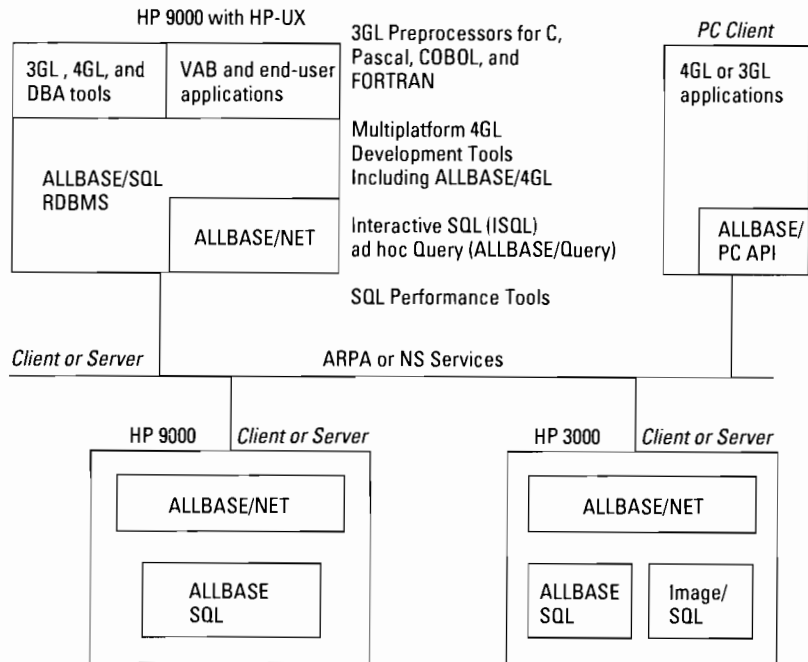
ALLBASE/SQL Configuration Guidelines

ALLBASE/SQL is Hewlett-Packard's high-performance relational database management system (RDBMS) for all HP-UX and MPE/iX systems. Key benefits include:

- Only RDBMS on HP-UX offering full read/write between an SQL database and IMAGE
- Excellent OLTP performance for mission-critical applications on HP 9000 servers
- Leading features such as stored procedures, rules and triggers, row-level locking, database shadowing, Microsoft ODBC API, and built-in referential integrity
- Costs anywhere from 25–90% less than third-party alternatives.

The ALLBASE/NET client/server remote database access product is bundled with ALLBASE/SQL on the Series 800 and is backward-compatible for client systems running earlier versions of

Figure 7.2 Interoperability between HP 9000s and HP 3000s with HP Databases



HP-UX. Read/write access from an HP-UX system to TurboIMAGE data on a target MPE/iX system is provided by using Image/SQL (available separately on the HP 3000). ALLBASE/Net is bundled with ALLBASE/SQL and IMAGE/SQL at no cost.

The development version of ALLBASE/SQL for HP-UX provides 3GL preprocessors for using embedded SQL in C, Pascal, and COBOL applications. Development and runtime versions of ALLBASE/SQL provide full support for multiplatform 4GL development tools including HP's ALLBASE/4GL and ALLBASE/Query and many third-party tools. Minimum system requirements are 4 Mbytes RAM and 20 Mbytes disk space.

Table 7.7 Software Matrix for ALLBASE/SQL Development and Runtime for the HP 9000 Series 800 (B3142A or B3143A)*

Description	Product No./ Option No.
ALLBASE/SQL V.G.0 Development for Series 800 Systems	B3143A
1/2-inch magnetic tape	Opt. AA1
Digital Audio Tape (DDS)	Opt. AAH
CD-ROM	Opt. AAU
QIC media	Opt. AA4
ALLBASE/SQL manuals—additional set	Opt. OB1
Japanese manuals—Japan only	Opt. ABJ
Single-user license	Opt. UA0
4-user license	Opt. UA2
8-user license	Opt. OAL
16-user license	Opt. UA5
32-user license	Opt. UA7
48-user license	Opt. UA8
64-user license	Opt. UA9
96-user license	Opt. UAA
128-user license	Opt. UAB
256-user license	Opt. UAD
512-user license	Opt. UCQ
Unlimited user license	Opt. UAT
Credit for 1-user license when upgrading to higher user level (Series 700 or 800)	Opt. UB0
Credit for 4-user license when upgrading to higher user level (Series 700 or 800)	Opt. UB2
Credit for 8-user license when upgrading to higher user level (Series 700 or 800)	Opt. UB3
Credit for 16-user license when upgrading to higher user level (Series 700 or 800)	Opt. UB5
Credit for 32-user license when upgrading to higher user level (Series 700 or 800)	Opt. UB7
Credit for 48-user license when upgrading to higher user level (Series 700 or 800)	Opt. UB8
Credit for 64-user license when upgrading to higher user level (Series 700 or 800)	Opt. UB9
Credit for 96-user license when upgrading to higher user level (Series 700 or 800)	Opt. UBW
Credit for 128-user license when upgrading to higher user level (Series 700 or 800)	Opt. UBA
Credit for 256-user license when upgrading to higher user level (Series 700 or 800)	Opt. UBV
Credit for 512-user license when upgrading to higher user level (Series 700 or 800)	Opt. UCP
ALLBASE/SQL V.G.0 Runtime for Series 800 Systems	B3142A
1/2-inch magnetic tape	Opt. AA1
Digital Audio Tape (DDS)	Opt. AAH
CD-ROM	Opt. AAU
QIC media	Opt. AA4
ALLBASE/SQL manuals—additional set	Opt. OB1
Japanese manuals—Japan only	Opt. ABJ
Single-user license	Opt. UA0
4-user license	Opt. UA2
8-user license	Opt. OAL
16-user license	Opt. UA5
32-user license	Opt. UA7
48-user license	Opt. UA8
64-user license	Opt. UA9
96-user license	Opt. UAA
128-user license	Opt. UAB
256-user license	Opt. UAD
512-user license	Opt. UCQ
Unlimited user license	Opt. UAT
Credit for 1-user license when upgrading to higher user level (Series 700 or 800)	Opt. UB0
Credit for 4-user license when upgrading to higher user level (Series 700 or 800)	Opt. UB2
Credit for 8-user license when upgrading to higher user level (Series 700 or 800)	Opt. UB3
Credit for 16-user license when upgrading to higher user level (Series 700 or 800)	Opt. UB5
Credit for 32-user license when upgrading to higher user level (Series 700 or 800)	Opt. UB7
Credit for 48-user license when upgrading to higher user level (Series 700 or 800)	Opt. UB8
Credit for 64-user license when upgrading to higher user level (Series 700 or 800)	Opt. UB9
Credit for 96-user license when upgrading to higher user level (Series 700 or 800)	Opt. UBW
Credit for 128-user license when upgrading to higher user level (Series 700 or 800)	Opt. UBA
Credit for 256-user license when upgrading to higher user level (Series 700 or 800)	Opt. UBV
Credit for 512-user license when upgrading to higher user level (Series 700 or 800)	Opt. UCP

* See price guide for upgrade credits.

ALLBASE/SQL PC API is a software product that provides a programmatic interface from PC-based applications to ALLBASE/SQL databases on an HP 9000 Series 800. It includes both Gupta and Microsoft (ODBC) APIs and comes bundled with ALLBASE/SQL at no extra cost. The applications and development tools reside on the client MS Windows environment while the DBMS is server resident. This allows application developers and end-users to exploit the graphical capabilities and extra processing power of the PC and at the same time, rely on the security, integrity and DBMS capabilities of ALLBASE/SQL.

Required Hardware

Client PC

- 386, 486 IBM-compatible PC
- LAN card
- Mouse for Microsoft Windows
- 4 MB minimum memory (8 MB recommended)
- 2 MB disk (PC API, more needed for Windows, 4GL, networking)

Server (HP 9000)

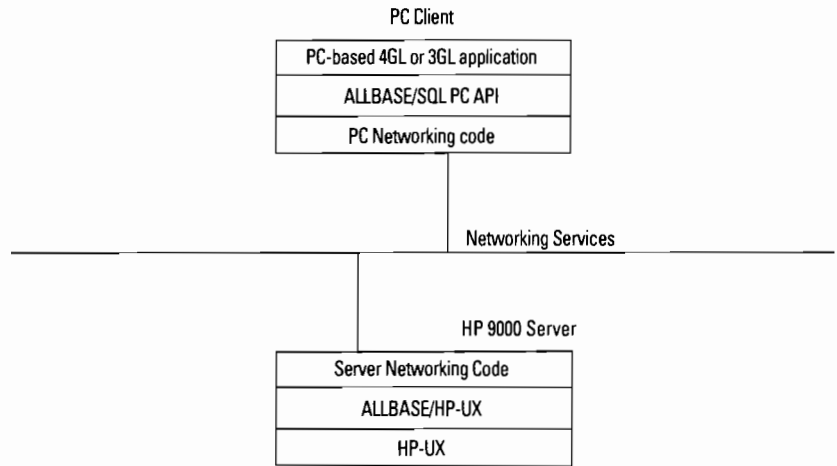
- HP 9000 Series 700 or 800

Required/Optional Software

PC Client

- MS-DOS 5.0 or later
- Microsoft Windows 3.1
- 4GL environment or 3GL application PLUS any of the listed networking products
 - PC ARPA+ NS for MS-DOS, Microsoft LAN Manager
 - NS 2.1/MS-DOS
 - Novell LAN Workplace for DOS
 - NetManage Chameleon
 - FTP Software

Figure 7.3 Client-Server Architecture for ALLBASE Applications



- Server (HP 9000)*
- HP-UX 9.0 or higher
 - ALLBASE/SQL (G.0)

Third Party Contacts

- Gupta Technologies Inc.
1-800-876-3267
- PowerSoft Corporation
1-800-395-3525
- Trinzic
603-427-0444
- Pioneer Software
1-800-876-3101
- Cognos, Inc.
1-800-426-4667
- Microsoft
1-800-227-4679
- Information Builders, Inc. (IBI)
1-800-969-INFO
- ASK/Ingres
1-800-446-4737
- Uniface
1-510-748-6145
- Progress
1-800-477-6473
- Speedware
1-800-447-0745

Ported 4GLs/Decision Support Tools for ALLBASE/SQL*

- Gupta Express Windows
- PowerSoft PowerBuilder
- Gupta SQL Windows
- Gupta SQL Talk/Windows
- Gupta ReportWindows
- Gupta Quest
- Cognos Impromptu
- Cognos PowerHouse 4GL
- Microsoft Visual Basic
- Microsoft Access
- Speedware 4GL
- HP Information Access
- HP ALLBASE 4GL and Query
- ASK/Ingres 4GL
- IBI Focus 4GL
- Progress 4GL
- Uniface 4GL
- Trinzic Forest and Trees
- Pioneer Q+E MultiLink
- Pioneer Q+E Database Library

*Some of these tools do not require ALLBASE PC API. Check with the tool vendor for specific requirements.

ALLBASE/REPLICATE Configuration Guidelines

ALLBASE/REPLICATE is a product that allows ALLBASE users to maintain shadow copies of ALLBASE databases (or subsets of databases). The REPLICATE mechanism allows shadow copies to stay synchronized with any updates to the primary copy of the data. In the simplest case, a **replicated** environment may consist of a primary database with one or more shadow or secondary databases. The REPLICATE mechanism allows a shadow (or secondary) database to extract relevant update operations from the primary database and then apply them to itself. Extending this basic case of replication, we may have two databases that are at once primary and secondary to each other for simultaneous replication.

Key Benefits

- **Disaster Recovery.** If a primary environment becomes unavailable for some reason, user applications may switch to one or more secondary environments.
- **Performance.** Since secondary environments are available AND may be kept up-to-date, user applications that are read-only may be offloaded to one or more secondary sites for decision support thereby freeing the primary environment for OLTP.
- **Data Warehousing.** A single database (at one site) can contain replicated data from multiple databases on the network for data warehousing and global decision support.
- **Remote, unattended backup operations.** This product is a great fit for environments that desire to be operatorless and/or do not have a local backup device. The REPLICATE mechanism may serve as an online or offline remote backup mechanism.
- **Heterogeneous Operations.** ALLBASE/REPLICATE also allows for replication between HP 3000 and HP 9000 (Series 700 or 800) ALLBASE environments.

Architecture of ALLBASE/REPLICATE

- The REPLICATE engine
- The REPLICATE application

Please refer to the architecture diagram in **Figure 7.4**. The REPLICATE application has two components: one running on the primary and one on the secondary.

The REPLICATE Application

The ALLBASE/REPLICATE product comes with a REPLICATE application. Users should note that they can create a REPLICATE application in one of the following ways:

- Users may directly use the REPLICATE application or custom-build it to suit their requirements (source code is made available on the product tape)
- Users may write their own REPLICATE application. A **REPLICATE API** is on the product tape

Hardware/Software and Networking Requirements

- HP 9000 Series 800 system
- ALLBASE/SQL G.0 or greater
- Minimum 20 Mbytes of disk space required
- NS software
- ALLBASE/REPLICATE G.0 or greater

For more information please call your local HP Sales Response Center.

Figure 7.4 Architecture of ALLBASE/REPLICATE

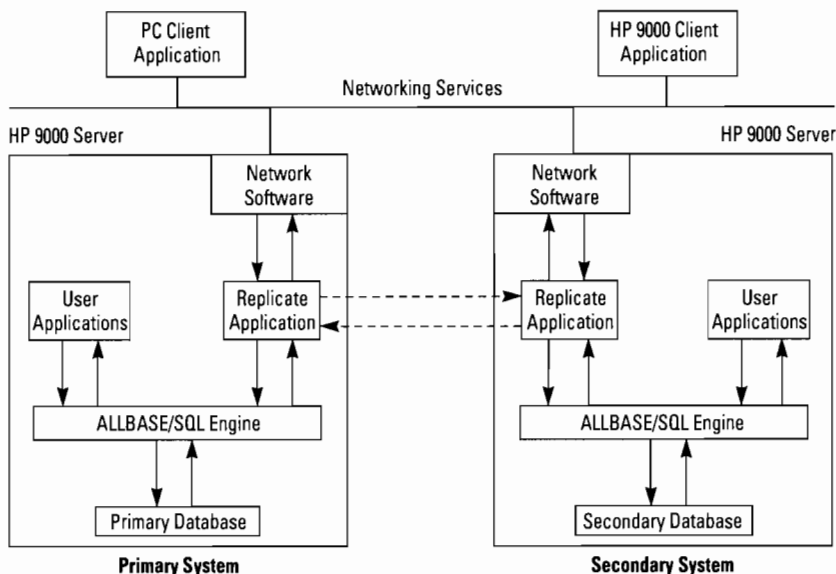


Table 7.8 Product Matrix for ALLBASE/REPLICATE V.G.0

Product Number	Option	Description
B3480B		ALLBASE/REPLICATE for HP 9000 Series 800
	AA1	1/2-inch magnetic tape (1600 bpi)
	AAH	Digital Audio Tape
	AAU	CD-ROM (Release 8.02 and 9.0 only)
	AA4	QIC media

Table 7.9 ALLBASE/SQL Documentation

Product	P/N
ALLBASE/SQL Reference Manual	36217-90001
ALLBASE/SQL Reference Manual for ALLBASE/SQL and IMAGE/SQL	36217-90188
ALLBASE/SQL Database Administration Guide	36217-90005
ALLBASE/SQL Message Manual	36217-90009
ALLBASE/NET User's Guide	36217-90093
ALLBASE/SQL Advanced Application Programming Guide for HP-UX	36217-90186
ALLBASE/SQL C Application Programming Guide	36217-90014
ALLBASE/SQL FORTRAN Application Programming Guide	36217-90013
ALLBASE/SQL COBOL Application Programming Guide	36217-90058
ALLBASE/SQL Pascal Application Programming Guide	36217-90007
HP ALLBASE PC API User's Guide for ALLBASE/SQL and IMAGE/SQL	36217-90187
ALLBASE/SQL Performance & Monitoring Guidelines	36217-90185
HP ALLBASE Replicate User's Guide	B3480-90002
Up and Running with HP ALLBASE/SQL	36389-90011

Information Access

Table 7.10 illustrates which servers are needed for each database type.

Table 7.10

Database Type	Platform	Server
Paradox, dBase, R:Base	DOS	No server needed, only client (B3538AA)
IMAGE, MPE Files	MPE V	IA Server/V (B3161A)
IMAGE, MPE Files	MPE iX	IA Server/iX (B3160A)
ALLBASE, ORACLE, INGRES	MPE iX	IA SQL/iX (B3162A)
ALLBASE, ORACLE, INGRES, INFORMIX, PROGRESS	HP-UX	IA SQL/UX (B3116A)
SYBASE	HP-UX	Non HP SYBASE Server
Microsoft SQL Server	OS/2	Non HP Microsoft SQL Server
Gupta's SQLBase	OS/2	Non HP Gupta SQL Base
Red Brick's Warehouse	HP-UX	Non HP Red Brick Warehouse Server
IBI/EDA	HP-UX	Non HP EDA Server
ODBC	Many	Many

Note: The client software, Information Access for Windows B3538AA, is always required; the server software is determined by the database type. All the major databases now support the Open Database Connectivity API (ODBC), so customers have the option in many cases of buying the ODBC driver or the server software.

Table 7.11 illustrates the networking interfaces supported by Information Access for Windows.

Table 7.11

Database/OS	WINSOCK.DLL	WSOCKETS.DLL	WIN_SOCKET.DLL	W3IPC.DLL
ALLBASE/UX	Yes	Yes	No	Yes
ORACLE/UX	Yes	Yes	No	Yes
INGRES/UX	Yes	Yes	No	No
INFORMIX/UX	Yes	Yes	No	No
PROGRESS/UX	Yes	Yes	No	No
SYBASE/UX	Yes	No	Yes	No
EDA/UX	No	Yes	No	No
IMAGE/MPE	No	Yes	No	Yes
ALLBASE/MPE	No	No	No	Yes
ORACLE/MPE	No	No	No	Yes
INGRES/MPE	Yes	Yes	No	No
SQL Server/OS2	(1)	(1)	(1)	(1)
SQLBase/OS2	(2)	(2)	(2)	(2)

(1) SQLServer on OS/2 only supports Named Pipes.

(2) SQLBase on OS/2 uses NetBIOS.

Table 7.12 HP Database Tools

B2964A	ALLBASE/SQL/4GL/Query Development Bundle for Series 800
1-16 User License	Option UA5
1-32 User License	Option UA7
1-64 User License	Option UA9
1-128 User License	Option UAB
Unlimited User License	Option UAT

ALLBASE/SQL/Query Bundle

B3492AA	UA5	16-User License
	UA7	32-User License
	UA9	64-User License
	UAB	128-User License
	UAT	Unlimited User License

ALLBASE/Query

B3148A (same options as above)
Media Options same as for ALLBASE/4GL

OpenODB from Hewlett-Packard Configuration Guidelines

What is OpenODB?

OpenODB is an object-oriented database management system (ODBMS) tuned for complex commercial applications. Commercial applications are characterized by:

- Short transactions
- Hundreds of users accessing the same data at the same time
- Strong need for security features
- Need for high-availability features such as transaction logging, recovery, and on-line backup
- Need to integrate with legacy data and applications

Features

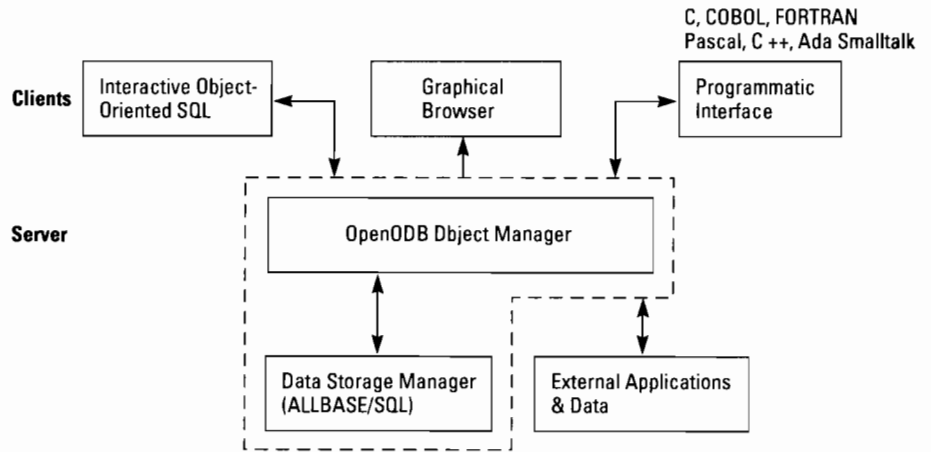
OpenODB is a complete object-oriented implementation which includes all of the following object-oriented features and more:

- Encapsulation
- Object identity
- Inheritance (including multiple inheritance)
- User-defined type hierarchy
- Dynamic typing
- Aggregate objects
- Function overloading

OpenODB applications can be written in any of the following languages:

- Ada
- C
- C++
- COBOL
- FORTRAN
- Pascal
- Smalltalk

Figure 7.5 OpenODB Architecture



Differentiators

OpenODB's differentiators are:

- Tuned for commercial applications
- Flexible and complete object model
- Ability to integrate any data and applications, anywhere on the network into the model

OpenODB uses a client/server architecture. The B.00.00 release supports the following workstations as clients:

- HP 9000 Series 700 with HP-UX
- Sun with SunOS or Solaris
- RS/6000 with AIX

PCs and X Terminals can also be used as clients. The server must be an HP 9000 system today, but HP has announced plans to port the server side to multiple hardware platforms as well.

How to Order OpenODB

Ordering Software and Support Together

To order OpenODB software with support you need to order a license, media, manuals, and support. The following example shows how to order OpenODB for 17 concurrent users with phone support and software updates.

Ordering Support Only

To order first year support for OpenODB (on a separate purchase order from the software license) order support options on both the license product and the media and manuals product. The second year of support is handled through the support contract renewal process. The following example shows how to order just support for a 7-user license system.

Table 7.13

Quantity	Product #	Description
17	B3767BB	OpenODB Concurrent User License for one HP 9000 System
1	B3767BB Opt. 0S2**	On-line Phone Support (includes software material update)
16	B3767BB Opt. 0S0**	Software materials update support
1	B3768BA	OpenODB Media and Manuals
1	B3768BA Opt. AAH	DDS cartridge (DAT media)
1	B3768BA Opt. 0S0*	Software materials update support

Table 7.14

Quantity	Product #	Description
0	B3767BB	OpenODB Concurrent User License for one HP 9000 System
1	B3767BB Opt. 0S2**	On-line Phone Support (includes software material update)
6	B3767BB Opt. 0S0**	Software materials update support
1	B3768BA	OpenODB Media and Manuals
1	B3768BA Opt. 0S0*	Software materials update support

* Note: It is VERY IMPORTANT to order a support option on the Media and Manuals product even though it is a zero cost option. ALL SOFTWARE UPDATES FOR FUTURE RELEASES WILL BE DRIVEN FROM THESE OPTIONS. Specifically, the customer pays for support with the support options on the license product, but the updates are driven by the support options on the media and manuals product.

** Note: To be correct, the total quantity of support options ordered against B3767BB must equal the quantity of concurrent user licenses for OpenODB.

How Much Disk Space and Memory Are Needed?

The disk and memory requirements for OpenODB when it is installed in a client/server configuration (with workstations or IBM-compatible PCs running MS-Windows as clients) are shown in **Figure 7.6**.

To support X-terminals and PCs running an X Windows emulator as clients use **Figure 7.7** to determine the disk and memory requirements.

Figure 7.6 OpenODB Disk and Memory Requirements for Workstation Clients

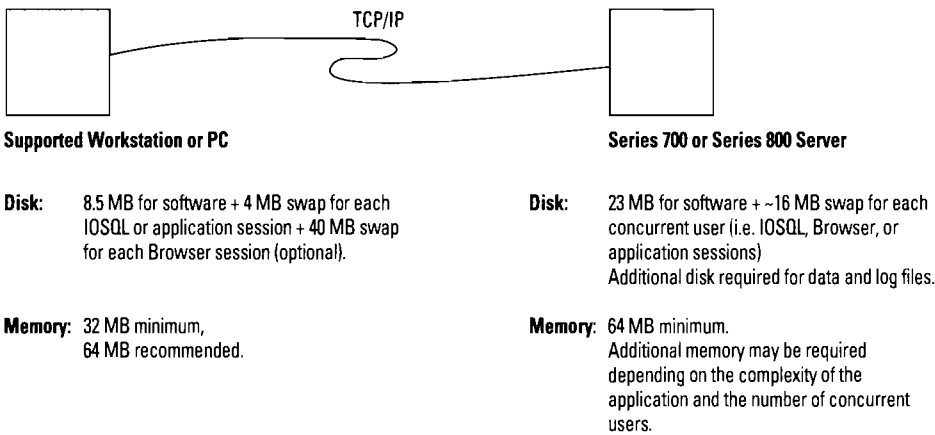
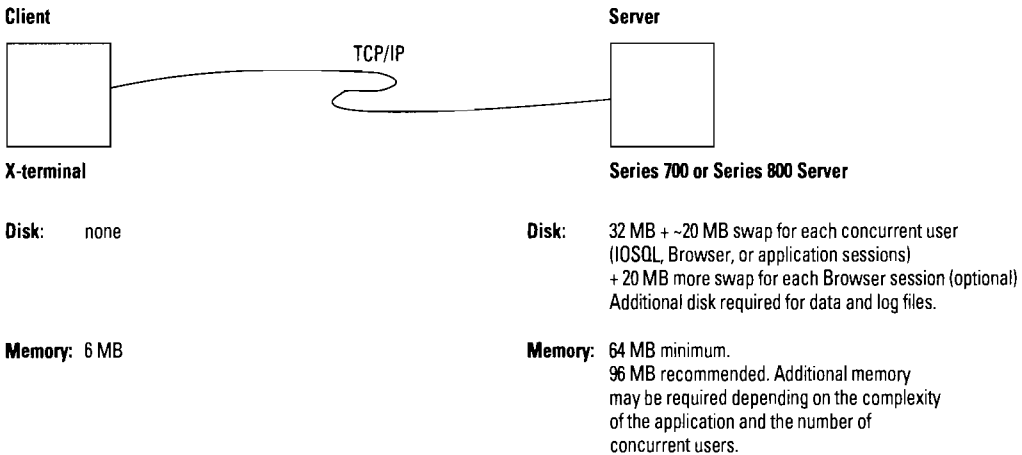


Figure 7.7 OpenODB Disk and Memory Requirements for X Terminal Clients



Application Development Tools

HP-UX Symbolic Debugger

Program defects need to be isolated and corrected, a process that is aided by the Symbolic Debugger/HP-UX. Symbolic Debugger/HP-UX is screen-oriented and can support multiple panes for viewing source statements and assembly instructions at the same time. It provides controlled execution that facilitates program fault isolation. With corrections made to the source code, it can be recompiled and retested. Symbolic Debugger/HP-UX provides complete support for programs written in C, C++, FORTRAN, Pascal, and Assembly Language. With HP-UX 8.0x and 9.0x, the Symbolic Debugger is bundled with the compiler products.

COBOL applications can use the ANIMATOR™ symbolic debugger which is available across all implementations of Micro Focus COBOL/2. The ANIMATOR supports debugging of intermediate code execution. Symbolic debugging of Native Code is not supported at this time.

Note: As of HP-UX 9.0, the Symbolic Debugger supports ANSI terminals.

Routine Execution

After debugging and compilation of an error-free program, the program development process ends with routine execution of a successful application program.

C++ Program Development

For program development in C++, the C++Developer is a powerful class browsing and construction tool that provides graphical editing, viewing, and construction of classes and class heir archives in a C++ software system. C++ Developer supports C++ 3.0 features as well (order C++ 3.0 compiler separately).

SoftBench Program Construction Tools

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

- Development Manager for all files related to a software project, including version control.
- Choice of Soft VI or language-sensitive Program Editor to provide an easy-to-use, window-based editor environment.
- Static Analyzer, with graphical source code browser, for determining program structure cross reference information, which facilitates maintenance and re-use of program code.
- Program Builder, with graphical make file browser, for coordination of compilations of source files.

- Program Debugger, based on the Symbolic Debugger/HP-UX, with a mouse/menu interface and graphical data browser added.
- Mail for easy communication among members of the development team.

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

HP also offers a C++SoftBench programming environment. C++SoftBench includes C++, C++ Developer, and SoftBench with full support for C++.

SoftBench Encapsulator

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

The Application Development Products

Table 7.15

Application Development Product Model	Use Product
C++ Compiler License to use	B2404A (on all tiers)
C++ Compiler Media and Manuals	B2405A (on all tiers)
C++ Developer License	B1696B (on all tiers)
C++ Developer Media and Manuals	B1697B (on all tiers)
C++ SoftBench License to Use	B2617B
End-User Kit	B2619B
SoftBench License to Use	B2600B
End-User Kit	B2602B
Encapsulator License to Use	B2606B
End-User Kit	B2608B

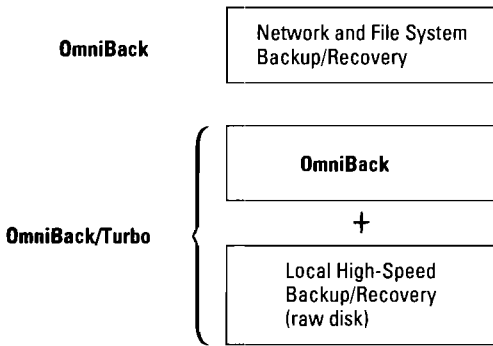
* Requires options with this product number. Refer to HP 9000 Series 800 Price Guide (P/N 5091-5686E) for details.

** These products currently are only supported on the HP-UX 8.0x and 9.0 operating system.

Systems Management Solutions

OmniBack and OmniBack/Turbo

Figure 7.8



For Backup and Recovery the Choice Is Simple—HP OpenView OmniBack

The increasing number of distributed, networked computing environments has brought the importance of central backup and recovery into clear view. As data is spread across a heterogeneous network, the availability and protection of data becomes critical. Data can be easily lost, system uptime is decreasing, and operating costs are on the rise in this type of networked environment. HP realized the need for a central backup and recovery system that would address these kinds of problems, both in the network and standalone environments. So, with a clear view of the future, HP created the

OpenView OmniBack family. The family consists of OmniBack, OmniBack/Turbo, and OmniBack/Link; the choice for better backup and recovery.

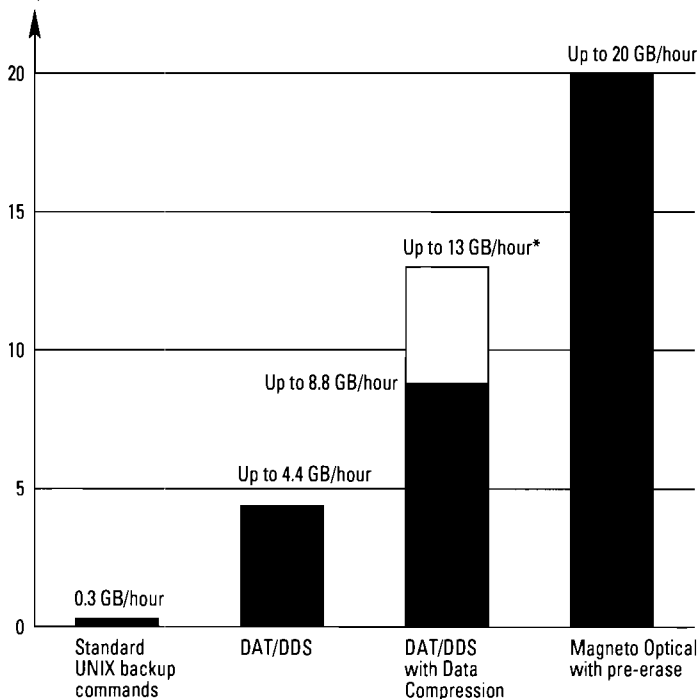
OmniBack Provides:

- Centrally controlled network backup
- User-friendly interface
- Unattended operation
- Sophisticated scheduling and journaling
- Heterogeneous environment support
- Reduced backup and recovery time
- Decreased operating costs
- Industry-standards-based system

Figure 7.9 OpenView OmniBack

OmniBack/Turbo: High Speed Component

Backup Recovery Performance (Gbytes/hour)



Driver Type	Performance in GB/Hour		
	1-drive	4-drives	8-drives
DAT/DDS	0.55	2.20	4.40
DAT/DDS with data compression (compression factor: 2 assumed)	1.10	4.40	8.80
Magnetic Tape	1.25	5.00	10.0
Magneto Optical	1.60	6.40	12.8
Magneto Optical with pre-erase	2.50	10.0	20.0

Any configuration from 1-8 drives (in parallel) is available.

* depending on compression factor

OmniBack/Turbo Provides:

All the functionality of OmniBack plus:

- Backup performance up to 20 GB/hour
- Increased server uptime
- Raw disk support
- Online backup of databases (e.g., ORACLE)

OmniBack/Link Provides:

Integration of OmniBack into OpenView management stations.

OmniBack Is Suitable for the Following Environments:

- Standalone systems
- Networked systems (LAN)

OmniBack Supports the Following Platforms:

- HP 9000 Series 300; HP-UX 8.0x or 9.0x
- HP Apollo 9000 Series 400/700; HP-UX 8.0x or 9.0x
- HP 9000 Series 800; HP-UX 8.0x or 9.0x
- HP Apollo Domain workstations; SR 10.3.5 or 10.4
- Sun SPARCstations (backup clients only); SunOS 4.1.1 and 4.1.2

OmniBack/Turbo and OmniBack/Link Are Available for the Following Platforms:

- HP Apollo 9000 Series 700; HP-UX 8.0x or 9.0x
- HP 9000 Series 800; HP-UX 8.0x or 9.0x

Supported Backup Devices for OmniBack and OmniBack/Turbo under HP-UX Are:

- DAT/DDS tape drives
- Rewritable Optical Disk Library systems
- Standalone Rewritable Optical Disk Drives
- 1/2-inch tape drives (Local High-Speed Backup of OmniBack/Turbo only for HP 7980A and 7980XC tape drives)
- 8 mm tape drives
- 3480 StorageTek tape drives
- All disks supported under HP-UX (OmniBack and OmniBack/Turbo's network component only)

Native Language Support

- U.S. English
- Japanese (Kanji; documentation only)

Specific Requirements for OmniBack/Link

- OmniBack or OmniBack/Turbo A.03.00 or later (Management station on HP-UX only)
- One of the OpenView management software products:
 - OpenView Network Node Manager 3.1 or later
 - OpenView OperationsCenter 1.0 or later
 - OpenView SNMP Platform 3.1 or later
 - OpenView DM Platform 3.1 or later

Prerequisites for HP OmniBack and HP OmniBack/Turbo (network component)

- ARPA Services
- LAN Link/9000

For More Information

Refer to the OpenView OmniBack Data Sheet (P/N 5091-7062E).

OpenSpool Product Family

The OpenSpool family, consisting of OpenSpool, OpenSpool/SharedPrint, and OpenSpool/Link, offer the following functions:

- Access to any printer or plotter without having to know all the network complexities. OpenSpool keeps the routing procedures transparent.
- Full support of multivendor platforms allows for a totally integrated print management system in mixed environments.
- OpenSpool/Link provides event integration into the OpenView management station.
- Reduced cost of operation, through:
 - easy administration of previously complicated tasks
 - unique capabilities which enable you to share any print or plot device anywhere in the network, thereby maximizing all available output devices
- Security for the client, by keeping:
 - access to print queues restricted
 - certain forms (e.g., checks) protected
- Single point administration, enabling installation, configuration, and software updates from one single system in the network.

- Full control of processing print or plot requests for easy modification of either until they are completed. Restart of text file printing at a specific page number.
- Ease of operation through a choice of three different interfaces and context-sensitive online help.

OpenSpool Is Suitable for the Following Environments:

- Commercial and engineering
- Standalone systems
- Networked systems

OpenSpool Supports the Following Platforms:

- HP workstations
- HP Business Servers
- Sun SPARC systems
- IBM RS/6000 (factory special)

Hardware Requirements

- HP 9000 Series 300, 400, or 700 workstations
- HP 9000 Series 800 Business Servers
- IBM RS/6000
- Sun SPARC stations

Software Requirements

- HP-UX 8.0 or 9.0x
- Sun Solaris 2.1
- AIX 3.2

Documentation

The following documentation is supplied with OpenSpool:

- 1 Software Release Notes
- 1 Spooler Administrator's Guide (Command Reference Guide included)

- 1 User's Guide for the Terminal Interface
- 1 User's Guide for the Graphical Interface

Native Language Support

The languages currently offered are:

- U.S. English
- German
- Spanish
- Japanese (Kanji)

Specific Requirements for OpenSpool/Link

- OpenSpool A.04.00 or later
- One of the following OpenView management software products:
 - OpenView Network Node Manager 3.1 or later
 - OpenView OperationsCenter 1.0 or later
 - OpenView SNMP Platform 3.1 or later
 - OpenView DM Platform 3.1 or later

Specific Requirements for OpenSpool/SharedPrint

- OpenSpool A.03.00 or later
- OpenSpool/SharedPrint filters must be ordered per device
- Only supported on Series 700 (HP-UX 8.07 or later versions) or Series 800 (HP-UX 9.0)

For More Information

Refer to the OpenView OpenSpool Data Sheet (P/N 5091-7059E).

Performance Tools

Whether the information systems environment includes a single system or a large data center, the fundamental goal is the same: To

maintain satisfactory service for users and applications while minimizing costs and optimizing use of computing resources. The amount invested in time and tools to achieve this goal depends on factors in the environment: the business importance of applications, management's requirements, and the capability of the IS staff, for example.

The following section provides some ideas to help frame thinking about specific performance management goals and to recommend tools that can help to leverage success.

System Monitoring and Problem Resolution

The most common requirement in performance management is to respond to and correct problems when they affect user productivity and application throughput. Solving these problems may require changing priorities for running processes or programs or rescheduling non-critical workloads. To resolve these problems, you must be able to monitor current workloads, resource utilization levels, and user activity levels to have the information you need to take corrective action. Since you cannot always see problems when they occur, many times it is helpful to see historical workload information for identifying a problem after the fact.

Minimum Toolkit	Recommended Toolkit
• GlancePlus	• GlancePlus Pak • PerfRX

Utilization Reporting and System Tuning

Beyond resolving current problems, the next most common performance management challenge is understanding and reporting on the nature of system workloads, user service levels, and the consumption of system resources such as CPU, memory, disk, etc. by your applications. Also important is seeing where workloads or data and files can be rebalanced, or how system configurations can be modified to improve system responsiveness and throughput. To effectively perform these tasks, you need easy access to useful historical workload information.

Minimum Toolkit	Recommended Toolkit
<ul style="list-style-type: none"> • GlancePlus Pak 	<ul style="list-style-type: none"> • GlancePlus Pak • PerfRX

Trend Analysis and Capacity Planning

Beyond problem solving and workload reporting, data center capacity planners often have to forecast future application service levels and resource use. Historical performance data combined with statistical analysis and modeling tools give you the information you need to predict the effects of implementing new applications or adding new users and resources.

Minimum Toolkit	Recommended Toolkit
<ul style="list-style-type: none"> • GlancePlus Pak 	<ul style="list-style-type: none"> • GlancePlus Pak • PerfRX • LaserRX / RXForecast

Management-by-Exception and Lights Out Operations

Managers of larger networks of systems and high-end business systems must identify and resolve potential performance problems before they seriously affect service levels and user productivity. Also, data center managers implementing “lights out” operations need to automate as many management tasks as possible. In both cases, performance alarms are required that can notify a central system operator when resource utilizations and service levels have exceeded certain thresholds, and mechanisms are required that automatically execute corrective action when needed.

Minimum Toolkit	Recommended Toolkit
<ul style="list-style-type: none"> • PerfView Desktop Agents • PerfView Analyzer 	<ul style="list-style-type: none"> • PerfView Full Agents • PerfView Analyzer

OpenView OperationsCenter

HP OpenView OperationsCenter manages multivendor, distributed computing environments, providing:

- Consolidates, standardized, and centralized operations
- Complete, pro-active, event-driven problem management facilities

One central Management System (HP 9000 Series 700 or 800) manages and controls Managed Nodes (HP 9000 Series 400/700/800, HP 3000 MPE/iX, IBM RS6000, Sun SPARC) throughout the environment. Intelligent software agents operating on each Managed Node collect, filter, and forward management information and start corrective actions. Multiple tools are available for problem resolution including pre-configured automatic actions and event-specified instructions which guide operators through problem resolution steps. Existing applications can be easily integrated without change, increasing OperationsCenter’s capabilities and effectiveness.

OperationsCenter’s primary part numbers are B1960AA and B1961AA. Current pricing structure is based on number of managed users (ASCII or X-terminals, workstations, or PCs using services on Managed Nodes). Requirements include 96 MB RAM (recommended) and 100 MB disk space on Management System, 20 MB disk space on each Managed Node, and HP OpenView SNMP Management Platform with Ingres database. Printed materials include Administrator’s Reference Guide, Concepts Guide, and Technical Evaluation Guide. Full support services are available.

Product Summaries

Table 7.16 Monitors, Collectors, and Agents

Product	Used For	Recommended For
GlancePlus	<ul style="list-style-type: none"> • Online, interactive utilization and process monitoring 	<ul style="list-style-type: none"> • All systems where occasional performance problems affect users
Performance Collection Software (PCS)	<ul style="list-style-type: none"> • Continuous, low-overhead collection of historical system, application, and process level performance information 	<ul style="list-style-type: none"> • Wherever controlling and tuning performance and reporting on resource utilizations and service levels are important
GlancePlus Pak	<ul style="list-style-type: none"> • Combines GlancePlus and PCS 	<ul style="list-style-type: none"> • See GlancePlus and PCS, above
PerfView Full Agent	<ul style="list-style-type: none"> • Exception-based monitoring of system and application performance problems 	<ul style="list-style-type: none"> • Centralized performance management of distributed servers
PerfView Desktop Agent	<ul style="list-style-type: none"> • Exception-based monitoring of UNIX client performance problems 	<ul style="list-style-type: none"> • Centralized performance management of distributed UNIX clients

Analyzers

Product	Used For	Recommended For
PerfRX	<ul style="list-style-type: none"> • Interactive graphical analysis of historical performance information 	<ul style="list-style-type: none"> • Utilization, trend, and bottleneck analysis using PCS collected data
PerfView Analyzer	<ul style="list-style-type: none"> • Online viewing of performance alarms and recent utilization histories 	<ul style="list-style-type: none"> • Centralized, online performance management using PerfView Agent alarms and data

System Availability

Degrees of Redundancy

Table 7.17 Backup/Redundancy

	Power Supply	Disk Drive	Disk Controller	SPU	I/F Cards	I/O Channel
UPS	✓					
RAID Disk Arrays		✓				
MirrorDisk/UX Disks	✓	✓	✓		✓	
SwitchOver/UX				✓		
890/T500						✓

MirrorDisk/UX

MirrorDisk/UX software prevents data loss due to disk failures by maintaining up to three copies of data on separate disks. Applications can continue to access data even after a single disk failure. In addition, you can perform on-line backups to avoid user and application disruption.

To prevent the failure of a single I/O interface from causing a system failure, HP recommends that mirrored disks be connected to separate interface cards.

MirrorDisk/UX Software

- B2491A—Software that provides LVM mirroring of SCSI and HP-FL disks. Increases data availability by protecting against disk failure. Requires HP-UX 9.0x.
- Fast/Wide Differential SCSI-2 support requires HP-UX 9.04.

MirrorDisk/UX Configuration Requirements

1. MirrorDisk/UX configurations support Single Ended SCSI-2, Fast/Wide Differential SCSI-2 and HP-FL disks. HP-IB disks are not supported. Configurations can mix SCSI and HP-FL disks.
2. To prevent the failure of a single I/O interface from causing a system failure, we recommend the mirrored disks be connected to separate SCSI or HP-FL I/O cards.
3. The maximum number of disks connected via:
 - Fast/Wide Differential SCSI-2 = 15
 - Single-Ended SCSI-2 = 7
 - HP Fiber-Link (via P-Bus) = 8

Note the internal SCSI bus on the 8X7S, E, F, G, H, and I-Class systems already has at least one device connected.

4. Maximum cable length limitations for:

- Fast/Wide Differential SCSI-2 = 25 m
- Single-Ended SCSI-2 = 6 m
- HP Fiber-Link = 500 m

Note that the internal SCSI bus on the 8X7S, E, F, G, H, and I-Class systems is approximately 1.5 to 3 meters long. See page 2-11, 2-12.

5. The integrated SCSI disks included in the 8X7S, E, F, G, H, and I-Class systems are supported with MirrorDisk/UX. Recommend that the internal disk be mirrored to an external disk to minimize single points of failure.
6. MirrorDisk/UX can not mirror RAM to disk.

SwitchOver/UX

SwitchOver/UX provides near-continuous operation of mission critical systems by significantly decreasing downtime due to system hardware or software failures. A SwitchOver/UX configuration can have up to seven primary systems and one designated standby system. This standby SPU is connected to the disks of all primaries in the SwitchOver/UX configuration. The standby continuously monitors the health of the primaries with a "heartbeat" message over the LAN. Should a primary fail, it stops sending the heartbeat. The standby reboots, assuming control of the failed primary's disks and takes over the "identity" of the failed primary. Users can then transparently log onto the standby and resume work as if they were logging onto the primary.

To increase the availability of the entire system, HP recommends customers include MirrorDisk/UX software in the SwitchOver/UX configuration.

SwitchOver/UX Software

- 92668A—One copy of SwitchOver/UX software must be ordered per system. HP recommends MirrorDisk/UX software for the primary systems.

SwitchOver/UX Configuration Types

A SwitchOver/UX configuration can be one of two types: symmetrical or asymmetrical. A symmetrical configuration consists of two or more SPUs, each of which has access to all disks in the configuration. In an

asymmetrical configuration, only the standby SPU has access to all the Single Ended SCSI-2 or Fast/Wide Differential SCSI-2 or HP-FL disks.

Choosing Symmetrical Versus Asymmetrical Configurations

Symmetrical Configuration

- *Advantage:* This configuration allows a primary system that has failed and been repaired to be brought back up as the new standby system. There is no need to have the original roles resumed and therefore avoids additional disruption.
- *Disadvantage:* Need to hook all SPUs to all Single-Ended SCSI-2 or Fast/Wide Differential SCSI-2 or HP-FL disks. This requires additional SCSI or HP-FL cards.

Asymmetrical Configuration

- *Advantage:* May be a less expensive solution since fewer SCSI or HP-FL cards are required.
- *Disadvantage:* When the failed primary system is repaired, you need to plan downtime so the standby and primary systems can resume their original roles.

SwitchOver/UX Configuration Requirements and Information

NOTE: This product is consulting intensive. It is highly recommended that technical support be involved in SwitchOver/UX configurations.

1. **WARNING:** If you are installing SwitchOver/UX on an 8X7S system with a SCSI I/O card (28655A) which was purchased

before 8/14/92, you will need an HP-PB SCSI IODC ROM upgrade (SCSI IODC ROM 28655-81004, socket U52). Please consult your local CE for details (Service Note Numbers: 28642A-01 and 28655A-01).

2. All systems must be within the same HP 9000 Series 800 SPU class or category. For example, a SwitchOver/UX configuration may include a G and H but not a G and a T500. It is recommended that the primary and the standby SPU have the same number of slots.

SPU class 1:
E-class

SPU class 2:
807S, 817S, 837S, and F-class

SPU class 3:
827S, 847S, 857S, 867S, 877S, 887S, 897S, G, H, and I-class

SPU class 4:
850S, 855S, 860S, 865S, and 870S/100-400

SPU class 5:
822S, 832S, 842S, and 852S

SPU class 6:
825S and 835S

SPU class 7:
845S

SPU class 8:
890 1-way to 4-way
T500 1-way to 12-way

3. SwitchOver/UX configurations support Single-Ended SCSI-2 or Fast/Wide Differential SCSI-2 or HP-FL disks. HP-IB disks are not supported. Configurations cannot mix Single-Ended SCSI-2 and Fast/Wide Differential SCSI-2 and HP-FL disks. Configurations cannot mix HP-FL interface cards (i.e., it is not possible that one system has the A1749A card configured whereas the other system has the 28615A configured). SwitchOver/UX does not switch over non-disk SCSI devices (e.g., tape drives).

4. SwitchOver/UX configurations are supported over FDDI or Ethernet LANs. Configurations cannot mix FDDI and Ethernet LANs.

5. The maximum number of disks (connected via the P-bus) to one HP-FL I/O card is eight. The maximum number of devices connected to one Single-Ended SCSI-2 I/O card is six, since each host counts as one device. The maximum number of devices connected to one Fast/Wide Differential SCSI-2 I/O card is 14, since each host counts as one device.

6. There is a maximum HP-FL cable length limitation of 500 meters. Therefore, system to disk distance is 500 meters, or the distance between two systems is 1000 meters. The maximum Single-Ended SCSI-2 cable length is 6 meters. The maximum Fast/Wide Differential SCSI-2 cable length is 25 meters.

7. SwitchOver/UX configurations cannot use the SCSI connection on the personality card to connect SPUs together, although the LAN connection can be used.

8. SwitchOver/UX configurations support the integrated Single Ended SCSI-2 disks included in the 8X7S, E, F, G, H, and I systems only as a dump disk. The internal disks cannot be used for boot or data because it won't be accessible after a switchover, and data could possibly be lost.

9. One copy of SwitchOver/UX software (92668A) must be ordered per system. The same HP-UX release is required for each system. HP recommends

MirrorDisk/UX software (B2491A) for the primary systems.

10. HP-FL SwitchOver/UX can have up to 7 primary systems with 1 standby system in both symmetrical or asymmetrical configurations. SCSI SwitchOver/UX can have up to 4 primary systems with 1 standby system in an asymmetrical configuration, and 1 primary system with 1 standby system in a symmetrical configuration.

11. A dump disk is required for the systems to be supported. A dump device is used for core dumps in the event of a failure. No data can be stored on the device designated as the dump disk. Having a dedicated dump disk will allow the primary to dump core at the same time that the standby is booting from the primary's boot disk. A single dump disk external to the SPUs can be shared among systems within the SwitchOver/UX configuration. HP-PB systems (i.e. 8X7S, E, F, G, H, I) can use the integrated disk as the dump device for each system.

12. To avoid a possible lockout during simultaneous system booting, do not have two HP-FL system disks on the same HP-FL interface where one or more of the system (Boot/Root) disks are directly connected to the HP-FL interface (instead of via the P-Bus connection).

13. The following are possible F, 807S, 817S, and 837S (2-slot system) configurations including their limitations.

Configuration 1 (Personality Card with LAN option and HP-FL I/O Card). There are 2 single

points of failure using this configuration:

- Since there is only 1 LAN card, if the network goes down or the LAN I/O card malfunctions, a switchover will occur.
- Since there is only 1 HP-FL card, you are not protected from a P-Bus or HP-FL card malfunction.

Configuration 2 (Personality Card without LAN option, LAN I/O card, and SCSI I/O Card). There are 2 single points of failure. See Configuration 1.

Configuration 3 (Personality Card with LAN option, SCSI I/O Card, and either a second SCSI I/O card or second LAN card). This configuration has 1 point of failure, either the SCSI bus or the network depending on which card you choose for the remaining slot. See Configuration 1.

14. In SCSI SwitchOver/UX configurations, the SwitchOver/UX software will turn off the primary system's AUTOBOOT flag. The standby system's AUTOBOOT flag will be turned on so that an automatic switchover will occur.

15. SwitchOver/UX configurations with the primary host and standby host owning disks on the same shared SCSI bus may not be the best configuration if both hosts are expected to be actively accessing the disks on the shared bus, and I/O performance is a concern.

If the standby host's job is purely to monitor the health of the primary and do no work of its own, the configurations shown in the configuration guide are fine, as this is not an I/O intensive

activity. If the standby host will be doing a significant amount of I/O as a part of its workload, a separate bus should be used for the disks that the standby host will be actively using.

SwitchOver/UX LAN Connection Information

Peripherals (terminals and printers) should be connected with a DTC over a LAN (Ethernet or FDDI). This allows communication and access to be re-established easily with the standby system in the event a primary system fails.

When the standby system reboots, taking over the failed primary's disks, it assumes the LAN address of the failed primary.

Recommend redundant LANs to avoid a single point of failure. This provides added security in the event of a LAN failure. If there is a LAN failure, the following will occur based on the connection:

1. DTC. A switch can be used on the LAN to provide the flexibility of switching to the alternate LAN when problems occur. Previously established connections will be lost and users will need to re-establish their environment. The DTC will need to be re-downloaded with the new IP address of the LAN.

2. Workstations can have two LAN cards and be connected to both LAN cables. The configuration should include a route statement to facilitate the redundant LAN being automatically used for reconnection.

3. PCs can have two LAN cards and be connected to both LAN cables. The user will need to alter the LAN configuration to provide the alternate IP address of the redundant LAN.

For More Information

Refer to the HP 9000 Series 800 High Availability Computing Products Technical Data Sheet (P/N 5091-3959E) and the Managing SwitchOver/UX Manual (P/N 92668-90005).

High Availability Disk Support Matrix (HP-UX 9.04)

Table 7.18

	DataPair/800 (92625A)	MirrorDisk/UX (B2491A)	SwitchOver/UX (92668A)
Single-Ended SCSI-2 I/O Cards	N/A	28655A (8X7S/890 E, F, G, H, I-Class, T500) 27147A (CIO systems)	28655A (8X7S/890* E, F, G, H, I-Class, T500)
Single-Ended SCSI-2 Boot/Root Disks	N/A	A2444A A2245A A2446A C2460F/R C2461F/R C2462F/R C2472F/R/S C2473F/R/S C2474F/R/S C3022T/R/RZ C3023T/R/RZ C3024T/R/RZ C3025R/RZ C3027U C3028U	A2444A A2245A A2446A C3022T/R/RZ C3023T/R/RZ C3024T/R/RZ C3025R/RZ C3027U C3028U
Single-Ended SCSI-2 Data Disks	N/A	A2444A A2245A A2446A C2460F/R C2461F/R C2462F/R C2472F/R/S C2473F/R/S C2474F/R/S C3022T/R/RZ C3023T/R/RZ C3024T/R/RZ C3025R/RZ C3027U C3028U	A2444A A2245A A2446A C2460F/R C2461F/R C2462F/R C2472F/R/S C2473F/R/S C2474F/R/S C3022T/R/RZ C3023T/R/RZ C3024T/R/RZ C3025R/RZ C3027U C3028U
HP-FL I/O Cards	A1749A (8X7S/8X2S) 27111A (CIO systems)	28615A (8X7S/890 G, H, I-Class, T500) A1749A (8X7S/8X2S) 27111A (CIO systems)	28615A (8X7S/890 G, H, I-Class, T500) A1749A (8X7S/8X2S) 27111A (CIO systems)
HP-FL Boot/Root and Data Disks	C2201A C2204A 7936FL 7937FL	C2201A C2204A 7936FL 7937FL	C2201A C2204A 7936FL 7937FL
HP-FL Boot/Root Disk Arrays w/A1749A or 27111A	N/A	N/A	N/A
HP-FL Boot/Root and Data Disk Arrays w/28615A	N/A	C2252HA/B C2254HA/B	C2252HA/B C2254HA/B
HP-FL Data Disk Arrays w/A1749A or 27111A	C2252HA/B** C2254HA/B**	C2252HA/B C2254HA/B	C2252HA/B C2254HA/B

* May need new SCSI IO DC ROM upgrade if purchased prior to 8/14/92.

** If used in raw mode, must be 2 KB aligned with 2 KB transfer size.

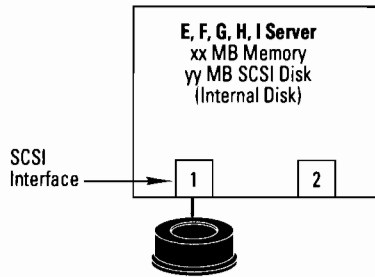
Table 18 (cont'd)

	DataPair/800 (92625A)	MirrorDisk/UX (B2491A)	SwitchOver/UX (92668A)
Fast/Wide Differential SCSI-2 I/O Cards	N/A	28696A	28696A
Fast/Wide Differential SCSI-2 Boot/Root and Data Disks	N/A	C3032T/R C3035T/R C3036T C3037U	C3032T/R C3035T/R C3036T C3037U
Fast/Wide Differential SCSI-2 Boot/Root and Data Disk Arrays	N/A	C2435A C2438A C2436HA/HZ C2437HA/HZ C2439HA/HZ C2440HA/HZ	C2435A C2438A C2436HA/HZ C2437HA/HZ C2439HA/HZ C2440HA/HZ

Note: No special cables are required for MirrorDisk/UX or SwitchOver/UX. The standard SCSI link and daisy chain cables, and HP-FL link and P-Bus cables are supported. See Sections 5 and 6 for cabling information.

Figure 7.10 Minimum Recommended SCSI MirrorDisk/UX Configuration

Minimum Recommended SCSI MirrorDisk/UX Configuration



Software: MirrorDisk/UX

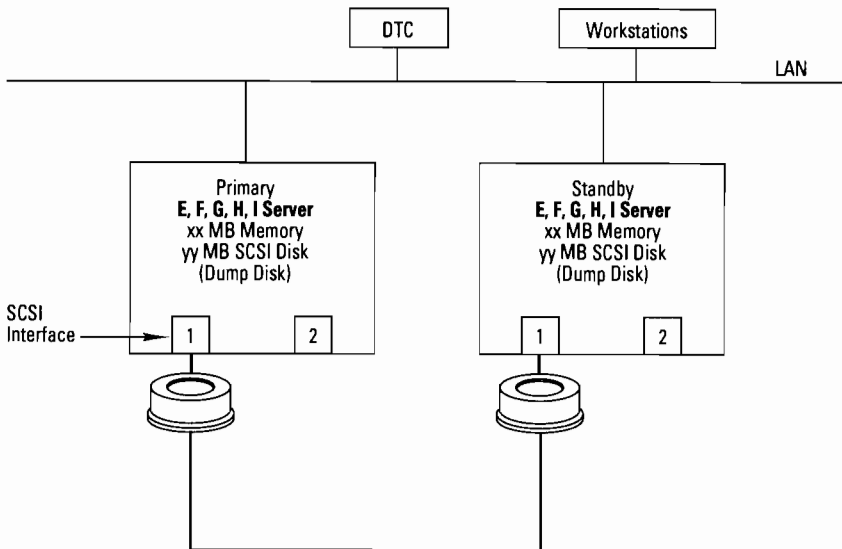
 = Mirrored disk

Notes:

1. This configuration mirrors the internal disk to the external disk.
2. It is possible to mirror internal disks to each other, but this configuration would have several points of failure.

Figure 7.11 Minimum SCSI SwitchOver/UX Configuration

Minimum SCSI SwitchOver/UX Configuration



Software: SwitchOver/UX

Notes:

1. This configuration has several points of failure.
2. HP recommends disk mirroring on the primary system, and redundant LAN.

Figure 7.12 Typical SCSI SwitchOver/UX Configuration

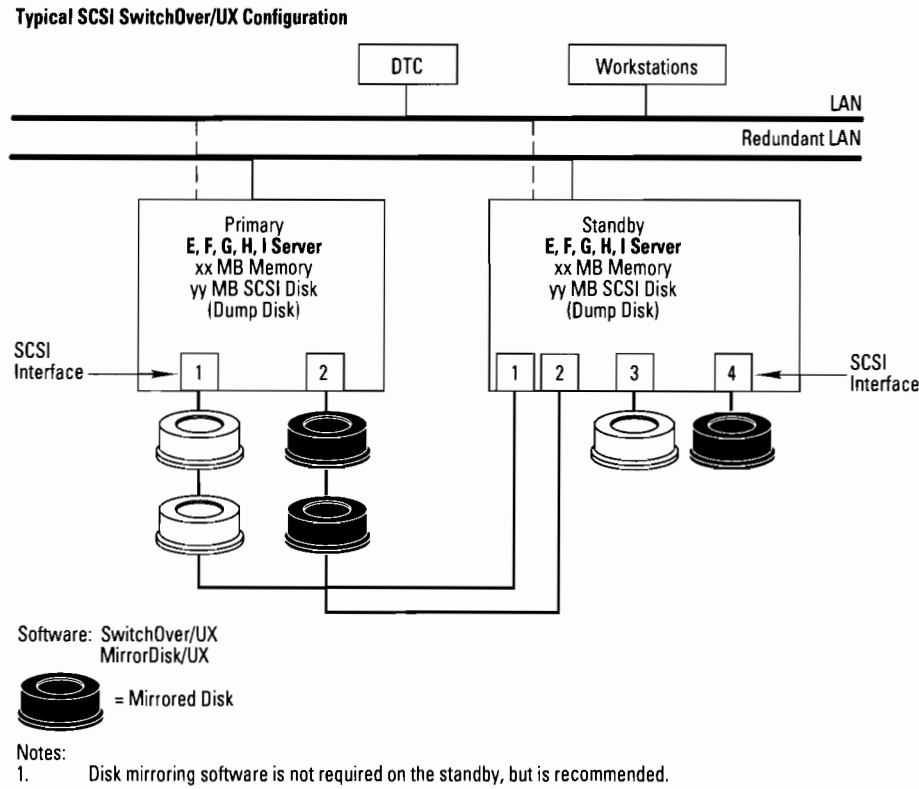
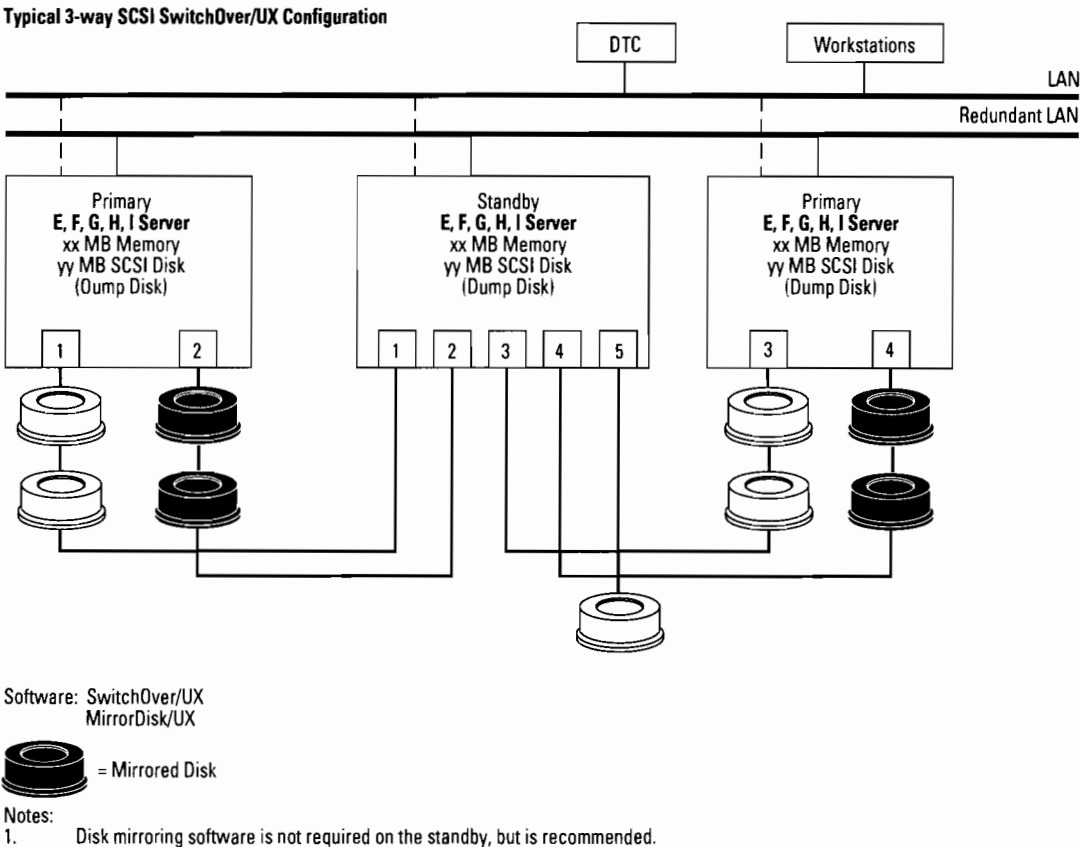


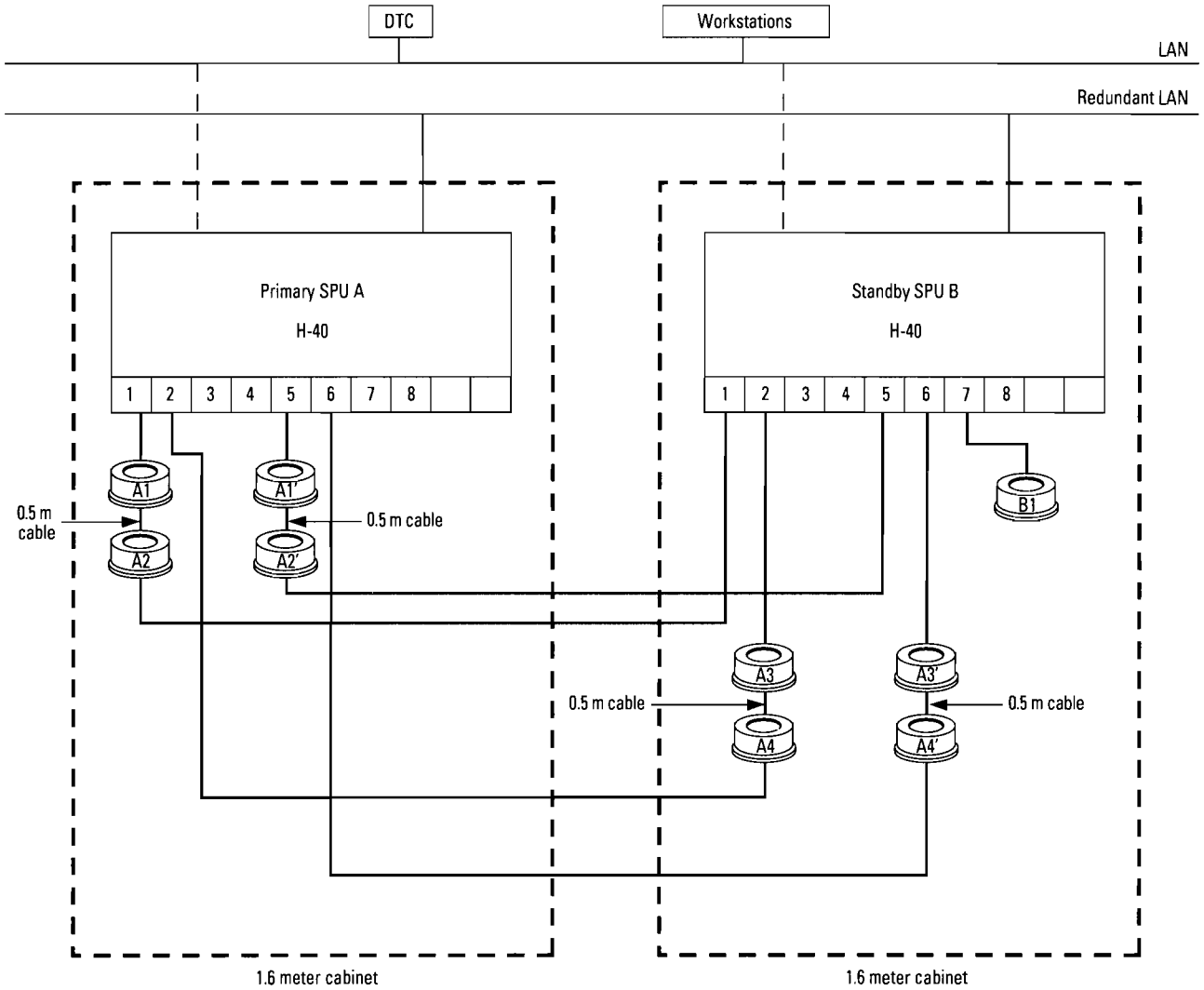
Figure 7.13 Typical 3-Way SCSI SwitchOver/UX Configuration



Detailed SwitchOver/UX Configuration Example

Figure 7.14 Detailed SCSI-2 SwitchOver/UX Configuration Example

The following is an asymmetrical SwitchOver/UX Configuration with a total of 24 Gbytes of mirrored disk storage connected to the Primary System (SPU A).



Notes:

1. The 1.6 meter cabinet provides 32 EIA units of rack space.
2. The F Class Business Servers require 6 EIA units of space.
The G, H, and I Class Business Servers require 10 EIA units.
The C302xRZ Disk Storage Systems require 4 EIA units.
3. The total Single-ended SCSI bus cable length should not exceed 6 meters.
4. All Single-ended SCSI cables are 1 meter except where noted (i.e. 0.5m).
5. The C302xRZ Disk Storage Systems use 1.75 meters of SCSI bus length.
6. The total Single-ended SCSI bus cable length (Primary SPU A to Standby SPU B) for Ax and Ax' is 6 meters (1.0 + 1.75 + 0.5 + 1.75 + 1.0)

Table 7.19 Partial Parts List

1.	(2)	HP 9000 Series 800 Model H40
2.	(9)	28655A HP-PB SCSI Host Adapter (includes 1 meter cable)
3.	(4)	92222A SCSI Interface Cable (0.5 meter)
4.	(1)	C3024RZ Series 6000 SCSI 2x2GB Disk Storage System (Rackmount)
5.	(8)	C3025RZ Series 6000 SCSI 3x2GB Disk Storage System
6.	(2)	C2786A Standalone Cabinet (1.6 meter)
7.	(2)	92668A SwitchOver/UX Software
8.	(1)	B2491A MirrorDisk/UX Software

SPU Slot Configuration

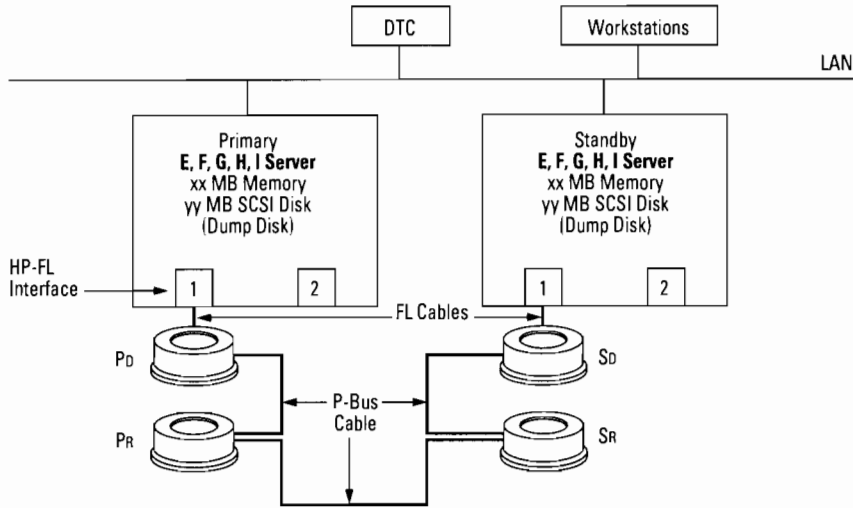
The following chart describes how each slot will be used in the example high availability configuration. Both HP 9000 Series 800 Business Servers, have unused slots. These can be used for anything not required by SwitchOver/UX or MirrorDisk/UX.

Table 7.20

Slot Number	SPU A	Standby SPU
1.	SCSI Card	SCSI Card
2.	SCSI Card	SCSI Card
3.	LAN Card	LAN Card
4.	Spare Slot	Spare Slot
5.	SCSI Card	SCSI Card
6.	SCSI Card	SCSI Card
7.	Spare Slot	SCSI Card
8.	Spare Slot	Spare Slot

Figure 7.15 Minimum HP-FL SwitchOver/UX Configuration

Minimum HP-FL SwitchOver/UX Configuration



Software: SwitchOver/UX

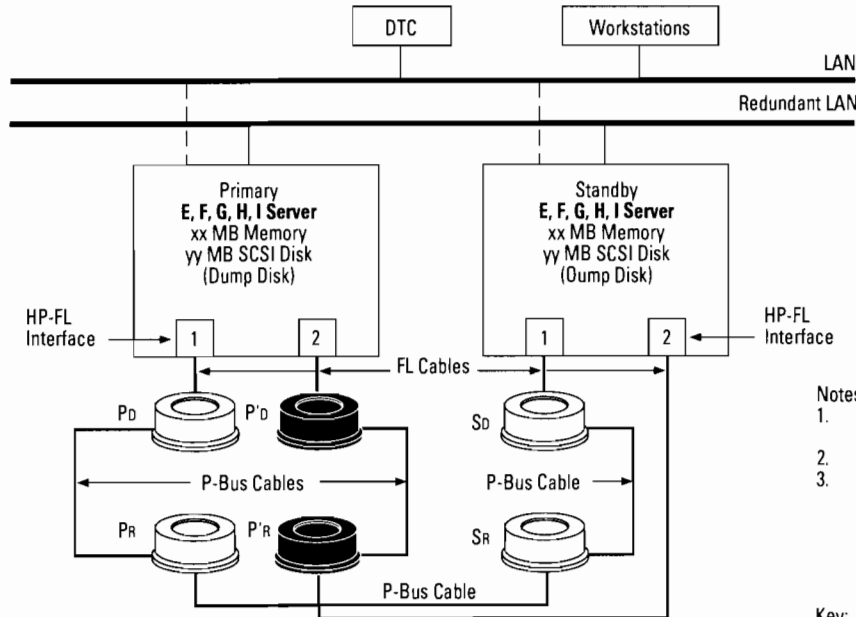
Notes:

1. This configuration has several points of failure.
2. HP recommends disk mirroring on the primary system, and redundant LAN.
3. HP-FL disks could be HP-FL disk arrays.
4. The data disks (Pd and Sd) must be the link disks in this configuration. See note 12 in the SwitchOver/UX Configuration Requirements section.

Key: Pd = Primary data disk Sd = Standby data disk
Pr = Primary root disk Sr = Standby root disk

Figure 7.16 Typical HP-FL SwitchOver/UX Configuration

Typical HP-FL SwitchOver/UX Configuration



Notes:

1. Disk mirroring software is not required on the standby, but is recommended.
2. HP-FL disks could be HP-FL disk arrays.
3. The data disks (Pd and Sd) must be the link disks in this configuration. See note 12 in the SwitchOver/UX Configuration Requirements section.

Key: Pd = Primary data disk Sd = Standby data disk
Pr = Primary root disk Sr = Standby root disk
Pd' = Primary data disk, mirrored Pr' = Primary root disk, mirrored

Software: SwitchOver/UX
MirrorDisk/UX



Distributed Computing

DCE/9000

DCE/9000 for the Series 800 consists of two groups of products: DCE Core Services and DCE Application Development Tools. The DCE Core Services provide a runtime environment for DCE applications, as well as a DCE Interface Compiler and DCE Validation Tests. The DCE Application Development Tools provide special tools designed to increase developer productivity.

The basic unit for a DCE application is the DCE Cell.

A Cell is defined as a group of users that share the same resources. The components for the Cell are available with the DCE Core Services and are available with the following products:

- B3188A—DCE Security Server License
- B3187A—DCE Cell Directory Services (CDS) Server License
- B3189A—DCE Client License
- B3786AA—DCE Distributed File Service (DFS) [February 1, 1994 CPL]
- J2393AA—DCE Global Directory Service (GDS) [February 1, 1994 CPL]
- B3785AA—DCE NFS-DFS Secure Gateway Server License [February 1, 1994 CPL]

The above products are License-To-Use (LTUs) for the DCE components. Media and documentation for the entire DCE Core Services are available with the:

- B3190A—DCE Core Media and Documentation (U.S. orders only)

- B3191A—DCE Core Media and Documentation (non-U.S. orders)

There are 2 different DCE Core Media products due to the U.S. export restrictions on some of the security technology included in the U.S. version.

A DCE Cell consists of one DCE Security Server, one CDS Server and a DCE Client on **every** system (including the Servers) in the DCE Cell. The DCE NFS-DFS Secure Gateway allows HP 9000 NFS clients to access a DFS server without compromising security. One B3189A DCE Client license must be purchased for every system in a DCE Cell. One B3188A license must be purchased for every Security Server. One B3187A license must be purchased for every CDS Server. One B3786AA license must be purchased for every DFS server. One J2393AA license must be purchased for every GDS server. One B3785AA license must be purchased for every NFS-DFS secure gateway. Only one DCE Core Media product needs to be purchased because it delivers the software for all the Core components.

Note: Both the CDS and Security Server can be replicated within a Cell, but a B3187A/88A license must be purchased for each CDS/Security replica.

The DCE Application Toolkit consists of the:

- B3193A—DCE Application Development Tools Media and Documentation
- B3192A—DCE Application Development Tools User License

Only one copy of the B3193A needs to be purchased. One user license (B3192A) must be purchased for each software developer that will use the Application Development Tools (B3193A). All DCE Developers' Environment documentation is available with the B2927A.

DCE Bundle Product

A DCE bundle is available that provides a complete DCE environment running on 5 systems with DCE development tools for 5 developers. All licenses, media, and documentation are provided (includes licenses for 5 clients, 1 CDS server, 1 Security server and 1 DFS server [February 1, 1994 CPL]). This bundle provides all the DCE software for the Series 800. The DCE bundle is available with product B3125A.

Ordering Example

A U.S. customer would like to purchase a 5-node DCE Cell for 5 developers. He would like to have each developer run the DCE Application Development Tools and also needs an extra copy of documentation. The order would require:

Table 7.21 Ordering Example

Qty	Product
5	B3189A—DCE Client (one for each node)
1	B3188A—DCE Security Server
1	B3187A—DCE CDS Server
1	B3190A—DCE Core Services Media and Docs
5	B3192A—DCE Application Tools User License
1	B3193A—DCE Application Tools Media and Docs
1	B2927A—DCE Documentation

Mixed Series 800 and Series 700 Cells

HP DCE/9000 is also available on the Series 700 Workstations and follows the same structure as the Series 800's structure.

The Series 700 products are:

- B2923A—DCE Client
- B2925A—DCE Security Server
- B2924A—DCE Cell Directory Services (CDS) Server
- B2919AA—DCE Distributed File Server (DFS)
- J2392AA—DCE Global Directory Service (GDS)
- B2929A—DCE NFS-DFS Secure Gateway Server License
- B2920A—DCE Core Media and Documentation (U.S. orders only)
- B2921A—DCE Core Media and Documentation (non-U.S. orders)
- B2922A—DCE Application Development Tools Media and Documentation
- B2926A—DCE Application Development Tools User License
- B2927A—DCE Hardcopy Documentation

The Series 800 products are:

- B3189A—DCE Client
- B3188A—DCE Security Server
- B3187A—DCE Cell Directory Services (CDS) Server
- B3786AA—DCE Distributed File Service (DFS)
- J2393AA—DCE Global Directory Service (GDS)
- B3785AA—DCE NFS-DFS Secure Gateway Server License
- B3190A—DCE Core Media and Documentation (U.S. orders only)
- B3191A—DCE Core Media and Documentation (non-U.S. orders)
- B3193A—DCE Application Development Tools Media and Documentation
- B3192A—DCE Application Development Tools User License
- B2927A—DCE Hardcopy Documentation

When ordering for a mixed Series 700/800 environment, you only need to order one media product. For the DCE Core Services, order either B3190A or B2920A, or for international orders, either B3191A or B2921A. For the DCE Application Development Tools media and documentation, order either B3193A or B2922A. The appropriate system licenses for the targeted systems must still be ordered for each Series 700 or Series 800 system.

MPOWER

- Multi-media integrated communications software:
 - Audio
 - Video
 - Graphics
 - Facsimile
 - Mail
 - Print
 - Real-time shared windows across the network
 - Multi-format information-sharing
- Series 800 server provides shared functions:
 - Facsimile
 - SharedPrint
 - Font
 - HP VUE Utility services
 - Server for X-Windows clients

Table 7.22

HP MPOWER Server License	B3385A
Tier 1 license-to-use	Opt. AH0
Tier 2 license-to-use	Opt. AE5
Tier 3 license-to-use	Opt. AEP
Upgrade from Tier 1	Opt. OGR
Upgrade from Tier 2	Opt. OC8
HP MPOWER Server Media and Manuals	B3386A
HP MPOWER for HP-UX 9.0	Opt. APH
Media and Manuals—1/2-inch tape	Opt. AA1
Media and Manuals—DDS DAT Tape	Opt. AA1
Media and Manuals—QIC Tape	Opt. AA4
Media and Manuals—CD-ROM certificate only	Opt. AAU

Encina/9000

The Encina family of products consists of product components with LTU and Media/Manuals separated as follows:

- B3494AA—Encina/9000 Server LTU
- B3496AA—Encina/9000 Client LTU
- B3495AA—Encina/9000 Monitor LTU
- B3498AA—Encina/9000 PPC Executive LTU
- B3787AA—Encina/9000 PPC Gateway LTU
- B3788AA—Encina/9000 RQS LTU
- B3499AA—Encina/9000 Server/Client Media and Manuals
- B3501AA—Encina/9000 Monitor Media and Manuals
- B3502AA—Encina/9000 PPC Executive Media and Manuals
- B3790AA—Encina/9000 PPC Gateway Media and Manuals
- B3791AA—Encina/9000 RQS Media and Manuals
- B3789AA—Encina/9000 Documentation

To set up a basic Encina configuration, customers must first have DCE software in place. All of the Encina components require DCE client software on the same HP-UX system. Customers should have already configured a DCE cell including the DCE Security Server and DCE Cell Directory Server prior to installing Encina.

Encina Server* and Monitor must be installed on at least one server system in the environment. Since Encina Monitor depends on Encina Server, these need to be installed together on the same

system. One Encina Server LTU (B3494AA) and one Encina Monitor LTU (B3495AA) must be purchased for each server system with this software.

When installing Encina Monitor, you will notice that it includes a component called Encina SFS. This is a unique VSAM-like file system developed for Encina environments. SFS is necessary for the Encina Monitor to operate and therefore has been bundled in the Encina Monitor component.

If customers want to use a recoverable queuing facility within an Encina environment, they will need to purchase Encina RQS software. This is an optional component. The Encina RQS software requires that the Encina Server software and Encina Client software be installed on the same system. One RQS LTU B3788AA should be purchased for each designated queuing system with media and manuals ordered separately.

Encina Client software should be installed on every system (including the servers) in the Encina environment. One B3496AA Encina Client license must be purchased for every system where Encina Client will be installed.

If customers want to use peer-to-peer communications protocols over TCP/IP via CPI-C or CPI-RR within an Encina environment, they will need to purchase Encina PPC Executive software. This is an optional component. PPC Executive

should be installed on each system which would be participating in peer-to-peer communications. One PPC Executive LTU (B3498AA) should be purchased for each system with media and manuals ordered separately.

If customers want to use peer-to-peer communications protocols between an Encina environment and any LU6.2 aware applications on an IBM Mainframe, they will need to purchase Encina PPC Gateway software that converts TCP/IP network traffic into LU6.2 network traffic. This is an optional component. The PPC Gateway provides the facility to initiate and perform transactions bi-directionally between the two environments. The Encina PPC Gateway software requires that the Encina PPC Executive software, Encina Client software, SNAPPlus software, Streams software, and appropriate Network Link driver(s) and hardware be installed on the same system. Both SDLC and Token Ring networking links are supported with the Encina PPC Gateway software. One PPC Gateway LTU B3787AA should be purchased for each designated gateway system with media and manuals ordered separately.

Note: The Encina Gateway is only supported on the Series 800 systems.

Ordering Example

For example, to set up a basic 6 client/1 server/1 gateway configuration of Encina, you would order.

*The Encina Server enables any XA-compliant database to be accessed by the monitor.

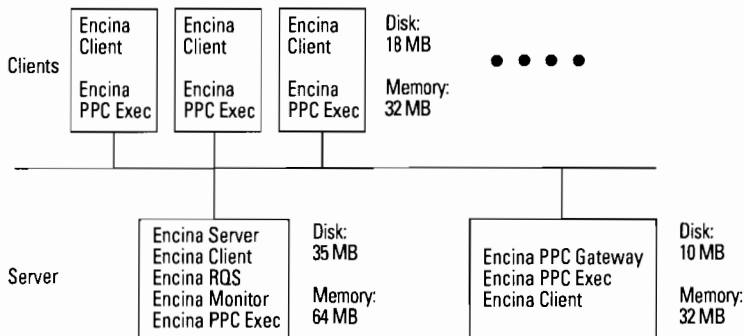
Table 7.23 Ordering Example for Encina

Quantity	Product	Product #
1	Encina Server LTU	B3494AA
1	Encina Monitor LTU	B3495AA
1	Encina RQS LTU	B3788AA
8	Encina Client LTUs	B3496AA
1	Encina Server/Client Media and Manuals	B3499AA
1	Encina Monitor Media and Manuals	B3501AA
1	Encina RQS Media and Manuals	B3791AA
For PPC communications, also order:		
8	Encina PPC Executive LTUs	B3498AA
1	Encina PPC Executive Media and Manuals	B3502AA
For PPC Gateway communications, also order:		
1	Encina PPC Gateway LTU	B3787AA
1	Encina PPC Gateway Media and Manuals	B3790AA

Mixed Series 800 and 700 Environments

Encina software is identical and has the same product numbering structuring, etc. for both Series 700 and 800 systems. Order and configure Encina identically for both environments.

Figure 7.17 Encina/9000 Disk and Memory



Networking

Networking

HP 9000 Series 800 networking can be broken down into four categories:

Networking Foundation—To build a strong enterprise-wide network, customers need the fundamental building blocks of the network. This category includes connectivity products (comprises both LAN and WAN products) such as X.25, 802.3/Ethernet, 802.5/Token Ring and FDDI adapters: products which comprise the lower level of a networking stack.

Server-to-Server Communications—These are products which enable Series 800 servers to communicate with other Midrange and UNIX systems such as Sun and DEC, using standards based networking such as OSI and ARPA Services.

Mainframe Systems Communication—Allows your customers to communicate between the Series 800 and Mainframe systems using SNA networking.

Desktop Integration—These are products which allow customers to integrate their terminals, workstations, and PCs with the HP 9000 Series 800.

The following roadmap (Figure 7.19) illustrates how HP networking products fit into the networking categories just described. This roadmap can be used as a tool that shows the interdependency of products. You must have the entire stack (top to bottom) to ensure a usable networking solution. Please note that this roadmap only depicts products that would reside in a single system (client/server and networking specific boxes are covered later).

Figure 7.18 HP 9000 Series 800 Networking

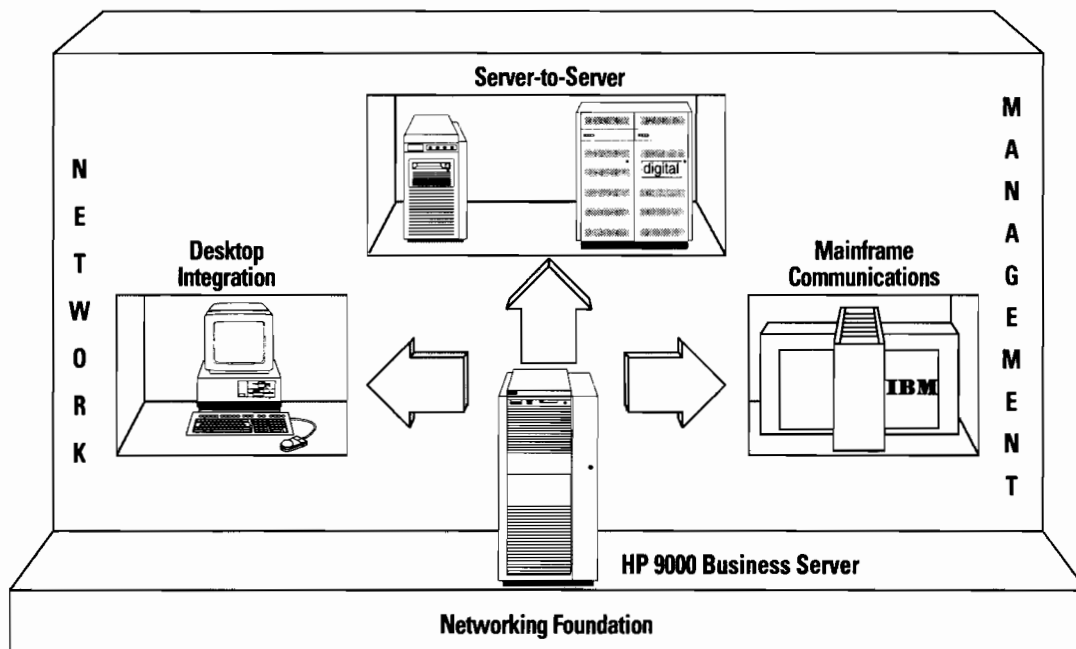
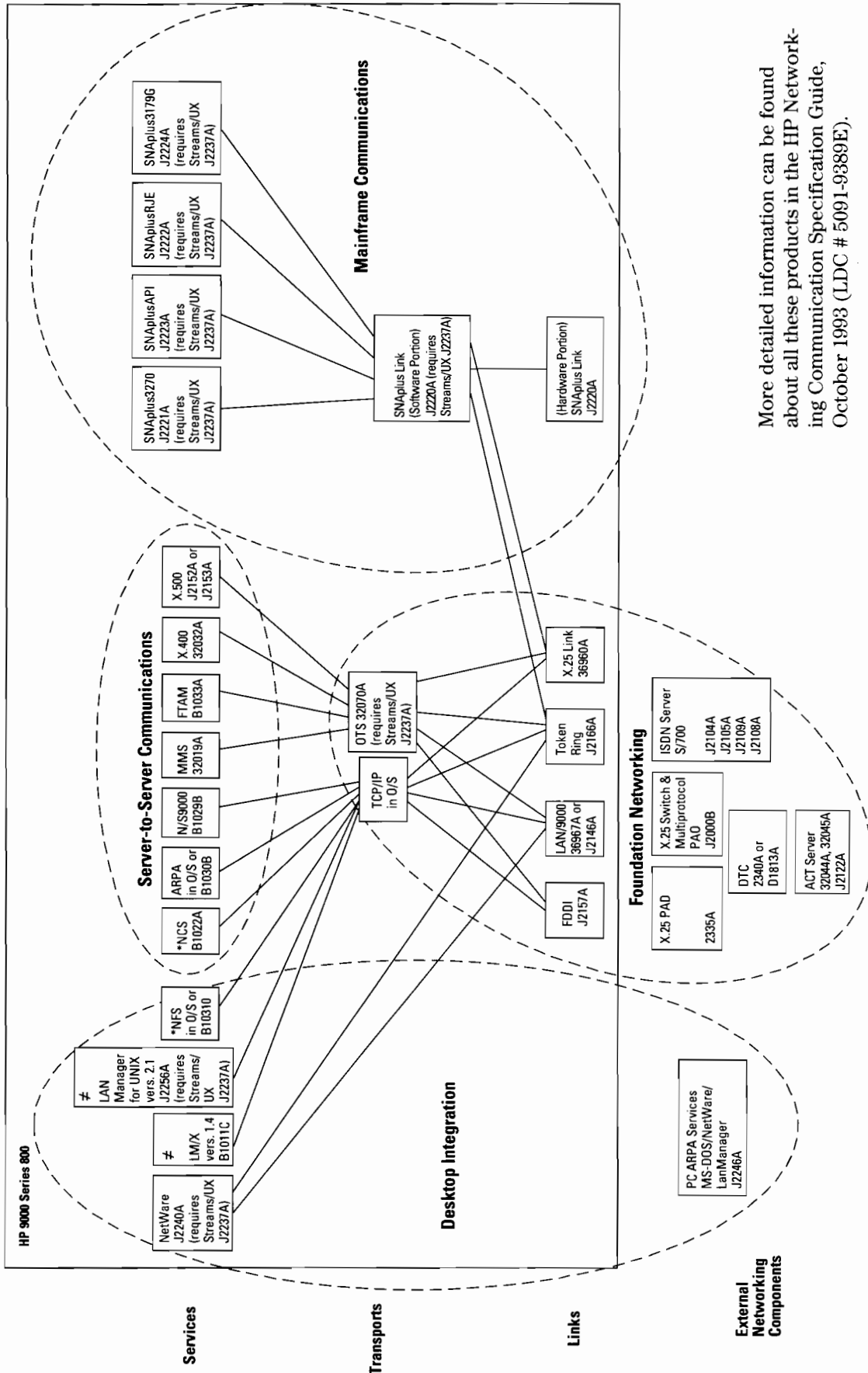


Figure 7.19 Roadmap for Series 800 Networking Products



More detailed information can be found about all these products in the HP Networking Communication Specification Guide, October 1993 (LDC # 5091-9389E).

* Supported over LANs only
 # Not supported over X.25 or FDDI

Networking Foundation

Table 7.24 LAN Links

Communications Packages	For HP 9000 Model	Use Product Number	Capabilities	Supports Communication with
LAN/9000 Series 800 Link	8x7S, E, F, G, H, I, 890, and T500	J2146A	Interface includes BNC connector for ThinLAN and AUI connector for EtherTwist transceiver or ThickMAU. The first LAN port is included on the LAN personality card for HP-UX 9.0. You must purchase the J2146A if 1) you are running HP-UX 8.0, or 2) you substitute the 8-port MUX personality card for the LAN personality card, or 3) you want additional LAN cards.	HP and other vendor systems that comply to the Ethernet/802.3 protocol standard.
LAN/9000 Series 800 Link*	All systems <i>except</i> 8x7S, E, F, G, H, I, 890, and T500	36967A	Interface includes BNC connector for ThinLAN and AUI connector for EtherTwist transceiver or ThickMAU.	HP and other vendor systems that comply to the Ethernet/802.3 protocol standard.
Token Ring	8x7S, E, F, G, H, I, 890, and T500	J2166A	Allows S/800 native physical connection to an existing Token ring network. 4 Mbps supported over UTP or STP, 16 Mbps over STP only.	Any system that supports TCP/IP or SNA over Token Ring; Netware PC clients
FDDI/9000** for Series 800 Business Servers	8x7S, E, F, G, H, I 890, and T500	J2157A	High speed Fiber LAN communications (100 Mbps max.)	Networks with systems that support OSI and TCP/IP over FDDI.

** An FDDI concentrator is required to connect single attach stations to the FDDI ring. HP does not manufacture its own FDDI concentrator.

* Supported Transceivers. The following transceiver units are recommended:

- HP 30241A ThickLAN Medium Attachment Unit—compatible with IEEE 802.3 Type 10Base5 networks
- HP 28685A EtherTwist Medium Attachment Unit—compatible with IEEE 802.3 Type 10BaseT networks
- HP 28683A Fiber-Optic Transceiver—provides compatibility with IEEE 802.3 FOIRL standard

Table 7.25 WAN Links
X.25 Products and Networking (X.25 2335A Asynchronous Pad)—see Figure 7.20

Communications Packages	For HP 9000 Model	Use Product Number	Capabilities	Supports Communication with
X.25/800	All Series 800	36960A	Native Series 800 connection to Public or Private Packet Switching Networks. 256 virtual circuits are supported per card for 256 byte packet size. (Fewer VCs are supported with larger packet sizes up to 4096 bytes.) A total of 1024 VCs are supported per system.	HP and other vendor systems that comply with CCITT X.25 standards.
X.25 PAD and Stat MUX	All Series 800	2335A Opt. 123	Connection of terminals and printers to public and private X.25 networks. 4 modem ports for connection of terminals and printers to X.25 networks.	HP and other vendor systems that comply with CCITT X.25 standards.
Cable	All Series 800	40220A	Cable between HP 2335A and ATP/DTC printer ports.	
Cable	All Series 800	40221A	Cable between HP 2335A and ATP/DTC terminal ports.	
X.25 Multi-protocol Concentrator Model 45 Plus Desktop Up to 18 Ports	All Series 800	J2000B	Concentrate multiple X.25 connections into a central HP 9000 S800. It includes X.25, Async., and SNA/SDLC. Two extra ALP 6-port card (J2004B) can be added.	HP and other vendor systems that comply with CCITT X.25 standards.
X.25 Multi-protocol Concentrator Model 45 Plus Tower Up to 30 Ports	All Series 800	J2001B	Concentrate multiple X.25 connections into a central HP 9000 S800. It includes X.25, Async., and SNA/SDLC. Up to 4 extra ALP 6-port cards (J2004A) can be added.	HP and other vendor systems that comply with CCITT X.25 standards.
Model 45 Plus Add'l 6-port ALP card	All Series 800	J2004B	Additional 6-port ALP card (include X.25, Async., and SNA/SDLC software).	
Model 45 Plus monitor pkg. (opt.)	All Series 800	J2007B	Optional package with VGA monitor and keyboard for HP Model 45 Plus configuration.	
Model 45 Plus RS-232 Cable	All Series 800	J2030A	6 RS232 port cable DTE/DCE configurable per port	
Model 45 Plus V.35 Cable	All Series 800	J2031A	2 V.35/4 RS232 cable DTE/DCE configurable per port	
Model 45 Plus X.21 Cable	All Series 800	J2032A	2 X.21/4 RS232 cable DTE/DCE configurable per port	
Model 45 Plus RS-449 Cable	All Series 800	J2033A	2 RS449/4 RS232 cable DTE/DCE configurable per port	
For Europe/Japan				
HP ISDN Link/S700*		J2104A Opt. AAH Opt. AAU	Plug-in ISA EISA card Software on DAT CD-ROM certificate	
		J2105A Opt. AAH Opt. AAU	Add-on software for J2104A Link/S700 to act as a non-dedicated TCP/IP router to ISDN for locally attached computers Software on DAT CD-ROM certificate	

Note: HP PC ISDN products have been discontinued. GND recommends OST products for PC ISDN connections.

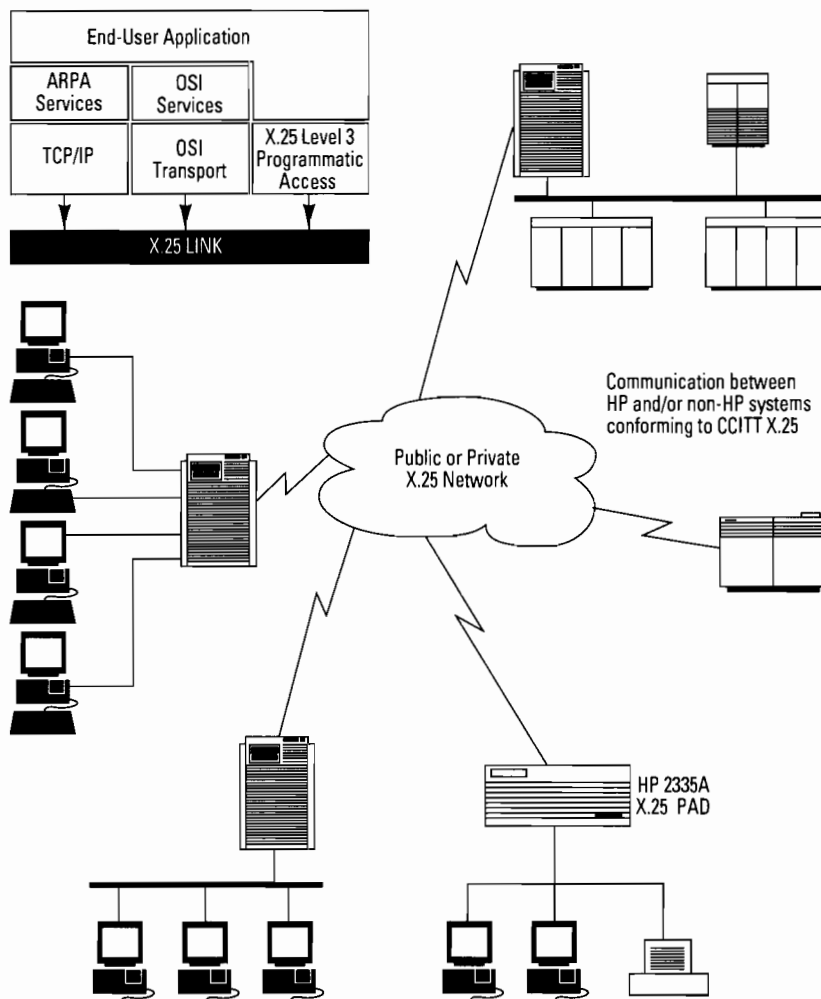
* S/700 gateway is required to provide connection to ISDN backbone.



Table 7.25 WAN Links (cont'd)

Communications Packages	Use Product Number	Capabilities
For U.S.		
HP ISDN Link/S700*		J2109A Plug-in ISAA/EISA card (U.S. ONLY). Supports both ISDN 64 Kb/s and ISDN 56 Kb/s channels Opt. AAH Software on DAT Opt. AAU CD-ROM certificate
		J2108A Add-on software for J2109A Link/S700 to act as a non-dedicated TCP/IP router to ISDN for locally attached computers Opt. AAH Software on DAT Opt. AAU CD-ROM certificate
Streams	J2237A	Required to run NetWare (J2240A), OTS (32070A), LAN Manager for UNIX version 2.2 (J2256A), SNAplus products (J2220A, J2221A, J2222A, J2223A, J2224A). Only one copy of Streams/UX is required per system.

Figure 7.20 X.25 Communications for HP 9000 Series 800 Business Servers



Software

X.25 Multiprotocol Access Products

The X.25 Multiprotocol Access products family includes cost-effective products such as the HP 2335A Asynchronous PAD and the HP Model 45 Plus X.25 Multiprotocol concentrator which are used to concentrate remote/distributed site access to HP 9000 systems.

These products provide the following to HP 9000 users:

- Remote Terminal access to HP 9000 systems

- Concentration of multiple X.25 access links in one location

- Turn-key solution to interconnect dispersed sites at high speed up to 1.5 Mbps

The *new* HP Model 45 Plus:
Open your HP 9000 network . . . with the following new features:

- Higher number of ports (up to 30 synch/asynch ports)
- Enhanced IBM SNA/SDLC features (SNA links up to 64 Kbps)

- State-of-the-art connectivity (RS-232/V.24, V.35, X.21, and RS-449 standards)

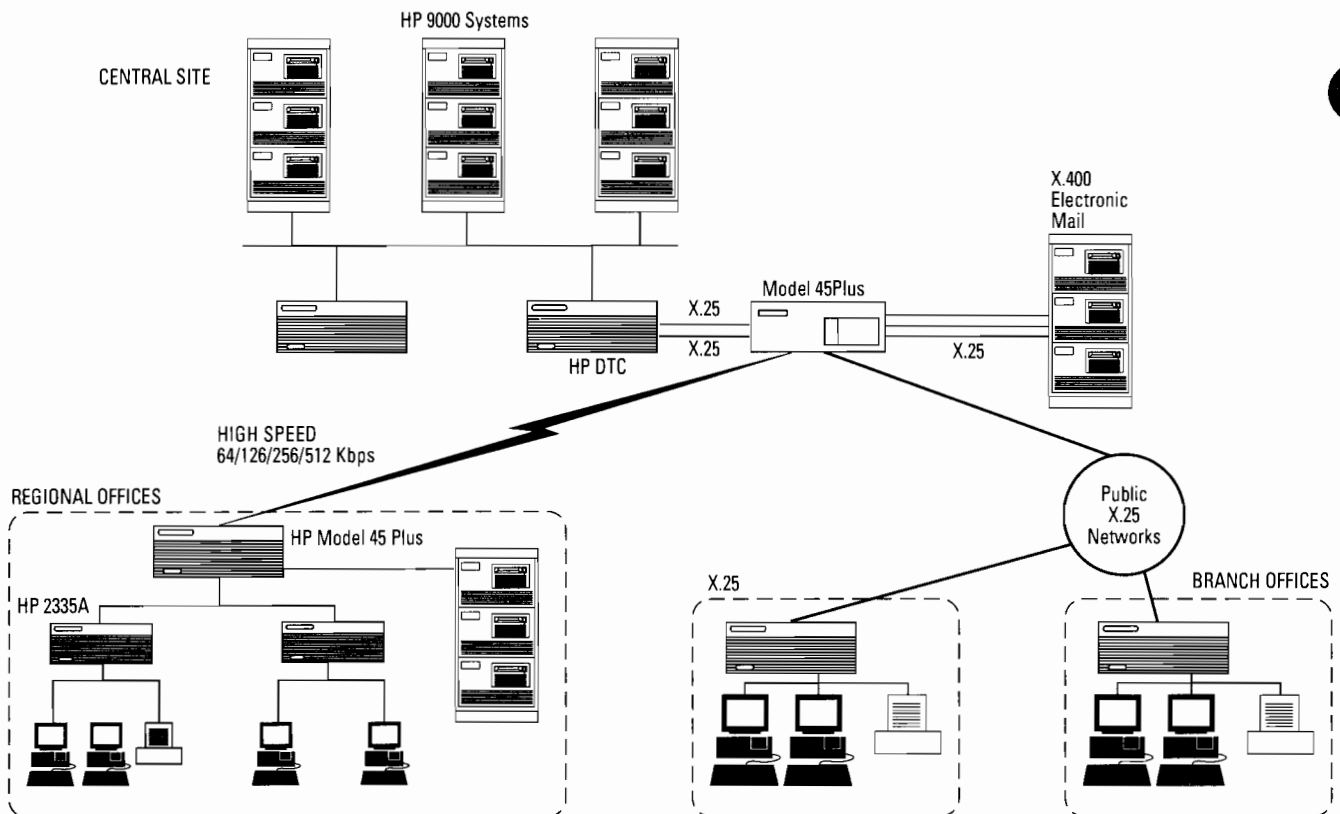
- High performance multiprotocol links up to 1.5 Mbps (T1 speed) with up to 3000 packets per second

- Full satellite links performance (packet size up to 1 Kbyte)

- Rackmountable and customer installable

- Managed by OpenView Switch/PAD Manager

Figure 7.21



ISDN

The ISDN Server allows for cost-effective interconnection of remote LAN's over an ISDN network, in a transparent way, for any application running on top of the standard TCP-IP protocol. The ISDN Server can host up to one Basic Rate Interface card.

The ISDN Server is a non-dedicated Series 700 workstation with an ISDN link (U.S.: J2109A, Europe/Japan: J2104A) and server software (U.S.: J2108A, Europe/Japan: J2105A).

The telephone-like tariff structure of ISDN services makes the ISDN products attractive for TCP-IP based applications that require LAN-to-LAN large file transfers. Example applications include: image management, batch file transfers, and ARPA FTP services.

ARPA services are bundled with the HP-UX operating system. A separate product number is available for those customers wishing to add ARPA after they have ordered their Series 800 system and decided to delete the software at the time of original purchase.

Figure 7.22

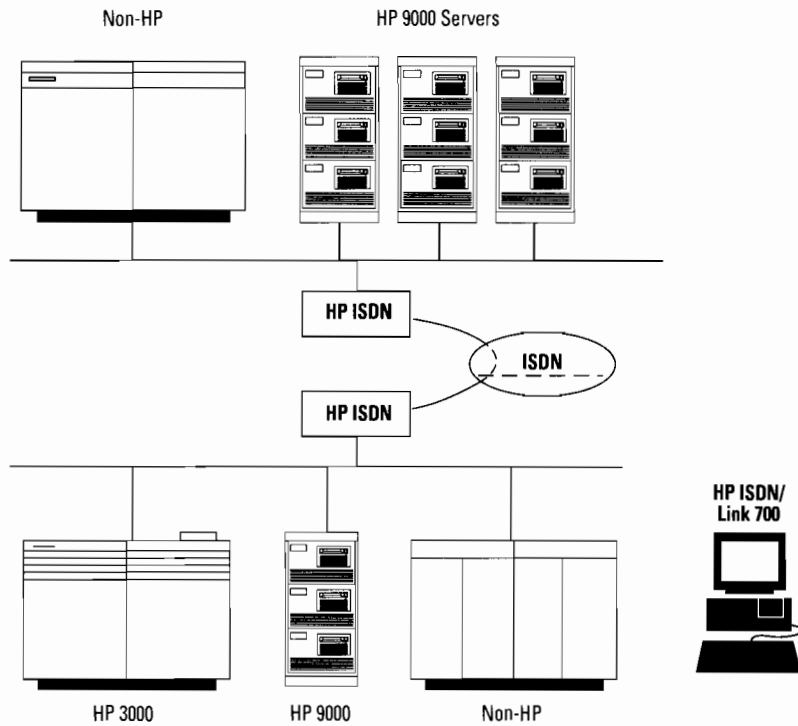


Table 7.26 Transports

Communications Packages	For HP 9000 Model	Use Product Number	Capabilities	Supports Communication with
OTS/9000 (OSI)	All Series 800	32070A	Provides OSI Model Layers 4, 5 and 6 for transport between the link and X.400, X.500, FTAM, or MMS. OTS requires the installation of Streams/UX J2237A to run on HP-UX 9.0.	HP and other vendor systems that comply with OSI Layers 4-6.
TCP/IP Transport	All Series 800	Bundled with HP-UX O/S	Provides TCP/IP Layers 3, 4, 5 for transport between links and services (see RoadMap).	HP and other vendor's systems that support TCP/IP.

Server-to-Server Communications

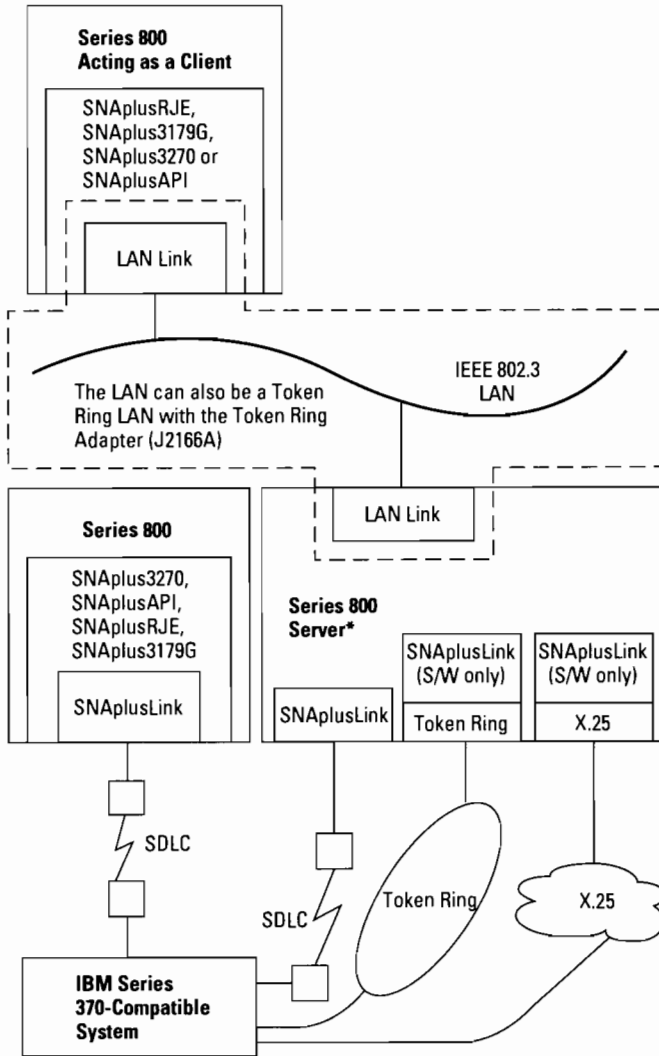
Table 7.27 OSI Products

Communications Packages	For HP 9000 Model	Use Product Number	Capabilities	Supports Communication with
X.400/9000	All Series 800	32032A	Standards based Electronic Messaging	HP and other vendor's systems that comply with the X.400 standard. Supports various E-mail packages such as OpenMail, HPDesk and SMTP based E-Mail products. Also supports CC:Mail and MS Mail through a third-party gateway.
FTAM/9000	All Series 800	B1033A	Standards based File Transfer, Access and Management	HP and other vendor's systems that comply with the FTAM standards.
MMS/9000	All Series 800	32019A	Standards based Messaging for the factory floor.	HP and other vendor's systems that comply with the MMS standard.
X.500 Server	All Series 800	J2152A	Provides a common enterprise-wide directory for E-Mail addresses, phone numbers, etc. which can be accessed by applications such as E-Mail, and other distributed applications. Includes Directory Server and Clients.	
X.500 Client Only	All Series 800	J2153A	Provides client access to X.500 Directory Server. Provides DUA capability.	HP and other vendor's systems that comply with X.500 standard.

Table 7.28 TCP/IP Products

Communications Packages	For HP 9000 Model	Use Product Number	Capabilities	Supports Communication with
ARPA Services/800	All Series 800	Bundled in O/S for HP-UX 8.0 and higher or B1030B	<ul style="list-style-type: none"> • File Transfer Protocol (FTP) (ARPA) • TELNET Virtual Terminal Capability (ARPA) • Simple Mail Transfer (ARPA) • Remote Copy (BSD 4.3) • Remote Login (BSD 4.3) • Remote Who (BSD 4.3) • Remote Uptime (BSD 4.3) • Remote Shell (BSD 4.3) • Sendmail (BSD 4.3) • Berkeley Sockets API (BSD 4.3) 	<ul style="list-style-type: none"> • HP 9000 Series 300 System with HP-UX 7.0 or later and NS/ARPA Services Series 300 software • DEC VAX BSD UNIX 4.3/4.3 System with BSD 4.3/4.3 networking • DEC VAX VMS 4.0 System with Wollongong's WIN/VX Rel. 2.2 (ARPA services only) • IBM PC-AT or HP Vectra with MS-DOS or PC-DOS 3.xx and ARPA Services/Vectra and ARPA ThinLAN Link/Vectra (Supports FTP and TELNET only) • Sun 68010 or 68020 computer with Sun Release 3.0 operating system and Sun ARPA
NCS	All Series 800	B1022A	Allows remote procedure calls between systems on LAN.	HP, IBM, DEC (Ultrix or NMS), Prime, Pyramid, and Sun.
Network Services/9000 Series 800	All Series 800	B1029B	<ul style="list-style-type: none"> • Network File Transfer • Net IPC API Virtual Terminal to HP 3000 	<ul style="list-style-type: none"> • HP 1000 A-Series System with Network Services/1000 software • HP 3000 System with Network Services/3000-V or 3000-XL software • HP 9000 Series 300 System with NS/ARPA Services Series 300 software • HP 9000 Series 400 system with NS/ARPA Service Series 400 software • HP 9000 Series 700 System with NS Services Series 700 software

Figure 7.23 HP 9000 Series 800 Communication with IBM Systems



Note: SNA Services running over Token Ring or X.25 REQUIRE the purchase of the software portion of SNAplusLink (J2220A) AS WELL AS the Token Ring (J2166A) or X.25 Link (36960A).

SNAplus Product Line

Communications Package	Product Number
SNAplusLink	J2220A
SNAplus3270	J2221A
SNAplusRJE	J2222A
SNAplusAPI	J2223A
SNAplus3179G	J2224A

* This server may also run SNAplusAPI, SNAplus RJE, SNAplus3179G, and/or SNAplus3270. It does not need to be a dedicated gateway. SNAplus products require the installation of Streams/UX J2237A to run on HP-UX 9.0.

Mainframe Communications

HP 9000 Series 800 systems can communicate with IBM System/370-compatible mainframes by direct connection via an HP 9000 Series 800 Gateway system and the LAN connection to that system. See **Figure 7.23**.

IBM Wide-Area Communication

Due to the IBM mainframe downsizing trend in the computer industry, customers are installing UNIX machines around their existing backbone networks.

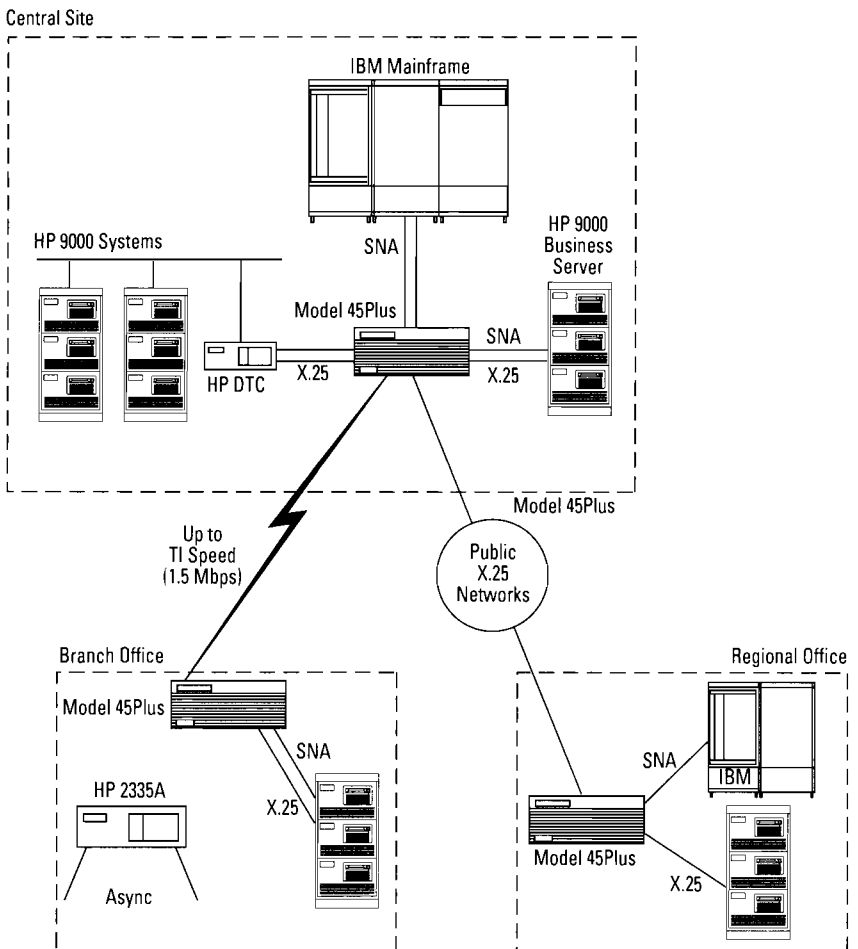
Very often, this backbone is based on X.25 technology and customers have the need to route SNA traffic over this X.25 backbone.

The HP Model 45 X.25 multiprotocol concentrator is an excellent solution for HP 9000 Business Servers access into this X.25 backbone.

The HP Model 45 Plus improves integration of HP 9000 systems within IBM SNA environment with the following enhanced SNA/SDLC features:

- Support of standard IBM QLLC protocol
- SNA Local Polling performed by HP Model 45 Plus allows SNA data only traffic to cross the network (not all the SNA polling overhead traffic)
- Support of SNA Links up to 64 Kbps with SNA frames up to 4K

Figure 7.24



The HP Model 45 Plus multiprotocol concentrator is a low-cost solution to concentrate and transport the data coming from multiple IBM and HP systems into one of multiple locations.

Table 7.29 Desktop Integration

Communications Packages	For HP 9000 Model	Use Product Number	Capabilities	Supports Communication with
Network File System Services/800	All Series 800	Bundled with O/S or B1031A	<ul style="list-style-type: none"> • Network File Sharing (ONC/NFS 3.X) • Remote Procedure Call (ONC/RPC) • External Data Report (XDR) • Network Information Services (NIS) • Virtual Home Environment (VHE) • Automounter (AM) • PC-NFS daemon (PC-NFSd) • Remote Execution (REX) <p>Note: All the above capabilities are supported over LAN only.</p>	<ul style="list-style-type: none"> • HP 9000 Series 300, 400, or 700 System with HP-UX 7.0 or later and Network File System Services/300 • DEC VAX VMS 4.0 System with Wollongong's WIN/TCP 3.0 and WIN/NFS 1.1 <ul style="list-style-type: none"> – HP-UX Series 400 and 700 – IBM RS/6000 and MUS – MPE/iX running NFS server from third party – HP/Apollo Domain running NFS • IBM PC-AT or HP Vectra with MS-DOS or PC-DOS 3.xx and Sun Microsystems PC NFS 1.0, or 2.0, 3.0 • Sun 2/xxx or 3/xxx system with Sun Release 3.x and 4.X operating system and Sun NFS
LAN Manager for UNIX Version 2.2	All Series 800 Factory approval required for 128 and 250 user licenses. Contact Sales Response Center for approval process.	J2256A	Transparent File and Peripheral Sharing. Standard Program Interface for Development of Distributed Applications. LAN Manager requires the installation of Streams/UX J2237A to run on HP-UX 9.0.	DOS and OS/2 Workstations. Only supported on HP-UX 9.0.
LAN Manager/X Version 1.4	All Series 800	B1011C	Transparent File and Peripheral Sharing. Standard Program Interface for Development of Distributed Applications.	DOS and OS/2 Workstations
NetWare	All Series 800 Factory approval required for 64, 128, and 250 user license. Contact Sales Response Center for approval process.	J2240A	Transparent File and Peripheral sharing. NetWare's application programming interface is available for development of distributor applications. NetWare requires the installation of Streams/UX J2237A to run on HP-UX 9.0.	DOS and OS/2 PCs and existing NetWare networks.
PC ARPA and Network Services (for MS-DOS, LAN Manager, NetWare)	PC clients	J2246A	Gives MS-DOS PC users the capability to access computers using the widely accepted ARPA/Berkeley networking services, FTP, telnet, Berkeley Sockets, and Berkeley Services (rcp, rsh).	DOS Workstations (either running LAN Manager, Novell NetWare, or standalone).

Applied Computerized Telephony (ACT)

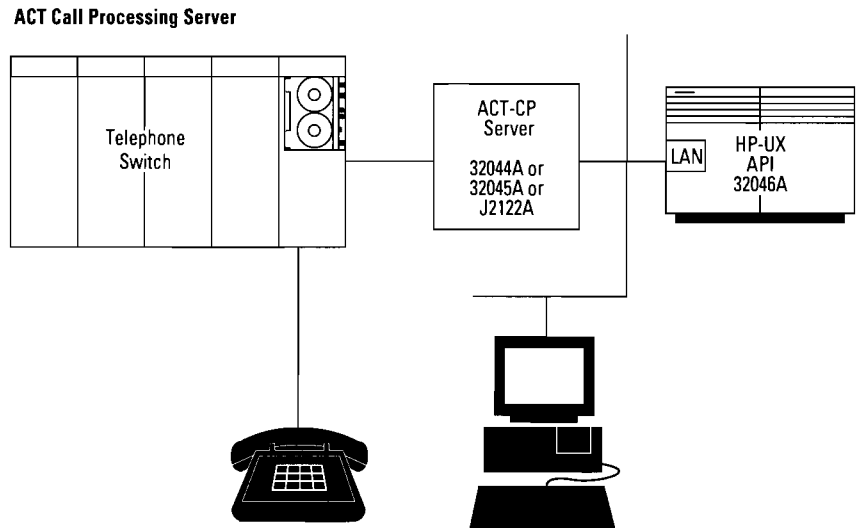
Applied Computerized Telephony (ACT) interfaces with a telephone switch to integrate voice and data technologies. An application using the ACT APIs (Application Programming Interfaces) uses information passed from the telephone switch. An application can identify the caller (by their calling number) or the purpose of their call (from the telephone number that was called) and automatically deliver caller and data specific information to the purpose of the call to a terminal or workstation.

ACT Products

ACT Call Processing (ACT-CP) requires two products, an ACT-CP Server and an ACT-CP API.

The ACT-CP Server is a pre-configured bundle (hardware and software) that is customer installable. There are two types of ACT-CP Servers:

Figure 7.25 ACT Call Processing Server



ACT Server

- 32044A Option 101—Interfaces with a Northern Telecom PBX (except SL-100)
- 32045A Option 101—Interfaces with a Northern Telecom Central Office switch (DMS100) and SL-100 PBX.
- J2122A Option 101—Interfaces with AT&T Generic 3 PBX

ACT API

- 32046A—ACT Call Processing, API for the HP 9000
- The ACT—CP Server communicates with the APIs over a thin LAN connection; therefore, the Series 800 requires a LAN/9000 Link.

Table 7.30 HP Networking Product Structure and Requirements

Product Name	Product No.	Media Types Available					3-Tier Model	Incremental System RAM Required	Disk Space Required (bytes)
		CD-ROM AAU	1/4" Cart* AA0	1/2" Mag AA1	DAT AAH	QIC AA4			
X.400/9000	32032A	Y	Y	Y	Y	Y	Y	8 M	16 M
OTS	32070A	Y	Y	Y	Y	Y	Y	16 M	30 M
X.25/9000	36960A	Y	Y	Y	Y	Y	Y	8 M	3.4 M
LAN/9000—C10	36967A	N	Y	Y	Y	N	Y	1 M/Link	5.29 M
LAN Manager for UNIX version 2.2	J2256A	Y	N	Y	Y	Y	User	8 M	8 M
LAN Manager/X version 1.4	B1011C	N	N	Y	Y	Y	User	8 M	5 M
NCS/NIDL	B1022A	Y	Y	Y	Y	Y		8 M	2.5 M
NS/9000 S/800s	B1029B	Y	Y	Y	Y	Y	Y	8 M	
ARPA Services—in O/S	B1030B	N	Y	Y	N	N	In O/S	8 M	163 M
NFS S/800—in O/S	B1031B	N	Y	Y	N	N	In O/S	500 K	2.28 M
FTAM	B1033A	Y	Y	Y	Y	Y	Y	2 M	2.33 M
LAN/9000—Nova (HP-PB)	J2146A	N/A	N/A	N/A	N/A	N/A	H/W only	1 M/Link	5.29 M
X.500 Server	J2152A	Y	Y	Y	Y	Y	Y	8 M	20 M
FDDI	J2157A	Y	Y	Y	Y	Y	Y	1 M	1 M
Token Ring/9000	J2166A	Y	Y	Y	Y	Y	Y	1 M/Link	5.3 M
SNAPplusLink	J2220A	Y	Y	Y	Y	Y	Y	2.1 M	5.2 M
SNAPplus3270	J2221A	Y	Y	Y	Y	Y	Y	1.6 M	4.6 M
SNAPplusAPI	J2223A	Y	Y	Y	Y	Y	Y	800 K	3.8 M
SNA plus RJE	J2222A	Y	N	Y	Y	Y	Y	1 M	3 M
SNA plus 3179G	J2224A	Y	N	Y	Y	Y	Y	600 K	6 M
STREAMS/UX	J2237A	Y	Y	Y	Y	Y	Y	500 K	5 M
Novell NetWare	J2240A	Y	Y	Y	Y	Y	User	16 M	20 M
PC ARPA and Network Services (MS-DOS and NetWare)	J2246A	N	N	N	N	N	Right to Copy	PC-640 K	2 M
OpenView DTC Manager	J2120A	N	Y	Y	Y	Y	One price		
ACT Server	32044A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ACT 9000 (API)	32046A	Y	Y	Y	Y	Y	Y	Y	
X.25 Concentrator	J2000A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
X.25 Concentrator	J2001A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4 Port X.25 Card	J2004A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Async Exp Card	J2006A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mon/Keyboard	J2007A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Q Cable—4 DTE	J2008A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Q Cable—2 DTE and 2 DCE	J2009A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Q Cable—4 DCE	J2010A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Q Cable—3 DTE and 1 DCE	J2011A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Q Cable—3 DCE and 1 DTE	J2012A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OpenView Switch PAD Manager	J2017A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ISDN Interface, S/700: U.S.	J2109A	Y	N	N	Y	N	N/A	N/A	N/A
ISDN Interface, S/700: Europe/Japan	J2104A	Y	N	N	Y	N	N/A	N/A	N/A
ISDN Server Software, S/700: U.S.	J2108A	Y	N	N	Y	N	N/A	N/A	N/A
ISDN Server Software, S/700: Europe/Japan	J2105A	Y	N	N	Y	N	N/A	N/A	N/A
MMS 802.3	32019A	N	Y	Y	Y	N	Y	16 M	150 M

*Not supported on HP-UX 9.0 or later.

Table 7.31 Series 800 Networking Product Configuration Reference

Business Server	I/O Bus Back Plane Type	Maximum number of cards supported for:				
		X.25 Link* 36960A	LAN Link*† 36967A or J2146A	TokenRing* J2166A	FDDI** J2157A	SNAPplusLink* J2220A
E	HP-PB	4	4	4	2	4
F	HP-PB	2	2	2	1	2
G	HP-PB	4	4	4	2	4
H	HP-PB	8	7	5	2	8
I	HP-PB	10	7	5	2	10
890	HP-PB	12	10	5	3	12
T500	HP-PB	12	10	5	3	12
807	HP-PB	2	2	2	1	2
808	HP-PB	2	5	0	0	2
815	HP-PB	4	5	0	0	4
817	HP-PB	2	2	2	1	2
822	HP-PB	4	5	0	0	4
825	CIO	4	5	0	0	4
827	HP-PB	6	5	5	2	6
832	HP-PB	4	5	0	0	4
835	CIO	4	5	0	0	4
837	HP-PB	2	2	2	1	2
840	CIO	5	5	0	0	5
842	HP-PB	5	5	0	0	5
845	CIO	3	5	0	0	3
847	HP-PB	6	5	5	2	6
850	CIO	7	5	0	0	7
852	HP-PB	7	5	0	0	7
855	CIO	7	5	0	0	7
857	HP-PB	10	7	5	2	10
860	CIO	7	5	0	0	7
865	CIO	7	5	0	0	7
867	HP-PB	6	5	5	2	6
870	CIO	7	5	0	0	7
877	HP-PB	10	7	5	2	10
887	HP-PB	6	5	5	2	6
897	HP-PB	10	5	5	2	10

* Uses one single high slot

** Uses one double high HP-PB slot

† These numbers do not include the LAN port on the LAN Personality Card

Note: Please check the power requirements tables in this Configuration Guide to ensure power consumption limits are not above acceptable levels.

Series 800 Software Matrix

Table 7.32 Series 800 Software Matrix

Software Product Name	AdvanceLink for MS-DOS ¹	AdvanceLink for MS-Windows	ALLBASE/4GL Bundle with SQL/Query
Part Number	D2102B	D2104C	B2964A
Media Types Available:			
CD-ROM	N/A	N/A	Opt. AAU
1/4"	N/A	N/A	Opt. AA0
1/2"	N/A	N/A	Opt. AA1
DAT	N/A	N/A	Opt. AAH
QIC	N/A	N/A	Opt. AA4
PC Floppy	3 1/2", 5 1/4"	3 1/2", 5 1/4"	
Release Option:			
APB			N/A
APC			N/A
APD			N/A
APH			N/A
S/W Tier-Model Structure?	No	No	User-based pricing
Incremental System RAM Required	None	None	Equal to minimum RAM requirements for the system. Additional memory may improve performance.
Disk Space Required	None	None	See following ALLBASE/4GL and SQL requirements, pp 7-54, 55
Additional Hardware Requirements	None	None	N/A
Additional Software Requirements	LAN, NS 2.1, ARPA 2.1	LAN, NS 2.1, ARPA 2.1	N/A
Localization Options	None	None	None
Documentation List (Title/Part Number)	AdvanceLink Reference MS-DOS D2102-90002 AdvanceLink Mask User Guide D2102-90001	AdvanceLink Reference MS-Windows D2104-90005 AdvanceLink NewWave Supplement D2104-90006 TermTalk 5060-2332 Release Notes D2104-90007	Developer Admin. Manual 30662-60001 Installation Manual 30662-90002 Developer Reference Manual Vol. 1 30662-60002 Developer Reference Manual Vol. 2 30662-60003 Quick Reference Manual 30662-90005 Developer Self-paced Training Guide 30662-60004 Runtime Admin. Manual 92241-64050

¹The AdvanceLink Family are two terminal emulation and file transfer products which enable you to integrate host/terminal applications with your client/server and personal computer applications. Both applications reside on the PC and connect to HP 9000/800s serially or over the LAN. The product is supplied on 3.5" or 5.25" flexible disks for PCs. It requires either LAN Manager/X or Portable NetWare be installed on the server in a LAN configuration.

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name	ALLBASE/4GL (Developer version)	ALLBASE/4GL (Runtime version)	ALLBASE/ Replicate
Part Number	B2962A	B2963A	B3480B
Media Types Available:			
CD-ROM	Opt. AAU	Opt. AAU	Opt. AAU
1/4"	Opt. AA0	Opt. AA0	N/A
1/2"	Opt. AA1	Opt. AA1	Opt. AA1
DAT	Opt. AAH	Opt. AAH	Opt. AAH
QIC	Opt. AA4	Opt. AA4	Opt. AA4
PC Floppy			N/A
Release Option:			
APB	N/A	N/A	Release 9.0
APC	N/A	N/A	
APD	N/A	N/A	
APH	N/A	N/A	
S/W Tier-Model Structure?	User-based pricing	User-based pricing	3-Tier
Incremental System RAM Required	Equal to minimum RAM requirements for the system. Additional memory may improve performance.	Equal to minimum RAM requirements for the system. Additional memory may improve performance.	4 Mbytes
Disk Space Required	23 Mbytes for installation. The base product uses 12 Mbytes once installed. More space will be needed as applications are developed.	13 Mbytes for installation. The base product uses 6 Mbytes once installed. Additional space will be needed as applications are loaded.	20 Mbytes
Additional Hardware Requirements	N/A	N/A	None
Additional Software Requirements	N/A	N/A	If doing client/server, LAN, ARPA 2.1, NS 2.1
Localization Options	None	None	Japanese
Documentation List (Title/Part Number)			ALLBASE Replicate User's Guide B3480-90002

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name	ALLBASE/SQL RDBMS V.G.0 Runtime	ALLBASE/SQL RDBMS V.G.0 Development	C/ANSI C
Part Number	B3142A	B3143A	B2412A
Media Types Available:	CD-ROM		
	1/4"		
	1/2"		
	DAT		
	QIC		
	PC Floppy		
Release Option:	APB		
	APC		
	APD		
	APH		
S/W Tier-Model Structure?	3-Tier	3-Tier	3-Tier
Incremental System RAM Required	4 Mbytes	4 Mbytes	16 Mbytes ⁴
Disk Space Required	20 Mbytes	20 Mbytes	3.3 Mbytes
Additional Hardware Requirements	None	None	None
Additional Software Requirements	If doing client/server, LAN, ARPA 2.1, NS 2.1	If doing client/server, LAN, ARPA 2.1, NS 2.1 and compilers	None
Localization Options	Japanese	Japanese	None
Documentation List (Title/Part Number)	ALLBASE/SQL Reference Manual 36217-90001 ALLBASE/ISQL Reference Manual for ALLBASE/SQL and IMAGE/SQL 36217-90188 ALLBASE/SQL Database Administration Guide 36217-90005 ALLBASE/SQL Message Manual 36217-90009 ALLBASE/Net User's Guide 36217-90093 ALLBASE/SQL PC API User's Guide for ALLBASE and IMAGE/SQL 36217-9018 ALLBASE/SQL Performance and Monitoring Guidelines 36217-90185 Up and Running with ALLBASE/SQL Manual 36389-90011	ALLBASE/SQL Runtime manuals, plus ALLBASE/SQL Advance Application Programming Guide for HP-UX 36217-90186 ALLBASE/SQL C App'l Programming Guide 36217-90014 ALLBASE/SQL COBOL App'l Programming Guide 36217-90058 ALLBASE/SQL Pascal App'l Programming Guide 36217-90007	C/HP-UX Reference 92453-90024 C/HP-UX Programmer 92434-90002 C Program Tools B1864-90009 HP-UX System Debug B2355-90044 HP-UX Program Guide B2355-90026

²The 8.0 version on CD-ROM and QIC are only available on 8X7 8.02 based systems. The 9.0 versions on CD-ROM and QIC are available on all 9.0 based systems.

³Option AA0 only available on 8.0 version of OS

⁴This product requires a MINIMUM of 16 Mbytes of memory (no incremental).

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name	COBOL (Micro Focus)* Developer's Package	COBOL (Micro Focus)* Compiler	COBOL (Micro Focus)* Run Time System	C++ Compiler
Part Number	B2433AB ⁶	B2434AB	B2435AB ⁷	B2404A
Media Product	B2433AA	B2434AA	B2435AA	B2405A
Media Types Available:	CD-ROM	Opt. AAU	Opt. AAU	Opt. AAU ⁴
	1/4"	Opt. AA0 ⁵	Opt. AA0 ⁵	Opt. AA0 ⁵
	1/2"	Opt. AA1	Opt. AA1	Opt. AA1
	DAT	Opt. AAH	Opt. AAH	Opt. AAH
	QIC	Opt. AA4	Opt. AA4	Opt. AA4
Release Option:	APB	Release 8.0	Release 8.0	Release 8.0
	APC	N/A	N/A	N/A
	APD	N/A	N/A	N/A
	APH	Release 9.0	Release 9.0	Release 9.0
S/W Tier-Model Structure?	No (User) ⁸	No (User) ⁸	No (User) ⁸	No (User)
Incremental System RAM Required	32 Mbytes ²	32 Mbytes ²	32 Mbytes ²	16 Mbytes ¹
Disk Space Required	See ³	See ³	See ³	16 Mbytes
Additional Hardware Requirements	None	None	None	None
Localization Options	None	None	None	None
Documentation List:	Title	Implementation Notes	Implementation Notes	C++ Programmers Guide
	Part Number	B2433-90001	B2433-90001	92501-90026
	Title	Language Reference Manual	Language Reference Manual	The C++ Programming Language
	Part Number	B2433-90007	B2433-90007	ISBN 0-201-53992-6 B2402-90002
	Title	Operating Guide	Operating Guide	USL C++ Language System Reference Manual
	Part Number	B2433-90009	B2433-90009	92501-90027
	Title	Getting Started	Getting Started	USL C++ Standard Components Manual
	Part Number	B2433-90005	B2433-90005	B2402-90004
	Title	Pocket Guide	Pocket Guide	C++ Quick Reference Card
	Part Number	B2433-90017	B2433-90017	B1637-90608
	Title	Compatibility Guide	Compatibility Guide	Codelibs Library Reference
	Part Number	B2433-90011	B2433-90011	B2617-90600
	Title	Error Messages	Error Messages	HP-UX Symbolic Debugger User's Guide
	Part Number	B2433-90013	B2433-90013	B2355-90044
	Title	Master Index	Master Index	
	Part Number	B2433-90015	B2433-90015	

*Based on Micro Focus' Compiler Technology.

¹This product requires a MINIMUM of 16 Mbytes of memory (no incremental).

²This product requires a MINIMUM of 32 Mbytes of memory (no incremental).

³Application Dependent but:

- Just to install B2433A version B.06.25 requires 18 Mbytes of disk
- Just to install B2434A version B.06.25 requires 11 Mbytes of disk
- Just to install B2435A version B.06.25 requires 5 Mbytes of disk

⁴Available for HP-UX 9.0 only

⁵Available for HP-UX 8.0 only

⁶The COBOL Developer's Package includes the Animator debugger, Forms/2, a profiler, and some conversion utilities in addition to the compiler. Note: In addition, Toolbox (B3453AA and B3453AB) and Dialog System (B3455AA and B3455AB) are now available as add-on products to the Developer's Package. See the Price Guide or PAL for option and user-based pricing information.

⁸ The number of licenses ordered should be equal to the number of different users who will be accessing the COBOL program (this is not necessarily equal to the number of user licenses purchased for the operating system). Although this product does not currently enforce user licenses, NetLS implementation is planned. NetLS should make it easier for customers to determine license usage.

⁷ Not currently purchase agreement discountable. This product utilizes "quantity breaks." At the time of print, the breaks were:

Quantity	Cost per user license
1	\$150
2-3	\$100
4-9	\$75
10 and over	\$50

Please check PAL prior to quoting.

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name	DCE CDS Server	DCE Security Server	DCE Client	DCE Application Tools
Part Number	B3187A	B3188A	B3189A	B3193A
Media Product	B3190/91A	B3190/91A	B3190/91A	B3192A
Media Types Available:	CD-ROM	Opt. AAU	Opt. AAU	Opt. AAU
	1/4"	N/A	N/A	N/A
	1/2"	Opt. AA1	Opt. AA1	Opt. AA1
	DAT	Opt. AAH	Opt. AAH	Opt. AAH
	QIC	Opt. AA4	Opt. AA4	Opt. AA4
S/W Tier-Model Structure?	3-Tier	3-Tier	3-Tier	3-Tier
Incremental System RAM Required	64 Mbytes ¹	64 Mbytes ¹	32 Mbytes ¹	32 Mbytes ¹
Disk Space Required	46 Mbytes	47 Mbytes	44 Mbytes	5 Mbytes
Additional Hardware Requirements	None	None	None	None
Localization Options	None	None	None	None
Documentation List:	Title			
	Part Number			
	Title			
	Part Number			

¹This product requires a MINIMUM of 32 Mbytes of memory (no incremental).

Software Product Name	DCE GDS Server	DCE Distributed File Service	DC NFS-DFS Secure Gateway
Part Number	J2393AA	B3786AA	B3785AA
Media Product	B3190/91A	B3190/91A	B3190/91A
Media Types Available:	CD-ROM	Opt. AAU	Opt. AAU
	1/4"	N/A	N/A
	1/2"	Opt. AA1	Opt. AA1
	DAT	Opt. AAH	Opt. AAH
	QIC	Opt. AA4	Opt. AA4
S/W Tier-Model Structure?	3-Tier	3-Tier	3-Tier
Incremental System RAM Required	32 Mbytes ¹	32 Mbytes ¹	32 Mbytes ¹
Disk Space Required	15 Mbytes	TBE	TBE
Additional Hardware Requirements	None	None	None
Localization Options	None	None	None
Documentation List:	Title		
	Part Number		
	Title		
	Part Number		

¹This product requires the minimum memory specified (not incremental).

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name	Document Manager	
Part Number	B3109A (license), B3110A (media/manual)	
Media Types Available:	CD-ROM	Opt. AAU
	1/4"	N/A
	1/2"	N/A
	DAT	Opt. AAH
	QIC	Opt. AA4
S/W Tier-Model Structure?	No	
Incremental System RAM Required	16 Mbytes	
Server Disk Space Required	36 Mbytes + catalog database + document storage rqmts.	
Additional Hardware Requirements	PC (80386 or 80486), MS Mouse, LAN	
Localization Options	None	
Documentation List	Title	Mezzanine Installation Handbook for HP-UX
	Title	Mezzanine Administrator's Handbook
	Title	Curo—User's Handbook and Administrator's Guide (B3110-90008)
	Title	FileShare User's Handbook
	Part Number	(All manuals included as part of Media and Manuals product B3110A)
MS-DOS Client Support:	No	
	Client Software Required	N/A
	Client RAM Required	N/A
	Client Disk Space Required	N/A
	Client Networking Required	N/A
MS Windows Client Support:	Yes	
	Client Software Required	MS-DOS 5.0, MS Windows 3.1
	Client RAM Required	4 MB
	Client Disk Space Required	6 MB
	Client Networking Required	Int. LAN Manager Services or Int. NetWare Services or ARPA 2.1 for DOS or ARPA 2.1 for NetWare
NewWave Client Support:	Yes	
	Client Software Required	MS-DOS 5.0, MS Windows 3.1, NewWave 4.X
	Client RAM Required	4 MB
	Client Disk Space Required	
	Client Networking Required	Int. LAN Manager Services or Int. NetWare Services or ARPA 2.1 for DOS or ARPA 2.1 for NetWare
HP-UX/Motif Client Support:	No	
	Client Software Required	N/A
	Client RAM Required	N/A
	Client Disk Space Required	N/A
	Client Networking Required	N/A
Apple Macintosh Client Support:	No	
	Client O/S Required	N/A
	Client RAM Required	N/A
	Client Disk Space Required	N/A
	Client Networking Required	N/A

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name		Encapsulator
Part Number		B2606B, B2608B, B2608BJ
Media Types Available:	CD-ROM	Opt. AAU
	1/4"	B2608BJ only: Opt. AA0
	1/2"	B2608BJ only: Opt. AA1
	DAT	Opt. AAH
	QIC	B2608BJ only: Opt. AA4
S/W Tier-Model Structure?		No
Incremental System RAM Required		5 Mbytes
Disk Space Required		1 Mbyte + 5 Mbytes Swap
Additional Hardware Requirements		None
Localization Options		B2608BJ End-user kit (Kanji)
Documentation List:	Title	Encapsulator Documentation (P/N B2608B, Opt. 0B1)
	Part Number	

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name	Encina/9000 Server	Encina/9000 Client	Encina/9000 Monitor	Encina/9000 PPC Executive
Part Number	B3494AA (LTU)	B3496AA (LTU)	B3495AA (LTU)	B3498AA (LTU)
Media Product	B3499AA	B3499AA	B3501AA	B3502AA
Media Types Available:				
CD-ROM	Opt. AAU	Opt. AAU	Opt. AAU	Opt. AAU
1/4"	N/A	N/A	N/A	N/A
1/2"	Opt. AA1	Opt. AA1	Opt. AA1	Opt. AA1
DAT	Opt. AAH	Opt. AAH	Opt. AAH	Opt. AAH
QIC	Opt. AA4	Opt. AA4	Opt. AA4	Opt. AA4
S/W Tier-Model Structure?	3-Tier	3-Tier	3-Tier	3-Tier
Incremental System RAM Required	64 MB ¹	32 MB ¹	64 MB ¹	64 MB ¹
Disk Space Required	4 MB	12 MB	8 MB	7 MB
Additional Hardware Requirements	None	None	None	None
Additional Software Requirements	DCE Client	DCE Client	DCE Client, Encina Server	DCE Client
Localization Options	None	None	None	None
Documentation List:				
Title				
Part Number				

¹This is MINIMUM memory required; no incremental; may need to increase with increased tx volume.

Software Product Name	Encina/9000 PPC Gateway	Encina/9000 RQS
Part Number	B3787AA (LTU)	B3788AA (LTU)
Media Product	B3790AA	B3791AA
Media Types Available:		
CD-ROM	Opt. AAU	Opt. AAU
1/4"	N/A	N/A
1/2"	Opt. AA1	Opt. AA1
DAT	Opt. AAH	Opt. AAH
QIC	Opt. AA4	Opt. AA4
S/W Tier-Model Structure?	3-Tier	3-Tier
Incremental System RAM Required	64 MB	64 MB
Disk Space Required	5 MB	4 MB
Additional Hardware Requirements	SNAPplusLink Version 3 (J2220A) Hardware and Driver. Token Ring Card needed if running Token Ring.	None
Additional Software Requirements	SNAPplusAPI (J2223A), STREAMS/UX (J2237A), DCE Client, Encina Client, Encina Server, PPC Executive (SNAPplusLink Version 3 Software driver, ordered as per additional hardware requirements.)	DCE Client, Encina Server
Localization Options	None	None
Documentation List:		
Title		
Part Number		

¹This is MINIMUM memory required; no incremental; may need to increase with increased tx volume.

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name	FORTRAN ¹	FORTRAN/9000	GlancePlus/UX 9.x	GlancePlus Pak
Part Number	B2409A	B2409B	B3692AA, B3693AA	B3169A
Media Types Available:				
CD-ROM	Opt. AAU	Opt. AAU	AAU	Opt. AAU
1/4"	Opt. 030	N/A	Opt. AA0	Opt. AA0
1/2"	Opt. 031	Opt. AA1	Opt. AA1	Opt. AA1
DAT	Opt. 032	Opt. AAH	Opt. AAH	Opt. AAH
QIC	Opt. AA4	Opt. AA4	Opt. AA4	Opt. AA4
Release Option:				
APB	N/A	N/A	Release 8.0	Release 8.0
APC	N/A	N/A	N/A	N/A
APD	N/A	N/A	Release 8.06	Release 8.06
APH	N/A	N/A	Release 9.0	Release 9.0
APN			Release 8.08	Release 8.08
S/W Tier-Model Structure?	3-Tier	3-Tier	3-Tier	3-Tier
Incremental System RAM Required	16 Mbytes ²	16 Mbytes ²	None	None
Disk Space Required	2.8 Mbytes	3.3 Mbytes	5 Mbytes	45 Mbytes
Additional Hardware Requirements	None	None	None	None
Localization Options	None	None	None	None
Documentation List (Title/Part Number)	FORTRAN Programmer 92430-90004 FORTRAN Reference 92430-90005 HP-UX System Debug B1864-90005	HP-UX FORTRAN Programmer B2408-90009 HP-UX FORTRAN Reference B2408-90010 HP-UX System Debug B2355-90044 Portability Guide B2355-90025 Floating Pt Guide B2355-90024 HP-UX Program Guide	GlancePlus/UX Users Manual B2660-90002	GlancePlus Users Manual B2660-90002 Performance Collection Software: Users Manual 5960-6605

¹Product is available on 8.0 OS. For 9.0, order B2409B²This product requires a MINIMUM of 16 Mbytes of memory (no incremental).

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name	Information Access
Part Number	B3116A (media, manual and license for 10 users)
Media Types Available:	
CD-ROM	Opt. AAU
1/4"	Opt. AA0
1/2"	Opt. AA1
DAT	Opt. AAH
QIC	N/A
S/W Tier-Model Structure?	No
Incremental System RAM Required	16 Mbytes
Server Disk Space Required	3 Mbytes
Additional Hardware Requirements	PC (80286, 80386, or 80486), MS Mouse, LAN
Localization Options	German, French
Documentation List:	
Title	Information Access SQL/UX System Manager Manual
Title	Using Information Access PC (B1716-90014)
Title	Learning Information Access PC (B1716-90016)
Title	Connections and Batch Files (B1716-90015)
Title	NewWave Access Guide for Windows Users (D2500-90014)
Title	NewWave Access Guide for NewWave Users (D2500-90002)
Part Number	(All manuals included as part of Media and Manuals product B3116A)
MS-DOS Client Support:	Yes
Client Software Required	MS-DOS 3.1 or later
Client RAM Required	640 KB
Client Disk Space Required	2.3 MB
Client Networking Required	Int. LAN Manager Services or Int. NetWare Services or ARPA 2.1 for DOS or ARPA 2.1 for NetWare
MS Windows Client Support:	Yes
Client Software Required	MS-DOS 3.2 or later, MS Windows 3.0 or 3.1
Client RAM Required	4 MB
Client Disk Space Required	2.7 MB
Client Networking Required	Int. LAN Manager Services or Int. NetWare Services or ARPA 2.1 for DOS or ARPA 2.1 for NetWare
NewWave Client Support:	Yes
Client Software Required	MS-DOS 3.2 or later, MS Windows 3.0/3.1, NewWave 3.0 or later
Client RAM Required	4 MB
Client Disk Space Required	2.7 MB
Client Networking Required	Int. LAN Manager Services or Int. NetWare Services or ARPA 2.1 for DOS or ARPA 2.1 for NetWare
HP-UX/Motif Client Support:	Yes
Client Software Required	N/A
Client RAM Required	N/A
Client Disk Space Required	N/A
Client Networking Required	N/A
Apple Macintosh Client Support:	No referenced product available—ClearAccess for the Mac, call 800-522-4252 for more information
Client O/S Required	N/A
Client RAM Required	N/A
Client Disk Space Required	N/A
Client Networking Required	N/A

*Available on WSY Hotline or with HP MPower Sales Kit, P/N 5091-8524E.

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name		Information Access	Information Access for Windows Client Software
Part Number		B3115A—Single-user License B3116A—HP-UX 800 Media	B3538AA
Media Types Available:	CD-ROM	Opt. AAU	N/A
	1/4"	Opt. AA0	N/A
	1/2"	Opt. AA1	N/A
	DAT	Opt. AAH	N/A
	QIC	N/A	N/A
	PC Floppy	For NW and Windows for DOS low density 3 1/2", 5 1/4"	Low Density 3 1/2", 5 1/4"
S/W Tier-Model Structure?		No	No
Incremental System RAM Required		3 Mbytes in PC	None
Disk Space Required		5 Mbytes in PC	None
Additional Hardware Requirements		MS mouse	Mouse Opt.
Additional Software Requirements		SQL DBMS, ³ 1A Client, ³ MS Windows, 1A SQL UX Server, ³ NS 2.1 or ARPA 2.1 ⁴	IA SQL UX Server ¹ NS 2.1 or ARPA 2.1 ²
Localization Options		German, French	German, French, Spanish
Documentation List:	Title	System Manager (with product only) NewWave Access User's Guide for NewWave Users	Using IA PC
	Part Number	D2500-90002	B1716-90014
	Title	NewWave Access Guide for Windows Users	Learning IA PC
	Part Number	D2500-90014 (Plus 3 from D2502B)	B1716-90016
	Title		Connections/Batch
	Part Number		B1716-90015

¹Information Access is client-server software that requires Information Access SQL UX server software be installed along with the DBMS, and requires that one of the PC clients be installed on each PC. DBMSs supported by IA SQL UX include ALLBASE/SQL, INGRES, ORACLE, INFORMIX and PROGRESS. NewWave Access can also access Sybase SQL SERVER via Sybase's client API, and does not require the IA SQL UX server software. Other databases supported using a client DBMS API include Microsoft SQL SERVER and Gupta SQLBase. In addition to accessing HP 9000 databases, NewWave Access can also interface to HP 3000 data sources via Information Access Server software for the HP 3000.

²ALLBASE/SQL and Oracle can be accessed via either a LAN or a serial connection. INGRES, INFORMIX and PROGRESS require a LAN connection. Supported LANs include LAN Manager and Novell NetWare. LAN Manager clients require either NS 2.1 or ARPA 2.1, while NetWare clients require either NS 2.1 for NetWare or ARPA 2.1 for NetWare.

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name		Interface Architect 2.0 License-to-Use	Interface Architect 2.0 End-user Kit	Interface Architect 2.0 HDIA Library Source Code	Interface Architect 1.0 License-to-Use	Interface Architect 1.0 Media and Manuals	Interface Architect 1.0 Library Source Code
Part Number		B1183A	B1185A	B1189A	B1165A	B1166A	B1167A
Media Types Available:	CD-ROM	N/A	N/A	N/A	N/A	N/A	N/A
	1/4"	N/A	Opt. AA0	Opt. AA0	N/A	Opt. AA0	Opt. AA0
	1/2"	N/A	Opt. AA1	Opt. AA1	N/A	Opt. AA1	N/A
	DAT	N/A	Opt. AAH	Opt. AAH	N/A	N/A	N/A
	QIC	N/A	N/A	N/A	N/A	N/A	N/A
S/W Tier-Model Structure?		No	N/A	No	No	No	No
Incremental System RAM Required		8 Mbytes	None	None	8 Mbytes	None	None
Disk Space Required		15 Mbytes	N/A	N/A	15 Mbytes	N/A	N/A
Additional Hardware Requirements		None	None	None	None	None	None
Localization Options		None	None	None	None	None	None
Documentation List:	Title	Architect 2.0 Documentation	HP-IB Manual Set				
	Part Number	B1164-90003	Opt. OB1				

Software Product Name		Interviews Plus License to Use/ Series 800 End User Kit
Part Number		B2622A, B2625A
Media Types Available:	CD-ROM	Opt. AAU
	1/4"	Opt. AA0
	1/2"	Opt. AA1
	DAT	Opt. AAH
	QIC	N/A
S/W Tier-Model Structure?		No
Incremental System RAM Required		None
Disk Space Required		5 Mbytes
Additional Hardware Requirements		Mouse
Additional Software Requirements		C++ 2.1 or 3.0, X11R4 or X11R5
Localization Options		None
Documentation List:	Title	Programmer's Guide
	Title	Reference Manual
	Part Number	(available with product only)

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name	Laser RX/UX	
Part Number	B1766B	
Media Types Available:	CD-ROM	N/A*
	1/4"	N/A*
	1/2"	N/A*
	DAT	N/A*
	QIC	N/A*
Release Option:	APB	N/A*
	APC	N/A*
	APD	N/A*
	APH	N/A*
	APN	N/A*
S/W Tier-Model Structure?	No	
Incremental System RAM Required	None	
Disk Space Required	None	
Additional Hardware Requirements	None*	
Localization Options	None	
Documentation List (Title/Part Number)	Laser RX/UX Users Manual: Analysis Software B1766-90010	

*Software is provided on 3 1/2" and 5 1/4" media for use on HP Vectra or compatible PC.

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name	MirrorDisk/UX	MPower Server
Part Number	B2491A	B3385A, B3385AA, B3386A
Media Types Available:		
CD-ROM	Opt. AAU	B3386A Opt. AAU
1/4"	N/A	N/A
1/2"	Opt. AA1	B3386A Opt. AA1
DAT	Opt. AAH	B3386A Opt. AAH
QIC	Opt. AA4	B3386A Opt. AA4
PC Floppy		N/A
Release Option:		
APB	N/A	N/A
APC	N/A	N/A
APD	N/A	N/A
APH	Release 9.0	Release 9.0
APN	N/A	N/A
S/W Tier-Model Structure?	3-Tier	3-Tier
Incremental System RAM Required	None	See Technical White Paper ¹
Disk Space Required	None	See Technical White Paper ¹
Additional Hardware Requirements	See System Availability section	MultiTech Fax Modem (612) 785-3500
Additional Software Requirements	See System Availability section	None
HP-UX/Motif Client Support:		Yes
Client Software Required		HP MPower Client (B1194A)
Client RAM Required		See Technical White Paper ¹
Client Disk Space Required		See Technical White Paper ¹
Client Networking Required		TCP/IP—See Technical White Paper ¹
Localization Options	None	None
Documentation List (Title/Part Number)	System Administration Tasks Manual B3108-90005	HP MPower Installation & Configuration Guide B1195-90002 HP MPower Getting Started (for client) B1194-90001

¹ Available on WSY Hotline or with HP MPower Sales Kit (P/N 5091-8524E).

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name	NewWave 4.1	NCS/NIDL	Net LS/LSLOCK
Part Number	D1704D	B1022A	B2678A
Media Types Available:	CD-ROM	N/A	Opt. AAU with 9.0
	1/4"	N/A	Opt. AAU
	1/2"	N/A	Opt. AA0
	DAT	N/A	Opt. AA1
	QIC	N/A	Opt. AAH
	PC Floppy	N/A	Opt. AA4
Release Option:	APB		
	APC		
	APD		
	APH		
	APN		
S/W Tier-Model Structure?	No	3-Tier	3-Tier
Incremental System RAM Required	None	None	None
Disk Space Required	LAN	None	2 Mbytes
Additional Hardware Requirements	None	None	None
Additional Software Requirements	LAN, NS 2.1, ARPA 2.1		
Localization Options	None	None	None
Documentation List (Title/Part Number)		Release notes B1020-90001 NCS Tutorial D-18355-B NCS Reference D-10200-C	Managing Software Products with the Network License System D-11272-B Licensing Software Products with the Network License System D-11273-B Managing NCS D-11895-E

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name	OmniBack	OmniBack/Turbo
Part Number	B1922A*	B1923A*
Media Types Available: CD-ROM	N/A	N/A
1/4"	Opt. AA0	Opt. AA0
1/2"	Opt. AA1	Opt. AA1
DAT	Opt. AAH	Opt. AAH
QIC	Opt. AA4	Opt. AA4
S/W Tier-Model Structure?	User-based pricing	User-based pricing
Incremental System RAM Required	None	None
Disk Space Required	4–5 Mbytes	5–6 Mbytes
Additional Hardware Requirements	None	None
Localization Options	ABA—English ABJ—Japanese Documentation	ABA—English ABJ—Japanese Documentation
Documentation List: Title	OmniBack Version 2.0 SW Release Document	OmniBack Version 2.0 SW Release Document
Part Number	B1921-90060	B1921-90060
Title	Managing Network Backups with OmniBack	Managing Network Backups with OmniBack
Part Number	2146-90001	B2146-90001
Title		Managing High-Speed Backups with OmniBack/Turbo
Part Number		B1921-90002
Title		Planning Your Backup Strategy with OmniBack/Turbo
Part Number		B1921-90003
Title		Version A.01.00 Software Release Document
Part Number		B1921-90004

*Evaluation copy is available by ordering B1908B Option AGZ.

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name	OpenMail
Part Number	B2290BZ (license) B2286A (media) B2280A (manual)
Media Types Available:	CD-ROM
	Opt. UJB
	1/4"
	N/A
	1/2"
	Opt. UJA
	DAT
	Opt. UJC
	QIC
	Opt. UJD
S/W Tier-Model Structure?	No
Incremental System RAM Required	.8 MB + 1 MB/client + temp space/request
Server Disk Space Required	32 MB + 1 MB/client
Additional Hardware Requirements	PC (80286, 80386, or 80486), MS Mouse, LAN
Localization Options	French, German
Documentation List:	Title
	OpenMail Technical Guide (B2280-90007)
	Title
	OpenMail Installation Instructions (B2280-90008)
	Title
	AdvanceMail User Guide (D2101-90022)
	Title
	NewWave Mail Technical Guide (D2103-90011)
	Part Number
	(All manuals included in product B2280A)
MS-DOS Client Support:	Yes
Client Software Required	MS-DOS 3.1, 3.2, 4.01, or 5.0
Client RAM Required	640 KB
Client Disk Space Required	2.0 MB
Client Networking Required	Int. LAN Manager Services or Int. NetWare Services or ARPA 2.1 for DOS or ARPA 2.1 for NetWare
MS Windows Client Support:	Yes
Client Software Required	MS-DOS 5.0 or 6.0
Client RAM Required	2 MB minimum, 4 MB recommended
Client Disk Space Required	2 MB
Client Networking Required	Int. NetWare Services or ARPA 2.1 for DOS, ARPA 2.1 for NetWare
NewWave Client Support:	Yes
Client Software Required	MS-DOS 3.2, 3.3, 4.01, or 5.0 MS Windows 3.00a NewWave 3.0
Client RAM Required	4 MB
Client Disk Space Required	2 MB
Client Networking Required	Int. NetWare Services or ARPA 2.1 for DOS or ARPA 2.1 for NetWare
HP-UX/Motif Client Support:	Yes
Client Software Required	HP-UX 8.x or 9.x X Window System, v11.r4 or V11.r5 Motif Windows Manager, v1.1 or v1.2 HP ARPA Services/9000
Client RAM Required	N/A
Client Disk Space Required	N/A
Client Networking Required	HP ARPA Services/9000
Apple Macintosh Client Support:	Yes
Client O/S Required	System 7.0 or 7.1
Client RAM Required	2 MB minimum, 4 MB recommended
Client Disk Space Required	2 MB
Client Networking Required	MacTCP 1.1, 1.1.1, 2.0 HP ARPA Services/900

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name	OpenODB Bundles ¹	OpenSpool	Operations Center
Part Number	B2470BA, B3179BA, B3767BB	B1900B, B1908B, B1912AA	B1960AA, B1961AA, B1968AA
Media Types Available:	CD-ROM	Opt. AAU	N/A
	1/4"	N/A	Opt. AA0
	1/2"	Opt. AA1	Opt. AA1
	DAT	Opt. AAH	Opt. AAH
	QIC	Opt. AA4	Opt. AA4
Release Option:	APB	N/A	N/A
	APC	N/A	N/A
	APD	N/A	N/A
	APH	N/A	N/A
	APN	N/A	N/A
S/W Tier-Model Structure?	No	User-based pricing	No
Incremental System RAM Required	64 Mbytes	None	
Disk Space Required	35 Mbytes (min.)	~21 Mbytes	
Additional Hardware Requirements	None	None	None
Localization Options	None	ABA—English ABD—German ABF—French ABE—Spanish ABJ—Japanese	
Documentation List (Title/Part Number)	OpenODB Reference Manual B3768-90001 OpenODB System Functions B3768-90002 ALLBASE/SQL Handbook of DBA Tasks 36389-90019 ALLBASE/SQL DBA Guide 36217-90154 Up and Running w/ALLBASE/SQL 36389-90016	Open Spool/UX Spooler Administrators Guide and Command Reference B1900-90022 Open Spool/UX The Graphical Interface B1900-90020 Open Spool/UX The Terminal Interface B1900-90021	

¹ OpenODB Swap Space Recommendations:

- Each Server: 15 Mbytes
- 1 Daemon: 4 Mbytes
- Each Browser: 15 Mbytes
- Each IQSQL: 1 Mbyte

Total System Minimums:

- Memory: 64 MB
- Disk: 1.3 GB

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name	Pascal	Passwd Etc	Performance Collection Software
Part Number	B2415A	B2680A	B2663A
Media Types Available: CD-ROM	Opt. AAU ¹	Opt. AAU with 9.0	Opt. AAU
1/4"	Opt. AA0 ²	Opt. AA0	Opt. AA0
1/2"	Opt. AA1	Opt. AA1	Opt. AA1
DAT	Opt. AAH	Opt. AAH	Opt. AAH
QIC	Opt. AA4 ¹	Opt. AA4	Opt. AA4
Release Option: APB	Release 8.0		Release 8.0
APC	N/A		N/A
APD	N/A		Release 8.06
APH	Release 9.0		Release 9.0
APN			Release 8.08
S/W Tier-Model Structure?	3-Tier	7-Tier	No
Incremental System RAM Required	16 Mbytes ³	None	None
Disk Space Required	3.5 Mbytes	None	40 Mbytes
Additional Hardware Requirements	None	None	None
Localization Options	None	None	None
Documentation List (Title/Part Number)	Pascal Reference 92431-90005 Pascal Programmer 92431-90006 HP-UX System Debug B2355-90044 HP-UX Program Guide B2355-90026	Release notes B2679-90600	Performance Collection Software: Users Manual 5960-6605

¹ The 8.0 version on CD-ROM and QIC are only available on 8X7 8.02 based systems. The 9.0 versions on CD-ROM and QIC are available on all 9.0 based systems.

² Option AA0 only available on 8.0 version of OS

³ This product requires a MINIMUM of 16 Mbytes of memory (no incremental).

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name	PerfRX Analysis	PerfView	RX Forecast
Part Number	B3467AB	H5324A	B1764B
Media Types Available:			
CD-ROM	Opt. AAU	N/A	N/A**
1/4"	N/A	Opt. AA0	N/A**
1/2"	N/A	Opt. AA1	N/A**
DAT	Opt. AAH	Opt. AAH	N/A**
QIC	Opt. AA4	N/A	N/A**
Release Option:			
APB	N/A*	N/A	N/A**
APC	N/A*	N/A	N/A**
APD	N/A*	N/A	N/A**
APH	N/A*	N/A	N/A**
APN	N/A*	N/A	N/A**
S/W Tier-Model Structure?	No	No	No
Incremental System RAM Required	None	16 Mbytes	None
Disk Space Required	40 Mbytes	65 Mbytes	None
Additional Hardware Requirements	None	See Technical Data Sheet (P/N 5091-5326E)	None**
Localization Options	None	None	None
Documentation List (Title/Part Number)	PerfRX Administrator's Guide B3468-90001	PerfView Administrator's Guide H5288-90001 PerfView Primer H5288-90003	RX Forecast/UX Users Manual B1764-90005 Capacity Planning Overview 5960-1761

* Software for both HP-UX 8.0 and 9.0 is provided on each of the media.

** Software is provided on 3 1/2" and 5 1/4" media for use on HP Vectra or compatible PC.

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name	SoftBench	C++ SoftBench ¹	SoftBench Link/1000 Encapsulation
Part Number	B3560BB, B3563BA, B2600A, B2536BJ	B2617B, B2619B, B2600A, B2619AJ	B2690A (LTU) B2693A
Media Types Available:	CD-ROM	N/A	N/A
	1/4"	Opt. AA0	Opt. AA0
	1/2"	Opt. AA1	Opt. AA1
	DAT	Opt. AAH	Opt. AAH
	QIC	Opt. AA4	Opt. AA4
Release Option:	APB		N/A
	APC		
	APD		
	APH		
S/W Tier-Model Structure?	No	No	No
Incremental System RAM Required	4 Mbytes	5 Mbytes	16 Mbytes ²
Disk Space Required	4 Mbytes + 6 Mbytes Swap	7 Mbytes + 7 Mbytes Swap ¹	1.2 Mbytes
Additional Hardware Requirements	None	None	None
Localization Options	B2602AJ (for B2600A) End-user kit (Kanji)	B2619AJ (for B2617A) End-user kit (Kanji)	
Documentation List (Title/Part Number)	SoftBench Documentation B2602B, Opt. 0B1	C++ SoftBench Documentation B2619, Opt. 0B1	SoftBench Link/1000 Encapsulation Documentation Kit B2693A, Opt. 0B1 ³ Installation and Reference Manual B2690-90001

¹ Also need C++ Language.

² Minimum of 8 Mbytes on HP 1000 RTE-A system.

³ Also requires:

- Softbench license (B2600A) version A.02.01 or greater
- HP-UX Programming environment 8.0 or greater
- HP1000 RTE-A, version 5.2 or greater
- NS-ARPA/1000 (91790A) software for RTE-A system

Software Product Name	Software Integration Sockets for HP-UX ^{1,2} Developers Kit (Services and Development S/W)	Software Integration Sockets for HP-UX ^{1,2} Run-Time Software Only	Software Integration for MVS License/Media —Manuals ³	Software Integration for MS-DOS License/Media —Manuals ³	Software Integration for SunOS License/Media —Manuals ³
Part Number	92768A	92568A	92730B/92740B	92731B/92741B	92732B/92742B
Media Types Available:	CD-ROM	N/A	N/A	N/A	N/A
	1/4"	Opt. AA0	Opt. AA0	Opt. AA0	Opt. AA0
	1/2"	Opt. AA1	Opt. AA1	Opt. AA1	Opt. AA1
	DAT	Opt. AAH	Opt. AAH	Opt. AAH	Opt. AAH
	QIC	N/A	N/A	N/A	N/A
S/W Tier-Model Structure?	3-Tier	3-Tier	No	No	No
Incremental System RAM Required	None	None	None	None	None
Disk Space Required	14 Mbytes	14 Mbytes	270 Kbytes	170 Kbytes	170 Kbytes
Additional Hardware Requirements	None	None	LAN	LAN	LAN
Localization Options	None	None	None	None	None
Documentation List:	Title	See 2.	See 2.	See 3.	

¹ For more detailed configuration information, consult the Software Integration Sockets Configuration Guide Available from "CCSY HOTLINE" on HPDesk, Subject: SIS ORDGU

² Manuals are included with the product, but are not orderable separately:

- Programmers Manual
- System Administrator's Manual
- Self-Paced Tutorial
- Installation Guide
- Access Routing Reference Guide

³ Manuals are included with the product, but are not orderable separately:

- Gateway Server Manual
- Gateway MVS Client Manual

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name	Software Distributor	Software Integration Sockets for OS/400 License Media/Manuals	Software Integration Sockets for VMS License Media/Manuals
Part Number	J2326AA, J2325AA	92733A/92743A 92753A	92734A/92744A
Media Types Available:			
CD-ROM	Opt. AAF	N/A	Opt. AAF
1/4"	Opt. AA0	Opt. AA0	Opt. AA0
1/2"	Opt. AA1	Opt. AA1	Opt. AA1
DAT	Opt. AAH	Opt. AAH	Opt. AAH
QIC	Opt. AA4	N/A	N/A
PC Floppy		N/A	N/A
S/W Tier-Model Structure?	No	No	No
Incremental System RAM Required		None	None
Disk Space Required		620 Kbytes	620 Kbytes
Additional Hardware Requirements		IBM AS/400, Ethernet, LANLink	DEC VAX
Additional Software Requirements		OS 400 V2R1, TCP/IP, Utilities/400, IBA SAA C/400	WIN TCP-for-VMS, VAX C V3.2
Localization Options		None	None
Documentation List:	Title	Software Integration Sockets MNLS for OS/400	Software Integration Sockets MNLS for VMS
	Part Number	92743A Opt. 0B1	92744A Opt. 0B1

¹ For more detailed configuration information, consult the Software Integration Sockets Configuration Guide Available from "CCSY HOTLINE" on HPDesk, Subject: SISORDGU

² Run-Time client orderable as 92752A.

³ Information Access is client-server software that requires Information Access SQL UX server software be installed along with the DBMS, and requires that one of the PC clients be installed on each PC. DBMSs supported by IA SQL UX include ALLBASE/SQL, INGRES, ORACLE, INFORMIX and PROGRESS. NewWave Access can also access Sybase SQL SERVER via Sybase's client API, and does not require the IA SQL UX server software. Other databases supported using a client DBMS API include Microsoft SQL SERVER and Gupta SQLBase. In addition to accessing HP 9000 databases, NewWave Access can also interface to HP 3000 data sources via Information Access Server software for the HP 3000.

⁴ ALLBASE/SQL and Oracle can be accessed via either a LAN or a serial connection. INGRES, INFORMIX and PROGRESS require a LAN connection. Supported LANs include LAN Manager and Novell NetWare. LAN Manager clients require either NS 2.1 or ARPA 2.1, while NetWare clients require either NS 2.1 for NetWare or ARPA 2.1 for NetWare.

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name	Software Vendor ¹	SwitchOver/UX
Part Number	D2506A	92668A
Media Types Available:		
CD-ROM	N/A	Opt. AAU
1/4"	N/A	Opt. AA0
1/2"	N/A	Opt. AA1
DAT	N/A	Opt. AAH
QIC	N/A	Opt. AA4
PC Floppy	High Density 3 1/2", 5 1/4"	
Release Option:		
APB		Release 8.0
APC		Release 8.02
APD		Release 8.06
APH		Release 9.0
S/W Tier-Model Structure?	No	3-Tier
Incremental System RAM Required	None	None
Disk Space Required	See 5.	None
Additional Hardware Requirements	None	See System Availability section
Additional Software Requirements	See 5.	Ethernet or FDDI LAN
Localization Options	None	None
Documentation List (Title/Part Number)	Installation Guide D2506-90002 Administration Guide D2506-90003 Vending Tips D2506-90009	Managing SwitchOver/UX 92668-90001

¹The Software Vendor product is supplied on 3.5" and 5.25" flexible disks for PCs. It requires either LAN Manager/X or Portable NetWare be installed on the server. Incremental disk space requirements for Software Vendor are 315 Kbytes plus the disk space required to store the packaged PC applications that are loaded onto a shared directory for distribution to PC users on the LAN.

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name	8.x X 11 R4 User Environment Developers Kit	9.x X 11 R5 User Environment Developers Kit
Part Number	B1170A	B1191A
Media Types Available: CD-ROM	N/A	N/A
1/4"	N/A	N/A
1/2"	Opt. AA1	Opt. AA1
DAT	N/A	N/A
QIC	N/A	N/A
PC Floppy		N/A
Release Option: APB	Yes	No
APC	Yes	No
APD	Yes	No
APH	No	Yes
S/W Tier-Model Structure?	User-based (one price)	User-based (one price)
Incremental System RAM Required	None	None
Disk Space Required	35 Mbytes	35 Mbytes
Additional Hardware Requirements	None	None
Additional Software Requirements	N/A	N/A
Localization Options	None	None
Documentation List (Title/Part Number)	VUE Programmers Guide B1171-90024 Programming with Xlib B1171-90026 X Toolkit Intrinsic—Prog B1171-90027 X Toolkit Intrinsic—Ref B1171-90028 X Window System C Quick Ref B1171-90029 Mastering OSF/Motif Widgets 5010-7168 OSF/Motif Style Guide B1171-90032 OSF/Motif Programmers Ref B1171-90033 OSF/Motif Programmer Guide B1171-90034	HPLib Extensions XLib B1171-90050 XLib Programming Manual, Vol. 1 B1171-90051 XLib Programmer Reference, Vol. 2 B1171-90052 Xt Intrinsic Programming Manual, Vol. 4 B1171-90053 Xt Intrinsic Programmer's Reference, Vol. 5 B1171-90054 HP Help Developer's Guide B1171-90055 C Quick Reference B1171-90056 Mastering OSF/Motif Widgets B1171-90057 HP OSF/Motif Style Guide B1171-90058 HP OSF/Motif Programmer's Reference, Vol. 1 B1171-90059 HP OSF/Motif Programmer's Guide B1171-90060

¹The Software Vendor product is supplied on 3.5" and 5.25" flexible disks for PCs. It requires either LAN Manager/X or Portable NetWare be installed on the server. Incremental disk space requirements for Software Vendor are 315 Kbytes plus the disk space required to store the packaged PC applications that are loaded onto a shared directory for distribution to PC users on the LAN.

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name	HP-UX 9.04	HP-UX 9.04	HP-UX 9.04
Part Number	B3108A	B3108C	B3108D
Media Types Available:			
CD-ROM	N/A	Inc.	N/A
1/4"	N/A	N/A	N/A
1/2"	Opt. AA1	N/A	Opt. AA1
DAT	Opt. AAH	N/A	Opt. AAH
QIC 525	Opt. AA4	N/A	Opt. AA4
S/W Tier-Model Structure?	No	No	No
Incremental System RAM Required	16 ¹	16 ¹	8 ²
Disk Space Required	200 Mbytes	200 Mbytes	150 Mbytes
Additional Hardware Requirements	None	None	None
Localization Options	None	None	None

¹This product requires a minimum of 16 MB (no incremental).

²This product requires a minimum of 8 MB (no incremental). No networking software is provided.

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name		Verity TOPIC
Part Number		B3124A (media), B3171A (merge ctr.)
Media Types Available:	CD-ROM	Opt. AAU
	1/4"	N/A
	1/2"	N/A
	DAT	N/A
	QIC	N/A
S/W Tier-Model Structure?		No
Incremental System RAM Required		N/A
Server Disk Space Required		47 Mbytes + index file + document storage rqmts.
Additional Hardware Requirements		PC (80386 or 80486) and MS Mouse, or Series 700 or X-station or Macintosh; LAN
Localization Options		None
Documentation List:	Title	TOPIC—Database Administrator's Guide
	Title	TOPIC—User's Guide for Microsoft Windows
	Title	TOPIC—User's Guide for Motif
	Title	TOPIC—User's Guide for the Macintosh
	Part Number	(Manuals and software license must be ordered separately from Verity Inc.)
MS-DOS Client Support:		No
	Client Software Required	N/A
	Client RAM Required	N/A
	Client Disk Space Required	N/A
	Client Networking Required	N/A
MS Windows Client Support:		Yes
	Client Software Required	MS-DOS 5.0, MS Windows 3.1
	Client RAM Required	8 MB
	Client Disk Space Required	7.5 MB
	Client Networking Required	Int. LAN Manager Services or Int. NetWare Services
NewWave Client Support:		Yes (with JoinWare bridge)
	Client Software Required	MS-DOS 5.0, MS Windows 3.1, NewWave 4.X
	Client RAM Required	8 MB
	Client Disk Space Required	7.5 MB
	Client Networking Required	Int. LAN Manager Services or Int. NetWare Services
HP-UX/Motif Client Support:		Yes
	Client Software Required	HP-UX 8.0X, Motif, VUE (optional)
	Client RAM Required	24 MB
	Client Disk Space Required	14.5 MB
	Client Networking Required	NFS
Apple Macintosh Client Support:		Yes
	Client O/S Required	System 7.0
	Client RAM Required	8 MB
	Client Disk Space Required	2.3 MB
	Client Networking Required	Integrated Macintosh Services

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name	8.X VUE 2.01
Part Number	Bundled with OS
Media Types Available:	
CD-ROM	N/A
1/4"	N/A
1/2"	Opt. AA1
DAT	N/A
QIC	N/A
S/W Tier-Model Structure?	No
Incremental System RAM Required	None
Disk Space Required	35 Mbytes
Additional Hardware Requirements	None
Localization Options	None
Documentation List (Title/Part Number)	VUE Users Guide B1171-90042 VUE Configuration Guide B1171-90041

Table 7.32 Series 800 Software Matrix (cont'd)

Software Product Name	WorkRouter
Part Number	B2497A (license), B2482A (media/manual)
Media Types Available:	
CD-ROM	Opt. AAU
1/4"	N/A
1/2"	N/A
DAT	N/A
QIC	N/A
S/W Tier-Model Structure?	No
Incremental System RAM Required	N/A (uses OpenMail on server)
Server Disk Space Required	N/A (uses OpenMail on server)
Additional Hardware Requirements	PC (80386 or 80486), MS Mouse, LAN
Localization Options	None
Documentation List:	
Title	WorkRouter "Getting Started" Manual (B2482-90001)
Title	WorkRouter Self-Paced Tutorial (B2482-90002)
Title	WorkRouter Designer's Guide (B2482-90003)
Part Number	(all manuals included as part of Media and Manuals product B2482A)
MS-DOS Client Support:	No
Client Software Required	N/A
Client RAM Required	N/A
Client Disk Space Required	N/A
Client Networking Required	N/A
MS Windows Client Support:	No
Client Software Required	N/A
Client RAM Required	N/A
Client Disk Space Required	N/A
Client Networking Required	N/A
NewWave Client Support:	Yes
Client Software Required	MS-DOS 5.0, MS Windows 3.1, NewWave 4.X
Client RAM Required	4 MB
Client Disk Space Required	1.2 MB
Client Networking Required	Int. LAN Manager Services or Int. NetWare Services or ARPA 2.1 for DOS or ARPA 2.1 for NetWare
HP-UX/Motif Client Support:	No
Client Software Required	N/A
Client RAM Required	N/A
Client Disk Space Required	N/A
Client Networking Required	N/A
Apple Macintosh Client Support:	No
Client O/S Required	N/A
Client RAM Required	N/A
Client Disk Space Required	N/A
Client Networking Required	N/A

Section 8

Customer Support Services

Hewlett-Packard's customer support services are designed to ensure long-term, productive use of HP 9000 systems. Support is available throughout the life of a system to meet the needs of particular applications and the working environment. HP offers a complete range of customer support services for HP 9000 systems:

- HP System Support Options provide improved response time on hardware support and add software support during the one-year warranty period.
- HP System Support Solutions provide scalable, integrated ongoing support coverage.
- Personalized System Support provides a dedicated team to work as the customer's advocate.
- Premier Account Support provides a premium level of complete service and support for Corporate Business systems customers.
- 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 System Support Engineers (SSEs), Customer Engineers (CEs), and HP Response Center Account Advocates (RCAAs). These extensively trained professionals work closely with HP sales representatives to provide customers with complete support for their HP 9000 products.

HP System Support Options

How to Order Support for the Series 800

New Simplified Support Pricing: One Price Per Server Regardless of the System's Integrated Peripheral Configuration

Hewlett-Packard offers a 1-year repair warranty with 72-hour on-site response time for hardware products. At the same time, the HP System Support Options program supplements the warranty with improved hardware on-site repair response time and by adding software support.

The HP System Support Options Program offers customers hardware and software maintenance and installation support, upfront at time of product purchase, as standard product options for HP systems, integrated and standalone peripherals, and standalone software applications during the first year of system ownership.

Note: Specific implementation of HP System Support Options varies from country to country. Consult with your country support manager for applicable details.

Tailor-Made for Selling
System Support Options fit your ordering process. If you order HP products, you already know how to order support options. Key program features include:

- Quoted and ordered as a product option
- One option gives you recommended hardware/software support

- CPL price represents total cost for first year of hardware/software support
- Options are also available for installation and network configuration

HP System Support Option Choices

Each support option represents a combination of hardware and software support for an HP

product or an installation service. **Table 8.1** illustrates the deliverables of each support option.

For on-going contractual support after the first year, talk to your HP Support Representative about System Support Solutions which can be tailored to meet the customer's individual support needs.

Table 8.1

Less Urgent	Urgent	Highly critical
Option 0S0	Option 0S1	Option 0S5
- License to use software updates	- License to use software updates	- License to use software updates
- Updates*	- Updates*	- Updates*
- Electronic access	- Electronic access	- Electronic access
- Next day on-site response, M-F	- 4 hr. on-site response, M-F	- 24 x 7 4 hr. on-site response
Option 0S2	Option 0S3	Option 0S6
- Phone-in support (SW assistance)	- Phone-in support (SW assistance)	- Phone-in support (SW assistance)
- License to use software updates	- License to use software updates	- License to use software updates
- Updates*	- Updates*	- Updates*
- Electronic access	- Electronic access	- Electronic access
- Next day on-site response, M-F	- 4 hr. on-site response, M-F	- 24 x 7 4 hr. on-site response
*Includes one copy of media and documentation updates for each media and documentation product ordered.		
Option 0S4		
- Installation and network configuration for product warranties that do not include installation.		
Option 0SZ		
- Network configuration only for product warranties which include installation.		

Personalized System Support
Customers who purchase System Support Options 0S2, 0S3 or 0S6 can upgrade their support to Personalized System Support (P/N H5682A).

Personalized System Support provides:

- An assigned System Support engineer
- An assigned HP Response Center Account Advocate
- Patch management assistance
- Scheduled operational reviews
- System release planning seminars
- Installation of software updates



Selecting the Appropriate Option

HP System Support Options are available for systems, integrated and standalone peripherals, and standalone software.

Systems

Now one System Support Option price covers the complete integrated system regardless of configuration. To select the appropriate option, follow these steps:

1. Select the customer's hardware, software and peripherals.
2. Determine the customer's desired response time for hardware repairs (next-day, 4-hour or 24 x 7).
3. Determine whether the customer has a Response Center Software Assistance caller set up who will be calling for support of the system being purchased.

If No, select Opt. 0S2, 0S3, or 0S6.

If Yes, select Opt. 0S0, 0S1, or 0S5.

Integrated Peripherals*

The System Support Option prices have been reduced to \$0 for peripherals that are integrated with the SPU chassis. Their support prices have now been rolled in with the System Support Option price for the SPU.

However, you still **must** select the option that provides the desired response time for repairs (next-day, 4-hour, or 24 x 7) for each of

*Note: All integrated peripherals on a given system must use the same HP System Support Options.

Table 8.2

Feature	Delivery Specifications		
Warranty upgrade	Support services are added to the product warranty to provide either next-day, 4-hour or 24 x 7 on-site response for hardware problems.		
	Next Day	4 Hour	24 x 7
Coverage Hours	8 am–5 pm Mon–Fri	8 am–9 pm* Mon–Fri	24 hours 7 days per week
Response Time	Next day	Best response; not to exceed 4 hours	Best response; not to exceed 4 hours
	*If service is requested before 5:00 pm, an HP engineer will respond on-site within 4 hours, if an on-site call is necessary.		
On-site repair	An HP engineer travels to the customer site and provides all labor, parts and materials necessary to maintain hardware products in good operating condition. Product malfunctions and failures are diagnosed and corrected.		
Phone-in support (SW assistance)	Unlimited, toll free access to the HP Response Center is provided for authorized callers. Response is immediate for critical calls and within 2 hours for all calls.		
License to use software updates	Customer can use and copy updates to HP software on each system covered by HP System Support Options.		
Updates	As HP releases updates to HP software, the latest revisions of the software and reference manuals are made available to the system manager. HP provides one copy of media and documentation updates for each media and documentation product ordered with HP System Support Options.		
Electronic access	HP SupportLine provides electronic access to a database of current product and support information. Includes new product information, software status bulletins, engineering and application notes, etc. HP SupportLine can also be used to submit Response Center calls.		
Installation/network configuration	Option 0S4 provides installation and network configuration for products whose purchase price does not include installation. Option 0S2 provides network configuration for products whose purchase price includes installation.		

the integrated peripherals. Select the same option as you chose for the system with which the peripheral will be used.

Standalone Peripherals

Standalone peripherals (e.g. printers and end-user terminals) carry their own System Support Option price separate from the SPU support price. However,

the selection procedure for the System Support Options is the same as for Integrated Peripherals.

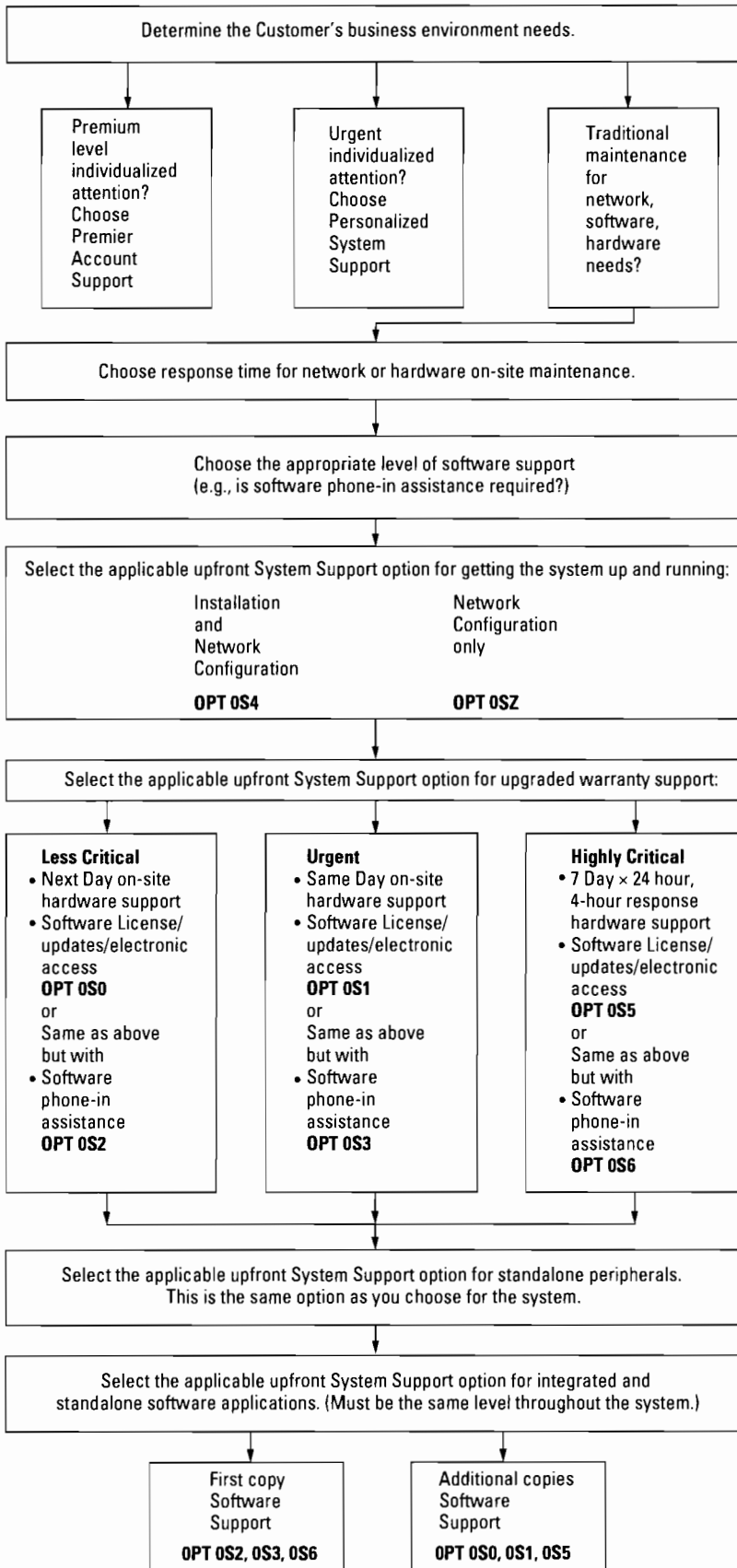
Standalone Software Applications

For standalone software applications, select options as follows:

Select Option 0S2, 0S3 or 0S6 for the first copy of the application.

Select Option 0S0, 0S1 or 0S5 for additional copies.

Figure 8.1 **Selecting the Right Support for Your Customer**



Corporate Business Server T500 System Support Options

The Corporate Business Server T500 System has standard HP System Support Options OS0 through OS6.

Note: Corporate Business Servers (A1826A) require System Support Options OSA - 0TH. The support deliverables for OSA - 0TH are the same as those for OS0-OS6.

To order the correct System Support Option, use **Table 8.3**.

1. Select appropriate processor option (101-104).
2. Determine desired level of support.

3. Choose one of the System Support Options associated with that processor option.

Each OSA - 0TH System Support Option description will specifically reference the processor option the support is being purchased for.

Table 8.3 System Support Options—Corporate Business Server 890

Order w/Prod. Number	Prod. Opt.	These options equivalent to:							
		OS0 LTU/ND	OS1 LTU/4HR	OS2 TEL/ND	OS3 TEL/4HR	OS4 Instl.	OS5 LTU/24	OS6 TEL/24	OSZ NW
A1826A	101	OSA	OSB	OSC	OSD	N/A	OTA	OTB	OSZ
	102	OSE	OSF	OSG	OSH	N/A	OTC	OTD	OSZ
	103	OSJ	OSK	OSL	OSM	N/A	OTE	OTF	OSZ
	104	OSN	OSP	OSQ	OSR	N/A	OTG	OTH	OSZ

OS0: LTU SW/Next Day HW
OS1: LTU SW/Same Day HW

OS2: Tel SW/Next Day HW
OS3: Tel SW/Same Day HW

OS4: Inst./Ntwk. Conf. Cust. Inst. Prod.
OS5: LTU SW/24 x 7 HW

OS6: Tel SW/24 x 7 HW
OSZ: Ntwk. Conf.—HP Inst. Prod.

HP System Support Options

The HP System Support Options offer customers basic hardware and software support for HP systems, standalone peripherals, and standalone software applications.

System Support Options improve the warranty response time, and give customers basic software support services. Key program features include:

- Quoted and ordered as a product option
- One option gives you recommended HW/SW support

- CPL prices represent the total cost for a full year of hardware and software support
- One price covers the whole system, regardless of the configuration of the integrated peripherals. (Standalone peripherals are quoted separately.)
- Quota credit and commission on every sale

Note: Specific implementation of HP System Support Options varies from country to country. Consult with your country support manager for applicable details.

HP System Support Options are widely available on Computer Services Organization and Computer Products Organization products, as well as standalone software applications. HP sales representatives are able to quote HP System Support Options coverage on any product they sell without having to contact the HP support organization for assistance. Customers will receive their product sales discount on HP System Support Options orders.

HP sales representatives sell HP System Support Options directly to customers at the same time they sell hardware and software products as part of the normal sales process.

HP System Support Solutions

HP System Support Solutions provide ongoing contractual support outside the terms of the product warranty. As with System Support Options, the HP System Support Solutions program provides a framework to create and sell a solution tailored to the customer's individual needs. Descriptions for HP System Support features are described below.

Hardware Service Levels

While these service levels meet the needs of most customers, HP also has the flexibility to individualize service for you.

Table 8.4 Hardware Service Level Selection Guide

Environment	Required Coverage Hours*	Required Response Time	HP Hardware Service Level	Support Suffix
Highly critical	24 hours a day 7 days a week	Best response; not to exceed 4 hours	Priority Plus	02G
Urgent	8:00 am–9:00 pm, Monday–Friday, excluding HP holidays**	Best response; not to exceed 4 hours (typically same working day)	Priority	02A
Less Critical	8:00 am–5:00 pm Monday–Friday, excluding HP holidays	Next working day	Next Day	02C

* Outside the United States, hours are subject to local availability.

** Service requests before 5:00 pm, bring an HP engineer on site within 4 hours if necessary.

Table 8.5 Hardware Support

Feature	Delivery Specification
On-site hardware support	HP travels to your site and provides all labor, parts, and materials necessary to maintain your hardware products in good operating condition. HP diagnoses and corrects products malfunctions and failures. Replacement parts are new or equivalent to new; replaced parts become the property of HP.
Work to completion	Once an HP engineer arrives at your site, the engineer continues service, uninterrupted, until your products are operational or as long as reasonable progress is being made. Work may be temporarily suspended if additional parts or resources are required, but resumes when they become available. With the Scheduled support service level, work resumes on the following business day.
Engineering improvements	HP installs appropriate engineering improvement on your system to ensure maximum performance and maintain compatibility with HP-supplied hardware replacement parts.
Escalation management (hardware)	HP has established formal escalation procedures to solve very complex hardware problems. Local HP management coordinates problem escalation, rapidly enlisting the skills of key problem-solving experts throughout HP.
24-hour hardware call submittal	If you've selected a hardware service level that only provides coverage during normal business hours, you can still place an after-hours service call. The HP Response Center logs the call and notifies your local office the following business day.*
Preventive hardware maintenance	An HP engineer visits your site at regularly scheduled intervals to perform diagnostics on your system, adjust mechanical or electronic system components as needed, and replace worn or defective parts if necessary.
Remote hardware support	Prior to any necessary on-site assistance, an HP engineer may initiate and perform remote diagnostics to facilitate problem resolution. By using an HP-qualified support modem to resolve problems remotely, HP can have your system up and running more quickly. HP performs remote support only upon receipt of your authorization.

* Subject to local availability outside the United States.

Phone-in Software Assistance, Information, and Updates

Includes the features of software license, information, and updates, plus:

Table 8.6 Phone-in Software Assistance, Information, and Updates

Feature	Delivery Specification
Phone-in software assistance	Remote assistance is available for software problems. Unlimited, toll-free access to the HP Response Center is available to authorized callers. Response is immediate for critical calls and within 2 hours all calls. Assistance is available from Monday through Friday, excluding HP holidays, during normal HP Response Center hours for all HP and select non-HP software products. Extended-hours support is available for operating system, subsystem, and application software products. Refer to the HP SupportLine database for details of products and coverage hours.
Electronic software call submittal	Authorized callers can submit calls electronically to the HP Response Center via HP SupportLine electronic support and request a call back within 2 hours (or the next business day if after normal hours) or a written electronic response the next business day.
Escalation management (software)	At HP's discretion, the HP Response Center may dispatch an HP service representative to the customer's site to assist with critical software problem resolution. In most cases, resources arrive within 1 working day if the site is within 100 miles of the nearest HP support office.
Remote software support	Prior to any necessary on-site assistance, an HP engineer may initiate and perform remote diagnostics to facilitate problem resolution. By using an HP-qualified support modem to resolve problems remotely, HP can have the customer's system up and running more quickly. HP performs remote support only upon receipt of authorization from the customer.

Table 8.7 Software License, Information, and Updates

Feature	Delivery Specification
License for software updates	Customers may use and copy updates to HP software on each system covered by HP System Support service as described in HP Terms and Conditions of Sale and Service, Exhibit 5, HP System Support Service.
Software media and documentation	As HP releases updates to your HP software, the latest revisions of the software and reference manuals are made available to the customer's system manager. Media types available for software and documentation updates include tape, disk, paper, electronic, and CD-ROM. HP value-added businesses (VABs) may request priority delivery of software releases.
HP SupportLine electronic support	HP SupportLine provides electronic access to a database of current product and support information. HP SupportLine includes new product information, software status bulletins, engineering and application notes, and information about available software patches. Keyword search and browse capabilities make it easy to locate appropriate information. Software patches, when available for HP 9000 systems, can be downloaded to the customer's system. HP SupportLine is available Sunday through Friday from 2:00 am to midnight, and Saturday from 2:00 am to 9:00 pm eastern time (U.S.). Outside the U.S., hours are subject to local availability.

Table 8.8 Network Support (requires hardware/software support)

Feature	Delivery Specification
Network support	Resolution of a network problem begins within 2 hours of the customer's call to the HP Response Center. Network specialists isolate the problem remotely and, if HP deems necessary, HP sends a support engineer to the site. Since the HP Response Center can manage the resources required to solve multivendor and multisite problems, HP can cover the entire network. To efficiently solve problems, HP may contact select vendors directly or work with the customer to contact the appropriate vendor.
Complete network documentation	Customer-specific network documentation for all of the customer's sites is updated annually by an HP representative. The customer's network map is included in the HP Response Center's database.
Assigned contract administrator	An account-assigned contract administrator serves as the customer's single point of contact for contract administration.

Personalized System Support

Personalized System Support consists of an assigned team of support experts to provide ongoing individualized account attention.

The Personalized System Support solution includes all of the underlying hardware and software support features. Customers receive network support if they purchase the network coverage option or have an all-HP network. In addition, this solution includes support management and planning activities. Personalized System Support is available for the following platforms: HP 1000, HP 3000, HP 9000, and PC-local area network (PC-LAN) systems.

Features

All hardware, software, and network* support features plus the following features for HP 1000, HP 3000, and HP 9000 systems:

- An account-assigned system support engineer (SSE)
- An HP Response Center advocate
- An assigned contract administrator

- Patch management assistance
- Operational reviews
- System release planning
- Software update installation

Benefits

- Increased system availability through proactive maintenance
- Faster and more precise problem resolution
- Increased productivity through personalized assistance
- Smooth new software release integration
- In-depth account knowledge

Personalized System Support targets new and existing customers who want proactive and personalized maintenance from HP. It is applicable to large and small customers (A, B, and C sales accounts).

All new HP customers should be primary targets for HP's Personalized System Support. They include new customers who need assistance learning about their systems and working with the HP support organization; small customers with little or no support staffs or with unsophisticated staffs; and large customers with large and highly technical support staffs who view support as insurance.

New customers can purchase Personalized System Support up front with their system purchase in conjunction with HP System Support Options. Sales representatives receive quota credit and commission, and customers receive applicable sales discounts.

To order Personalized System Support up front, order option 0S2, 0S3 or 0S6 on all hardware, software and network products to get hardware, software and network support. In addition, you must order product number H5682A with the appropriate 0Tx option to get the account management deliverables of Personalized System Support.

Table 8.9 Personalized System Support Pricing Tiers: 0Tx Options

Option	Products
0T1	E25, E35, E45 F10, F20, F30 G30, G40, G50, G60, G70 H20
0T2	H30, H40, H50, H60, H70
0T3	I30, I40, I50, I60, I70
0T4	T500 1-way and 2-way SPU's
0T5	T500 3-way and 4-way SPU's
0T6	T500 5-way and 6-way SPU's
0T7	T500 7-way through 12-way SPU's

*Not available in all countries. Check with your country support manager.

Table 8.10 Personalized System Support

Feature	Delivery Specification
Assigned system support engineer	The customer's assigned system support engineer (SSE) coordinates all hardware, software, and network on-site maintenance services, schedules operational reviews, installs software updates, and ensures that all appropriate HP resources are made available. The SSE is available during normal HP business hours, excluding HP holidays.
Assigned HP Response Center Account Advocate	An assigned HP Response Center Account Advocate (RCAA) understands the customer's computing environment and acts as an advocate to ensure that customer support needs from the HP Response Center are met. The RCAA monitors calls placed to the HP Response Center for software assistance to help identify trends and potential problems. The RCAA contacts the customer immediately if a class problem arises and works with the customer to implement a solution that minimizes system disruptions. Assistance is available Monday through Friday, 8:00 am to 5:00 pm local HP Response Center time, excluding local HP Response Center holidays.
Patch management assistance	Patch management assistance consists of patch analysis and proactive notification of new patches. The RCAA provides a full patch analysis twice a year as a scheduled activity. As the RCAA becomes aware of new patches through normal activities, the RCAA will proactively advise the customer of new patches that may prevent potential problems. Assistance is available Monday through Friday, 8:00 am to 5:00 pm local HP Response Center time, excluding local HP Response Center holidays.
Operational reviews	The customer's SSE schedules two operational reviews per year, covering review topics mutually agreed to. Possible topics include review of operational procedures such as system security; plans for add-on hardware, software, and network products; and review of HP Response Center calls. Operational reviews are provided during normal HP business hours.
System release planning seminars	In system release planning seminars, HP support representatives review changes to new software releases—including new features and functions, problem fixes, and performance implications; new hardware, software, and network products supported by new releases; hardware needs; and impact on system and network configurations. System release planning seminars are provided for major releases only, generally one per year. HP schedules meetings 1 month in advance at an HP office, with one seminar for each major release.
Installation of software updates and add-on hardware products	<p>The SSE installs one operating system update per year on the customer's central system. Installation is available 7 days a week, 24 hours a day, excluding HP holidays. Installation must be scheduled at least 1 week in advance at a mutually agreed-upon time, and the customer's system manager or alternate must be present during the installation.</p> <p>Additional HP hardware products purchased directly from HP and added to the HP System Support service agreement are installed at no additional charge. This applies to select products and does not apply to hardware that is designated as customer-installable.</p>

Premier Account Support Benefits

Premier Account Support provides a premium solution ranging from traditional maintenance through disaster recovery planning.

HP System Support service for premier accounts provides HP's highest level of hardware, software, and network support for HP 3000 and HP 9000 Corporate Business System Servers. It ensures the customer's success by providing a designated HP premier support team to keep your customer's data center running smoothly. In addition, this service provides customers with immediate problem-resolution activities to get their systems up and running if a problem arises.*

Features

All Personalized System Support solution features plus:

- 24-hour, 7-day hardware, software, and network support
- An account-assigned System Support Engineer (SSE)
- Direct access to an account-assigned Response Center Engineer (RCE)
- An assigned technical consultant (when selected)
- An assigned contract administrator

- Maximum system availability
- Comprehensive coverage and better resource planning
- Technology advances that create competitive advantages

Premier Account Support is a proactive, structured, yet flexible support offering for high-end customers. There are two target markets for premier account support service: new corporate business system or server (Emerald) accounts, specifically those replacing a large HP system or large non-HP system; and installed-base, high-end customers with Emerald systems in a data center environment.

There are two ways to sell premier account support: a fixed-price upfront solution or the flexible post-warranty system support solution. All of the solutions offer HP's highest level of complete maintenance coverage.

The fixed-price upfront solutions, designed for the sales force to sell up front with the corporate business system or server sale, are available as three fixed-price packages:

- Package 1 includes an enhanced level of complete maintenance, operations assistance (for example, disaster recovery, performance, and network management reviews), and customer education. Order product number H5897AA with the appropriate processor option.
- Package 2 includes an enhanced level of complete maintenance and additional SSO implementation assistance. Order product number H5677A with the appropriate processor option.
- Package 3 includes an enhanced level of complete maintenance. Order product number H5678A with the appropriate processor option.

Since some customers do not need the full content of package 1 (for example, operations assistance or education), packages 2 and 3 are viable alternatives.

The simple packages make selling support easy, and the support coverage can be integrated into a customer's ongoing contract during the renewal process. Sales representatives receive quota and commission for each HP Premier Account support service package sold up front with the system.

NOTE: The fixed price upfront Premier Account Solutions are sold in place of HP System Support Options.

*Unless the customer does not select the immediate response hardware service level.

Section 9

Reference Sources

Table 9.1 Sales Tools and Guides Currently Available

Description	Pub. No	Available From
Brochures		
Mainframe Alternatives from HP: Right Time. Right Solutions	5091-8991E	LDC
The Bigger the Better Brochure	5091-4999E	LDC
Client/Server Brochure	5091-7586E	LDC
HP 9000 Series 800 Buyer's Guide to Success	5091-7297E	LDC/HPFIRST/PowerTools
Open for Business: HP 9000 Series 800 Systems Brochure	5091-9264E	LDC
Ten Reasons to Partner with Hewlett-Packard Brochure	5091-6941E	LDC
HP's Business System Support for Your Organization's Long-term Success	5952-0852	LDC
"Together We'll Get the Job Done Better" Brochure	5952-4891	LDC
Technical data sheets		
Models F10, F20, F30, G30, G40, G50, G60, G70, H20, H30, H40, H50, H60, H70, I30, I40, I50, I60, I70 Product Data Sheet	5091-7264E	LDC/HPFIRST/PowerTools
Models E25, E35, E45 Product Data Sheet	5091-8997E	LDC/HPFIRST/PowerTools
Model T500 Product Data Sheet	5091-8959E	LDC/HPFIRST/PowerTools
HP 9000 High Availability Computing Products Data Sheet	5091-8957E	LDC/HPFIRST/PowerTools
HP DCE/9000 Technical Data Sheet	5091-9000E	LDC/HPFIRST/PowerTools
HP Encina/9000 Product Brief	5091-9001E	LDC/HPFIRST/PowerTools
HP-UX 9.0 Operating System Data Sheet	5091-8993E	LDC/HPFIRST/PowerTools
HP-UX B-Level Security Technical Data Sheet	5091-5872E	LDC/HPFIRST/PowerTools
HP 9000 DTC Solutions Technical Data Sheet	5091-6441E	LDC/HPFIRST/PowerTools
TPC, Spec, & LADDIS Benchmark Details	N/A	HPFIRST/PowerTools
UNIX Systems Performance Quick Reference Card	5091-7908E	PowerTools
HP Networking Communications Specification Guide, 10/93	5091-9389E	LDC
Price and configuration guides		
HP 9000 Series 800 Price Guide (U.S. only)	5091-9212E	LDC/PowerTools
HP 9000 Series 800 Configuration Guide	5091-9206E	LDC/PowerTools
HP 9000 Series 800 E Class Server Price & Configuration Guide	5091-9209E	LDC/PowerTools
Sales and product guides		
HP 9000 Product Guide	5091-9133E	LDC
HP 9000 Distributed Replicated Site Sales Guide	5091-9205E	LDC
HP 9000 Small Business Sales Guide	5091-9638E	LDC
Guide to HP Service and Support	5091-7696E	LDC
Presentation tools		
Client/Server Presentation	CSPRES	GSY HOTLINE
High Level Mainframe Alternative	HILEVEL	MFA HOTLINE
HP 9000 Series 800 MFA Reference Accounts	800REF	MFA HOTLINE
HP 9000 Series 800 Slide Presentation Kit	9000-1, 9000-2, 9000-3	GSY HOTLINE
HP-UX Transaction Processing Performance Brief	PERFBRF5	GSY HOTLINE/PowerTools
MIS Mainframe Alternative	MFMS	MFA HOTLINE
Ten Reasons to Partner with Hewlett-Packard	REASONS	GSY HOTLINE
HP 9000 Performance Marketing Tools Directory	PERFDIR	GSY HOTLINE/PowerTools
Competitors At a Glance Cards	5091-9254E thru 5091-9260E	PowerTools/Comac
Videotapes (available from HP TV)		
Client/Server Video-Customer Testimonials	90593T	HP TV
HP 9000 Database Partners	90396T	HP TV
HP and Informix	90395T	HP TV
HP and Ingres	90560T	HP TV
HP and Oracle	90394T	HP TV
HP and Sybase	90424T	HP TV
HP: Your Open Systems Partner	90462T	HP TV
More Smart Moves		HP TV
Powershift: HP Business Computing	S-1665	HP TV
Skadnet - Technology for the 90's and Beyond	I-305	HP TV

Reference Sources (cont'd)

Description	Pub. No	Available From
Article reprints/MFA Success Stories		
Aberdeen Group article "Commercial Multiuser RISC/UNIX: Hewlett-Packard Leads the Downsizing Transformation"	5091-7063E	LDC
Aberdeen Group article "Gartner Catches Up with Trends"	5091-2395E	LDC
Agropur/Natrel Success Story	5091-1482E	
*"Hewlett-Packard's MAGIC Offers Increased Efficiency, More Flexibility, and Better Price/Performance"	5091-3025EUS	
Australian Financial Review "HP in \$10M Deal for TNT Upgrade"	5091-6581E	LDC
Batch Performance Brief "HP 9000 Series 800 Provides Mainframe Class"	5091-6419E	LDC
ComputerWorld article "UNIX Serves Eatery's MIS Unit"	5091-2405E	LDC
ComputerWorld Reprint "Giving Downsizing the Hard Sell" (Brueners)	5091-4896E	LDC
ComputerWorld Reprint *"Migration Woes Promise Gold"—Hughes	5091-5765E	LDC
ComputerWorld Reprint *"MobileNet Unites Staff"	5091-6709E	LDC
Far Eastern Economic Review "Hewlett-Packard Shakes Japan's Computer Market"	5091-6616E	LDC
Information Week article "Trucking Firm Seeks Faster Dispatching"	5091-3705E	LDC
Information Week Reprint *"GTE Takes the UNIX Plunge"	5091-5643E	LDC
InfoWeek article "Hamersly Iron dares to downsize"	5091-4635E	LDC
Ingres/HP Success Story "Cellular One Makes the Right Call"	5091-5783E	LDC
Open Systems Advisory article "IBM and HP: The Nouveau Plug Compatibles"	5091-6892E	LDC
Open Systems Today Reprint *"Liberty Bancorp Implements an Open Strategy"	5091-7221E	LDC
UNIX Today! article "The Mainframe Alternative"	5091-4205E	LDC
"Chesebrough Ponds"	5091-6322E	LDC
Dept. of Planning & Housing (Australia) "DPH Replaces Mainframe with HP Client/Server Architecture"	5091-6581E	LDC
"HP Security Wins IT Down-Under Deal"	5091-5781E	LDC
"HP Security Wins IT Down-Under Deal"	5091-5768E	
"NPD Reengineers Its Information System with Ingres and HP"	5091-5700E	LDC
Poster		
Series 800—HP Logo	5091-9644E	LDC
Series 800—Channel Partner Logo	5091-9645E	LDC

Ordering Information

Literature Distribution Center (LDC):

Send an HPDesk message to Literature Order/HP 0000/53, and include the following information:

- Your name
- Your entity number
- Your telnet number
- Date the literature is required
- Address and mailstop where the literature is to be sent
- Publication number
- Quantity required

HP FIRST

HP FIRST provides quick and easy access to a wide range of literature available to field offices and Channel Partners through Group 3 fax touch-tone access. To get copies of materials available on HP FIRST:

1. Pick up the handset on your fax machine and dial from the fax keypad: 1-800-333-1917.*
2. The computer will prompt you to enter the code number for the product support information you need (it will also ask if you need an index).
3. When HP FIRST prompts you, hit the start/copy or receive button on your fax machine and hang up to receive the fax.

PowerTools

Electronic retrieval system for sales and marketing documents available as an online system and via CD-ROM for users without HP Internet access.

- For accessing PowerTools online or via CD-ROM, please send an HPDesk message to PowerTools/HP6650/AF.

HPDesk Hotline

Send an HPDesk message to the appropriate HOTLINE using the subject of the topic you wish to receive. For example:

```
Intray> send
Subject: INDEX
TO: GSY HOTLINE
Text: //
MESSAGE> mail
```

HP-TV

To order video tapes from HP-TV, send an HPDesk message to HPTV/HP0000/SE, and include the following information:

- Your name
- Your complete mailing address
- Quantity of each videotape desired
- Billing information (your account and location codes)
- Part number and video title
- Format: 1/2" VHS or 3/4" UMATIC
- Standard: NTSC, PAL, or SECAMH

* Anywhere in the U.S. or Canada or dial 208-344-4809 elsewhere worldwide (include country code).



Section 10

Index

Index by Product Number

10833A	6-32	32032A	7-40, 7-46, 7-51	36217-90186	7-55
10833A/B/C	6-31, 6-32	32044A	7-40, 7-50, 7-51	36217-90188	7-55
10833B/C	6-20	32045A	7-40, 7-50	3630A	6-20, 6-31, 6-42
13222Y	5-17	32046A	7-50, 7-51	36389-90011	7-55, 7-70
13242N	6-20	32054D	5-11, 5-12, 5-16	36389-90017	7-70
17255D	3-81, 4-19	32070A	7-40, 7-43, 7-45, 7-51	36960A	3-12, 3-21, 3-30, 3-35, 3-44, 3-49, 3-58, 3-64, 3-72, 3-74, 5-1, 7-40, 7-42, 7-51, 7-52
17355D	5-17	33440A	6-20, 6-41	36967A	5-1, 7-40, 7-41, 7-51, 7-52
17440A	6-38	33447A	6-41	37204A	6-34
19508A	4-16	33459A	6-31, 6-41	39967A	6-29
19511A	5-8	33471A	6-41	40220A	5-17, 7-42
19570A	6-32	33491A	6-31	40221A	5-17, 7-42
19571A	6-32	3480	6-14	40223A	5-17
19572A	5-8	27110B	6-9, 6-10	40233A	6-23, 6-25
19573A	5-8	27111A	7-28	40234A	5-17, 6-23, 6-24, 6-25
20234A	5-17	27147A	5-2, 6-11, 6-21, 7-28	40242C	6-24
2146-90001	7-68	2786A	5-8	40242M	6-20, 6-24, 6-32
2225C	6-39, 6-40, 6-41, 6-42	28615A	1-5, 3-1, 3-15, 3-24, 3-30, 3-35, 3-38, 3-44, 3-49, 3-52, 3-58, 3-64, 3-72, 3-74, 4-4, 5-1, 5-7, 5-8, 6-8, 6-9, 6-36, 6-37, 7-25, 7-28	40242Y	5-17
2225D	6-20, 6-31, 6-39	28641B	6-26, 6-28	4024M	6-31
2225P	6-39	28642A-01	7-25	40299B	3-8, 3-30, 3-44, 3-58, 3-72, 5-1, 5-9, 5-10, 6-23
2227A	6-20, 6-31, 6-39	28643A	3-79, 5-7, 6-21	41063A	5-17, 6-20, 6-42
2227B	6-20, 6-39	28650B	3-21, 3-30, 3-35, 3-44, 3-49, 3-58, 3-64, 3-72, 5-1, 5-9, 6-9, 6-10	42034A	5-17
2228A	6-20, 6-39	28655-81004	7-25	45610A	6-43
2235A	6-39	28655A	2-5, 2-12, 3-12, 3-21, 3-30, 3-35, 3-44, 3-49, 3-58, 3-64, 3-72, 3-74, 3-78, 4-12, 5-1, 5-2, 5-6, 6-2, 6-11, 6-18, 6-21, 7-25, 7-28, 7-33	45610A/B	6-24
2235B	6-20, 6-39	28685A-01	7-25	45711A..D	6-24
2235C	6-39	28683A	6-26, 7-41	45970C	6-43
2235D	6-39	28685A	7-41	46299A	5-8
225XHA/B	5-8	28685B	3-3, 5-18	46299Y	5-8
2276A	6-39	28696A	1-1, 2-5, 3-8, 3-12, 3-21, 3-30, 3-35, 3-44, 3-49, 3-58, 3-64, 3-72, 3-74, 3-78, 5-1, 5-3, 5-6, 6-2, 6-6, 6-7, 7-29	5010-7168	7-76
2277A	6-39	28698A	5-4	5060-2332	7-53
2323A	6-43	2932A	6-20, 6-41	5061-4001	6-31
2335A	7-40, 7-42, 7-43, 7-44	2934A	6-20, 6-31, 6-41	5062-3383	2-12
2340A	4-7, 4-16, 7-40	35199E	4-7, 4-16	5091-7228E	1-1
2345A	4-7, 4-16	35328-90001	7-56	5091-1482E	9-2
235xA	6-31	35328-90003	7-56	5091-1633E	7-27
2382A	6-43	35328-90012	7-56	5091-2395E	9-2
2392A	6-24, 6-43	35401A	6-44	5091-2405E	9-2
2393A	6-43	36217-90001	7-55	5091-3025EUS	9-2
2394A	6-24, 6-43	36217-90005	7-55	5091-3705E	9-2
2397A	6-43	36217-90007	7-55	5091-3821E	5-11
2442A	3-3	36217-90009	7-55	5091-4205E	9-2
24540B	5-17	36217-90014	7-55	5091-4367E	1-1
24541B	5-17	36217-90058	7-55	5091-4635E	9-2
24542M	5-17, 6-24	36217-90093	7-55	5091-4896E	9-2
2562C	6-20, 6-31, 6-39	36217-90154	7-70	5091-4999E	9-1
2563C	6-20, 6-31	36217-9018	7-55	5091-5326E	7-72
2566C	6-20, 6-31	36217-90185	7-55	5091-5643E	9-2
2567C	6-20, 6-31			5091-5686E	7-18
2622A	6-43			5091-5700E	9-2
2684A	6-20			5091-5759E	1-1
2684P	6-41			5091-5765E	9-2
2686A	6-20, 6-41			5091-5768E	9-2
2686D	6-41			5091-5781E	9-2
30062B	5-17			5091-5783E	9-2
30241A	5-18, 7-41			5091-5872E	9-1
30662-60001	7-53			5091-6322E	9-2
30662-60004	7-53			5091-6419E	9-2
30662-90005	7-53			5091-6441E	9-1
3081A	6-24, 6-43				
3082B	6-24, 6-43				
32019A	7-40, 7-46, 7-51				

Index (cont'd)

5091-6581E	9-2	7937H	6-35	92431-90006	7-71
5091-6616E	9-2	7957A	6-35	92434-90002	7-53, 7-55
5091-6709E	9-2	7957B	6-35	92453-90024	7-55
5091-6892E	9-2	7957S	6-35	92501-90001	7-56
5091-6941E	9-1	7958A	6-35	92501-90005	7-56
5091-7059E	7-21	7958B	6-35	92568A	7-73
5091-7062E	7-20	7958S	6-35	92625A	7-28, 7-29
5091-7063E	9-2	7959B	6-35	92668-90001	7-75
5091-7221E	9-2	7959S	6-35	92668-90005	7-27
5091-7264E	9-1	7962B	6-35	92668A	7-2, 7-25, 7-26, 7-28, 7-29, 7-33, 7-75
5091-7297E	9-1	7963B	6-35	92730B	7-73
5091-7586E	9-1	7974A	6-44	92731B	7-73
5091-7907E	9-1	7979A	4-6, 6-44	92732B	7-73
5091-8524E	7-62, 7-66	7980A	4-6, 6-44, 7-20	92733A	7-74
5091-8957E	9-1	7980S	4-6, 6-15, 6-44	92734A	7-74
5091-8959E	9-1	7980SX	4-6, 4-12, 6-15, 6-44	92740B	7-73
5091-8991E	9-1	7980XC	4-6, 6-44, 7-20	92741B	7-73
5091-8993E	9-1	79xxA/B/H/P/R	6-9	92742B	7-73
5091-8997E	9-1	8120-1625	4-21	92743A	7-74
5091-9000E	9-1	8120-1860	4-6, 4-10, 4-16, 6-15	92744A	7-74
5091-9001E	9-1	8120-1900	4-16	92752A	7-74
5091-9133E	9-1	90190A	6-23	92753A	7-74
5091-9205E	9-1	902284A	6-31	92768A	7-73
5091-9206E	9-1	90394T	9-1	9742A	1-3
5091-9209E	9-1	90395T	9-1	97902B	6-35
5091-9212E	9-1	90396T	9-1	97903B	6-35
5091-9264E	9-1	90424T	9-1	97962B	6-35
5091-9389E	7-40	90462T	9-1	97963B	6-35
5091-9638E	9-1	90560T	9-1	98173A	3-30, 3-44, 3-58
5091-9644E	9-2	90593T	9-1	98174A	3-30, 3-44, 3-58
5091-9645E	9-2	9122C	6-35	98196A	6-23
51080-0010	6-31	9127A	6-35		
5262-3669	3-83	9144A	6-17, 6-44		
5959-2479	6-14	9145A	6-17, 6-44		
5959-4986	5-12	9153C	6-35		
5959-9684	7-69	91790A	7-73		
5960-1761	7-72	92205A	6-34		
5960-6605	7-61, 7-71	92205B	6-34		
5960-7318	1-1	92211Y	5-8		
5961-0373	5-12, 5-14	92218A	6-20, 6-24		
72425A	6-24	92221M	5-17, 6-24		
72445A	6-24	92222A	5-6, 6-33, 7-33		
7440A	6-31, 6-32, 6-38	92222A/B/C	6-33		
7475A	6-38	92222B	5-6, 6-33		
7476A	6-32	92222C	5-6, 6-33		
7550A	6-38	92222D	5-6, 6-33		
7550B	6-32, 6-38	92227A/B/C/D/ E/F/G/H	5-18		
7576A	6-32	92227L	5-18		
7586B	6-38	92227N	5-18		
7595A	6-38	92227P	5-18		
7595B	6-32, 6-38	92227S	5-18		
7596A	6-38	92241-64050	7-53		
7596B	6-32, 6-38	92253A/B/C/D/ E/F/G/H	5-18		
7599A	6-32, 6-38	92254A/B/C/D/ E/F/G/H	5-18		
7670A	6-32	92268A/B/C/D	5-18		
7907A	6-35	92284A	6-32		
7914CT	6-35	92430-90004	7-61		
7914P/R	6-35	92430-90005	7-61		
7933H	6-35	92431-90005	7-71		
7936FL	6-35, 7-28				
7936H	6-35				
7937FL	6-35, 7-28				
				A	
				A1004A	1-3
				A1035A	1-3
				A1044A	1-3
				A1071A	1-3
				A1114A	1-3
				A1135A	1-3
				A1146A	1-3
				A1147A	1-3
				A1148A	1-3
				A1154A	1-3
				A1155A	1-3
				A1608A	1-3
				A1625A	1-3
				A1703A	1-3, 4-23
				A1704A/B	4-23
				A1704B	1-3
				A1706A	1-3, 4-23
				A1716A	1-3
				A1749A	1-5, 3-1, 3-15, 3-24, 3-30, 3-35, 3-38, 3-44, 3-49, 3-52, 3-58, 3-64, 5-1, 5-8, 6-9, 7-25, 7-28
				A1751A/B	4-23
				A1751B	1-3
				A1765A	1-3, 4-23
				A1766A	1-3, 4-23
				A1768A	1-3, 4-23

Index (cont'd)

A1769A	1-3, 4-23	A2429A	1-2, 3-24, 3-34, 3-35, 4-6, 4-23, 5-14	A3025A	3-64
A1809-90001	3-83	A2430A	1-2, 3-38, 3-48, 3-49, 4-6, 4-23	A3025B	3-64
A1809-90006	3-83	A2431A	1-2, 3-52, 3-63, 3-64, 4-6, 4-9, 4-23, 5-14	A3032A	1-1, 1-2, 3-68, 3-73, 3-77, 3-83
A1809-90009	3-83	A2432A	1-2, 3-15, 3-20	A3033A	3-76, 3-84
A1820-90001	3-83	A2433A	1-2, 3-15, 3-20	A3034A	3-76, 3-84
A1826A	1-2, 1-3, 8-5	A2434A	1-2, 3-24, 3-34, 3-35, 5-14	A3035A	3-76, 3-84
A1827A	3-84	A2435A	1-2, 3-24, 3-34	A3036A	3-76, 3-84
A1828A	3-68, 3-69, 4-4, 4-7	A2436A	1-2, 3-24, 3-34	A3062A	3-73
A1828AZ	4-4, 4-12, 4-13	A2437A	1-2, 3-38, 3-48	A3085A	3-76, 3-84, 4-21
A1829A	4-11	A2438A	1-2, 3-38, 3-48	A3086A	3-11, 3-21, 3-35, 3-49, 3-64, 6-44
A1829AZ	3-73	A2439A	1-2, 3-38, 3-48	A3087A	1-1, 3-21, 3-35, 3-49, 3-64, 6-37
A1843A	1-3	A2440A	3-11, 3-20, 3-34, 3-48, 3-63, 3-73, 7-2	A3130AW	1-1, 3-11
A1845A	1-3	A2441A	3-20, 3-27, 3-34, 3-41, 3-48, 3-55, 3-63	A3131A	3-7
A1896A	4-1, 4-2, 4-3, 4-4, 4-5, 4-7, 4-9, 4-10, 5-14, 5-16, 6-35	A2442A	3-6, 3-11, 3-18, 3-20, 3-27, 3-34, 3-41, 3-48, 3-55, 3-63, 5-9	A3132A	3-10
A1897A	3-68, 3-75, 3-77, 3-80, 3-81, 3-83, 4-1, 4-2, 4-5, 4-8, 4-9, 4-10, 4-11, 4-12, 4-13, 4-14, 4-19, 4-21, 5-14, 5-16	A2443A	3-21, 3-35, 3-49, 3-64	A3133A	3-10
A1999A	6-44	A2444A	7-28	A3142A	7-2
A2230A	3-19, 3-28, 3-42	A2445A	3-21, 3-35, 3-49, 3-64	B	
A2230AZ	3-21	A2446A	3-21, 3-49, 3-64, 7-28	B1011C	7-40, 7-49, 7-51
A2231A	3-19, 3-28, 3-29, 3-42, 3-43, 3-56, 3-57	A2511A	3-19, 3-28, 3-42, 3-56	B1020-90001	7-67
A2231AZ	3-21, 3-35, 3-42, 3-49, 3-56, 3-64	A2511AZ	3-21, 3-35, 3-49, 3-56, 3-64	B1022A	7-40, 7-46, 7-51, 7-66, 7-67
A2232A	3-19, 3-28, 3-56	A2516A	3-19, 3-28, 3-42, 3-56	B1029B	7-40, 7-46, 7-51
A2232AZ	3-21, 3-35, 3-49, 3-56, 3-64	A2516AZ	3-21, 3-35, 3-49, 3-56, 3-64	B1030B	7-40, 7-51
A2233A	3-76, 3-84	A2554A	3-11	B10310	7-40
A2233AZ	3-73	A2570A	3-76, 3-84	B1031A	7-49
A2234A	3-76, 3-84	A2570AZ	3-73	B1031B	7-51
A2234AZ	3-73	A2902A	4-23	B1033A	7-40, 7-46, 7-51
A2241A	3-18, 3-27, 3-41, 3-55	A2937A	3-10	B1164-90003	7-64
A2242A	3-18	A2937AW	1-1, 1-2, 3-1, 3-11	B1165A	7-64
A2245A	7-28	A2938A	3-10	B1166A	7-64
A2293A	3-20, 3-34, 3-48, 3-63	A2938AW	1-1, 1-2, 3-1, 3-11	B1167A	7-64
A2306A	1-3, 4-23, 6-44	A2941A	1-1, 3-12, 3-34, 3-48, 3-63, 4-20	B1170A	7-76
A2307A	1-3, 4-23, 6-44	A2942A	1-1, 3-11, 6-35, 6-44	B1171-90024	7-76
A2311A	6-44	A2943A	3-10, 3-12	B1171-90026	7-76
A2311AZ	3-21, 3-35, 3-49, 3-64, 6-17	A2944A	1-1, 3-11, 6-17, 6-44	B1171-90027	7-76
A2312A	6-44	A2946A	3-7, 3-11	B1171-90028	7-76
A2319A	6-44	A2948A	3-7, 3-11	B1171-90029	7-76
A2320A	6-44	A2957AZ	5-14, 5-16	B1171-90032	7-76
A2321A	3-12, 3-21, 3-35, 3-49, 3-64, 3-74	A2958A	1-1, 3-11, 3-21, 3-35, 3-49, 3-64, 6-37	B1171-90033	7-76
A2339A	1-1, 3-73, 4-4	A2959AW	1-1, 1-2, 3-1, 3-11, 4-6, 4-8, 4-10	B1171-90034	7-76
A2362A	1-2, 3-52, 3-63	A2962AZ	3-12, 4-6, 4-8	B1171-90041	7-79
A2363A	1-2, 3-52, 3-63, 5-14	A2970A	1-2, 3-38, 3-48	B1171-90042	7-79
A2364A	1-2, 3-52, 3-63	A2971A	1-2, 3-24, 3-34	B1171-90055	7-76
A2365A	1-2, 3-52, 3-63	A2980A	1-2, 3-24, 3-34	B1171-90059	7-76
A2366A	1-2, 3-38, 3-48	A2981A	1-2, 3-38, 3-48	B1171-90060	7-76
A2367A	1-2, 3-15, 3-20, 3-21	A2982A	1-2, 3-52, 3-63	B1183A	7-64
A2368A	3-34, 3-48, 3-63	A2998A	1-1, 3-75, 3-76, 4-4, 4-6, 4-20	B1185A	7-64
A2369A	3-20	A3024A	1-1, 4-6, 6-4, 6-15, 6-18, 6-19, 6-44	B1189A	7-64
A2428A	1-2, 3-15, 3-20, 3-21, 4-6, 4-9, 4-10, 4-23			B1194-90001	7-66
A2428AW	4-23			B1194A	7-66
				B1195-90002	7-66
				B1637-90001	7-56
				B1696B	7-18
				B1697B	7-18
				B1716-90014	7-62, 7-63
				B1716-90015	7-62, 7-63
				B1716-90016	7-62, 7-63

Index (cont'd)

B1764-90005	7-72	B2459A	3-20, 3-34, 3-48, 3-63	B3109A	7-58
B1764B	7-72	B2470-90001	7-70	B3110-90008	7-58
B1766-90010	7-65	B2470A	7-70	B3110A	7-58
B1766B	7-65	B2482-90001	7-80	B3116A	7-13, 7-62, 7-63
B1864-90005	7-61	B2482-90002	7-80	B3124A	7-78
B1864-90009	7-53, 7-55	B2482-90003	7-80	B3125A	7-35
B1900-90020	7-70	B2482A	7-80	B3133A	7-7
B1900-90021	7-70	B2491A	7-2, 7-24, 7-26, 7-28, 7-29, 7-33, 7-66	B3134A	7-7
B1900-90022	7-70	B2497A	7-80	B3135A	7-7
B1900B	7-70	B2600A	7-73	B3136A	7-7
B1908B	7-68, 7-70	B2600B	7-18, 7-73	B3142A	7-9, 7-55
B1912AA	7-70	B2602AJ	7-73	B3143A	7-9, 7-55
B1921-90002	7-68	B2602B	7-18, 7-73	B3148A	7-13
B1921-90003	7-68	B2606A	7-59	B3160A	7-13
B1921-90004	7-68	B2606B	7-18	B3161A	7-13
B1921-90060	7-68	B2608A	7-59	B3162A	7-13
B1922A	7-68	B2608AJ	7-59	B3169A	7-61
B1923A	7-68	B2608B	7-18	B3171A	7-78
B1960AA	7-22, 7-70	B2608BJ	7-59	B3179A	7-70
B1961AA	7-22, 7-70	B2617A	7-73	B3187A	7-35, 7-36, 7-57
B1968AA	7-70	B2617B	7-18, 7-73	B3187A/88A	7-35
B2146-90001	7-68	B2619	7-73	B3188A	7-35, 7-36, 7-57
B2202A	7-7	B2619AJ	7-73	B3189A	7-35, 7-36, 7-57
B2206A	7-7	B2619B	7-18, 7-73	B3190/91A	7-57
B2210A	7-7	B2622A	7-64	B3190A	7-35, 7-36
B2214A	7-7	B2625A	7-64	B3191A	7-35, 7-36
B2280A	7-69	B2660-90002	7-61	B3192A	7-35, 7-36, 7-57
B2286A	7-69	B2660A	7-61	B3193A	7-35, 7-36, 7-57
B2290BZ	7-69	B2663A	7-71	B3385A	7-36
B2355-90024	7-61	B2678A	7-67	B3385AA	7-66
B2355-90025	7-61	B2679-90600	7-71	B3386A	7-36, 7-66
B2355-90026	7-54, 7-55, 7-71	B2680A	7-71	B3453AA	7-56
B2355-90044	7-53, 7-55, 7-61, 7-71	B2690-90001	7-73	B3453AB	7-56
B2402-90001	7-56	B2693A	7-73	B3455AA	7-56
B2402-90004	7-56	B2920A	7-36	B3455AB	7-56
B2404A	7-56	B2920A	7-36	B3467AB	7-72
B2404B	7-18	B2921A	7-36	B3468-90001	7-72
B2405A	7-2, 7-56	B2922A	7-36	B3480A	7-12
B2405B	7-18	B2923A	7-36	B3480B	7-54
B2408-90009	7-61	B2924A	7-36	B3492AA	7-13
B2408-90010	7-61	B2925A	7-36	B3494AA	7-37, 7-38, 7-60
B2409A	7-61	B2926A	7-36	B3495AA	7-37, 7-38, 7-60
B2409B	7-61	B2927A	7-35, 7-36	B3496AA	7-37, 7-38, 7-60
B2412A	7-2, 7-55	B2929A	7-36	B3498AA	7-37, 7-38, 7-60
B2415A	7-71	B2962A	7-54	B3499AA	7-37, 7-38, 7-60
B2433-90001	7-56	B2963A	7-54	B3501AA	7-37, 7-38, 7-60
B2433-90005	7-56	B2964A	7-13, 7-53	B3502AA	7-37, 7-38, 7-60
B2433-90009	7-56	B3016AA	7-36	B3538AA	7-13, 7-63
B2433-90011	7-56	B3100A	7-69	B3563BA	7-73
B2433-90013	7-56	B3108-60047	7-6	B3693AA	7-2, 7-61
B2433-90015	7-56	B3108-60070	7-6	B3701AA	7-2
B2433A	7-56	B3108-60071	7-6	B3711AA	7-36
B2433AA	7-2, 7-56	B3108-60072	7-6	B3767BB	7-15, 7-70
B2433AB	7-56	B3108-90005	7-66	B3768-90002	7-70
B2434A	7-56	B3108A	3-20, 3-34, 3-48, 3-63, 3-68, 3-73, 7-1, 7-4, 7-77	B3768BA	7-15
B2434AA	7-2, 7-56	B3108A/C/D	7-1	B3785AA	7-35, 7-36, 7-57
B2434AB	7-56	B3108C	3-68, 7-1, 7-4, 7-5, 7-77	B3786AA	7-35, 7-36, 7-57
B2435A	7-56	B3108D	7-1, 7-4, 7-77	B3787AA	7-37, 7-38, 7-60
B2435AA	7-2, 7-56	B3108L	3-5, 3-68, 5-14, 7-1, 7-2, 7-4, 7-5	B3788AA	7-37, 7-38
B2435AB	7-56	B3108M	3-5, 7-5	B3790AA	7-38, 7-60
B2447A	7-7			B3791AA	7-38, 7-60
B2449A	7-7			B3811AA	7-35

Index (cont'd)

B3817AA 7-36
 BELL103J 6-34
 BELL202T 6-34
 BELL212A 6-34

C

C1001A/G/W 6-43
 C1002A/G/W 6-43
 C1003A/G 6-43
 C1004A/G/W 6-43
 C1006A/G/W 6-24, 6-43
 C1007A/G/W 6-24, 6-43
 C1010C 6-43
 C1010J 5-17, 6-43
 C1010K 6-43
 C1010T 5-17, 6-43
 C1017A/G/W 6-24, 6-43
 C1064A/G/W 6-43
 C1064AZ 3-21, 3-35, 3-49, 3-64,
 3-73
 C1064GZ 3-21, 3-35, 3-49, 3-64,
 3-73
 C1064WZ 3-21, 3-35, 3-49, 3-64,
 3-73
 C1065A/G/W 6-43
 C1080A 3-21, 3-35, 3-49, 3-64
 C1080A/G/W 6-24, 6-43
 C1080G 3-21, 3-35, 3-49, 3-64
 C1080GX 3-12
 C1080W 3-21, 3-35, 3-49, 3-64
 C1080WX 3-12
 C1083W 3-21, 3-35, 3-49, 3-64,
 6-43
 C1084W 6-43
 C1085W 6-43
 C1200A 5-17, 6-20, 6-42
 C1202A 5-17, 6-20
 C1501A 6-44
 C1502A 6-44
 C1511A 6-16, 6-44
 C1512A 6-2, 6-15, 6-16, 6-44
 C1520A 6-2, 6-16
 C1520B 6-15, 6-44
 C1521B 6-15, 6-32, 6-44
 C152DS 6-32
 C1600A 6-38
 C1601A 6-38
 C1602A 6-20, 6-42
 C1620A 6-32, 6-38
 C1625A 6-32, 6-38
 C1627A 6-32, 6-38
 C1633A 6-32
 C1642A 6-32
 C1645A 6-42
 C1700A 5-2, 6-33
 C1700C 6-35
 C1700T 6-11, 6-35
 C1701A 6-11, 6-33, 6-35
 C1701C 6-11, 6-33, 6-35
 C1704A 6-33, 6-35
 C1704C 6-35

C1704T 6-11, 6-33, 6-35
 C1705A 3-87, 3-89, 6-11, 6-35
 C1705C 6-35
 C1705T 6-11, 6-33, 6-35
 C1708C 6-11, 6-33
 C1708T 6-11, 6-33, 6-35
 C1750A 3-87, 3-89
 C1828AZ 4-14
 C2001A 6-31, 6-42
 C2003A 6-42
 C2041RZ 4-8
 C2070A 4-14
 C2071S 6-20
 C2071T 6-20
 C2106A 6-20, 6-42
 C2114A 6-42
 C2121A 6-42
 C2200A 6-35
 C2201A 5-8, 6-9, 6-35, 7-28
 C2203A 6-35
 C2204A 5-8, 6-9, 6-35, 7-28
 C220XA 4-16, 5-8
 C2212A 5-2, 6-36
 C2213A 5-2, 6-36
 C221XA 4-16
 C2227A/B/C/D/
 E/F/G/H 5-18
 C2240HA 6-7
 C2240HZ 4-14
 C2247M1 2-6
 C2251A 2-9, 6-9
 C2251B 2-10
 C2252B 4-4, 4-23, 5-8, 6-8, 6-9
 C2252B/BZ 4-7, 6-36
 C2252BZ 3-75, 4-4
 C2252HA 2-10, 4-4, 4-23, 6-8, 6-9
 C2252HA/B 6-9, 6-32, 7-28
 C2252HA/HZ 4-7, 6-36
 C2252HZ 3-75, 4-4
 C2254B 2-9, 2-10, 4-4, 4-23, 5-8,
 6-8, 6-9
 C2254B/BZ 4-7, 6-36
 C2254BZ 3-75, 4-4
 C2254HA 2-6, 2-9, 2-10, 4-4, 4-23,
 5-8, 6-8, 6-9
 C2254HA/B 6-9, 6-32, 7-28
 C2254HA/HZ 4-7, 6-36
 C2254HZ 3-75, 4-4, 4-13
 C225XB 2-6
 C225XHA/B 5-8
 C2270A 6-22
 C2281A 6-36
 C2282A 6-36
 C2290A 6-36
 C2291A 6-36
 C2292A 6-16, 6-44
 C2293A 6-14
 C2293U 6-2, 6-44
 C2294A 6-36
 C2297AZ 4-6
 C2298AZ 4-6
 C2300A 6-43

C2301B 6-24
 C2303B 6-24
 C2304B 6-24
 C2305B 6-24
 C2354A 6-20, 6-41
 C2356A 6-20
 C2401A 5-17
 C2402A 5-17
 C2424A 5-6
 C2435A 7-29
 C2436/37/39/40HZ ... 3-80
 C2436HA 4-23, 5-4, 6-6, 6-7
 C2436HA/HZ 6-2, 6-37, 7-29
 C2436HZ 3-75, 4-3, 4-4, 4-7
 C2437/39/40HZ 1-1
 C2437HA 4-23, 5-4, 6-6, 6-7
 C2437HA/HZ 6-2, 6-37, 7-29
 C2437HZ 2-9, 3-75, 4-3, 4-4, 4-7
 C2438A 7-29
 C2439HA 4-23, 5-4, 6-6, 6-7
 C2439HA/HZ 6-2, 6-37, 7-29
 C2439HZ 2-9, 3-75, 4-3, 4-4, 4-7,
 4-8
 C2440HA 4-23, 5-4, 6-6
 C2440HA/HZ 6-2, 6-37, 7-29
 C2440HZ 2-9, 3-75, 4-3, 4-4, 4-12
 C2460F 6-36
 C2460F/R 6-2, 6-32, 7-28
 C2460R 6-5, 6-36
 C2461AZ 4-3
 C2461F 6-36
 C2461F/R 6-2, 6-32, 7-28
 C2461R 6-36
 C2462AZ 4-3
 C2462F 6-5, 6-36
 C2462F/R 6-2, 6-32, 7-28
 C2462HZ 4-13
 C2462R 4-3, 4-23, 6-5, 6-36
 C2463AZ 4-3, 4-9, 4-13
 C2463F 6-44
 C2463R 4-23, 6-44
 C2464AZ 4-3, 4-9, 4-10
 C2464F 6-44
 C2464F/R 6-2, 6-16
 C2464R 4-23, 6-4, 6-44
 C2464T/R 6-2, 6-32
 C2465F/R 6-16
 C2465R 4-6, 4-23, 6-4
 C2465T/R 6-2, 6-32
 C2466F 6-44
 C2466F/R 6-16
 C2466R 4-6, 4-23, 6-4, 6-44
 C2466T/R 6-2, 6-32
 C2467F 6-44
 C2467F/R 6-16
 C2467R 4-23, 6-4, 6-44
 C2467R/RZ 4-6
 C2467RZ 3-75, 4-3, 4-4, 4-12, 4-14
 C2467T/R 6-2, 6-32
 C2470S 6-36
 C2471S 6-36
 C2472F 6-5, 6-36

- C2472F/R 6-2
 C2472F/R/S 7-28
 C2472R 6-36
 C2472S 2-6, 6-36
 C2472SZ 3-35, 3-49
 C2473F 6-5, 6-36
 C2473F/R 6-2
 C2473F/R/S 7-28
 C2473R 6-36
 C2473S 2-6, 6-36
 C2474F 6-5, 6-36
 C2474F/R 6-2
 C2474F/R/S 7-28
 C2474R 2-9, 4-3, 6-5, 6-36
 C2474S 6-36
 C2474SZ 3-21, 3-64
 C2476F 6-5
 C2476F/R 6-2, 6-44
 C2476R 4-23, 6-5
 C2476S 6-44
 C2476SZ 3-21, 3-35, 3-49, 3-64
 C2477F 6-5
 C2477F/R 6-2, 6-16, 6-44
 C2477R 6-5
 C2477S 6-15, 6-44
 C2477SZ 3-11, 3-21, 3-35, 3-49,
 3-64
 C2477U 4-3, 6-3, 6-15, 6-16, 6-44
 C2478SZ 3-21, 3-35, 3-49, 3-64
 C2478U 4-12, 6-3, 6-15, 6-16,
 6-44
 C247x 2-7
 C2487SZ 3-11
 C2701A 6-29
 C2701B 6-31
 C2702A 6-29
 C2702B 6-31
 C2704A 6-29, 6-31
 C2705A 6-29, 6-31
 C2706A 6-29
 C2706B 6-31
 C2709A 6-29, 6-31
 C2710A 6-29
 C2710B 6-31
 C2711A 6-29, 6-31
 C2716A 6-29
 C2749A 6-29, 6-31
 C2750-90101 6-22
 C2753A 6-22, 6-42
 C2753B 6-22, 6-42
 C2754A 6-22, 6-42
 C2754B 6-22, 6-42
 C2755B 6-22
 C2756B 6-22
 C2758A 6-22
 C2760A 6-22
 C2761A 6-22
 C2762A 6-22
 C2763A 6-22
 C2768A 6-22
 C2769A 6-22
 C2772A 6-22, 6-42
 C2773A 6-22
 C2774A 6-22
 C2775A 6-22
 C2776A 6-22, 6-42
 C2777A 6-22
 C2779A 6-22
 C2785-63000 4-16
 C2785A 4-1, 4-2, 4-5, 4-7, 4-15,
 4-16, 4-17, 6-4
 C2786-63004 4-16
 C2786A 3-77, 4-1, 4-2, 4-5, 4-16,
 4-17, 5-8, 6-4, 7-33
 C2788A 4-7, 4-10, 4-16
 C2788AC 4-14
 C2790A 4-2, 4-6, 4-7, 4-10, 4-16
 C2791A 4-16
 C2792A 4-7, 4-16
 C2792AZ 5-14
 C2797A 4-6, 4-16, 4-23
 C2797AZ 3-20, 4-2, 4-9
 C27985A 4-3
 C2798A 4-6, 4-16, 4-23
 C2798AZ 3-34, 3-48, 3-63, 4-2,
 4-9, 5-14
 C2799A 4-7, 4-16, 4-18
 C279xA 5-10
 C2900A 5-6, 6-33
 C2911A 5-6
 C2925A 5-6
 C2926A 5-6
 C2962AZ 4-2
 C2963F/R 6-32
 C3010 2-6
 C3020T 6-3
 C3022R 4-6, 4-23, 6-4, 6-5, 6-36
 C3022T 6-3, 6-36
 C3022T/R 6-2, 6-5, 6-32
 C3022T/R/RZ 7-28
 C3023R 2-9, 2-10, 4-23, 6-3
 C3023R/RZ 4-6, 6-36
 C3023RZ 3-75, 4-3, 5-14
 C3023T 6-36
 C3023T/R 6-2, 6-32
 C3023T/R/RZ 7-28
 C3024R 4-23
 C3024R/RZ 4-6, 4-7, 6-36
 C3024R/T 6-3
 C3024RZ 3-75, 4-3, 4-9, 4-10,
 5-14, 7-33
 C3024T 6-36
 C3024T/R 6-2, 6-32
 C3024T/R/RZ 7-28
 C3025R 4-23
 C3025R/RZ 7-28
 C3025RZ 3-75, 4-3, 4-6, 4-7, 6-36,
 7-33
 C3027U 6-3, 6-37, 7-28
 C3028U 6-37, 7-28
 C302XR 6-4
 C302XT 6-4
 C3032R 6-4, 6-6
 C3032R/T 1-1, 6-37
 C3032T 6-3, 6-6
 C3032T/R 7-29
 C3035R 6-4, 6-6
 C3035R/T 1-1, 6-2, 6-37
 C3035T 6-3, 6-6
 C3035T/R 7-29
 C3036T 1-1, 6-2, 6-3, 6-37, 7-29
 C3036U 6-6
 C3037U 6-3, 6-6, 6-37, 7-29
 C303T/R 7-29
 C303xR/T 6-3
 C303XT 6-4
 C3040 6-3
 C3040R 4-23, 6-4
 C3040R/RZ 4-7
 C3040R/T 1-1
 C3040R/T/RZ 6-37
 C3040RZ 3-75, 4-3
 C3040T 6-3
 C3041R 4-23, 6-4
 C3041R/T 1-1, 6-3
 C3041R/T/RZ 6-37
 C3041RZ 3-75, 4-3, 4-4
 C3041T 6-3
 C3042R 4-10, 4-23
 C3042RZ 3-75, 4-3, 4-4, 6-37
 C3044U 6-3, 6-37
 C304XR 6-4
 C3086A 1-1
 C3226A 6-29, 6-31
 C3227A 6-29, 6-31
 C3228A 6-29, 6-31
 C3301A 6-36, 6-37
 C3401A 6-26
 C3402A 6-26
 C3403A 6-26
 C3404A 6-26
 C3405A 6-26
 C3406A 6-26
 C3407A 6-26
 C3410A 6-26, 6-27
 C3411A 6-26
 C3412A 6-26
 C3413A 6-26
 C3414A 6-26
 C3415A 6-26
 C3416A 6-26
 C3417A 6-26
 C3490A 6-27
 C3491A 6-27
 C3492A 6-27
 C3493A 6-27
 C3550R 6-4, 6-7
 C3550R/T 1-1, 6-2, 6-7, 6-37
 C3550T 6-3, 6-7
 C3551R 4-23, 6-4, 6-7
 C3551R/RZ 4-7
 C3551R/T 1-1, 5-3, 6-2, 6-7,
 6-37
 C3551RZ 3-75, 4-3
 C3551T 6-3
 C3553R 4-23, 6-7

Index (cont'd)

C3553R/RZ 4-7
C3553RZ 3-75, 4-3, 4-4, 5-3, 6-2,
6-37
C3553T 6-7
C3554U 6-3, 6-7, 6-37
C355xRT 6-3
C3560U 6-3

D

D-10200-C 7-67
D-11272-B 7-67
D-11273-B 7-67
D-11895-E 7-67
D-18355-B 7-67
D1704D 7-67
D1813A 7-40
D1824D 5-16
D2102-90001 7-53
D2102-90002 7-53
D2102B 7-53
D2103-90010 7-69
D2104-90005 7-53
D2104-90006 7-53
D2104-90007 7-53
D2104C 7-53
D2355A 5-11, 5-12, 5-16
D2500-90002 7-62, 7-63
D2500-90014 7-62, 7-63
D2502B 7-63
D2506-90002 7-75
D2506-90003 7-75
D2506-90009 7-75
D2506A 7-75
D3108M 7-7
D3538AA 7-63
DC 300XL/P 6-17
DC 600A 6-17
DC 6150 6-17
DC 6250 6-17
DC 6320 6-17
DC 6525 6-17
DC NFS-DFS 7-57
DC6525 6-17

E

E3660A 4-17
E3661A 4-17
E3664A 4-7
E4452A 4-16, 4-18
E4453A 4-16
E4456A 4-16, 4-18
E4457A 4-16
E4460A 4-17
E4462A 4-17
E4464A 4-16
E4465A 4-16
E4466A 4-16, 4-17
E4468A 4-16, 4-17
E4469A 4-17
E4470A 4-16

E4471A 4-16
E4472A 4-18

H

H5288-90001 7-72
H5288-90003 7-72
H5324A 7-72
H5677A 8-12
H5678A 8-12
H5682A 8-2, 8-10
H5897AA 8-12
HFBR-AWDxxx 5-7
HFDR-AWQXXX 6-32
HP2227A 5-17
HP2392A 5-17
HP2393A 5-17
HP2394A 5-17
HP2397A 5-17
HP2562A 5-17
HP2622A/23A/
24B/27A 5-17
HP2625A/24B 5-17
HP2684A/P 5-17
HP2932A 5-17
HP3081A 5-17
HP3082A/B 5-17
HP33440A/F 5-17

I

ISBN 0-201-
53992-6 7-56

J

J2000A 7-51
J2000B 7-40, 7-42
J2001A 7-51
J2001B 7-42
J2004A 7-42, 7-51
J2004B 7-42
J2006A 7-51
J2007A 7-51
J2007B 7-42
J2008A 7-51
J2009A 7-51
J2010A 7-51
J2011A 7-51
J2012A 7-51
J2017A 5-11, 7-51
J2030A 7-42
J2031A 7-42
J2032A 7-42
J2033A 7-42
J2060A 5-1, 5-12, 5-15
J2060AZ 4-3, 4-4, 4-7, 4-8, 5-14,
5-16
J2070A 4-14, 5-1, 5-12, 5-15
J2070AZ 1-1, 4-3, 4-4, 4-7, 4-9,
4-10, 5-14, 5-16
J2076A 5-15

J2077A 5-15
J2079A 5-15
J2080A 5-15
J2084A 5-10
J2084AZ 5-14
J2085A 5-15
J2087AZ 5-14
J2092A 3-30, 3-44, 3-58, 3-61,
3-72, 5-1, 5-9, 5-10
J2092AZ 3-12, 3-21, 3-35, 3-49,
3-64, 3-74
J2093A 3-30, 3-44, 3-58, 3-72,
5-1, 5-9, 5-10
J2094A 3-30, 3-44, 3-46, 3-47,
3-58, 3-61, 3-62, 3-72,
5-1, 5-9, 5-10
J2096A 3-30, 3-44, 3-58, 3-72,
5-1, 5-9, 5-10
J2096AZ 3-12, 3-21, 3-35, 3-49,
3-64, 3-74
J209XA 5-9, 6-23, 6-24
J2101A 7-40
J2102A 7-42
J2103A 7-43
J2104A 7-42, 7-45, 7-51
J2105A 7-40, 7-45, 7-51
J2108A 7-40, 7-43, 7-45, 7-51
J2109A 7-40, 7-43, 7-45, 7-51
J2120A 5-11, 5-12, 5-16, 7-51
J2122A 7-40, 7-50
J2123A 5-11, 5-16
J2146A 3-12, 3-21, 3-30, 3-35,
3-44, 3-49, 3-58, 3-64,
3-72, 3-74, 3-87, 3-89,
5-1, 7-40, 7-41, 7-51,
7-52
J2152A 7-40, 7-46, 7-51
J2153A 7-40, 7-46
J2157A 3-8, 3-30, 3-44, 3-58,
3-72, 5-1, 7-40, 7-41,
7-51, 7-52
J2166A 3-12, 3-21, 3-30, 3-35,
3-44, 3-49, 3-58, 3-64,
3-72, 3-74, 5-1, 7-40,
7-41, 7-47, 7-51, 7-52
J2220A 3-12, 3-30, 3-44, 3-58,
3-72, 5-1, 7-40, 7-43,
7-47, 7-51, 7-52, 7-60
J2221A 7-2, 7-40, 7-43, 7-47,
7-51
J2222A 7-2, 7-40, 7-43, 7-47,
7-51
J2223A 7-2, 7-40, 7-43, 7-47,
7-51, 7-60
J2224A 7-40, 7-43, 7-47, 7-51
J2237A 7-2, 7-40, 7-43, 7-45,
7-47, 7-49, 7-51, 7-60
J2240A 7-43, 7-49, 7-51
J2246A 7-40, 7-49, 7-51
J2250A 3-12, 3-21, 3-35, 3-49,
3-64, 3-74
J2256A 7-40, 7-43, 7-51

J2325AA 7-74
 J2382B 6-20
 J2391AA 3-12
 J2393AA 7-35, 7-57
 J2957AZ 4-3, 4-4

K

K2291 6-32, 6-33
 K2296 5-6, 6-32, 6-33
 K22967 6-33
 K2297 5-6, 6-32, 6-33

U

USR HST 6-34
 USR2400 6-34
 USR9600 6-34

Index by Product Name

1 Gbyte Quarter-Inch Cartridge Drive (QIC) 1-1
 1.1 Meter Cabinet 5-14
 1.44 Mbyte 3.5" MicroFloppy Disk Drive 1-1
 1.6 m Integrated Cabinet 3-77
 1.6 m Standalone Cabinet 3-77
 1.6 Meter Cabinet 5-14
 1.6 meter Integrated Cabinet 3-83
 10-Base-T LAN 5-12
 10BaseT 5-18
 128 MB Module 3-7
 16 MB Module 3-7
 2 Gbyte 3.5" Single-Ended SCSI Disk 1-1
 3.0 kVA UPS 3-80, 3-88, 4-19
 3.5" Disk Drive 1-1
 300 lpm Dot Matrix 6-42
 3480-Compatible Tape Drive 1-1
 6-Pen Graphics Plotter 6-38
 600 VA UPS 4-21
 64 MB Module 3-7
 7550 Plus 4 Color Desktop Plotter 6-38
 8 mm Tape Drive 1-1, 3-59, 3-60, 6-4, 6-14
 8 port MUX 3-8
 8-Pen Graphics Plotter 6-38
 8.X VUE 2.01 7-79
 8.x X 11 R4 User Environment Developers Kit 7-76
 802.3 Ethernet Controller 3-74
 802.3 LAN 3-26, 3-40, 3-44, 3-46, 3-54, 3-58, 3-72
 802.3 ThinLAN/9000 3-21, 3-49, 3-64, 3-74
 802.3/Ethernet 7-39
 802.5 LAN 3-44, 3-58
 802.5 Token Ring 3-21, 3-49, 3-64, 3-72, 7-39
 807S 1-3 to 1-8
 808S 1-3 to 1-8
 815S 1-3 to 1-8, 2-4
 817S 1-3 to 1-8
 822S 1-3 to 1-8, 2-4
 825S 1-3 to 1-8
 827S 1-3 to 1-8
 82863K 6-24
 832S 1-3 to 1-8
 835S/635S 1-3 to 1-8
 837S 1-3 to 1-8
 840S 1-3 to 1-8
 842S 1-3 to 1-8
 845S/645 1-4
 845S/645S 1-3 to 1-8
 847S 1-3 to 1-8
 850S 1-3 to 1-8
 852S 1-3 to 1-8
 855S 1-3 to 1-8
 857S 1-3 to 1-8
 860S 1-3 to 1-8
 865S 1-3 to 1-8
 867S 1-3 to 1-8

870S/100 1-3 to 1-8
 870S/200 1-3 to 1-8
 870S/300 1-3 to 1-8
 870S/400 1-3 to 1-8
 877S 1-3 to 1-8
 887S 1-3 to 1-8
 890 1-3 to 1-7, 3-77, 3-88
 890 Corporate Business Servers 1-5, 2-10
 890 Power Consumption 3-88
 890 processor boards 3-84
 890 to T500 Upgrades 3-84
 890 Upgrades 3-76
 890/1 1-8, 2-3
 890/2 1-8, 2-3
 890/3 1-8, 2-3
 890/4 1-8, 2-3
 890S 3-89
 897S 1-3 to 1-8
 8x7 5-9, 6-9
 9.x X 11 R5 User Environment Developers Kit 7-76

A

A0/E Rollfeed 6-38
 ACT 9000 7-51
 ACT Products 7-50
 ACT Server 7-51
 Adapter-to-Peripheral SCSI Cables 5-6
 AdvanceLink 7-53
 Agents 7-23
 ALLBASE/4GL 7-8, 7-53, 7-54
 ALLBASE/NET 7-8
 ALLBASE/Query 7-8, 7-13
 ALLBASE/REPLICATE 7-11, 7-12, 7-54
 ALLBASE/SQL 7-8, 7-9, 7-10, 7-13, 7-55
 ALLBASE/SQL Documentation 7-12
 ALLBASE/SQL V.G.0 7-9
 Analyzers 7-23
 ANIMATOR 7-17
 ANSI 6-11
 anti-tip ballast 4-2, 4-7, 4-15, 4-16
 Application Development Products 7-17, 7-18
 Application Development Tools 7-17
 Application Support 6-12
 Applied Computerized Telephony (ACT) 7-50
 Archival Management 6-13
 ARPA Extensions—Telnet/OLTP 5-16
 ARPA Services 7-45, 7-51
 ARPA Services/800 7-46
 Article reprints 9-2
 Asian Line Printer 6-42
 Asian WS Printer 6-42
 Async Exp Card 7-51
 Asynchronous Multiplexers 5-9, 6-23
 Asynchronous PAD 7-42, 7-44
 AW3 4-18
 AW5 4-18

- B**
- Backplane Upgrades 3-10
 - Backup Devices 6-18
 - ballasts 4-2, 4-7, 4-15, 4-16
 - boot-up device 6-1
 - Brochures 9-1
- C**
- C++ Compiler 7-2, 7-18, 7-56
 - C++ Developer 7-18
 - C++ Program 7-17
 - C++ SoftBench 7-18, 7-73
 - C/ANSI C 7-2, 7-55
 - Cabinet measurements 4-5
 - Cabinet Mounting 4-23
 - Cabinet power 4-5, 4-16
 - Cabinets 4-1 to 4-23
 - Cable 3-74, 6-31, 6-32
 - Cable lengths 3-78
 - Cable Pin-Outs 6-14
 - Cabling 6-25
 - Cabling and Racking 3-78
 - CD-ROM Software 7-5
 - CD-ROM 3-21, 3-30, 3-49, 3-57, 3-58, 3-64, 3-68, 3-69, 3-87, 6-14, 6-33
 - CD-ROM Drive 3-4, 3-46, 3-59, 3-60
 - Centronics Connected Printers 6-21
 - Chinese HP700/92A Keyboard 6-43
 - CIO SCSI Host Adapter 5-2
 - COBOL 7-56
 - COBOL Compiler 7-2
 - COBOL Developer 7-2
 - COBOL Runtime System 7-2
 - Collectors 7-23
 - Color-Pro Graphics Plotter 6-38
 - communications 7-49
 - communications devices 5-9
 - computer racks 5-16
 - connection accessory products 5-15
 - CONRAD 1-1, 2-13
 - console terminal 3-21
 - Console/Display Terminal
 - Interfacing 6-23
 - cord 3-76
 - Corporate Business Server 3-83
 - Corporate Bus. Server Model 890 3-88
 - Corporate Bus. Server Model T500 3-67
 - Corporate Business Servers 8-5
 - country/language option 6-27
 - CPU Upgrades 3-10
 - Custom Configurations 7-2
 - Customer Support Services 8-1 to 8-12
- D**
- "Daisy-chain" cables 3-78
 - DAT 3-59, 3-60
 - DAT drives 3-61, 6-61
 - DAT storage 3-75, 6-16
 - DAT/DDS 3-64, 6-14, 6-15, 6-16, 7-6
 - Data Terminal Connects 4-7
 - Database 7-8, 7-13
 - DATAComm Devices 6-34
 - DataPair/800 7-28, 7-29
 - DB-25 connector 3-81, 5-9
 - DB-9 connector 3-81
 - DCE 7-35, 7-36, 7-57
 - Default Configurations 7-2
 - DeskJet 500 Printer 6-42
 - DeskJet 500C Printer 6-42
 - DeskJet Plus Printer 6-39
 - Direct Connect (RS232C) 5-10
 - Direct Distribution Panel (DDP)
 - and Cable 3-6
 - Disk Devices 3-87
 - Disk Drives 6-32, 6-35 to 6-37
 - Disk Support 7-28
 - DISKBENCH3 2-6
 - DISKBENCH4 2-6
 - Disks (disk storage systems) 6-1
 - Display Terminals 6-24, 6-43
 - Document Manager 7-58
 - Dot Matrix Line Printer 6-41
 - Dot-Matrix Serial Impact Printers 6-20
 - DTC (Datacommunication and Terminal Controller) 3-87, 3-89, 5-11
 - DTC 16TN 5-1, 5-11, 5-12, 5-14, 5-15, 5-16, 5-17, 5-18
 - DTC 64 port bundle (RJ-45) 5-14, 5-16
 - DTC72MX 1-1, 5-1, 5-11 to 5-18
 - DTC Connections 3-87, 3-89
 - DTC Devices and Cabling 5-17, 5-18
 - Dual Bus-Converters 3-69, 3-71, 3-80, 3-82, 3-86 to 3-89, 4-11
 - Dual Processor Board 3-86
 - Dual Upper-Bus Converter card 3-78
- E**
- E Class Business Server ... 1-1, 3-3, 3-4, 3-11
 - E25 1-2, 1-4, 1-5, 1-6, 1-7, 1-8, 2-3, 3-1, 3-2, 3-10
 - E25/E35/E45 3-1, 3-3, 3-7, 3-11, 3-14
 - RS-232 3-6
 - Upgrades 3-10
 - E35 1-1, 1-2, 1-4, 1-5, 1-6, 1-7, 1-8, 2-3, 3-1, 3-2, 3-10
 - E45 1-1, 1-2, 1-4, 1-5, 1-6, 1-7, 1-8, 2-3, 3-1, 3-2, 3-10
 - ECC memory 3-49, 3-64, 3-67, 3-76, 3-84
 - ECMA 6-11
 - EIA Units 3-77
 - Emerald systems 8-12
 - Encapsulator 7-18, 7-59
 - Encina 7-37
 - Encina/9000 7-37, 7-38, 7-60
 - Ethernet AUI Connector 3-7
 - EtherTwist 3-7, 3-72, 5-18, 7-41
 - European power options 4-15
 - Exabyte 8mm tape drives 6-18
 - Expansion Cabinet Installation/
 - Configuration Guide 3-83
 - Expansion Cabinets and Peripherals ... 3-77
 - Expansion Kits 6-3
 - Expansion Modules 3-78, 4-7
 - Expansion Rack 3-75
 - Extender cables 3-78
 - extension cable 3-74
 - External Single-Ended SCSI-2 Connector 2-12
- F**
- F Class Business Servers 3-21
 - F/W adapter 6-7
 - F/W SCSI 3-83
 - F/W SCSI Cables 5-6
 - F10 1-2, 1-4, 1-5, 1-6, 1-7, 1-8, 2-3, 2-6, 3-15, 3-16
 - F10/F20/F30
 - Integrated Business Servers 3-15
 - Memory Array 3-19
 - Product Summary 3-20, 3-21
 - F20 1-2, 1-4, 1-5, 1-6, 1-7, 1-8, 2-3, 2-6, 3-15, 3-16
 - F30 1-2, 1-4, 1-5, 1-6, 1-7, 1-8, 2-3, 2-6, 3-15, 3-16
 - fan 4-15, 4-17
 - Fast/Wide Differential SCSI-2 1-1, 2-5, 2-6, 3-8, 3-21, 3-44, 3-58, 3-64, 3-72, 3-74, 3-87, 3-88, 3-89, 5-3, 6-2
 - Disk Arrays 1-1, 3-78, 3-87, 3-89, 4-4, 4-23, 5-4, 5-5, 6-6
 - Disk Drive 3-78, 3-83, 4-4, 6-6
 - Independent Mode Array 3-87, 3-89
 - Connections 3-78
 - Optiors 4-7
 - HP-PB I/O Card 1-1
 - Fbackup/Frecover 6-13
 - FDDI 3-8, 3-44, 3-46, 3-58, 3-72, 3-87, 3-89, 5-1, 7-39, 7-41, 7-51, 7-52
 - Fiber-Optic SCSI Extender 3-79, 5-7
 - Fiber-Optic Transceiver 7-41
 - Floppy Disk Drive 6-14
 - Fonts 6-22
 - FORTTRAN 7-61
 - FTAM 7-46, 7-51
- G**
- G Class Business Servers 3-34
 - G30 1-2, 1-4, 1-5, 1-6, 1-7, 1-8, 2-3, 2-6, 3-24, 3-25
 - G30/G40/G50 3-24
 - Memory Extender Board Layout 3-28
 - Configuration Guidelines 3-28, 3-29
 - G40 1-2, 1-4, 1-5, 1-6, 1-7, 1-8, 2-3, 2-6, 3-24, 3-25

G50 1-2, 1-4, 1-5, 1-6, 1-7, 1-8,
2-3, 2-6, 3-24, 3-25
G60 1-2, 1-4, 1-5, 1-6, 1-7, 1-8,
2-3, 2-6, 3-24, 3-25
G70 1-2, 1-4, 1-5, 1-6, 1-7, 1-8,
2-3, 2-6, 3-24, 3-25
GlancePlus 7-2, 7-21, 7-23, 7-61
GlancePlus Pak 7-2, 7-22
Graphics Enhancement Cartridge 6-38

H

H Class Business Servers 3-38
H20 1-2, 1-4, 1-5, 1-6, 1-7, 1-8,
2-3, 2-6, 3-38, 3-39
H20/H30/H40/H50/H60/H70
 Business Server Layout 3-40
 Integrated Business Server 3-38
 Memory and I/O Configuration 3-42
 Memory Extender Board Layout 3-42
 Product Summary 3-48
H30 1-2, 1-4, 1-5, 1-6, 1-7, 1-8,
2-3, 2-6, 3-38, 3-39
H40 1-2, 1-4, 1-5, 1-6, 1-7, 1-8,
2-3, 2-6, 3-38, 3-39
H50 1-2, 1-4, 1-5, 1-6, 1-7, 1-8,
2-3, 2-6, 3-38, 3-39
H60 1-2, 1-4, 1-5, 1-6, 1-7, 1-8,
2-3, 2-6, 3-38, 3-39
H70 1-2, 1-4, 1-5, 1-6, 1-7, 1-8,
2-3, 2-6, 3-38, 3-39
Hardware Support 8-7
HiComp HIBACK/HIBARS 6-13
High-Performance CD-ROM Drive 1-1
Host System Backup 6-13
HP 3000 Telnet Access Board 5-15
HP 5000 6-42
HP 5000 Model printers 6-21, 6-22
HP 5000 Paper Specifications Guide ... 6-22
HP 700/60 Ergonomic terminals 3-21,
3-49, 3-64
HP 700/96 console terminal 3-49, 3-64
HP 700/RX X Stations 6-29
HP 9000 Series 800 Gateway 7-48
HP 9000 Series 800 High Avail. Computing
 Products Tech. Data Sheet 7-27
HP 9000 Series 800 Price Guide 7-18
HP Assist Installation Utility 6-25
HP Disk Arrays 6-8
HP DTC Manager 5-11
HP DTC Manager/UX 5-11, 5-16
HP ENVIZEX stations 6-30
HP EtherTwist 5-12
HP FIRST 9-3
HP ISDN Link/S700 7-43
HP JetDirect Interface 6-20
HP LaserJet 4 printer 6-21
HP LaserJet printer 6-21
HP LaserJet Series III printer 6-21
HP Model 45 Plus 7-48
HP Model 45 X.25 7-48

HP OmniBack 6-13, 6-18, 6-19
HP OmniBack/Turbo 6-13
HP OpenView 5-11, 5-12, 5-16
HP PowerTrust 600 VA UPS 3-20, 3-34
HP PowerTrust Uninterruptible
 Power Systems (UPS) 3-68, 3-74, 3-75,
3-76, 3-80, 3-81, 3-82,
3-83, 3-84, 3-88, 4-6,
4-19, 4-20
HP PowerTrust UPS Options 4-4
HP Rewritable optical disk 6-11
HP SwitchOver/UX 3-77
HP VUE Utility 7-36
HP Windows Client 6-25, 6-26
HP-PB 5-1, 6-8
HP-UX 8.02 3-17, 3-26, 3-40, 3-54
HP-UX 9.0 media and documentation 7-6
HP-UX OS 3-77
HP-FL 2-6, 3-49, 3-64, 3-72, 3-74,
3-78, 3-79, 3-83, 3-87, 3-89,
5-1, 5-5, 5-7, 6-8
HP-FL cables 3-79
HP-FL connections 3-79
HP-FL Disk Arrays 2-9, 3-75, 3-89, 4-7,
4-23, 6-8, 6-9
HP-FL Disk Options 4-4
HP-FL Disk Storage 6-8
HP-FL Disks 6-9
HP-FL Disks and Disk Arrays 5-8
HP-FL HA Arrays 3-87, 3-89
HP-FL Independent Mode 3-89
HP-FL Independent Mode Arrays .. 2-8, 3-87
HP-FL SwitchOver/UX 7-34
HP-IB 3-21, 3-44, 3-49, 3-58,
3-64, 3-87, 3-89
HP-IB Disk Memory Connections 6-10
HP-IB Disk Storage 6-10
HP-IB Interface 1-5, 3-72
HP-IB tape drives 1-5
HP-PB 3-69, 3-74, 5-1, 5-9
HP-PB Asynchronous Multiplexers 5-10
HP-PB Card Cage 2-8, 2-9
HP-PB Expansion I/O Card Cage 3-87
HP-PB Expansion Modules . 3-72, 3-78, 4-11
HP-PB FL 3-1, 3-15, 3-44, 3-52,
3-58, 3-61
HP-PB I/O Card Cages 3-70, 3-71,
3-72, 3-86, 3-87, 3-89
HP-PB I/O Expansion Modules 3-80, 3-88
HP-PB I/O Slots 3-87, 3-89
HP-PB Link 3-86
HP-PB SCSI interface 6-21
HP-PB Single-Ended SCSI/Parallel
 Adapter 5-2
HP-PB slot upgrade 3-12
HP-Precision Bus 3-67
HP-Precision Bus Interfaces 5-1
HP-TV 9-3
HP-UX 3-68, 3-75, 3-80, 6-11
HP-UX 10.0 1-2, 1-3, 2-3, 3-15
HP-UX 2-user license 7-2

HP-UX 8.0 5-2, 5-9, 7-1
HP-UX 8.02 1-4, 3-21, 3-34, 3-49,
3-64, 5-1, 7-1
HP-UX 8.06 7-1
HP-UX 9.0 2-6, 3-68, 3-83,
5-1, 5-2, 6-8, 6-21, 7-1
HP-UX 9.04 3-11, 3-34, 3-49, 3-64,
6-6, 6-7, 6-11, 6-18, 7-1,
7-4, 7-28, 7-77
HP-UX 9.0x 1-4, 3-21
HP-UX Documentation 7-5
HP-UX License Product 7-2, 7-5
HP-UX media 3-11, 3-68, 3-83
HP-UX Operating System 3-4, 3-11, 3-20
HP-UX Release 6-8
HP-UX Revisions 7-6
HP-UX Swap Space 6-1
HP-UX Symbolic Debugger 7-17
HP-UX User License Upgrade 3-68
HP-UX User License Upgrades and
 Backup Media and Documentation 3-5
HP-UX User Upgrade Credit 7-4
HP-UX Version 9.04 Documentation 7-7
HP150-II Terminal 6-43
HP700/22 Terminal 6-43
HP700/22/32/43/45 5-17
HP700/32 Terminal 6-43
HP700/41 Terminal 6-43
HP700/43 Terminal 6-43
HP700/44 Terminal 6-43
HP700/60 Terminal 6-43
HP700/92 Terminal 6-43
HP700/92/94/96/98 5-17
HP700/94 Terminal 6-43
HP700/96 Terminal 6-43
HP700/98 Terminal 6-43
HP7600 Series Model 250 6-38
HP7600 Series Model 255 6-38
HP7600 Series/240D 6-38
HP7600 Series/240E 6-38
HP7600 Series/355 Electrostatic 6-38
HPDesk Hotline 9-3

I

I Class Business Servers 3-64
I/O Card Cage 3-69
I-305 9-1
I/O and networking cards 3-12
I/O cards 3-30, 3-44, 3-58, 3-60,
3-72, 3-87, 3-89
I/O Expansion 4-4
I/O Interfaces 5-1 to 5-18
I30 1-2, 1-4, 1-5, 1-6, 1-7, 1-8,
2-3, 2-6, 3-52, 3-53
I30/I40/I50/I60/I70 3-54
 Configuration Guidelines 3-56, 3-57
 Integrated Business Servers 3-52
 Product Summary 3-63
I40 1-2, 1-4, 1-5, 1-6, 1-7, 1-8,
2-3, 2-6, 3-52, 3-53



150 1-2, 1-4, 1-5, 1-6, 1-7, 1-8,
2-3, 2-6, 3-52, 3-53
160 1-2, 1-4, 1-5, 1-6, 1-7, 1-8,
2-3, 2-6, 3-52, 3-53
170 1-2, 1-4, 1-5, 1-6, 1-7, 1-8,
2-3, 2-6, 3-52, 3-53
IBM Wide-Area Communication 7-48
IMAGE/SQL 7-8
independent mode 6-8
Industrial Line Impact Printer 6-39
Industrial Terminal 6-43
Information Access 7-62, 7-63
Inkjet Printers 6-20
Instant Ignition 1-1, 3-4, 3-11, 7-2, 7-3
Integrated Cabinet 4-2, 4-3, 4-4
Interface Architect 7-64
Interface cables 3-78, 5-9
Interfaces 5-1 to 5-18
Internal disk drives 3-11, 3-54
Internal peripherals 3-30, 3-44, 3-58, 3-60
Internal removable media drives 3-11
Interviews Plus 7-64
ISDN 7-45, 7-51
ISO 6-11

J

Japanese HP700/92A Keyboard 6-43

K

Korean HP700/92A Keyboard Kit 6-43

L

LAN (802.3) 3-87, 3-89
LAN Cabling 6-26
LAN card 3-72
LAN Link 5-1, 6-29, 7-41, 7-52
LAN Manager 7-43, 7-49, 7-51
LAN Manager/X 7-49
LAN Multifunction I/O Card 3-18, 3-27,
3-41, 3-55
LAN Personality Card 7-52
LAN/9000 3-74, 7-41, 7-51
LAN/Console 3-72
LAN/SCSI 3-30, 3-46, 3-59, 3-60
language options 6-27
Laser Printers 6-20
Laser RX/UX 7-65
LaserJet 2000 Printer 6-41
LaserJet 4 6-42
LaserJet 500+ 6-41
LaserJet IID Dual Tray 6-41
LaserJet IIID Printer Dual 6-41
LaserJet IIISi 6-42
LaserJet IIP 4 ppm Laser 6-41
LaserJet Printer 6-41
LaserJet Series II 6-41
LaserRX /RXForecast 7-22
Line Impact Printers 6-21, 6-40

Link/S700 7-43
Literature Distribution Center (LDC) 9-3
Logical Volume Manager (LVM) 3-83

M

Magnetic Tape Drive 6-14, 7-6
Mainframe Communications 7-48
Mass Storage 6-1
MAU 3-72
Memory Extender/Carrier Board 3-17,
3-19, 3-26, 3-40, 3-54
Memory Modules 1-4, 3-11, 3-28, 3-56
Mini-Tower SCSI Storage Systems 6-3
MirrorDisk/UX 7-2, 7-24, 7-28, 7-29,
7-33, 7-66
MMS 802.3 7-51
MMS/9000 7-46
Mode Array 3-89
Model 20LT 6-11, 6-12
Model 425SX 6-26
Model 433SX 6-26
Model 890 3-67
Model 8x7S 3-69
Modem Connect (RS232-C) 5-10
Modem Distribution Panel (MDP)
and Cable 3-6
Monitors 7-23
Mounting Hardware 4-6, 4-7
MPE/iX 7-8
MPower Server 7-66
Multifunction I/O card 1-5, 1-6, 2-11,
2-12, 3-30, 3-44, 3-58, 3-60
Multiplexers 5-9
MUX 3-44, 3-46, 3-58, 3-61,
3-72, 3-81, 3-87, 3-89, 5-9
MUX Connections 3-87, 3-89
MUX Multifunction I/O Card 3-18, 3-27,
3-41, 3-55
MUX/SCSI 3-30, 3-59, 3-60, 3-61

N

NCS 7-46
NCS/NIDL 7-51, 7-67
Net LS/LSLOCK 7-67
NetArchive 6-13
NetWare 7-51
Network File System Services/800 7-49
Network Links 3-89
Network Support 8-9
Networking 7-39
Networking Communications
Specification Guide 5-11
Networking Interfaces 5-1
Networking Products 7-51, 7-52
NewWave 7-67
NFS 7-51
NLI/O Software for Series 800 7-7
Novell NetWare 7-43, 7-49, 7-51
NS/9000 7-51

O

OmniBack 7-20, 7-68
OmniBack and OmniBack/Turbo 7-19
OmniBack/Turbo 2-4, 3-8, 3-9,
6-18, 6-19, 7-20, 7-68
OmniBack/Link 7-20
OpenMail 7-69
OpenODB 7-14, 7-15, 7-16, 7-70
OpenSpool 7-21, 7-70
OpenSpool/Link 7-20, 7-21
OpenSpool/SharedPrint 7-20, 7-21
OpenView DTC Manager 7-51
OpenView OmniBack 7-19
OpenView Switch PAD Manager 7-51
Operations Center 7-70
Optical Disk Library 5-2
Optical Drives 6-11
Optical Libraries 3-79, 3-87, 6-12
OSI Products 7-46
OTS/9000 (OSI) 7-45, 7-51

P

PA-RISC 3-67
PaintJet Color Graphics 6-42
PaintJet XL300 6-42
Parallel Centronics I/F 3-3, 3-17, 3-26,
3-40, 3-54
Pascal 7-71
Passwd Etc 7-71
PBA-FL 3-1, 3-15, 3-44, 3-52, 3-58, 5-1
PBus cables 5-8
PC ARPA 7-49, 7-51
PCL 6-21
Performance Collection Software 7-71
PerfRX 7-21, 7-22, 7-23
PerfRX Analysis 7-72
PerfView 7-22, 7-23, 7-72
PerfView Analyzer 7-23
Peripheral Interfaces 5-1
Peripheral-to-Peripheral SCSI Cables 5-6
Peripherals 6-1 to 6-44
personality card 3-20, 3-34
Personalized Sys. Support 8-2, 8-10, 8-11
Plotters 6-32, 6-38
Poster 9-2
power 3-75, 3-76
power cord 4-16, 4-18, 4-21
Power Distribution Strip 3-84
power distribution unit (PDU) 3-80,
4-16, 4-18
power failure 6-8
Power Protection 3-75
powerfail battery backup 3-20, 3-34,
3-80, 3-84
Powerfail Recovery Support 5-3
PowerTools 1-1, 9-3
PowerTrust Rackmount Guide 3-83

PowerTrust Uninterruptible Power Systems 1-1, 3-68, 3-74, 3-75, 3-76, 3-80, 3-81, 3-82, 3-83, 3-84, 3-88, 4-6, 4-19, 4-20

Pre-loaded software 7-2

Premier Account Support 8-12

Presentation tools 9-1

Price and configuration guides 9-1

Printer Fonts 6-22

Printers 6-20, 6-31, 6-39 to 6-42

Processor board upgrades 3-84

Processor/Memory Bus (PMB)
 Card Cage 3-70

Processors 3-71

Q

Q Cable 7-51

QIC 6-14

QIC drive 3-64

QIC media 6-17

QIC tape 7-6

QIC tape drive 3-46, 3-59, 3-60, 3-61

QIC1000 drives 6-17

Quarter-Inch Cartridge (QIC1000) 6-17

QuietJet Plus Printer 6-39

QuietJet Printer 6-39

R

Rack Front Doors 4-17

Rack Tie-Together Kit 4-17

Racking 4-1 to 4-23

Rackmount kit 3-12, 3-20, 3-34, 4-6, 4-16, 4-18

Rackmount SCSI Storage System 6-4

Rackmounting Hardware 4-7

RAID 3-67, 3-87, 6-6, 6-7

RAID 3 Array 2-9, 3-75, 3-88, 6-8

RAID 5 Array 2-9, 3-83, 3-88

Receptable types 4-16, 4-18

REPLICATE 7-11, 7-12, 7-54

reprints, article 9-2

Rewritable Optical Disk Libraries
 and Drives 6-11, 6-33

Roll Feed Drafting Plotter 6-38

Root Volume Configuration 7-2

RS-232 ports 3-4, 3-11, 3-74, 3-81, 5-18

RS-232 direct connect MUX 3-21, 3-30, 3-44, 3-49, 3-58, 3-64

RS-232 terminals 6-25

RS-232-C 3-74, 5-1, 5-9

RS-423 5-1, 5-9

RS-423 direct connect MUX 3-44, 3-58

RuggedWriter 480 Printer 6-39

RX Forecast 7-72

S

S-1665 9-1

Sales and product guides 9-1

Sales Tools and Guides 9-1

SCSI 2-6, 3-87, 3-89

SCSI Cables 6-33

SCSI Disk Array 3-75

SCSI Disk Configuration 3-79

SCSI Extender 3-79, 5-6

SCSI Interface Cards 1-5, 3-44, 3-58, 3-70, 3-72, 3-77, 3-78

SCSI MirrorDisk/UX 7-30

SCSI Printers 3-77

SCSI Storage System 3-75

SCSI SwitchOver/UX 7-31

SCSI Tape Drives 3-77, 6-15

Series 6000 3-78, 6-5

Series 6000 SCSI Storage System 4-23

Series 800 Peripherals 6-31

Series 800 Plotters 6-38

Series 800 Printers 6-39 to 6-42

Series 800 Supported Disk Drive 6-35, 6-36, 6-37

Series 800 Tape Drive and CD-ROM 6-44

Series 800 Terminals 6-43

SIMM 3-7

Simplified Chinese HP700/92A
 Keyboard 6-43

Single-Ended SCSI-2 1-1, 2-5, 2-6, 2-11, 2-12, 3-3, 3-17, 3-21, 3-26, 3-40, 3-46, 3-54, 3-78, 3-83, 3-87, 4-6, 5-1 to 5-6, 6-2

Single-Ended Half-Height SCSI Disk
 Options 4-4

Single-Ended SCSI Interface
 Connections 3-78

Single-Ended SCSI-2 Cables 2-11, 2-12, 6-33

SNA 3-44, 3-58

SNAPLUS 3179G 7-51

SNAPLUS 7-43

SNAPLUS Link 3-72, 3-87, 3-89, 5-1, 7-51, 7-52

SNAPLUS product line 7-47

SNAPLUS RJE 7-2, 7-51

SNAPLUS3270 7-2, 7-51

SNAPLUSAPI 7-2, 7-51

Snooping Bus 3-86

SoftBench 7-17, 7-18, 7-73

SoftBench Link/1000 Encapsulation 7-73

Software 7-1 to 7-80

Software Assistance 8-8

Software Distributor 7-74

Software Installation and Backup 6-14

Software Integration Products 7-73, 7-74

Software License 8-8

Software Vendor 7-75

Special Configuration 7-2

SPUs 4-23

SSP 3-84

Standalone Cabinets 4-2, 4-16

Standalone SCSI Disk Storage
 Systems 6-5

StorageTek Models 4220/4280 1-1

Streams 7-43

Streams/UX 7-2, 7-43, 7-49, 7-51

Structured Solution Product ... 1-2, 3-1, 3-15

Support 8-1 to 8-12

Support Bus 3-86

Support Options 8-2

SwitchOver "V-Cables" 3-78

SwitchOver/UX 3-79, 7-2, 7-25, 7-28, 7-29, 7-32, 7-33, 7-75

SwitchOver/UX Manual 7-27

Symbolic Debugger/HP-UX 7-17

System Console Terminal 3-12

System Support Options 8-2, 8-3, 8-5, 8-6

System Support Solutions 8-7

System Upgrade and Installation
 Guide 3-83

Systems Management Solutions 7-19

T

T500 1-4, 1-5, 1-6, 1-7, 3-67, 3-69, 3-70, 3-77, 3-80, 3-81, 3-82, 3-87, 4-11, 8-5

T500 Configuration 3-68

T500 Corporate Business Server 1-1

T500 Installation Guide 3-83

T500 Memory 3-70

T500 Operator's Guide 3-83

T500 Ordering 3-83

T500 processor boards 3-84

T500 Product Summary 3-73, 3-74, 3-76

T500 SPU 1-1

T500 Upgrade SSP 3-76, 3-84

T500/1-CPU 1-2, 1-8, 2-3

T500/10-CPU 1-2, 2-3

T500/11-CPU 1-2, 2-3

T500/12-CPU 1-2, 1-8, 2-3

T500/2-CPU 1-2, 1-8, 2-3

T500/3-CPU 1-2, 2-3

T500/4-CPU 1-2, 1-8, 2-3

T500/5-CPU 1-2, 2-3

T500/6-CPU 1-2, 2-3

T500/7-CPU 1-2, 2-3

T500/8-CPU 1-2, 1-8, 2-3

T500/9-CPU 1-2, 2-3

Tape Drives 3-87, 3-89, 6-14

Tape Drives/DAT 6-32

TCP/IP 6-20, 7-45, 7-46

Technical data sheets 9-1

Teletbit 6-34

Telnet/OLTP 5-11

Terminal Cable Selection 6-25

Index (cont'd)

Terminal Connections 3-87, 3-89
Terminals 6-23, 6-31
ThickLAN 5-18, 7-41
ThickLAN MAU 5-18
ThinkJet Printer 6-39
ThinLAN 3-72, 5-18
ThinLAN cable 3-70
ThinLAN cabling 6-28
Third-Party Network Backup 6-13
Token Ring 3-74, 5-1, 7-41, 7-51, 7-52
Token Ring (802.5) 3-87, 3-89
Traditional Chinese HP700/92A
 Keyboard 6-43
Trailblazer V.32 6-34
Transceivers 7-41

U

Unattended Network Backup 6-13
Uninterruptible Power Supply 2-7, 3-12,
 4-1 to 4-23
UNIX version 2.2 7-43

V

Vectra ES/12 Model 20 SPU 6-43
Verity TOPIC 7-78
Videotapes 9-1

W

WAN Links 7-42, 7-43
Windows Client 6-26
WorkRouter 7-80
Workstation Terminal 6-43

X

X stations 2-7, 6-29
X terminal 2-7
X Terminal Clients 7-16
X Windows 2-7, 7-16, 7-36
X.25 3-44, 3-49, 3-58, 3-64,
 3-72, 3-74, 3-87, 3-89,
 5-15, 7-39, 7-48, 7-51
X.25 Communications 7-43
X.25 Concentrator 7-51
X.25 Link 3-21, 5-1, 7-52
X.25 Multiprotocol Access Products ... 7-44
X.25 Products 7-42
X.25 Switches and PADs 5-11
X.25/9000 7-51
X.400/9000 7-46
X.400/9000 7-51
X.500 Client/Server 7-46, 7-51
X/Windows 2-4
XWindow Graphic Terminal (700/X) ... 6-43

