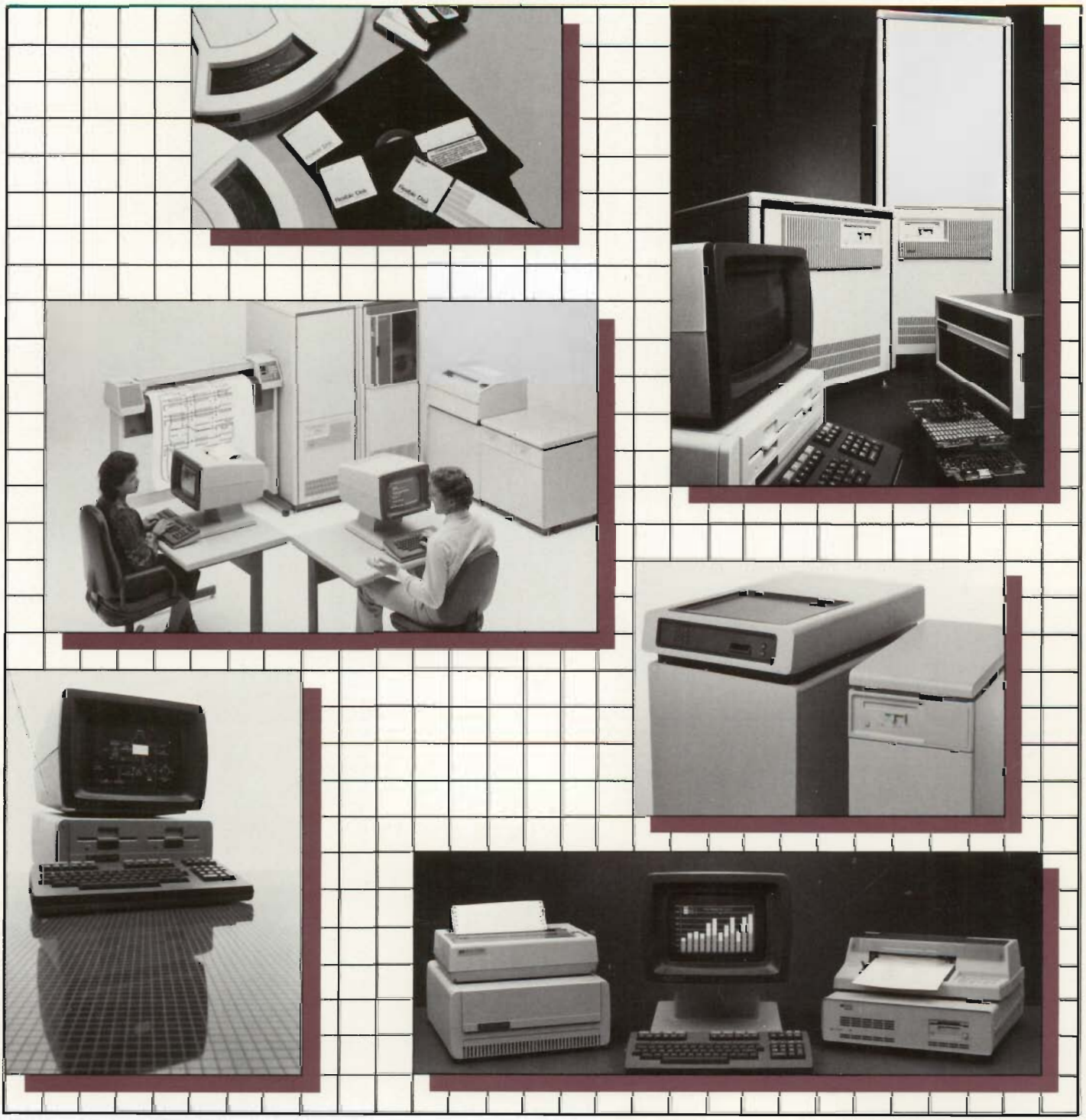
HP 1000
System Designers Guide

HEWLETT PACKARD



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HP 1000

System Designer's Guide

HEWLETT PACKARD

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Data Systems Division
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Cupertino, California 95014

MANUAL PART NO. 92007-90001
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Printing History

The Printing History below identifies the Edition of this Manual and any Updates that are included. Periodically, Update packages are distributed which contain replacement pages to be merged into the manual, including an updated copy of this Printing History page. Also, the update may contain write-in instructions.

Each reprinting of this manual will incorporate all past Updates, however, no new information will be added. Thus, the reprinted copy will be identical in content to prior printings of the same edition with its user-inserted update information. New editions of this manual will contain new information, as well as all Updates.

To determine what software manual edition and update is compatible with your current software revision code, refer to the appropriate Software Numbering Catalog, Software Product Catalog, or Diagnostic Configurator Manual.

First Edition ..... Jun 1983
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List of Effective Pages

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i	August 1984
ii	November 1983
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Product Number Index

Introduction

This System Designer's Guide provides instructions and reference information to help Hewlett-Packard Sales Reps, Systems Engineers, and selected HP customers, with configuration of HP 1000 Computer Systems for a variety of applications. Prices and maintenance prices, not included in this guide, are provided in the current HP 1000 Computational Products Ordering Information booklet.

Start your design with this overview section

The remaining pages of this overview section consist of two tables that provide an overview and basis for selection of the performance levels, packaging levels, operating systems, peripherals, and additional software subsystems that are available in HP 1000 Systems. Page references in these selection tables lead you to the system or computer section, software section, and/or peripherals section for further system design guidance.

Locating the information you need

To help with finding needed information, the main sections of this guide are indexed by tabs, with detailed contents of each section in an Information Locator for Sections 2 through 6 following each tab.

MAIN SECTIONS and Subsections **Pages**

Select a Performance Level

	DISTRIBUTED INTELLIGENCE ARCHITECTURE			CENTRALIZED INTELLIGENCE ARCHITECTURE		
Performance/Capability Comparison	**A900 — maximum computational power for scientific, engineering and interactive graphics applications, especially those that require vector/matrix processing, plus highly efficient I/O performance**	**A700 — excellent computational power for scientific, engineering and interactive graphics applications, especially those that require vector/matrix processing, when equipped with hardware Floating Point Processor (FPP), plus highly efficient I/O performance**	**A600+ — for excellent computational power in price-sensitive applications and highly efficient I/O performance**	**L-Series — for good microcomputer-level computational performance and highly efficient I/O performance.**	**F-Series — for computation-intensive applications in science, engineering, and interactive graphics.**	**E-Series — for excellent performance in general applications.**
Base set instructions/sec	3,000,000	1,000,000	1,000,000	300,000	1,000,000	1,000,000
Single precision floating point operations/sec	500,000 (Hardware FPP)	54,400 (firmware based)	53,400 (firmware based)	2,000 (software based)	183,000 (Hardware FPP)	47,000 (firmware based)
Floating point with hardware FPP **— Single precision oper/sec** **— Double precision oper/sec**	 500,000 245,000	With 12156A Hardware FPP 204,000 99,700	Not applicable	Not applicable	 183,000 84,000	Not applicable
Scientific instruction set **— Single precision oper/sec**	Estimated 49,800	With 12156A Hardware FPP 36,500	Not applicable Not specified	Not applicable	Firmware 22,000	Software equivalent Not specified
Vector instruction set **— Single precision oper/sec** **— Double precision oper/sec**	Estimated 688,000 after 4.9μs setup 421,000 after 6.2μs setup	With 12156A Hardware FPP 245,000 after 13.5μs setup 144,000 after 13.5μs setup	Software equivalent Not specified Not specified	Not applicable	With 12824A or 12829A 73,000 base/130,000 loops 65,000 base/94,000 loops	Software equivalent Not specified Not specified
Maximum memory capacity	6 Megabytes of error correcting code memory	4 Megabytes (2.0 Mb with error correcting code memory)	4 Megabytes	512 kilobytes	2 Megabytes	2 Megabytes
Memory cycle time (std)	181 nanosec average effective, assuming 88% cache kit rate	500 nanosec with or without error correct capability	454 nanosec	680 nanosec	420 nanosec* (490 nanosec* with fault control)	665 nanosec* (735 nanosec* with fault control)
Memory cycle time (optional)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Same as F-Series (Std)
I/O Bandwidth (Mbytes/sec)	3.7	4.0	4.27	2.7	2.1	1.6 (2.1 with opt memory)
No. of DMA channels	24	24	24	24	2 (software assignable)	2 (software assignable)
No. of available I/O channels	Up to 15	Up to 16	Up to 18	Up to 8	9 or 14, exp to 41 or 46	9 or 14, exp to 41 or 46
User microprogrammable	Yes	Yes	No	No	Yes	Yes
Control Store Space Available for User Microprograms	6,144 48-bit instr. words	8,192 32-bit instr. words	Not applicable	Not applicable	5,632 24-bit instr. words	11,776 24-bit instr. words
Digital Signal Processing	Not currently supported	Not currently supported	Not available	Not available	w/92835A firmware-aided	Not available

* *Tolerance is ±35 nanoseconds.*

Select a Packaging Level

SYSTEMS — HP-packaged standalone systems that combine hardware and operating software in a base system configuration	Model 29 (page 3.1-20)	Model 27 (page 3.1-18)	Model 26 (page 3.1-14)		Model 45 (page 2.1-2) Model 65 (page 2.1-5)	Model 40 (page 2.2-2) Model 60 (page 2.2-5)
MICRO/1000 SYSTEMS — Systems in smaller desk-side or rack-mountable-Micro/1000 package	Micro 29 (page 3.1-11)	Micro 27 (page 3.1-8)	Micro 26 (page 3.1-5)			
MICROSYSTEMS — HP-packaged table-top systems that combine a compact system processor and operating software in a base configuration	Not available	Not available	Model 6+ (page 3.1-2)	Model 5 (page 3.2-2)	Not available	Not available
COMPUTERS — Rack-mountable, table-top, or desk-side CPUs of various capacity and package sizes. Operating software is purchased separately.	2139A (page 3.3-3) 2439A (page 3.3-7)	2137A (page 3.3-2) 2437A (page 3.3-6)	2136C/D (page 3.3-1) 2156B (page 3.3-4) 2436A (page 3.3-5)	2103L (page 3.4-1) 2122A/B (page 3.4-2)	2117F (page 2.3-1)	2109E (page 2.3-2) 2113E (page 2.3-3)
BOARD COMPUTERS — for packaging into OEM products. Operating software is purchased separately.	Not available	2107AK and 12030A Card Cage (page 3.3-9)	2106BK and 1203xx Card Cages (page 3.3-8)	2103LK and 1203xx Integration Accessories (page 3.4-3)	Not available	2109EK and 12728x Integration Accessories (page 2.3-4)

Select the operating system that will support the application

OPERATING SYSTEM CHOICES	M/E/F-SERIES COMPUTERS 92084A RTE-6/VM	92068A RTE-IVB▶	L-SERIES COMPUTERS 92071A RTE-XL	92070B RTE-L	A-SERIES COMPUTERS 92077A RTE-A	92077A & 92078A RTE-A & VC+
Standard in HP 1000 System Model(s)	**60 & 65**	**40 & 45**	**5**		**6+ & 26**	**27 & 29**
MEMORY						
— Minimum required	256kb	128kb	128kb	64kb	256kb	256kb
— Maximum supported	2Mb	2Mb	512kb	64kb	32Mb*	32Mb*
CAPACITY AVAILABLE TO THE USER						
— Maximum Length of Resident Program	1.9Mb§	54kb	64kb	52kb§	64kb	64kb
— Maximum Path Length	64kb	n/a	n/a	n/a	n/a	62kb
— Maximum Virtual Memory Data Space	128Mb	n/a	n/a	n/a	128Mb	128Mb
— Maximum Overlay Code	(D)	n/a	n/a	n/a	n/a	7.75Mb
— Maximum In-Memory Data Space	1.9Mb§	1.9Mb§	(A)	(A)	2Mb per prog.	2Mb per prog.
— Number of partitions	64	64	255	2**	255	255
— Number of logical units	255	64	64	64	255	255
— Number of I/O select codes that can use DMA	n/a	n/a	29	n/a	24	24
REAL-TIME PROGRAM SCHEDULING						
— By Time	Yes	Yes	Opt.	Opt.	Opt.	Opt.
— By Event	Yes	Yes	Opt.	Opt.	Opt.	Opt.
— By Another Program	Yes	Yes	Opt.	Opt.	Opt.	Opt.
— By Operator	Yes	Yes	Yes	Yes	Yes	Yes
MULTI-USER SUPPORT						
— By Session Monitor or VC+	Yes	Yes	No	No	No	Yes
— By Multi-Terminal Monitor	Yes	Yes	Yes	No	Yes	No
— By operating system only	No	No	No	Yes	No	No
— Time Slicing Among Users	Yes	Yes	Yes	No	Yes	Yes
PROGRAM DEVELOPMENT SUPPORT						
— File Manager	Yes	Yes	Yes	Yes	Yes	Yes
— Command Interpreter	No	No	No	No	Yes	Yes
— Input/Output Spooling	Yes	Yes	No	No	Yes†	Yes
— Batch Processing	Yes	Yes	No	No	No	No
— Interactive Screen Editor (EDIT)	Yes	Yes	Yes	No	Yes	Yes
— Interactive Editor (EDITR)	Yes	Yes	Yes	Yes	No	No
— Symbolic Debug/1000	w/92860A	No	No	No	w/92860A	w/92860A
— Interactive Debug Utility	Yes	Yes	Yes	Yes	No	No
— Relocating Loader	Yes	Yes	Yes	Yes	Yes	Yes
— Absolute Program Loader	Yes	Yes	Yes	Yes	No	No
PROGRAMMING LANGUAGES						
— Pascal/1000 Compiler	w/92833A	w/92832A	w/92854A	(E)	w/92833A	w/92833A
— FORTRAN 77 Compiler	w/92836A	(E)	(E)	(E)	w/92836A	w/92836A‡
— FORTRAN 4X Compiler	w/92834A	w/92834A	w/92834A	(E)	(E)	(E)
— Assembler	Included	Included	Included	(E)	Included	Included
— BASIC	w/92857A or 92101A	w/92101A	w/92076A	No	w/92857A or 92076A	w/92857A or 92076A
— FORTRAN IV	(E)	Included	(E)	(E)	(E)	(E)

▶ *An execute-only version of RTE-IVB, the 92068E RTE-IVE product, is available for user-configured systems that require most of the power and versatility of RTE-IVB, but without the added cost and environmental vulnerability of a system disc. RTE-IVE cannot be used for system generation, program development, batch processing, program swapping, spooling, or multi-user operations under session monitor.*

* *Current physical memory limit is 6Mb.*

§ *Actual memory available for user's programs and data in RTE-L is determined by other demands on the 64kb address space available to the system. Actual memory available for in-memory data in RTE-IVB and RTE-6/VM is equal to total memory available less memory used by the operating system, resident libraries, programs, and software subsystems.*

n/a *Not Applicable.*

(A) *Programs and data together occupy the user's partition in RTE-XL/L; maximum data space equals maximum length of program less space actually required by the program code.*

(D) *Limited only by disc space available in the system, currently up to 3.2 Gigabytes (two 12821A interfaces, each supporting four 400M byte discs).*

** *Multiple programs can be loaded into the real-time partition of RTE-L.*

† *For output to printer only.*

Opt. *Denotes a module furnished with the operating system that is optional in the user's configuration.*

‡ *Only 92836A FORTRAN 77 supports the code and data separation and large program capability of RTE-A and VC+ at first release.*

(E) *Denotes execute-only support of programs or microprograms written in a particular language.*

Select the operating system that will support the application, continued

OPERATING SYSTEM CHOICES	M/E/F-SERIES COMPUTERS 92084A RTE-6/VM	92068A RTE-IVB▶	L-SERIES COMPUTERS 92071A RTE-XL	92070B RTE-L	A-SERIES COMPUTERS 92077A RTE-A	92077A & 92078A RTE-A & VC+
Standard in HP 1000 System Model(s)	**60 & 65**	**40 & 45**	**5**		**6+ & 26**	**27 & 29**
PERFORMANCE ENHANCEMENT						
— RTE Profile Monitor	w/92083A	w/92083A	No	No	w/92083A	w/92083A
— RTE Microprogramming Package	w/92061A	w/92061A	No	No	w/92045A or 92049A	w/72045A or 92049A
— Signal/1000 Digital Signal Proc. Pkg	w/92835A	w/92835A	No	No	No	No
OPER. TERMINAL COMM. (pages 4.1-1 through 14)						
— 2382A Terminal via point-to-point interface	w/12966A +106	w/12966A +106	w/12005B +002	w/12005B +002	not EMI qual.	not EMI qual.
— 2621B or 2629L Terminal via point-to-point interface	w/12966A +106	w/12966A +106	w/12005B +002	w/12005B +002	not EMI qual.	not EMI qual.
— Other 262x Terminals via point-to-point interface to port 1	w/12966A +105†	w/12966A +105†	w/12005A/B +001	w/12005A/B +001	w/12005A/B +001 or 12005B+005	w/12005A/B +001 or 12005B+005
— 2635B Terminal via point-to-point interface	w/12966A +106	w/12966A +106	w/12005A/B +002	w/12005A/B +002	w/12005A/B +002	w/12005A/B +002
— 264x Terminals via point-to-point interface	w/12966A +001	w/12966A +001	w/12005A +005	w/12005A +005	Not tested	Not tested
— 2382A, 262x, 2635B, and 264x, Terminals via multiplexer interface	w/12792A/B	w/12792A/B or 12920B	w/12040A/B	w/12040A/B	w/12040A/B	w/12040A/B
— 262x and 264x Terminals via multipoint interface & software	w/12790A & 91730A	w/12790A & 91730A	No	No	w/12092A & 91732A	w/12092A & 91732A
— 8-Channel Async Multiplexer Interface	12792A/B	12792A/B	12040A/B	12040A/B	12040A/B	12040A/B
— RS-232-C 8-Channel Conn. Panel	12828A*	12828A*	12828A*	12828A*	12828A*	12828A/B*
— 16-Channel Async Multiplexer Interface	No	12920B	Not Av.	Not Av.	Not Av.	Not Av.
— 16-Channel Multiplexer Software	No	91731A	Not Sup.	Not Sup.	Not Sup.	Not Sup.
DISC MEMORIES (pages 5.1-1 through 6)						
— 7906H/HR 19.6M byte Cartridge ICD Memory	w/12821A	w/12821A	w/12009A	w/12009A	w/12009A	w/12009A
— 7906M/MR 19.6M byte MAC Master Cartridge Disc Memory	w/13175B	w/13175B	No	No	No	No
— 7908/11/12/14P/R 16/28/65/132Mb Fixed Disc w/cartridge tape backup	w/12821A	No	w/12009A	No	w/12009A	w/12009A
— 7914TD 132.1Mb Fixed Disc and 1600 bpi Mag Tape Unit	w/7914TD Opt 236	No	w/7914TD & 12009A	No	w/7914TD & 12009A	w/7914TD & 12009A
— 7920M 50M byte MAC Master Disc Memory	w/13175B	w/13175B	No	No	No	No
— 7925M 120M byte MAC Master Disc Memory	w/13175B	w/13175B	No	No	No	No
— 7933H 404Mb Fixed Disc‡	w/12821A	No	No	No	w/12009A‡	w/12009A‡
— 7935H 404Mb Removable Media Disc	w/12821A	No	No	No	w/12009A‡	w/12009A‡
— 9121D/S Dual/Single 572kb/286kb Micro-floppy Disc	No	No	w/12009A	No	w/12009A	w/12009A
— 9133A/B 4.6Mb/9.2Mb Fixed Disc plus 286kb Single Microfloppy Disc	No	no	w/12009A	No	w/12009A	w/12009A
— 9134A/B 4.6Mb/9.2Mb Mini Winchester Disc	No	No	w/12009A	w/12009A	w/12009A	w/12009A
— 9895A 2.36M byte dual Flexible Disc Memory	w/12821A	w/12821A	w/12009A	w/12009A	w/12009A	w/12009A
— 12732A 500k byte Flexible Disc Subsys.	Yes	Yes	No	No	No	No

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† *Interface connector hood in 12966A Opt. 005 cable must be jumpered to set baud rate for 2122A, 2623A, 2642B, 2627A, or 2629E/F/G Terminal.*

* *12828A Multiplexer panel is included in 12792B and 12040B Multiplexers.*

‡ *7970E+626 or 636 Mag Tape Unit is also required for support of 7933H or 7935H system discs in RTE-A.*

Select the operating system that will support the application, continued

OPERATING SYSTEM CHOICES	M/E/F-SERIES COMPUTERS 92084A RTE-6/VM	92068A RTE-IVB▶	L-SERIES COMPUTERS 92071A RTE-XL	92070B RTE-L	A-SERIES COMPUTERS 92077A RTE-A	92077A & 92078A RTE-A & VC+
Standard in HP 1000 System Model(s)	**60 & 65**	**40 & 45**	**5**		**6+ & 26**	**27 & 29**
PRINTERS (pages 5.1-1 through 4)						
— 2611A 600 LPM, 132 col Chain Printer	w/12845B	w/12845B	No	No	No	No
— 2619A 1000 LPM, 132 col Chain Printer	w/12845B	w/12845B	No	No	No	No
— 2608A 400 LPM, 132 col Dot-Matrix Impact Line Printer	w/26099A	w/26099A	No	No	No	No
— 2608S 400 LPM, 132 col Dot-Matrix Impact Line Printer	w/2608S Opt. 210	w/2608S Opt. 210	w/2608S +214 & 12009A	No	w/2608S +214 & 12009A	w/2608S +214 & 12009A
— 2631B 180 cps, 136 col, Dot-Matrix Impact Serial Printer	w/2631B +210	w/2631B +210	w/2631B +214 & 12009A	w/2631B +214 & 12009A	w/2631B +214 & 12009A	w/2631B +214 & 12009A
— 9876A 90-480 LPM, 80 col Thermal Graphics Printer	w/59310B	w/59310B	No	No	No	No
— 2601A 40 cps, 10/12/15 cpi Daisywheel Serial Impact Printer	No	No	w/12005A/B +003	w/12005A/B +003	w/12005A/B +003	w/12005A/B +003
— 267xA/G 120 cps, 80/132 col Dot-Matrix Thermal Serial Printer	No	No	w/12009A	w/12009A	w/12009A	w/12009A
— 82905A/B 80 cps, 80 col Dot-Matrix Impact Serial Printer	No	No	w/12009A	w/12009A	w/12009A	w/12009A
GRAPHICS (pages 5.3-1 through 4)						
— 1350S* Graphics Display System	w/92841A	w/92841A or 92840A	w/92841A	w/92841A	No	No
— 1351S Graphics Display System	w/92841A	w/92841A	w/92841A	w/92841A	No	No
— 2608A Line Printer	w/92841A	w/92840A	No	No	No	No
— 2608S+210/214 Line Printer	w/92841A	w/92841A	w/92841A	No	w/92841A	w/92841A
— 2623A (or 2629G OEM) Graphics Terminal	w/92841A	w/92841A	w/92841A	w/92841A	w/92841A	w/92841A
— 2627A Color Graphics Terminal	w/92841A	w/92841A	w/92841A	w/92841A	w/92841A	w/92841A
— 2647A (or 2649G OEM) Intelligent Graphics Terminal	w/92841A	w/92841A or 92840A	w/92841A	w/92841A	Not tested	Not tested
— 2648A (or 2649C OEM) Graphics Terminal	w/92841A	w/92841A or 92840A	w/92841A	w/92841A	Not tested	Not tested
— 7220/21C/T Graphics Plotter	w/92841A	w/92841A	No	No	No	No
— 7470A Two-Pen Plotter	w/92841A	w/92841A	w/92841A	w/92841A	w/92841A	w/92841A
— 7580B or 7585B Drafting Plotter	w/92841A	w/92841A	w/92841A	w/92841A	w/92841A	w/92841A
— 9872C/T Eight-Pen Plotter	w/92841A	w/92841A	w/92841A	w/92841A	w/92841A	w/92841A
— 9111A Graphics Tablet	w/92841A	w/92841A	w/92841A	No	w/92841A	w/92841A
— 92841A Graphics/1000-II Device-Independent Graphics Library	Yes	Yes	Yes	Yes	Yes	Yes
— 92842A Graphics/1000-II Advanced Graphics Package	w/92841A	w/92841A	w/92841A	No	w/92841A	w/92841A
— 92840A Graphics Plotting Software (mature)	No	Yes	No	No	No	No
DATA BASE MGT. SOFTWARE						
— Image/1000 with or without Query	w/92081A or 92069A	w/92069A	w/92069A	No	w/92081A or 92069A	w/92081A or 92069A
DATA CAPTURE (pages 4.2-1 and 2)						
— 307x Data Capture Terminals via multi-point Interface	w/12790A & 92080A	w/12790A & 92080A	No	No	Not Tested	Not Tested
— 92080A DATACAP/1000-II Software	Yes	Yes	No	No	No	No

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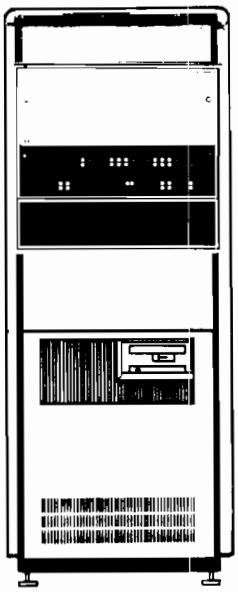
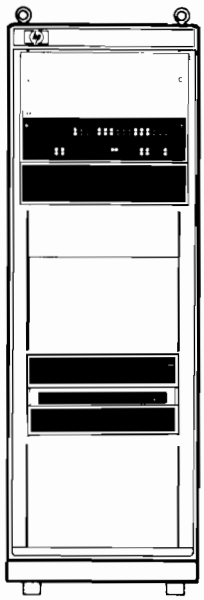
HP 1000 F-Series Computer Systems Selection Guide

EMI-Qualified Model 45/65 System



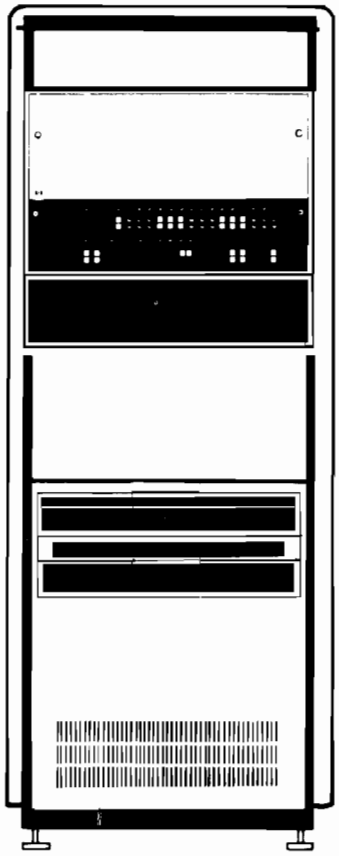
Model 45/65 System (Not EMI-Qualified)



	MODEL 45 is a hard disc-based multi-session real-time system with extensive support for program development and optimization as well as the processing of large data arrays.		**MODEL 65 is a very large capacity, hard disc-based real-time system with all of the capabilities of the Model 45 plus capacity for extremely large programs and virtual memory data space.**	
	EMI-Qualified (2177F)	**Not EMI-Qualified (2177C)**	**EMI-Qualified (2179C)**	**Not EMI Qualified (2179A)**
HARDWARE CAPACITY				
Available I/O Channels	10 to 26*	10 to 26*	10 to 26*	10 to 26*
Main Memory Included	256k bytes	128k bytes	256k bytes	256k bytes
Main Memory Expandability	to 2Mb	to 2Mb	to 2Mb	to 2Mb
Disc memory capacity	19.6Mb to 960Mb hard disc capacity with one or more hard discs ordered by product number		Limited only by available hardware; currently 16Mb to 20Gb with one or more hard discs ordered by product number	
USER-AVAILABLE CAPACITY				
Max. Length of Res. Program	54k bytes		1.9Mb shared w/resident data	
Max. Path Length	54k bytes		64k bytes	
Max. Virtual Data Space	Not applicable		128M bytes	
Max. Overlay Code	Not applicable		Up to total disc capacity	
Max. In-Memory Data Space	1.9M bytes		1.9Mb shared w/res. programs	
Number of Logical Units	64		255	
PROGRAM LANGUAGE SUPPORT FOR PROGRAM DEVELOPMENT	Pascal, FORTRAN 4X, Assembly, BASIC and Micro-assembler		FORTRAN 77, FORTRAN 4X, Pascal, Macro/1000 (Assembler), BASIC, and Micro-assembler	

* *The installation of a 12979B Dual-Port I/O Extender adds 16 I/O channels.*

Model 45 EMI-Qualified Computer System Sample Configuration



2177F+007, 031, System Processor Unit

7906MR+025
19.6 megabyte
Cartridge Disc
Memory

2645A Display Station
with Option 007

Ordering Guide for Alternate EMI-Qualified HP 1000 Model 45 Systems

A. Order HP 1000 Model 45 System Processor Unit

2177F System Processor Unit in 56-inch cabinet

ORDER ANY APPROPRIATE OPTIONS

005: 12966-60014 5m (16.4 ft) Cable for connection to 262x terminal used as system console (except 2621B).

006: 12966-60015 5m (16.4 ft) Cable for connection to 2621B Interactive Terminal or 2635B Printing Terminal used as system console.

007: 12966-60016 5m (16.4 ft) Cable for connection to 264x Terminal used as system console.

014: Deletes 256kb memory package, which must be replaced by other high performance HP memory — see page 2.4-5 for details.

015: Operation from 230V/50 Hz ac power.

031: System software on 7906M/MR disc cartridge.

032: System software on 7920M disc pack.

033: System software on 7925M disc pack.

B. Order one system/maintenance console

2621B Interactive Terminal**

2622A Display Terminal*

2623A Graphics Terminal*

2624B Display Terminal*

2626A Display Station*

2627A Color Graphics Terminal*

2635B Printing Terminal**

2645A+007 Display Station†

* *Requires 2177F system console connect option 005.*

** *Requires 2177F system console connect option 006.*

† *Requires 2177F system console connect option 007.*

C. Order one of the following system discs (appropriate disc interface and cables are furnished with the system)

7906M 19.6Mb MAC Cartridge Disc Memory (standalone)

7906MR+025 19.6Mb MAC Cartridge Disc Memory (rack mounting)

7920M 50Mb MAC Disc Memory (standalone)

7925M 120Mb MAC Disc Memory (standalone)

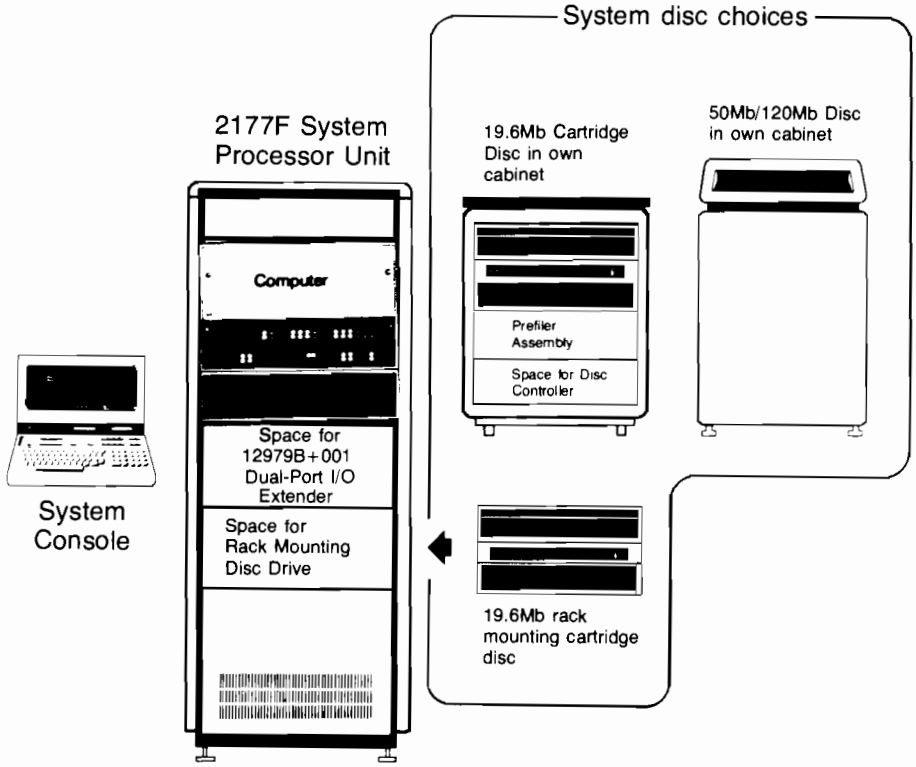
D. Order optional software (page 2.4-1) and, if necessary, order larger system memory (page 2.4-5)

E. Order Other Accessories and Interfaces (see page 2.4-8)

F. Order Additional Terminals (page 4.1-5), System-to-System Communications Capabilities (page 4.3-1), and Peripheral Devices (sections that follow the Peripheral Devices Tab)

NOTE: An HP 7970E Mag Tape or an HP 264x Terminal with minicartridge I/O or an HP 85A Desktop Computer is required by users who wish to have the ability to load and run diagnostics and/or use the off-line backup utility. See the current HP 1000 Ordering and Compatibility Information booklet for status of peripherals with respect to FCC and FTZ Electro Magnetic Interference (EMI) qualification

HP 1000 Model 45 EMI-Qualified System Processor Unit



Hardware supplied

- 2117 F-Series Computer with:
  - — Hardware floating point processor
  - — Scientific instruction set
  - — Fast FORTRAN Processor
  - — CRT terminal loader ROM
  - — 10 available I/O channels and space for up to 2Mb of memory*
- 12788B 256kb High performance memory package
- 12829A Vector Instruction Set
- 13175D MAC Disc Interface and cable
- 12791A Firmware Expansion Module
- 12991B Power Fail Recovery System
- 12897B Dual Channel Port Controller for DMA
- 12539C Time Base Generator
- 12966A Buffered Asynchronous Terminal Interface with 2177F option 005, 006, or 007 cable to system console
- 12992B RPL-compatible MAC Disc Loader ROM
- 12992D 7970 Mag Tape Loader ROM
- One-bay 56-inch cabinet

** 2048M bytes of High Performance Memory in 12788H or 12789M package, can be provided without a 12990B Memory Extender. For other alternatives, see pages 2.4-5 through 2.4-7.*

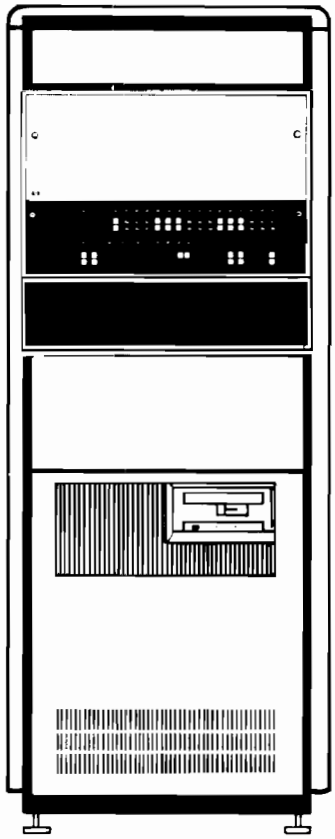
Required options and hardware (must be on same order as 2177F)

- 2177F option 031, 032, or 033 for system software media
- System Console with interface cable option 005, 006, or 007 as appropriate
- System Disc

Software and services included

- RTE-IVB operating system with session monitor, file manager, FORTRAN IV Compiler, Assembler, Interactive Screen Editor, Debug package, and backup utilities on option-specified media
- HP 1000 M/E/F-Series on-line and off-line diagnostics on 264x minicartridges
- Complete set of hardware and software manuals
- Site preparation consultation
- On-site installation and checkout, including integration and test with primary system
- 90-day on-site warranty
- Ten HP 93285A Engineering Units

Model 65 EMI-Qualified Computer System Sample Configuration



2179C+007, 022 System Processor Unit

7911R 28.1 Megabyte Fixed Disc with built-in cartridge tape backup

2645A Display Station with Option 007

Ordering Guide for Alternate EMI-Qualified HP 1000 Model 65 Systems

A. Order HP 1000 Model 65 System Processor Unit

2179C System Processor Unit in 56-inch cabinet

ORDER ANY APPROPRIATE OPTIONS

005: 12966-60014 5m (16.4 ft) Cable for connection to 262x terminal used as system console (except 2621B).

006: 12966-60015 5m (16.4 ft) Cable for connection to 2621B Interactive Terminal or 2635B Printing Terminal used as system console.

007: 12966-60016 5m (16.4 ft) Cable for connection to 264x terminal used as system console.

014: Deletes 256kb memory package, which must be replaced by other high performance HP memory — see page 2.4-5 for details.

015: Operation from 230V/50 Hz ac power.

022: System software on CS/80 tape cartridge*.

031: System software on 7906M/MR disc cartridge**. (Opt 050 is also needed for rack mounting of 7906MR+025 disc.)

032: System software on 7920M disc pack**.

033: System software on 7925M disc pack**.

050: Cabinet changes for rack mounting 7906MR+025 disc.

053: Cabinet changes for system without a rack mounting disc.

060: Software on 800 bpi mag tape in CS/80 format‡.

061: Software on 1600 bpi mag tape in CS/80 format‡.

101: Value Pack with 1 megabyte of memory instead of 256 kb memory plus FORTRAN 77 and Pascal compilers, Graphics/1000-II Device Independent Graphics Library and Advanced Graphics Package, and Image/1000 with Query on 1600 bpi mag tape. Requires option 061 and NO option 014.

102: Value Pack similar to Option 101, but with 2 megabytes of memory. Requires option 061 and NO option 014.

121: Value Pack similar to Option 101, but with Image/1000-II Data Base Management System, and Symbolic Debug/1000 software instead of Image/1000. Requires option 061 and NO option 014.

122: Value Pack similar to Option 101, but with 2 megabytes of memory instead of 256 kb memory and Image/1000-II and Symbolic Debug/1000 software instead of Image/1000. Requires option 061 and NO option 014.

* *12821A+001 CS/80 discinterface and cable and 12992J CS/80 Disc Loader ROM are included with the system when this option is ordered.*

** *13175D MAC disc interface and cable and 12992B MAC Disc Loader ROM are included with the system when this option is ordered.*

‡ *12821A+001 CS/80 disc interface and cable and 12992D 7970 Mag Tape Loader ROM are included with the system when this option is ordered.*

B. Order one system/maintenance console

2621B Interactive Terminal**

2622A Display Terminal*

2623A Graphics Terminal*

2624B Display Terminal*

2626A Display Station*

2627A Color Graphics Terminal*

2635B Printing Terminal**

2645A+007 Display Station†

* *Requires 2179C system console connect option 005.*

** *Requires 2179C system console connect option 006.*

† *Requires 2179C system console connect option 007.*

C. Order one of the following system discs (disc interface, cable, and appropriate loader ROM are included with the system)

7908R 16.5Mb CS/80 Fixed Disc with cartridge tape backup.

7911R 28.1Mb CS/80 Fixed Disc with cartridge tape backup.

7912R 65.6Mb CS/80 Fixed Disc with cartridge tape backup.

7914R 132.1Mb CS/80 Fixed Disc with cartridge tape backup.

7914TD+236 132.1Mb CS/80 Fixed Disc and 7970E+236 mag tape subsystem (includes mag tape interface and cables) in 56-in cabinet.

7906M 19.6Mb MAC Cartridge Disc Memory (standalone).

7906MR+025 19.6Mb MAC Cartridge Disc Memory (rack mounting).

7920M* 50Mb MAC Disc Memory.

7925M* 120Mb MAC Disc Memory.

* *This disc requires a 7970E Magnetic Tape Unit or another compatible 79xxR/M/MR disc for system backup or (with the 7933H/7935H disc) for the loading of system software.*

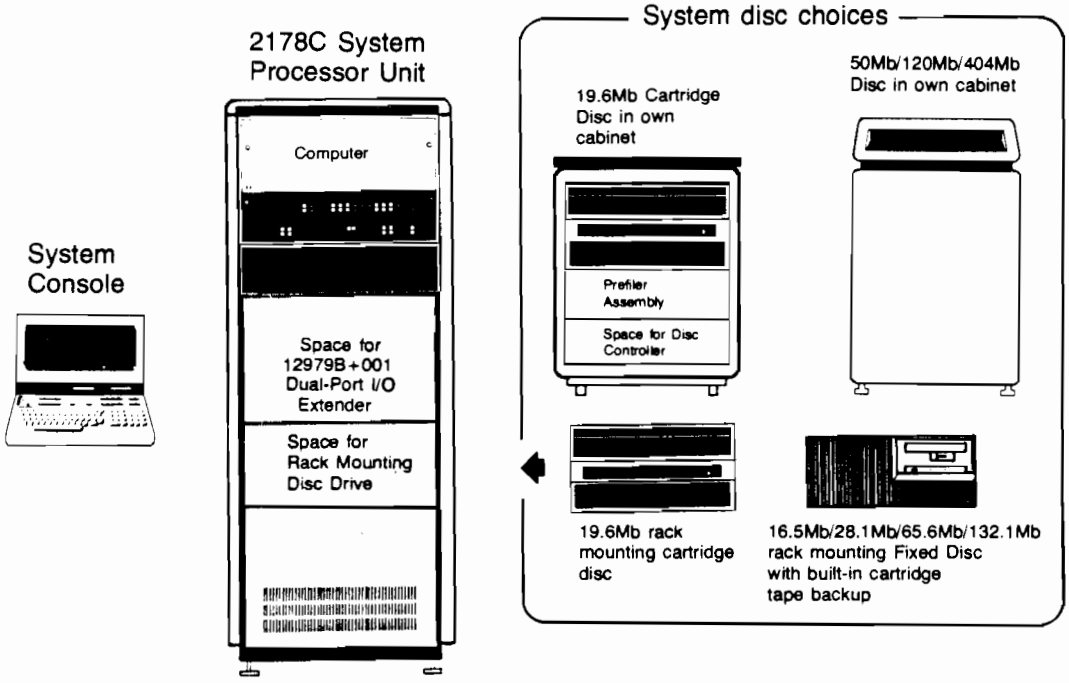
D. Order optional software (page 2.4-1) and, if necessary, order larger system memory (page 2.4-5)

E. Order Other Accessories and Interfaces (see page 2.4-8)

F. Order Additional Terminals (page 4.1-5), System-to-System Communications Capabilities (page 4.3-1), and Peripheral Devices (sections that follow the Peripheral Devices Tab)

NOTE: An HP 7970E Mag Tape or an HP 264x Terminal with minicartridge I/O or an HP 85A Desktop Computer is required by users who wish to have the ability to load and run diagnostics and/or use the off-line backup utility. See the current HP 1000 Ordering and Compatibility Information booklet for status of peripherals with respect to FCC and FTZ Electro Magnetic Interference (EMI) qualification

HP 1000 Model 65 EMI-Qualified System Processor Unit



Hardware supplied

- 2117 F-Series Computer with:
  - — Hardware floating point processor
  - — Scientific instruction set
  - — Fast FORTRAN Processor
  - — CRT terminal loader ROM
  - — 10 available I/O channels and space for up to 2Mb of memory*
- 12788BB 256kb High performance memory package
- 12829A Vector Instruction Set
- 12821A+001 CS/80 Disc Interface and cable or 13175D MAC Disc Interface and cable, as appropriate
- 12791A Firmware Expansion Module
- 12991B Power Fail Recovery System
- 12897B Dual Channel Port Controller for DMA
- 12539C Time Base Generator
- 12966A Buffered Asynchronous Terminal Interface with 2179C option 005, 006, or 007 cable to system console
- 12992J CS/80 Disc Loader ROM or 12992B RPL-compatible MAC Disc Loader ROM or 12992D 7970 Mag Tape Loader ROM, as appropriate
- One-bay 56-inch cabinet

** 2048M bytes of High Performance Memory in 12788H or 12789M package, can be provided without a 12990B Memory Extender. For other alternatives, see pages 2.4-5 through 2.4-7.*

Required options and hardware (must be on same order as 2179C)

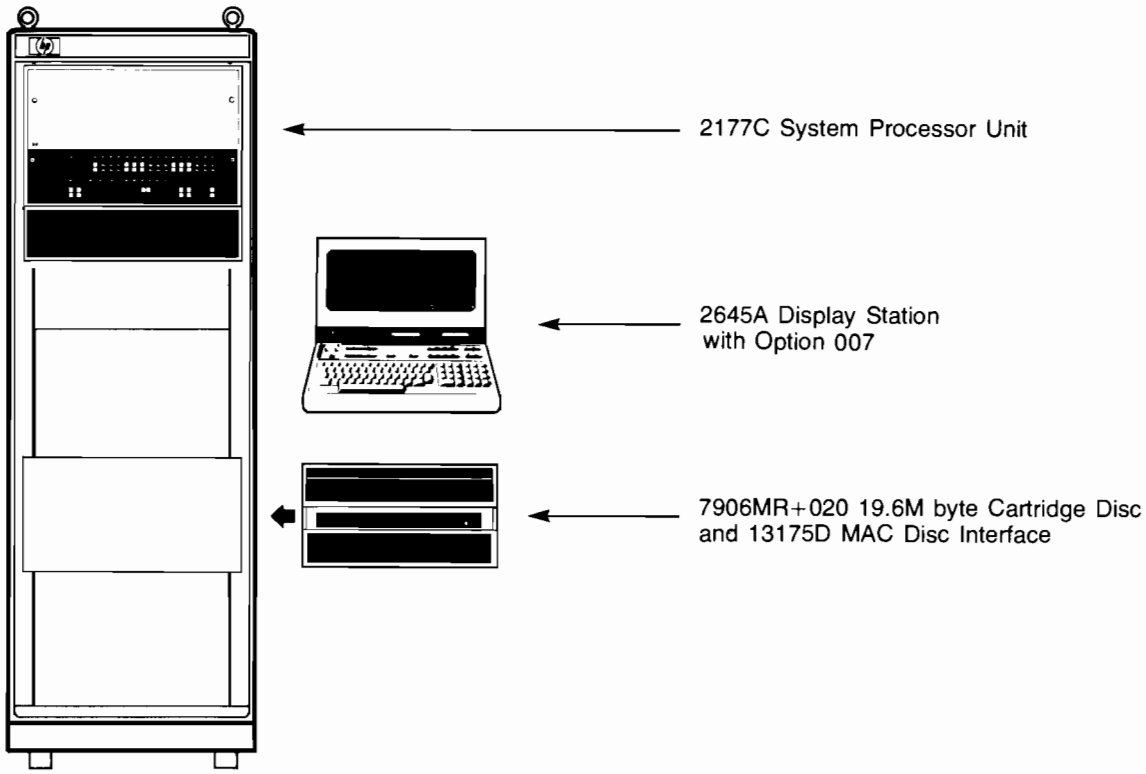
- 2179C option 022, 031, 032, 033, 060, or 061 for system software media
- System Console with interface cable option 005, 006, or 007 as appropriate
- System Disc (16.1Mb, 19.6Mb, 28.1Mb, 50Mb, 65.6Mb, 120Mb, 132.1Mb, or 404Mb)

Software and services included

- RTE-6/VM operating system with session monitor, file manager, Macro/1000 Assembler, Interactive Screen Editor, Debug package, and backup utilities on option-specified media
- HP 1000 M/E/F-Series on-line and off-line diagnostics on 264x minicartridges
- Primary system
- Complete set of hardware and software manuals
- Site preparation consultation
- On-site installation and checkout, including integration and test with primary system
- 90-day on-site warranty
- Ten HP 93285A Engineering Units

Model 45 Computer System Sample Configuration (Not EMI-Qualified)

In 56-inch Cabinet



Ordering Guide for Alternate HP 1000 Model 45 Systems (Not EMI-Qualified)

A. Order HP 1000 Model 45 System Processor Unit

2177C System Processor Unit in 56-inch cabinet.

ORDER ANY APPROPRIATE OPTIONS

2177C Option 002: Adds second 56-inch cabinet bay.

2177C Option 014: Deletes 128kb memory package, which must be replaced by other HP memory — see page 2.4-5 for details.

2177C Option 015: Operation from 230V/50 Hz ac power.

B. Order one system/maintenance console

2645A Display Station with Option 007

OR

2648A Graphics Terminal with Option 007

NOTE: Other system console choices listed on page 4.1-1 (following the Communications tab) are permissible when a 264x terminal with minicartridge I/O will be readily available at the operating site to HP Customer Engineers and System Engineers for loading diagnostics and updates into the system.

C. Order one system disc and appropriate interface

Disc (order one)		Interface (order one)
7906M 19.6M byte MAC Master Cartridge Disc Memory. 7906MR+020 19.6M byte rack mounting MAC Master Cartridge Disc Memory 7920M† 50M byte MAC Master Disc Memory. 7925M† 120M byte MAC Master Disc Memory.	**PLUS**	13175D MAC disc interface (can add up to seven 79xxS slave drives)

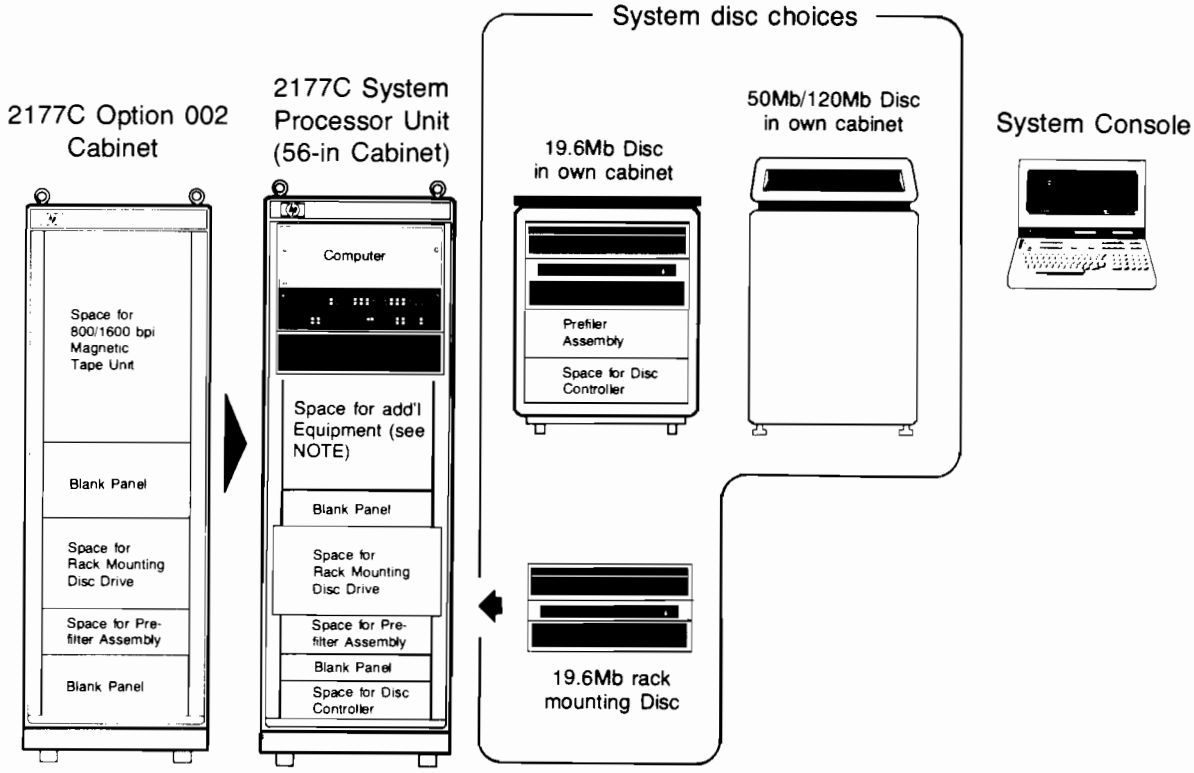
† *A 7970B/E+226/236 Magnetic Tape Subsystem (page 5.5-1) or an additional disc (page 5.1-2) is required to provide backup and copy capability for the 7920M or 7925M 50 or 120 Megabyte Disc. This requirement is satisfied if there is an HP 1000 E/F-Series Computer System with the same disc and provision for backup at the same operating site.*

D. Order optional software (page 2.4-1) and, if necessary, order larger system memory (page 2.4-5)

E. Order other accessories and interfaces (see page 2.4-8)

F. Order additional terminals (page 4.1-5), System-to-System Communications capabilities (page 4.3-1), and Peripheral Devices (sections that follow the Peripheral Devices Tab)

HP 1000 Model 45 System Processor Unit (Not EMI-Qualified)



NOTE: Care must be exercised in racking additional equipment in the 56-inch cabinet to avoid exceeding the 2000W power rating of the cabinet, which could cause more than 15°C (27°F) internal temperature rise, excessively stressing the computer and other racked equipment. Use the power requirements table on pages 6.1-2 and 6.1-3 (following the Configuration Reference Information Tab) to determine that total power dissipation inside the cabinet will not exceed 2000W.

Hardware supplied

- 2117 F-Series Computer with:
  - — Hardware floating point processor
  - — Scientific instruction set
  - — Fast FORTRAN Processor
  - — CRT Terminal Loader ROM
  - — 10 available I/O channels and space for up to 2Mb of memory
- 12992B RPL-compatible MAC Disc Loader ROM
- 12788A 128kb High performance memory package
- 12824A Vector Instruction Set
- 12791A Firmware Expansion Module
- 12991B Power Fail Recovery System
- 12897B Dual Channel Port Controller for DMA
- 12539C Time Base Generator
- 12966A Buffered Asynchronous Terminal Interface with cable to system console
- One-bay 56-inch cabinet

Required hardware (must be on same order as 2177C)

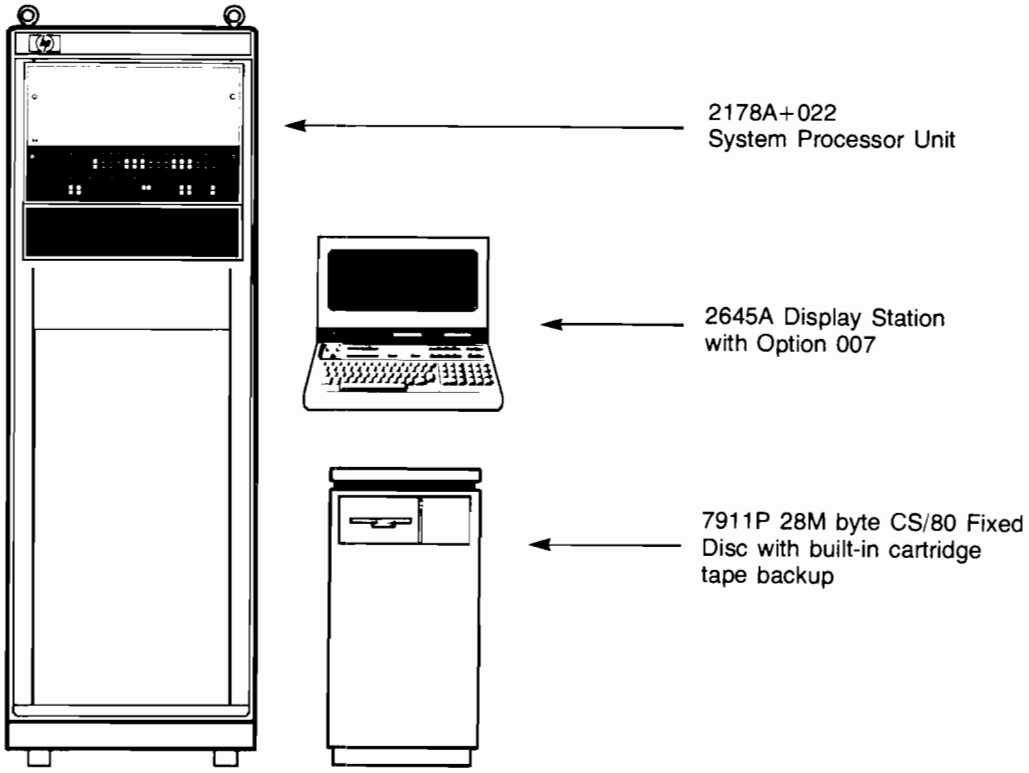
- System Console
- System Disc (19.6Mb, 50Mb, or 120Mb) and interface

Software and services included

- RTE-IVB operating system with session monitor, file manager, FORTRAN IV Compiler, Assembler, Interactive Screen Editor, Debug package, and backup utilities on compatible disc media
- HP 1000 M/E/F-Series diagnostics library on 264x minicartridges
- Complete set of hardware and software manuals
- Site preparation consultation
- On-site installation assistance and checkout including integration and test with primary system
- 90-day on-site warranty
- Six 93285A Engineering Units

Model 65 Computer System Sample Configuration (Not EMI-Qualified)

In 56-inch Cabinet



Ordering Guide for Alternate HP 1000 Model 65 Systems (Not EMI-Qualified)

A. Order HP 1000 Model 65 System Processor Unit

2179A System Processor Unit in 56-inch cabinet

ORDER ANY APPROPRIATE OPTIONS

002: Adds second 56-inch cabinet bay.

005: Cable for connection to 262x terminal used as system console (except 2621B).

006: Cable for connection to 2382A, or 2621B terminal used as system console.

014: Deletes 256kb memory package, which must be replaced by other HP memory — see page 2.4-5 for details.

015: Operation from 230V/50 Hz ac power.

022: Software on CS/80 tape cartridge, 12821A+001 interface, 12992J CS/80 Disc Loader ROM, and 40017B Cabinet Stabilizer.

031: Software on 7906MR+020 Disc, 13175D interface, and 12992B RPL-compatible MAC Disc Loader ROM.

032: Software on 7920M Disc, 13175D interface, 12992B RPL-compatible MAC Disc Loader ROM, and 40017B Cabinet Stabilizer.

033: Software on 7925M Disc, 13175D interface, 12992B RPL-compatible MAC Disc Loader ROM, and 40017B Cabinet Stabilizer.

060: Software on 800 bpi mag tape in CS/80 format, 12821A+001 interface, 12992J CS/80 Disc and 12992D Mag Tape Loader ROMs, and 40017B Cabinet Stabilizer.

061: Software on 1600 bpi mag tape in CS/80 format, 12821A+001 interface, and 12992J CS/80 Disc and 12992D Mag Tape Loader ROMs, and 40017B Cabinet Stabilizer.

101: Value Pack with 1 megabyte of memory plus FORTRAN 77 and Pascal compilers, Graphics/1000-II Device Independent Graphics Library and Advanced Graphics Package-3D, and Image/1000 with Query on 1600 bpi mag tape. Requires option 061 and NO option 014.

102: Value Pack similar to Option 101, but with 2 megabytes of memory. Requires option 061 and NO option 014.

111: Value Pack similar to Option 101, but with software on 264x minicartridges for system that uses 79xxM, 7933H, or 7935H disc as the system disc. Requires option 031, 032, or 033 and NO option 014.

112: Value Pack similar to Option 101, but with 2 megabytes of memory and with software on 264x minicartridges for system that uses 79xxM, 7933H, or 7935H disc as the system disc. Requires option 031, 032, or 033 and NO option 014.

B. Order one system/maintenance console

2645A Display Station and Option 007

2648A Graphics Terminal and Option 007

NOTE: Other system console choices (listed on page 4.1-1 following the Communications Tab) are permissible when a 264x terminal with minicartridge I/O will be readily available at the operating site to HP Customer Engineers and System Engineers for loading diagnostics and updates into the system.

C. Order one of the following system discs (appropriate disc interface is obtained with software option)

7908P 16Mb CS/80 Fixed Disc with cartridge tape backup.

7911P 28Mb CS/80 Fixed Disc with cartridge tape backup.

7912P 65Mb CS/80 Fixed Disc with cartridge tape backup.

7914P 132.1Mb CS/80 Fixed Disc with cartridge tape backup.

7914TD+236 132.1Mb CS/80 Fixed Disc and 7970E+236 mag tape subsystem in 56-in cabinet.

7933H†404Mb CS/80 Fixed Disc.

7935H†404Mb CS/80 Removable Media Disc.

7906MR+020 19.6M byte rack mounting MAC Master Cartridge Disc Memory for use in 2179A System Processor Unit.

7920M† 50M byte MAC Disc Memory.

7925M† 120M byte MAC Disc Memory.

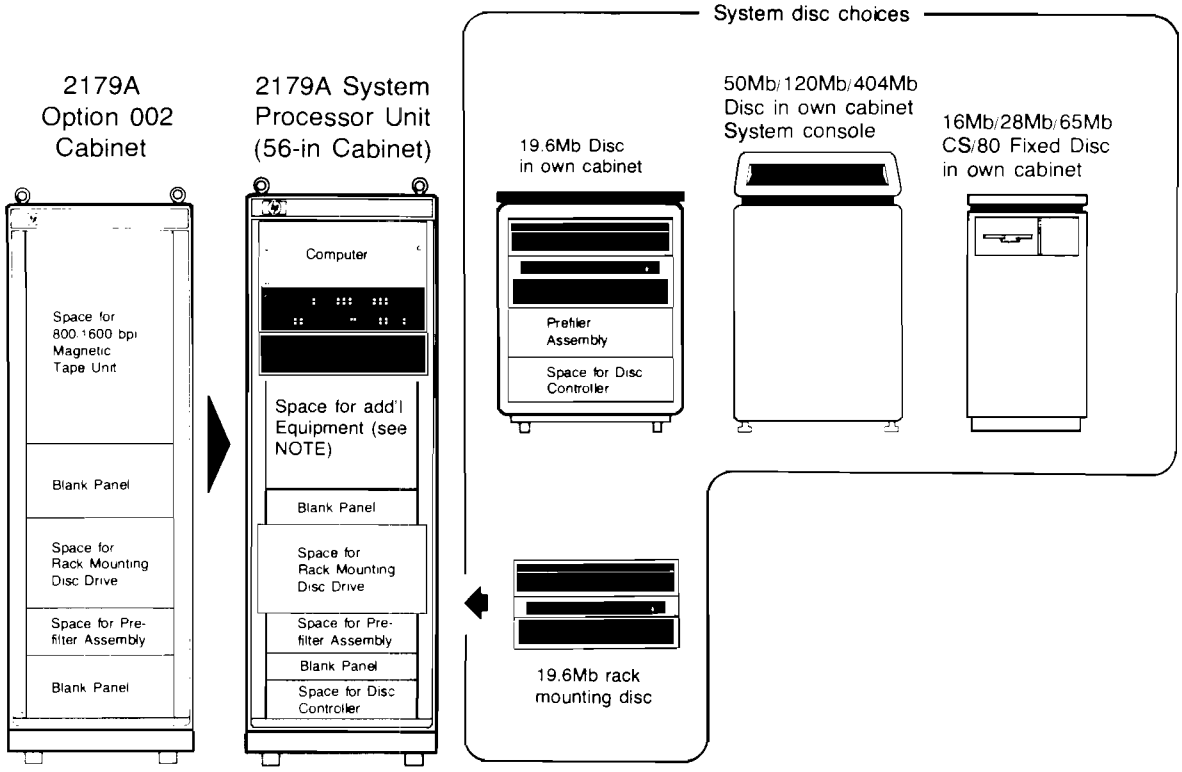
† *This disc requires 7970E Magnetic Tape Unit or another compatible 79xxP/M/MR disc for system backup or (with the 7933H/7935H disc) for the loading of system software.*

D. Order optional software (page 2.4-1) and, if necessary, order larger system memory (page 2.4-5)

E. Order Other Accessories and Interfaces (see page 2.4-8)

F. Order Additional Terminals (page 4.1-5), System-to-System Communications Capabilities (page 4.3-1), and Peripheral Devices (sections that follow the Peripheral Devices Tab)

HP 1000 Model 65 System Processor Unit (Not EMI-Qualified)



NOTE: Care must be exercised in racking additional equipment in the 56-inch cabinet to avoid exceeding the 2000W power rating of the cabinet, which could cause more than 15°C (27°F) internal temperature rise, excessively stressing the computer and other racked equipment. Use the power requirements table on pages 6.1-2 and 6.1-3 (following the Configuration Reference Information Tab) to determine that total power dissipation inside the cabinet will not exceed 2000W.

Hardware supplied

- 2117 F-Series Computer with:
  - — Hardware floating point processor
  - — Scientific instruction set
  - — Fast FORTRAN Processor
  - — CRT Terminal Loader ROM
  - — 10 available I/O channels and space for up to 2Mb of memory
- 12788B 256kb High performance memory package
- 12824A Vector Instruction Set
- 12791A Firmware Expansion Module
- 12991B Power Fail Recovery System
- 12897B Dual Channel Port Controller for DMA
- 12539C Time Base Generator
- 12966A Buffered Asynchronous Terminal Interface with cable to system console
- One-bay 56-inch cabinet

Required options and hardware (must be on same order as 2179A)

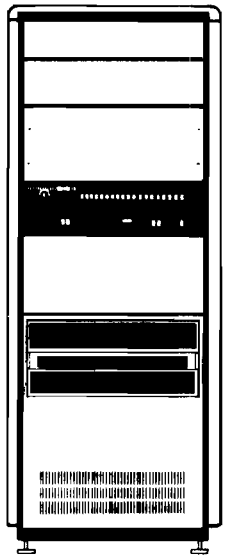
- 2179A option 022, 031, 032, 033, 060, or 061 for system software media, the appropriate disc interface, and the appropriate loader ROM
- System Console
- System disc (16Mb, 19.6Mb, 28Mb, 50Mb, 65Mb, 120Mb, 132.1Mb, or 404Mb)

Software and services included

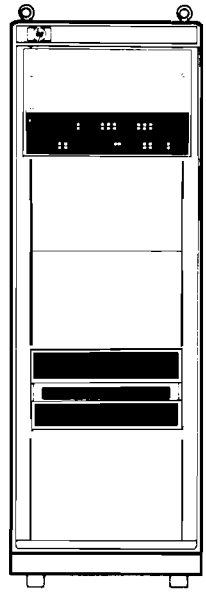
- RTE-6/VM operating system with session monitor, file manager, Macro/1000 Assembler, Interactive Screen Editor, Debug package, and backup utilities on option-specified media
- HP 1000 M/E/F-Series on-line and off-line diagnostics on 264x minicartridges
- Primary system
- Complete set of hardware and software manuals
- Site preparation consultation
- On-site installation checkout, including integration and test with primary system
- 90-day on-site warranty
- Ten 93285A Engineering Units

HP 1000 E-Series Computer Systems Selection Guide

EMI-Qualified Model 40/60 System



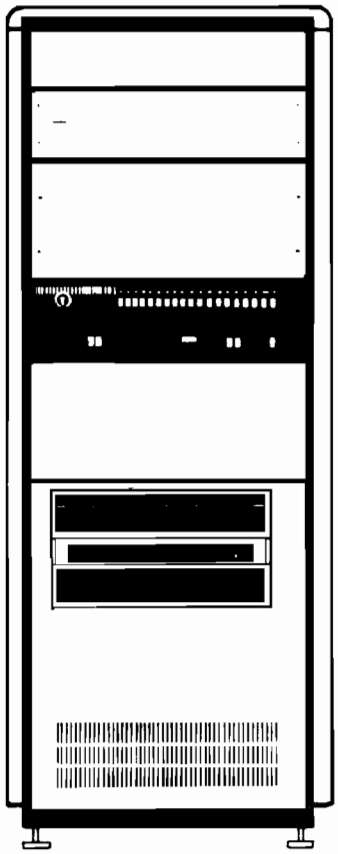
Model 40/60 System (Not EMI-Qualified)



	MODEL 40 is a hard disc-based multi-session real-time system with extensive support for program development and optimization as well as the processing of large data arrays.		**MODEL 60 is a very large capacity, hard disc-based real-time system with all of the capabilities of the Model 40 plus capacity for extremely large programs and virtual memory data space.**	
	EMI-Qualified (2176E)	**Not EMI-Qualified (2176C)**	**EMI-Qualified (2178C)**	**Not EMI-Qualified (2178A)**
HARDWARE CAPACITY				
Available I/O Channels	11 to 27*	11 to 27*	10 to 26*	10 to 26*
Main Memory Included	128k bytes	128k bytes	256k bytes	256k bytes
Main Memory Expandability	to 2Mb	to 2Mb	to 2Mb	to 2Mb
Disc memory capacity	19.6Mb to 960Mb hard disc capacity with one or more hard discs ordered by product number		Limited only by available hardware; currently 16Mb to 20Gb with one or more hard discs ordered by product number	
USER-AVAILABLE CAPACITY				
Max. Length of Res. Program	54k bytes		1.9Mb shared w/resident data	
Max. Path Length	54k bytes		64k bytes	
Max. Virtual Data Space	Not applicable		128M bytes	
Max. Overlay Code	Not applicable		Up to total disc capacity	
Max. In-Memory Data Space	1.9M bytes		1.9Mb shared w/res. programs	
Number of Logical Units	64		255	
PROGRAM LANGUAGE SUPPORT FOR PROGRAM DEVELOPMENT	Pascal, FORTRAN 4X, Assembly, BASIC, and Micro-assembler		FORTRAN 77, FORTRAN 4X, Pascal, Macro/1000 (Assembler), BASIC, and Micro-assembler	

* *The installation of a 12979B Dual-Port I/O Extender adds 16 I/O channels.*

Model 40 EMI-Qualified Computer System Sample Configuration



2176E+007, 031, System Processor Unit

7906MR+025
19.6 megabyte
Cartridge Disc Memory

2645A Display Station
with Option 007

Ordering Guide for Alternate EMI-Qualified HP 1000 Model 40 Systems

A. Order HP 1000 Model 40 System Processor Unit

2176E System Processor Unit in 56-inch cabinet

ORDER ANY APPROPRIATE OPTIONS

005: 12966-60014 5m (16.4 ft) Cable for connection to 262x terminal used as system console (except 2621B).

006: 12966-60015 5m (16.4 ft) Cable for connection to 2621B Interactive Terminal or 2635B Printing Terminal used as system console.

007: 12966-60016 5m (16.4 ft) Cable for connection to 264x Terminal used as system console.

014: Deletes 256kb memory package, which must be replaced by other HP memory — see page 2.4-5 for details.

015: Operation from 230V/50 Hz ac power.

031: System software on 7906M/MR disc cartridge, (Option 050 is also required for mounting of 7906MR+025 disc.

032: System software on 7920M disc pack.

033: System software on 7925M disc pack.

B. Order one system/maintenance console

2621B Interactive Terminal**

2622A Display Terminal*

2623A Graphics Terminal*

2624B Display Graphics Terminal*

2626A Display Station*

2627A Color Graphics Terminal*

2635B Printing Terminal**

2645A+007 Display Station†

* *Requires 2176E system console connect option 005.*

** *Requires 2176E system console connect option 006.*

† *Requires 2176E system console connect option 007.*

C. Order one of the following system discs (appropriate disc interface is obtained with software option)

7906M 19.6Mb MAC Cartridge Disc Memory (standalone)

7906MR+025 19.6Mb MAC Cartridge Disc Memory (rack mounting)

7920M 50Mb MAC Disc Memory (standalone)

7925M 120Mb MAC Disc Memory (standalone)

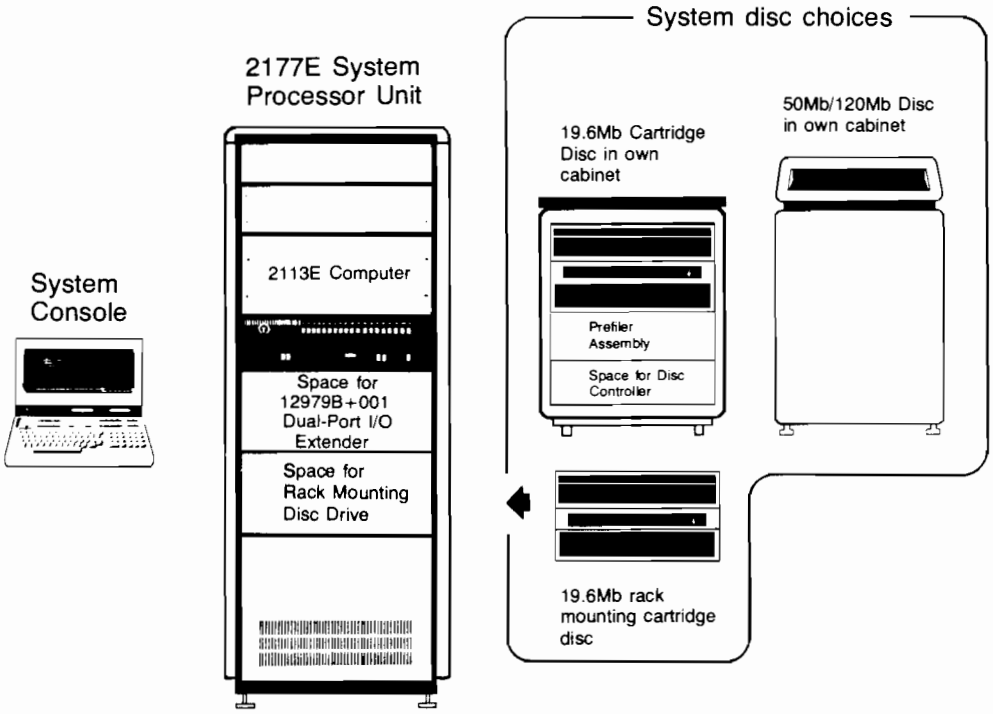
D. Order optional software (page 2.4-1) and, if necessary, order larger system memory (page 2.4-5)

E. Order Other Accessories and Interfaces (see page 2.4-8)

F. Order Additional Terminals (page 4.1-5), System-to-System Communications Capabilities (page 4.3-1), and Peripheral Devices (sections that follow the Peripheral Devices Tab)

NOTE: An HP 7970E Mag Tape or an HP 264x Terminal with Mini cartridge I/O (not EMI qualified) or an HP 85A Desktop Computer is required by users who wish to have the ability to load and run diagnostics and/or use the off-line backup utility.

HP 1000 Model 40 EMI-Qualified System Processor Unit



Hardware supplied

- 2113 E-Series Computer with:
  - — CRT Terminal Loader ROM
  - — 10 available I/O channels and space for up to 2Mb of memory*
- 12788BB 256kb High performance memory package
- 13175D MAC Disc Interface and cable
- 12791A Firmware Expansion Module
- 12991B Power Fail Recovery System
- 12897B Dual Channel Port Controller for DMA
- 12539C Time Base Generator
- 12966A Buffered Asynchronous Terminal Interface with 2176E option 005, 006, or 007 cable to system console
- 12992B RPL-compatible MAC Disc Loader ROM
- 12992D 7970 Mag Tape Loader ROM
- One-bay 56-inch cabinet

* *2M bytes of High Performance Memory in 12788H or 12789M package, can be provided without a 12990B Memory Extender. For other alternatives, see pages 2.4-5 through 2.4-7.*

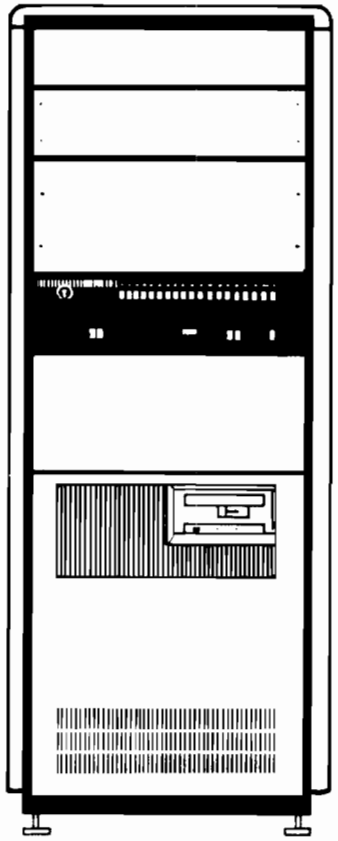
Required options and hardware (must be on same order as 2176E)

- 2176E option 031, 032, or 033 for system software media
- System Console with interface cable option 005, 006, or 007 as appropriate
- System Disc

Software and services included

- RTE-IVB operating system with session monitor, file manager, FORTRAN IV Compiler, Assembler, Interactive Screen Editor, Debug package, and backup utilities on option-specified media
- HP 1000 M/E/F-Series on-line and off-line diagnostics on 264x minicartridges
- Primary system
- Complete set of hardware and software manuals
- Site preparation consultation
- On-site installation and checkout, including integration and test with primary system
- 90-day on-site warranty
- Ten HP 93285A Engineering Units per System

Model 60 EMI-Qualified Computer System Sample Configuration



2178C+007, 022 System Processor Unit

7911R 28.1 Megabyte Fixed Disc with built-in cartridge tape backup

2645A Display Station with Option 007

Ordering Guide for Alternate EMI-Qualified HP 1000 Model 60 Systems

A. Order HP 1000 Model 60 System Processor Unit

2178C System Processor Unit in 56-inch cabinet

ORDER ANY APPROPRIATE OPTIONS

005: 12966-60014 5m (16.4 ft) Cable for connection to 262x terminal used as system console (except 2621B).

006: 12966-60015 5m (16.4 ft) Cable for connection to 2621B Interactive Terminal or 2635B Printing Terminal used as system console.

007: 12966-60016 5m (16.4 ft) Cable for connection to 264x terminal used as system console.

014: Deletes 256kb memory package, which must be replaced by other HP memory — see page 2.4-5 for details.

015: Operation from 230V/50 Hz ac power.

022: System software on CS/80 tape cartridge*

031: Systems software on 7906M/MR disc cartridge**. (Option 050 is also required for rack mounting of 7906MR+025 disc.)

032: System software on 7920M disc pack**.

033: System software on 7925M disc pack**.

050: Cabinet changes for rack mounting 7906MR+025 disc.

053: Cabinet for system without a rack mounting disc.

060: Software on 800 bpi Mag Tape in CS/80 format‡.

061: Software on 1600 bpi Mag Tape in CS/80 format‡.

* *Provides 12821A+001 interface and 12992J CS/80 Disc Loader ROM.*

** *Provides 13175D interface and 12992B MAC Disc Loader ROM.*

‡ *Provides 12821A+001 interface and 12992D 7970 Mag Tape Loader ROM.*

B. Order one system/maintenance console

2621B Interactive Terminal**

2622A Display Terminal*

2623A Graphics Terminal*

2624B Display Graphics Terminal*

2626A Display Station*

2627A Color Graphics Terminal*

2635B Printing Terminal**

2645A+007 Display Station†

* *Requires 2178C system console connect option 005.*

** *Requires 2178C system console connect option 006.*

† *Requires 2178C system console connect option 007.*

C. Order one of the following system discs (appropriate disc interface is obtained with software option).

7908R 16.5Mb CS/80 Fixed Disc with cartridge tape backup.

7911R 28.1Mb CS/80 Fixed Disc with cartridge tape backup.

7912R 65.6Mb CS/80 Fixed Disc with cartridge tape backup.

7914R 132.1Mb CS/80 Fixed Disc with cartridge tape backup.

7914TD+236 132.1Mb CS/80 Fixed Disc and 7970E+236 Mag Tape Subsystem in 56-in cabinet.

7933H* 404Mb CS/80 Fixed Disc Memory.

7935H* 404Mb CS/80 Removable Media Disc Memory.

7906M 19.6Mb MAC Cartridge Disc Memory (standalone).

7906MR+025 19.6Mb MAC Cartridge Disc Memory (rack mounting)

7920M* 50Mb MAC Disc Memory.

7925M* 120Mb MAC Disc Memory.

* *This disc requires a 7970E Magnetic Tape Unit or another compatible 79xxR/M/MR disc for system backup or (with the 7933H/7935H disc for the loading of system software.*

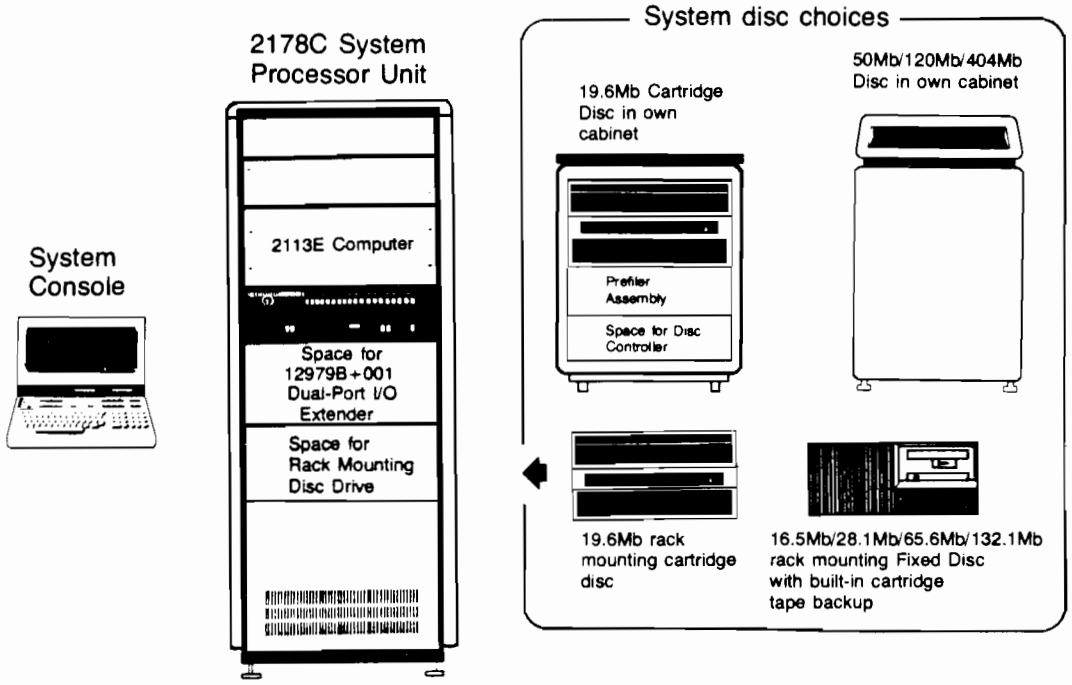
D. Order optional software (page 2.4-1) and, if necessary, order larger system memory (page 2.4-5)

E. Order Other Accessories and Interfaces (see page 2.4-8)

F. Order Additional Terminals (page 4.1-5), System-to-System Communications Capabilities (page 4.3-1), and Peripheral Devices (sections that follow the Peripheral Devices Tab)

NOTE: An HP 7970E Mag Tape or an HP 264x Terminal with mini-cartridge I/O or an HP 85A Desktop Computer is required by users who wish to have the ability to load and run diagnostics and/or use the off-line backup utility.

HP 1000 Model 60 EMI-Qualified System Processor Unit



Hardware supplied

- 2113 E-Series Computer with:
  - — CRT Terminal Loader ROM
  - — 10 available I/O channels and space for up to 2.048Mb of memory*
- 12788B 256kb High performance memory package
- 12821A+001 CS/80 Disc Interface and cable or 13175D MAC Disc Interface and cable, as appropriate
- 12791A Firmware Expansion Module
- 12991B Power Fail Recovery System
- 12897B Dual Channel Port Controller for DMA
- 12539C Time Base Generator
- 12966A Buffered Asynchronous Terminal Interface with 2178C option 005, 006, or 007 cable to system console
- 12992J CS/80 Disc Loader ROM or 12992B RPL-compatible MAC Disc Loader ROM or 12992D 7970 Mag Tape Loader ROM, as appropriate
- One-bay 56-inch cabinet

* *2048M bytes of High Performance Memory in 12788H or 12789M package, can be provided without a 12990B Memory Extender. For other alternatives, see pages 2.4-5 through 2.4-7.*

Required options and hardware (must be on same order as 2178C)

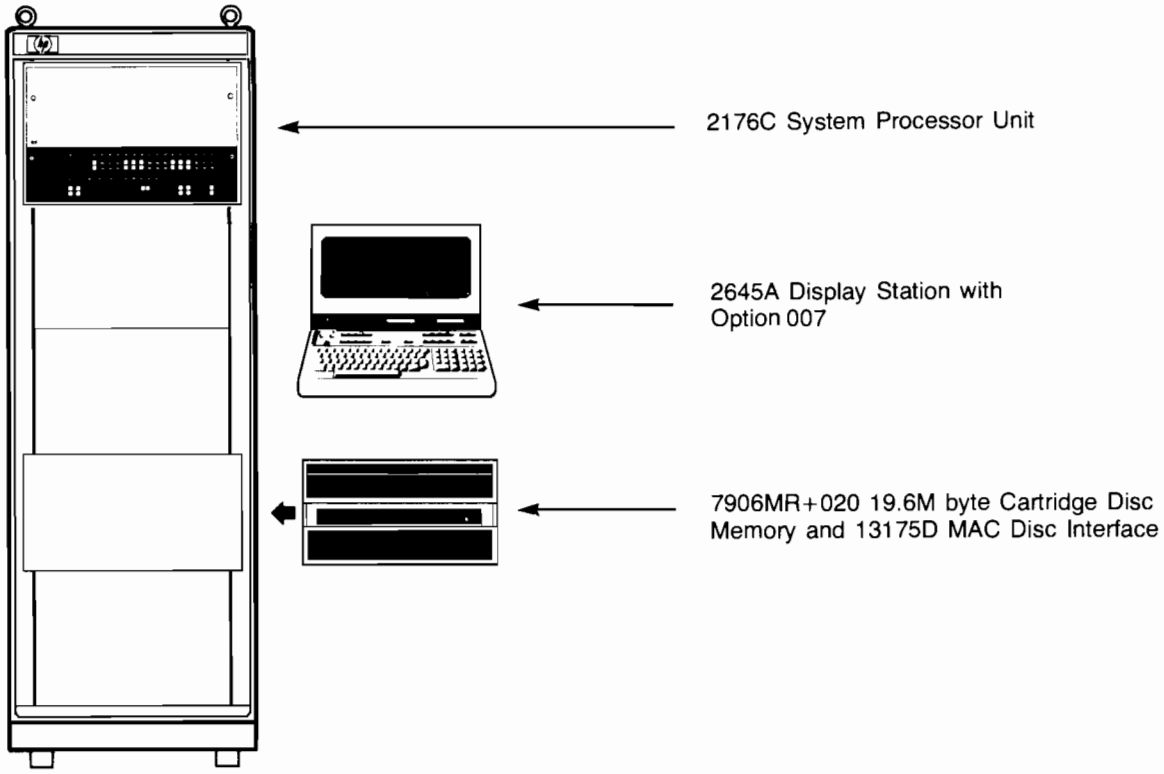
- 2178C option 022, 031, 032, 033, 060, or 061 for system software media
- System Console with interface cable option 005, 006, or 007 as appropriate
- System disc (16.5Mb, 19.6Mb, 28.1Mb, 50Mb, 65.6Mb, 120Mb, 132.1Mb, or 404Mb) and interface

Software and services included

- RTE-6/VM operating system with session monitor, file manager, Macro/1000 Assembler, Interactive Screen Editor, Debug package, and backup utilities on option-specified media
- HP 1000 M/E/F-Series on-line and off-line diagnostics on 264x minicartridges
- Primary system
- Complete set of hardware and software manuals
- Site preparation consultation
- On-site installation and checkout, including integration and test with primary system
- 90-day on-site warranty
- Ten HP 93285A Engineering Units per System

Model 40 Computer System Sample Configuration (Not EMI-Qualified)

In 56-inch Cabinet



Ordering Guide for Alternate HP 1000 Model 40 Systems (Not EMI-Qualified)

A. Order HP 1000 Model 40 System Processor Unit

2176C System Processor Unit in 56-inch cabinet.

ORDER ANY APPROPRIATE OPTIONS

2176C Option 002: Adds second 56-inch cabinet bay.

2176C Option 014: Deletes 128kb memory package, which must be replaced by other HP memory — see page 2.4-5 for details.

2176C Option 015: Operation from 230V/50 Hz ac power.

B. Order one system/maintenance console

2645A Display Station with Option 007.

OR

2648A Graphics Terminal with Option 007.

NOTE: Other system console choices listed on page 4.1-1 (following the Communications Tab) are permissible when a 264x terminal with minicartridge I/O will be readily available at the operating site to HP Customer Engineers and System Engineers for loading diagnostics and updates into the system.

C. Order one system disc and appropriate interface

Disc (order one)		Interface (order one)
7906M 19.6M byte MAC Master Cartridge Disc Memory. 7906MR+020 19.6M byte rack mounting MAC Master Cartridge Disc Memory. 7920M† 50M byte MAC Master Disc Memory. 7925M† 120M byte MAC Master Disc Memory.	PLUS	13175D MAC disc interface (can add up to seven 79xxS slave drives)

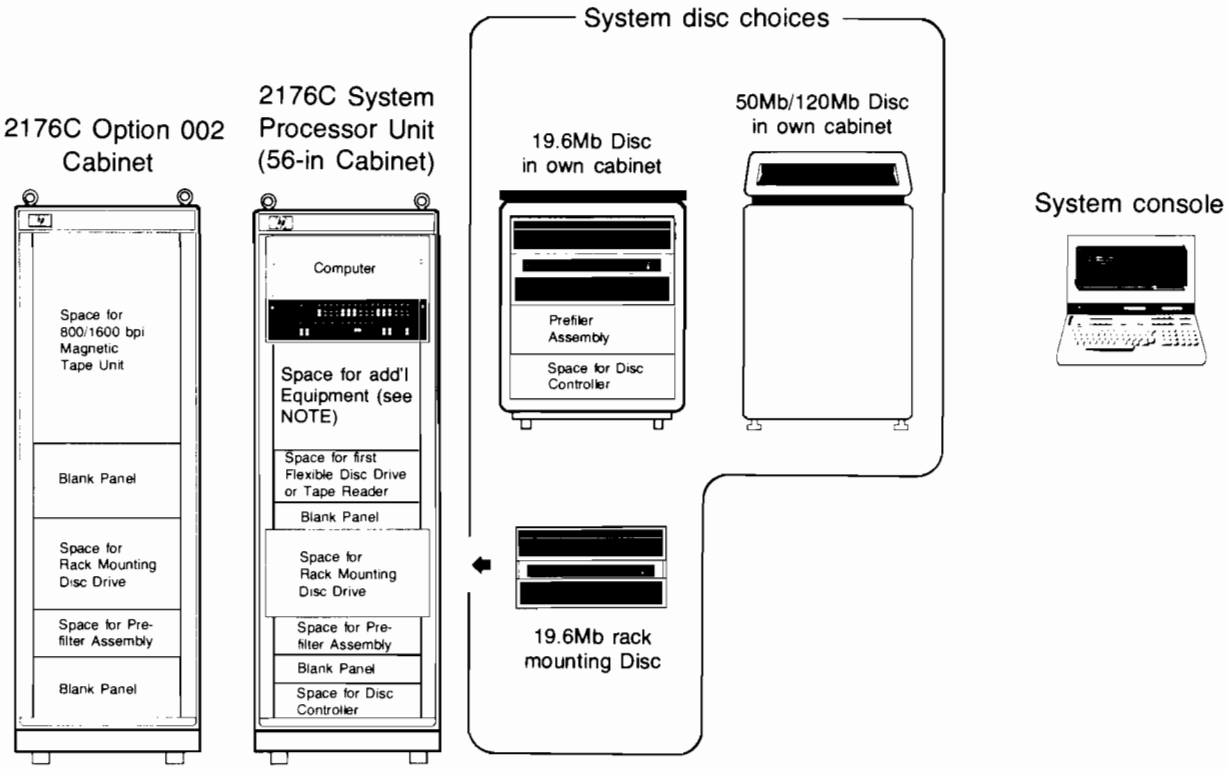
† *A 7970B/E+226/236 Magnetic Tape Subsystem (page 5.5-1) or an additional disc (page 5.1-2) is required to provide backup and copy capability for the 7920M or 7925M 50 or 120 megabyte Disc. This requirement is satisfied if there is an HP 1000 E/F-Series Computer System with the same disc and provision for backup at the same operating site.*

D. Order optional software (page 2.4-1) and, if necessary, order larger system memory (page 2.4-5)

E. Order Other Accessories and Interfaces (see page 2.4-8)

F. Order Additional Terminals (page 4.1-5), System-to-System Communications Capabilities (page 4.3-1), and Peripheral Devices (sections that follow the Peripheral Devices Tab)

HP 1000 Model 40 System Processor Unit (Not EMI-Qualified)



NOTE: Care must be exercised in racking additional equipment in the 56-inch cabinet to avoid exceeding the 2000W power rating of the cabinet, which could cause more than 15°C (27°F) internal temperature rise, excessively stressing the computer and other racked equipment. Use the power requirements table on pages 6.1-2 and 6.1-3 (following the Configuration Reference Information Tab) to determine that total power dissipation inside the cabinet will not exceed 2000W.

Hardware supplied

- 2113 E-Series Computer with:
  - — CRT Terminal Loader ROM
  - — 11 available I/O channels and space for up to 2Mb of memory*
- 12992B RPL-compatible MAC Disc Loader ROM
- 12786A 128kb Std performance memory package
- 13304A Firmware Accessory Board
- 12991B Power Fail Recovery System
- 12897B Dual Channel Port Controller for DMA
- 12539C Time Base Generator
- 12966A Buffered Asynchronous Terminal Interface with cable to system console
- One-bay 56-inch cabinet

* *If option 014 is ordered along with 12788H package, 2M bytes of High Performance Memory can be provided without a 12990B Memory Extender. For other alternatives, see pages 2.4-5 through 2.4-7.*

Required hardware (must be on same order as 2176C)

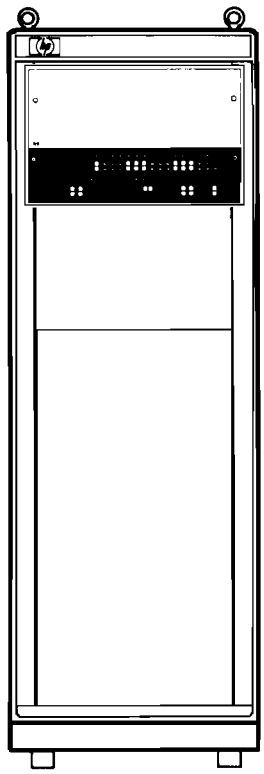
- System Console
- System Disc (19.6Mb, 50Mb, or 120Mb) and interface

Software and services included

- RTE-IVB operating system with session monitor, file manager, FORTRAN IV Compiler, Assembler, Interactive Screen Editor, Debug package, and backup utilities on compatible disc media
- HP 1000 M/E/F-Series diagnostics library on 264x minicartridges
- Complete set of hardware and software manuals
- Site preparation consultation
- On-site installation assistance and checkout including integration and test with primary system
- 90-day on-site warranty
- Six 93285A Engineering Units

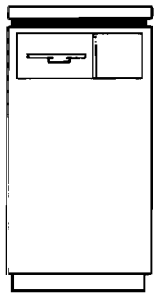
Model 60 Computer System Sample Configuration (Not EMI-Qualified)

In 56-inch Cabinet



2178A+022
System Processor Unit

2645A Display Station
with Option 007



7911P 28M byte CS/80 Fixed
Disc with built-in cartridge
tape backup

Ordering Guide for Alternate HP 1000 Model 60 Systems (Not EMI-Qualified)

A. Order HP 1000 Model 60 System Processor Unit

2178A System Processor Unit in 56-inch cabinet

ORDER ANY APPROPRIATE OPTIONS

002: Adds second 56-inch cabinet bay.

005: Cable for connection to 262x terminal used as system console (except 2621B).

006: Cable for connection to 2382A or 2621B terminal used as system console.

014: Deletes 256kb memory package, which must be replaced by other HP memory — see page 2.4-5 for details.

015: Operation from 230V/50 Hz ac power.

022: Software on CS/80 tape cartridge, 12821A+001 interface, 12992J CS/80 Disc Loader ROM, and 40017B Cabinet Stabilizer.

031: Software on 7906MR+020 Disc, 13175D interface, and 12992B RPL-compatible MAC Disc Loader ROM.

032: Software on 7920M Disc, 13175D interface, 12992B RPL-compatible MAC Disc Loader ROM, and 40017B Cabinet Stabilizer.

033: Software on 7925M Disc, 13175D interface, 12992B RPL-compatible MAC Disc Loader ROM, and 40017B Cabinet Stabilizer.

060: Software on 800 bpi mag tape in CS/80 format, 12821A+001 interface, 12992J CS/80 Disc and 12992D Mag Tape Loader ROMs, and 40017B Cabinet Stabilizer.

061: Software on 1600 bpi mag tape in CS/80 format, 12821A+001 interface, 12992J CS/80 Disc and 12992D Mag Tape Loader ROMs, and 40017B Cabinet Stabilizer.

B. Order one system/maintenance console

2645A Display Station with Option 007

2648A Graphics Terminal with Option 007

NOTE: Other system console choices (listed on page 4.1-1 following the Communications Tab) are permissible when a 264x terminal with minicartridge I/O will be readily available at the operating site to HP Customer Engineers and System Engineers for loading diagnostics and updates into the system.

C. Order one of these system discs (appropriate disc interface is obtained with software option)

7908P 16Mb CS/80 Fixed Disc with cartridge tape backup.

7911P 28Mb CS/80 Fixed Disc with cartridge tape backup.

7912P 65Mb CS/80 Fixed Disc with cartridge tape backup.

7933H† 404Mb CS/80 Fixed Disc.

7935H† 404Mb CS/80 Removable Media Disc.

7906MR+020 19.6M byte rack mounting MAC Master Cartridge Disc Memory.

7920M† 50M byte MAC Disc Memory.

7925M† 120M byte MAC Disc Memory.

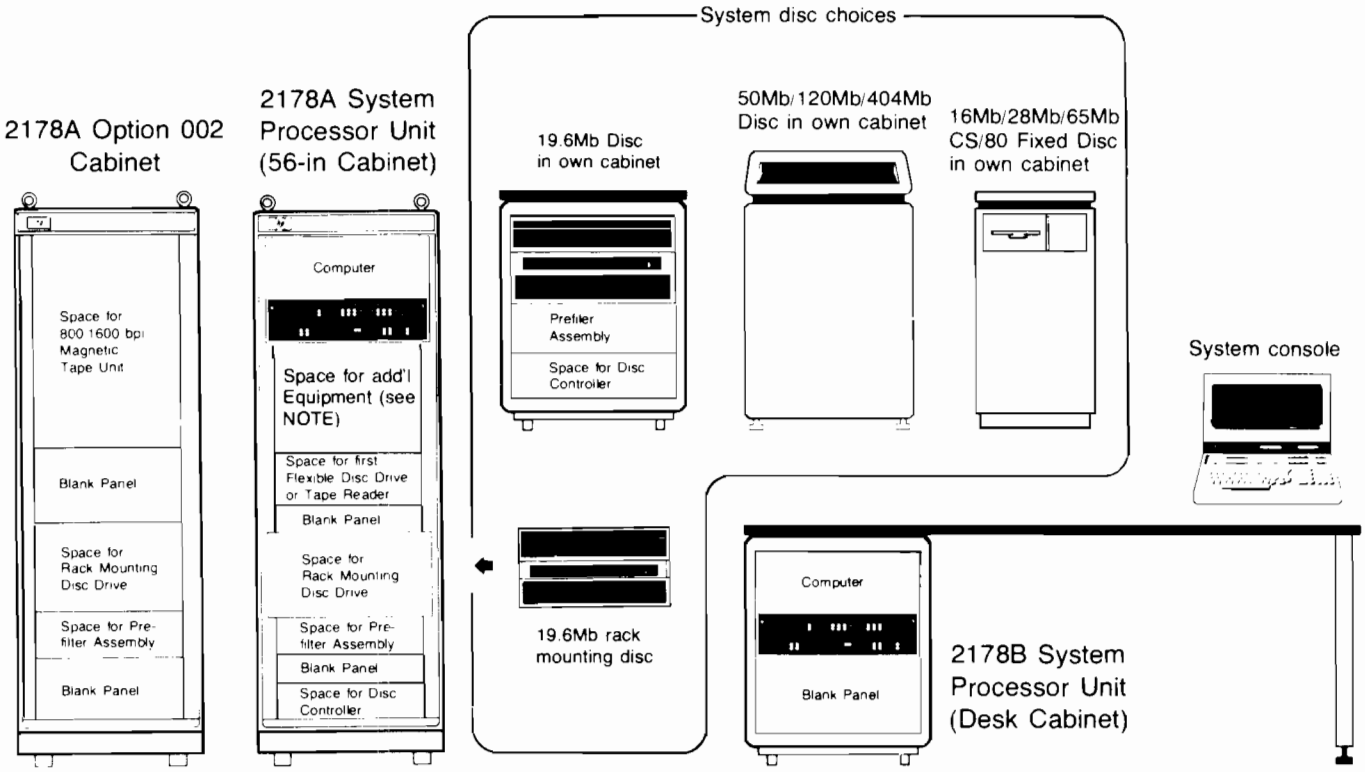
† *This disc requires 7970E Magnetic Tape Unit or another compatible 79xxP/M/MR disc for system backup or (with the 7933H/7935H disc) for the loading of system software.*

D. Order optional software (page 2.4-1) and, if necessary, order larger system memory (page 2.4-5)

E. Order Other Accessories and Interfaces (see page 2.4-8)

F. Order Additional Terminals (page 4.1-5), System-to-System Communications Capabilities (page 4.3-1), and Peripheral Devices (sections that follow the Peripheral Devices Tab)

HP 1000 Model 60 System Processor Unit (Not EMI-Qualified)



NOTE. Care must be exercised in racking additional equipment in the 56-inch cabinet to avoid exceeding the 2000W power rating of the cabinet, which could cause more than 15°C (27°F) internal temperature rise, excessively stressing the computer and other racked equipment. Use the power requirements table on pages 6.1-2 and 6.1-3 (following the Configuration Reference Information Tab) to determine that total power dissipation inside the cabinet will not exceed 2000W.

Hardware supplied

- 2113 E-Series Computer with:
  - — CRT Terminal Loader ROM
  - — 10 available I/O channels and space for up to 2Mb of memory*
- 12786B 256kb Std performance memory package
- 12791A Firmware Expansion Module
- 12991B Power Fail Recovery System
- 12897B Dual Channel Port Controller for DMA
- 12539C Time Base Generator
- 12966A Buffered Asynchronous Terminal Interface with cable to terminal
- One-bay 56-inch cabinet

* *If option 014 is ordered along with 12788H package, 2M bytes of High Performance Memory can be provided without a 12990B Memory Extender. For other alternatives, see pages 2.4-5 through 2.4-7.*

Required options and hardware (must be on same order as 2178A)

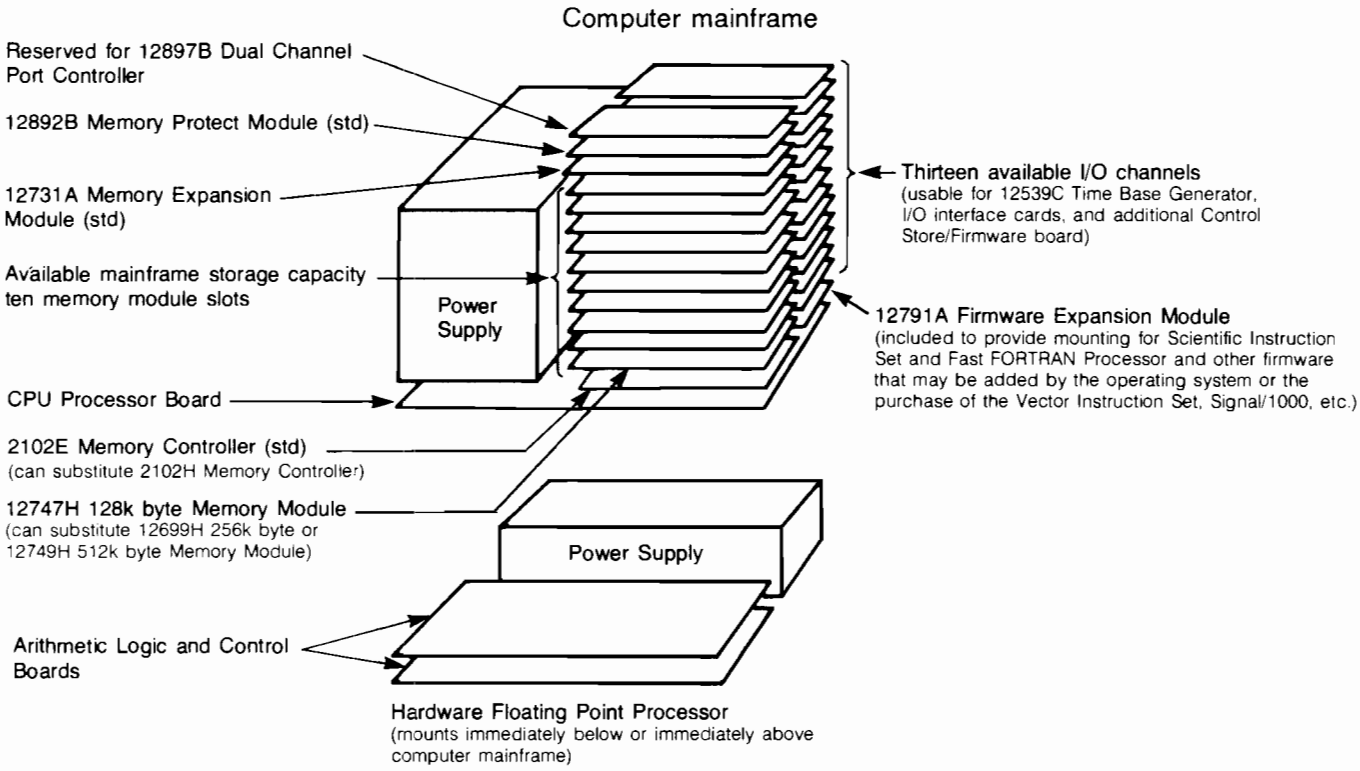
- 2178A option 022, 031, 032, 033, 060, or 061 for system software media, the appropriate disc interface, and the appropriate loader ROM
- System Console
- System disc (16Mb, 19.6Mb, 28Mb, 50Mb, 65Mb, 120Mb, or 404Mb)

Software and services included

- RTE-6/VM operating system with session monitor, file manager, Macro/1000 Assembler, Interactive Screen Editor, Debug package, and backup utilities on option-specified media
- HP 1000 M/E/F-Series on-line and off-line diagnostics on 264x minicartridges
- Complete set of hardware and software manuals
- Site preparation consultation
- On-site installation checkout, including integration and test with primary system
- 90-day on-site warranty
- Ten 93285A Engineering Units

2117F Computer

2117F Computer configuration (front view)



2117F Hardware Supplied

- 2113B Box Computer with 14 I/O channels, space for 2.048Mb of parity or fault control memory, and loader ROMs for 264x Mini cartridge and MAC Disc memory
- 12740A Floating Point Processor, which includes:
  - — Base set and Extended Instruction Group firmware ROMs
  - — Fast FORTRAN Processor and Dynamic Mapping firmware ROMs
  - — Scientific Instruction Set firmware ROMs
- 12791A Firmware expansion module (uses one I/O channel)
- 2102E High performance memory controller
- 12747H 128kb High performance memory module
- 12892A Memory protect module
- 12731A Memory expansion module

Manuals included

- 02111-90001 F-Series Operation and Reference manual
- 02111-90002 F-Series Installation and Service manual
- 02109-90004 E/F-Series Microprogramming manual
- 5955-0282 M/E/F-Series Technical Reference handbook
- 12791-90001 12791A Installation and Service manual
- 5955-4311 High Performance Memory Installation and Service manual

Options available

013: Deletes 12892B and 12731A modules and replaces 12747H 128kb memory module with 12746H 64kb memory module.

014: Deletes 2102E Memory controller and 12747H, 12892B, and 12731A modules to permit their replacement with an equal or larger amount of parity or fault control high performance memory.

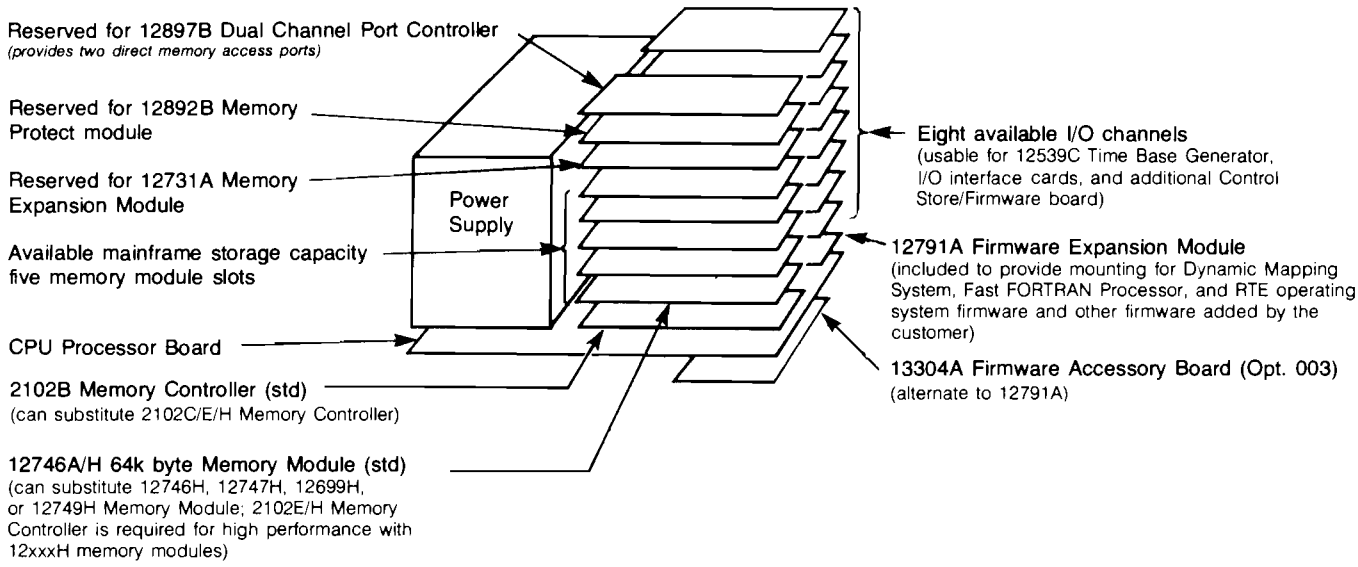
015: Operation from 230V/50 Hz ac power

Requirements for operation

See page 2.3-5.

2109E Computer

2109E Computer configuration (front view)



2109E Hardware Supplied

- 2109B Computer with 9 I/O channels, space for 2.048Mb of parity memory or 1.536Mb of fault control memory, and loader ROMs for 264x Mini cartridge and MAC disc memory
- Dynamic Mapping firmware ROMs
- 12791A Firmware expansion module (uses one I/O channel)
- 2102B Standard performance memory controller
- 12746A/H 64kb Memory module

Manuals included

- 02109-90014 E-Series Operation and Reference manual
- 02109-90015 E-Series Installation and Service manual
- 02109-90004 E/F-Series Microprogramming manual
- 5955-0282 M/E/F-Series Technical Reference handbook
- 12791-90001 12791A Installation and Service manual
- 5955-4310 Standard Performance Memory Installation and Service manual

Options available

003: Replaces 12791A Firmware Expansion Module with 13304A Firmware Accessory Board for users who need all nine of the I/O channels in the 2109E for interfaces

012: Replaces 2102B Memory controller and 12746A Memory module with 2102E High performance memory controller and 12746H 64kb High performance memory module

014: Deletes 2102B Memory controller and 12746A/H Memory module to permit their replacement with an equal or larger amount of standard performance or high performance parity or fault control memory

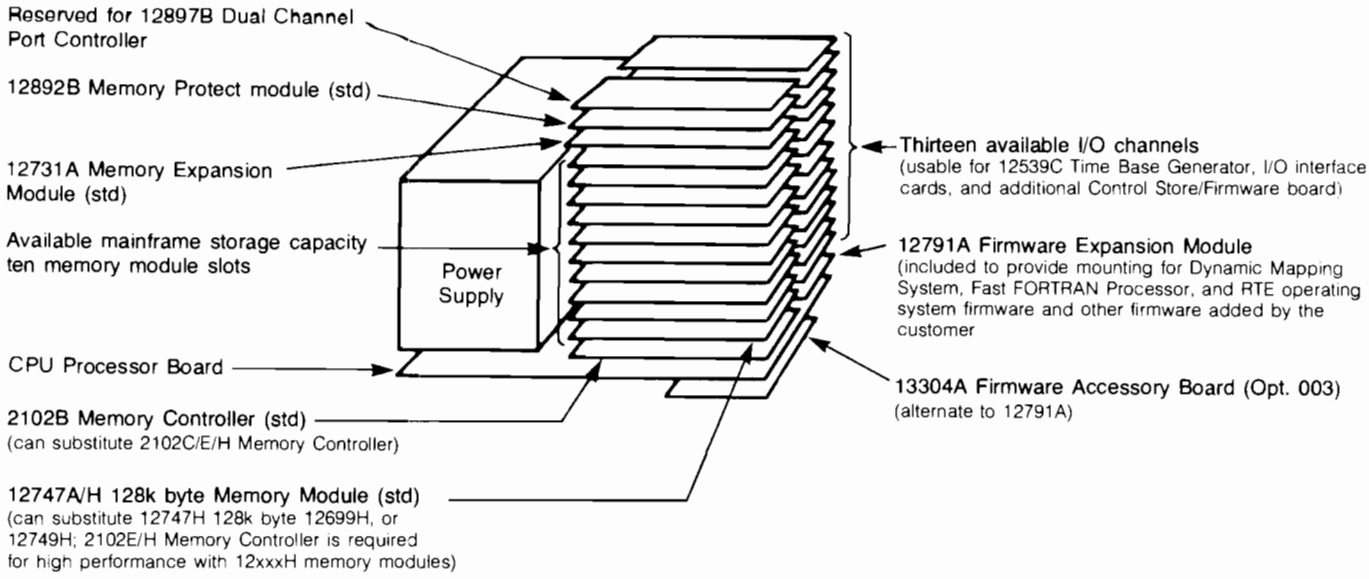
015: Operation from 230V/50 Hz ac power

Requirements for operation

See page 2.3-5.

2113E Computer

2113E Computer configuration (front view)



2113E Hardware Supplied

- 2113B Computer with 14 I/O channels, space for 2.048Mb of parity memory or fault control memory, and loader ROMs for 264x Mini cartridge tape and MAC disc memory
- Dynamic Mapping firmware ROMs
- 12791A Firmware expansion module (uses one I/O channel)
- 2102B Standard performance memory controller
- 12747A/H 128kb Memory module
- 12892B Memory Protect module
- 12731A Memory Expansion module

Manuals included

- 02109-90014 E-Series Operation and Reference manual
- 02109-90015 E-Series Installation and Service manual
- 02109-90004 E/F-Series Microprogramming manual
- 5955-0282 M/E/F-Series Technical Reference handbook
- 12791-90001 12791A Installation and Service manual
- 5955-4310 Standard Performance Memory Installation and Service manual

Options available

003: Replaces 12791A Firmware Expansion Module with 13304A Firmware Accessory Board for users who need all 14 of the I/O channels in the 2113E for interfaces

012: Replaces 2102B Memory controller and 12747A, 12731A, and 12892B modules with 2102E High performance memory controller and 12746H 64kb High performance memory module

013: Replaces 12892B, 12731A, and 12747A modules with 12746A 64kb standard performance memory module

014: Deletes 2102B Memory controller and 12746A/H, 12892B, and 12731A modules to permit their replacement with an equal or larger amount of standard performance or high performance parity or fault control memory

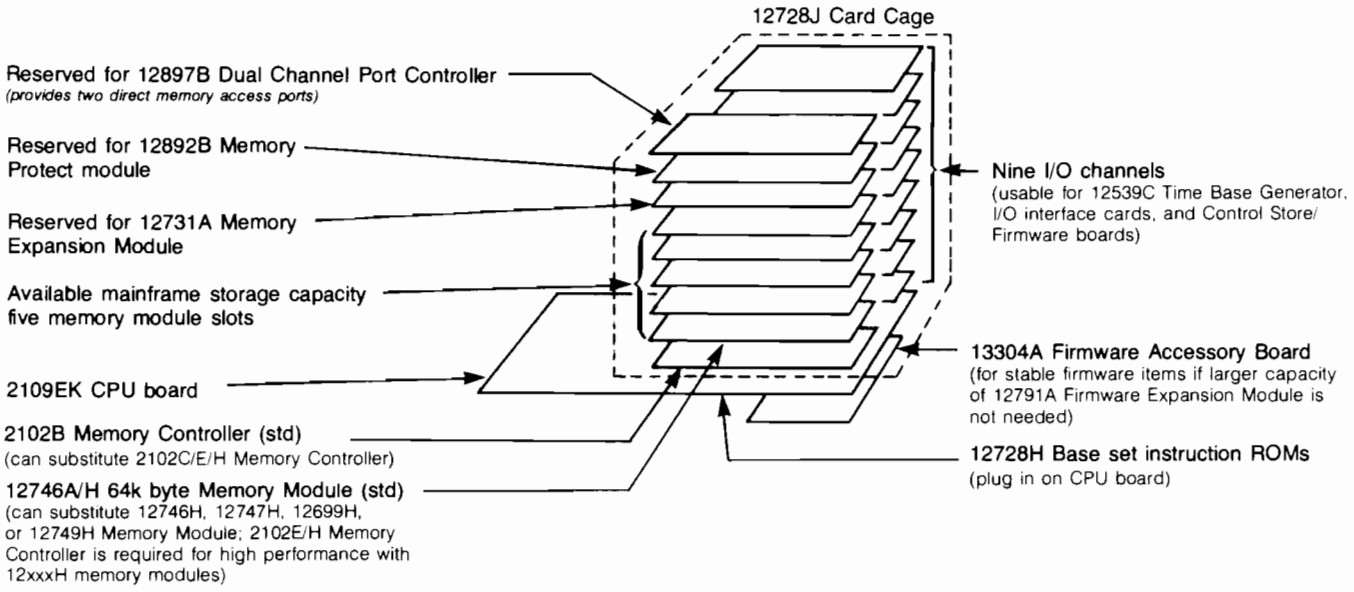
015: Operation from 230V/50 Hz ac power

Requirements for operation

See page 2.3-5.

2109EK Board Computer

2109EK BoardComputer (configuration with 18-slot card cage)



2109EK Hardware Supplied

- 2109K Board Computer with loader ROMs for 264x Mini cartridge tape and MAC disc memory
- 2102B Standard performance memory controller
- 12746A/H 64kb Memory module
- 12739B Three-connector cpu-memory cable

Documentation included

- 02108-90029 Information sheet
- 5955-4310 Standard Performance Memory Installation and Service manual

Option available

014: Deletes 2102B Memory controller, 12746A/H Memory Module, and 12739B cable to permit their replacement with an equal or larger amount of standard performance or high performance parity or fault control memory

Integration accessories available

12728G E-Series Front Panel

12728H E-Series Base Set Instruction ROMs

12728J 18-Slot Card Cage Kit (capacity for 9 I/O channels and space for 2.048Mb of parity memory, 1.536Mb of fault control memory)

Items required to make 2109EK functionally equivalent to 2109E Computer

- 2109EK Board Computer
- 12728G E-Series Front Panel
- 12728H E-Series Base Set Instruction ROMs
- 12728J 18-Slot Card Cage Kit
- 12791A Firmware Expansion Module or 13304A Firmware Accessory Board
- 13307B Dynamic Mapping Instruction ROMs
- User's power supply with 36A at +5V, 2.5A at +12V, 2A at −12V, and 6A at −2V.
- Appropriate enclosure

Requirements for operation of 2109EK that is functionally equivalent to a 2109E Computer

See page 2.3-5.

Requirements for operation of E/F-Series Computers under active RTE Operating Systems

APPLICABILITY			
RTE-6/VM	RTE-IVB	RTE-IVE	COMPUTER AND REQUIRED OPTIONS AND ACCESSORIES
FOR MEMORY-BASED DS/1000-IV NETWORK NODE WITHOUT LOCAL SYSTEM CONSOLE			
		X	2109E, 2113E, or 2117F Computer with option 014
		X	256kb or more memory (see pages 2.4-5 through 2.4-7)
		X	12539C Time Base Generator
		X	12897B Dual Channel Port Controller
		X	12944B Power Fail Recovery System for 2109E, 12991B Power Fail Recovery System for 2113E or 2117F
		X	One or more of the following DS/1000-IV interface-connect combinations: — 12794A DS/1000-IV Modem interface to HP 1000 and user-furnished modem-telephone line link — 12825A DS/1000-IV Direct connect interface to HP 1000 and 12712A/13A/14A extension kits as needed — 12830A DS/1000-IV Data Link Slave interface to HP 1000 and cable from data link master interface — 12793B DS/1000-IV Modem interface to HP 3000 and user-furnished modem-telephone line link — 12834A DS/1000-IV Direct connect interface to HP 3000 and 12712A/13A/14A extension kits as needed
		X	92068E Right to Execute RTE-IV License*
		X	91750R Right to Copy DS/1000-IV License*
		X	Other equipment interfaced to the computer
		X	Cabinet to hold computer and other equipment used with it
FOR DISC-BASED SYSTEM			
	X		2109E Computer with option 014 and 128kb or more memory (see pages 2.4-5 and 2.4-7)
	X		2113E or 2117F Computer
X	X		2109E, 2113E, or 2117F with option 014 and 256kb or more memory (see pages 2.4-5 and 2.4-7
X	X		12539C Time Base Generator
X	X		12897B Dual Channel Port Controller
X	X		12944B Power Fail Recovery System for 2109E, 12991B Power Fail Recovery System for 2113E or 2117F
X	X		12966A Buffered Asynchronous Communications interface with appropriate system console cable option
X	X		A supported system console (see pages 4.1-0 and 4.1-1)
X	X		One of the following disc-interface combinations (see pages 5.1-1 through 5.1-6) — 7908P/R, 7911P/R, 7912P/R, or 7933H CS/80 Disc with 12821A+001 Disc interface and 12992J Loader ROM (usable only in RTE-6/VM) — 7906M/MR, 7920M, or 7925M MAC Disc with 13175B MAC Disc interface — 13178C interface to second through seventh ports of a 7906M/MR, 7920M, or 7925M MAC disc that also serves another computer
X	X		92084A/R* RTE-6/VM or 92068A/R* RTE-IVB operating system (must order appropriate media option with 92084A or 92068A product)
X	X		Cabinet to hold computer and other equipment used with it

* *Prerequisite to purchase of 92068E/R or 92084R Right to Execute ("E" product) or Right to Copy ("R" product) is purchase of the 92068A or 92084A product at full list price (not with a 217x system) less applicable purchase agreement discount.*

Application and memory requirements

Optional software helps the user to customize the HP 1000 Computer System to satisfy specific application needs for operator and system-to-system communication, data base management, program development, graphics, etc. The facing table is provided to help you match optional software and additional hardware to various applications. A memory worksheet is also provided on this page from which you can make copies to use in determining what additional memory, if any, will be required for support for a specific application.

Memory requirements worksheet

Item	Memory Availability (+)/ Usage (−)
BASE SYSTEM MEMORY AVAILABILITY	
Memory included in base system	+____ kb
Less operating system usage	−____ kb
Net available for applications	+____ kb
ADDITIONAL BASE REQUIREMENTS	
A. Multiterminal communication via multiplexer	
— Base requirement	−____ kb
— Per chan −____ bytes x No. of chan ____ =	−____ kb
— Other (_____) =	−____ kb
— Other (_____) =	−____ kb
— Total	−____ kb
B. Multiterminal communication and/or Data Capture Terminal comm via multipoint line or multidrop data link	
— Base requirement −3.3 kb	
— Power fail restart subroutine −0.2 kb	
— System exerciser program −4.2 kb	
— System status program −2.5 kb	
— Total	−____ kb
C. Distributed system point-to-point comm (select one choice)	
[ ] HP 1000-to-HP 1000 only −128 kb	−____ kb
[ ] HP 1000-to-HP 3000 only −128 kb	−____ kb
[ ] HP 1000-to-HP 1000 and HP 3000 −194 kb	−____ kb
D. Distributed system data link communication	
— Multipoint/data line comm (Select B, above.)	
— Comm w/other HP 1000 or 98xx comp −128 kb	−____ kb
E. Comm via X.25 Packet-switching network −128 kb	−____ kb
F. Remote Job Entry to IBM 360/370	
— Base requirement	−____ kb
— No. of Users (7, max.) ___ x − ___ kb =	−____ kb
— Total	−____ kb
G. Data Capture	
— Multipoint/data link comm (Select B, above.)	
— Base requirement −150 kb	
— No. of sets of 5 DC terminals* ___ x 22 kb =	−____ kb
— No. of Data Bases accessed ___ x 56 kb =	−____ kb
— Interfacing to user subroutines −10 kb	
— Transaction Generator Program Resident −40 kb	
— Total	−____ kb
Any set of less than 5 DC terminals counts as 5.	
H. Data Base Management	−____ kb
I. Duplicate recording of disc cartridges for protection of data −46 kb	−____ kb
SUBTOTAL	____ kb

Item	Memory Availability (+)/ Usage (−)
SUBTOTAL FORWARD	____ kb
J. Graphics (92842A only)	
— AGP Monitor program −16 kb	
— No. of AGP Workstations ___ x −(20 to 64kb) = − ____ kb	
— Total	−____ kb
K. Process Monitoring and Control	
— Base requirement (1st operator) −896 kb	−____ kb
— No. of add'l oper (7, max.) ___ x −64 kb = − ____ kb	−____ kb
L. Programmable Controller Interfacing	
— Initialization −48 kb	
— Operational Requirements −10 kb	−____ kb
M. Quality Data Monitoring	
— Minimum −768 kb	
— Additional for over seven users −1024 kb	−____ kb
N. Measurement & Control Programming Support −25 kb	−____ kb
O. Program activity profiling −30 kb	−____ kb
P. On-line diagnostics and verification (−28 kb)	−____ kb
MULTI-USER PARTITION REQUIREMENTS (Assume a mix of various user operations, so many editing, compiling, debugging, loading, accessing an Image data base, etc., at the same time, then calculate the total multiple partition requirements for each operation, below.)	
Operation — **No. of Users** — **Required Partition Size**	
Editing ___ x −36 kb =	−____ kb
BASIC/1000C/D Interpreter ___ x −___ kb =	−____ kb
BASIC/1000C Compiler ___ x −___ kb =	−____ kb
FORTRAN Compiler ___ x −___ kb =	−____ kb
Pascal/1000 Compiler ___ x −___ kb =	−____ kb
Symbolic Debug/1000 ___ x −64 kb =	−____ kb
Microprogram Development ___ x −___ kb =	−____ kb
Local Data Base user ___ x −___ kb =	−____ kb
Remote Data base user ___ x −___ kb =	−____ kb
Execution of user's application ___ x −___ kb =	−____ kb
Execution of user's application ___ x −___ kb =	−____ kb
Execution of user's application ___ x −___ kb =	−____ kb
LARGE MEMORY DATA ARRAY STORAGE REQUIREMENTS (As encountered in graphics and other signal processing applications)	
Data Type — **No. of Array Elements** — **Bytes Per Element**	
Single Precision Fixed Point ___ x 2 =	−____ kb
Double Precision Fixed Point ___ x 4 =	−____ kb
Single Precision Floating Point ___ x 4 =	−____ kb
Extended Precision Floating Point ___ x 6 =	−____ kb
Double Precision Floating Point ___ x 8 =	−____ kb
Complex ___ x 8 =	−____ kb
NET TOTAL AVAILABLE (+)/REQUIRED (−)	____ kb
ADDITIONAL MEMORY TO BE ORDERED (should leave about 32kb available for drivers, SAM, etc.) See page 2.4-5.	____ kb

Application Requirements for Optional Software, Memory, and Additional Hardware in E/F-Series Systems

Application	Optional Software Required	Approx. Memory Avail. (+)/ Req'd (−) Model 40/45 System RTE-IVB	Approx. Memory Avail. (+)/ Req'd (−) Model 60/65 System RTE-6/VM	Additional Hardware Required
BASIC SYSTEM MEMORY AVAILABILITY				
— Base system memory		+128kb	+256kb	
— Less operating system usage		−62kb	−86kb	
— Net avail. for applications		+66kb	+170kb	
COMMUNICATIONS				
MULTI-TERMINAL COMMUNICATIONS VIA 8-CHANNEL MULTIPLEXER at terminal rates to 960 cps (no support for Mini cartridge I/O or modem control)	Software is incl. in op sys — Base requirement — Per channel	 −3.1kb −72 bytes	 −3.1kb −72 bytes	12792B 8-Channel Multiplexer with multiplexer panel, terminals, and cables (see pages 4.1-4 through 4.1-7 and 4.1-11 through 4.1-13)
MULTI-TERMINAL COMMUNICATIONS VIA 16-CHANNEL MULTIPLEXER at terminal rates to 240 cps with support for Mini cartridge I/O and modem control	**91731A Multiplexer software** — 16 Char mode channels — 16 Char or block mode channels — Add-1 for Mini cartridge I/O — Add'l for 16 more channels — Per configured channel	 −3.8kb −5.8kb −1kb −0.6kb −52 bytes	Not supported	12920B 16-Channel Multiplexer, 12620A used as Privileged Interrupt Fence, terminals, and cables (see pages 4.1-4 through 4.1-7 and 4.1-11)
MULTI-TERMINAL COMMUNICATIONS VIA MULTIPOINT/DATA LINE INTERFACE	**91730A Multipoint software▶** — Base requirement — Power fail restart subr — System exerciser program — System status program	 −3.3kb −0.2kb −4.2kb −2.5kb	 −3.3kb −0.2kb −4.2kb −2.5kb	12790A Multipoint interface, terminals, and cables (see pages 4.1-4 through 4.1-7 and 4.1-12)
DISTRIBUTED SYSTEM POINT-TO-POINT COMMUNICATIONS BETWEEN HEWLETT-PACKARD systems	**91750A DS/1000-IV Network Software** — Communication with other HP 1000 only — Communication with HP 3000 only — Communication with both HP 1000 and HP 3000	 −128kb −128kb −192kb	 −128kb −128kb −192kb	12794B or 12825A interface and modems or cables to other HP 1000 system; 12793B or 12834A interface and modems or cables to HP 3000 system (see pages 4.3-1 through 4.3-6)
DISTRIBUTED SYSTEM DATA LINK COMMUNICATIONS BETWEEN HEWLETT-PACKARD SYSTEMS	**91730A Multipoint/Data Link Software** for master sys, as specified above, and **91750A DS/1000-IV Network Software** for HP 1000 Master or Slave systems. — Comm with other HP 1000 or HP 98xx Computer	 −128kb	 −128kb	12790A Multipoint/Data Link interface w/3074A Data Link Adapter for Master sys, 12830A Data Link interface for Slave sys on the data link (see pages 4.3-1 through 4.3-6)
COMMUNICATION BETWEEN HEWLETT-PACKARD SYS AND PACKET SWITCHED NETWORKS	**91751A DSN/X.25 Communications** software (usable with or without 91750A software).	Not supported	−128kb	12250A interface and modems
MULTILEAVING REMOTE JOB ENTRY COMMUNICATION WITH IBM 360 SYSTEMS VIA HASP EMULATION	**91782A DSN/MRJE Remote Job Entry package** — Base requirement — Additional per user (max. of 7 users)	Not supported	 −96kb −6kb	12260A interface
REMOTE JOB ENTRY COMMUNICATION WITH IBM 360/370 SYSTEM VIA 2780 EMULATION	**91780A RJE/1000 Remote Job Entry package** (single-user operation only)	−20kb	−20kb	91780A includes a two-card interface, but also requires 12620A used as privileged interrupt fence

▶ = *91730A Multipoint software can be used for multipoint terminal communication, DATACAP communication, and/or data link communication; regardless of use, only one copy of 91730A software is required per system.*

Application Requirements for Optional Software, Memory, and additional Hardware in E/F-Series Systems, continued

Application	Optional Software Required	Approx. Memory Avail. (+)/ Req'd (−) Model 40/45 System RTE-IVB	Model 60/65 System RTE-6/VM	Additional Hardware Required
DATA BASE MANAGEMENT				
DATA BASE MANAGEMENT WITH ON-LINE QUERY CAPABILITY	**92081A Image/1000-II** *– (Not supported in 91747A Datashare/1000 environment.)*			7970B/E+226/236 Magnetic Tape subsystem (see pages 5.5-1 and 2) or second disc drive (see pages 5.1-1 thru 5.1-4) for data base backup and logging/ recovery and a 2608A/S or 261xA Line Printer for fast printout of reports (see pages 5.2-1 thru 5.2-4)
	— Minimum system	Not supported	−304kb	
	— Additional per local user		−64kb*	
	— Full-blown system		−750kb	
	— Additional per remote user		−48kb*	
	92069A Image/1000			
	— Minimum system	−15kb	−15kb	
	— Additional per local user	−64kb*	−64kb*	
	— Full-blown system	−84kb	−84kb	
	— Additional per remote user	−48kb*	−48kb*	
RELIABILITY AND COMPUTATIONAL ENHANCEMENT SOFTWARE				
DUPLICATE RECORDING OF DISC CARTRIDGES FOR DATA PROTECTION	**91745A Datasafe/1000**	Not supported	−46kb	79xxM/P/R/H disc (Note A)
MULTI-COMPUTER SHARING OF DISC SPACE FOR REDUNDANT COMPUTER CONFIGURATIONS	**91747A Datashare/1000**	Not supported	NAM	79xxM Multi-Access Controller Discs only
VECTOR/MATRIX PROCESSING	**12824A Vector Instruction Set** for RTE-IVB (included in Model 45 System. Note C)	Note B	Not supported	Not applicable
	12829A Vector Instruction Set for RTE-6/VM (included in Model 65 System. Note C)	Not supported	Note B	Not applicable
DIGITAL SIGNAL PROCESSING	**92835A Signal/1000**	Note B	Note B	12824A or 12829A Vector Instruction Set firmware in Model 45 or 65 System or 2117F Computer
GRAPHICS AND CIRCUIT SIMULATION SOFTWARE				
TWO-DIMENSIONAL PLOTTING	**92840A Graphics/1000 Graphics Plotting Software** (MATURE, not recommended for new applications)	Note D	Not supported	One or more graphics devices (see page 5.3-1)
GENERAL GRAPHICS PROGRAMMING	**92841A Graphics/1000-II Device-Independent Graphics Library (DGL)**	Note D	Note D	One or more graphics devices (see page 5.3-1)

* = *Partition space required for each concurrently-active user of this software.*

NAM = No Additional Memory required.

NOTE A: The individual cartridges of a duplicate pair can be on different physical discs, provided that both physical discs have the same number of sectors per track. See following Sectors per track (disc product number list): 35 (7908P/R), 48 (7906M/H, 7920M/H, 7905A), 64 (7911P/R, 7912P/R, 7925M/H), 92 (7933H, 7935H).

NOTE B: Although the Vector Instruction Set and Signal/1000 do not of themselves have a program-independent memory requirement, they will normally be used in applications with very large data arrays, up to a megabyte or more.

NOTE C: Software equivalents of the 12824A/12829A Vector Instruction Set are usable in the Model 40 and 60 Systems and 2109E and 2113E Computers; firmware is included in the Model 45 and 65 Systems and is usable in the 2117F Computer.

NOTE D: Graphics subroutines of the 92840A, 92841A, and 92842A Graphics software packages are incorporated into user's programs and therefore have no independent memory requirements. Graphics programs usually require 16-54kb. However, 2608A/S operation with 92841A requires a 48kb partition for vector-to-raster conversion.

Application Requirements for Optional Software, Memory, and Additional Hardware in E/F-Series Systems, continued

Application	Optional Software Required	Approx. Memory Avail. (+)/ Req'd (−) Model 40/45 System RTE-IVB	Model 60/65 System RTE-6/VM	Additional Hardware Required
GRAPHICS AND CIRCUIT SIMULATION SOFTWARE, continued				
INTERACTIVE AND THREE-DIMENSIONAL GRAPHICS	**92842A Graphics/1000-II Advanced Graphics Package** and **92841A DGL**			One or more graphics devices (see page 5.3-1)
	— Monitor program	−16kb‡	−16kb‡	
	— Each Workstation	−(20-64)kb*	−(20-64)kb*	
	— User's programs	Note D	Note D	
CIRCUIT SIMULATION	**92091A HPSPICE Circuit Simulation Software** and **92841A DGL**	Not supported	−768kb	One or more graphics terminals and graphics plotter (see page 5.3-1)
MANUFACTURING APPLICATIONS SOFTWARE				
PROCESS MONITORING AND CONTROL	**92120A HP Process Monitoring and Control/1000 (PMC/1000) & 92841 DGL**	Not supported		2627A Color Graphics Terminal, 2608S Line Printer, and 2250 Measurement and Control Processor in addition to base requirements for RTE-6/VM based system
	— Base requirement (1st Oper)		−896kb	
	— Six additional operators		−512kb	
	— Up to 20,000 addressable inputs, 4000 addressable blocks, or 600 trends		−512kb	
PROCESS CONTROL INTERFACE TO THE ALLEN-BRADLEY DATA HIGHWAY	**92140A Programmable Controller Link/1000-AB (PCL/1000-AB)**	Not supported		12661A Multiplexer Interface and 12828A Multiplexer Panel in addition to appropriate Allen-Bradley hardware
	— Initialization		−48kb	
	— Driver		−3.3kb	
	— Monitor programs		−6kb	
QUALITY DATA MONITORING, ANALYSIS, AND REPORTING	**92130A HP Quality Decision Management/1000, 92069A Image/1000, 92841A Graphics/1000-II Device-Independent Graphics Library,** and **91730A Multipoint Software**	Not supported		262xA Graphics Terminal, 79xxP/R, 7920M/25M, or 7933H/35H disc, 2608S+210 or 2631B+210 Printer, 9872C/T, 7470A+002, 7580B or 7585B Plotter with 59310B interface, 12792A/B Multiplexer for every 8 terminals, and one 12790A Multipoint interface with 3074A/M Data Link Adapter and data link conn accessories as needed to connect terminals, 7970B+226/236 Mag Tape Subsystem, and 262x terminals
	— Minimum		−768kb	
	— Additional for over seven devices		−1024kb	
DATA CAPTURE VIA MULTIPOINT LINE AND/OR DATA LINK	**92080A DATACAP/1000-II Data Capture Software** and **91730A Multipoint Software**			12790A 16-Channel Multipoint interface, up to 55 307x Data Capture terminals, in RTE-IVB, up to 92 in RTE-6/VM, and cables with or without 3074A/M data Link Adapter (see pages 4.2-1 and 4.2-2)
	— Base requirement	−150kb	−150kb	
	— Buffering for each set of 5 DC Terminals	−22kb	−22kb	
	— Add'l per Image/1000 data base	−56kb	−56kb	
	— Add'l for user subroutines	−10kb	−10kb	
	— Transaction generator program	−40kb†	−40kb†	
MEASUREMENT AND CONTROL				
MEASUREMENT AND CONTROL PROGRAMMING SUPPORT	**92066A RTE Measurement and Control Software Package**	−25kb	−25kb	2313B/91000A Analog I/O Subsystem and/or 6940B Multiprogrammer interfaced to system
MEASUREMENT AND CONTROL COMPUTATION SUPPORT	**92400A Sensor-Based DAS Utility Library**	Note E	Note E	Not applicable

* = *Partition space required for each concurrently active user of this software.*

‡ = *Single partition required to support 92842A Advanced Graphics software.*

† = *Additional partition recommended to minimize swapping and maximize throughput and user productivity.*

NOTE E: 92400A Sensor-Based DAS Library subroutines are incorporated into user's programs and therefore have no independent memory requirements.

Application Requirements for Optional Software, Memory, and Additional Hardware in E/F-Series Systems, continued

Application	Optional Software Required	Approx. Memory Avail. (+)/ Req'd (−) Model 40/45 System RTE-IVB	Model 60/65 System RTE-6/VM	Additional Hardware Required
DIAGNOSTICS				
OFF-LINE DIAGNOSTICS	**24396A-F Diagnostics Library** (included in Model 40, 45, 60, and 65 Systems)	NAM	NAM	Not applicable
ON-LINE DIAGNOSTICS AND VERIFICATION	**91711B On-Line Diagnostics and Verification Package** (included in Model 40, 45, 60, and 65 Systems)	−28kb	−28kb	
PROGRAM DEVELOPMENT				
INTERACTIVE SCREEN EDITING	Editor is included with the operating system	−36kb*	−36kb*	Not applicable
BASIC LANGUAGE PROGRAMMING	**92857A BASIC/1000C** — Interpreter's Editor — Interpreter's Executor — Compiler	Not supported	−64kb* −352kb* −196kb*	Not applicable
	92101A BASIC/1000D (Interpreter only)	−28kb* Note F	−28kb* Note F	Not applicable
FORTRAN PROGRAMMING	**92836A FORTRAN 77 Compiler** (2500-4000 Lines/minute) — Up to 2000 line program — Up to 5000 line program	Not supported	−46kb* −64kb*	Not applicable
	92834A FORTRAN 4X Compiler (2000-3000 Lines/minute — Up to 2000 line program — Up to 5000 line program	−38kb* −56kb*	Not supported	Not applicable
PASCAL PROGRAMMING (For compilation speed − memory usage tradeoffs, see the Pascal/1000 Configuration Guide, 92833-90003 or 92832-90003)	**92833A Pascal/1000 Compiler** — Pascal Monitor — For 250 lines/min speed — For 1,200 lines/min speed	Not supported	−42kb* −80kb* −400kb*	Not applicable
	92832A Pascal/1000 Compiler — Pascal Monitor — For 50 lines/min speed — For 400 lines/min speed	−34kb* −84kb* −440kb*	Not supported	Not applicable
PROGRAM DEBUGGING	**92860A Symbolic Debug/1000**	Not supported	−64kb	Not applicable
	Less-capable debug utility included with the operating system	−8kb	−8kb	Not applicable
ON-LINE PROGRAM LOADING	On-line relocating loader is included with the operating system	−(32-40)kb*	−(32-40)kb*	Not applicable
PROGRAM ACTIVITY PROFILING (Only one profiling operation can be active in the system at a time)	**92083A RTE Profile Monitor**	−30kb	−30kb	2608A/S or 261xA Line Printer (see pages 4.2-1 through 4.2-4)
MICROPROGRAM DEVELOPMENT (Only one microprogram development operation can be active in the system at a time)	**92061A RTE Microprogramming Package** — Microprog development — WCS Driver DVR36	−36kb* −2.1kb	−36kb* −2.1kb	13197A Writable Control Store Board

* = *Partition space required for each concurrently active user of this software.*

NOTE F: Additional space for user's program and data could increase partition space required for 92101A BASIC/1000D to as much as 56kb.

NAM = No Additional Memory required.

E/F-Series System Memory Changes and Expansion

Changes and expansion applicable to initial order

HP 1000 E/F-Series Computer Systems are equipped with 128kb or 256kb of memory. High performance memory in E-Series Systems, more memory, and/or fault control memory can be provided by specifying 217x Option 014 to delete the memory normally supplied with the base system, permitting its replacement with a different or expanded configuration, as shown in the next four tables. Information for later configuration changes and/or expansion follows these four tables.

Ordering Summary for
STANDARD PERFORMANCE PARITY MEMORY
Used in HP 1000 E-Series Systems only

Memory Size	Order
256kb	12786B 256kb Memory Package
384kb	12786B 256kb Memory Package 12747A*/H 128kb Memory Module
512kb	12786C 512kb Memory Package
640kb	12786C 512kb Memory Package 12747A*/H 128kb Memory Module
768kb	12786C 512kb Memory Package 2 x 12747A*/H 128kb Memory Modules
896kb	12786C 512kb Memory Package 3 x 12747A*/H 128kb Memory Modules
1024kb	12786D 1024kb Memory Package
1152kb	12786D 1024kb Memory Package 12747A*/H 128kb Memory Module
1280kb	12786D 1024kb Memory Package 2 x 12747A*/H 128kb Memory Modules
NOTE: The following Memory sizes cannot be accommodated in Desk Cabinet systems because there is no space in the desk cabinet for the 12990B Memory Extender. A full 2M bytes of high performance memory can be accommodated without the memory extender in either type of cabinet (see page 2.4-6).	
1408kb	12786D 1024kb Memory Package 3 x 12747A*/H 128kb Memory Modules 12990B Memory Extender
1536kb	12786D 1024kb Memory Package 4 x 12747A*/H 128kb Memory Modules 12990B Memory Extender
1792kb	12786D 1024kb Memory Package 6 x 12747A*/H 128kb Memory Modules 12990B Memory Extender
2048kb	12786D 1024kb Memory Package 8 x 12747A*/H 128kb Memory Modules 12990B Memory Extender

Ordering Summary for
STANDARD PERFORMANCE FAULT CONTROL MEMORY
Used in HP 1000 E-Series Systems only

Memory Size	Order
128kb	12787A 128kb Memory Package
256kb	12787B 256kb Memory Package
384kb	12787B 256kb Memory Package 12747A*/H 128kb Memory Module 12779A*/H 256kb FC Check Bit Board
512kb	12787C 512kb Memory Package
640kb	12787C 512kb Memory Package 12747A*/H 128kb Memory Module 12779A*/H 256kb FC Check Bit Board
768kb	12787C 512kb Memory Package 2 x 12747A*/H 128kb Memory Modules 12779A*/H 256kb FC Check Bit Board
896kb	12787C 512kb Memory Package 3 x 12747A*/H 128kb Memory Modules 2 x 12779A*/H 256kb FC Check Boards
1024kb	12787D 1024kb Memory Package
NOTE: The following Memory sizes cannot be accommodated in Desk Cabinet systems because there is no space in the desk cabinet for the 12990B Memory Extender. A full 2M bytes of high performance memory can be accommodated without the memory extender in either type of cabinet (see page 2.4-6).	
1152kb	12787D 1024kb Memory Package 12747A*/H 128kb Memory Module 12779A*/H 256kb FC Check Bit Board 12990B Memory Extender
1280kb	12787D 1024kb Memory Package 2 x 12747A*/H 128kb Memory Modules 12779A*/H 256kb FC Check Bit Board 12990B Memory Extender
1408kb	12787D 1024kb Memory Package 3 x 12747A*/H 128kb Memory Modules 2 x 12779A*/H 256kb FC Check Boards 12990B Memory Extender
1536kb	12787D 1024kb Memory Package 4 x 12747A*/H 128kb Memory Modules 12780A*/H 512kb FC Check Bit Board 12990B Memory Extender
1792kb	12787D 1024kb Memory Package 6 x 12747A*/H 128kb Memory Modules 12779A*/H 256kb FC Check Bit Board 12780A*/H 512kb FC Check Bit Board 12990B Memory Extender

Ordering Summary for
HIGH PERFORMANCE PARITY MEMORY
Used in HP 1000 E/F-Series Systems

Memory Size	Order
128kb	12788A 128kb Memory Package
256kb	12788BB 256kb Memory Package
384kb	12789BB 256kb Memory Package 12747H 128kb Memory Module
512kb	12788E 512kb Memory Package
640kb	12788E 512kb Memory Package 12747H 128kb Memory Module
768kb	12788E 512kb Memory Package 12699H 256kb Memory Module
896kb	12788E 512kb Memory Package 12699H 256kb Memory Module 12747H 128kb Memory Module
1024kb	12788F 1024kb Memory Package
1152kb	12788F 1024kb Memory Package 12747H 128kb Memory Module
1280kb	12788F 1024kb Memory Package 12699H 256kb Memory Module
1408kb	12788F 1024kb Memory Package 12699H 256kb Memory Module 12747H 128kb Memory Module
1536kb	12788G 1536kb Memory Package
1792kb	12788G 1536kb Memory Package 12699H 256kb Memory Module
2048kb	12788H 2048kb Memory Package

Ordering Summary for
HIGH PERFORMANCE FAULT CONTROL MEMORY
Used in HP 1000 E/F-Series Systems

Memory Size	Order
128kb	12789A 128kb Memory Package
256kb	12789B 256kb Memory Package
384kb	12789B 256kb Memory Package 12747H 128kb Memory Module 12779H 256kb FC Check Bit Board
512kb	12789J 512kb Memory Package
1024kb	12789K 1024kb Memory Package
1536kb	12789L 1536kb Memory Package
2048kb	12789M 2048kb Memory Package

NOTE: Other 12788x and 12789x Memory packages are available, but are not recommended because of their higher usage of memory module space and computer power supply current.

Memory configuration changes and expansion applicable to existing E-Series System

Maximum system memory capacity

HP 1000 E/F-Series Systems have 10 memory module slots, which are sufficient to accommodate up to 2 Megabytes of parity or fault control memory based on 64k RAMs in the computer's memory section. However, +5V(M) current limitations may preclude use of all of the memory module slots in the computer. For configurations of more than six memory cards, check bit boards, calculate total +5V(M) current usage to assure that it does not exceed available +5V(M) current (page 6.1-7). The 2109E Computer has 5 memory module slots, which are sufficient to accommodate up to 2 Megabytes of parity memory or 1.5 Megabytes of fault control memory based on 64k RAMs in its memory section.

Additions to Parity Memory

128k byte (12747A*/H), 256k byte (12699H), and 512k byte (12749H) memory modules can be used together in the same system. However, the 12747H 128k byte, 12699H 256k byte, and 12749H 512k byte memory modules support high performance memory access only when used with a high performance memory controller. Any of the memory module combinations listed under the Memory Module columns in the table on page 2.4-7 can be used.

* *NOTE: The 1274xA, 12779A, and 12780A are mature products that are scheduled to be discontinued in less than a year. They are not recommended for new applications.*

Change from standard performance memory to high performance memory in E-Series

This change involves the replacement of the 2102B/C Standard Performance Parity/Fault control Memory Controller with a 2102E/H High Performance Parity/Fault Control Memory Controller and replacement of 12746A/12747A Standard Performance Memory Modules with one or more 12749H/12699H 512k/256k byte High Performance Memory Modules (or 12747H/12746H 128k/64k byte High Performance Memory Modules if less than 384k bytes of memory is involved).

Change from parity memory to fault control memory

This change involves the replacement of the 2102B/E Memory Controller with a 2102C (Standard Performance) or 2102H (High Performance) fault control memory controller and the addition of appropriate Fault Control Check Bit Array Boards, 12779A*/H (256kb), 12780A*/H (512kb), and/or 12666H (1Mb) check bit boards. Use the fault control memory configurations and additions worksheet table at right to determine the appropriate combination of fault control check bit array boards and 12749H 512k byte and/or 12699H 256k byte high performance memory modules and/or 12747A*/H 128k byte memory modules. H-Suffix memory modules and fault control check bit boards and the 2102H Memory Controller are required for high performance.

Fault control memory additions

NOTE: When adding to existing memory, always use the highest capacity memory boards. If total memory and fault cards will exceed 6, calculate total +5V(M) current (using information on page 6.1-7 to make sure it does not exceed the +5V(M) current available in the system).

Additions to fault control memory are most easily determined by reference to the worksheet table at right. As shown in the "sample memory additions calculation" section, you use the space for "your memory additions calculation" to:

1. Note the memory size you want to expand to **(A. Memory desired).**
2. Note the amount of fault control memory you now have **(B. Existing memory).**
3. For each of these memory sizes, A and B, transcribe the number of 12749H, 12699H, and/or 12747A*/H Memory Modules and 12779A*/H, 12780A*/H, and/or 12666H check bit boards required. Note that several different memory configurations are listed for the larger memory sizes. This is done to cover various possible combinations of 512k byte and 128k byte memory modules for those memory sizes.
4. Subtract the **Existing Memory** numbers from the **Memory Desired** numbers to determine the number of each additional component that must be ordered.
5. Order additional memory components.

Fault control memory configurations and memory additions worksheet

Fault control memory sizes and description	Memory Modules			Check Bit Bds		
	12749H 512kb	12699H 256kb	12747A*/H 128kb	12779A*/H 256kb	12780A*/H 512kb	12666H 1Mb
128k bytes (12787A/89A package)	0	0	1	1	0	0
256k bytes (12787B/89B package)	0	0	2	1	0	0
256k bytes	0	1	0	1	0	0
384k bytes	0	0	3	2	0	0
384k bytes	0	1	1	2	0	0
512k bytes (12789J package)	1	0	0	0	0	1
512k bytes (12789E package)	1	0	0	0	1	0
512k bytes (12787C/89C package)	0	0	4	0	1	0
512k bytes	0	1	2	0	1	0
768k bytes	1	0	2	1	0	1
768k bytes	1	1	0	1	1	0
768k bytes	0	2	2	1	1	0
768k bytes	0	1	4	1	1	0
1024k bytes (12789K package)	2	0	0	0	0	1
1024k bytes (12789F package)	2	0	0	0	2	0
1024k bytes	1	2	0	0	2	0
1024k bytes	1	1	2	0	2	0
1024k bytes	1	0	4	0	2	0
1024k bytes (12787D/89D package)	0	0	8	0	2	0
1280k bytes	2	1	0	1	0	1
1280k bytes	2	0	2	1	2	0
1280k bytes	1	2	2	1	2	0
1280k bytes	1	1	4	1	2	0
1536k bytes (12789L package)	3	0	0	0	0	2
1536k bytes (12789G package)	3	0	0	0	3	0
1536k bytes	2	1	2	0	1	1
1792k bytes	3	1	0	1	0	2
1792k bytes	3	0	2	1	3	0
1792k bytes	2	1	4	1	3	0
2048k bytes (12789M package)	4	0	0	0	0	2
SAMPLE MEMORY ADDITIONS CALCULATION						
A. Memory Desired = 1280 k bytes	1	1	4	1	2	0
B. Existing Memory = 512 k bytes	—	—	4	—	1	0
No. of components to be added (A-B)	1	1	0	1	1	—
YOUR MEMORY ADDITIONS CALCULATION						
A. Memory Desired = _____ k bytes	—	—	—	—	—	—
B. Existing Memory = _____ k bytes	—	—	—	—	—	—
No. of components to be added (A-B)	—	—	—	—	—	—

* *NOTE: The 1274xA, 12779A, and 12780A are mature products that are scheduled to be discontinued in less than a year. They are not recommended for new applications.*

Accessories and Interfaces for E/F-Series Systems and Computers

Accessory or Interface Product Number and Name	Purpose	Prerequisites
LOADER ROMS (NOTE: Only two of four loader ROM sockets in the computer are available for addition of Loader ROMs unless an existing ROM is removed to make another socket available)		
12992B RPL-COMPATIBLE MAC DISC LOADER ROM	Supports remotely/locally-initiated binary load from 7906M/20M/25M disc	217x System or 2109E/13E/17F Computer with 79xxM disc
12992D MAG TAPE LOADER ROM	Supports initial binary load from 800/1600 bpi Magnetic Tape Subsystem	217x System or 2109E/13E/17F Computer with 7970B/E+226/236 or 7971A+2xx Magnetic Tape Subsystem
12992J CS/80 DISC LOADER ROM	Supports initial binary load from 7908/11/12/14P/R or 7933H/7935H Disc	2109E/13E/17F Computer with 7908/11/12/14P/R or 7933H or 7935H Disc (included in 217x system with Option 022)
12992K PAPER TAPE LOADER ROM	Supports initial binary load from 12925A Punched Tape Reader Subsystem (obsolete)	217x System or 2109E/13E/17F Computer with 12925A Punched Tape Reader Subsystem
FIRMWARE AND MICROPROGRAMMING SUPPORT HARDWARE		
12791A FIRMWARE EXPANSION MODULE (FEM) (Maximum of two FEMs per system or computer)*	Provides convenient socket mounting for eight blocks of non-volatile control memory (512k words/block with 4k ROMs, 1024 words/block with 8k ROMs), for HP or user-developed control store microprograms	217x System or 2109E/13E/17F Computer (one FEM is standard, except with 2176A, which includes 13304A Firmware Accessory Board
13306B FAST FORTRAN PROCESSOR (FFP)@ (firmware)	Speed-up of extended precision calculations, floating point conversions, array mapping, and subroutine parameter passing	2176x or 2178x System or 2109E/13E Computer (this capability is included in 2177x and 2179x Systems and 2117F Computer)
12824A VECTOR INSTRUCTION SET (VIS), firmware and software equivalents@ -002: Deletes firmware (provides software equivalents and manuals)	Supports fast processing of data arrays in system operating under RTE-IVB/IVE For use in E-Series Systems and Computers to provide transportability of programs using VIS	2117F Computer operating under RTE-IVB/IVE (12824A VIS is included in 2177x System) 2176x System or 2109E or 2113E Computer operating under RTE-IVB/IVE
12829A VECTOR INSTRUCTION SET (VIS), firmware & software equivalents@ -001: Deletes firmware (provides software equivalents and manuals at a discount for customer not supported under 12824T/S) -002: Same as Opt 001, but for customer supported under 12824T/S	Supports fast processing of data arrays in system operating under RTE-6/VM For use in E-Series Systems and Computers to provide transportability of programs using VIS	2117F Computer operating under RTE-6/VM (12829A VIS is included in 2179x System) 2178x System or 2109E or 2113E Computer operating under RTE-6/VM
13197A WRITABLE CONTROL STORE (WCS) (maximum of three WCS cards per system or computer)*	Provides two 512 word blocks of control store overlay memory for microprogram development and dynamic control store overlaying	217x System or 2109E/13E/17F Computer operating under RTE-IVB or RTE-6/VM; 92061A RTE Microprogramming Package is also required.
MISCELLANEOUS MAINFRAME PLUG-INS		
12897B DUAL-CHANNEL PORT CONTROLLER (DCPC)	Provides two-channel Direct Memory Access for interfaces in computer mainframe.	2109E, 2113E, or 2117F Computer (included in 217x Systems)
12620A BREADBOARD INTERFACE	Privileged interrupt operation under RTE under RTE operating systems	217x System or 2109E/13E/17F Computer
12777A PRIORITY JUMPER CARD	Completes I/O priority chain continuity through an unused I/O slot	217x System or 2109E/13E/17F Computer

* 11,776 words of control store address space is available in 2176x and 2178x Systems and 2109E and 2113E Computers. 5,632 words of control store address space is available in 2177x and 2179x Systems and 2117F Computers for user's microprograms on 12791A Firmware Expansion Module and/or 13197A Writable Control Store card(s).

@ Software subscription service support is available for this product. See HP 1000 Ordering and Compatibility Information.

Accessories and Interfaces for E/F-Series Systems and Computers, continued

Accessory or Interface Product Number and Name	Purpose	Prerequisites
EXTENDERS, EXTENDER PLUG-INS, AND POWER FAIL RECOVERY SYSTEMS		
12979B DUAL-PORT I/O EXTENDER -001: EMI adaptation	Adds 16 I/O channels (max. of one 12979B per system, two 12979Bs per computer) Required to enable 2176E, 2177F, 2178C, or 2179C system with 12979B to meet EMI stds	217x System in rack cabinet (excludes 12990B Extender) or 2109E, 2113E, or 2117F Computer
12898B DCPC for 12979B Dual-Port I/O Extender	Extends Direct Memory Access to I/O interfaces housed in the 12979B Extender	12897B Dual-Channel Port Controller in computer and 12979B Dual-Port I/O Extender
12781A DUAL CPU KIT for 12979B Extender	Connection of a second computer to 12979B Extender	12979B Dual-Port I/O Extender and 2nd 2109E, 2113E, or 2117F Compuer to connect to it.
12990B MEMORY EXTENDER	Adds nine memory module slots and power for large memory systems using 16k RAMs.	217x System in rack cabinet or 2109E/13E/17F Computer (excludes 12979B in 217x systems).
12944B POWER FAIL RECOVERY SYSTEM	Sustains memory for at least 1.6 hours in event of power failure#	2109E Computer
12991B POWER FAIL RECOVERY SYSTEM	Sustains memory for at least 1.8 hours in event of power failure#	2113E or 2117F Computer or 12990B Memory Extender (included in 217x Systems)
HP-IB INTERFACE AND HP-IB EXTENDER		
59310B HP-IB INTERFACE with 3.7m/12ft cable	HP-IB bus connection of up to 14 "slow" HP-IB devices to the system.	217x System or 2109E/13E/17F Computer operating under RTE-6/VM or RTE-IVB/IVE
37203A HP-IB EXTENDER (stand-alone product used w/59310B interface) -001: Fiber Optic Interface	Extension of HP-IB comm with other 37203A Extender or 37203L A/L-Series HP-IB Extender Card up to 1km (3281ft) via coax cable Adds fiber optic cable communication (same maximum distance)	217x System or 2109E/13E/17F Computer with 59310B interface and remote 37203A/L Extender connected via Belden 9428 Coaxial cabling Same as std 37203A, but connection can also be via HP 39200B Fiber Optic Cabling
RECOMMENDED TERMINAL INTERFACES (See pages 4.1-1 through 4.1-15 for applications.)		
12966A BUFFERED ASYNCHRONOUS COMMUNICATIONS INTERFACE w/15.2m/50ft std EIA terminal cable -001: 15.2m/50ft Cable -002: 15.2m/50ft Cable -004: 15.2m/50ft and 1.5m/15ft Cables -005: 15.2m/50ft Cable -105: 5m/16.4ft Cable with EMI filter -106: 5m/16.4ft Cable with EMI filter -107: 5m/16.4ft Cable with EMI filter	Block or character mode communication with 2382A, 262x, 2635A*/B, or 264x terminal at rates to 960 cps. Std cable connects to 2382A terminal. For connection to 264x or 2635A*/B+051 terminal For connection to U.S. Modem For eavesdrop-mode connection to 722xC/T Plotter and 2635A*/B+051 or 264x Terminal For connection to 262x Terminal other than 2621B Terminal For EMI-qualified connection to 262x Terminal other than 2621B For EMI-qualified connection to 2621B or 2635B Terminal For EMI-qualified connection to 264x Terminal	217x System or 2109E/13E/17F Computer operating under RTE-6/VM or RTE-IVB/IVE, terminal, and appropriate cable option. (NOTE: Optional cable(s) replace the std EIA terminal cable.)
12790A MULTIPOINT/DATA LINK INTERFACE@ with 10.6m/35ft direct-conn multipoint cable -001: 7.6m/25ft Data Link/Modem multipoint cable	For connecting 262x or 264x Multipoint terminals to system via multipoint lines at terminal rates to 960 cps. For connecting Data Link Slave Systems or 307x Data Capture Terminals via 3074A Data Link Adapter.	217x System or 2109E/13E/17F Computer operating under RTE-6/VM or RTE-IVB/IVE, 91730A Multipoint Software, and appropriate systems, terminals, and data connection hardware.
12792B 8-CHANNEL TERMINAL MULTIPLEXER with 3m/10ft cable and RS-232-C Connector Panel -001: Firmware only -002: Deletes Connector Panel -003: Edge Connector Kit	Interfacing of up to eight 2382A, 262x, 2635B, and/or 264x terminals via a single I/O channel at terminal rates to 960 cps. Upgrade of 12792A to 12792B Use with 37214A Systems Modem For uses that do not require the Connector Panel or the 3m/10ft connecting cable.	217x System or 2109E/13E/17F Computer operating under RTE-6/VM or RTE-IVB/IVE and cables and terminals. 12792A Multiplexer 37214A Systems Modem and appropriate 3721xA plug-ins and 1556xA and other cables User-fabricated cabling to connected terminals or equipment.

* Identifies obsolete product listed here for reference only.

@ Software subscription service support is available for this product. See HP 1000 Ordering and Compatibility Information.

Memory sustaining time given assumes that backup batteries are fully charged.

Accessories and Interfaces for E/F-Series Systems and Computers, continued

Accessory or Interface Product Number and Name	Purpose	Prerequisites
DS/1000-IV INTERFACES (See pages 4.3-1 through 4.3-14 for application)		
12793B BISYNC MODEM INTERFACE with 5m/17ft RS-232-C Cable -001: Firmware only -002: RS-449 Cable	Modem communication with suitably-equipped HP 3000 System or HP 98xx Desktop Computer Provides latest firmware ROMs for customer not on 91750x Opt 201/202/204/208/216 firmware update support Substitute for RS-232-C cable	217x System or 2109E/13E/17F Computer operating under RTE-6/VM or RTE-IVB/IVE; 91750A DS/1000-IV software, 128kb or more additional memory, and suitable modem and telephone line connection are also required at the local node.
12794B HDLC MODEM INTERFACE with 5m/17ft RS-232-C Cable -001: Firmware only -002: RS-449 Cable	Point-to-point modem communication with other DS/1000-IV network node. Provides latest firmware ROMs for customer not on 91750x Opt 101/102/104/108/116 firmware update support Substitute for RS-232-C cable	Same as 12793B, above
12825A HDLC DIRECT CONNECT INTERFACE with two 5m/17ft Cables and verifier hoods -001: Firmware only -002: Deletes cables and verifier hoods	Direct point-to-point communication with other DS/1000-IV network node. Provides latest firmware ROMs for customer not on 91750x Opt 101/102/104/108/116 firmware update support Cables and verifier hoods are not needed for second HDLC interface	Same as 12793B, above. However 91712A, 91713A, and/or 91714A Extension Cable products may also be required.
12834A BISYNC DIRECT CONNECT INTERFACE with one 5m/17ft Cable -001: Firmware only	Direct communication with suitably-equipped HP 3000 System or HP 98xx Desktop Computer Provides latest firmware ROMs for customer not on 91750x Opt 201/202/204/208/216 firmware update support	Same as 12793B, above. However, 91721A, 91713A, and/or 91714A Extension Cable products may also be required.
12771A DS/1000 COMPUTER SERIAL INTERFACE (two cards, one for each system) with 3.65m/12ft male and female cables	Direct connection from DS/1000 or DS/1000-IV network node to another that also has 91740B*/R firmware.	217x System or 2109E/13E/17F Computer operating under RTE-6/VM or RTE-IVB/IVE; 91750A DS/1000-IV software, 91740B*/R firmware, and 128kb or more additional memory are also required, and 91720A and/or 91721A Extension cables may also be required.
12773A DS/1000 COMPUTER MODEM INTERFACE with 3 65m/12ft cable	Modem connection from DS/1000 or DS/1000-IV network node to another that also has 91740B*/R firmware.	217x System or 2109E/13E/17F Computer operating under RTE-6/VM or RTE-IVB/IVE; 91750A DS/1000-IV software, 91740B*/R firmware, 12620A as Priv. Int. Fence, 128kb or more additional memory, and suitable modem and telephone line connection are also required.
OTHER DATA COMMUNICATIONS INTERFACES		
12660A MULTI-USE PROGRAMMABLE SERIAL INTERFACE	Modem communication with IBM or IBM Plug-Compatible System with HASP II, JES2, or JES3 Remote Job Entry System	217x System or 2109E/13E/17F Computer with 91782A DSN/MRJE 1000 software and 384kb or more memory operating under RTE-6/VM and suitable modem and telephone line link between the local and remote systems.
12661A MULTI-USE PROGRAMMABLE MULTIPLEXER	Interfacing to Allen-Bradley Data Highway under control of 92140A PCL/1000-AB software.	2178x/9x System or 2109E/13E/17F Computer operating under RTE-6/VM; also requires 12828A Multiplexer Panel and 92140A PCL/1000-AB software.
12826B PROGRAMMABLE SERIAL INTERFACE Card with 5m/17ft RS-232-C cable. -001: RS-449 Cable -002: Edge conn. kit -003: Deletes self-test PROM and Diagnostic Hood	User-customizable intelligent communications (modem) interface to RS-232-C equipment Substitute for RS-232-C cable Substitute for RS-232-C cable	217x System or 2109E/13E/17F Computer operaunder RTE-6/VM or RTE-IVB/IVE. 24602A Firmware Development Package is strongly recommended for use with the 12826B.
24602A PROGRAMMABLE SERIAL INTERFACE FIRMDEVELOPMENT PACKAGE -001: Deletes Development Debug Monitor EPROM and DDM Accessory Cable	Assistance with development of firmware for the 12826B Programmable Serial Interface (provides manual, Development Debug Monitor (DDM) EPROM, and DDM Accessory Cable)	12826B Programmable Serial Interface with self-test and a 264x terminal with minicartridge I/O or an HP 64000 Microprogramming workstation.

* Identifies obsolete product listed here for reference only.

Accessories and Interfaces for E/F-Series Systems and Computers, continued

Accessory or Interface Product Number and Name	Purpose	Prerequisites
OTHER DATA COMMUNICATIONS INTERFACES, continued (See page 4.1-4 for application of 12531C/D)		
12531C TELEPRINTER INTERFACE -001: 7.6m/25ft cable -002: 7.6m/25ft cable	Character mode, current loop communication with teleprinter at rates to 176 cps For direct connection to teleprinter For connection to U.S. Modem	217x System or 2109E/13E/17F Computer operating under RTE-6/VM or RTE-IVB/IVE, terminal, annd appropriate cable option.
12531D TERMINAL INTERFACE -001: 7.6m/25ft cable -002: 7.6m/25ft cable -004: 15.2m/50ft cable	Character mode, current loop communication with non-HP terminal at rates to 240 cps EIA interface cable For connection to U.S. Modem For connection to HP 264x or 2635B+051 terminal	217x System or 2109E/13E/17F Computer operating under RTE-6/VM or RTE-IVB/IVE, terminal, and appropriate cable option.
12618A SYNCHRONOUS COMMUNICATIONS (2-card) INTERFACE with 15.2m/50ft cable assembly	Half or full-duplex communication via synchronous modem (12618A is included in 91780A RJE/1000 Remote Job Entry Package to IBM 360/370).	217x System or 2109E/13E/17F Computer operating under RTE-6/VM or RTE-IVB/IVE, 12620A as Priv. Int. Fence, and appropriate modem and telephone line link.
12920B 16-CHANNEL ASYNC MULTIPLEXER (3 cards, cables, & mpxer panel) -001: Bell Type 202 data set support (add'l interface card)	Communication with up to 16 262x, 2635B, and/or 264x Terminals at terminal rates to 240 cps. (Not software supported by Hewlett-Packard) Packard)	217x or 2109E/13E/17F Computer with 12620A as privileged interrupt fence and 91731A software operating under RTE-IVB/IVE or RTE-6/VM, cables, and interfaced terminals.
DISC INTERFACES (See pages 5.1-4 through 5.1-6 for application)		
12821A INTERFACE with 3.69m/12ft cable and 12992H ICD Disc Loader ROM -001: Deletes 12992H ICD Disc Loader ROM	Interfaces up to two 7906H/20H/25H and/or 9895A Discs Interfaces up to four 7908/11/12/14P/R/TD and/cr 7933H/7935H CS/80 discs	217x System or 2109E/13E/17F Computer operating under RTE-6/VM or RTE-IVB/IVE, and compatible discs Same as above, but CS/80 discs are not supported under RTE-IVB (12821A+001 is included in2178x/2179x systems using CS/80 discs)
13175D MAC DISC INTERFACE with 5.5m/18ft cable	Interfaces one 79xxM MAC Master Disc and up to seven 79xxS MAC Slave Discs	217x system or 2109E/13E/17F Computer operating under RTE-IVB or RTE-6/VM, and 79xxM MAC Master Disc (13175D interface is included in inuded in 217x systems using MAC discs)
13178D MULTI-CPU INTERFACE with 1.85m/6ft interface cable and 2.44m/8ft Multi-CPU cable -001: 4.9m/8ft multi-CPU cable	Interfaces additional computer to 79xxM MAC Master Disc (max. of 7 additional computers connected to MAC Master Disc) Alternate multi-CPU cable length.	217x System or 2109E/13E/17F Computer operating under RTE-IVB or RTE-6/VM system and 79xxM MAC Master Disc that is shared#
PRINTER INTERFACES (See page 5.2-4 for application)		
12821A+001 INTERFACE with 15.2m/50ft cable	Interfaces one 2608S+210 Line Printer	217x System or 2109E/13E/17F Computer operaopating under RTE-6/VM and 2608S Option 210 Line Printer.
12845B PRINTER INTERFACE with 7.6m/25ft cable	Interfaces one 2611A, 2617A, 2619A, or 2631A/B Printer	217x System or 2109E/13E/17F Computer operating under RTE-6/VM or RTE-IVB/IVE, and compatible printer.
26099A PRINTER INTERFACE with 7.6m/25ft cable	Interfaces one 2608A Line Printer	217x System or 2109E/13E/17F Computer operating under RTE-6/VM or RTE-IVB/IVE, and 2608A Line Printer.

When multiple computers are ordered to interface with a single 79xxM disc, installation includes running of disc diagnostics only once, from one of the interfaced computers. Installation and verification of additional disc-computer connections is not included in system installation. NOTE: In 2178/9A/B System or 2109E/13E/17F Computer operating under RTE-6/VM, 91747A Datashare/1000 software supports multi-computer access to shared cartridges and file spaces on 79xxM and 79xxS Discs.

Accessories and Interfaces for E/F-Series Systems and Computers, continued

Accessory or Interface Product Number and Name	Purpose	Prerequisites
MEASUREMENT AND CONTROL INTERFACE		
91000A PLUG-IN A-TO-D INTERFACE SUBSYSTEM with connector kit -005: 4.8m/16ft cable, unterminated at input -006: 4.8m/16ft cable, unterminated at input	Interfaces 8 differential or 16 single-ended +10.23Vfs analog inputs measured with 12-bit resolution at maximum 20,000 channels/sec sample rate For connection of single-ended inputs (instead of connector kit) For connection of differential inputs (instead of connector kit)	217x System or 2109E/13E/17F Computer operating under RTE-6/VM or RTE-IVB/IVE, and 92066A Measurement and Control Software Package.
GENERAL-PURPOSE INTERFACES		
12551B 16-BIT RELAY OUTPUT REGISTER w/conn kit -001: Adds read-back	Device control with 16 floating contact closures Returns current bit states to the system	217x System or 2109E/13E/17F Computer operating under RTE-6/VM or RTE-IVB/IVE, with user-written driver.
12554A 16-BIT DUPLEX REGISTER, positive in, positive out, w/conn kit -001: Neg in, neg out	16-bit input and 16-bit output, storage, and control and interrupt logic at discrete-transistor logic levels	217x System or 2109E/13E/17F Computer operating under RTE-6/VM or RTE-IVB/IVE, with user-written driver.
12556B 40-BIT REGISTER, positive-true, with connector kit -001: 2.4m/8ft cable instead of connector kit	40-bit output for driving program input lines, control panel indicators, or 5055A Digital Recorder (printer) Connection to 5055A Digital Recorder (obsolete product)	217x System or 2109E/13E/17F Computer operating under RTE-6/VM or RTE-IVB/IVE.
12566C MICROCIRCUIT INTERFACE with 48-pin connector kit -001: 24-pin connector kit instead of 48-pin kit	16-bit input and 16-bit output, storage, and control and interrupt logic at DTL/TTL logic levels For connection to single, bi-directional data bus	217x System or 2109E/13E/17F Computer operating under RTE-6/VM or RTE-IVB/IVE.
12597A 8-BIT DUPLEX REGISTER, positive-in, positive-out, w/conn kit -001: Neg-in, neg out -002: Cable instead of connector kit -005: Cable instead of connector kit	8-bit input and 8-bit output, storage, and control and interrupt logic at discrete-transistor logic levels For connection to 2748B Tape Reader (obsolete product) For connection to 2895B Tape Punch	217x System or 2109E/13E/17F Computer operating under RTE-IVB or RTE-6/VM with user-user-written driver.
12620A BREADBOARD INTERFACE with connector kit	Provides standard flag and interface logic and 49 spaces for mounting TTL packages of user-designed interface. Can also serve as RTE privileged interrupt fence.	217x System or 2109E/13E/17F Computer operating under RTE-IVB or RTE-6/VM with user-written driver.
12930A UNIVERSAL INTERFACE w/differential input logic and conn kit -001: Ground-true TTL input -002: Positive-true TTL input	16-bit input and 16-bit output, storage, and 6-bit command input, and 6-bit status outupt with differential input of +1V or greater. For compatibility with ground-true TTL device For compatibility with positive-true TTL device	217x System or 2109E/13E/17F Computer operating under RTE-IVB or RTE-6/VM with user-written driver.
91200B VIDEO DISPLAY I/F CARD with connector kit -001: 7.6m/25ft Cable, incl. BNC-to-UHF adapter -002: 7.6m/25ft Cable assembly, including BNC-to-UHF adapters	Display of graphics output on TV monitor, B&W w/one 91200B, color w/three 91200Bs. Connection from one 91200B card to B&W TV Monitor Connection from three 91200B cards to color TV Monitor	217x System or 2109E/13E/17F Computer operating under RTE-6/VM or RTE-IVB/IVE. (Not supported by Graphics/1000 or Graphics/1000-II.)

HP 1000 A/L-Series Systems and Computers Information Locator

A-Series Systems

L-Series Systems

A-Series Computers and Board Computers

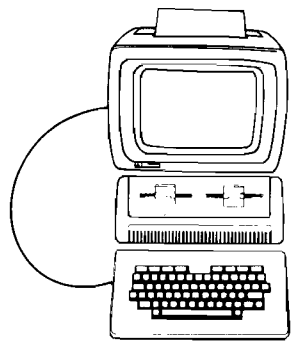
L-Series Computers and Board Computers

Expansion of Systems Based on A/L-Series Systems and Computers

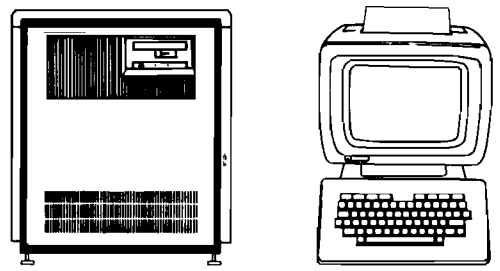
HP 1000 A-Series Computer Systems Selection Guide

Standalone HP 1000 A-Series Computer Systems are available in the configurations shown below. The Model 6+ tabletop configuration and Micro 26, 27, and 29 configurations offer compactness and convenience. The 23-inch cabinet provides low-profile, standalone rack mounting of the microcomputer system components. The 56-inch cabinet offers standalone rack mounting of system components plus available rack-mounting space for a limited set of additional equipment in (80.9 cm) (31.87 in) panel space, weighing up to 200kg (440 lb)).

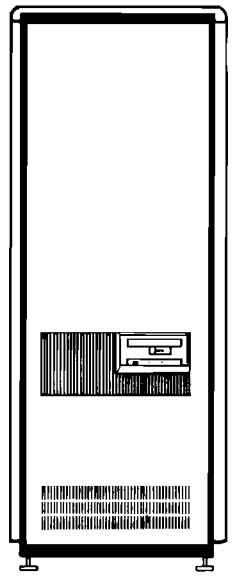
Model 6+ System with integral 262x terminal



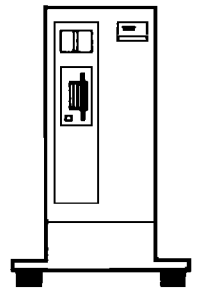
Model 26, 27, or 29 System in 23-inch Cabinet



Model 26, 27, or 29 System in 56-inch Cabinet



Micro 26, 27, or 29 System (shown on optional 40025A Vertical Floor Mount)

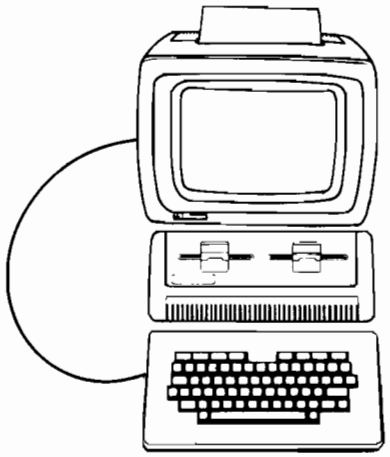


	TABLETOP CONFIGURATION (2186C)	TABLETOP CONFIGURATION (2186D)	IN 56-INCH CABINET (2196C)	IN 23-INCH CABINET (2196D)	IN 56-INCH CABINET (2197C)	IN 23-INCH CABINET (2197D)	IN 56-INCH CABINET (2199C)	IN 23-INCH CABINET (2199D)	(2486A)	(2487A)	(2489A)
	MODEL 6+ is a real-time Microsystem of compact tabletop design for use as a workstation. It can be equipped with Minifloppy and/or hard disc for program development, Image data base management, and graphics support.		**MODEL 26 is an A600+ hard disc-based real-time computer system for cost sensitive applications.**		**MODEL 27 is an A700 hard disc-based real-time computer system recommended for good performance in computation-intensive applications in science, engineering and/or interactive graphics.**		**MODEL 29 is an A900 hard disc-based real-time computer system recommended for highest performance in computation-intensive applications in science, engineering and/or interactive graphics.**		**MICRO 26 is an A600+ real-time computer system in compact Micro/1000 package.**	**MICRO 27 is an A700 real-time computer system in compact Micro/1000 package.**	**MICRO 29 is an A900 real-time computer system in compact Micro/1000 package.**
HARDWARE CAPACITY											
Spare rack space	No	No	Yes	No	Yes	No	Yes	No	No	No	No
Supports A-Series cards that use 25kHz power	No	No	Yes, with 12158A Power Module		Yes, with 12158A Power Module		Yes, with 12158A Power Module		Yes, with 12159A	Yes, with 12159A	Yes, with 12159A
Avail. Card Cage Slots	3	4	16		13		13		12 (10 with 12159A Battery Backup)	10 (8 with 12159A Battery Backup)	9 (7 with 12159A Battery Backup)
Main Memory	512kb, expandable to 4Mb		512kb, expandable to 4Mb		512kb, expandable to 4Mb		768kb (ECC), expandable to 6Mb		512kb, expandable to 4Mb	512kb, expandable to 4Mb	768kb, expandable to 1.5Mb
Disc memory capacity	2186C includes dual 270kb Minifloppy disc (540kb total); 4.6/9.2/16.5/28.1/65.6/132.1Mb Fixed Disc, or 1.18Mb/2.36Mb Flexible Disc is optional with 2186C required with 2186D.		16.5/28.1/65.6/132.1Mb Fixed disc.		16.5/28.1/65.6/132.1Mb Fixed Disc.		16.5/28.1/65.6/132.1Mb Fixed disc		Option 110 integrated fixed 9.4Mb disc or 16.5/28.1/65.6/132.1 fixed disc	Option 110 integrated Fixed 9.4Mb disc or 16.5/28.1/65.6/132.1 fixed disc	Option 110 integrated fixed 9.4Mb disc or 16.5/28.1/65.6/132.1 Fixed disc
USER-AVAILABLE CAPACITY											
	RTE-A standard		**RTE-A standard**		**RTE-A with VC+ standard**		**RTE-A w/VC+ standard**		**RTE-A standard**	**RTE-A standard**	**RTE-A standard**
Memory Mgt. Capacity	512k bytes to 3M bytes		512k bytes to 4M bytes		512k bytes to 4M bytes		768k bytes to 6M bytes		512k bytes to 4M bytes	512k bytes to 4M bytes	768k bytes to 1.5M bytes
Max. Size of Unsegmented Program	64k bytes		64k bytes		64k bytes		64k bytes		64k bytes	64k bytes	64k bytes
No. of User Partitions	255		255		255		255		255	255k bytes	255
Max. In-Memory Data Space	Up to 2M bytes/program		Up to 2M bytes/program		Up to 2M bytes/program		Up to 2M bytes/program		Up to 2M bytes/program	Up to 2M bytes/program	Up to 2M bytes/program
No. of Logical Units	255		255		255		255		255	255	255
Program Language Support	Programming in Macro/1000 Assembly, and BASIC/1000L with Minifloppy, BASIC/1000C, FORTRAN 77, and Pascal/1000 with hard disc		Programming in FORTRAN 77, Pascal/1000, BASIC/1000L, and Macro/1000 Assembly language		Programming in FORTRAN 77, Pascal/1000, BASIC/1000C/L, Macro/1000 Assembly language, and Microprogramming Paraphraser		Programming in FORTRAN 77, Pascal/1000, BASIC/1000C/L, Macro/1000 Assembly language, and Microprogramming Paraphraser		Programming in FORTRAN 77, Pascal/1000, BASIC/1000C/L, and Macro/1000 Assembly language	Programming in FORTRAN 77, BASIC/1000, BASIC/1000C/L, Macro/1000 Assembly language, and Microprogramming Paraphraser	Programming in FORTRAN 77, Pascal/1000, BASIC/1000C/L, Macro/1000 Assembly language, and Microprogramming Paraphraser

Model 6+ Microsystem Sample Configuration

Standard Integrated
Tabletop Configuration

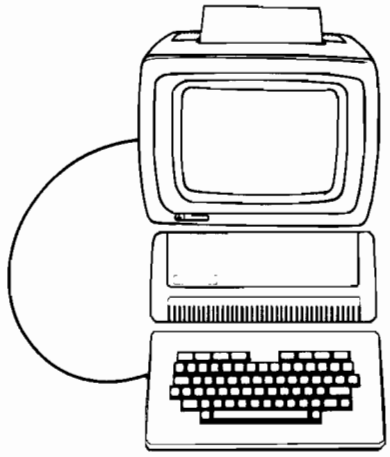
2186C:



2621B+090 Interactive Terminal

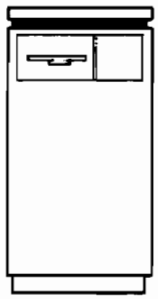
2186C System Processor Unit
with dual 540 kilobyte
Minifloppy disc

2186D:



2621B+090 Interactive Terminal

2186D System Processor Unit



7908P 16.5Mb Fixed Disc with built in
cartridge tape backup

Ordering Guide for Alternate HP 1000 Model 6+ Microsystems

A. Order one HP 1000 Model 6+ Microsystem System Processor Unit

2186C System Processor Unit with dual Minifloppy Disc.

OR

2186D System Processor Unit without dual Minifloppy Disc.

B. Order a system/maintenance console

2621B Interactive Terminal (Order Opt. 090 or use A cable)

2622A Display Terminal (Order Opt. 090 or use B cable)

2623A Graphics Terminal (Order Opt. 090 or use B cable)

2624B Display Terminal (Order Opt. 090 or use B cable)

2627A Color Graphics Terminal (Order Opt. 090 or use B cable)

2635B Printing Terminal (Order Opt. 090 or use C cable)

C. Order one of the following system console interface-cable configurations

CONSOLE INTERFACE	CONSOLE CONNECT CABLES		
	A	B	C
Async Serial Interface (std) OR 2186C/D Opt 008# to Delete Async Interface AND 12040B 8-Chan Multiplexer	2186C/D Opt 006 Cable 5m/16ft OR 13242Y Cable 4.5m/15ft	2186C/D Opt 005 Cable 15m/49ft OR 13222Y Cable 5m/17ft	2186C/D Opt 006 Cable 5m/16ft OR 3.6m/12ft Cable*

\# Available on January 1, 1984.

* Cable is included with the 2635B Printing Terminal

D. For 2186D, order one of the discs listed in the first group of disc choices, below. These discs and those listed in the second group are optional with 2186C. (The 12009A interface and 2m (6.5ft) cable to disc are included in 2186C and 2186D; however, in the 2186C only, an HP part no. 8120-3396 jumper cable will also be required to permit change of the position of the minifloppy controller card in the Model 6+ card cage)

System Disc choices for 2186D

7908P 16.5Mb CS/80 Standalone Fixed Disc with built-in cartridge tape backup

7911P 28.1Mb CS/80 Standalone Fixed Disc with built-in cartridge tape backup

7912P 65.6Mb CS/80 Standalone Fixed Disc with built-in cartridge tape backup

7914P 132.1Mb CS/80 Standalone Fixed Disc with built-in cartridge tape backup

7914TD 132.1Mb CS/80 Fixed Disc and 7970E 1600 bpi mag tape unit in 1.6m (63-in) cabinet (also requires a 12009A interface to the mag tape unit)

-240 Adds cartridge tape drive in 7914R

9121D/S 572kb Dual/286kb Single Microfloppy Disc

9895A 2.36 Megabyte Dual Flexible Disc

Additional discs for 2186C/D

Any of the discs in the list above

E. Order appropriate system and software media options

015: Operation from 230V ac power

022: Software on CS/80 cartridge tape (2186D only)

041: Software on 1.2Mb flexible disc (2186D only)

044: Software on microfloppy discs (2186D only)

061: Software on 1600 bpi mag tape (2186D only)

F. Order optional software (page 3.5-2) and order more memory array cards (page 3.5-6) if needed to provide more memory

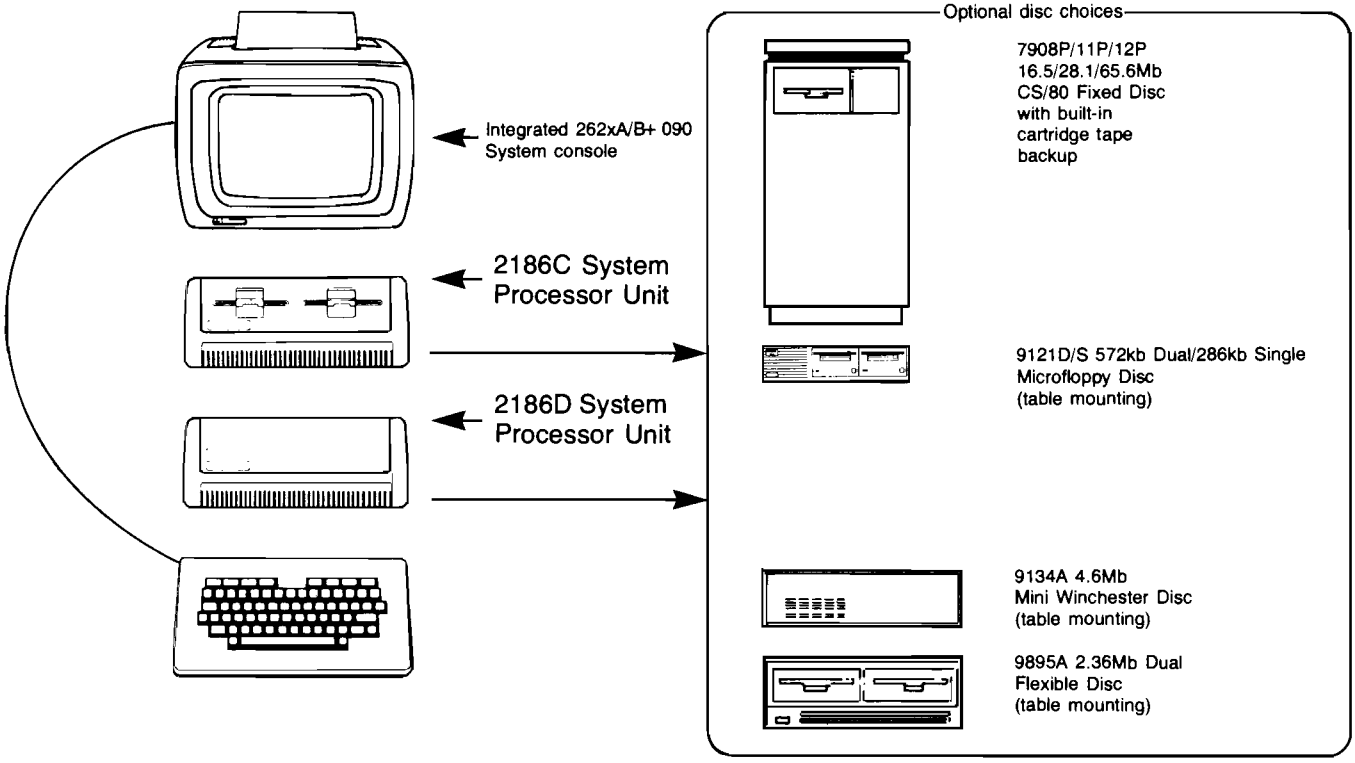
NOTE: Language compilers must be ordered separately to perform program development.

G. Order Other Accessories and Interfaces (see page 3.5-8)

H. Order Additional Terminals (page 4.1-5), System-to-System Communications Capabilities (page 4.3-1), and Peripheral Devices (sections that follow the Peripheral Devices Tab)

NOTE: See the current HP 1000 Ordering and Compatibility Information booklet for status of peripherals with respect to FCC and FTZ Electro Magnetic Interference (EMA) qualification.

HP 1000 Model 6+ Microsystem System Processor Unit



Hardware supplied: 2186C/D system processor unit, consisting of:

- HP 12102B 512k byte memory card
- HP 12105A A600+ CPU Card
- HP 12005B Asynchronous Serial (terminal) Interface card. **Effective 1/1/84, delete Option 008 makes possible substitution of 12040B 8-channel multiplexer and appropriate terminal cable.**
- Terminal data and power cables
- 12009A HP-IB Interface card and cable
- Minifloppy controller card and jumper cable (2186C only)
- 8-slot card cage with 3 (2186C) or 4 (2186D) available card cage slots and power supply
- Dual 270 kilobyte 5-inch Minifloppy disc (540 kilobytes total) (2186C only)
- Microsystem package with power cable (power cable not supplied with 2186C/D Option 015)

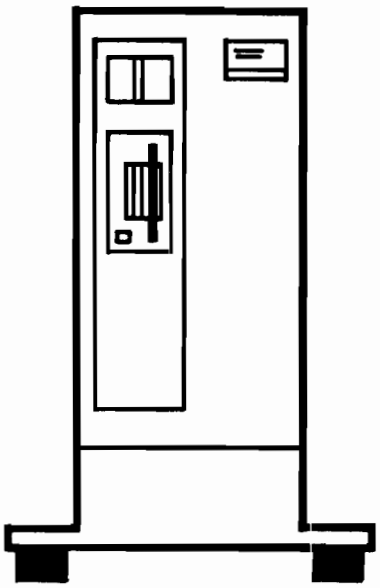
Required options and hardware (see page 3.1-3 for choices; must be on same order as 2186C/D)

- 262x+090 integrated system console or 2627A or other non-integrated 262x or 2635B system console with appropriate cable choice (see p 3.1-3)
- 7908/11/12/14, 9121D/S, or 9895A Disc (2186D requirement only)
- Appropriate software media option for 2186D Microsystem

Software and services included

- RTE-A operating system with file manager and command interpreter, assembler, interactive screen editor, and utilities on minifloppy disc media (2186C) or option-specified media (2186D)
- HP 1000 A-Series diagnostics library on minifloppy disc media (2186C) or option-specified media (2186D)
- Primary system (preconfigured RTE-A operating system on minifloppy disc (2186C) or option-specified media (2186D))
- Complete set of hardware and software manuals
- On-site installation assistance and checkout including integration and test with primary system
- 90-day on-site warranty
- Four 93285A Engineering Units

HP 1000 Micro 26 System Sample Configuration

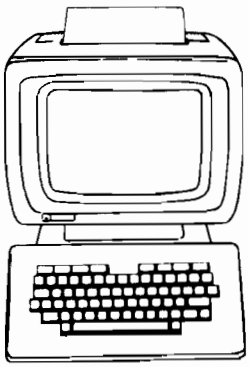


2486A+006, 044, 110 System Processor Unit

2486A Option 110 Integrated
9.4M byte fixed and 270k byte microfloppy discs

40025A Vertical Floor Mount

NOTE: 2486A can also be rack mounted or set atop a bench, table, desk, or shelf.



2621B Interactive Terminal

Ordering Guide for Alternate HP 1000 Micro 26 Systems

A. Order HP 1000 Micro 26 System Processor Unit

2486A System Processor Unit in Micro/1000 package

B. Order a system/maintenance console

2621B Interactive Terminal (Use A cable)
2622A Display Terminal (Use B cable)
2623A Graphics Terminal (Use B cable)
2624B Display Terminal (Use B cable)
2627A Color Graphics Terminal (Use B cable)
2635B Printing Terminal (Use C cable)

C. Order one of the following system console interface-cable configurations

CONSOLE INTERFACE	CONSOLE CONNECT CABLES		
	A	B	C
Async Serial Interface (std)	2486A Opt 006 Cable 5m/16ft	2486A Opt 005 Cable 15m/49ft	2486A Opt 006 Cable 5m/16ft
OR	OR	OR	OR
2486A Opt 008# to Delete Async Interface AND 12040B 8-Chan Multiplexer	13242Y Cable 4.5m/15ft	13222Y Cable 5m/17ft	3.6m/12ft Cable*

\# Available on January 1, 1984.

* Cable is included with the 2635B Printing Terminal

D. Order a system disc (appropriate interface and cable are included with the system)

2486A+110	Integrated 9.4Mb fixed and 270kb Micro-floppy discs.
7908P/R	16.5Mb CS/80 Fixed disc with cartridge tape backup in standalone cabinet (7908P) or for rack mounting in user-furnished cabinet (7908R).
7911P/R	28.1Mb CS/80 Fixed disc with cartridge tape backup in standalone cabinet (7911P) or for rack mounting in user-furnished cabinet (7911R).
7912P/R	65.6Mb CS/80 Fixed disc with cartridge tape backup in standalone cabinet (7912P) or for rack mounting in user-furnished cabinet (7912R).
7914P/R	132.1Mb CS/80 Fixed disc with cartridge tape backup in standalone cabinet (7914P) or for rack mounting in user-furnished cabinet (7914R).
7914TD	7914R 132.1Mb CS/80 Fixed Disc and 7970E 1600 bpi mag tape unit in 1.6m (63 in) cabinet (also requires a 12009A interface to the mag tape unit).
-240	Adds cartridge tape drive in 7914R.

E. Order appropriate base system options

015: Operation from 230V ac power.
022: Software on CS/80 cartridge tape.
044: Software on microfloppy discs.
061: Software on 1600 bpi mag tape.
110: Provides integrated 9.4Mb fixed and 270kb micro-floppy discs (replaces 12009A interface to external discs with 12022A interface).

F. Order any desired Micro 26 Value Pack option

		VALUE PACK OPTIONS		
MEDIA:	CS/80 Cartridge Tape	101	102	103
	3.5-in Microfloppy Disc	121	122	123
	1600 bpi Magnetic Tape	131	132	133
SOFTWARE INCLUDED:	VC+ for RTE-A	Yes	Yes	Yes
	Image/1000 DBMS	Yes	Yes	Yes
	Graphics/1000-II DGL	Yes	Yes	Yes
	BASIC/1000C	Yes	No	No
	FORTRAN 77	No	Yes	No
	Symbolic Debug/1000	No	Yes	No
	Pascal/1000	No	No	Yes
ADDITIONAL MEMORY PROVIDED		512 kilobytes		

G. Order optional software (page 3.5-2) and, if necessary, order additional memory array cards to provide more memory (if not provided satisfactorily in a value pack option)

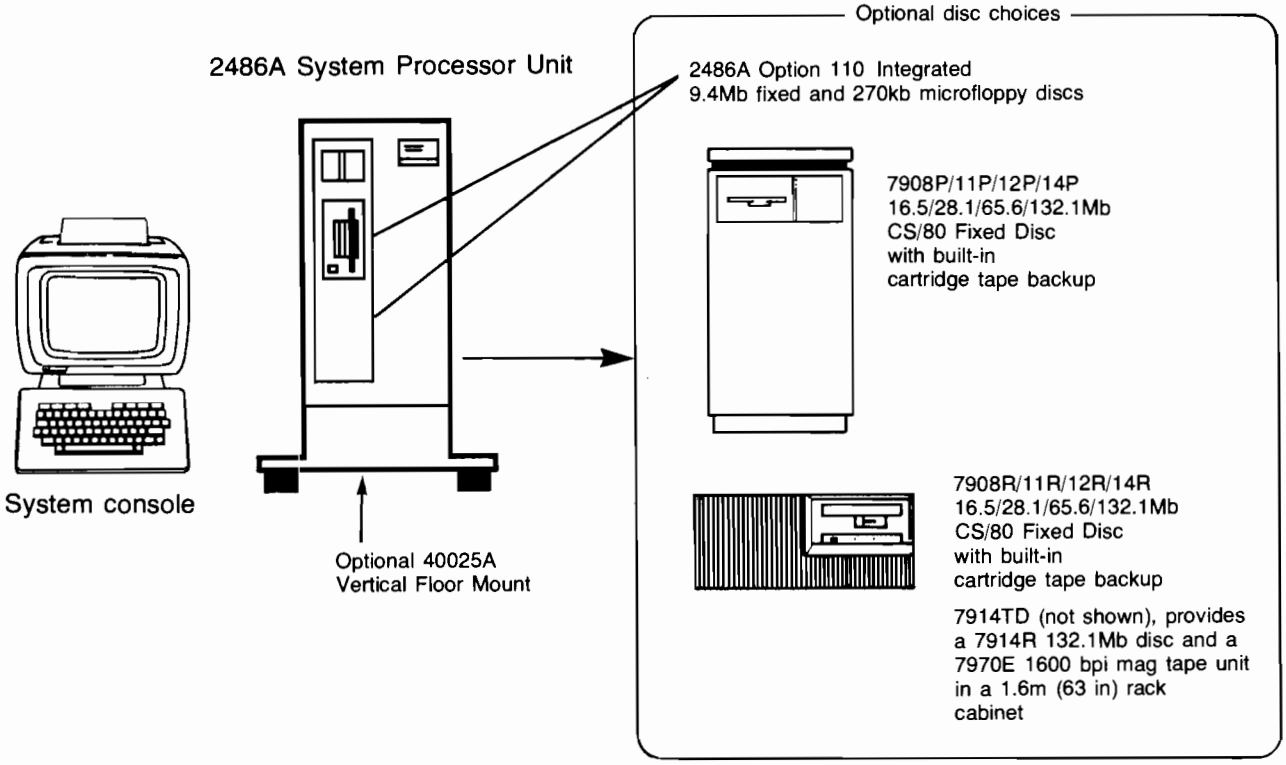
NOTE: Language compilers must be ordered separately to support program development.

H. Order Other Accessories and Interfaces (page 3.5-8).

I. Order Additional Terminals (page 4.1-5), System-to-System Communications Capabilities (page 4.3-1), and Peripheral Devices (sections that follow the Peripheral Devices tab).

NOTE: See the current HP 1000 Ordering and Compatibility Information booklet for status of peripherals with respect to FCC and FTZ Electro Magnetic Interference (EMI) qualification.

HP 1000 Micro 26 System Processor Unit



Hardware supplied: 2486A system processor unit, consisting of:

- 12102B 512k byte memory card
- 12105A A600+ CPU card
- 12038A Frontplane connector
- 12005B Asynchronous serial (terminal) interface card with 2486A cable Option 005 or 006. **Effective 1/1/84, delete Option 008 makes possible substitution of 12040B 8-channel multiplexer and appropriate terminal cable.**
- 12009A HP-IB disc interface and cable
- Micro/1000 Package with power supply and 14 card cage slots available for CPU, memory, and I/O cards, and dedicated slots for 25kHz power module and battery backup* cards.

Required options and hardware (see page 3.1-6 for choices; must be on same order as 2486A)

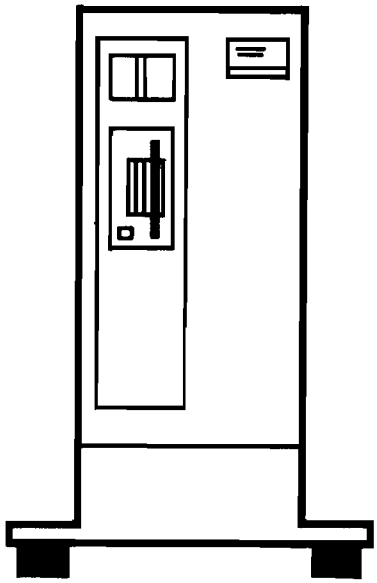
- 262x or 2635B System console with appropriate cable choice (see page 3.1-6)
- 2486A Option 110 integrated disc or 7908/11/12P/R or 7914P/R/TD separate fixed disc
- Software media Option 022, 044, or 061

Software and services included

- RTE-A operating system and relocatable modules on option-specified media with file manager, command interpreter, interactive screen editor, assembler, and relocatable and absolute loaders
- A600+ and disc diagnostic libraries
- Primary system (preconfigured RTE-A operating system on option-specified media)
- Complete set of hardware and software manuals
- Site preparation consultation.
- On-site installation assistance and checkout by a Hewlett-Packard service engineer, including integration and test with primary system
- 90-day on-site warranty.
- Four 93285A Engineering Units

* *The optional 12154A Battery Backup Card extends up into two otherwise-available card cage slots, reducing the total number of available card cage slots by two.*

HP 1000 Micro 27 System Sample Configuration

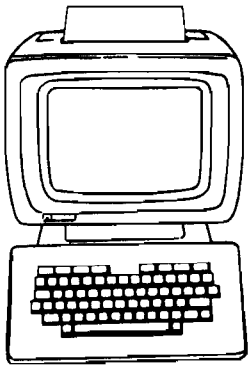


2487A+006, 044, 110 System Processor Unit

2487A Option 110 Integrated
9.4M byte fixed and 270k byte microfloppy discs

40025A Vertical Floor Mount

NOTE: 2487A can also be rack mounted or set atop a bench, table, desk, or shelf.



2621B Interactive Terminal

Ordering Guide for Alternate HP 1000 Micro 27 Systems

A. Order HP 1000 Micro 27 System Processor Unit

2487A System Processor Unit in Micro/1000 package

B. Order a system/maintenance console

2621B Interactive Terminal (Use A cable)
2622A Display Terminal (Use B cable)
2623A Graphics Terminal (Use B cable)
2624B Display Terminal (Use B cable)
2627A Color Graphics Terminal (Use B cable)
2635B Printing Terminal (Use C cable)

C. Order one of the following system console interface-cable configurations

CONSOLE INTERFACE	CONSOLE CONNECT CABLES		
	A	B	C
Async Serial Interface (std)	2487A Opt 006 Cable 5m/16ft	2487A Opt 005 Cable 15m/49ft	2487A Opt 006 Cable 5m/16ft
OR	OR	OR	OR
2487A Opt 008# to Delete Async Interface AND 12040B 8-Chan Multiplexer	13242Y Cable 4.5m/15ft	13222Y Cable 5m/17ft	3.6m/12ft Cable*

\# Available on January 1, 1984.

* Cable is included with the 2635B Printing Terminal

D. Order a system disc (appropriate interface and cable are included with the system)

2487A+110 Integrated 9.4Mb fixed and 270kb Micro-floppy discs.

7908P/R 16.5Mb CS/80 Fixed disc with cartridge tape backup in standalone cabinet (7908P) or for rack mounting in user-furnished cabinet (7908R).

7911P/R 28.1Mb CS/80 Fixed disc with cartridge tape backup in standalone cabinet (7911P) or for rack mounting in user-furnished cabinet (7911R).

7912P/R 65.6Mb CS/80 Fixed disc with cartridge tape backup in standalone cabinet (7912P) or for rack mounting in user-furnished cabinet (7912R).

7914P/R 132.1Mb CS/80 Fixed disc with cartridge tape backup in standalone cabinet (7914P) or for rack mounting in user-furnished cabinet (7914R).

7914TD 7914R 132.1Mb CS/80 Fixed Disc and 7970E 1600 bpi mag tape unit in 1.6m (63 in) cabinet (also requires a 12009A interface to the mag tape unit).

-240 Adds cartridge tape drive in 7914R.

E. Order appropriate base system options

001: Adds 12156A Floating Point Processor Card with Scientific and Vector Instruction Sets (uses one card cage slot and decreases maximum memory capacity to a total of three memory array cards; 3Mb of parity memory, 1.5Mb of ECC memory).

014: Deletes 12103C 512kb Memory Array Card and 12038A Memory frontplane connector, permitting their replacement with other Memory Array Cards and an appropriate 12038x Memory frontplane connector).

015: Operation from 230V ac power.

022: Software on CS/80 cartridge tape.

044: Software on microfloppy discs.

061: Software on 1600 bpi mag tape.

110: Provides integrated 9.4Mb fixed and 270kb micro-floppy discs (replaces 12009A interface to external discs with 12022A interface).

F. Order any desired Micro 27 Value Pack option

		VALUE PACK OPTIONS (INCLUDE OPT 014)		
MEDIA:	CS/80 Cartridge Tape	101	102	103
	3.5-in Microfloppy Disc	121	122	123
	1600 bpi Magnetic Tape	131	132	133
SOFTWARE INCLUDED:	VC+ for RTE-A	Yes	Yes	Yes
	Image/1000 DBMS	Yes	Yes	Yes
	Graphics/1000-II DGL	Yes	Yes	Yes
	BASIC/1000C	Yes	No	No
	FORTRAN 77	No	Yes	No
	Symbolic Debug/1000	No	Yes	No
	Pascal/1000	No	No	Yes
ADDITIONAL MEMORY PROVIDED		512 kilobytes*		

* A 1M byte memory array card instead of a 512k byte memory array card.

G. Order optional software (page 3.5-2) and, if necessary, order 2487A Option 014 with one or more 12103x or 12104A memory array cards (page 3.5-6) to provide enough memory (if not provided satisfactorily in a value pack option)

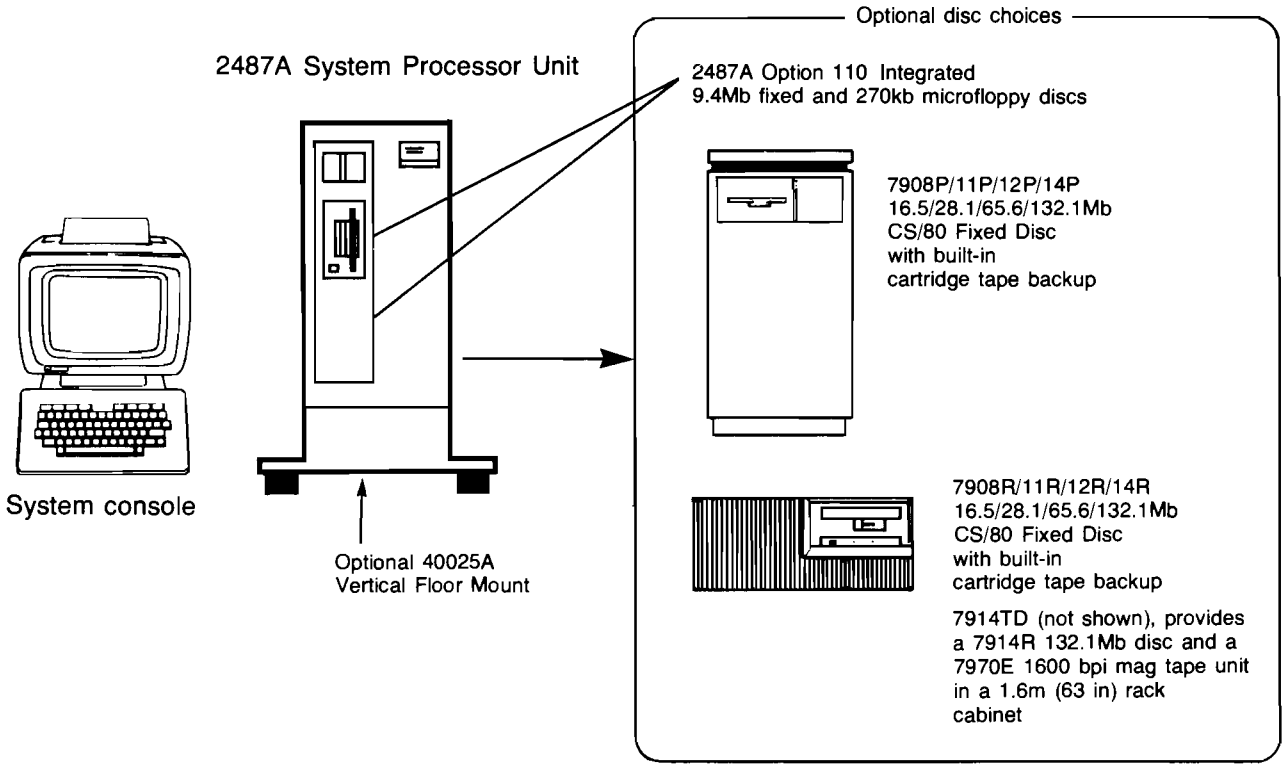
NOTE: Language compilers must be ordered separately to support program development.

H. Order Other Accessories and Interfaces (page 3.5-8).

I. Order Additional Terminals (page 4.1-5), System-to-System Communications Capabilities (page 4.3-1), and Peripheral Devices (sections that follow the Peripheral Devices tab).

NOTE: See the current HP 1000 Ordering and Compatibility Information booklet for status of peripherals with respect to FCC and FTZ Electro Magnetic Interference (EMI) qualification.

HP 1000 Micro 27 System Processor Unit



Hardware supplied: 2487A system processor unit, consisting of:

- 12103C 512kb Memory array card
- 12152A CPU, which includes:
  - — 12152-60001 Upper processor card
  - — 12152-60002 Lower processor card
  - — 12152-60003 Memory controller card
  - — VCP and base set ROMs
- 12160A Frontplane connector assembly
- 12038A Memory connector
- 12005B Asynchronous serial (terminal) interface card with 2487A cable Option 005 or 006. **Effective 1/1/84, delete Option 008 makes possible substitution of 12040B 8-channel multiplexer and appropriate terminal cable.**
- 12009A HP-IB disc interface and cable
- Micro/1000 Package with power supply and 14 card cage slots available for CPU, memory, and I/O cards, and dedicated slots for 25kHz power module and battery backup* cards.

Required options and hardware (see page 3.1-9 for choices; must be on same order as 2487A)

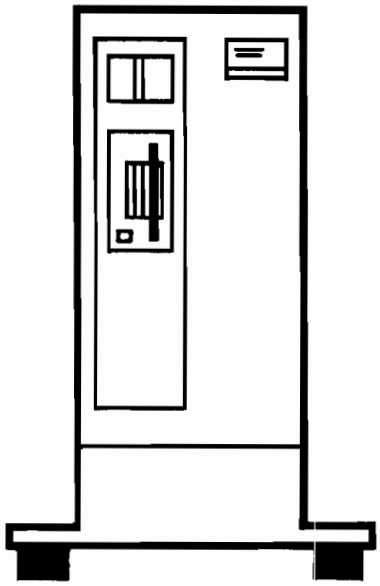
- 262x or 2635B System console with appropriate cable choice (see page 3.1-9)
- 2487A Option 110 integrated disc or 7908/11/12P/R or 7914P/R/TD separate fixed disc
- Software media Option 022, 044, or 061

Software and services included

- RTE-A operating system and relocatable modules on option-specified media with file manager, command interpreter, interactive screen editor, assembler, and relocatable and absolute loaders
- A700 and disc diagnostic libraries
- Primary system (preconfigured RTE-A operating system on option-specified media)
- Complete set of hardware and software manuals
- Site preparation consultation.
- On-site installation assistance and checkout by a Hewlett-Packard service engineer, including integration and test with primary system
- 90-day on-site warranty.
- Four 93285A Engineering Units

* *The optional 12154A Battery Backup Card extends up into two otherwise-available card cage slots, reducing the total number of available card cage slots by two.*

HP 1000 Micro 29 System Sample Configuration

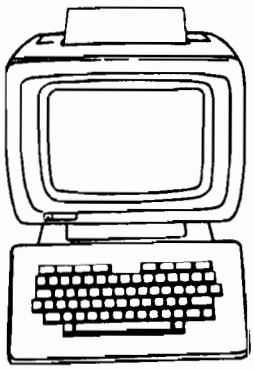


2489A+006, 044, 110 System Processor Unit

2489A Option 110 Integrated
9.4M byte fixed and 270k byte microfloppy discs

40025A Vertical Floor Mount

NOTE: 2489A can also be rack mounted or set atop a bench, table, desk, or shelf.



2621B Interactive Terminal

Ordering Guide for Alternate HP 1000 Micro 29 Systems

A. Order HP 1000 Micro 29 System Processor Unit

2489A System Processor Unit in Micro/1000 package

B. Order a system/maintenance console

2621B Interactive Terminal (Use A cable)
2622A Display Terminal (Use B cable)
2623A Graphics Terminal (Use B cable)
2624B Display Terminal (Use B cable)
2627A Color Graphics Terminal (Use B cable)
2635B Printing Terminal (Use C cable)

C. Order one of the following system console interface-cable configurations

CONSOLE INTERFACE	CONSOLE CONNECT CABLES		
	A	B	C
Async Serial Interface (std)	2489A Opt 006 Cable 5m/16ft	2489A Opt 005 Cable 15m/49ft	2489A Opt 006 Cable 5m/16ft

D. Order a system disc (appropriate interface and cable are included with the system)

2489A+110 Integrated 9.4Mb fixed and 270kb Micro-floppy discs.

7908P/R 16.5Mb CS/80 Fixed disc with cartridge tape backup in standalone cabinet (7908P) or for rack mounting in user-furnished cabinet (7908R).

7911P/R 28.1Mb CS/80 Fixed disc with cartridge tape backup in standalone cabinet (7911P) or for rack mounting in user-furnished cabinet (7911R).

7912P/R 65.6Mb CS/80 Fixed disc with cartridge tape backup in standalone cabinet (7912P) or for rack mounting in user-furnished cabinet (7912R).

7914P/R 132.1Mb CS/80 Fixed disc with cartridge tape backup in standalone cabinet (7914P) or for rack mounting in user-furnished cabinet (7914R).

7914TD 7914R 132.1Mb CS/80 Fixed Disc and 7970E 1600 bpi mag tape unit in 1.6m (63 in) cabinet (also requires a 12009A interface to the mag tape unit).

-240 Adds cartridge tape drive in 7914R.

E. Order appropriate base system options

014: Deletes 12220A 768kb ECC Memory Array Card and 12222A Memory frontplane connector, permitting their replacement with a 12220B 1.5Mb ECC Memory package (two 12220A Memory Array Cards and a 12222B Memory frontplane connector).

015: Operation from 230V ac power.

022: Software on CS/80 cartridge tape.

044: Software on microfloppy discs.

061: Software on 1600 bpi mag tape.

110: Provides integrated 9.4Mb fixed and 270kb micro-floppy discs (replaces 12009A interface to external discs with 12022A interface).

F. Order any desired Micro 29 Value Pack option

		VALUE PACK OPTIONS (INCLUDE OPT 014)		
MEDIA:	CS/80 Cartridge Tape	101	102	103
	3.5-in Microfloppy Disc	121	122	123
	1600 bpi Magnetic Tape	131	132	133
SOFTWARE INCLUDED:	VC+ for RTE-A	Yes	Yes	Yes
	Image/1000 DBMS	Yes	Yes	Yes
	Graphics/1000-II DGL	Yes	Yes	Yes
	BASIC/1000C	Yes	No	No
	FORTRAN 77	No	Yes	No
	Symbolic Debug/1000	No	Yes	No
	Pascal/1000	No	No	Yes
ADDITIONAL MEMORY PROVIDED		768 kilobytes*		

* Total becomes 1.5M bytes and no further expansion is possible in the 2489A

G. Order optional software (page 3.5-2) and, if necessary, order 2489A Option 014 with two 12220A memory array cards to provide enough memory (if not provided satisfactorily in a value pack option)

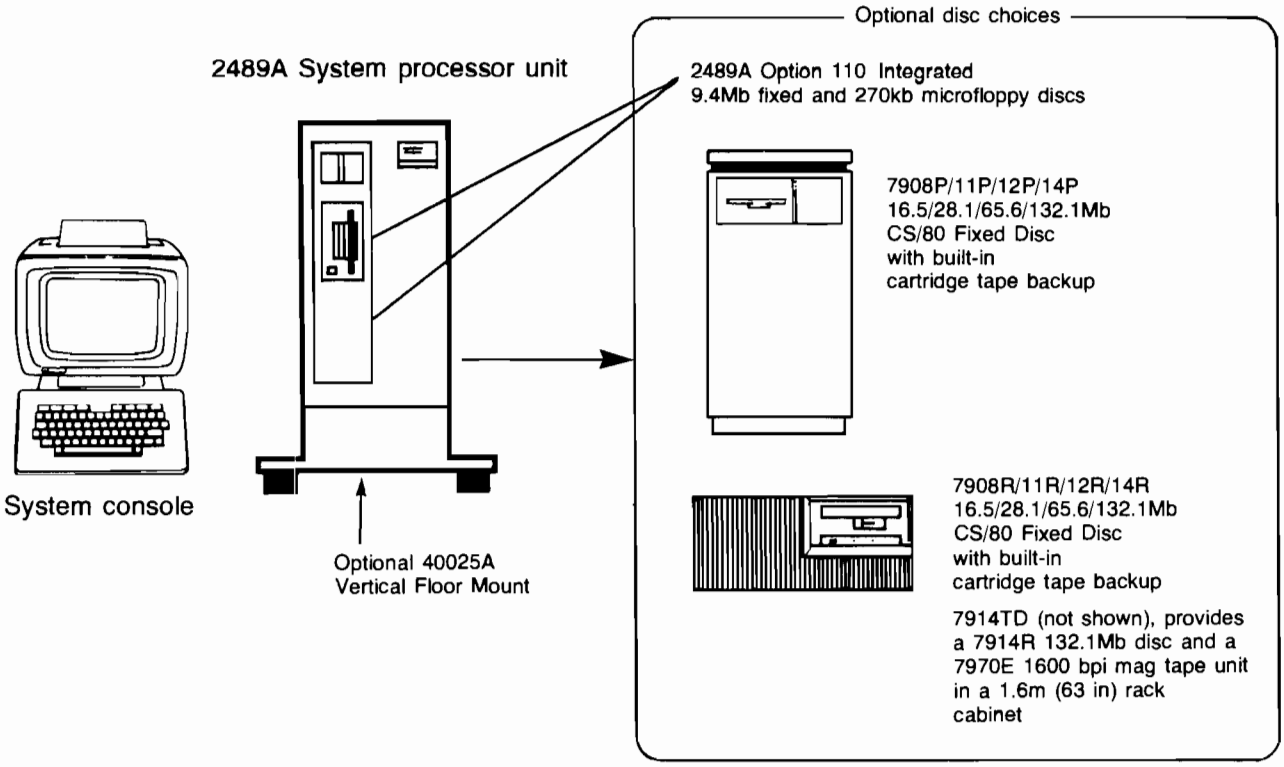
NOTE: Language compilers must be ordered separately to support program development.

H. Order Other Accessories and Interfaces (page 3.5-8).

I. Order Additional Terminals (page 4.1-5), System-to-System Communications Capabilities (page 4.3-1), and Peripheral Devices (sections that follow the Peripheral Devices tab).

NOTE: See the current HP 1000 Ordering and Compatibility Information booklet for status of peripherals with respect to FCC and FTZ Electro Magnetic Interference (EMI) qualification.

HP 1000 Micro 29 System Processor Unit



Hardware Supplied: 2489A System Processor Unit, consisting of:

- 12201A Sequencer card
- 12202A Data Path card
- 12203B Cache Control card
- 12204A Memory Controller card
- 12220A 768kb ECC Memory Array card
- 12222A Memory connector
- 12005B Asynchronous serial (terminal) interface card with 2489A cable Option 005 or 006
- 12009A HP-IB disc interface and cable
- Micro/1000 Package with power supply and 14 card cage slots available for CPU, memory, and I/O cards, and dedicated slots for 25kHz power module and battery backup* cards.

Required options and hardware (see page 3.1-12 for choices; must be on same order as 2489A)

- 262x or 2635B System console with appropriate cable choice (see page 3.1-12)
- 2489A Option 110 integrated disc or 7908/11/12P/R or 7914P/R/TD separate fixed disc
- Software media Option 022, 044, or 061

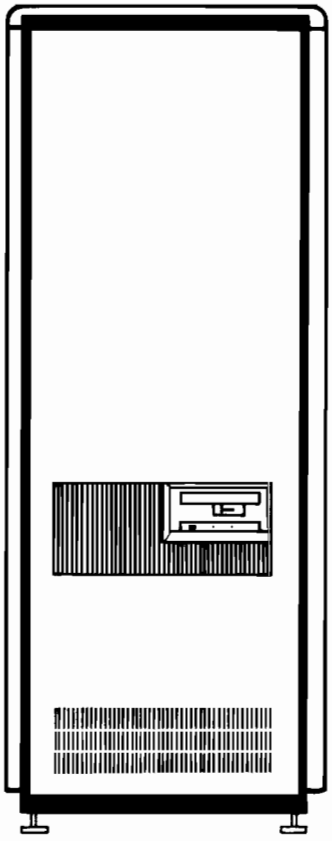
Software and services included

- RTE-A operating system and relocatable modules on option-specified media with file manager, command interpreter, interactive screen editor, assembler, and relocatable and absolute loaders
- A900 and disc diagnostic libraries
- Primary system (preconfigured RTE-A operating system on option-specified media)
- Complete set of hardware and software manuals
- Site preparation consultation.
- On-site installation assistance and checkout by a Hewlett-Packard service engineer, including integration and test with primary system
- 90-day on-site warranty
- Four 93285A Engineering Units

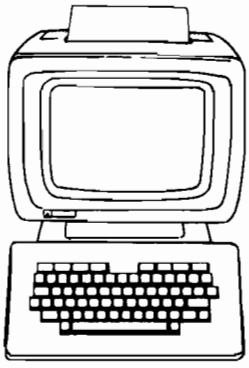
** The optional 12154A Battery Backup Card extends up into two otherwise-available card cage slots, reducing the total number of available card cage slots by two.*

Model 26 Computer System Sample Configuration

In 56-inch Cabinet

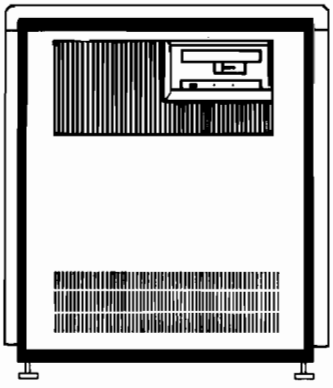


2196C+006, 022 System Processor Unit with 7908R 16.5 megabyte fixed disc with built-in cartridge tape backup

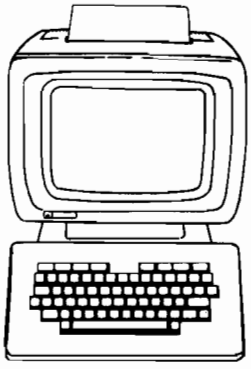


2621B Interactive Terminal

In 23-inch Cabinet



2196D+006, 022 System Processor Unit with 7908R 16.5 megabyte fixed disc with built-in cartridge tape backup



2621B Interactive Terminal

Ordering Guide for Alternate HP 1000 Model 26 Systems

A. Order One HP 1000 Model 26 System Processor Unit

2196C System Processor Unit in 56-inch cabinet

2196D System Processor Unit in 23-inch cabinet

B. Order a system/maintenance console

2621B Interactive Terminal (Use A cable)

2622A Display Terminal (Use B cable)

2623A Graphics Terminal (Use B cable)

2624B Display Terminal (Use B cable)

2627A Color Graphics Terminal (Use B cable)

2635B Printing Terminal (Use C cable)

C. Order one of the following system console interface-cable configurations

CONSOLE INTERFACE	CONSOLE CONNECT CABLES		
	A	B	C
Async Serial Interface (std)	2196C/D Opt 006 Cable 5m/16ft	2196C/D Opt 005 Cable 15m/49ft	2196C/D Opt 006 Cable 5m/16ft
OR	OR	OR	OR
2196C/D Opt 008# to Delete Async Interface AND 12040B 8-Chan Multiplexer	13242Y Cable 4.5m/15ft	13222Y Cable 5m/17ft	3.6m/12ft Cable*

\# Available on January 1, 1984.

* Cable is included with the 2635B Printing Terminal

D. Order one of these system discs (interface and cable are included in 2196C/D)

7908R 16.5Mb rack mounting CS/80 Fixed Disc with built-in cartridge tape backup†

7911R 28.1Mb rack mounting CS/80 Fixed Disc with built-in cartridge tape backup†

7912R 65.6Mb rack mounting CS/80 Fixed Disc with built-in cartridge tape backup†

7914R 132.1Mb rack mounting CS/80 Fixed Disc with built-in cartridge tape backup†

7914TD, 7914R Disc without built-in cartridge tape and 7970E 1600 bpi mag tape unit in 1.6m (63 in) rack cabinet.▶

7933H 404Mb Fixed Disc.‡

7935H 404Mb Removable Media Disc.‡

† *Requires Media Option 022.*

▶ *Requires Media Option 061 and Option 070 or a 12009A interface to the mag tape unit in the 7914TD.*

‡ *Requires 7970E+626 or 636 1600 bpi Mag Tape Unit (7970E+636 is included in 7914TD) and Media Option 061.*

E. Order appropriate base system options

015: Operation from 220V Hz ac power. Power options for peripherals must be ordered separately.

022: Software on CS/80 cartridge tape for 79xxR disc

051: Magnetic Tape Trim. Provides a large cutout in upper door of 2196C cabinet for a 7970E Mag tape unit

052: Door trim package in upper space in 2196C

053: Lower door in 2196C without cutout for system that does not use a 79xxR disc

061: Software on 1600 bpi magnetic tape for system with 7970E+626 or 636 Mag Tape Unit or 7914TD used as software load device

070: Racking in 7914TD cabinet. Deletes cabinet from 2196C to permit racking of the SPU in cabinet of 7914TD Disc-Magnetic Tape Unit package and adds a second 12009A interface for connection to Mag Tape Unit

F. Order optional software (page 3.5-2) and order more memory array cards (page 3.5-6) if needed to provide more memory

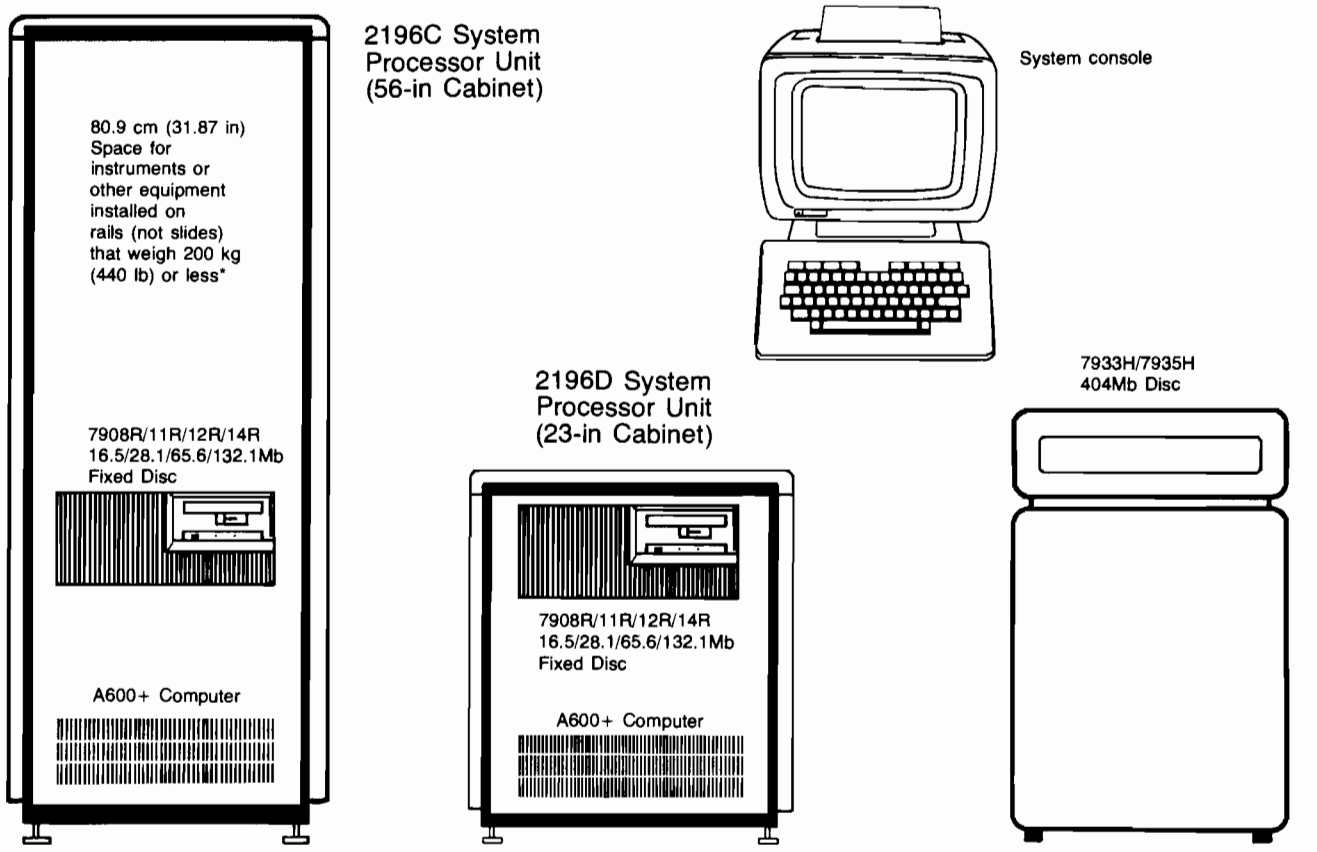
NOTE: Language compilers must be ordered separately to perform program development.

G. Order Other Accessories and Interfaces (see page 3.5-8)

H. Order Additional Terminals (page 4.1-5), System-to-System Communications Capabilities (page 4.3-1), and Peripheral Devices (sections that follow the Peripheral Devices Tab)

NOTE: See the current HP 1000 Ordering and Compatibility Information booklet for status of peripherals with respect to FCC and FTZ Electro Magnetic Interference (EMA) qualification.

HP 1000 Model 26 System Processor Unit



** This weight limitation is required to meet anti-tip safety requirements.*

Hardware Supplied: 2196C/D System Processor Unit, consisting of:

- HP 12102B 512k byte memory card
- 12105A A600+ CPU card
- 12005B Asynchronous Serial (terminal) Interface card with 2196C/D cable Option 005 or 006. **Effective 1/1/84, delete Option 008 makes possible substitution of 12040B 8-channel multiplexer and appropriate terminal cable.**
- 12009A HP-IB disc interface and cable
- 20 Slot card cage with 16 available card cage slots
- 56-inch (2196C) or 23-inch (2196D) system cabinet with power distribution module (and power cable with standard 2196D)

Required Options and Hardware (see page 3.1-15 for choices) (Must be on same order as 2196C/D)

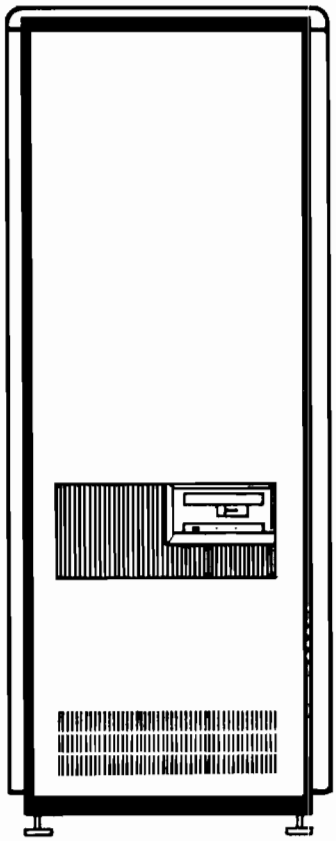
- 262x or 2635B System Console with appropriate cable choice (see page 3.1-15)
- 7908R/7911R/7912R/7914R/7914TD/7933H/7935H System Disc
- Software Media Option 022 or 061.

Software and services included

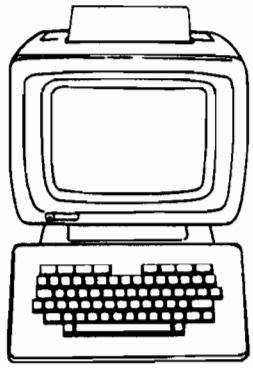
- RTE-A operating system relocatable modules with file manager, command interpreter, interactive screen editor, assembler, and utilities on Option 022 or 061 media
- HP 1000 A-Series diagnostics libraries on Option 022 or 061 media
- Primary system (preconfigured RTE-A operating system on Option 022 or 061 media)
- Complete set of hardware and software manuals
- Site preparation consultation
- On-site installation assistance and checkout, including integration and test with primary system
- 90-day on-site warranty
- Four 93285A Engineering Units

Model 27 Computer System Sample Configuration

In 56-inch Cabinet

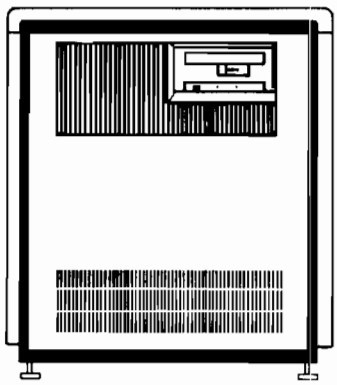


2197C+006, 022 System Processor Unit with 7911R 28.1 megabyte fixed disc with built-in cartridge tape backup

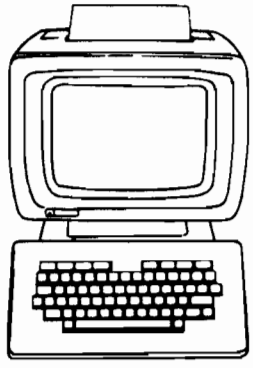


2621B Interactive Terminal

In 23-inch Cabinet



2197D+006, 022 System Processor Unit with 7911R 28.1 megabyte fixed disc with built-in cartridge tape backup



2621B Interactive Terminal

Ordering Guide for Alternate HP 1000 Model 27 Systems

A. Order One HP 1000 Model 27 System Processor Unit

2197C System Processor Unit in 56-inch cabinet

2197D System Processor Unit in 23-inch cabinet

B. Order a system/maintenance console

2621B Interactive Terminal (Use A cable)

2622A Display Terminal (Use B cable)

2623A Graphics Terminal (Use B cable)

2624B Display Terminal (Use B cable)

2627A Color Graphics Terminal (Use B cable)

2635B Printing Terminal (Use C cable)

C. Order one of the following system console interface-cable configurations

CONSOLE INTERFACE	CONSOLE CONNECT CABLES		
	A	B	C
Async Serial Interface (std)	2197C/D Opt 006 Cable 5m/16ft	2197C/D Opt 005 Cable 15m/49ft	2197C/D Opt 006 Cable 5m/16ft
OR	OR	OR	OR
2197C/D Opt 008# to Delete Async Interface AND 12040B 8-Chan Multiplexer	13242Y Cable 4.5m/15ft	13222Y Cable 5m/17ft	3.6m/12ft Cable*

\# Available on January 1, 1984.

* Cable is included with the 2635B Printing Terminal

D. Order system disc (interface and cable are included in 2197C/D)

7908R 16.5Mb rack mounting CS/80 Fixed Disc with built-in cartridge tape backup.†

7911R 28.1Mb rack mounting CS/80 Fixed Disc with built-in cartridge tape backup.†

7912R 65.6Mb rack mounting CS/80 Fixed Disc with built-in cartridge tape backup.†

7914R 132.1Mb rack mounting CS/80 Fixed Disc with built-in cartridge tape backup.†

7914TD, 7914R Disc without built-in cartridge tape and 7970E 1600 bpi mag tape unit in 1.6m (63 in) rack cabinet.▶

7933H 404Mb Fixed Disc.‡

7935H 404Mb Removable Media Disc.‡

† *Requires Media Option 022.*

▶ *Requires Media Option 061 and Option 070 or a 12009A interface to the mag tape unit in the 7914TD.*

‡ *Requires 7970E+626 or 636 1600 bpi Mag Tape Unit (7970E+636 is included in 7914TD) and Media Option 061.*

E. Order appropriate base system options

014: Deletes 512kb memory array card and connector, permitting their replacement with other cards and connector, which must be ordered (see page 3.5-6)

015: Operation from 220V Hz ac power. Power options for peripherals must be ordered separately

022: Software on CS/80 cartridge tape for 79xxR disc

051: Magnetic Tape Trim. Provides a large cutout in upper door of 2197C cabinet for a 7970E Mag tape unit.

052: Door trim package in upper space in 2197C

053: Lower door in 2197C without cutout for system that does not use a 79xxR disc

061: Software on 1600 bpi magnetic tape for system with 7970E+626 or 636 Mag Tape Unit or 7914TD used as software load device

070: Racking in 7914TD cabinet. Deletes cabinet from 2197C to permit racking of the SPU in cabinet of 7914TD Disc Magnetic Tape Unit package and adds a second 12009A interface for connection to Mag Tape Unit

701: Microprogramming development package with 2Mb memory, FORTRAN 77 and Pascal compilers, Symbolic Debug/1000, the 92045A RTE Microprogramming package, and a 12153A Writable Control Store Card (Includes Option 014)

F. Order optional software (page 3.5-2) and order 2197C/D Option 014 with other memory cards (page 3.5-6) if needed to provide more memory

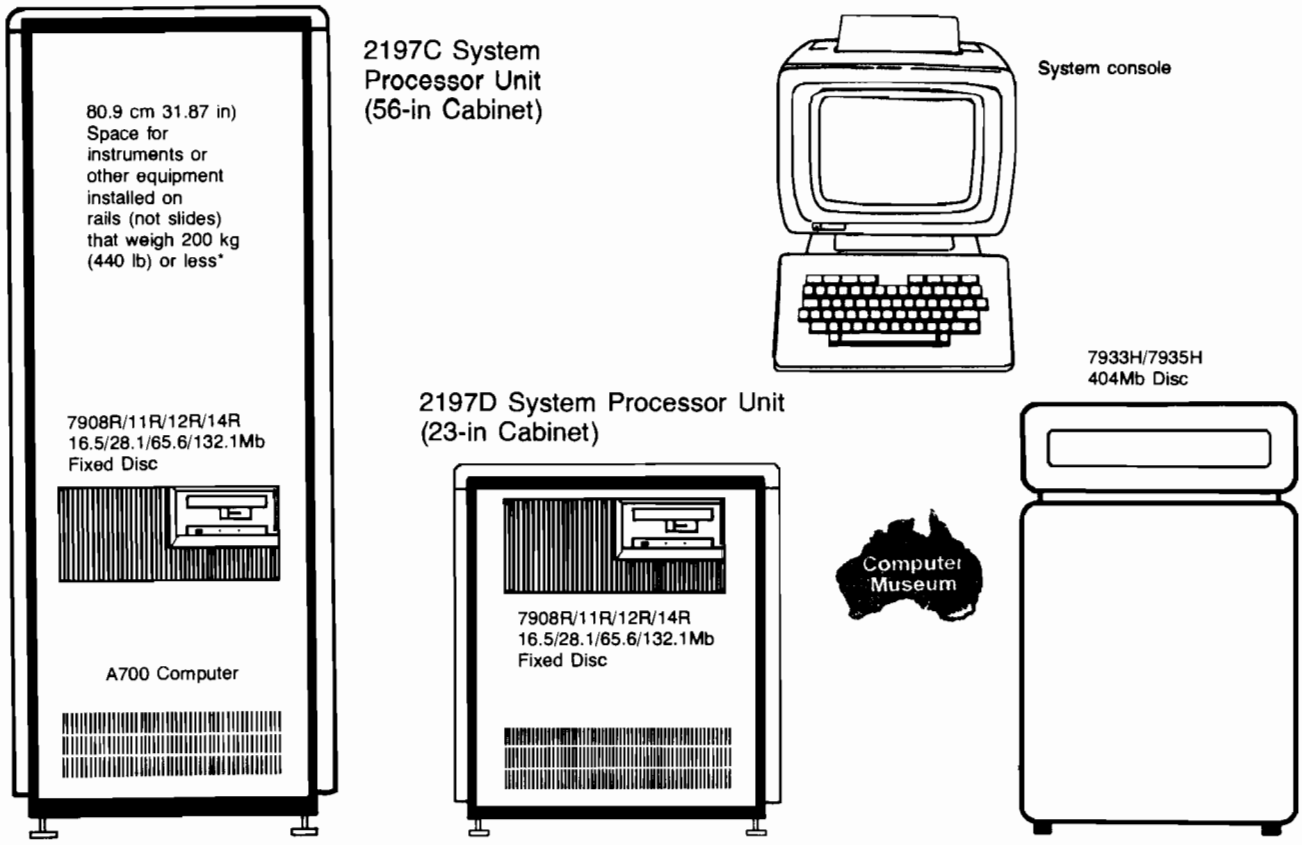
NOTE: Language compilers must be ordered separately to perform program development.

G. Order Other Accessories and Interfaces (see page 3.5-8)

H. Order Additional Terminals (page 4.1-5), System-to-System Communications Capabilities (page 4.3-1), and Peripheral Devices (sections that follow the Peripheral Devices Tab)

NOTE: See the current HP 1000 Ordering and Compatibility Information booklet for status of peripherals with respect to FCC and FTZ Electro Magnetic Interference (EMI) qualification.

HP 1000 Model 27 System Processor Unit



** This weight limitation is required to meet anti-tip safety requirements.*

Hardware Supplied: 2197C/D System Processor Unit, consisting of:

- HP 12103C 512k byte memory array card
- 12038A Connector from memory controller to one array card
- 12152-60003 Memory Controller Card
- 12152-60001 Upper A700 CPU card
- 12156A Hardware Floating Point Processor Card
- 12152-60002 Lower A700 CPU card
- 12005B Asynchronous Serial (terminal) Interface card with 2197C/D cable Option 005 or 006. **Effective 1/1/84, delete Option 008 makes possible substitution of 12040B 8-channel multiplexer and appropriate terminal cable.**
- 12009A HP-IB disc interface and cable
- 20 Slot card cage with 13 available card card cage slots
- 56-inch (2197C) or 23-inch (2197D) System cabinet with power distribution module (and power cable with standard 2197D Option 015)

Required Options and Hardware (see page 3.1-18 for choices) (Must be on same order as 2197C/D)

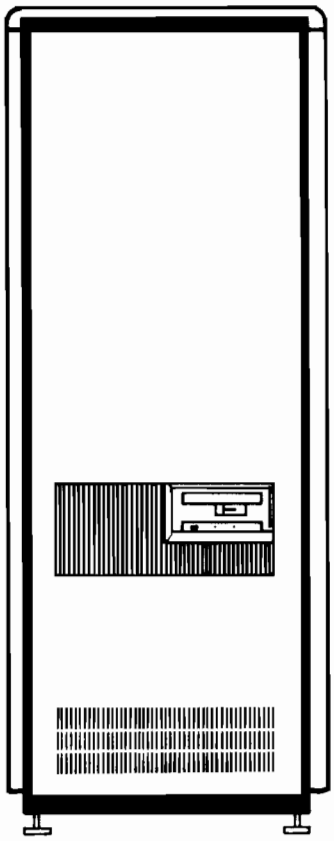
- 262x or 2635B System Console with appropriate cable choice (see page 3.1-18).
- 7908R/7911R/7912R/7914R/7914TD/7933H/7935H Fixed System Disc
- Software Media Option 022 or 061.

Software and services included

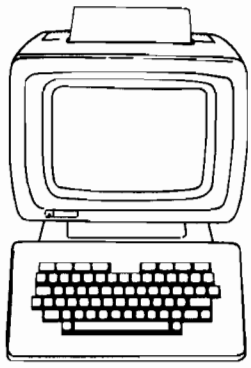
- RTE-A operating system and VC+ relocatable modules with file manager, command interpreter, interactive screen editor, assembler, and utilities on Option 022 or 061 media.
- HP 1000 A-Series diagnostics libraries on Option 022 or 061 media.
- Primary system (preconfigured RTE-A/VC+ operating system on Option 022 or 061 media).
- Complete set of hardware and software manuals.
- Site preparation consultation.
- On-site installation assistance and checkout, including integration and test with primary system.
- 90-day on-site warranty.
- Four 93285A Engineering Units.

Model 29 Computer System Sample Configuration

In 56-inch Cabinet

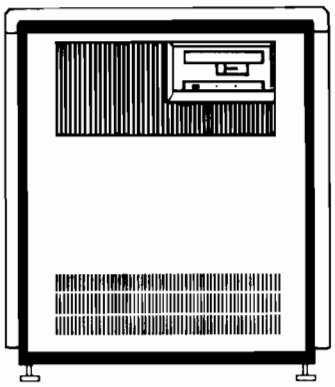


2199C+006, 022 System Processor Unit with 7914R 132.1 megabyte fixed disc with built-in cartridge tape backup

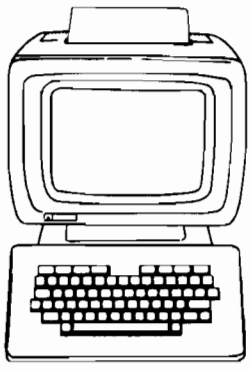


2621B Interactive Terminal

In 23-inch Cabinet



2199D+006, 022 System Processor Unit with 7914R 132.1 megabyte fixed disc with built-in cartridge tape backup



2621B Interactive Terminal

Ordering Guide for Alternate HP 1000 Model 29 Systems

A. Order One HP 1000 Model 29 System Processor Unit

2199C System Processor Unit in 56-inch cabinet
2199D System Processor Unit in 23-inch cabinet

B. Order a system/maintenance console

2621B Interactive Terminal (Use A cable)
2622A Display Terminal (Use B cable)
2623A Graphics Terminal (Use B cable)
2624B Display Terminal (Use B cable)
2627A Color Graphics Terminal (Use B cable)
2635B Printing Terminal (Use C cable)

C. Order one of the following system console interface-cable configurations

CONSOLE INTERFACE	CONSOLE CONNECT CABLES		
	A	B	C
Async Serial Interface (std)	2199C/D Opt 006 Cable 5m/16ft	2199C/D Opt 005 Cable 15m/49ft	2199C/D Opt 006 Cable 5m/16ft

D. Order system disc (interface and cable are included in 2199C/D)

7908R 16.5Mb rack mounting CS/80 Fixed Disc with built-in cartridge tape backup.†
7911R 28.1Mb rack mounting CS/80 Fixed Disc with built-in cartridge tape backup.†
7912R 65.6Mb rack mounting CS/80 Fixed Disc with built-in cartridge tape backup.†
7914R 132.1Mb rack mounting CS/80 Fixed Disc with built-in cartridge tape backup.†
7914TD, 7914R Disc without built-in cartridge tape and 7970E 1600 bpi mag tape unit in 1.6m (63 in) rack cabinet.▶
7933H 404Mb Fixed Disc.‡
7935H 404Mb Removable Media Disc.‡

† *Requires Media Option 022.*

▶ *Requires Media option 061 and Option 070 or a 12009A interface to the mag tape unit in the 7914TD.*

‡ *Requires 7970E+626 or 636 1600 bpi Mag Tape Unit (7970E+636 is included in 7914TD) and Media Option 061.*

E. Order appropriate base system options

014: Deletes 768kb error correcting memory array card and connector permitting their replacement with other cards and connector, which must be ordered (see page 3.5-6)
015: Operation from 230V/50 Hz ac power
022: Software on CS/80 cartridge tape for 79xxR disc
051: Magnetic Tape Trim. Provides a large cutout in upper door of 2199C cabinet for a 7970E Mag Tape Unit
052: Door trim package for upper space in 2199C
053: Lower door in 2199C without cutout for system that does not use a 79xxR disc
061: Software on 1600 bpi magnetic tape for system with 7970E+626 or 636 Mag Tape Unit or 7914TD used as software load device
070: Racking in 7914TD cabinet. Deletes cabinet from 2199C to permit racking of the SPU in cabinet of 7914TD Disc-Magnetic Tape Unit package and adds a second 12009A interface for connection to Mag Tape Unit
100: Credit for system ordered with one of Performance/900 options to replace an HP 1000 M/E/F-Series system

F. Order any desired Performance/900 Value Pack Option

	PERFORMANCE 900 OPTIONS (ALL INCLUDE OPTION 014)			
MEDIA				
CS/80 Cartridge Tape	101	102	103	104
1600 bpi Mag Tape	111	112	113	114
SOFTWARE INCLUDED				
Image/1000-II DBMS	Yes	Yes	Yes	Yes
Graphics/1000-II DGL & AGP	Yes	Yes	Yes	Yes
FORTRAN 77	Yes	Yes	Yes	Yes
Symbolic Debug/1000	Yes	Yes	Yes	Yes
Pascal/1000	Yes	Yes	No	No
BASIC/1000C	No	No	Yes	Yes
TOTAL MEMORY PROVIDED	1.5Mb		3.0Mb	

G. Order optional software (page 3.5-2) and order 2199C/D Option 014 with other memory cards (page 3.5-6) if needed to provide more memory (when not ordered in a value pack option)

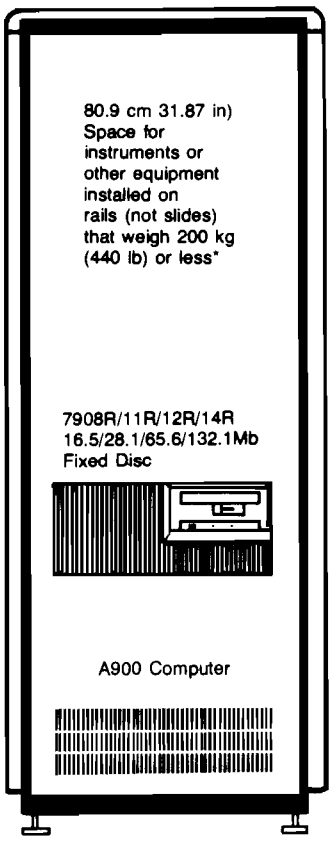
NOTE: Language compilers must be ordered separately to perform program development.

H. Order Other Accessories and Interfaces (see page 3.5-8)

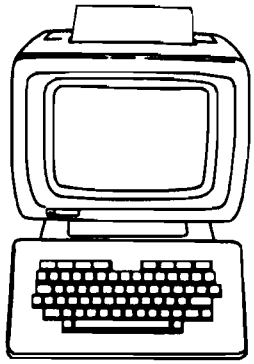
I. Order Additional Terminals (page 4.1-5), System-to-System Communications Capabilities (page 4.3-1), and Peripheral Devices (sections that follow the Peripheral Devices Tab)

NOTE: See the current HP 1000 Ordering and Compatibility Information booklet for status of peripherals with respect to FCC and FTZ Electro Magnetic Interference (EMI) qualification.

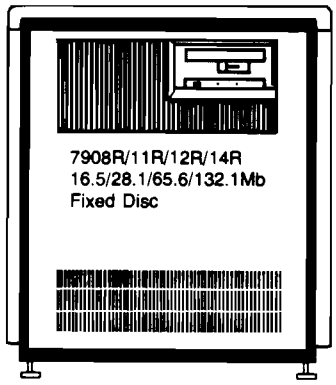
HP 1000 Model 29 System Processor Unit

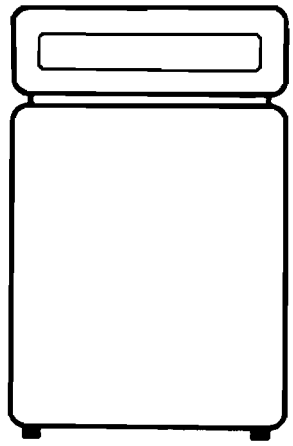


2199C System Processor Unit (56-in Cabinet)



2199D System Processor Unit (23-in Cabinet)





** This weight limitation is required to meet anti-tip safety requirements.*

Hardware Supplied: 2199C/D System Processor Unit, consisting of:

- HP 12220A 768k byte error correcting memory array card
- 12222A Connector from memory controller to one array card
- 12204A Memory Controller Card
- 12201A Sequencer Card
- 12202A Data Path Card
- 12203A Cache Control Card
- 12005B Asynchronous Serial (terminal) Interface card with 2199C/D cable Option 005 or 006.
- 12009A HP-IB disc interface and cable
- 20 Slot card cage with 13 available card card cage slots
- 56-inch (2199C) or 23-inch (2199D) System cabinet with power distribution module (and power cable with standard 2199D)

Required Options and Hardware (see page 3.1-21 for choices) (Must be on same order as 2199C/D)

- 262x or 2635B System Console with appropriate cable choice (see page 3.1-21).
- 7908R/7911R/7912R7914R/7914TD/7933H/7935H Fixed System Disc.
- Software Media Option 022 or 061.

Software and services included

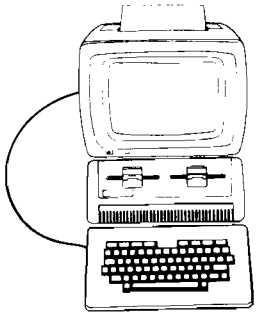
- RTE-A operating system and VC+ relocatable modules with file manager, command interpreter, interactive screen editor, assembler, and utilities on Option 022 or 061 media.
- HP 1000 A-Series diagnostics libraries on Option 022 or 061 media.
- Primary system (preconfigured RTE-A/VC+ operating system on Option 022 or 061 media).
- Complete set of hardware and software manuals.
- Site preparation consultation.
- On-site installation assistance and checkout, including integration and test with primary system.
- 90-day on-site warranty.
- Four 93285A Engineering Units.

HP 1000 L-Series Microcomputer Systems Summary

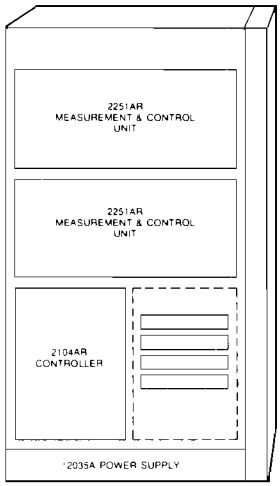
HP 1000 L-Series Microcomputer Systems are available in the configurations shown below. The Model 5 tabletop Microsystem offers compactness and convenience. The HP 1000 Automation Processor is a four-card board microcomputer system intended only for use in and support of the operations of an HP 2250N/R Measurement and Control Processor.

HP 1000 Automation Processor

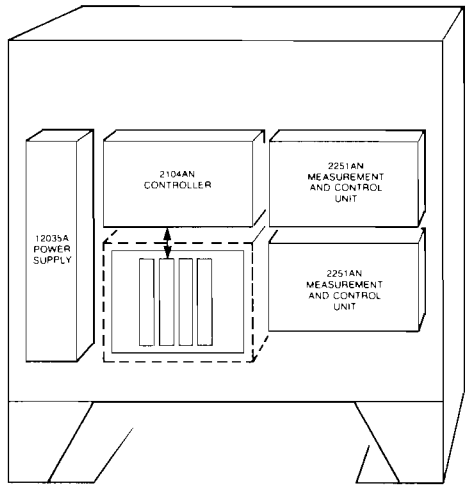
Model 5 System with integral 262x terminal



In 2250R Cabinet



In 2250N NEMA-12 Cabinet

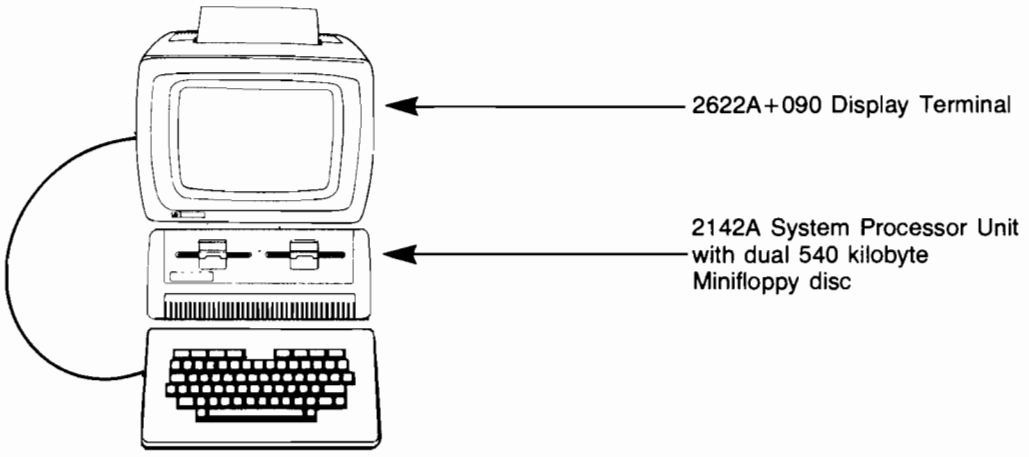


	MODEL 5 is a real-time Microsystem of compact tabletop design for use as a workstation. It can be equipped with Minifloppy and/or hard disc for program development, Image data base management, and graphics support.		**HP 1000 Automation Processor is a four-card board microcomputer system used in the HP 2250N/R Measurement and Control Processor to support data buffering, preprocessing, data reduction, and DS/1000-IV Network communication with an HP 1000 host System.**
	2142A	**2142B**	**2162A**
HARDWARE CAPACITY			
Available card cage slots	3	4	3 are available in 2250N/R for addition of DS/1000-IV interface, 12013A Battery Backup Card, and one other L-Series interface
Main memory	128kb, expandable to 512kb		512kb
Disc memory capacity	2142A includes dual 270kb Minifloppy disc (540kb total); 4.6Mb/16Mb/28Mb/65Mb Fixed disc, 19.6Mb Cartridge disc, or 1.18Mb/2.36Mb Flexible disc is optional with 2142A, required with 2142B.		None
USER-AVAILABLE CAPACITY			
Operating System	RTE-XL standard		RTE-XL standard
Memory mgt. capacity	128k bytes to 512k bytes		512k bytes
Maximum size of unsegmented program	64k bytes		64kb bytes
No. of user partitions	Up to 255		Up to 255
Maximum in-Memory Data Space	Included in program space		Included in program space
No. of Logical Units	64		64
Program language support	Programming in Macro/1000 Assembly, FORTRAN 4X, BASIC/1000L with Minifloppy or 2Mb or larger disc, Pascal/1000 with 2Mb or larger disc		None, intent is to have programs developed on HP 1000 host system and down-loaded to the HP 1000 Automation Processor

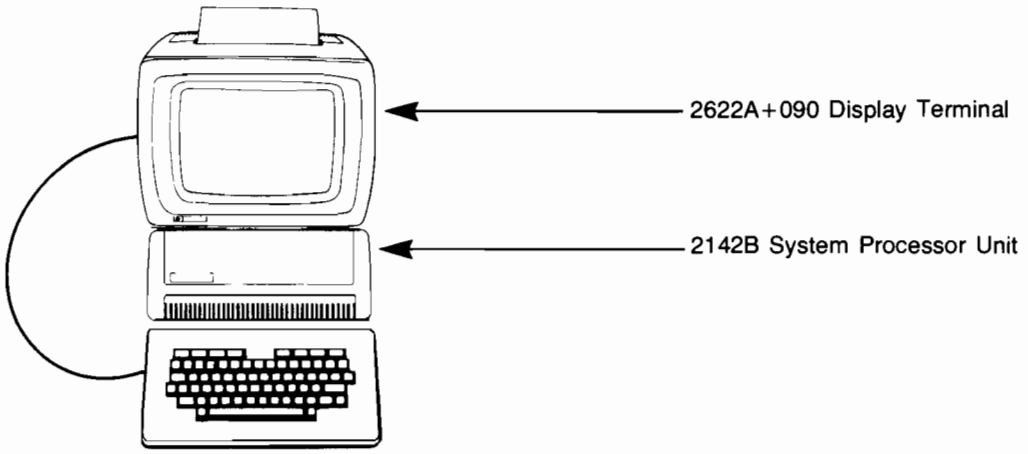
Model 5 Microsystem Sample Configuration

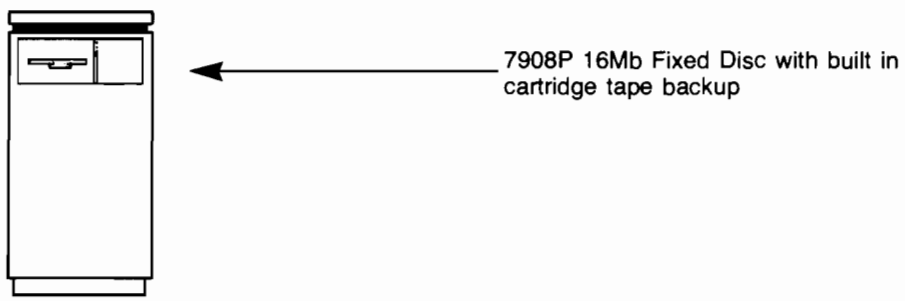
Standard Integrated Tabletop Configuration

2142A:



2142B:





Ordering Guide for Alternate HP 1000 Model 5 Microsystems

A. Order one HP 1000 Model 5 Microsystem System Processor Unit

2142A System Processor Unit with dual Minifloppy Disc.

OR

2142B System Processor Unit without dual Minifloppy Disc.

ORDER ANY APPROPRIATE OPTIONS

005: Cable for 2627A (or 2629H OEM) Color Graphics Terminal used as system console

012: 512k byte memory instead of 128k byte memory.

015: Operation from 230V ac power.

041: System software on 1.2M byte Flexible disc media instead of 7908/11/12 compatible cartridge tape (2142B only)

B. Order one of the following terminals listed under System/maintenance Consoles

System/Maintenance Console Choices

2622A (or 2629E OEM) Display Terminal with Option 090.

2623A (or 2629G OEM) Graphics Terminal with Option 090.

2624B (or 2629F OEM) Display Terminal with Option 090.

2627A (or 2629H OEM) Color Graphics Terminal (requires 2142A/B option 005).

C. For 2142B, order one of the four Discs listed in the first group of Disc Choices, below. These discs and those listed in the second group are optional with 2142A. (The 12009A Interface and 2M (6.5ft) cable to disc are included in 2142A and 2142B; however, in the 2142A only, an HP Part No. 8120-3396 Jumper cable will also be required to permit change of the position of the minifloppy controller card in the Model 5 card cage.)

Disc choices for 2142B

7908P 16.5Mb CS/80 standalone Fixed Disc with built-in cartridge tape backup

7911P 28.1Mb CS/80 standalone Fixed Disc with built-in cartridge tape backup

7912P 65.6Mb CS/80 standalone Fixed Disc with built-in cartridge tape backup

9895A 2.36 Megabyte Dual Flexible Disc

Additional discs for 2142A

Any of the discs in the list above

9134A 4.6Mb Mini Winchester Disc

D. Order optional software (page 3.5-1) and, if necessary, order 2142A/B option 012 and/or one or more 12003A Memory Array Cards (page 3.5-5) to provide more memory.

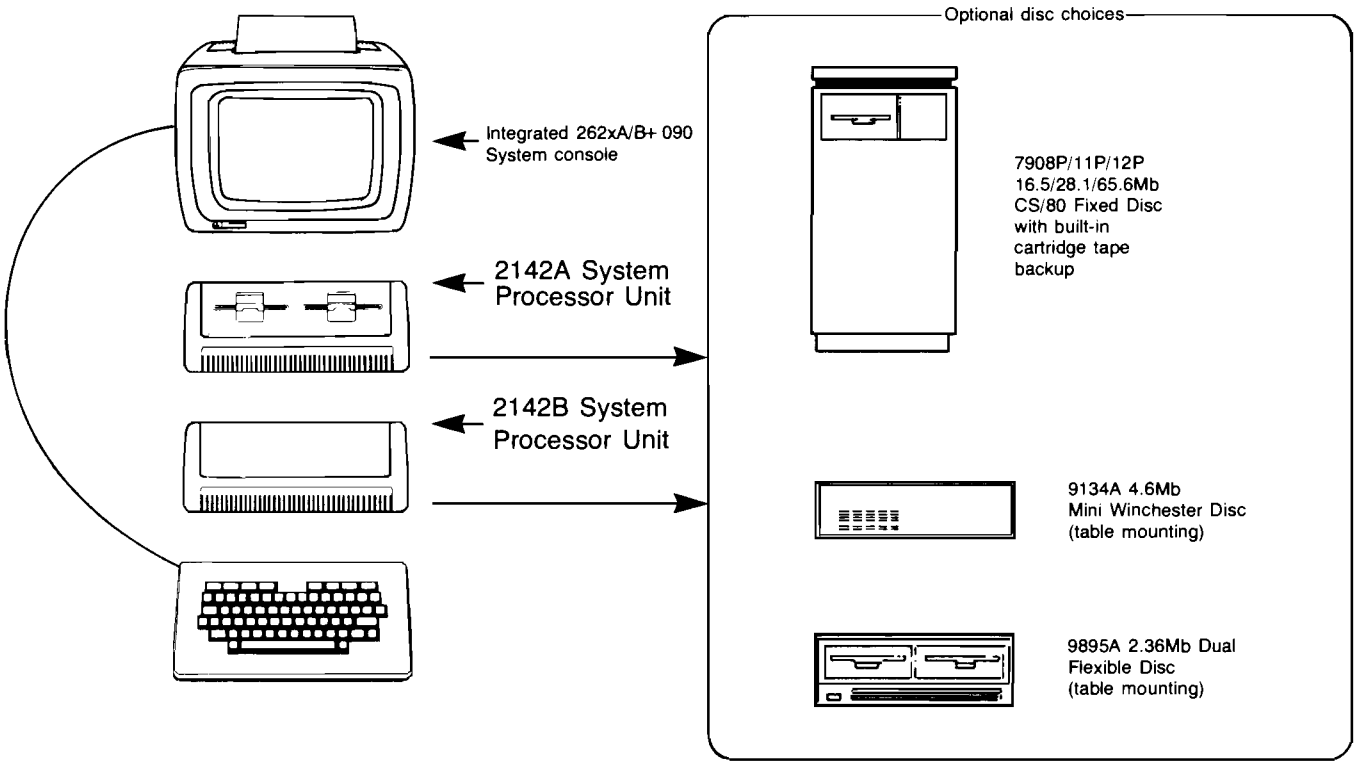
NOTE: Language compilers must be ordered separately or with 2142B option 102 or 103 to perform program development.

E. Order other accessories and interfaces (see page 3.5-6).

F. Order additional terminals (pages 4.1-5 through 4.1-11), System to System Communications capabilities (pages 4.3-1 through 4.3-14), and Peripheral Devices (sections that follow the Peripheral Devices Tab).

NOTE: See pages 6.2-9 through 6.2-12 for status of peripherals with respect to FCC and FTZ Electro Magnetic Compatibility (EMC) qualification.

HP 1000 Model 5 Microsystem System Processor Unit



Hardware Supplied: 2142A/B System Processor Unit, consisting of:

- HP 1000 L-Series 128k byte memory card
- HP 1000 L-Series CPU Card
- HP 12005A Asynchronous Serial (terminal) Interface card
- Terminal data and power cables
- 12009A HP-IB Interface card and cable
- Minifloppy controller card (2142A only)
- 8-slot card cage with 3 (2142A) or 4 (2142B) available card cage slots
- Power supply
- Dual 270 kilobyte 5-inch Minifloppy disc (540 kilobytes total) (2142A only)
- Microsystem package with power cable (power cable not supplied with 2142A/B Option 015)

Required Options and Hardware (see page 3.2-3 for choices) (Must be on same order as 2142A/B)

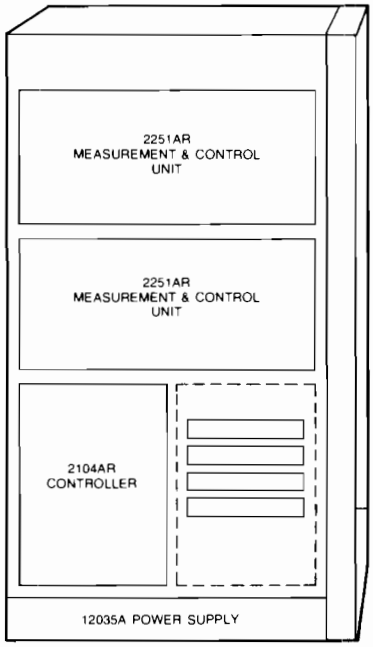
- 2142B option 041 for system software if 9895A is selected as 2142B system disc
- 262x System Console with Model 5 Compatibility Option 090 or 2627A (or 2629H OEM) Color Graphics Terminal as system console with 2142A/B cable option 005
- 7908/11/12 or 9895A Disc (2142B requirement only)

Software and services included

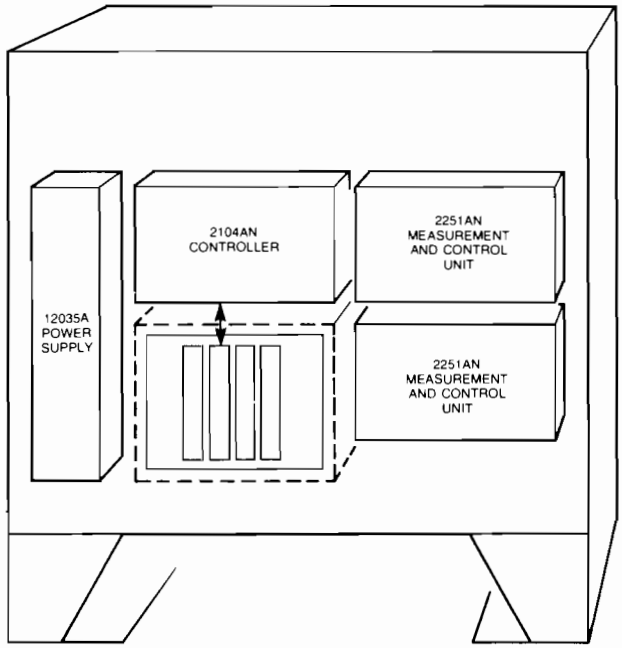
- RTE-XL operating system with File Manager, Assembler, Interactive Screen Editor, Debug package and utilities on Minifloppy disc media (2142A) or 7908/11/12 compatible cartridge tape if option 041 is not ordered requesting flexible disc media (2142B)
- HP 1000 L-Series diagnostics library on Minifloppy disc media (2142A) or 7908/11/12 compatible cartridge tape if option 041 is not ordered requesting flexible disc media (2142B)
- Primary system (preconfigured RTE-XL operating system on Minifloppy disc (2142A) or 7908/11/12 compatible cartridge tape if option 041 is not ordered requesting flexible disc media (2142B)) and on site checkout of assembled system (four 93285A Engineering Units per System)
- Complete set of hardware and software manuals
- Site preparation consultation
- On-site installation assistance
- 90-day on-site warranty

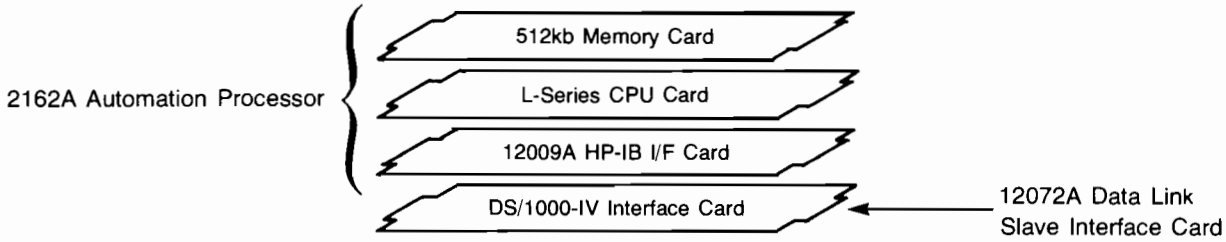
HP 1000 Automation Processor Sample Configuration

In 2250R 56-inch Cabinet



In 2250N NEMA-12 Cabinet





Ordering Guide for Alternate HP 1000 Automation Processors

A. Order one HP 1000 Automation Processor

2162A Automation Processor

ORDER ONE OF THESE SOFTWARE MEDIA OPTIONS

041: Provides 2162A Primary system and diagnostics on 1.2M byte flexible disc
050: Provides 2162A Primary system and diagnostics on 800 bpi magnetic tape
051: Provides 2162A Primary system and diagnostics on 1600 bpi magnetic tape

B. Order 91750R Right to Copy DS/1000-IV Network software and one of the following DS/1000-IV Network Interfaces

12072A Data Link Slave Interface

OR

12044A HDLC Direct Connect Interface

OR

12007B HDLC Modem Interface

C. Order 12013A Battery Backup Card if desired to sustain memory contents in event of power failure

NOTE: The 12013A Battery Backup Card is usable in 2162A Automation Processor installed in 2250N only if maximum ambient temperature will not exceed 40°C (104°F).

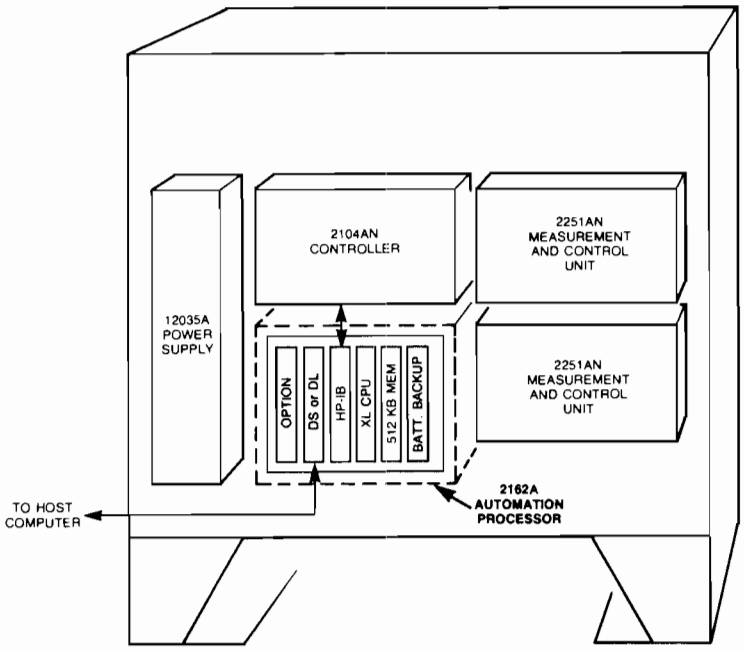
D. Order any one of the following optional additional L-Series accessories (see pages 3.5-6 through 3.5-8 and NOTE below):

- 12005A Asynchronous serial interface for 26xx terminal
- 12006A Parallel interface for general-purpose interfacing
- 12009A HP-IB interface for a second HP-IB bus
- 12007B HDLC Modem Interface for a point-to-point DS/1000-IV connection (to provide a possible second transmission path)
- 12008A PROM Card for non-volatile program storage
- 12044A HDLC Direct Connect Interface for a point-to-point DS/1000 connection (to provide a possible second transmission path)
- 12072A Data Link Slave Interface Card (to provide a possible second data link connection)

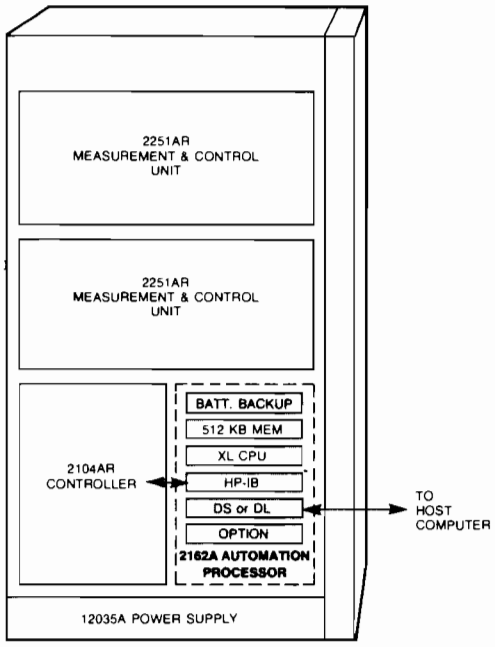
NOTE: The total number of L-Series accessories usable with the 2162A is subject to CPU +5V current qualification for use in the 2250N/R Measurement and Control Processor and to Environmental qualification for use in the 2250N. These qualifications are covered in the 2162A Automation Processor data sheet, HP Literature Stock Number 5953-2870 and any later revision of that data sheet.

HP 1000 Automation Processor

2162A Automation Processor in 2250N Cabinet



2162A Automation Processor in 2250R Cabinet



Hardware Supplied: 2162A Automation Processor, consisting of:

- 2103LK Board Computer with 512k byte memory option 012
- 12009A HP-IB interface card and 2m/6.5ft cable
- Nameplate, power cable, and labels

Required Software and Hardware Ordered Separately (Must be on same order as 2162A)

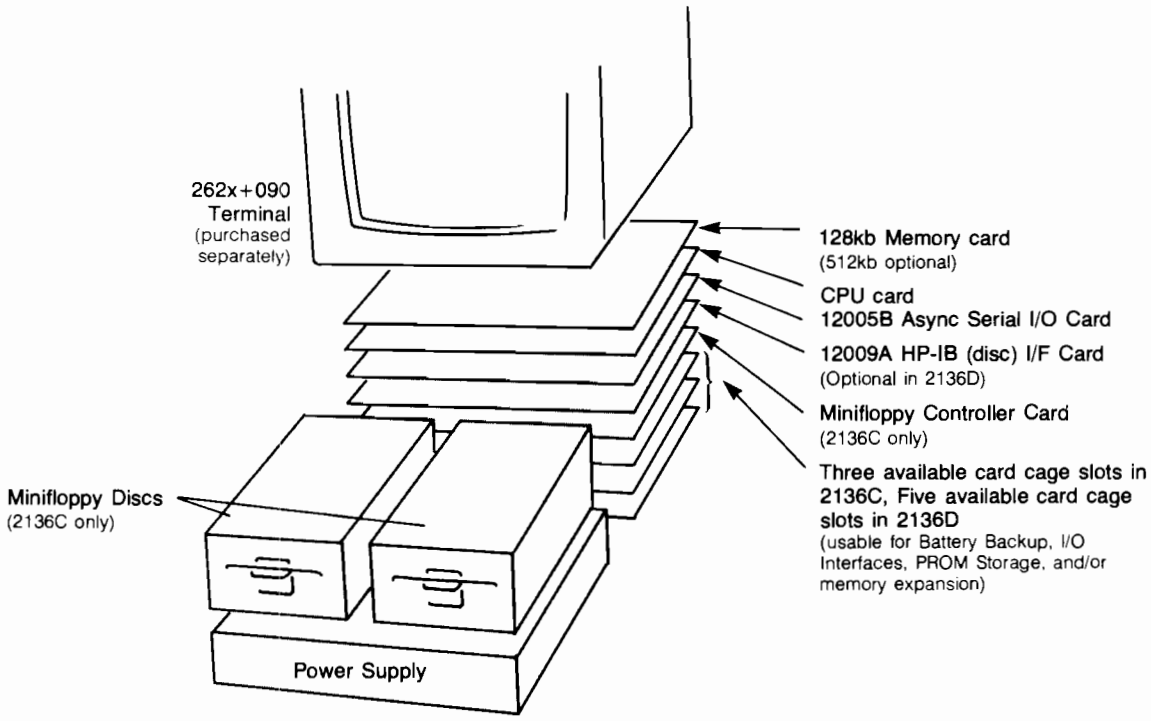
- 91750R Right to Copy DS/1000-IV network software from the host system
- DS/1000-IV Network Interface

Software and services included

- RTE-XL Primary system with Automation Processor Exerciser verification program on option-selected software media
- License to execute RTE-XL on the 2162A Automation Processor
- L-Series Diagnostic Packages
- Installation of the 2162A into the 2250N/R and diagnostic checkout
- Hardware and software manuals

2136C/D Microsystem Component

2136C/D Microsystem Component Configuration (front view)



2136C Hardware Supplied

- Microsystem package with power supply, ventilation fans, two minifloppy disc drives, eight-slot card cage, and power cable
- 12105A A600+ CPU Card (uses one card cage slot)
- 12102A 128kb Memory Card (uses one card cage slot)
- 12005B Asynchronous Serial (system console) Interface Card and cable
- 12009A HP-IB (disc) Interface Card and cable
- 12021A Minifloppy Controller Card
- 12038A Connector, CPU-to-Memory card

2136D Hardware Supplied

Similar to 2136C, but without minifloppy disc drives, and 12009A and 12021A cards.

Manuals and primary system included with 2136C

- 02103-90005 L-Series I/O Interfacing Guide
- 02156-90001 A600+ Computers Reference manual
- 02136-90001 HP 1000 Model 6+ Computer Installation and Service manual
- 12005-90002 HP 12005A/B Reference Manual
- 12009-90001 12009A HP-IB Interface Reference Manual
- RTE-A Primary system on minifloppy discs (must purchase 92077E Right to Execute RTE-A)

Manuals included with 2136D

Similar to 2136C, but without 12009A HP-IB Interface Reference Manual.

Options available

005: 15m (49ft) Fiber optic cable connection to 2627A Color Graphics Terminal or other 262x Terminal (except 2621B or 2629L) used as non-integrated system console

006: 5m (16.4ft) Cable to 2635B Printing Terminal used as non-integrated system console

012: Replaces 12102A Memory card with 12102B 512kb Memory card

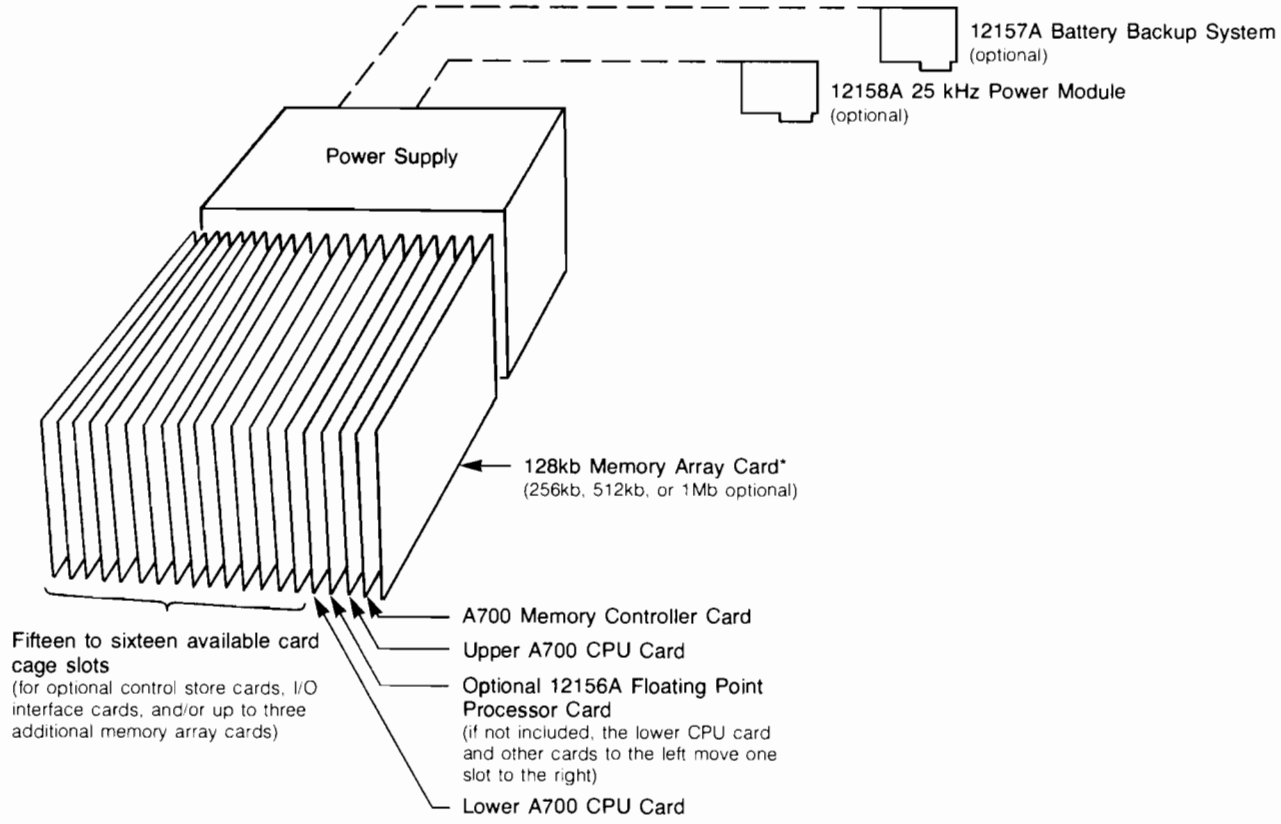
015: Operation from 230V/50Hz ac power

Requirements for operation

See page 3.3-10.

2137A A700 Computer

2137A Computer Configuration (rear view)



* *Additional memory array cards must plug into space immediately to the right of the Memory Controller card, moving all card positions to the left.*

2137A Hardware Supplied

- Computer cabinet with power supply, ventilation fans, 20-slot card cage, and power cable
- 12103A 128kb Memory array card (uses one card cage slot)
- 12152A CPU (uses three card cage slots), which includes:
  - — 12152-60001 Upper Processor card
  - — 12152-60002 Lower Processor card
  - — 12152-60003 Memory Controller card
  - — VCP and Base Set ROMs
- 12160A Front plane connector assembly
- 12038A Memory connector

Manuals included

- 02103-90005 L-Series I/O Interfacing Guide
- 02137-90001 A700 Computer Reference manual
- 02137-90002 A700 Computer Installation and Service manual

Options available

001: Adds 12156A Floating Poit Processor card (uses one card cage slot) with Scientific and Vector Instruction Sets and replaces 12160A Front Plane Connector Assembly with a different front plane connector assembly included in the 12156A product.

014: Deletes 12103A 128k byte Memory Array card and array connector permitting its replacement with other memory array cards and array connector. (See page 3.5-3.)

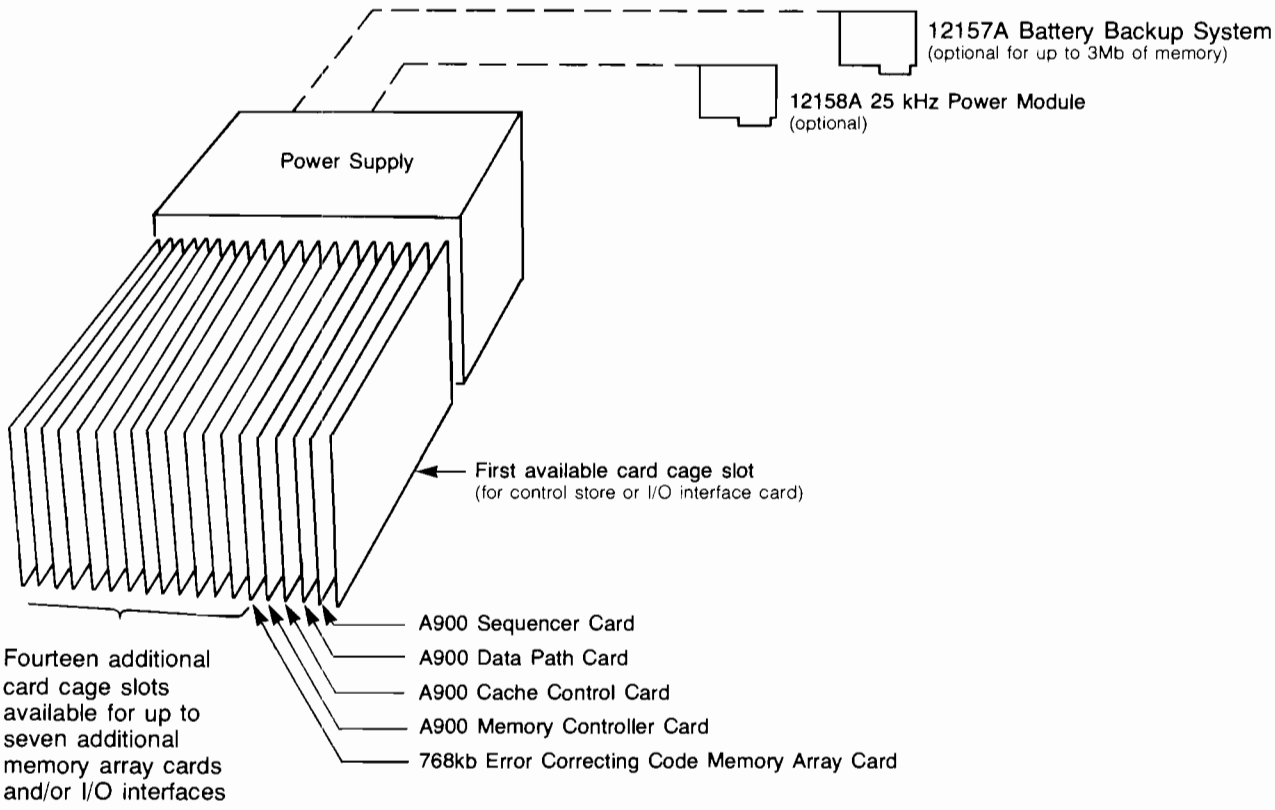
015: Operation from 230V/50Hz ac power.

Requirements for operation

See page 3.3-10.

2139A A900 Computer

2139A Computer Configuration (rear view)



** Additional memory array cards must plug into space immediately to the left of the Memory Controller card, moving all card positions to the left.*

2139A Hardware Supplied

- Computer cabinet with power supply, ventilation fans, 20-slot card cage, and power cable
- 12201A Sequencer board
- 12202A Data Path board
- 12203A Cache Control board
- 12204A Memory Controller board
- 12220A 768k byte Error Correcting Code Memory Array card

Manuals included

- 02103-90005 I/O Interfacing Guide
- 02139-90001 A900 Computer Reference manual
- 02139-90002 A900 Computer Installation and Service manual

Options available

014: Deletes 12220A 768kb Error Correcting Code Memory Array card and 12222A Array connector permitting their replacement with two to eight 12220A memory array cards* and the appropriate 12222x Array connector. (See page 3.5-3.)

015: Operation from 230V/50Hz ac power.

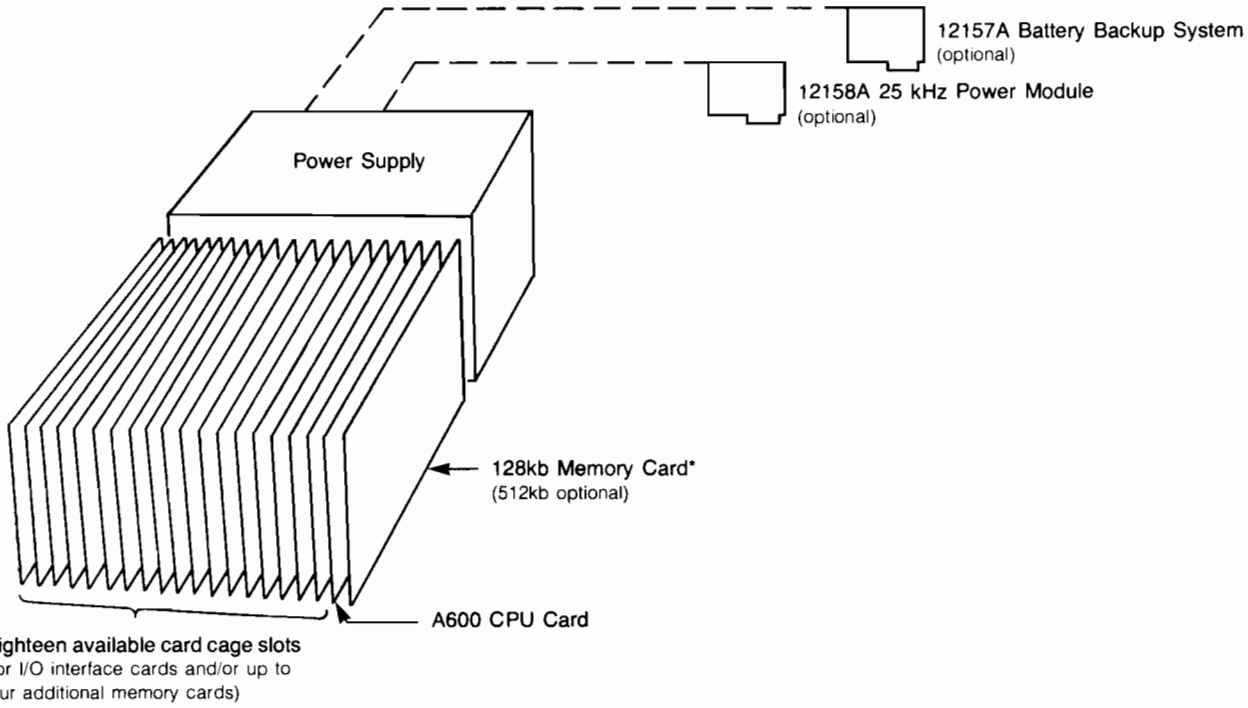
** 12157A Battery Backup System supports a maximum of five 12220A Array Cards.*

Requirements for operation

See page 3.3-10.

2156B A600+ Computer

2156B Computer Configuration (rear view)



* *Additional memory array cards must plug into space immediately to the right of the Memory Controller card, moving all card positions to the left.*

2156B Hardware Supplied

- Computer cabinet with power supply, ventilation fans, 20-slot card cage, and power cable
- 12105A A600+ CPU card (uses one card cage slot)
- 12102A 128kb Memory card (uses one card cage slot)
- 12038A Memory connector

Manuals included

- 02103-90005 L-Series I/O Interfacing Guide
- 02156-90001 A600 Computer Reference manual
- 02156-90002 A600 Computer Installation and Service manual

Options available

012: Replaces 12102A Memory card with 12102B 512kb Memory card

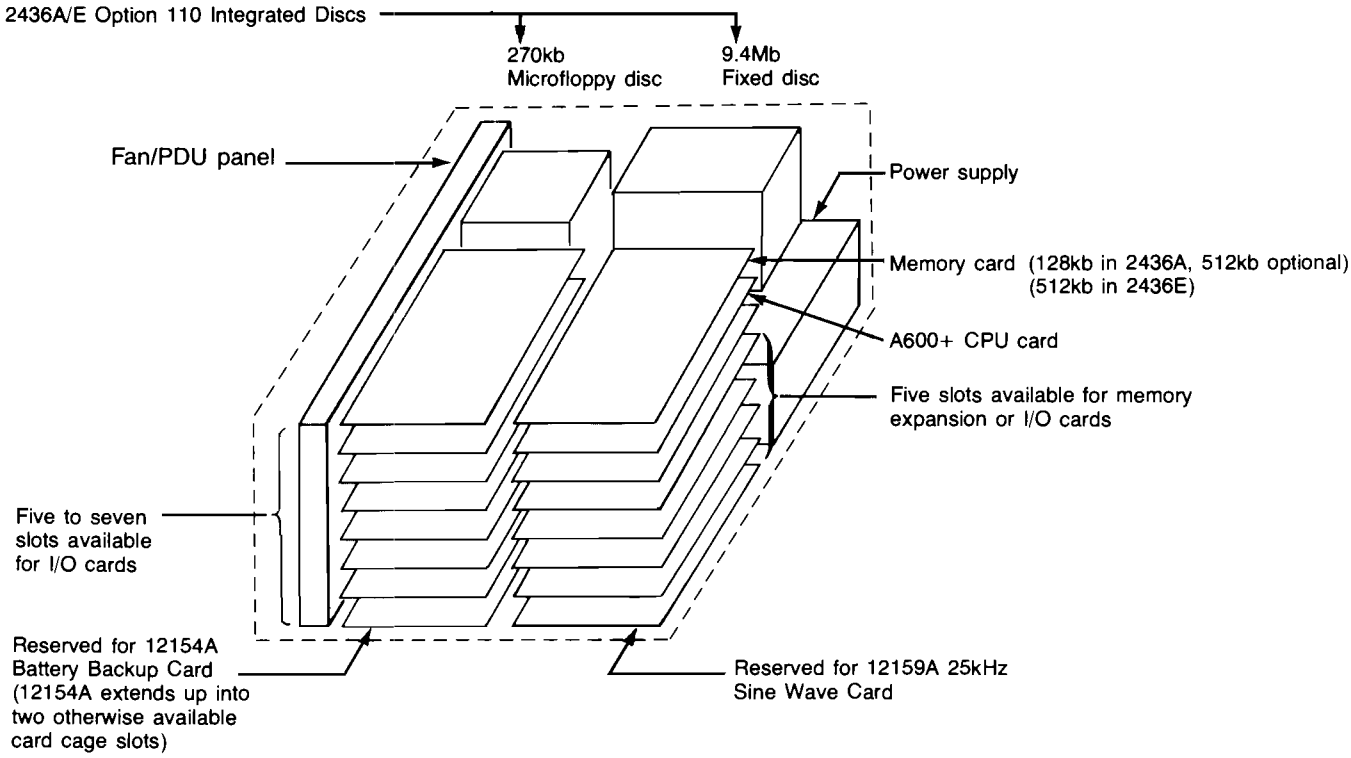
015: Operation from 230V/50Hz ac power

Requirements for operation

See page 3.3-10.

2436A/E Micro 26 System Component

2436A/E Micro 26 System Component configuration (rear view)



2436A Hardware Supplied

- 12102A 128k byte memory card
- 12105A A600+ CPU card
- 12038A Frontplane connector
- Micro/1000 Package with power supply and 14 card cage slots available for CPU, memory, and I/O cards, and dedicated slots for 25kHz power module and battery backup cards.

2436E Hardware Supplied

- 12102B 512k byte memory card instead of 12102A 128k byte memory card
- All other hardware items same as for 2436A

Manuals Included with 2436A

- 02430-90001 Micro/1000 Computer System Installation Manual
- 02103-90005 Computer I/O Interfacing Guide
- 02156-90001 HP 1000 A600 Computer Reference Manual

Manuals and Right-to-Execute Included with 2436E

- Same manuals as for 2436A
- Right-to-Execute RTE-A on the 2436E

Options Available

012: 12102B 512kb memory card instead of 12102A 128kb memory card (included in 2436E)

015: Operation from 230V ac power. Power option must be ordered separately for peripherals

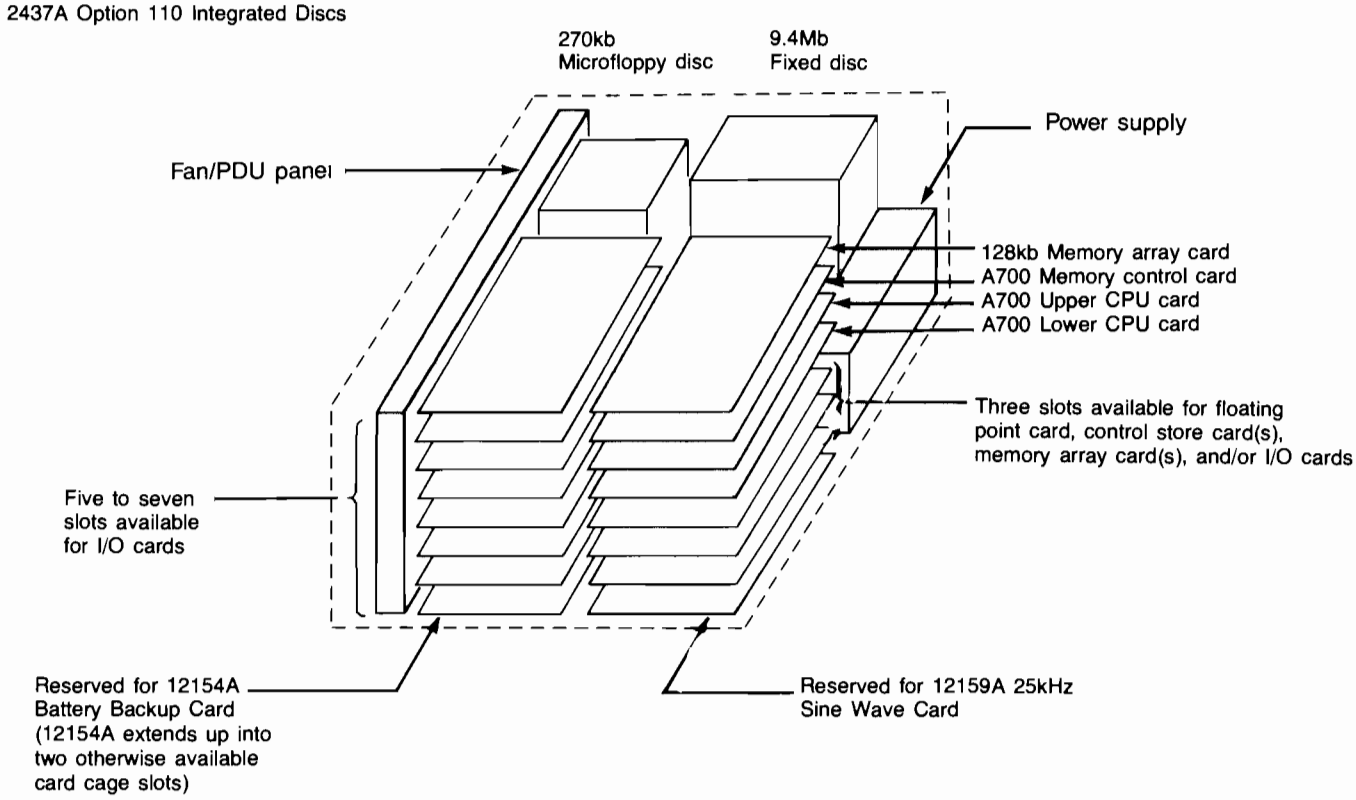
110: Adds integrated 9.4Mb fixed and 270kb microfloppy discs and 12022A disc interface

Requirements for operation

See page 3.3-10

2437A Micro 27 System Component

2437A Micro 27 System Component configuration (rear view)



2437A Hardware Supplied

- 12103A 128kb Memory array card
- 12152A CPU, which includes:
  - — 12152-60001 Upper processor card
  - — 12152-60002 Lower processor card
  - — 12152-60003 Memory controller card
  - — VCP and base set ROMs
- 12160A Frontplane connector assembly.
- 12038A Memory connector
- Micro/1000 Package with power supply and 14 card cage slots available for CPU, memory, and I/O cards, and dedicated slots for 25kHz power module and battery backup cards.

Manuals Included with 2437A

- 02430-90001 Micro/1000 Computer System Installation Manual
- 02103-90005 Computer I/O Interfacing Guide
- 02137-90001 HP 1000 A700 Computer Reference Manual

Options Available

001: Adds 12156A Hardware Floating Point Processor Card with Scientific and Vector Instruction Sets (uses one card cage slot and reduces capacity for memory array cards to a maximum of three, 3Mb of parity memory, 1.5Mb of ECC memory)

014: Deletes 12103A 128kb memory card and 12038A memory connector, permitting its replacement with other 12103x or 12104A Memory Array cards and an appropriate 12038x memory connector.

015: Operation from 230V ac power. Power option must be ordered separately for peripherals

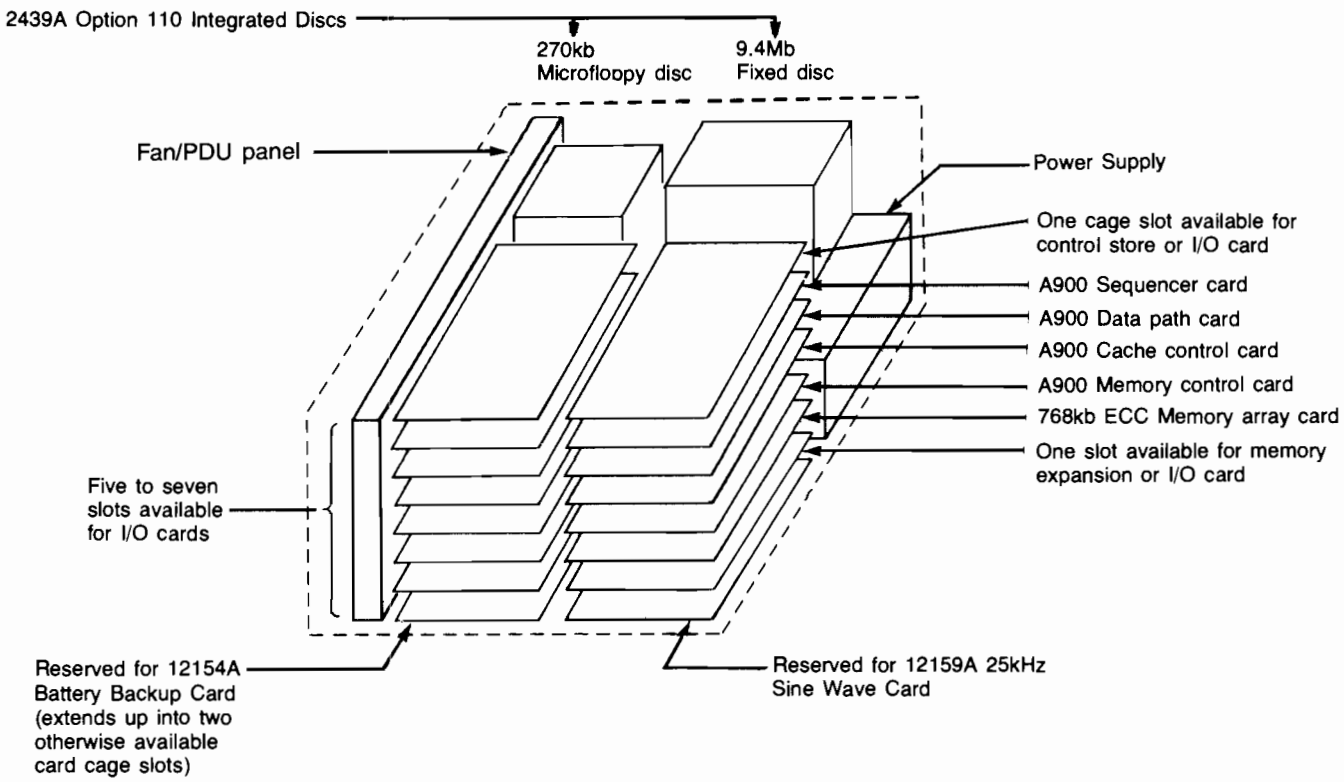
110: Adds integrated 9.4Mb fixed and 270kb microfloppy discs and 12022A disc interface

Requirements for operation

See page 3.3-10.

2439A Micro 29 System Component

2439A Micro 29 System Component configuration (rear view)



2439A Hardware Supplied

- 12201A Sequencer card
- 12202A Data Path card
- 12203B Cache Control card
- 12204A Memory Controller card
- 12220A 768kb ECC Memory Array card
- 12222A Memory connector
- Micro/1000 Package with power supply and 14 card cage slots available for CPU, memory, and I/O cards, and dedicated slots for 25kHz power module and battery backup cards.

Manuals Included with 2439A

- 02430-90001 Micro/1000 Computer System Installation Manual
- 02103-90005 Computer I/O Interfacing Guide
- 02139-90001 HP 1000 A900 Computer Reference Manual

Options Available

014: Deletes 12220A 768kb ECC memory card and 12222A memory connector, permitting its replacement with a 12220B 1.5Mb ECC memory package (two 12220A 768kb ECC memory array cards) and a 12222B memory connector

015: Operation from 230V ac power. Power option must be ordered separately for peripherals

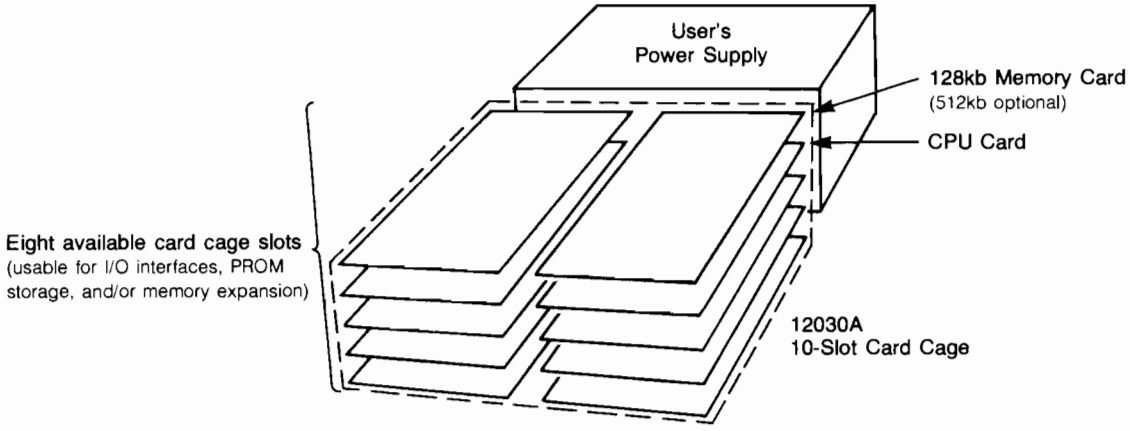
110: Adds integrated 9.4Mb fixed and 270kb microfloppy discs and 12022A disc interface

Requirements for operation

See page 3.3-10.

2106BK Board Computer

2106BK Board Computer Configuration (rear view)



2106BK Hardware Supplied

- 12105A A600+ CPU Card
- 12102A 128kb Memory card

Option available

012: Replaces 12102A Memory card with 12102B 512kb Memory card

Integration accessories available

12030A 10-Slot Card Cage

12032A 5-Slot Card Cage

Items required to make 2106BK functionally equivalent to 2156B Computer (except for the number of card cage slots)

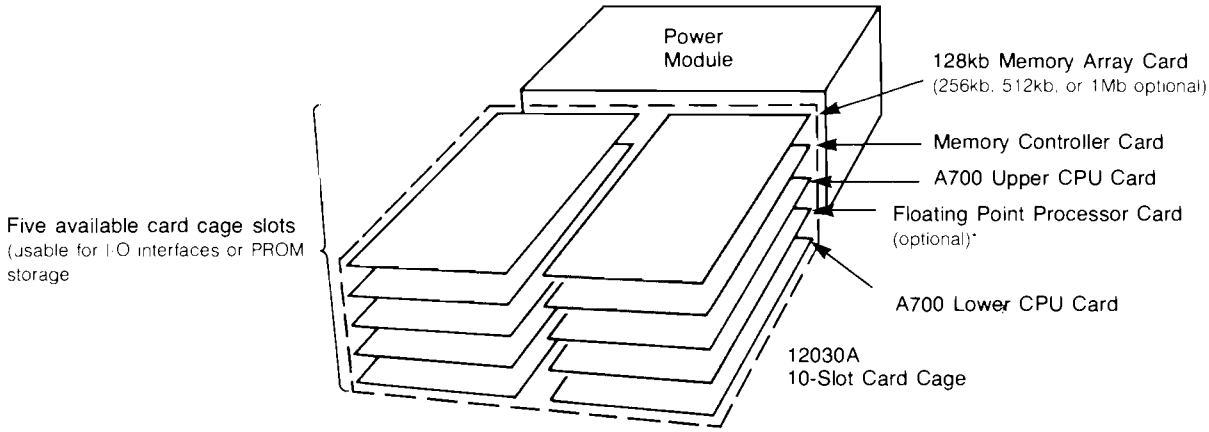
- 2106BK Board Computer
- 12030A 10-Slot Card Cage
- User's power supply with 60A at +5V, 5A for +5V for memory, 5.6A at +12V, 3.5A at −12V, and up to 50W of 39V rms ac at 25kHz
- Appropriate enclosure

Requirements for operation of 2106BK that is functionally equivalent to a 2156B Computer

See page 3.3-10.

2107AK Board Computer

2107AK Board Computer configuration (rear view)



* *Space for Floating Point Processor can instead be used for one additional memory array card by moving down the upper CPU and memory controller cards one slot.*

2107AK Hardware Supplied

- 12103A 128kb Memory Array Card
- 12152A CPU, which includes:
  - — 12152-60001 Upper Processor Card
  - — 12152-60002 Lower Processor Card
  - — 12152-60003 Memory Controller Card
  - — VCP and Base Set ROMs
- 12160A Front Plane Assembly
- 12038A Memory Connector

Option available

001: Adds 12156A Floating Point Processor Card (uses one card cage slot) with Scientific and Vector Instruction Sets and replaces 12160A Front Plane Connector with a different Front Plane Connector assembly included in the 12156A product.

014: Deletes 12103A 128k byte Memory Array card and 12038A Memory Connector, permitting its replacement with one or two other Memory Array cards and 12038A/B Memory Connector.

Integration accessories available

12030A 10-Slot Card Cage

Items required to make 2107AK functionally equivalent to 2137A Computer (except for the number of card cage slots)

- 2107AK Board Computer
- 12030A 10-Slot Card Cage
- User's power supply with 60A at +5V, 5A for +5V for memory, 5.6A at +12V, 3.5A at −12V, and up to 50W of 39V rms ac at 25kHz
- Appropriate enclosure

Requirements for operation of 2107AK that is functionally equivalent to a 2137A Computer

See page 3.3-10.

Requirements for operation of A-Series Computers under the RTE-A Operating System

COMPUTER AND REQUIRED OPTIONS AND ACCESSORIES

FOR MEMORY-BASED DS/1000-IV NETWORK NODE WITHOUT LOCAL SYSTEM CONSOLE

2139A Computer, 2439A Micro 29 system component, 2437A Micro 27 system component or 2137A Computer with Option 014 and 12103B/C/D 256kb/512kb/1Mb Memory Module and 12038A Memory Connector, or 2156B Computer or 2436A Micro 26 system component with Option 012

One or more of the following DS/1000-IV interface-connect combinations:
— 12007B DS/1000-IV Modem interface to HP 1000 and user-furnished modem-telephone link
— 12044A DS/1000-IV Direct connect interface to HP 1000 and 91712A/13A/14A extension kits as needed
— 12072A DS/1000-IV Data Link Slave interface to HP 1000 and cable from data link master interface
— 12073A DS/1000-IV Modem interface to HP 3000 and user-furnished modem-telephone link
— 12082A DS/1000-IV Direct connect interface to HP 3000 and 91712A/13A/14A extension kits as needed

92077E Right to Execute RTE-A License*

91750R Right to Copy DS/1000-IV License*

Other interfaces and equipment interfaced to the computer

FOR MEMORY-BASED MICROSYSTEM USING 2136C MICROSYSTEM COMPONENT

2136C Microsystem component

A 262x Option 090 System console (see page 4.1-2)

92077A/E*/R* RTE-A operating system (must order appropriate media option with 92077A product)

Other interfaces and equipment interfaced to the computer

FOR MEMORY-BASED SYSTEM WITH SYSTEM CONSOLE

2139A, 2137A, or 2156B Computer or 2436A, 2437A, or 2439A Micro 26, 27, or 29 system component

12005B Asynchronous Serial Interface with appropriate cable option (see page 4.1-3)

A supported system console (see page 4.1-3)

12009A HP-IB (flexible disc) interface

9895A Flexible disc, 9121D/S Microfloppy disc, or other software load device

92077A/E*/R* RTE-A operating system (must order appropriate media option with 92077A product)
Other interfaces and equipment interfaced to the computer

FOR DISC-BASED MICROSYSTEM USING 2136C/D MICROSYSTEM COMPONENT

2136C/D Microsystem component

262x Option 090 or 2627A Color Graphics Terminal as System console (see page 4.1-2)

12009A HP-IB (disc) interface (included in 2136C)

9134A/B Mini Winchester Disc (2136C only) or, 7908P, 7911P, 7912P, or 7914P CS/80 Disc or 9133A/B Mini Winchester Disc with Microfloppy Disc (see pages 5.1-2, 3, 4, and 6)

92077A/E*/R* RTE-A operating system (must order appropriate media option with 92077A product)

FOR DISC-BASED SYSTEM WITH SYSTEM CONSOLE

2139A, 2137A, or 2156B Computer or 2436A, 2437A, or 2439A Micro 26, 27, or 29 system component

12005B Asynchronous Serial Interface with appropriate cable option (see page 4.1-3)

A supported system console (see page 4.1-3)

12009A HP-IB (disc) interface

7908P/R, 7911P/R, 7912P/R, or 7914P/R CS/80 disc (see pages 5.1-2 and 5.1-4)

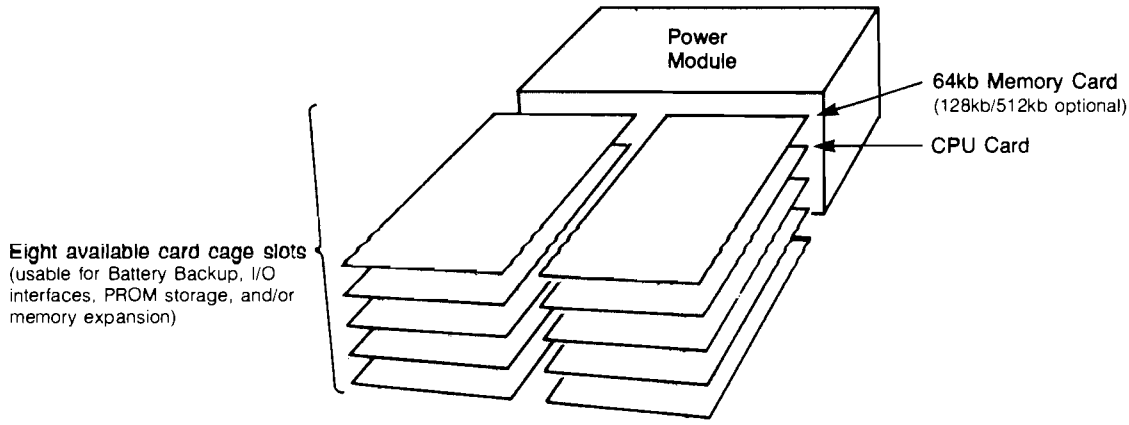
92077A/E*/R* RTE-A operating system (must order appropriate media option with 92077A product)

Other interfaces and equipment interfaced to the computer

** Prerequisite to purchase of 92077E Right to Execute ("E" product) or 92077R or 91750R Right to Copy ("R" product) is purchase of the 92077A or 91750A product at full list price (not with a 218x, 219x, or 248x system) less applicable purchase agreement discount.*

2103L Computer

2103L Computer configuration (rear view)



NOTE: Optional 12013A Battery Backup Module must occupy card cage position of 64kb Memory card in diagram above. (Memory and CPU cards move down one position if 12013A Battery Backup Card is used.

2103L Hardware Supplied

- Computer cabinet with power supply, ventilation fans, 10-slot card cage, and power cable
- 12001D L-Series CPU Card
- 12004A 64kb Memory Card

Manuals included

- 02103-90003 L-Series Computers Installation and Service manual
- 02103-90005 L-Series I/O Interfacing Guide
- 02103-90007 L-Series Computers Reference manual

Options available

011: Replaces 12004A Memory card with 12002A 128kb Memory card

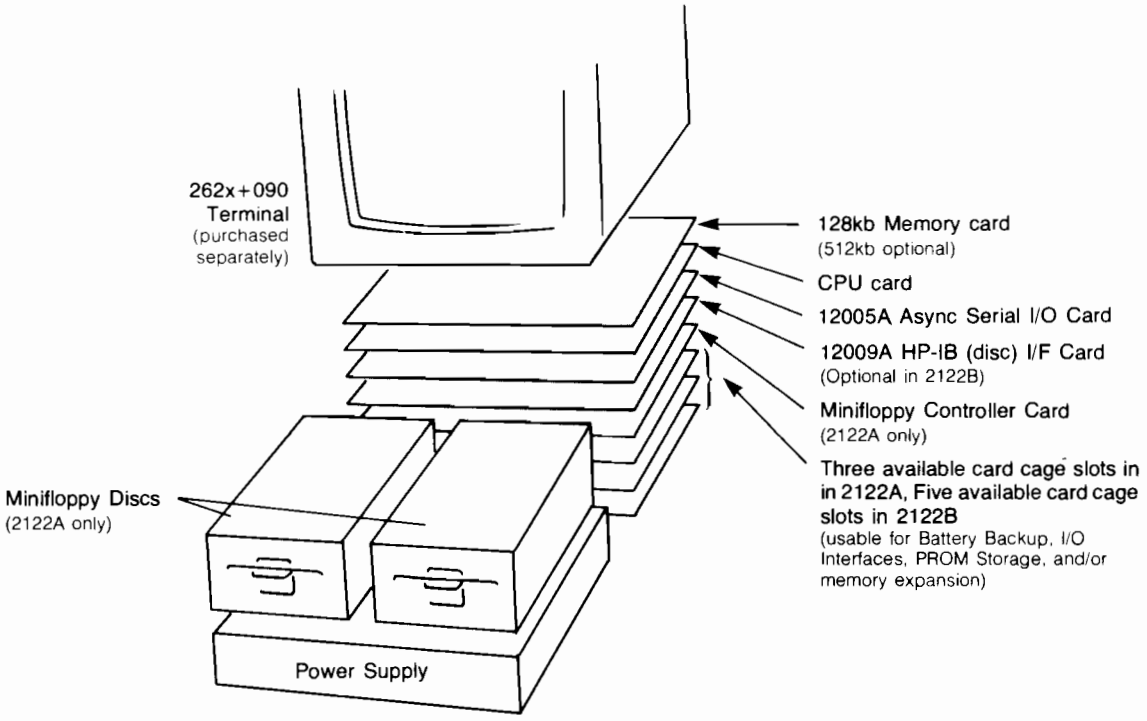
012: Replaces 12004A Memory card with 12002B 512kb Memory card

Requirements for operation

See page 3.4-4.

2122A/B Microsystem Component

2122A/B Microsystem Component configuration (front view)



2122A Hardware Supplied

- Microsystem package with power supply, ventilation fans, two Minifloppy disc drives, eight-slot card cage, and power cable
- 12001D L-Series CPU Card (uses one card cage slot)
- 12004A 64kb Memory Card (uses one card cage slot)
- 12005A Asynchronous Serial (system console) Interface Card and cable
- 12009A HP-IB (disc) Interface Card and cable
- 12021A Minifloppy Controller Card

Manuals and primary system included with 2122A

- 02103-90005 L-Series I/O Interfacing Guide
- 02103-90007 L-Series Computers Reference manual
- 02142-90001 Getting Started with the Model 5 Microsystem
- 02142-90002 HP 1000 Model 5 Computer Installation and Service manual
- RTE-L Primary system on minifloppy discs (must purchase 92070E Right to Execute RTE-L)

2122B Hardware Supplied

- Microsystem package with power supply, ventilation fans, eight-slot card cage, and power cable
- 12001D L-Series CPU Card (uses one card cage slot)
- 12004A 64kb Memory Card (uses one card cage slot)
- 12005A Asynchronous Serial (system console) Interface Card

Manuals included with 2122B

- 02103-90007 L-Series Computers Reference manual
- 02142-90008 HP 1000 Model 5 Computer Installation and Service manual

Options available

005: Cable for 2627A (or 2629H OEM) Color Graphics Terminal used as system console.

011: Replaces 12004A Memory card with 12002A 128kb Memory card (and RTE-L primary floppies with RTE-XL primary floppies in 2122A)

012: Replaces 12004A Memory card with 12002B 512kb Memory card (and RTE-L primary floppies with RTE-XL primary floppies in 2122A)

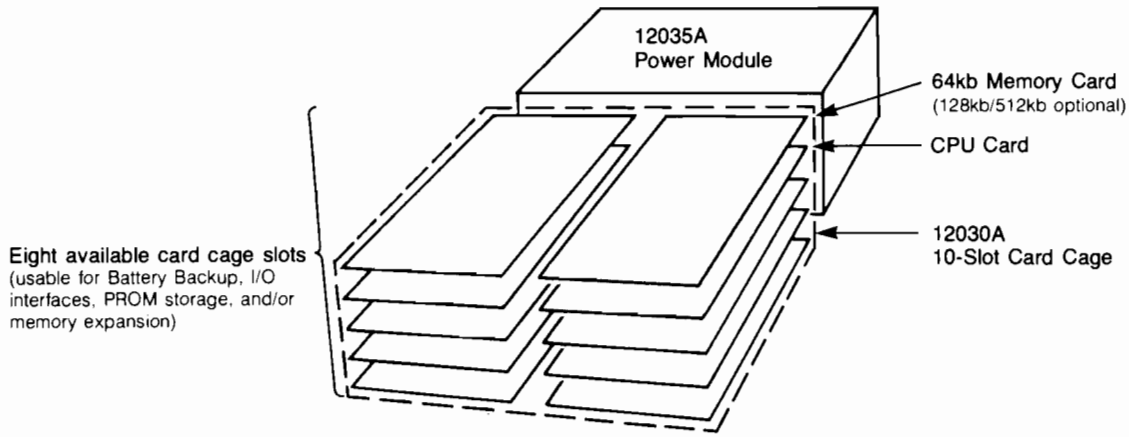
015: Operation from 230V/50Hz ac power

Requirements for operation

See page 3.4-4.

2103LK Board Computer

2103LK Board Computer configuration (rear view)



NOTE: Optional 12013A Battery Backup Module must occupy card cage position of 64kb Memory card in diagram above. (Memory and CPU cards move down one position if 12013A Battery Backup Card is used.

2103LK Hardware Supplied

- 12001D CPU Card
- 12004A 64kb Memory Card

Options available

011: Replaces 12004A Memory card with 12002A 128kb Memory card

012: Replaces 12004A Memory card with 12002B 512kb Memory card

Integration accessories available

12030A 10-Slot Card Cage

12031A 16-Slot Card Cage

12032A 5-Slot Card Cage

12035A Power Module

Items required to make 2103LK functionally equivalent to 2103L Computer

- 2103LK Board Computer
- 12030A 10-Slot Card Cage
- 12035A Power Module
- Appropriate enclosure

Requirements for operation of 2103LK that is functionally equivalent to a 2103L Computer

See page 3.4-4.

Requirements for operation of L-Series Computers under active RTE Operating Systems

APPLICABILITY		
RTE-L	RTE-XL	COMPUTER AND REQUIRED OPTIONS AND ACCESSORIES
FOR MEMORY-BASED DS/1000-IV NETWORK NODE WITHOUT LOCAL SYSTEM CONSOLE		
X		2103L Computer
	X	2103L Computer with option 011 or 012
X	X	One or more of the following DS/1000-IV interface-connect combinations: — 12007B DS/1000-IV Modem interface to HP 1000 and User-furnished modem-telephone line link — 12044A DS/1000-IV Direct connect interface to HP 1000 and 12712A/13A/14A extension kits as needed — 12072A DS/1000-IV Data Link Slave interface to HP 1000 and cable from data link master interface
X		92070E Right to Execute RTE-L License*
	X	92071E Right to Execute RTE-XL License*
X	X	91750R Right to Copy DS/1000-IV License*
X	X	Other interfaces and equipment interfaced to the computer
FOR MEMORY-BASED MICROSYSTEM USING 2122A MICROSYSTEM COMPONENT		
X		2122A Microsystem component
	X	2122A Microsystem component with option 011 or 012
X	X	A 262x Option 090 or 2627A (or 2629H OEM) Color Graphics Terminal as System console (see page 4.1-2)
X		92070B/E*/R* RTE-L operating system (must order appropriate media option with 92070B product)
	X	92071A/E*/R* RTE-XL operating system (must order appropriate media option with 92071A product)
X	X	Other interfaces and equipment interfaced to the computer
FOR MEMORY-BASED SYSTEM WITH SYSTEM CONSOLE		
X		2103L Computer
	X	2103L Computer with option 011 or 012
X	X	12005A Asynchronous Serial Interface with appropriate cable option (see page 4.1-3)
X	X	A supported system console (see page 4.1-3)
X	X	12009A HP-IB (flexible disc) interface
X	X	9895A Flexible disc or other software load device
X		92070B/E* RTE-L operating system (must order appropriate media option with 92070B product)
	X	92071A/R* RTE-XL operating system (must order appropriate media option with 92071A product)
X	X	Other interfaces and equipment interfaced to the computer
FOR DISC-BASED MICROSYSTEM USING 2122A/B MICROSYSTEM COMPONENT		
X		2122A/B Microsystem component
	X	2122A/B Microsystem component with option 011 or 012
X	X	A 262x Option 090 or 2627A (or 2629H OEM) Color Graphics Terminal as System console (see page 4.1-2)
X	X	12009A HP-IB (disc) interface (included in 2122A)
X	X	9134A Mini Winchester Disc (2122A only) or 7908P, 7911P, or 7912P CS/80 Disc (see pages 5.1-2 and 5.1-4)
X		92070B/E*/R* RTE-L operating system (must order appropriate media option with 92070B product)
	X	92071A/E*/R* RTE-XL operating system (must order appropriate media option with 92071A product)
FOR DISC-BASED SYSTEM WITH SYSTEM CONSOLE		
X		2103L Computer
	X	2103L Computer with option 011 or 012
X	X	12005A Asynchronous Serial Interface with appropriate cable option (see page 4.1-3)
X	X	A supported system console (see page 4.1-3)
X	X	12009A HP-IB (disc) interface
X	X	7908P/R, 7911P/R, or 7912P/R CS/80 disc (see pages 5.1-2 and 5.1-4)
X		92070B/E*/R* RTE-L operating system (must order appropriate media option with 92070B product)
	X	92071A/E*/R* RTE-XL operating system (must order appropriate media option with 92071A product)
X	X	Other interfaces and equipment interfaced to the computer

** Prerequisite to purchase of 92070E or 92071E Right to Execute ("E" product) or 92070R, 92071R, or 91750R Right to Copy ("R" product) is purchase of the 92070B, 92071A, or 91750A product at full list price (not with a 214x system) less applicable purchase agreement discount.*

Application and memory requirements

Optional software helps the user to customize the HP 1000 Computer System to satisfy specific application needs for operator and system-to-system communication, data base management, program development, graphics, etc. The facing table is provided to help you match optional software and additional hardware to various applications. A memory worksheet is also provided on this page from which you can make copies to use in determining what additional memory, if any, will be required for support for a specific application.

Memory requirements worksheet

Item	Memory Required
BASE REQUIREMENTS	
A. OPERATING SYSTEM USAGE	
-- Base requirement ..... ____kb	
-- System avail memory (32-64kb) ____kb	
-- Total	_____kb
B. MULTITERMINAL COMM VIA MULTIPLEXER	
-- Base Requirement 3.6kb	
-- ___ channels x 0.1kb = ____kb	
-- Minicartridge (M/c) I/O 1.1kb	
-- ___ M/c units x 0.04kb = ____kb	
-- Total	_____kb
C. MULTITERMINAL COMM VIA MULTIPOINT LINE OR MULTIDROP DATA LINK	
-- Auto restart ..... ____kb	
-- Terminal exerciser ..... ____kb	
-- Total	_____kb
D. DISTRIBUTED SYSTEM POINT-POINT COMM, HP 1000 TO:	
-- HP 1000 only or HP 3000 only 128kb	
-- Add'l to both HP 1000 & 3000 66kb	
-- Total	_____kb
E. DISTRIBUTED SYSTEM DATA LINK COMM, HP 1000 to HP 1000 ..... 128kb	_____kb
F. COMM VIA X.25 PACKET SWITCHING NETWORK	_____kb
G. REMOTE JOB ENTRY TO IBM 360/370	
-- Base requirement ..... ____kb	
-- ___ Users (7, max.) x ____kb = ____kb	
-- Total	_____kb
H. DATA BASE MANAGEMENT	_____kb
I. GRAPHICS (92842A Only)	
-- AGP Monitor Program 16kb	
-- __ Workstations x ____kb = ____kb	
-- Total	_____kb
J. PROGRAMMABLE CONTROLLER INTERFACE	
-- Base requirement 72kb	
-- __ PCs x 0.5kb = ____kb	
-- Total	_____kb
SUBTOTAL	_____kb

Item	Memory Required
SUBTOTAL FORWARD	_____kb

MULTI-USER PARTITION REQUIREMENTS

(Assume a mix of various user operations, so many editing, compiling, debugging, loading, accessing an Image data base, etc., at the same time, then calculate total multiple partition requirements for each operation.)

Operation	No. of Users		Required Partition Size		
DATA LINK MONITORING					
-- Config Reporting	_____	x	30kb	=	_____kb
-- Link Verification	_____	x	10kb	=	_____kb
-- Dynamic Status	_____	x	32kb	=	_____kb
EDITING	_____	x	36kb	=	_____kb
BASIC/1000C/L INTERPRETER	_____	x	____kb	=	_____kb
BASIC/1000C COMPILER	_____	x	____kb	=	_____kb
FORTRAN COMPILER	_____	x	____kb	=	_____kb
PASCAL/1000 COMPILER	_____	x	____kb	=	_____kb
MICROPROGRAM DEVELOPMENT	_____	x	64kb	=	_____kb
SYMBOLIC DEBUG/1000	_____	x	64kb	=	_____kb
LOCAL DATA BASE USER	_____	x	____kb	=	_____kb
REMOTE DATA BASE USER ...	_____	x	____kb	=	_____kb
USER'S APPLICATION	_____	x	____kb	=	_____kb
USER'S APPLICATION	_____	x	____kb	=	_____kb
USER'S APPLICATION	_____	x	____kb	=	_____kb

LARGE MEMORY DATA ARRAY STORAGE REQUIREMENTS

(As encountered in graphics and other signal processing applications.)

Data Type	No. of Array Elements		Bytes Per Element		
SINGLE PRECISION INTEGER	_____	x	2	=	_____kb
DOUBLE PRECISION INTEGER	_____	x	4	=	_____kb
SINGLE PRECISION REAL	_____	x	4	=	_____kb
EXTENDED PRECISION REAL	_____	x	6	=	_____kb
DOUBLE PRECISION REAL	_____	x	8	=	_____kb
COMPLEX	_____	x	6	=	_____kb
TOTAL MEMORY REQUIRED*					_____kb

* If memory furnished with the base system is less than required, order additional memory (see pages 3.5-5 and 3.5-6 for information on A-Series memory and page 3.5-7 for information on L-Series memory).

Application Requirements for Optional Software, Memory, and Additional Hardware in A/L-Series Systems

Application	Optional Software Required	Approx. Memory Avail. (+)/ Req's (−) Model 6+/26/27/29 & Micro 26/27/29 Systems	Approx. Memory Avail. (+)/ Req's (−) Model 5 System	Additional Hardware Required
OPERATING SYSTEM	Not applicable	RTE-A	RTE-XL	Not applicable
BASIC SYSTEM MEMORY AVAILABILITY	Not applicable			Not applicable
Base system memory	**92077A RTE-A or 92071A RTE-XL**			
— In Model 5 system	(included in respective systems)		+128kb	
— In Model 6+, 26 or 27 System		+512kb		
— In Micro 26 or 27 System		+512kb		
— In Model 29 or Micro 29 System		+768kb		
— Less usage in Model 5			−28kb	
— Less usage in Model 6+, 26, Micro 26, Micro 27, or Micro 29		−102kb		
— Less usage in Model 27 or 29		−104kb		
— Less VC+ Enhancement in Model 6+, 26, Micro 26, 27, or 29	**92078A** VC+ (included in Models 27 and 29)	−2kb	n/a	
COMMUNICATIONS				
MULTI-TERMINAL COMMUNICATIONS VIA 8-CHANNEL at terminal rates to 960 cps (no support for modem control)	Software is incl. in op sys			12040B 8-Channel Multiplexer, with Multiplexer Panel, terminals, and cables (see pages 4.1-4 through 4.1-7 and 4.1-11 through 4.1-13)
	— Base requirement	−3.6kb	−3.6kb	
	— Per channel	−112 bytes	−112 bytes	
	— Mini cartridge I/O	−1.1kb	−1.1kb	
	— Per Mini cartridge Unit	−44 bytes	−44 bytes	
MULTITERMINAL COMMUNICATIONS VIA MULTIPOINT/DATA LINK MASTER INTERFACE	**91732A Data Link/Multipoint software**		Not supported	12092A Data Link Master Interface
	— Auto restart	10kb		
	— Configuration reporting	30kb*		
	— Data Link Verification	10kb*		
	— Dynamic Status reporting	32kb*		
	— Terminal Exerciser	14kb		
DISTRIBUTED SYSTEM POINT-TO-POINT COMMUNICATIONS BETWEEN HEWLETT-PACKARD SYSTEMS	**91750A DS/1000-IV Network Software**			12007B or 12044A interface and modems or cables to other HP 1000 system; 12073A or 12082A interface and modems or cables to HP 3000 system (see pages 4.3-1 through 4.3-7)
	— Communication with other HP 1000 only	−128kb	−128kb	
	— Communication with HP 3000 only	−128kb	−128kb	
	— Communication with both HP 1000 and HP 3000	−192kb	−192kb	
DISTRIBUTED SYSTEM DATA LINK COMMUNICATIONS BETWEEN HEWLETT-PACKARD SYSTEMS	**91750A DS/1000-IV Network Software** for HP 1000 Data Link Slave system	−128kb	−128kb	12072A Data Link interface for Slave system on the Data Link (see pages 4.3-1 through 4.3-7)
COMMUNICATION BETWEEN HEWLETT-PACKARD SYSTEMS AND PACKET SWITCHED NETWORKS	**91751A DSN/X.25 Communications** software (usable with or without software).	Not supported	−128kb	12075A interface and modems
MULTILEAVING REMOTE JOB ENTRY COMMUNICATION WITH IBM 360/370 SYSTEMS VIA HASP EMULATION	**91782A DSN/MRJE 1000 Remote Job Entry package**	Not supported		12043A interface
	— Base requirement		−96kb	
	— Additional per user (max. of 7 users)		−6kb	
DATA BASE MANAGEMENT				
DATA BASE MANAGEMENT WITH ON-LINE QUERY CAPABILITY	**92081A Image/1000-II**		Not supported	7970+626/636 Magnetic Tape subsystem (see pages 5.5-1 and 2) or second disc drive (see pages 5.1-1 thru 5.1-4) for data base backup and a 2608S Line Printer for fast printout of reports (see pages 5.2-1 through 5.2-4)
	— Minimum system	−304kb		
	— Additional per local user	−64kb*		
	— Full-blown system	−756kb		
	— Additional per remote user	−48kb*		
	92069A Image/1000			
	— Minimum system	−15kb	−15kb	
	— Additional per local user	−64kb	−64kb	
	— Full blown system	−84kb	−84kb	
	— Additional per remote user	−48kb	−48kb	

Application Requirements for Optional Software, Memory, and Additional Hardware in A/L-Series Systems, continued

Application	Optional Software Required	Approx. Memory Avail. (+)/ Req'd (−) Model 6+/16/17/19 and Micro 26/27/29 Systems RTE-A	Approx. Memory Avail. (+)/ Req'd (−) Model 5 System RTE-XL	Additional Hardware Required
GRAPHICS SOFTWARE				
GENERAL GRAPHICS PROGRAMMING	**92841A Graphics/1000-II Device-Independent Graphics Library (DGL)**	Note A	Note A	One or more graphics devices (see pages 5.3-1 through 5.3-4)
INTERACTIVE AND THREE-DIMENSIONAL GRAPHICS	**92842A Graphics/1000-II Advanced Graphics Package** and **92841A DGL**			One or more graphics devices (see pages 5.3-1 through 5.3-4)
	— Monitor program	−16kb‡	−16kb‡	
	— Each Workstation	−(20-64)kb*	−(20-64)kb*	
	— User's programs	Note A	Note A	
PROCESS CONTROL				
PROCESS CONTROL INTERFACE TO PROGRAMMABLE CONTROLLERS	**94200A PCIF/1000**		Not supported	12041A Multiplexer Interface and 12828A Multiplexer panel in addition to appropriate Allen-Bradley, Siemens, or Telemecanique Programmable Controller hardware
	— Base requirement	72kb		
	— Additional per Prog Ctrlr	0.5kb		
	94201A PCIF/1000 User Definable Interface Package		Not supported	Same as 94200A, but with different programmable controller hardware
	— Base requirement	72kb		
	— Additional per Prog Ctrlr	Note B		
PROGRAM DEVELOPMENT				
INTERACTIVE SCREEN EDITING	Editor is included with the operating system	−36kb*	−36kb*	Not applicable
BASIC LANGUAGE PROGRAMMING	**92857A BASIC/1000C**		Not supported	Not applicable
	— Interpreter's Editor	−64kb*		
	— Interpreter's Executor	−396kb*		
	— Compiler	−240kb*		
	92076A BASIC/1000L (Interpreter only)	−28kb* Note C	−28kb* Note C	Not applicable
FORTRAN PROGRAMMING	**92836A FORTRAN 77 Compiler** (2500-4000 Lines/minute)		Not supported	Not applicable
	— Up to 2000 line program	−46kb*		
	— Up to 5000 line program	−64kb*		
	92834A FORTRAN 4X Compiler (500-1000 Lines/minute	Not supported		Not applicable
	— Up to 2000 line program		−38kb*	
	— Up to 5000 line program		−56kb*	
PASCAL PROGRAMMING (For compilation speed − memory usage tradeoffs, see the Pascal/1000 Configuration Guide, 92833-90003 or 92854-90003)	**92833A Pascal/1000 Compiler**		Not supported	Not applicable
	— Pascal Monitor	−42kb*		
	— For 250 lines/min speed	−80kb*		
	— For 1,200 lines/min speed	−400kb*		
	92854A Pascal/1000 Compiler	Not supported		Not applicable
	— For 30 lines/min speed		−28kb*	
	— For 150 lines/min speed		−442kb*	

* = *Partition space required for each concurrently active user of this software.*

‡ = *Single partition required to support 92842A Advanced Graphics software.*

NOTE A: Graphics subroutines of the 92841A and 92842A Graphics software packages are incorporated into user's programs and therefore have no independent memory requirements. Graphics programs usually require 16-54kb. However, 2608S operation with 92841A requires a 48kb partition for vector-to-raster conversion.

NOTE B: Additional memory requirement per programmable controller in the 94201A environment depends upon the design of user-developed PC device handlers.

NOTE C: Additional space for user's program and data could increase partition space required for 92076A BASIC/1000L to as much as 56kb.

Application Requirements for Optional Software, Memory, and Additional Hardware in A/L-Series Systems, continued

Application	Optional Software Required	Approx. Memory Avail. (+)/ Req'd (−) Model 6+/16/17/19 and Micro 26/27/29 Systems RTE-A	Approx. Memory Avail. (+)/ Req'd (−) Model 5 System RTE-XL	Additional Hardware Required
PROGRAM DEBUGGING	**92860A Symbolic Debug/1000**	−64kb	Not supported	Not applicable
	Less-capable debug utility included with the operating system	−8kb	−4kb	Not applicable
ON-LINE PROGRAM LOADING	On-line relocating loader is included with the operating system	−(32-40)kb*	−24kb*	Not applicable
MICROPROGRAM DEVELOPMENT (Only one microprogram development operation can be active in the system at a time)	**92045A RTE Microprogramming Package for A700**	−64kb*	Not supported	12153A Writable Control Store Card in 2197C/D System, 2137A Computer, 2437A Micro 27 System Component, or 2487A Micro 27 System Processor Unit.
	92049A RTE Microprogramming Package for A900	−64kb*	Not supported	12205A Control Store Board in 2199C/D System, 2139A Computer, 2439A Micro 29 System Component, or 2489A Micro 29 System Processor Unit

* = *Partition space required for each concurrently active user of this software.*

A-Series Memory Changes and Expansion

The following sections summarize the various memory array cards that are usable in A600+, A700, and A900 Systems and Computers and the memory controller to array connectors that are required with them.

Following these sections, Table 1 summarizes the recommended memory configurations for Model 6 and 16 Systems and A600 Computers and Table 2 summarizes the recommended memory configurations for Model 17 and 19 Systems and A700 and A900 Computers. For each memory size, Tables 1 and 2 identify whether the System Processor Unit or computer should have the standard memory or should be ordered with a memory change or delete option. Also given with the memory size is the quantity of each memory array card to order for that size, and the suffix letter of the memory array connector to be ordered for that configuration.

Memory Array Cards Usable in Model 6+ and 26 Systems, Micro 26 Systems, and A600+ Computer

12103A 128k byte (parity) Memory Array Card
12103C 512k byte (parity) Memory Array Card
12103D 1M byte (parity) Memory Array Card

Memory Array Cards Usable in Model 27 System, Micro 27 System, and A700 Computer

12103A 128k byte (parity) Memory Array Card
12103B 256k byte (parity) Memory Array Card
12103C 512k byte (parity) Memory Array Card
12103D 1M byte (parity) Memory Array Card
12104A 512k byte Error-Correcting Code Memory Array Card

Connectors Required for Memory in Model 6+, 26, and 27 Systems, Micro 26 and 27 Systems, and A600+ and A700 Computers

12038A Memory controller to one memory array card
12038B Memory controller to two memory array cards
12038C Memory controller to three memory array cards
12038D Memory controller to four memory array cards

Memory Array Card Usable in Model 29 System, Micro 29 System, and A900 Computer

12220A 768k byte Error-Correcting Code Memory Array Card

Connectors Required for Memory in Model 29 System, Micro 29 System, and A900 Computer

12222A Memory controller to one memory array card
12222B Memory controller to two memory array cards
12222C* Memory controller to three memory array cards
12222D* Memory controller to four memory array cards
12222E* Memory controller to five memory array cards
12222F* Memory controller to six memory array cards
12222G* Memory controller to seven memory array cards
12222H* Memory controller to eight memory array cards

* *Not usable in Micro 29 System because of its limited card cage capacity.*

NOTE: The connector ordered must exactly support the number of array cards being connected. A connector capable of supporting more array cards than are being connected will interfere with installation of I/O interfaces in some A900 card cage slots.

A600+/A700 Memory Combinations Not Listed in Tables 1 and 2

Within the basic limitation of a memory controller and four memory array cards (three memory array cards in the 2186C Microsystem), any of the memory array cards listed as usable for a system or computer can be used, provided that memory in the card cage is an integer multiple of any array card being added. (One megabyte memory consisting of the 128kb memory controller, three additional 128kb memory array cards and one 512kb memory array card shown for the Model 26 System and A600+ Computer in the first section of Table 1 is an example of this rule.

Table 1. Recommended Memory Configurations for Model 6+, 26, and Micro 26 Systems and A600+ Computers

Memory Size	Model 6+ Microsystem						Model 26 or Micro 26 System or A600+ Computer					
			Memory Array Cards and Connector						Memory Array Cards and Connector			
	2136C/D	2186C/D	12103A	12103C	12103D	12038*	2156B & 2436A/E	2196C/D & 2486A	12103A	12103C	12103D	12038*
PARITY MEMORY CONFIGURATIONS BASED ON 128kb MEMORY CONTROLLER IN STANDARD (S) OR OPTION 012 (Op) SYSTEM OR COMPUTER												
128kb	S	Op	0	0	0	0	S	Op	0	0	0	0
NOTE: The following configurations are not supportable in 2136C/D or 2186C/D Model 6+ Microsystem with 12013A Battery Backup Module.												
256kb	S	Op	1	0	0	A	S	Op	1	0	0	A
384kb	S	Op	2	0	0	B	S	Op	2	0	0	B
512kb	S	Op	3	0	0	C	S	Op	3	0	0	C
1.0Mb*	S	Op	3	1	0	D	S	Op	3	1	0	D
PARITY MEMORY CONFIGURATIONS BASED ON 512kb MEMORY CONTROLLER IN STANDARD (S) OR OPTION 012 (Op) SYSTEM OR COMPUTER												
512kb	Op	S	0	0	0	0	Op#	S	0	0	0	0
NOTE: The following configurations are not supportable in 2136C/D or 2186C/D Model 6+ Microsystem with 12013A Battery Backup Module.												
1.0Mb	Op	S	0	1	0	A	Op#	S	0	1	0	A
1.5Mb	Op	S	0	2	0	B	Op#	S	0	2	0	B
2.0Mb	Op	S	0	1	1	B	Op#	S	0	1	1	B
2.5Mb	Op	S	0	2	1	C	Op#	S	0	2	1	C
3.0Mb	Op	S	0	1	2	C	Op#	S	0	1	2	C
3.5Mb*	Op	S	0	2	2	C	Op#	S	0	2	2	C
4.0Mb*	Op	S	0	1	3	D	Op#	S	0	1	3	D

* Exceeds available card cage space in 2136C/D or 2186C/D.

Option 012 in 2436A, Standard in 2436E.

Table 2. Recommended Memory Configurations for Model 27 and 29, and Micro 27 and 29 Systems and A700 and A900 Computers

Memory Size	Model 27 or Micro 27 System or A700 Computer						Model 29 or Micro 29 System or A900 Computer			
			Memory Array Cards and Connector						Memory Array Cards and Connector	
	2137A & 2437A#	2197C/D & 2487A#	12103C	12103D	12104A	12038*	2139A & 2439A	2199C/D & 2489A	12220A Mem Array Card	12222* Mem Array Conn
PARITY MEMORY CONFIGURATIONS (STANDARD = S, OPTION 014 = Op, N = NOT SUPPORTED) IN SYSTEM OR COMPUTER										
128kb	S	N	0	0	0	0	N	N	0	0
512kb		S	0	0	0	0	N	N	0	0
512kb	Op		1	0	0	A	N	N	0	0
1.0Mb	Op	Op	0	1	0	A	N	N	0	0
1.5Mb	Op	Op	1	1	0	B	N	N	0	0
2.0Mb	Op	Op	0	2	0	B	N	N	0	0
2.5Mb	Op	Op	1	2	0	C	N	N	0	0
3.0Mb	Op	Op	0	3	0	C	N	N	0	0
3.5Mb	Op	Op	1	3	0	D	N	N	0	0
4.0Mb	Op	Op	0	4	0	D	N	N	0	0
ERROR-CORRECTING CODE MEMORY CONFIGURATIONS (OPTION 014 = 0, STANDARD = S, N = NOT SUPPORTED) IN SYSTEM OR COMPUTER										
512kb	Op	Op	0	0	1	A	N	N	0	0
768kb	N	N	0	0	0	0	S	S	0	0
1.0Mb	Op	Op	0	0	2	B	N	N	0	0
1.5Mb	Op	Op	0	0	3	C	Op	Op	2	B
NOTE: The following coniqurations are not supportable in the 2439A or 2489A Micro 29 System because they exceed the card cage capacity of the Micro/1000										
2.0Mb	Op	Op	0	0	4	D	N	N	0	0
2.25Mb	N	N	0	0	0	0	Op	Op	3	C
3.0Mb	N	N	0	0	0	0	Op	Op	4	D
3.75Mb	N	N	0	0	0	0	Op	Op	5	E
NOTE: The following configurations are not supportable by the 12157A Battery Backup Module in the 2139A Computer or the 2199C/D (Model 29) System										
4.5Mb	N	N	0	0	0	0	Op	Op	6	F
5.25Mb	N	N	0	0	0	0	Op	Op	7	G
6.0Mb	N	N	0	0	0	0	Op	Op	8	H

In 2437A or 2487A, Option 001 Floating Point Card and/or each control store card decreases maximum parity memory capacity by 1 megabyte, maximum ECC memory capacity by 512k bytes

L-Series Memory Changes and Expansion

Memory for the L-Series Microcomputer, Board Microcomputer, and Microsystem Component on initial order

The standard memory in the 2103L Microcomputer, 2103LK Board Microcomputer, and 2122A/B Model 5 Microsystem Component is 64k bytes, which can be expanded to 128k bytes by ordering option 011 or to 512k bytes by ordering option 012 on the original order.

Memory for the Model 5 Microsystem on Initial Order

The standard memory in the 2142A/B Model 5 Microsystem Processor Unit is 128k bytes, which can be expanded to 512k bytes by ordering option 012 on the original order.

Upgrade from 64kb to 128kb or 512kb Subsequent to Initial Order

Any L-Series Microcomputer or Model 5 Microsystem component can be upgraded to larger memory by replacing its 64k byte memory controller with a new 12002A 128k byte or 12002B 512k byte Memory Controller.

Expansion from 128k byte memory

Any of the L-Series Microcomputers or Microsystems with 128k byte memory can be expanded to provide up to 512k byte memory by adding one to three 12003A 128k byte Memory Array Cards, along with the appropriate 12028x Memory Controller to Array Connector Assembly, selected from the following:

12028A	Connector to one 12003A Array card
12028B	Connector to two 12003A Array cards
12028C	Connector to three 12003A Array cards

Accessories and Interfaces for A/L-Series Systems and Computers

Accessory or Interface Product Number and Name	Purpose	Prerequisites
MISCELLANEOUS MAINFRAME A/L-SERIES PLUG-INS (Each uses one card cage slot.)		
12008A PROM Storage Module	Provides mounting for up to 64k bytes of PROMs for non-volatile program storage	2142A/B, 2186x, 219x, or 248x System or 2103L, 2122A/B, 213x, 2156A/B, or 243x Computer
12011A Extender Card	Provides out-of-card cage service access to system-connected A/L-Series plug-ins, except A900 CPU cards	2142A/B, 2186x, 219x, or 248x System or 2103L, 2122A/B, 213x, 2156A/B, or 243x Computer; 2199x or 2489A System and 2139A or 2439A Computer also need 12240A
12012A Priority Jumper Card	Continuity of hardware priority chain through otherwise-unoccupied card cage slot	2142A/B, 2186A/B, 219x, or 248x System or 2103A, 2122A/B, 213x, 2156A/B or 243x Computer
12013A Battery Backup Card	Provides memory sustaining power during power outages as well as battery charge circuit and battery condition signalling	2142A/B Microsystem or 2122A/B Microsystem component or 2103L Computer or (support of memory controller only) in 2186A/B Microsystem or 2136A/B Microsystem component
12240A Extender Card	Provides out-of-card cage service access to system-connected A900 CPU cards	2199x or 2489A System or 2139A or 2439A Computer. (12011A is also required for other A/L-Series plug-ins used with the A900 System or Computer)
CONTROL STORE CARDS (Each uses one card cage slot — max. of three A700 control store cards per system or computer)		
12153A 4k Word A700 Writable Control Store Card (WCS)	Provides dynamic overlayable control store for user's microcode	2197x or 2437A System or 2137A or 2437A Computer operating under RTE-A; 92045A RTE Microprogramming Package is also required
12155A 8k Word A700 PROM Control Store Card (PCS)	Provides mounting for non-volatile control store for user's microcode	2197x System or 2137A or 2437A Computer operating under RTE-A; 92045A RTE Microprogramming Package is also required
12205A A900 Control Store Board	Provides 4k words of writable control store and mounting for 2k words non-volatile control store for user's microcode	2199x or 2489A System or 2137A or 2439A Computer operating under RTE-A; 92049A RTE Microprogramming Package is also required
A-SERIES POWER SUPPLY ENHANCEMENTS		
12154A Battery Backup Card for Micro 26, 27, or 29	Provides memory sustaining power during power outages for a maximum of four memory array cards	248x System or 243x System Component
12157A Battery Backup System	Provides memory sustaining power during power outages for a maximum of five memory array cards	219x System or 2137A, 2139A, or 2156A/B Computer
12158A 25kHz Power Module	Provides up to 50W of 39Vrms (two phases) of 25kHz for powering certain interfaces	219x System or 2137A, 2139A, or 2156A/B Computer
12159A 25kHz Sine Wave Card	Provides up to 30W of 39Vrms (two phases) of 25kHz for powering certain interfaces	248x System or 243x System Component
HP-IB INTERFACE AND HP-IB EXTENDER		
12009A HP-IB Interface Card with 2m/6.5ft cable **-001:** 4m/13ft cable in place of 2m/6.5ft cable	Provides for HP-I3 bus connection of up to 14 "fast" or 14 "slow" HP-IB devices, such as 79xxP/R discs, printers, graphics devices, etc. (Note: Mixed connection of discs, printers, tape units, and other devices should be planned with careful consideration of overall and individual device response)	2142A/B, 2186x, 219x, or 248x System or 2103L or 2122A/B Computer operating under RTE-L/XL or 213x, 2156A/B or 243x Computer operating under RTE-A; (12009A interface for disc is included in 2142A/B, 2186x, 219x, and 248x Systems and 2122A and 2136A component Microsystems)
37203L HP-IB Extender Card	Extension of HP-IB communication with other 37203L Extender Card or 37203A HP-IB Extender up to 1km (3281ft) via coax cable via coaxial cable	219x System with 12158A 25kHz power module, 248x System with 12159A 25kHz sine wave card, or 2103L Computer or 2137A, 2139A, or 2156A/B Computer with 12158A 25kHz power module or 243x System component with 12159A 25kHz sine wave card also requires 12009A HP-IB Interface
-001: Fiber Optic Interface	Adds fiber optic cable communication (same maximum distance as standard 37203L)	For communication via Fiber Optic Cabling, same prerequisites as standard 37203L; except that with 12009A HP-IB 12158A 25kHz Power Module or 12159A 25kHz sine wave card is NOT required

Accessories and Interfaces for A/L-Series Systems and Computers, continued

Accessory or Interface Product Number and Name	Purpose	Prerequisites
RECOMMENDED TERMINAL INTERFACES (See pages 4.1-2 through 4.1-13 for applications)		
12005A Asynchronous Serial Interface Card	Point-to-point communication with 238x, 262x, 2635B, or 264x Terminal	2142A/B, 2186x, 219x, or 248x System or 2103L or 2122A/B Computer operating under RTE-L/XL or 23xA/B, 2156A/B, or 243x Computer operating under RTE-A, terminal, and appropriate cable option (One 12005A interface with appropriate cable is included with L-Series Microsystems.)
-001: 4.9m/16.2ft cable	For connection to 262x terminal (except 2621B or 2629L)	
-002: 5.3m/17.4ft cable	For connection to 238x, 2621B, 2629L, or 2635B terminal	
-003: 4.9m/16.2ft cable	For connection to U.S. Modem	
-005: 5.3m/17.4ft cable	For connection to 264x terminal	
12005B Asynchronous Serial Interface Card with electrical and fiber optic connectors and 15m (49ft) fiber optic cable	Point-to-point communication with 238x, 262x, 2635B, or 264x Terminal.	2142A/B, 2186x, 219x, or 248x System or 2103L or 2122A/B Computer operating under RTE-L/XL or 213x, 2156A/B, or 243x Computer operating under RTE-A, terminal, and appropriate cable option (One 12005B interface with appropriate cable is
-001: 5m (16.4ft) filtered cable*	Conn to 262x terminal other than 2621B/29L.	
-002: 5m (16.4ft) filtered cable*	Connection to 2635B Printing Terminal.	
-003: 4.9m (16.2ft) cable*	Connection to RS-232-C Modem.	
-004: 5.3m (17ft) cable*	Connection to 264x terminal.	
-005: Fiber optic adapter pod	Fiber optic conn to 262x terminal other than 2621B/29L.	
12040B 8-Channel Async Multiplexer with RS-232-C Connector Panel	Connection of up to eight 238x, 262x, 2635B, and/or 264x Terminals via a single I/O channel at terminal rates to 960 cps.	2142A/B, 2186x, 219x, or 248x System or 2103L or 2122A/B Computer operating under RTE-L/XL or 213x, 2156A, or 243x Computer operating under RTE-A, and terminals and cables.
-001: Set of firmware ROMs (deletes other parts of interface)	Upgrade 12792A Multiplexer to 12792B.	
-002: Deletes connector panel	Use with 37214A Systems Modem.	37214A Systems Modem and 3721xA plug-ins.
-003: Edge connector kit instead of connector panel and cable	User-fabricated connection to terminals and/or modems.	
DS/1000-IV INTERFACES (See pages 4.3-1 through 4.3-12 for application)		
12007B HDLC Modem Interface with 5m/17ft RS-232-C Cable	Modem connection to other point-to-point DS/1000-IV network node	2142A/B, 2186x, 2197x, System or 2103L or 2122A/B Computer operating under RTE-L/XL or 213x, 2156A/B, or 243x Computer operating under RTE-A. Also requires 91750A DS/1000-IV Network software and its additional memory requirements, and suitable modem and telephone line connection
-001: Set of updated firmware ROMs (deletes other parts of interface)	Provides latest firmware ROMs for customer not on 91750x Opt 101/102/104/108/116 firmware update support	
-002: RS-449 Cable	Substitute for RS-232-C cable	
12044A HDLC Direct Connect Interface with two 5m/17ft Cables and verifier hoods	Direct connection to other point-to-point DS/1000-IV network node	2142A/B, 2186x, 219x, or 248x System or 2103L or 2122A/B Computer operating under RTE-L/XL or 213x, 2156A/B, or 243x Computer operating under RTE-A. Also requires 91750A DS/1000-IV Network software and its additional memory requirement. 91712A, 91713A, and 91714A Extension cable products may also be required
-001: Set of updated firmware ROMs (deletes other parts of interface)	Provides latest firmware ROMs for customer not on 91750x Opt 101/102/104/108/116 firmware update support	
-002: Deletes cables and verifier hoods	Cables and verifier hoods are not needed for second HDLC interface	
12072A Data Link Slave Interface to HP with 5m/16.4ft cable to 92901A Conn. box	Connection of HP 1000 Slave system to DS/1000-IV data link	2142A/B, 2186x, 219x, or 248x System or 2103L or 2122A/B Computer operating under RTE-XL or 213x, 2156A/B, or 243x Computer operating under RTE-A. Also requires 91750A DS/1000-IV Network software and its additional memory requirement
-001: Set of updated firmware ROMs	Provides latest firmware ROMs (deletes other parts of interface)	
12073A Bisync Modem Interface with 5m/16.4ft RS-232-C Cable	Modem connection to suitably-equipped HP 3000 System or HP 98xx Desktop Computer	Same as 12007B, avove.
-001: Set of updated firmware ROMs (deletes other parts of interface)	Provides latest firmware ROMs for customer not on 91750x Opt 201/202/204/208/216 firmware update support	
-002: RS-449 Cable	Substitute for RS-232-C cable	
12082A Bisync Direct Connect Interface with one 5m/16.4ft cable	Direct connection to suitably-equipped HP 3000 System or HP 98xx Desktop Computer	Same as 12044A, above.
-001: Set of updated firmware ROMs (deletes other parts of interface)	Provides latest firmware ROMs for customer not on 91750x Opt 201/202/204/208/216 firmware update support	

* *Instead of fiber optic cable.*

Accessories and Interfaces for A/L-Series Systems and Computers, continued

Accessory or Interface Product Number and Name	Purpose	Prerequisites
DSN/X.25 INTERFACE TO PACKET-SWITCHED NETWORKS		
12075A DSN/X.25 Network (modem) **Interface** with 5m/16.4ft RS-232-C Cable	Connection to HP 1000, HP 3000, or other systems via private or public packet-switched networks. 91750A DS/1000-IV software capabilities are supported for communication with HP 1000 and HP 3000	2142A/B, 2186x, 219x, or 248x System or 2103L or 2122A/B Computer operating under RTE-XL or 213x, 2156A/B, or 243x Computer operating under RTE-A. Also requires 92751A DSN/X.25 software and its additional memory requirement and suitable modem and telephone line connection
-001: Set of updated firmware ROMs (deletes other parts of interface	Provides latest firmware ROMs for customer not on 91751x option 301, 302, 304, or 308 firmware update support	
-002: RS-449 Cable	Substitute for RS-232-C cable	
OTHER DATA COMMUNICATIONS INTERFACES		
12041A Multi-Use Programmable Multiplexer	For interfacing to programmable controllers under control of 94200A or 94201A PCIF/1000 software	2186C/D, 219xC/D, or 248xA System or 213x, 2156A/B, or 243x Computer operating under RTE-A; also requires 12828A Multiplexer Panel and 94200A or 94201A PCIF/1000 software
12092A Data Link/ Multipoint Master Interface with 5.17m (17ft) RS-232-C cable **-001** Set of updated firmware ROMs	For interfacing up to 64 terminals on a multipoint/ data link line under control of 91732A Data Link/ Multipoint Software	2186C/D, 219xC/D, or 248xA System or 213x, 2156A/B, or 243x Computer operating under RTE-A; also requires 91732A Data Link/Multipoint Software
37222A Integral Modem Card	Modem communication with remote terminals via dial-up telephone lines, including auto-dial/auto redial, auto answer, and auto disconnect capabilities	Any A/L-Series system or computer operating under RTE-A, RTE-XL, or RTE-L, a 1556xA Modem telephone cable, dial-up telephone line, and remote modem, cable, and terminal that are compatible with RTE drivers IDM.00 and DD.00
12042B Programmable Serial Interface Card with 5m/16.4ft RS-232-C cable	User-customizable intelligent communications (modem) interface to RS-232-C equipment	2142A/B, 2186x, 219x, or 248x System or 2103L or 2122A/B Computer operating under RTE-L/XL or 213x, 2156A/B, or 243x Computer operating under RTE-A. 24602A Firmware Development Package is strongly recommended for use with the 12042B
-001: RS-449 Cable	Substitute for RS-232-C cable	
-002: Edge conn. kit	Substitute for RS-232-C cable	
-003: Deletes self-test PROM and Diagnostic Hood		
24602A Programmable Serial Interface Firmware Development Package **-001:** Deletes Development Debug Monitor EPROM and DDM Accessory Cable	Provides manual, Development Debug Monitor (DDM), EPROM, and DDM Accessory Cable for development of firmware for 12826B Programmable Serial Interface	12826B Programmable Serial Interface with self-test and a 264x terminal with Mini cartridge I/O or an HP 64000 Microprogramming workstation.

Accessories and Interfaces for A/L-Series Systems and Computers, continued

Accessory or Interface Product Number and Name	Purpose	Prerequisites
OTHER DATA COMMUNICATIONS INTERFACES, continued		
12043A Multi-Use Programmable Serial Interface Card with 5m/16.4ft RS-232-C cable	Intelligent communications (modem) interface used with 91782A DSN/MRJE 1000 software	2186x, 219x, or 248x System or 213x, 2156A/B, or 243x Computer operating under RTE-A with 384kb or more memory and 91782A DSN/MRJE 1000 software
-001: RS-449 Cable	Substitute for RS-232-C cable	
MAC/1000 MEASUREMENT AND CONTROL INTERFACES		
NOTE: The following interfaces are NOT supported in the Model 5 (2142A/B or 2122A/B) or Model 6+ (2186C/D or 2136C/D) Microsystem because of their requirement for 25kHz power, which is not available in the Microsystems.		
12060A High-Level Analog Input Card **-020:** Calib software on 264x Mini cartridge **-041:** Calib software on 1.2M byte flexible disc	Interfaces 8 differential ±1.28V to ±10.23V fs inputs measured with 12-bit resolution at maximum 55,000 channel/second sample rate	219x System with 12158A 25kHz Power Module, 248x System with 12159A 28kHz Sine Wave Card, or 2103L Computer operating under RTE-L/XL or 2137/9A or 2156A/B Computer with 12158A Power Module or 243x System Component with 12159A Sine Wave Card operating under RTE-A.
12061A Expansion Multiplexer Card	Multiplexes 32 additional channels to 12060A High-Level Analog Input Card	12060A High-Level Analog Input Card
12062A Analog Output Card (same options as 12060A)	Provides four independent ±10.23V fs bipolar analog outputs at 20mA per output	Same as 12060A, above
12063A 16-Input/16-Output Isolated Digital I/O Card	Provides 16 isolated inputs for sensing 5-42Vdc or 6-29V rms inputs and 16 isolated contact closure outputs for device activation, via user-furnished ribbon connectors (50-conductor for output, 34 conductor for input)	Same as 12060A, above
GENERAL-PURPOSE INTERFACES		
12006A Parallel Interface Card with connector kit	Provides 8-bit or 16-bit bidirectional data transfers to/from external devices at TTL or discrete-transistor logic levels	2142A/B, 2186x, 219x, or 248x System or 2103L or 2122A/B Computer operating under RTE-L/XL or 213x, 2156A/B, or 243x Computer operating under RTE-A
12010A Breadboard Interface Card with connector kit	Provides standard A/L-Series I/O master circuit and spaces for sixth 16-pin wire-wrap sockets for user-designed custom interface	2142A/B, 2186x, 219x, or 248x System or 2103L or 2122A/B Computer operating under RTE-L/XL or 213x, 2156A/B, or 243x Computer operating under RTE-A. Also requires user-written interface driver

Communications Information Locator

Operator Terminal Communications

Data Capture Terminals and Data Link Communications

System-to-System Communications

System Console Requirements

In any HP 1000 Computer System not connected in a DS/1000-IV Distributed Systems Network, at least one terminal is required for operator communication with the system. This terminal, designated the System Console, must communicate with the system via a point-to-point interface and, in addition to providing the input keyboard and output display or printout, functions as the system logging device. Additional requirements in certain systems are covered in the tables below, which summarize all compatible System Console configurations for the various series of HP 1000 Systems. In each table, terminals are listed in product number order. For terminal selection criteria, see the HP 1000 Operator terminals capability, capacity, and performance comparison on page 4.1-5.

Required System Console Configurations for HP 1000 E/F-Series Computer Systems Based on 2176C, 2177C, 2178A, and 2179A SPUs

The following terminal configurations provide Mini cartridge I/O capability that satisfies software, software update, and diagnostic loading requirements of HP 1000 Model 40, 45, 60, and 65 Computer Systems and user-assembled systems based on non-EMI qualified HP 1000 E/F-Series Computers that will use HP software, software updates, and/or diagnostics. The first HP 1000 Computer System at a site MUST use one of these terminal configurations for its system console to assure proper support. Additional systems may use one of the other HP 1000 E/F-Series system console configurations listed in the next table, provided that a terminal with Mini cartridge I/O will be readily available at the system site to HP Customer Engineers and System Engineers to assist their support of the system with the "other" system console. All the terminals listed here support the convenient soft-key utilities provided in the RTE operating systems used with HP 1000 E/F-Series Systems.

TERMINAL PRODUCT NUMBER AND NAME	REQUIRED TERMINAL OPTIONS AND DESCRIPTION	INTERFACE AND CABLE FOR SYSTEMS	INTERFACE AND CABLE OPTION FOR COMPUTERS	COMMENTS
2645A DISPLAY STATION	007: Minicartridge I/O	Included	12966A+001 or 12966A+107	Lowest-priced required system console. With minicartridge I/O, the 2645A also functions as a standard input/output unit.
2648A GRAPHICS TERMINAL	007: Minicartridge I/O	Included	12966A+001 or 12966A+107	Graphics capability is supported by HP 1000 graphics software. With minicartridge I/O, the 2648A also functions as a standard input/output unit.

Compatible System Console Configurations for HP 1000 E/F-Series Computer Systems Based on 2176E, 2177F, 2178C, and 2179C SPUs

The terminals listed below preserve the EMI qualification of Model 40, 45, 60, and 65 Systems based on the 2176E, 2177F, 2178C, and 2179C SPUs. However a 7970B/E Magnetic Tape Unit, a 264x terminal with minicartridge I/O, or an HP 85A Desktop Computer is also required by users who wish to have the ability to load and run diagnostics.

TERMINAL PRODUCT NUMBER AND NAME	REQUIRED TERMINAL OPTIONS AND DESCRIPTION	INTERFACE AND CABLE FOR 2176E/2177F or 2178C/2179C BASED SYSTEMS	INTERFACE AND CABLE OPTION FOR COMPUTERS	COMMENTS
2621B INTERACTIVE TERMINAL	None	Order 2176E/7F or 2178C/9C cable opt 006	12966A+106 (12966-60015)	Lowest priced system console available.
2622A DISPLAY TERMINAL	None	Order 2176E/7F or 2178C/9C cable opt 005	12966A+105 (12966-60014)	Low-priced block mode system console. Line drawing set and built-in printer are optional. Use with RTE soft-key utilities not tested.
2623A GRAPHICS TERMINAL	None			Low-priced graphics capability is supported by Graphics/1000-II software. Line drawing set and built-in printer are optional. Use with RTE soft-key utilities not tested.
2624B DISPLAY TERMINAL	None			Supports RTE soft-key utilities, forms capability, and advanced format editing. Built-in printer, additional memory, and math & large character sets are optional.
2626A DISPLAY STATION	None			Supports RTE soft-key utilities and interactive forms design. Multiple workspaces and split-screen capabilities are available to the applications programmer. Built-in printer and math and large character sets are optional.
2627A COLOR GRAPHICS TERMINAL	None			Color graphics capability will be supported under Graphics/1000-II software starting with date code 2301. RGB video interface is optional. Use with RTE soft-keys not tested.
2635B PRINTING TERMINAL	None	Order 2176E/7F or 2178C/9C cable opt 006	12966A+106 (12966-60015)	Dot-matrix impact serial printing terminal. Does not support RTE soft-key utilities.
2645A DISPLAY STATION	007: Minicartridge I/O	Order 2176E/7F or 2178C/9C cable opt 007	12966A+107 (12966-60016)	Terminal with built-in minicartridge I/O also functions as standard input/output unit. Supports RTE soft-key utilities.
2648A GRAPHICS TERMINAL	007: Minicartridge I/O			Graphics capability is supported by Graphics/1000-II software. With built-in minicartridge I/O also functions as standard input/output unit. Supports RTE soft-key utilities.

Compatible Integrated System Console Configurations for HP 1000 A/L-Series Microsystems

One of the terminal configurations listed below MUST be used for HP 1000 L-Series Model 5 Microsystems (2142A/B and 2122A/B) and may be used for HP 1000 A-Series Model 6+ Microsystems (2186C/D and 2136C/D)

TERMINAL PRODUCT NUMBER AND NAME	REQUIRED TERMINAL OPTIONS AND DESCRIPTION	INTERFACE AND CABLE FOR MICROSYSTEMS	INTERFACE AND CABLE OPTION FOR COMPUTERS	COMMENTS
2621B INTERACTIVE TERMINAL	090: Model 5/6+ Compatibility	Included in Microsystem	Not applicable	Lowest priced system console available.
2622A DISPLAY TERMINAL	090: Model 5/6+ Compatibility	Included in Microsystem	Not applicable	Low-priced block mode system console. Line drawing set and built-in printer are optional
2623A GRAPHICS TERMINAL	090: Model 5/6+ Compatibility	Included in Microsystem	Not applicable	Low-priced graphics capability is supported by Graphics/1000-II software. Line drawing set and built-in printer are optional.
2624B DISPLAY TERMINAL	090: Model 5/6+ Compatibility	Included in Microsystem	Not applicable	Supports forms capability and advanced format editing. Built-in printer, additional memory and math and large character sets are optional.
2626A DISPLAY STATION	090: Model 5/6+ Compatibility	Included in Microsystem	Not applicable	Supports interactive forms design. Multiple workspaces and split-screen capabilities are available to the applications programmer. Built-in printer and math and large character sets are optional.

System Console Configurations for Other HP 1000 A/L-Series Systems

The terminal configurations listed below may be used for HP 1000 A-Series Model 6+ (non-integrated system console), 26, 27, and 29 Computer Systems, Micro 26, 27, and 29 Computer Systems, for the 2162A Automation Processor, and for user-assembled systems based on 2103L or 2156B Microcomputers, 2137A and 2139A Computers, 2436A, 2437A, and 2439A Micro 26, 27, and 29 System Components, and 2103LK, 2106BK, and 2107AK Board Computers.

TERMINAL PRODUCT NUMBER AND NAME	REQUIRED TERMINAL OPTIONS AND DESCRIPTION	INTERFACE AND CABLE FOR 2186C/D, 219xC/D, OR 248xA SYSTEMS	INTERFACE AND CABLE OPTION FOR COMPUTERS	COMMENTS
2621B INTERACTIVE TERMINAL	None	Order SPU cable opt 006 or SPU 12005B interface delete option 008*, 12040B Multiplexer, and 13242Y cable	12005B+002 or 12005B+003 (modem) plus 13242N cable or 12040B Multiplexer and 13242Y cable	Lowest priced system console available.
2622A DISPLAY TERMINAL	None	Order SPU cable opt 005 or SPU 12005B interface delete option 008*, 12040B Multiplexer, and 13222Y cable	12005B+005 or 12005B+003 (modem) plus 13222N cable or 12040B Multiplexer and 13222Y cable	Low-priced block mode system console. Line drawing set and built-in printer are optional.
2623A GRAPHICS TERMINAL	None			Low-priced graphics capability is supported by Graphics/1000-II software. Line drawing set and built-in printer are optional.
2624B DISPLAY TERMINAL	None			Supports forms capability and advanced format editing. Built-in printer, additional memory and math and large character sets are optional.
2626A DISPLAY STATION	None			Supports interactive forms design. Multiple workspaces and split-screen capabilities are available to the applications programmer. Built-in printer and math and large character sets are optional.
2627A COLOR GRAPHICS TERMINAL	None			Color graphics capability will be supported under Graphics/1000-II software starting with data code 2301. RGB video interface is optional.
2635B PRINTING TERMINAL	None	Order SPU cable opt 006 or SPU 12005B interface delete option 008*, and 12040B Multiplexer (use cable included with 2635B)	12005B+002 or 12005B+003 (modem) plus cable included with 2635B or 12040B Multiplexer and cable included with 2635B	Dot-matrix impact serial printing terminal.
2645A DISPLAY STATION	None	Not supported in A-Series Systems	12005B+004 or 12005B+003 (modem) plus 13232N cable or 12040B Multiplexer and 13232Y cable	Minicartridge I/O is optional (2645A option 007).
2648A GRAPHICS TERMINAL	None			Graphics capability is supported by Graphics/1000-II software. Minicartridge I/O is optional (2648A option 007).

* Delete option 008 is effective January 1, 1984.

Operator Terminal Interfacing Selection Guide

	POINT-TO-POINT INTERFACES			MULTIPLEXER INTERFACES			MULTIPOINT INTERFACE	
	Required to interface system console or other terminal at which support of Mini cartridge I/O, auxiliary printer output, and other capabilities is desired.			To interface multiple terminals at a low cost per channel where terminals are most advantageously connected in a "star" configuration.			To interface multiple terminals at the lowest possible transmission cost when terminals can be advantageously connected in a "string" configuration.	
	(for connections, see pages 4.1-9 and 4.1-10)			(for connections, see pages 4.1-11 through 4.1-13)			(for connections, see pages 4.1-14 and 4.1-15)	
COMPARISON ITEMS	**12005A/B**	**37222A**	**12966A**	**12040B**	**12792B**	**12920B**	**12092A**	**12790A**
Usability in HP 1000 Series	A/L	A/L	M/E/F	A/L	M/E/F	M/E/F	A	M/E/F
Additional Computer Hardware Required	None	None	None	None	None	12620A Priv. Inter. Fence	None	None
Additional Software Required	None	None	None	None	None	91731A Multiplexer Software	91732A Data Link Software	91730A Multipoint Software
I/O Channels Used	1	1	1	1	1	4†	1	1
Communication channels provided	1	1	1	8	8	16	One multipoint channel	
Terminals per channel	1	1	1	1	1	1	Up to 32	Up to 32
Recommended for use with HP terminals	Yes	Yes	Yes	Yes	Yes	Note A	Yes	Yes
Max. data rates††								
— 2382A Terminal, System-Display	960 cps	120 cps	960 cps	N/T	960 cps	N/T	N/S	N/S
— 262x Terminal, System-Display	960 cps	120 cps	960 cps	960 cps	960 cps	240 cps	960 cps (2624B/6A/9D/9F)	
— 262x Graphics Output	210 vps	30 vps	210 vps	N/T	210 vps	N/T	N/S	N/S
— 2635A*/B Term., System-Buffer	240 cps	120 cps	240 cps	240 cps	240 cps	240 cps	N/S	N/S
— 264x Term., System-Display	960 cps	N/T	960 cps	960 cps	960 cps	240 cps	N/T	960 cps (2645A/2648A)
— 264x Mini cartridge I/O	120 cps	N/T	120 cps	N/S	N/S	120 cps	Requires user-written subroutine	
— 2642A Minifloppy I/O	960 cps	N/T	960 cps	N/S	N/S	N/S	Requires user-written subroutine	
— 264x Auxiliary printer output	180 cps§	N/T	180 cps§	N/S	N/S	180 cps§	Requires user-written subroutine	
— 264x Graphics Output	100 vps	N/T	100 vps	N/S	100 vps	N/S	N/S	N/S
Max. Direct Connect Distance to Terminal	152.4m (500ft)‡	Modem conn. only	152.4m (50ft) Note B	94.1m (300ft) to Conn. Panel, 15.24m (50ft), panel-terminal		15.24m (50ft)	4,867m (16,000ft)**	

Note A: Because of its slow data rate, the large number of I/O channels used, and its incompatibility with several software subsystems, the 12920B/91731A combination should be used only where modem communication with modem control via the multiplexer is required.

Note B: A 93546A EIA-to-20mA Current Loop Translator capable of serving up to 16 channels can be used to increase maximum direct connect distance from 12966A interface(s) to terminal(s) to 304.8m (1,000ft) at 960 cps data rate, 609.6m (2,000ft) at 240 cps data rate via user fabricated cable. The 93546A Translator requires 178mm (7in) of vertical front panel space in 29402B/C or equivalent rack cabinet, or one I/O channel in the computer or I/O Extender. (Rear rack panel space of 222mm (8.75in) is also required.) The 93546A Translator is available through DSD Specials Engineering; standard installation and support services are not available for the 93546A.

† = *Including 12620A used as Privileged Interrupt Fence (one I/O channel) and 12920B Multiplexer (three I/O channels).*

†† = *Modem rates are essentially determined by choice of modem and line speed.*

* = *Obsolete product that is listed here for reference.*

N/T = *Not Tested.*

N/S = *Not Supported.*

§ = *Using 2631A*/B+240 Printer.*

‡ = *With user-fabricated cable and 13266A Current Loop Converter pod for the 262x terminal, option 032 with 264x terminal other than 2640B*.*

** = *Up to 16 terminals at rates to 480 cps.*

HP 1000 Operator Terminals Selection Guide

Terminal Product No. and Name	HP 1000 Software-Supported Capabilities	Char per Line	Lines per Display	Memory Capacity		System -to- Display	Maximum Data Rates*			HP 1000 Interfacing Choices
				Text§	Graphics (Dots x Rows)		Print Output	CTU I/O	Graphics Output	
2382A office Display Terminal	Keyboard-display I/O only	80	24	48 lines x 80 char		960 cps				Point-to-point & multiplexer
2621B Interactive Terminal	Keyboard-display I/O only, lowest-priced terminal available	80	24	48 lines x 80 char		960 cps				Point-to-point & multiplexer
2622A Display Terminal	Keyboard-display I/O with block mode; line drawing set and integral 40/80/132 column thermal printer optional	80	24	48 lines x 80 char		960 cps	60 cps typ w/Opt 050**			Point-to-point & multiplexer†
2623A (or 2629G OEM) Graphics Terminal	Keyboard-display I/O with graphics capability; supported by Graphics/1000-II software; line drawing set and integral 40/80/132 column thermal printer optional	80	24	48 lines x 80 char	512 x 390	960 cps	60 cps Typ. w/ Opt 050‡‡		210 vectors per second	Point-to-point & multiplexer
2624B Display Terminal	Keyboard-display I/O with softkey capability and forms capability; integral 40/80/132 thermal printer optional	80	24	96** lines x 80 char, exp. to 216		960 cps	60 cps typ w/Opt 050**			Point-to-point, multiplexer†, & multipoint
2626A Display Station	Keyboard-display I/O with softkey capability and line drawing set with interactive forms design capability, integral 40/80/132 column thermal printer optional. Multiple workspaces and split screen capabilities are available to the application programmer	80 (160 int)	24	107 lines x 80 char		960 cps	60 cps typ. w/Opt 050**			Point-to-point, multiplexer†, & multipoint‡
2627A Color Graphics Terminal	Keyboard display I/O with color graphics capability that will be supported by Graphics/1000-II software starting with date code 2301; RGB video interface is optional.	80	24	48 lines x 80 char	512 x 390 x 3 color planes	960 cps			210 vectors per second	Point-to-point & multiplexer
2635B Printing Terminal	Keyboard-printer I/O with a choice of normal (136 col), expanded (68 col) and compressed (227 col) dot-matrix impact printing	136					180 cps (240 cps to buffer)			Point-to-point & multiplexer†

* *Actual data rate will depend upon the choice of interfacing mode and whether the connection to the system is via direct connect cable or modems and telephone lines.*

§ *The basic text memory capacity stores characters, so more than the specified number of lines can be stored if there are fewer than 80 characters per line.*

** *Maximum memory is available when applications do not make extensive use of alternate character sets, display enhancements and/or edit checks.*

** *External 2601A, 2631B, 2671A/G opt. 040, or 2673 opt. 040 Printer for data rate to 180 cps (with 2631B) may be connected to 2624B/2626A/2629D/2629F terminal port 2 via 13242G cable.*

* *With 2631B+240 Auxiliary Printer (also requires Mini cartridge I/O or Device Support Firmware in 264x Terminal).*

† *The 12792A multiplexer supports only keyboard-display or keyboard-printer communication; it does not support terminal peripherals, such as Mini cartridge tapes or auxiliary printer output. The 12920B 16-channel multiplexer for M/E/F-Series does support terminal peripherals.*

‡ *Multipoint communication is supported on HP 1000 A/M/E/F-Series systems. Multipoint access to terminal peripherals, such as Mini cartridge tapes or auxiliary printer requires a multipoint subroutine, which does not provide a direct interface to/from the RTE File Manager.*

HP 1000 Operator Terminals Selection Guide, continued

Terminal Product No. and Name	HP 1000 Software-Supported Capabilities	Char per Line	Lines per Display	Memory Capacity: Text§	Memory Capacity: Graphics (Dots x Rows)	System-to-Display	Maximum Data Rates*: Print Output	Maximum Data Rates*: CTU I/O	Maximum Data Rates*: Graphics Output	HP 1000 Interfacing Choices
2645A Display Station	Keyboard-display I/O with soft-key capability and display enhancements; Mini cartridge tape I/O, line drawing set for forms capability, and auxiliary printer output are optional.	80	24	32 lines x 80 char, exp. to 88		960 cps	180 cps*	120 cps w/Opt 007		Point-to-point, multiplexer†, & multipoint‡
2648A Graphics Terminal Terminal	Keyboard-display I/O with graphics display and device support firmware; dual Mini cartridge tape I/O, display enhancements, and auxiliary printer or graphics hard-copy output on raster dump device are optional. This terminal is supported by HP 1000 Graphics software.	80	24	37 lines x 80 char	720x 360	960 cps	180 cps*	120 cps w/Opt 007	100 vectors per second	Point-to-point, multiplexer†, & multipoint‡

* *Actual data rate will depend upon the choice of interfacing mode and whether the connection to the system is via direct connect cable or modems and telephone lines.*

§ *The basic text memory capacity stores characters, so more than the specified number of lines can be stored if there are fewer than 80 characters per line.*

* *With 2631B+240 Auxiliary Printer (also requires Mini cartridge I/O or Device Support Firmware in 264x Terminal).*

† *The 12792A multiplexer supports only keyboard-display or keyboard-printer communication; it does not support terminal peripherals, such as Mini cartridge tapes or auxiliary printer output. The 12920B 16-channel multiplexer for A/M/E/F-Series does support terminal peripherals.*

‡ *Multipoint communication is supported only on HP 1000 M/E/F-Series systems. Multipoint access to terminal peripherals, such as Mini cartridge tapes or auxiliary printer requires a multipoint subroutine, which does not provide a direct interface to/from the RTE File Manager.*

238xA/B, 262x, and 2635B Operator Terminals Option and Accessories Summary

Option and Accessories Description	2382A	2621B	2622A, and 2623A	2624B	2626A	2627A	2635B
TERMINAL OPTIONS							
Swedish-Finnish Character Set	−001	−001	−001	−001	−001*	−001	−001
Norwegian-Danish Character Set	−002	−002	−002	−002	−002*	−002	−002
French Character Set	−003	−003	−003	−003	−003*	−003	−003
German Character Set	−004	−004	−004	−004	−004*	−004	−004
United Kingdom Character Set	−005	−005	−005	−005	−005*	−005	−005
Spanish Character Set	−006	−006	−006	−006	−006*	−006	−006
Adds integral thermal printer	n/a	−050	−050	−050	−050	n/a	n/a
264x Edge I/O Connector in 2635B	n/a	n/a	n/a	n/a	n/a	n/a	−051
Kit of three ribbons for 2635B	n/a	n/a	n/a	n/a	n/a	n/a	−068
Adds RGB video interface	n/a	n/a	n/a	n/a	n/a	−087	n/a
Model 5/6+ Microsystem Compatibility	n/a	−090	−090	−090	−090	n/a	n/a
Adds 2 to 5 pages of display memory	n/a	n/a	n/a	−160	n/a	n/a	n/a
Adds Math and Large Character sets	n/a	n/a	n/a	−201	−201	n/a	n/a†
Adds Line Drawing set	−202	n/a	−202	Std	Std	n/a	n/a†
Tilt and swivel display head	n/a	−401	−401	−401	−401	−401	n/a
TERMINAL ACCESSORIES							
13264A Data Link adapter for 262x terminal	n/a	n/a	n/a	Yes	Yes	Yes	n/a
13265A 300 bps Modem	n/a	n/a	Yes	Yes	n/a	Yes	n/a
13266A Current loop converter pod for 262x terminal	Yes	n/a	Yes	Yes	Yes	Yes	Yes
13267A Async multipoint interface for 1st terminal in line	n/a	n/a	n/a	Yes	Yes	n/a	n/a
-001 Synchronous multipoint instead of asynchronous	n/a	n/a	n/a	Yes	Yes	n/a	n/a
13268A Async multipoint interface for add'l 262x terminal in line	n/a	n/a	n/a	Yes	Yes	n/a	n/a
-001 Synchronous multipoint instead of asynchronous	n/a	n/a	n/a	Yes	Yes	n/a	n/a
17263A Graphics Tablet	n/a	n/a	n/a	n/a	n/a	Yes	n/a
26097A Stand with paper catcher for 2635B	n/a	n/a	n/a	n/a	n/a	n/a	Yes
27201A Speech Output Module	n/a	n/a	Yes‡	Yes‡	Yes‡	Yes‡	n/a

* = *These options also include Math and Large Character sets.*

n/a = *Not Applicable to, or Not Available for, this terminal or accessory.*

† = *Math, line drawing, and National character sets are standard.*

‡ = *Requires terminal option 050 or 27201A Option 002.*

264x Operator Terminals Option and Accessories Summary

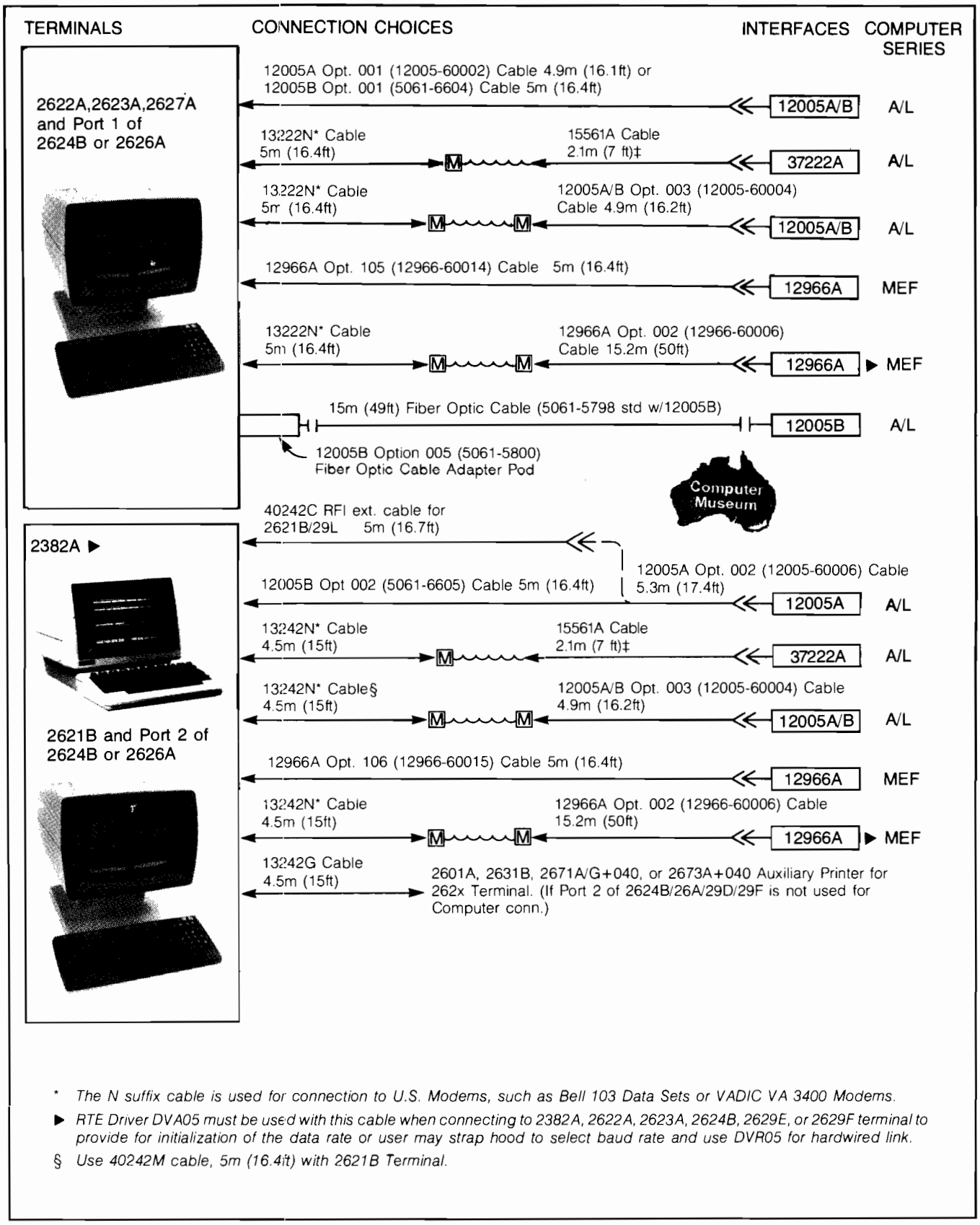
Option and Accessories Description	2645A	2645A +007	2648A	2648A +007
TERMINAL OPTIONS				
Display enhancements, including line drawing set	−003	−003	−003	−003
Display enhancements, including line drawing, math, & large char set	−004	−004	−004	−004
United Kingdom Character set	−005	−005	−005	−005
Integrated dual Mini cartridge I/O (instead of Minifloppy in 2642A)	−007	Incl.	−007	Incl.
Increases display memory to 8k bytes	−008	−008	n/a	n/a
Increases display memory to 12k bytes	−009	−009	n/a	n/a
Extended Asynchronous comm, including 20mA current loop interface	−032	−032	−032	−032
Asynchronous Multipoint Interface	−033	−033	−033	−033
Synchronous Multipoint Interface	−034	−034	−034	−034
Adds Device Support Firmware	−061	Incl.	Incl.	Incl.
Shared Peripheral (HP-IB) Interface	−096	−096	−096	−096
TERMINAL ACCESSORIES				
13231A Display enhancements, including Line Drawing Set	Yes	Yes	Yes	Yes
-201 Adds Math Symbol Set	Yes	Yes	Yes	Yes
-203 Adds Large Character Set	Yes	Yes	Yes	Yes
13234A Adds 4kb to display memory	Yes	Yes	n/a	Yes
13236A Mini cartridge I/O field upgrade kit*	Yes	n/a	Yes	n/a
13260B Point-to-Point Extended Async Comm (incl. 20mA current loop capability)	Yes	Yes	Yes	Yes
-003 Use in 2648A Graphics Terminal	n/a	n/a	Yes	Yes
13260C Asynchronous Multipoint Communications	Yes	Yes	Yes	Yes
-001 Adds Monitor Mode	Yes	Yes	Yes	Yes
13260D Synchronous Multipoint Communications	Yes	Yes	Yes	Yes
-001 Adds Monitor Mode	Yes	Yes	Yes	Yes
13261A Device Support Firmware	Yes	Incl.	Yes	Incl.
-001 Device Support Firmware for Terminal without Mini cartridge tapes	Yes	n/a	Yes	n/a
13265A+001 300 bps Modem	Yes	Yes	Yes	Yes
13296A Shared peripheral (HP-IB) Interface‡*	Yes	Yes	Yes	Yes
-048 Raster dump firmware for 2648A w/13261A or Opt 007 ordered before 9/78	n/a	n/a	Yes	Yes
27201A+003 Speech Output Module	Yes	Yes	Yes	Yes
98200A Box of 5 Minicartridges	n/a	Yes	n/a	Yes

n/a = Not Applicable to this terminal or accessory.

* = *Also requires Device Support Firmware provided as 264x Option 061 or as accessory 13261A.*

‡ = *Not supported by drivers in RTE-IVB operating system.*

2382A and 262x Terminal Point-to-Point Connection Configurations

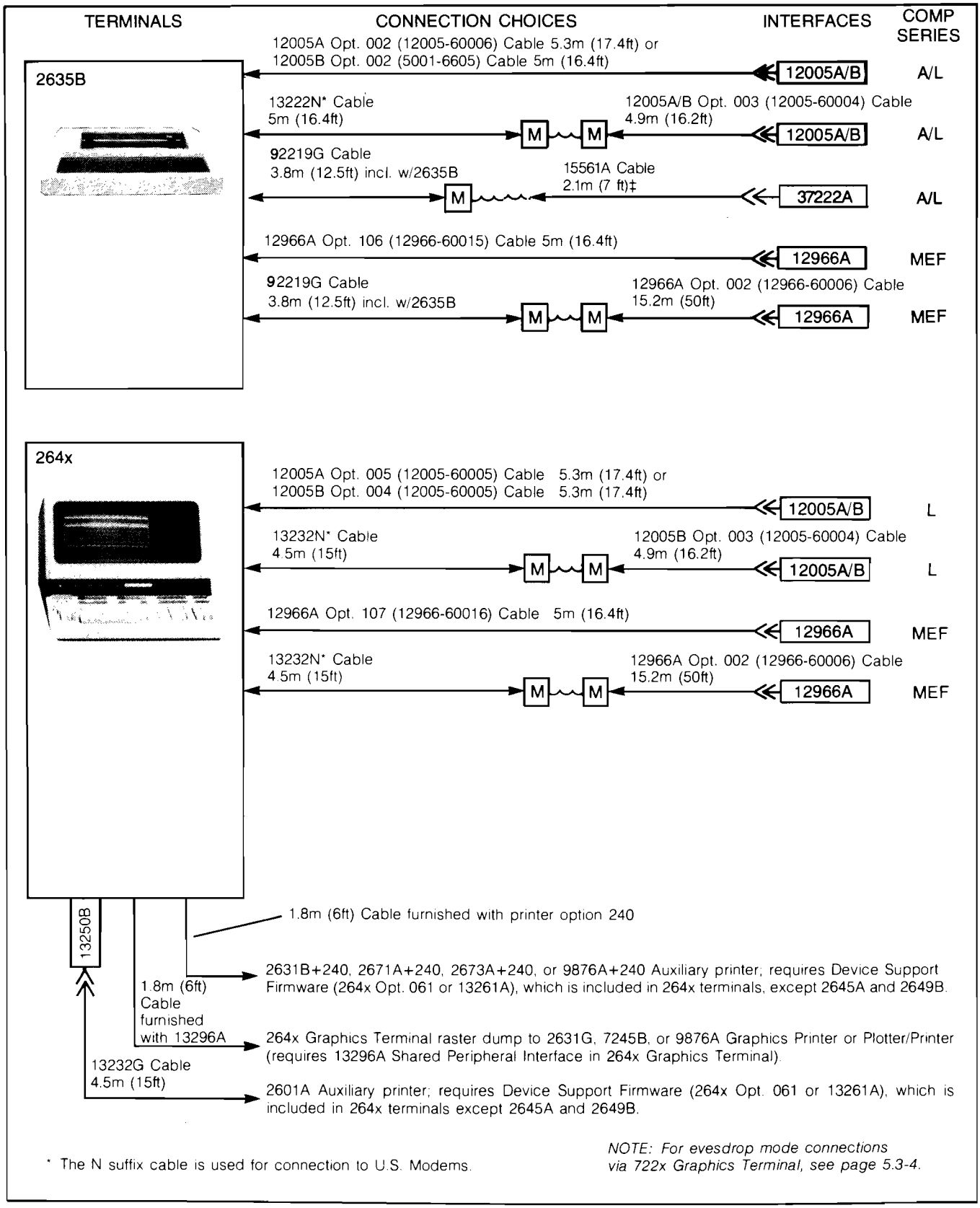


* *The N suffix cable is used for connection to U.S. Modems, such as Bell 103 Data Sets or VADIC VA 3400 Modems.*

▶ *RTE Driver DVA05 must be used with this cable when connecting to 2382A, 2622A, 2623A, 2624B, 2629E, or 2629F terminal to provide for initialization of the data rate or user may strap hood to select baud rate and use DVR05 for hardwired link.*

§ *Use 40242M cable, 5m (16.4ft) with 2621B Terminal.*

2635B and 264x Terminal Point-to-Point Connection Configurations



HP 1000 Asynchronous Multiplexer Connection Configurations via Standard Connector Panel

The 12040B and 12792B Multiplexers support terminal data rates to 960 cps; the 12920B Multiplexer supports terminal data rates to 240 cps.

RTE-L/XL based L-Series System or RTE-A.1 based A-Series System

12040B 8-Chan Multiplexer

RTE-IVB/IVE or RTE-6/VM based M/E/F-Series System

12792B 8-Chan Multiplexer

91731A Multiplexer Software*

12920B 16-Chan Multiplexer

3m (10ft) Cable included with Multiplexer

8-Port RS-232-C Multiplexer Panel included with 12040B or 12792B Multiplexer or 16-Port Connector Panel included with 12920B

3.6m (12ft) Cable and connector panel included with 12920B Port

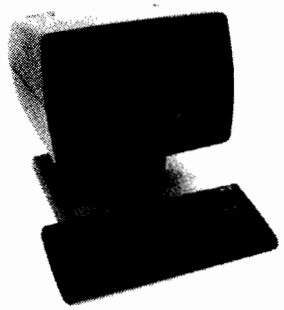
30062B Cable 7.6m(25ft)

M

M

TERMINALS

262x



Port 1

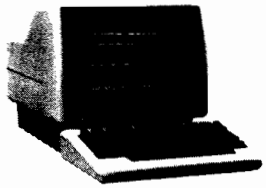
13222Y Cable† 5m(16.4ft)

Port 2‡

13242Y Cable† ▶ 4.5m(15ft)

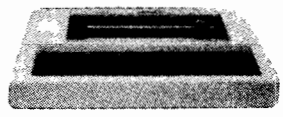
‡ Applies only to the 2621B Terminal and Port 2 of 2624B, or 2626A Terminals.

2382A



13242Y Cable† 4.5m (15ft)

2635B



92219G 3.8m (12.5ft) Cable incl. with 2635B

264x

13232A Cable† 4.5m (15ft)

* *91731A Multiplexer Software is not supported in RTE-6/VM and is not compatible with Edit/1000 (the screen editor included with RTE-IVB) or 92834A FORTRAN 4X.*

Typical alternate connection via modem. (Any of the terminal cables shown directly connected to the connector panel can instead connect to a modem that in turn connects to the connector panel via another modem and a 30062B cable.)

NOTE: Modem connection via the standard connector panel of the 12040B or 12792B Multiplexer is passive; for connection that supports modem control, see page 4.1-12.

▶ *40242M Cable 5m (16.4ft) is required for 2621B/29L Terminal in place of 13242Y cable to meet EMI standards.*

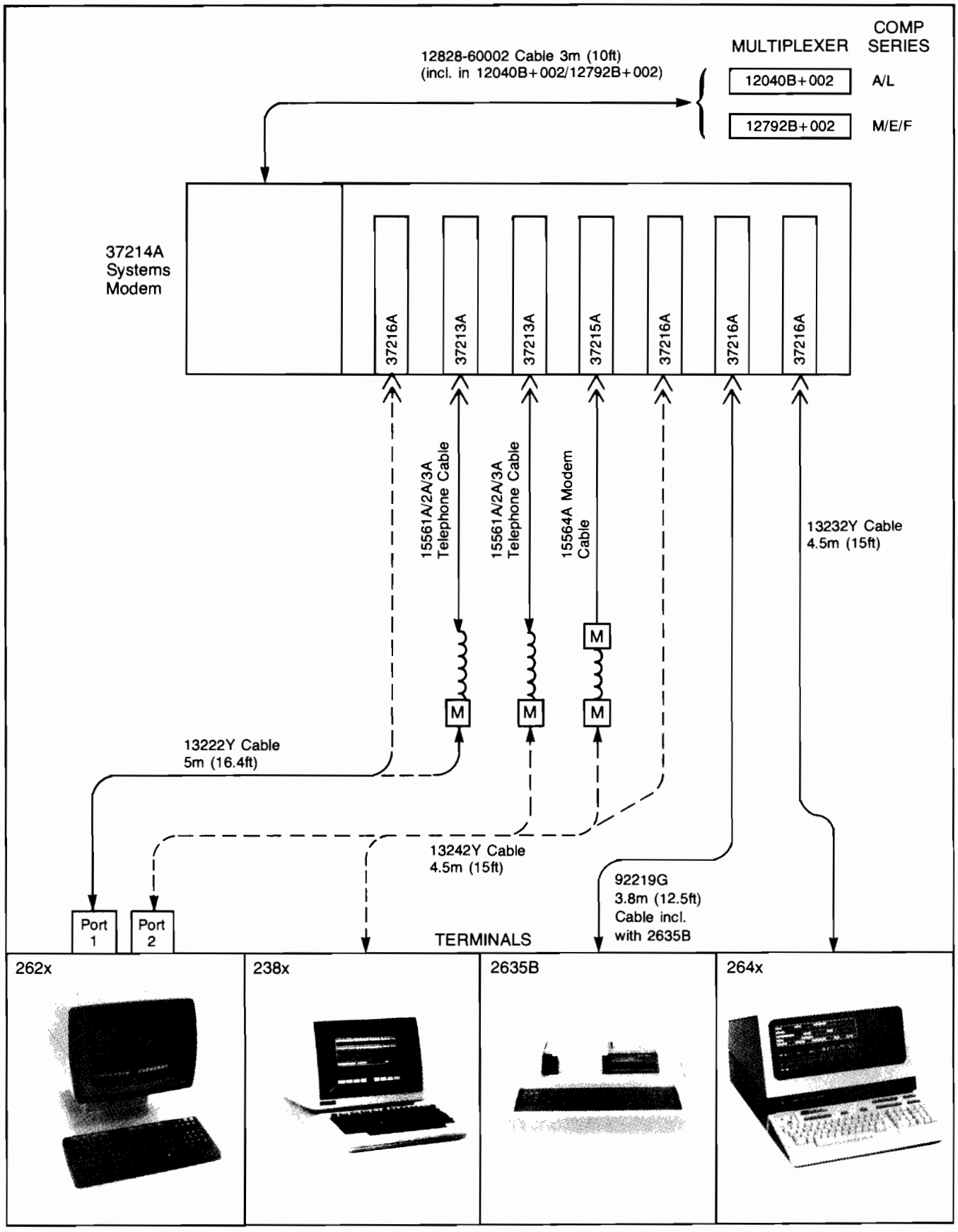
† *The following cables may be used for connection to the 8-Port RS-232-C Panel included with 12040B/12792B Multiplexer. Certain of these cables are not usable with the 12920B Connector Panel.*

Terminal	Cables usable with 12040B/12792B & 12920B	Cables usable with 12040B/12792B, but not 12920B
262x	13222N & 13222Y 13242N & 13242Y	13222M
2382A	13242N & 13242Y	
264x	13232A & 13232Y	13222N & 13222M

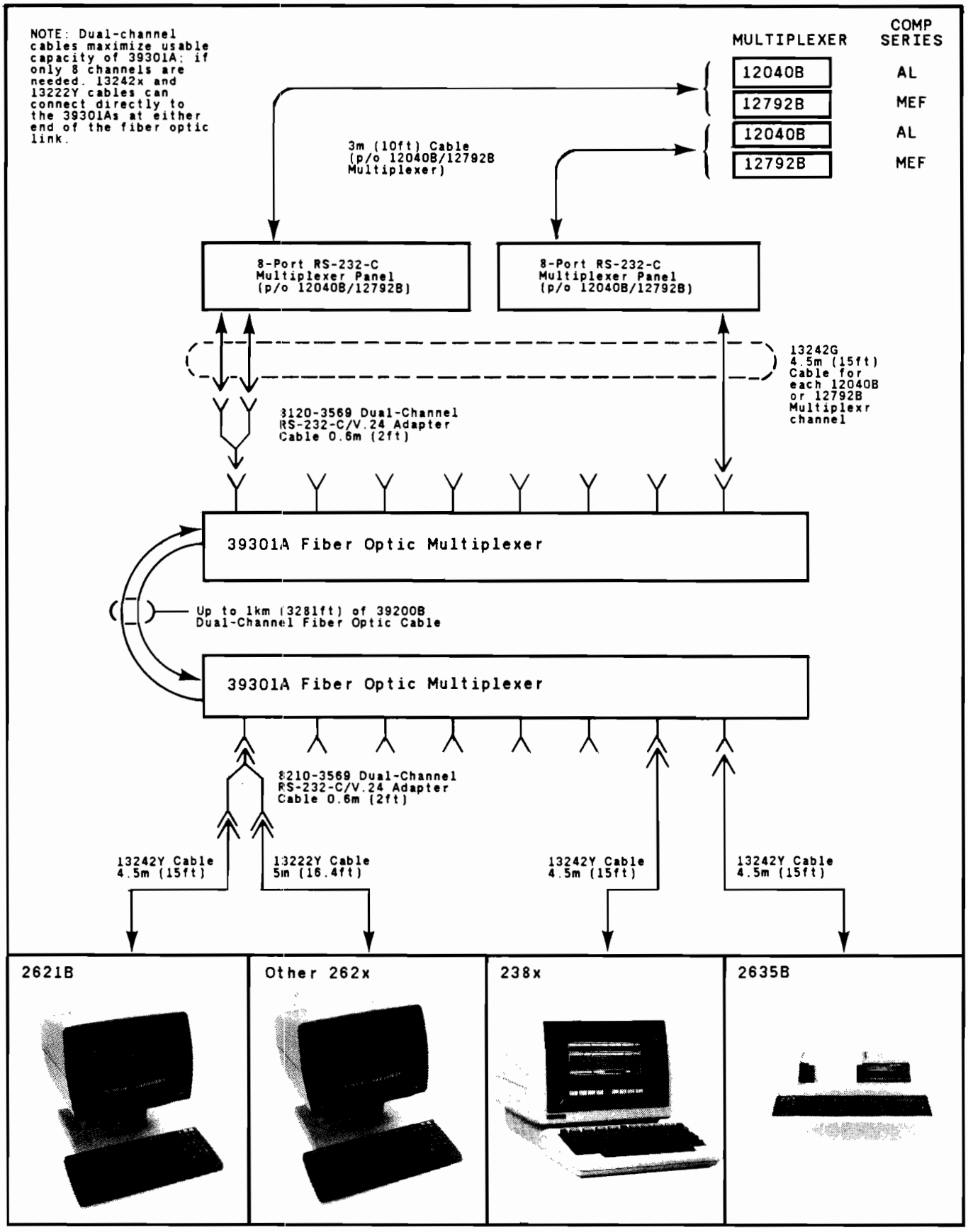
Extension Cables For Use with Multiplexers

30062C	7.6m (25ft)
30062C+001	19.2m (50ft)
30062C+002	30.4m (100ft)

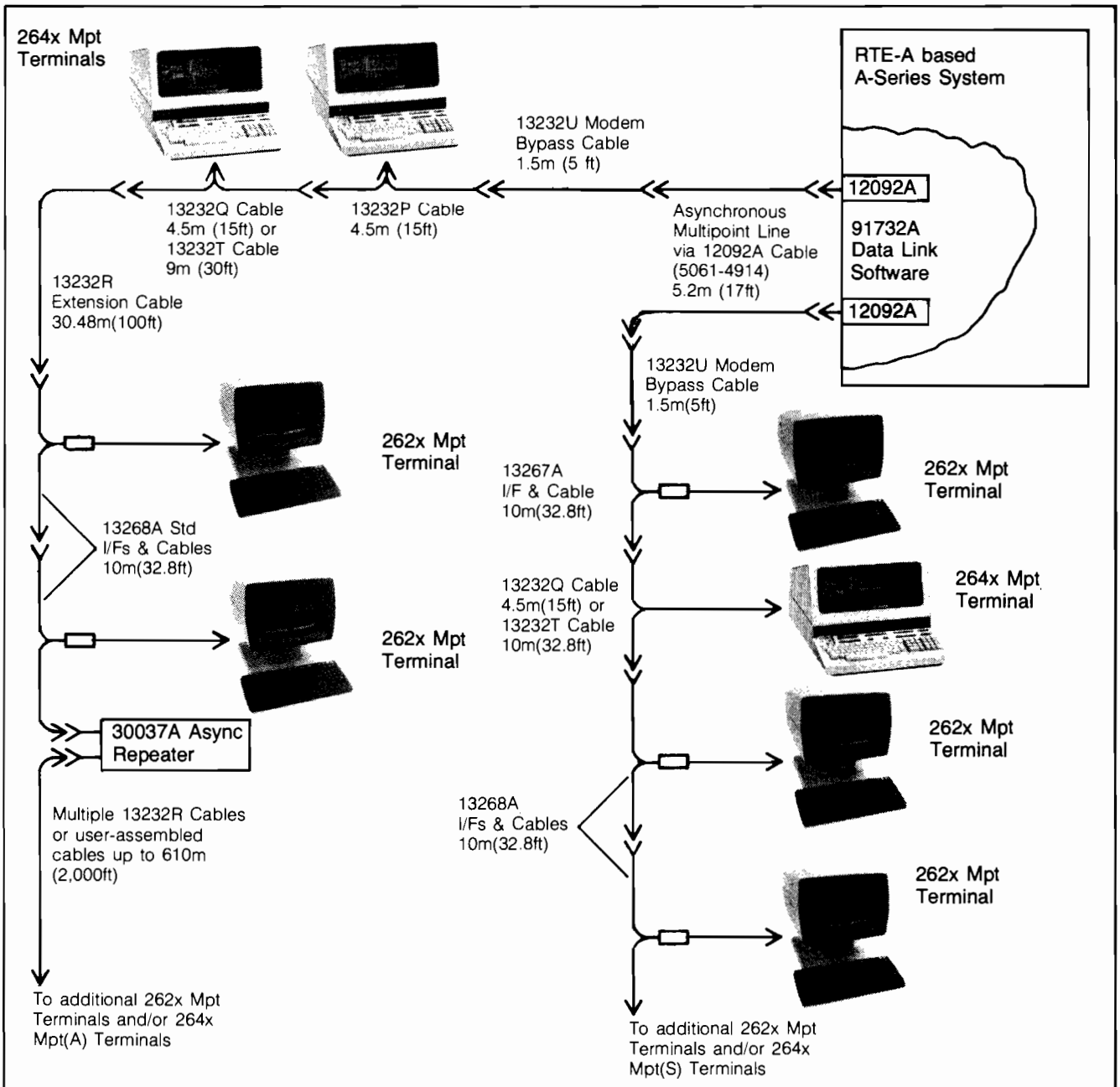
HP 1000 Asynchronous Multiplexer Connection Configurations via 37214A Systems Modem



HP 1000 Asynchronous Multiplexer Connection Configurations via 39301A Fiber Optic Multiplexer



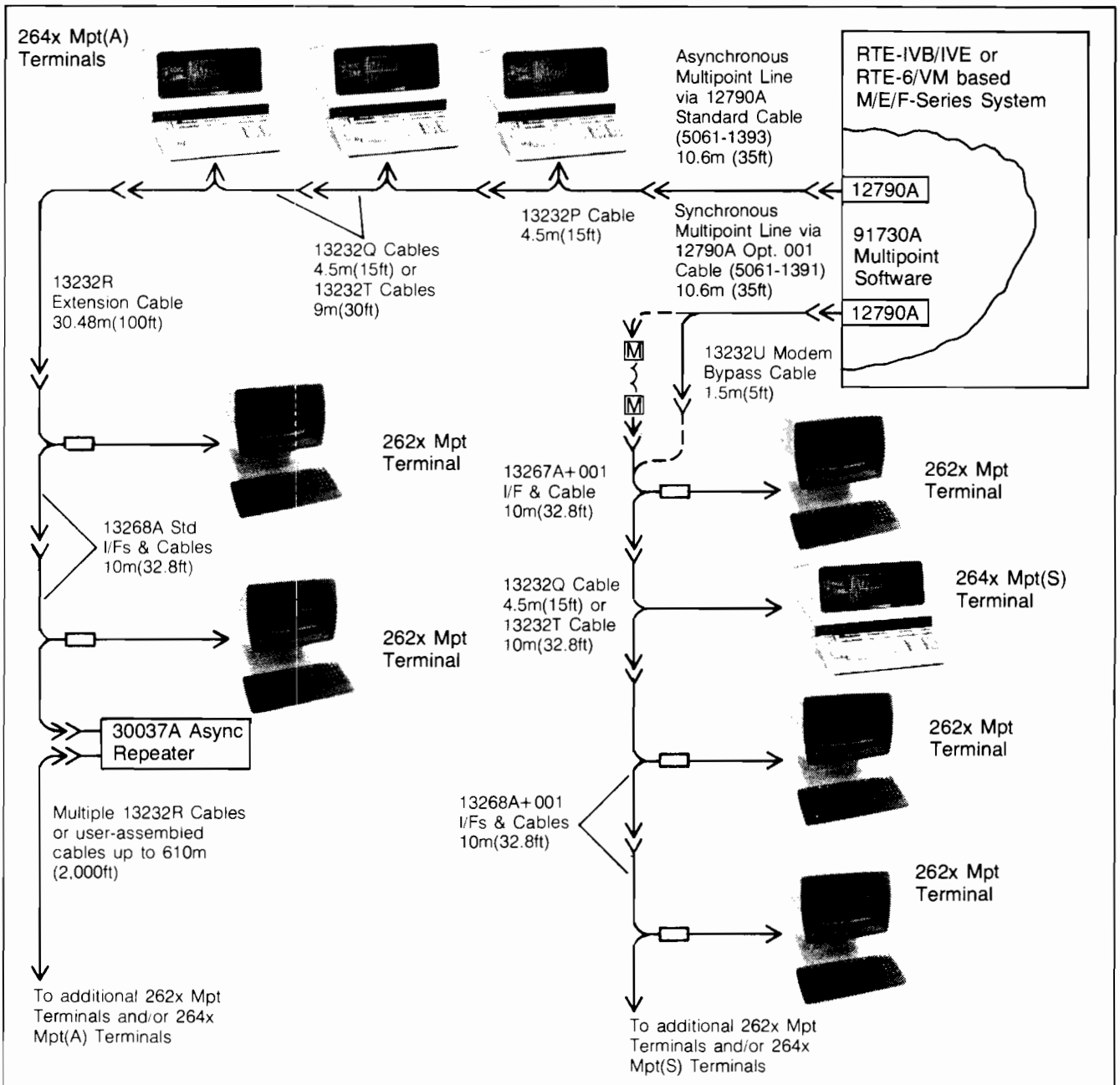
HP 1000 A-Series Sample Multipoint Connection Configurations



LEGEND:

264x Mpt	=	2645A/2648A terminal with Async multipoint option 033 (or 13260C accessory) and at least 4kb more than standard display memory.
262x Mpt	=	2624B/2626A terminal with 13267A Async multipoint interface pod for first terminal on the line, 13268A Async multipoint interface pod for each additional terminal on the line.
13232P	=	Modem multipoint cable to first 264x Mpt(A/S) terminal on the line.
13232Q	=	Multipoint continuation cable to 264x Mpt(A/S) terminal that is not the first terminal on the line.
13232T	=	Power protect multipoint continuation cable to 264x Mpt(A/S) terminal that is not the first terminal on the line.

HP 1000 M/E/F-Series Sample Multipoint Connection Configurations

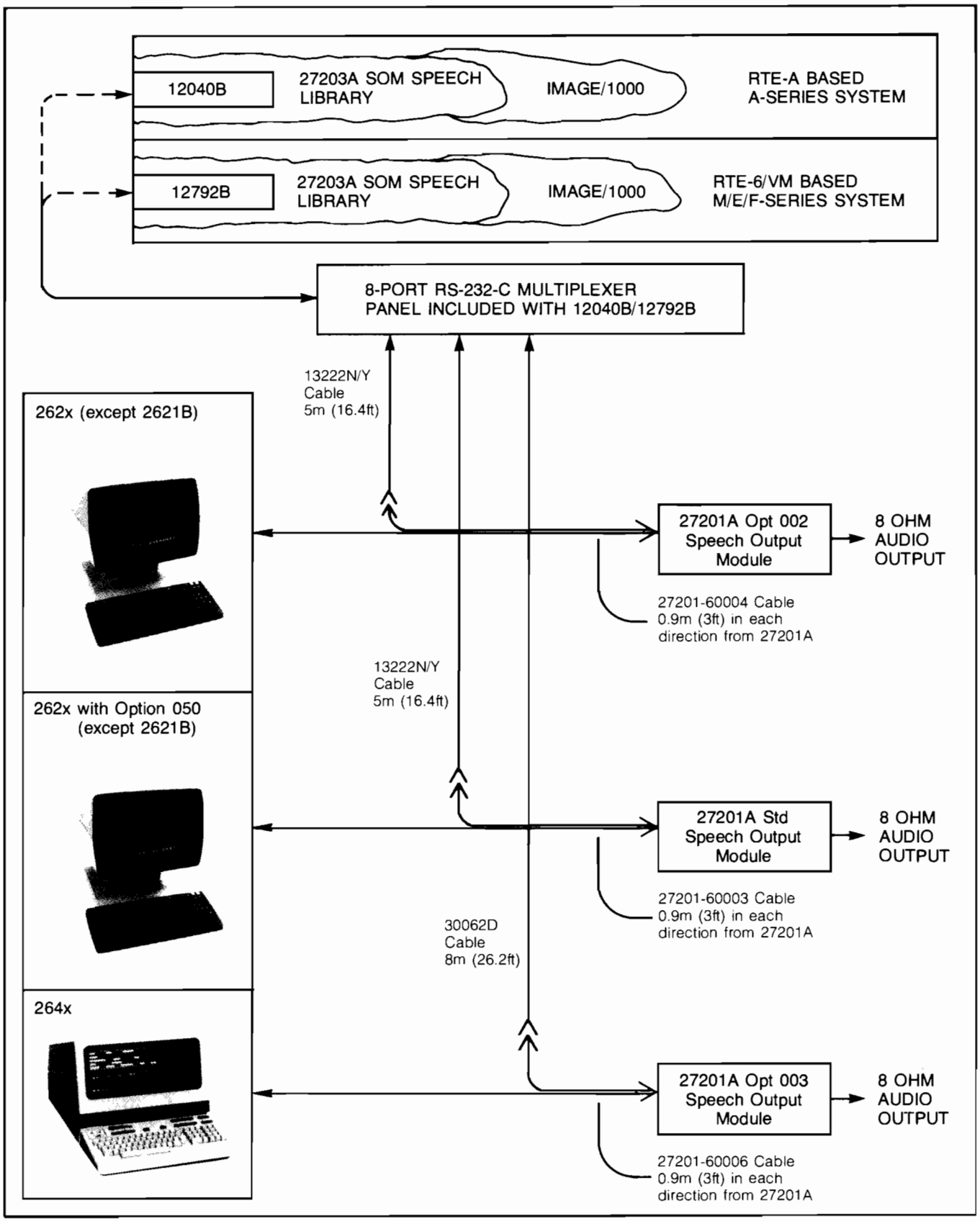


** Communications mode of line (synchronous or asynchronous) is determined by choice of modem. Direct connect line, either via 12790A Std cable or 12790A Opt. 001 cable and 13232U Modem bypass cable will always be asynchronous, requiring the use of 13267A/13268A Standard 262x multipoint interface pods and 264x Option 033.*

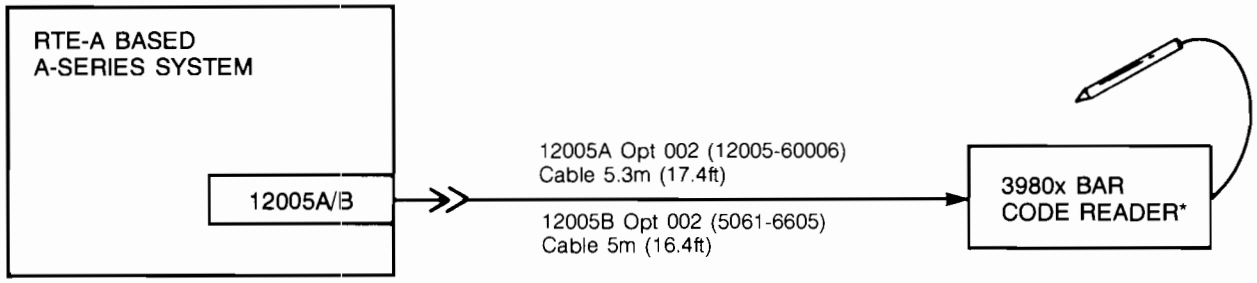
LEGEND:

264x Mpt(A)	=	2645A/2648A terminal with Async multipoint option 033 (or 13260C accessory) and at least 4kb more than standard display memory.
264x Mpt(S)	=	2645A/2648A terminal with Sync multipoint option 034 (or 13260D accessory) and at least 4kb more than standard display memory.
262x Mpt	=	2624B/2626A terminal with 13267A Async multipoint interface pod or 13267A+001 Sync multipoint interface pod for first terminal on the line, 13268A Async multipoint interface pod or 13268A+001 Sync multipoint interface pod for each additional terminal on the line.
13232P	=	Modem multipoint cable to first 264x Mpt(A/S) terminal on the line.
13232Q	=	Multipoint continuation cable to 264x Mpt(A/S) terminal that is not the first terminal on the line.
13232T	=	Power protect multipoint continuation cable to 264x Mpt(A/S) terminal that is not the first terminal on the line.

HP 1000 Connections to HP 27201A Speech Output Module



HP 1000 Connections to HP 3980x Bar Code Readers



** The 3980x Bar Code Readers include:*

HP 39800A Programmable Bar Code Reader and
HP 39801A Non-Programmable Bar Code Reader

Data Capture Terminals and Data Link Communications

HP 1000 M/E/F-Series Computer Systems operating under 92084A RTE-6/VM or 92068A RTE-IVB can be equipped with up to 90 Data Capture Terminals offering an extensive choice of optional capabilities (listed in Table below) for factory data collection and other data capture uses. Operations can be supported by HP's high-level, off-the-shelf 92080A DATACAP/1000-II software* running in the 92084A RTE-6/VM or 92068A RTE-IVB operating system. Terminals are available in both desktop and wall-mounting configurations. The wall-mounting terminals use a 92904A Wall-Mounting Cradle which includes a relay that can be switched by the HP 1000 Computer System to control an electric door lock or other external device. Connections are shown in a diagram on the next page.

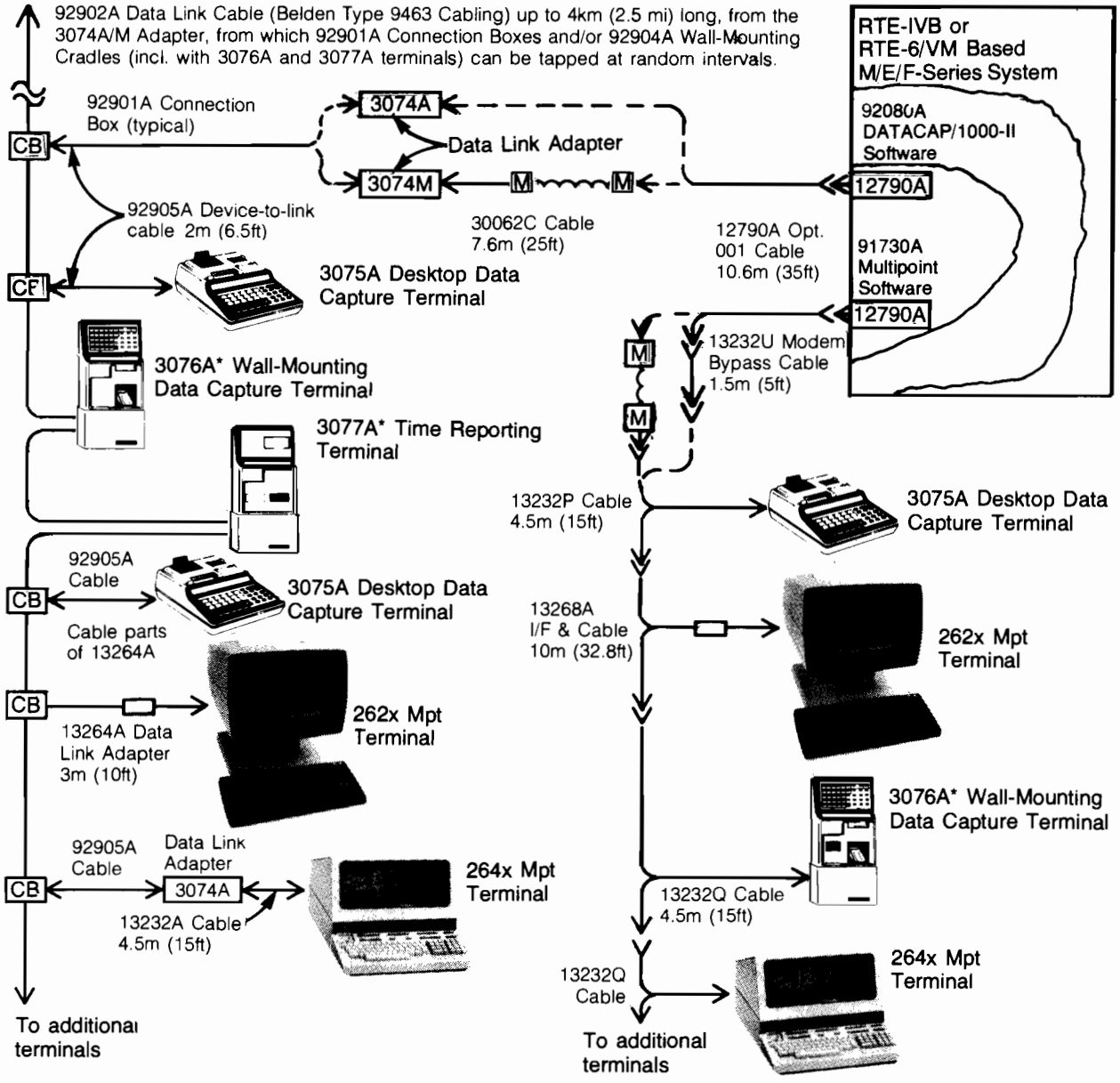
** 91730A Multipoint/Data Link software is also required.*

HP 1000 Data capture terminals capability summary

	3075A Desk-top Data Capture Terminal	3076A Wall-Mounting Data Capture Terminal	3077A Wall-Mounting Time Reporting Terminal
Base capabilities	On-line data capture using 15-key numeric and 10-key function keyboards, 15-position numeric display, and 17 user-definable prompting lights		Timekeeping and name/security data input via Type V badge reader
Dir Conn Interface	To HP 1000 M/E/F-Series Computer via 12790A Multipoint interface and multipoint cables, or via 12790A+001 Multipoint-interface, 3074A Data Link Adapter, HP 92902A and 92905A Data Link cabling, and 92901A Data Link Connection Boxes		
Modem Interface	To HP 1000 M/E/F-Series Computer via 12790A+001 Multipoint interface, modems, and multipoint cables or via 12790A+001 Multipoint interface, modems, 3074M Data Link Adapter, HP 92902A and 92905A Data Link cabling, and 92901A Data Link Connection Boxes		
Opt. 001	Not available	Not available	Multifunction card/badge reader instead of Type V badge reader
Opt. 002	Not available	Not available	Hand-operated, uni-directional magnetic stripe reader instead of Type V badge reader
Opt. 004	26-key alphabetic keyboard in addition to numeric keyboard; keys are settable for transmission of either alphabetic or function information		Not available
Opt. 005	24-position alphanumeric display instead of numeric-only display		Adds 24-position alphanumeric display
Opt. 006	8/16-line CRT display instead of 1-line numeric or alphanumeric display		Not available
Opt. 007	Adds multifunction card/badge reader that can read either marks or holes		Not available
Opt. 008	Adds Type V badge reader		Not available
Opt. 009	Adds 40 LPM, 20 column thermal alphanumeric strip printer to record operator's transactions at the terminal		Not available
Opt. 010, 054, or 055	Adds hand-held Bar Code Reader wand capable of bi-directional reading of bar codes printed on shipping papers, inventory cards, or other turnaround documents		Not available
Opt. 011	Adds HP-IB I/O port for connection of HP-IB instruments or other HP-IB devices to the 3075A/3076A terminal, which functions as controller. The HP-IB port cannot be used for connection to the HP 1000 Computer System		Not available
Opt. 012	Adds hand-operated, uni-directional magnetic stripe reader for reading magnetic stripes from credit-card type badges or documents where the greater security of data entry from magnetically encoded sources is desirable		Not available
Opt. 013	Adds RS-232-C/CCITT V.24 serial I/O port for connection of an external device, such as a digital weighing scale, serial printer, or cassette recorder to the 3075A/3076A terminal. This I/O port cannot be used for connection to the HP 1000 Computer System		Not available
Opt. 020	Not available	Deletes wall-mounting cradle	Deletes wall-mounting cradle
Opt. 030	Installation and programming kit	Installation and programming kit	Installation and programming kit

NOTE: Only two of options 007 through 013 can be ordered for any 3075A/3076A terminal.

Data capture terminal data link and multipoint connections



NOTE: DATACAP/1000-II supports only the 3075A, 3076A, and 3077A terminals. The 262x Mpt (Multipoint) and 264x Mpt terminals shown in this diagram can share the Data Link and/or async multipoint line and its supporting 91730A Multipoint software with the 307x terminals, but have no interaction with the DATACAP/1000-II software.

** 3076A & 3077A Wall-mounting terminals with 92904A Wall-Mounting Cradle are connected to the Data Link or the Multipoint line at screw terminals within the 92904A cradle and thus do not require a connection box or a 92905A Device-to-Link Cable.*

LEGEND: M = Asynchronous Modem CB = data link Connection Box

262x Mpt = 2624B/29F/26A/29D Terminal, which can support connection to the Data Link via a 13264A Data Link Adapter and 92901A Connection Box, or to the multipoint line via a 13267A/13268A Multipoint Adapter (for more on multipoint connection, see page 4.1-15)

264x Mpt = 2645A/48A/49B/49C Terminal with Asynchronous Multipoint Option 033 and at least 4kb more than standard display memory

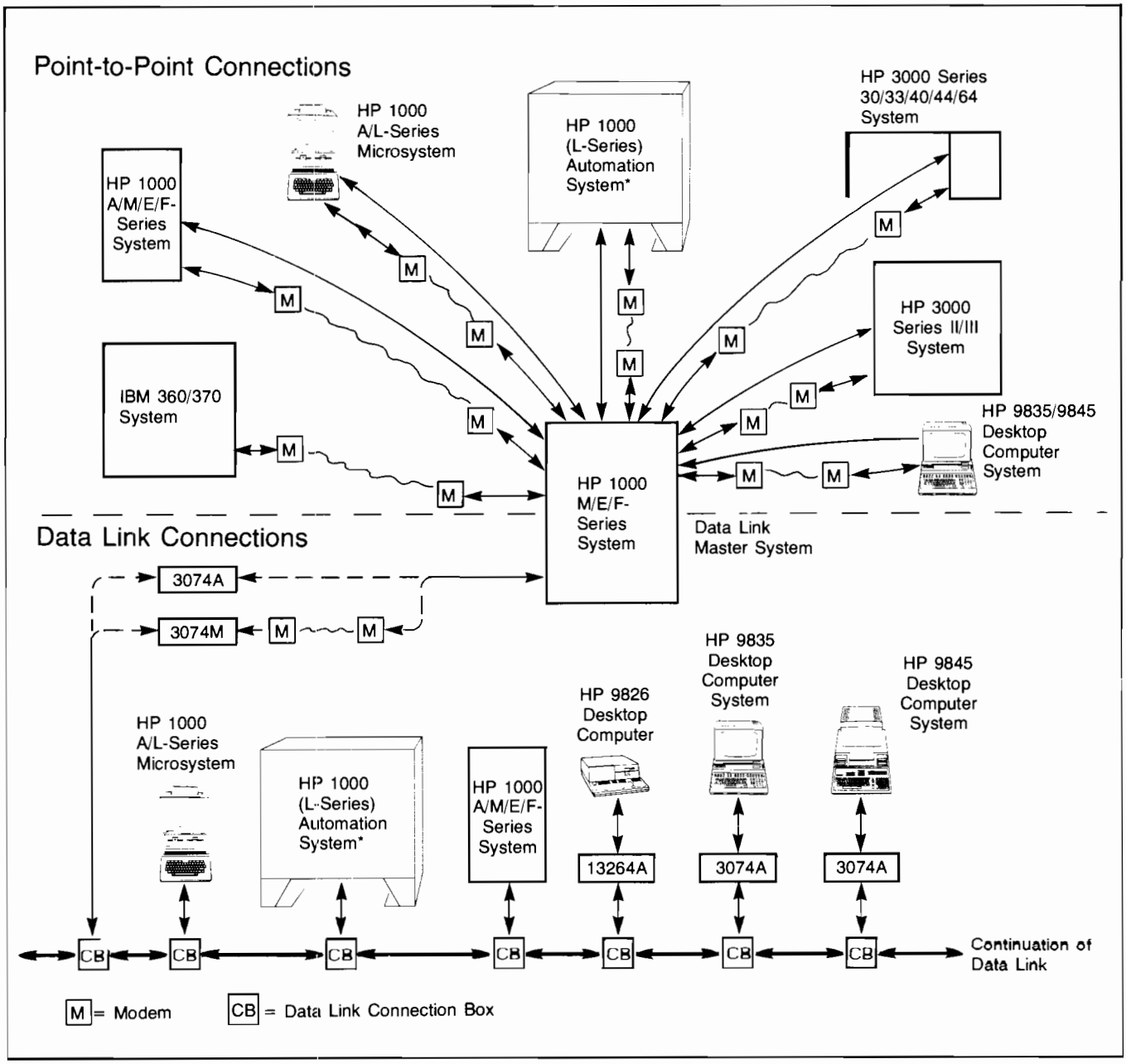
13232P = Modem multipoint cable to first 307x or 264x Mpt Terminal on the multipoint line

13232Q = Multipoint continuation cable to additional 307x and 264x Mpt Terminals on the multipoint line

System-to-System Communications Overview

HP 1000 Computer Systems can communicate with each other and with HP 3000 and HP 9800-Series Systems as well. HP 1000 system-to-system connection choices, shown in the diagram below, can make use of either point-to-point or Data Link connection. Network configuration examples are shown on page 4.3-2 and criteria for selection of point-to-point or Data Link connection are on page 4.3-3. Interfaces, required software, and description of remote systems that can be connected to HP 1000 Computer Systems are summarized in the table on pages 4.3-4 through 4.3-7. System-to-system communication capabilities supported under DS/1000-IV and under non-DS/1000-IV data link communication with 9800-Series Desktop Computers are summarized on pages 4.3-8 and 4.3-9. The pages following 4.3-9 provide network specification instructions.

HP 1000 System-to-System Connection Choices



** The HP 1000 Automation System consists of an HP 2162A Automation Processor (L-Series Board Computer System) in a 2250 Measurement and Control Processor.*

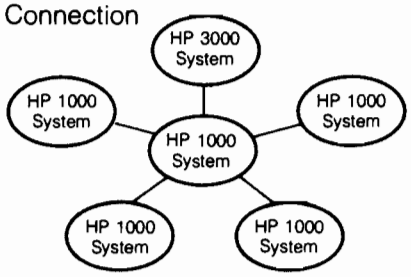
HP 1000 Network Configuration Examples

Note: Any of the Point-to-Point and Data Link connections can be combined in the same network.

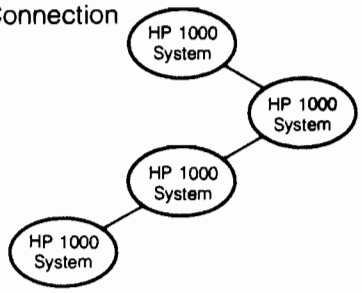
Point-to-Point Configurations

* Only one HP 3000 link per HP 1000 System.

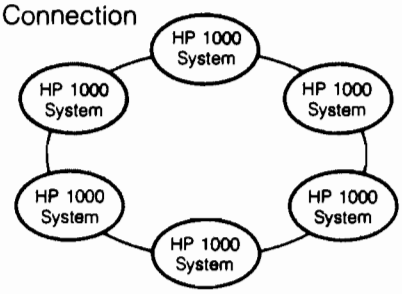
Star Connection



String Connection



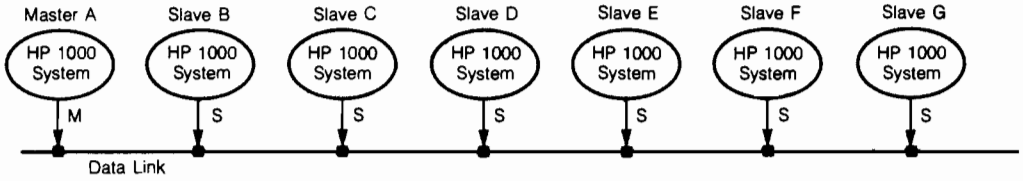
Ring Connection



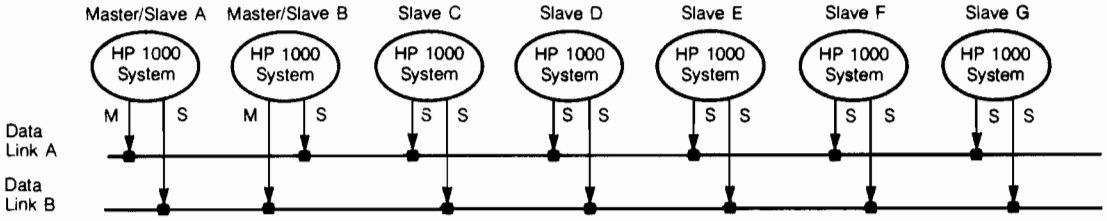
Data Link Configurations (Up to eight 9.6kb/sec or four 19.2kb/sec data links per HP 1000 M/E/F-Series* Master System)

stem)

Basic Connection — Network operations are crucially dependent upon Master



Redundant Data Link Connection — Master A controls data link A and functions as a slave system on data link B. Master B controls data link B and functions as a slave system on data link A. Two-link connection maximizes reliability. Integration of the redundant connection requires user programming.



* Although software compatible, HP 1000 M-Series computers are not recommended for use as data link master because of lower performance than E/F-Series computers. Only one data link at rates to 19.2k bps is supported in an M-Series computer.

HP 1000 System-to-System Connections Mode Selection Guide

SELECTION CRITERIA	POINT-TO-POINT CONNECTION should be used where maximum communication speed between systems is essential to the success of the application.	DATA LINK CONNECTION should be used for the many applications in which its throughput and response speed are adequate.
Communication Line Bit Rate	To 230,000 bits/sec, not shared with other systems.	To 19,200 bits/sec line speed, a capacity that is shared among all systems on the data link line. Data rate is set by the slowest system on the link.
Data Throughput	Up to 20k bytes/sec per connection for 8k byte transfers.	Up to 1.6k bytes/sec (96k bytes/min) aggregate total for the Data Link for 8k byte transfers. Three slaves could each have an effective continuous throughput of 533 bytes per second.
Responsiveness	Determined by the operating system and CPU speed; servicing of crucial link(s) can be given high priority. However, time required for each store-and-forward transmission via an intervening system adds to delay of receipt of a message at the addressed system.	Determined primarily by polling and servicing delays whose maximum value depends upon the number of systems on the link and the amount of servicing required by each system.
Network Cost and Flexibility	Any type of point-to-point configuration (shown on the facing page) can be set up, but each connection between systems requires an interface in each system and a separate communications link between the interfaces. Connection of a new system in the network requires powering down all systems to which it connects to install new interface cards. The Star configuration provides the fastest communication. The String configuration offers the lowest point-to-point interfacing cost between all systems at the sacrifice of store-and-forward transmission delays and reduced network reliability. By closing the string, the Ring configuration provides an alternate path that improves overall communications reliability. Network configurations combining Star, String, and Ring topologies can be created to suit user applications.	A single Data Link cable up to 4km (2.5mi) long can be run along a predetermined path with connection boxes inserted at intervals. The master system and slave systems can be tapped into the data link at any connection box without disturbing link communications. The cost per system is lower since only one interface is required per slave connection. One Data Link master interface can physically support up to 128 systems. However, the number of systems usable per link depends very much upon the application. Up to 12 systems per Data Link can usually be supported with adequate speed of response.
Network Reliability	Depends upon configuration, as follows (see facing page): 1. Star configuration is crucially dependent upon the central system. 2. Communication from one end to the other of a String configuration depends upon functioning of the intervening systems. 3. Ring configuration can be used to close the string configuration and provide a backup communications path at the cost of two additional interfaces and the communications link between them. 4. The Star, String, and Ring configurations can be combined to meet specific needs.	Network reliability is crucially dependent upon the master system, as in the point-to-point star configuration. Except for the crucial role of the master, communication from any system on the data link to another system on the link depends only on the integrity of the link cabling and the sending and receiving systems. A redundant Data Link configuration (see facing page) can be used to improve overall network reliability by providing backup for the master. User programming is required to integrate information transfers via the redundant connection.

HP 1000 System-to-System Connections Summary

LOCAL HP 1000 COMPUTER SYSTEM						REMOTE COMPUTER SYSTEM		
Computer Series	Operating System	Required Comm. Software	Interface	Maximum Comm. Data Rate (bits/sec)	Maximum Comm. Distance (km/ft)	Interface	Required Comm. Software	System Description
POINT-TO-POINT CONNECTIONS, HP 1000 A/L-SERIES TO OTHER HP 1000 SYSTEMS (can have multiple communication paths)								
A/L	RTE-A or RTE-L/XL	91750A/R DS/1000-IV Network Software	12007B (M)	230,000*	No Limit	12007B (M)	91750A/R DS/1000-IV Network Software	HP 1000 A/L-Series System operating under RTE-A or RTE-L/XL
			12044A (D)	230,000 57,600	1.0/3281 2.2/7218	12044A (D)		
			12007B (M)	230,000*	No Limit	12794B (M)	91750A/R DS/1000-IV Network Software	HP 1000 M/E/F-Series System operating under RTE-6/VM, RTE-IVB, or RTE-IVE
			12044A (D)	230,000 57,600	1.0/3281 2.2/7218	12825A (D)		
POINT-TO-POINT CONNECTIONS, HP 1000 M/E/F-SERIES TO OTHER HP 1000 SYSTEMS (can have multiple communication paths)								
M/E/F	RTE-6/VM, RTE-IVB, or RTE-IVE	91750A/R DS/1000-IV Network Software	12794B (M)	230,000*	No Limit	12007B (M)	91750A/R DS/1000-IV Network Software	HP 1000 A/L-Series System operating under RTE-A or RTE-L/XL
			12825A (D)	230,000 57,600	1.0/3281 2.2/7218	12044A (D)		
			12794B (M)	230,000*	No Limit	12794B (M)	91750A/R DS/1000-IV Network Software	HP 1000 M/E/F-Series System operating under RTE-6/VM, RTE-IVB, or RTE-IVE
			12825A (D)	230,000 57,600	1.0/3281 2.2/7218	12825A (D)		
		91750A/R DS/1000-IV and 91740x DS/1000 Network Firmware	12771A (D)	500,000 313,600 179,200 96,800 50,400 25,760	0.18/600 0.36/1200 1.2/4000 1.6/5400 2.2/7300 3.0/10000	12771A (D)	91750A/R DS/1000-IV and 91740x DS/1000 Network Firmware	HP 1000 M/E/F-Series System operating under RTE-6/VM, RTE-IVB, or RTE-IVE
			12773A (M) & 12620A	19,200*	No Limit	12773A (M) & 12620A		
POINT-TO-POINT CONNECTION, HP 1000 A/L-SERIES TO HP 3000 OR HP 9835/9845 SYSTEMS (can have up to eight of these communications links in each HP 1000 system)								
A/L	RTE-A, or RTE-XL	91750A/R DS/1000-IV Network Software	12073A (M)	57,600*	No Limit	30020B	32190A/R/M DS/3000 Network Software	HP 3000 Series 30/33/39/40/42/44/48/64/68 System
			12082A (D)	57,600	1.0/3281	30020B		
			12073A (D)†	57,600	15.2m/50	30020B		
			12073A (M)	57,600*	No Limit	30010A or 30055A	32190A/R/M DS/3000 Network Software	HP 3000 Series II/III System
			12082A (D)	57,600	1.0/3281	30010A		
			12073A (M)	9,600*	No Limit	98046B+001	09835-10210 DS/35 Software	HP 9835A+202 Desktop Computer with 98317A, 98318A, and 98332A ROMS
			12073A (D)	9,600	15.2m/50	98046B		
			12073A (M)	9,600*	No Limit	98046B+001	09845-10210 DS/45 Software	HP 9845B/C+204 Desktop Computer with 98412A, 98417A, and 98418A ROMs
			12073A (D)	9,600	15.2m/50	98046B		

HP 1000 System-to-System Connections Summary, continued

LOCAL HP 1000 COMPUTER SYSTEM						REMOTE COMPUTER SYSTEM		
Computer Series	Operating System	Required Comm. Software	Interface	Maximum Comm. Data Rate (bits/sec)	Maximum Comm. Distance (km/ft)	Interface	Required Comm. Software	System Description
POINT-TO-POINT CONNECTION, HP 1000 M/E/F-SERIES TO HP 3000 OR HP 9835/9845 SYSTEMS (can have up to eight of these communications links in each HP 1000 system)								
M/E/F	RTE-6/VM, RTE-IVB, or RTE-IVE	91750A/R DS/1000-IV Network Software	12793B (M)	57,600*	No Limit	30020B	32190A/R/M DS/3000 Network Software	HP 3000 Series 30/33/39/40/42/44/48/64/68 System
			12834A (D)	57,600	1.0/3281	30020B		
			12793B (D)†	57,600	15.2m/50	30020B		
			12793B (M)	57,600*	No Limit	30010A or 30055A	32190A/R/M DS/3000 Network Software	HP 3000 Series II/III System
			12834A (D)	57,600	1.0/3281	30010A		
			12793B (M)	9,600*	No Limit	98046B+001	09835-10210 DS/35 Software	HP 9835A+202 Desktop Computer with 98317A, 98318A, and 98332A ROMS
			12793B (D)	9,600	15.2m/50	98046B		
			12793B (M)	9,600*	No Limit	98046B+001	09845-10210 DS/45 Software	HP 9845B/C+204 Desktop Computer with 98412A, 98417A, and 98418A ROMs
			12793B (D)	9,600	15.2m/50	98046B		
DATA LINK CONNECTIONS, HP 1000 M/E/F-SERIES MASTER TO OTHER HP 1000 SYSTEMS (can have up to eight data links at 9600 bits/sec, up to four data links at 19,200 bits/sec, up to 128 systems or devices per data link, provided logical address and servicing capacity of the operating system in the master system is not exceeded)								
M/E/F	RTE-6/VM, RTE-IVB, or RTE-IVE	91750A/R DS/1000-IV Network Software and 91730A Multipoint Software	12790A+001 & 3074A or Modems and 3074M (Master Data Link Interface)	19,200*	4.0/13124	12072A Data Link Slave Interface	91750A/R DS/1000-IV Network Software	HP 1000 A/L-Series System operating under RTE-A or RTE-L/XL
				19,200	4.0/13124	12830A Data Link Slave Interface	91750A/R DS/1000-IV Network Software	HP 1000 M/E/F-Series System operating under RTE-6/VM, RTE-IVB, or RTE-IVE
DATA LINK CONNECTIONS, HP 1000 A-SERIES MASTER TO OTHER HP 1000 SYSTEMS (can have up to four data links at 19,200 bits/sec, up to 64 systems or devices per data link, provided logical address and servicing capacity of the operating system in the master system is not exceeded)								
A	RTE-A	91750A/R DS/1000-IV Network Software and 91732A Data Link Software	12092A & 3074A (Master Data Link Interface)	19,200*	4.0/13124	12072A Data Link Slave Interface	91750A/R DS/1000-IV Network Software	HP 1000 A/L-Series System operating under RTE-A or RTE-L/XL
				19,200	4.0/13124	12830A Data Link Slave Interface	91750A/R DS/1000-IV Network Software	HP 1000 M/E/F-Series System operating under RTE-6/VM, RTE-IVB, or RTE-IVE

(M) = Modem interface requiring user-furnished modems and telephone line link for communication.

(D) = Direct connect interface that may require extension cables. Pre-assembled cables or components for user assembly of extension cables are available as separate cable or parts kit products

* = *Maximum data rate of the interface. Actual data rate with modem communication is determined by the modems and communications line used.*

HP 1000 System-to-System Connections Summary, continued

LOCAL HP 1000 COMPUTER SYSTEM						REMOTE COMPUTER SYSTEM		
Computer Series	Operating System	Required Comm. Software	Interface	Maximum Comm. Data Rate (bits/sec)	Maximum Comm. Distance (km/ft)	Interface	Required Comm. Software	System Description
DATA LINK CONNECTION, HP 1000 M/E/F-SERIES MASTER TO HP 98XX DESKTOP COMPUTERS (can have up to eight data links at 9600 bits/sec, up to four data links at 19,200 bits/sec, up to 128 devices per data link, provided logical unit address and servicing capacity of the operating system in the master system is not exceeded).								
M/E/F	RTE-6/VM, RTE-IVB, or RTE-IVE	91730A Multipoint Software	12790A+001 & 3074A or Modems and 3074M (Master Data Link Interface)	19,200*	4.0/13124	13264A and 98628A	BASIC 2.0	HP 9826A Desktop Computer
				9,600	4.0/13124	3074A and 98046B+001	09835-10240 Data Link Software	HP 9835A/B+202 Desktop Computer with 98317A and 98332A ROMS
				9,600	4.0/13124	3074A and 98046B+001	09845-10240 Data Link Software	HP 9835A/B+202 Desktop Computer with 98417A ROM
				9,600	4.0/13124	82966A	900-0080 900-0078 900-0078 Data Link Emulator	HP 85 Desktop Computer HP 86 Desktop Computer HP 87 Desktop Computer
DATA LINK CONNECTION, HP 1000 A-SERIES MASTER TO HP 98XX DESKTOP COMPUTERS (can have up to four data links at 19,200 bits/sec, up to 64 devices per data link, provided logical unit address and servicing capacity of the operating system in the master system is not exceeded). CHECK WITH SALES CENTER								
A	RTE-A	91732A Data Link Software	12092A & 3074A (Master Data Link Interface)	19,200*	4.0/13124	13264A and 98628A	BASIC 2.0	HP 9826A Desktop Computer
				9,600	4.0/13124	3074A and 98046B+001	09835-10240 Data Link Software	HP 9835A/B+202 Desktop Computer with 98317A and 98332A ROMS
				9,600	4.0/13124	3074A and 98046B+001	09845-10240 Data Link Software	HP 9845B/C+204 Desktop Computer with 98417A ROM
				9,600	4.0/13124	82966A	900-0080 900-0078 900-0078 Data Link Emulator	HP 85 Desktop Computer HP 86 Desktop Computer HP 87 Desktop Computer
POINT-TO-POINT CONNECTION, HP 1000 A-SERIES TO IBM 360/370 COMPUTER SYSTEM FOR UP TO SEVEN USERS								
A	RTE-A	91782A MRJE/1000 Communications Pkg	12043A	9,600*	No Limit	IBM or IBM Plug Compatible Host Systems that use JES2, JES3, or HASP II (Version 4 or later) Job Entry Systems		
POINT-TO-POINT CONNECTION, HP 1000 M/E/F-SERIES TO IBM 360/370 COMPUTER SYSTEM FOR UP TO SEVEN USERS OR FOR SINGLE USER								
M/E/F	RTE-6/VM,	91782A MRJE/1000 Communications Pkg	12260A	9,600*	No Limit	IBM or IBM Plug Compatible Host Systems that use JES2, JES3, or HASP II (Version 4 or later) Job Entry Systems		
	RTE-IVB or RTE-6/VM	91780A RJE/1000 Communications Pkg	Two-card modem i/f is included w/91780A	9,600*	No Limit	IBM Host Systems that use HASP, RES, JES2, or JES3 Job Entry Systems		

* = *Maximum data rate of the interface. Actual data rate with modem communication is determined by the modems and communications line used.*

System-to-System Communications Capabilities

SUPPORTED CAPABILITIES

LEGEND:

Y = Support for local request to remote system AND request from remote system
YL = Support only for local request to remote system
Yp = Support via point-to-point interface only; not supported via data link
N = Not supported

	M/E/F-Series Computers			A/L-Series Computers		
	RTE-6/VM	RTE-IVB	RTE-IVE	RTE-A	RTE-XL	RTE-L†
DS/1000-IV CAPABILITIES, HP 1000-TO-HP 1000 COMMUNICATIONS, Including:						
Remote commanding (local operator to remote system)	Y	Y	Y	Y	Y	Y
Remote QUERY Access (local operator's requests to QUERY at remote system)	Y	Y	YL	Y	Y	YL
Program-to-Program Intrinsics (program requests for communication between programs at local and remote systems)	Y	Y	Y	Y	Y	Y
Remote Data Base Access Intrinsics (program requests for access to data base in a remote HP 1000 system)	Y	Y	YL	Y	Y	YL
Remote File Access Intrinsics (program requests for access to file in a remote HP 1000 system)	Y	Y	Y	Y	Y	YL
Remote EXEC Calls (program requests for action by executive in remote HP 1000 system)	Y	Y	Y	Y	Y	Y
Nodal Addressing with Store-and-forward operations, and optional dynamic message rerouting and/or message accounting	Y	Y	Y	Y	Y	Y
Transaction logging and reporting	Y	Y	Y	Y	Y	Y
Remote I/O Mapping (exchange of messages from the local node (system) with a unit record device at any other node in the network	Y	Y	Y	Y	Y	Y
Remote Virtual Control Panel Access	N	N	N	Yp	Yp	Yp
DS/1000-IV CAPABILITIES, HP 1000-TO-HP 3000 COMMUNICATIONS, Including:						
Remote commanding (local operator to remote system)	Y	Y	Y	Y	Y	N
Program-to-Program Intrinsics (program requests for communication between programs at local and remote systems)	Y	Y	Y	Y	Y	N
Remote File Access Intrinsics (program requests for access to file in a remote HP 3000 system)	Y	Y	Y	Y	Y	N
Transaction Logging and reporting	Y	Y	Y	Y	Y	N
DS/1000-IV CAPABILITIES, HP 3000-TO-HP 1000 COMMUNICATIONS, Including:						
Remote commanding (local operator to remote system)	Y	Y	Y	Y	Y	N
Program-to-Program Intrinsics (program requests for communication between programs at local and remote systems)	Y	Y	Y	Y	Y	N
Remote File Access Intrinsics (program requests for access to file in a remote HP 1000 system)	Y	Y	Y	Y	Y	N
Remote EXEC Calls (program requests for action by executive in a remote HP 1000 system)	Y	Y	Y	Y	Y	N
Transaction logging and reporting	Y	Y	Y	Y	Y	N
DS/1000-IV CAPABILITIES, HP 9835/9845-to-HP 1000 COMMUNICATIONS, including:						
Remote commanding (local operator to remote system, except for interactive running of FMGR, EDIT, or other RTE subsystems)	Y	Y	Y	Y	Y	N
Remote File Transfer Intrinsics (program requests for transfer of sharable ASCII files or non-sharable desktop files to/from a remote HP 1000)	Y	Y	Y	Y	Y	N
Remote overwriting of non-disc files (peripheral devices) on a remote HP 1000	Y	Y	Y	Y	Y	N

† *Because maximum memory supported under RTE-L is 64k bytes, the remote response capabilities supportable at an RTE-L based node are relatively limited. The level of capability that is available is generally adequate for a dedicated node that functions mainly as a satellite to one or more disc-based RTE nodes that can have 256k bytes or more memory.*

System-to-System Communications Capabilities, continued

SUPPORTED CAPABILITIES

LEGEND:	M/E/F-Series Computers			A/L-Series Computers		
Y = Support for local request to remote system AND request from remote system YL = Support only for local request to remote system Yp = Support via point-to-point interface only; not supported via data link N = Not supported	RTE-6/VM	RTE-IVB	RTE-IVE	RTE-A	RTE-XL	RTE-L†
DATA LINK CAPABILITIES, HP 98xx-TO-HP 1000 COMMUNICATIONS, Including:						
Virtual Terminal Access (local operator to remote HP 1000 System)	Y	Y	Y	Y	Y	N
Program-to-Program Intrinsics (program requests for communication between programs at local and remote systems)	Y	Y	Y	Y	Y	N
Remote File Transfer Intrinsics (program requests for access to file in a remote HP 1000 system)	Y †	Y	Y	Y	Y	N
MRJE/1000 FOR MULTI-USER HP 1000 EMULATION OF HASP WORKSTATION COMMUNICATIONS WITH IBM 360/370 using Communications Access Method with 360/370 operating under HASPII (Version 4 or later), JES2 or JES3 scheduler software						
Multi-user submission of batched jobs to remote IBM/360/370	Y	N	N	Y	N	N
Receives output from IBM 360/370	Y	N	N	Y	N	N
RJE/1000 FOR SINGLE-USER HP 1000 BATCHED-JOB COMMUNICATIONS WITH IBM 360/370 using **BTAM, TCAM, or RTAM** Communications Access Method with 360/370 operating under HASP, RES, JES2 or JES3 scheduler software						
Submits job stream to remote IBM 360/370	Y	Y	N	N	N	N
Receives output from remote IBM 360/370	Y	Y	N	N	N	N

† *Because maximum memory supported under RTE-L is 64k bytes, the remote response capabilities supportable at an RTE-L based node are relatively limited. The level of capability that is available is generally adequate for a dedicated node that functions mainly as a satellite to one or more disc-based RTE nodes that can have 256k bytes or more memory.*

HP 1000 System-to-System Communications Network Specification

1. Outline the network

Make working copies of pages 4.3-12 and 4.3-14 and leave pages 4.3-4, 5, 11, and 13 loose for easy reference. On the copy of the blank System-to-System Connections Diagram, sketch out the interconnections of the planned network as has been done on the diagram example, initially including system numbers, locations, and system type (1000E, 1000L, 3000, 9845, etc.)

2. Specify connection modes

Communication with HP 3000 systems must use Point-to-Point connection and with HP 98xx Desktop Computer Systems should use Data Link connection.

For each HP 1000-HP 1000 link, select the connection mode according to the type of message traffic it is likely to carry. Links that will exchange large files or large program buffers, or that require fast communication of data with minimal transmission delay, should use Point-to-Point connection.

Multiple systems that will each receive a few commands and then send short buffers of measurement and/or computation results to another system every few seconds or so can take advantage of Data Link connection. In this mode, the communications of several systems are routed via a common data link cable to an HP 1000 E/F-Series System that functions as a Data Link master system in addition to any other role it may play in the network.

As the connection mode is determined for each connection, mark a small (PP) for Point-to-Point or (DL) for Data Link alongside the line on your diagram that links the two systems.

3. Summarize the nodes, links, and interfaces

On your blank copy of the HP 1000 Network Summary, for each system in the network, enter the system number, location, the numbers of the other systems it connects to, connection mode (PP or DL and M for Modem or DC for Direct Connect), and interfaces required. (Use the System-to-System connections Summary on pages 4.3-4 through 6 to specify interfaces.)

4. Specify appropriate interface options

Option 002, listed below, applies to the 12044A and 12825A HDLC direct connect interfaces. HP 12790A option 001 is required for the Multipoint interface used as a Data Link Master interface.

Interface	Opt.	Description and Purpose
12044A 12825A	002	Deletes cables and loop-back verifier hood (order for every second 12044A/ 12825A interface because each interface includes a set of cables and hoods for two interfaces)

5. Summarize software and right to copy requirements

On the summary, for each system in the diagram, enter the software or right-to-copy product required. As shown in the example, the 91750A software product is required for only the first system in the network, assuming that is the first system using DS/1000-IV software that has been ordered by the customer. The right to use the 91750A software in additional systems is obtained by purchasing the 91750R Right to Copy product for each system using DS/1000-IV software.

An HP 1000 system that functions as a Data Link master will also require the 91730A software, which need be purchased only once and may thereafter be copied without restriction.

6. Summarize software support

The first system in the network should be supported under either the 91750T Customer Support Service (CSS), which includes updates and S.E. assistance as required, or the 91750S Software Subscription Service (SSS), which provides updates only.

If system 1 is supported under 91750T CSS, that support must be extended to each additional system that uses 91750A/R software in the same network by purchasing the 91750V product, which includes the right to copy updates to the system supported under 91750V.

If system 1 is supported under 91750S, that support must be extended to each additional system that uses 91750A/R software in the same network by purchasing the 91750W product.

The same principles generally apply to the support of the 91730A Multipoint Software, except that 91730S updates may be copied to additional systems without restriction, so there is no 91730W product. However, if 91750T CSS is ordered for the 91750A software, then 91730T must be ordered for 91730A software and extended by purchasing 91730V support for each additional system using the 91730A software.

7. Specify interface firmware support

The firmware in each point-to-point interface and each 12790A Multipoint (Data Link Master) interface in the network must also be kept up to current revision if support is ordered for the respective supporting software. This may be done by ordering firmware support for 12007B, 12044A, 12794B, and 12825A HDLC interfaces and for 12793B and 12834A Bisync interfaces as option(s) to the 91750T/S/V/W products for the system, as listed in the table below and by ordering 12790S firmware update support for the 12790A Multipoint interface.

Interface Firmware Support Options

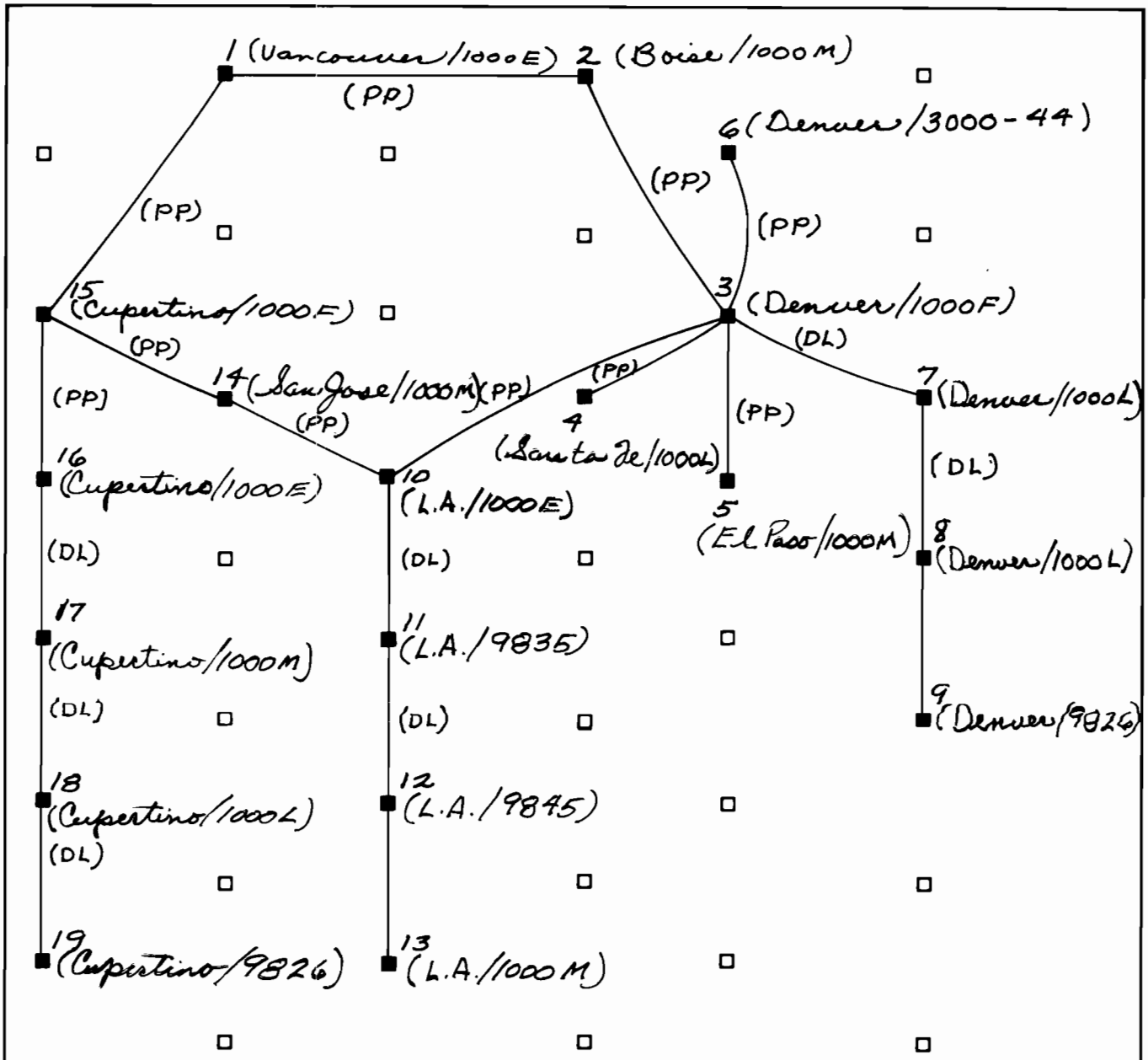
Number of Interfaces in System	1	2	3	4	5	6	7	8
Options for HDLC interfaces	101	102	101 102	104	101 104	102 104	101 102 104	108
Option for Bisync interfaces	201	202	201 202	204	201 204	202 204	201 202 204	208

NOTE: For systems with more than 8 interfaces, the options may be combined in the same general way as shown above to accommodate up to 15 interfaces. A fifth option (116 for HDLC interfaces, 216 for Bisync interfaces) may be used to order support for the firmware in 16 interfaces.

8. Specify other aspects of the network

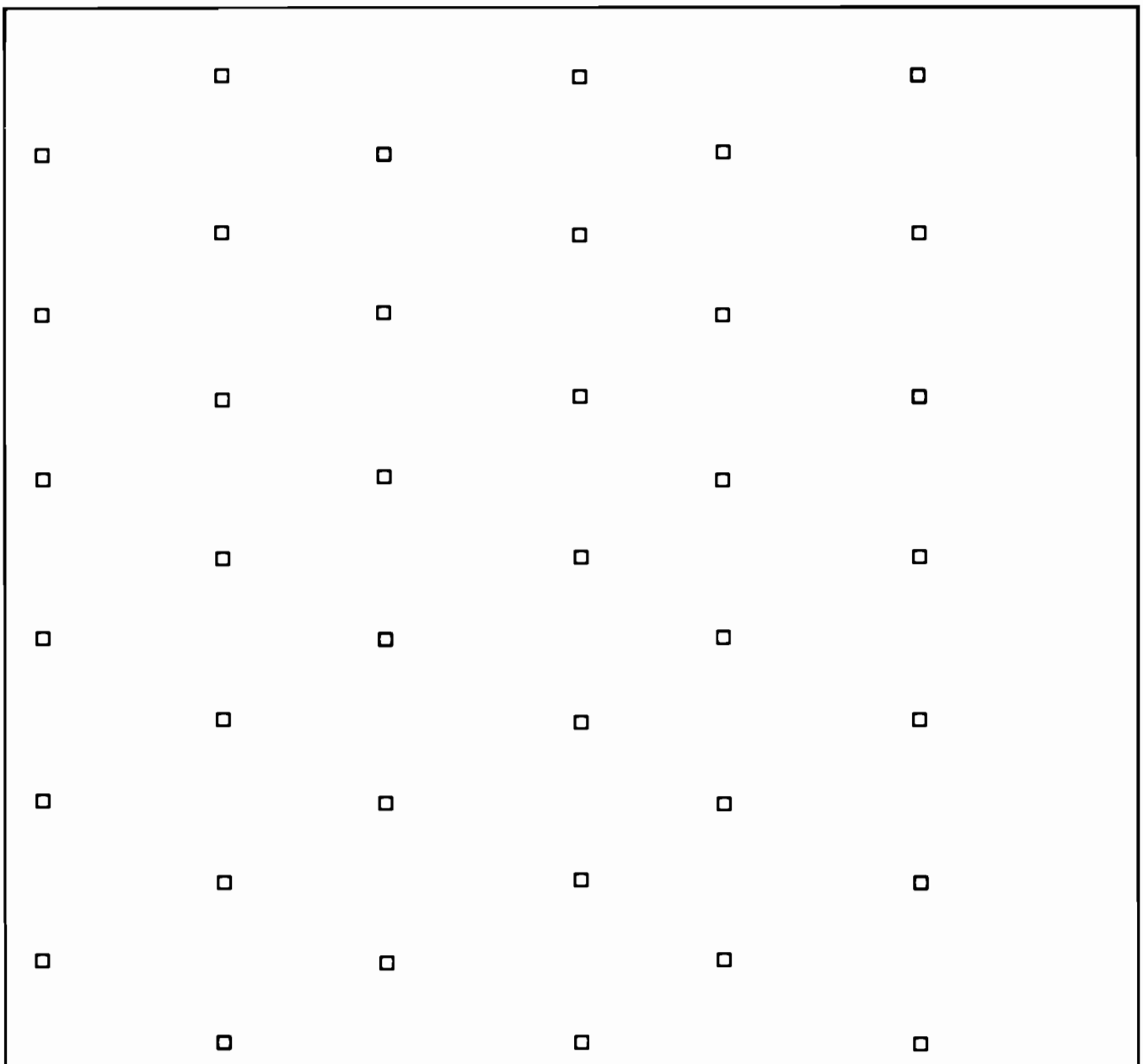
Data link cables and connection boxes will be needed to complete Data Link connection. Other software, additional memory, and peripherals will probably also be needed by the systems in the network. The operating system and all software in each system in the network must be supported if DS/1000-IV network software is to be supported. These other aspects must also be specified and summarized separately (not on the Network Summary) for each system in the network.

System-to-System Connections Diagram EXAMPLE



NOTES: All L.A. and Denver systems are in the same building and can be direct connected using either point-to-point (PP) or data links (DL) comm mode. Cupertino systems 17-19 are in a different building than systems 15 and 16, so modem connection (PP) must be used between system 16 and systems 17-19.

System-to-System Connections Diagram



NOTES: _____

HP 1000 Network Summary EXAMPLE

Sys. No.	Location	System Type	Links to Sys.	Comm Mode		Interface	I/F Opt.	Software or Right to Copy Product	Software Support Product	Interface Firmware Support
				PP/DL	DC/M					
1	Vancouver	1000E	2	PP	M	12794B		91750A	91750T	Opt 102
			15	PP	M	12794B				
2	Boise	1000M	1	PP	M	12794B		91750R	91750V	Opt 102
			3	PP	M	12794B				
3	Denver	1000F	2	PP	M	12794B		91750R	91750V	Opt 104
			4	PP	M	12794B				
			5	PP	M	12794B				
			10	PP	M	12794B				
			6	PP	DC	12834A				Opt 201
			7-9	DL/M	DC	12790A +	001	91730A	91730T	12790S
						3074A				
4	Santa Fe	1000F	3	PP	M	12794B		91750R	91750V	Opt 101
5	El Paso	1000M	3	PP	M	12794B		91750R	91750V	Opt 101
6	Denver	3000/44	3	PP	DC	30020B		Part of 3000/44 Configuration		
7	Denver	1000L	3	DL/S	DC	12072A		91750R	91750V	
8	Denver	1000L	3	DL/S	DC	12072A		91750R	91750V	
9	Denver	9826	3	DL/S	DC	98628A +		Part of 9826 Configuration		
						13264A				
10	L.A.	1000E	3	PP	M	12794B		91750R	91750V	Opt 102
			14	PP	M	12794B				
			11-13	DL/M	DC	12790A +		Copy of	91730V	12790S
						3074A		91730A S/W		
11	L.A.	9835	10	DL/S	DC	98046B	001	Part of 9835 Configuration		
12	L.A.	9845	10	DL/S	DC	98046B	001	Part of 9845 Configuration		
13	L.A.	1000M	10	DL/S	DC	12830A		91750R	91750V	
14	San Jose	1000M	10	PP	M	12794B		91750R	91750V	Opt 102
			15	PP	M	12794B				
15	Cupertino	1000E	1	PP	M	12794B		91750R	91750V	Opt 101
			14	PP	M	12794B				Opt 102
			16	PP	DC	12825A				
16	Cupertino	1000E	15	PP	DC					
			17-19	DL/M	M	12790A +	001	Copy of	91730V	12790S
						3074M*		91730A S/W		
17	Cupertino	1000M	16	DL/S		12830A		91750R	91750V	
18	Cupertino	1000L	16	DL/S		12830A		91750R	91750V	
19	Cupertino	9826	16	DL/S		98628A +		Part of 9826 Configuration		
						13264A				

*And Modems

HP 1000 Network Summary

Sys. No.	Location	System Type	Links to Sys.	Comm Mode		Interface	I/F Opt.	Software or Right to Copy Product	Software Support Product	Interface Firmware Support
				PP/DL	DC/M					

Peripherals Information Locator

Terminals (see Communications section)

Disc Memories

Printers

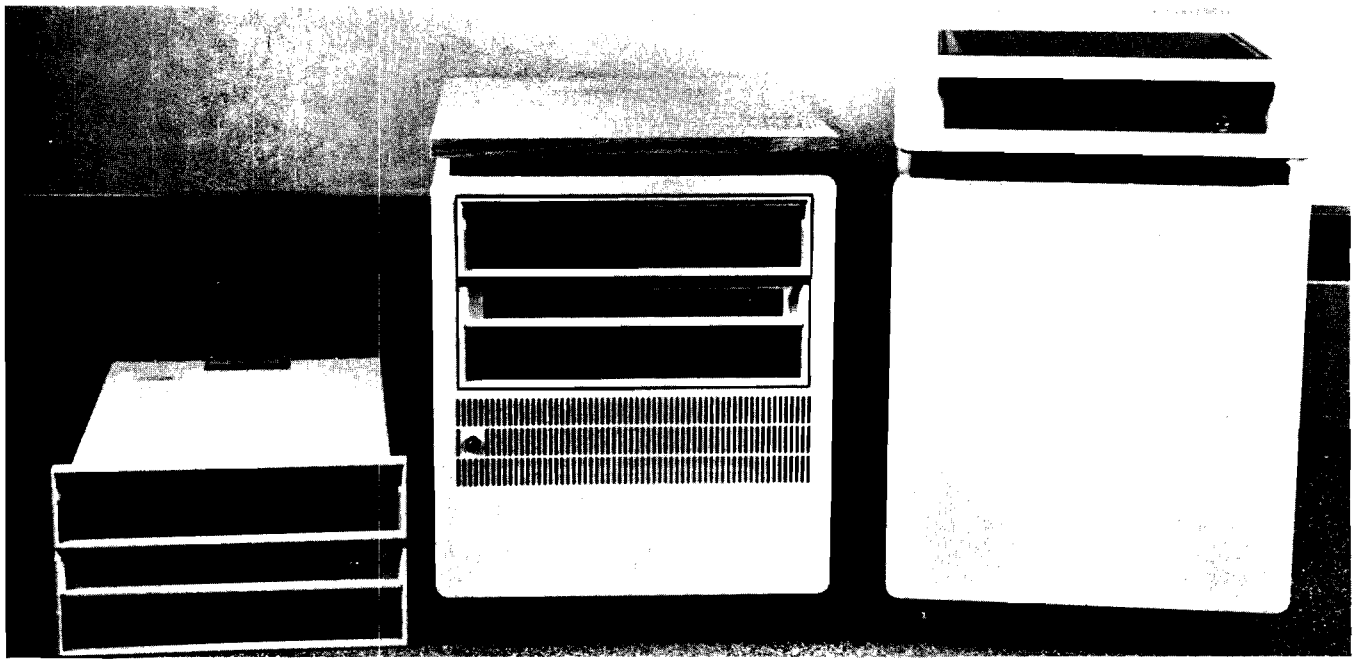
HP 1000 Graphics Software Supported Graphics Devices

Measurement and Control

Magnetic Tape Units

Punched Tape and Tab Card Peripherals

Disc Memories Selection Guide



Select the Appropriate Type of Disc Memory†

Type of Disc Memory	Basis for Selection	Disc Products Available	Usable in HP 1000 Series A	L	E	F
CS/80 (Command Set 80) Discs (See connection diagram on page 5.1-4)	Lowest cost per byte of storage, fast, easy backup of most fixed discs on convenient cartridge tape, maximum disc capacity, latest Hewlett-Packard disc technology.	7908P/R 16.5MB Fixed Disc	Y	X	6	6
		7911P/R 28.1Mb Fixed Disc	Y	X	6	6
		7912P/R 65.6Mb Fixed Disc	Y	X	6	6
		7914P/R/TD 132.1Mb Fixed Disc	Y	X	6	6
		7933H 404Mb Fixed Disc	A	N	6	6
		7935H 404Mb Removable Media Disc	A	N	6	6
MAC Multi-Access Controller Discs (See connection diagram on page 5.1-5)	Accommodates multi-system access to common disc storage facility*, up to 1920Mb with two 13175B interfaces, two 7925M discs, and 14 7925S discs.	7906M Standalone 19.6Mb Cartridge disc	N	N	Y	Y
		7906MR+020 Rack mtg 7906M	N	N	Y	Y
		7920M Standalone 50Mb Disc	N	N	Y	Y
		7925M Standalone 120Mb Disc	N	N	Y	Y
ICD (Integrated Controller Disc) Memories (See connection diagram on page 5.1-6)	Only removable media discs supported for L-Series.	7906H Standalone 19.6Mb Cartridge disc	N	Y	Y	Y
		9121D/S 540 kb Dual/270 kb single Microfloppy Disc	Y	N	N	N
		9895A 2.36Mb Master Dual Flexible Disc	Y	Y	Y	Y

Y = Yes, X = requires RTE-XL, 6 = requires RTE-6/VM, A = requires RTE-A

M = requires minifloppy disc in Model 5/6+, microfloppy, or flexible disc, N = No.

† *Multiple disc interfaces can be used in the RTE-6/VM primary system in the same E/F-Series computer to connect disc I/O facilities. These can be two MAC Master Discs, each expandable to a total capacity of 960Mb (1920Mb total) or two CS/80 discs or both CS/80 and MAC discs. CS/80 discs can be expanded to a total of four per interface (up to 1.6GB) when the proper interconnecting HP-IB cables are used. However, the aggregate transfer rate cannot exceed the I/O bandwidth of the computer, which may preclude DMA access via two or more disc interfaces at the same time, particularly in HP 1000 E-Series Computers with standard performance memory.*

* *Multiple E/F-Series computers can be connected to one MAC Master disc. Multi-computer compatibility is supported by the RTE-6/VM and RTE-IVB systems and their file managers for computers that access their own exclusive disc spaces on one or more MAC disc drives. Shared access to the same file space by one or more HP 1000 E/F-Series computers is supported under RTE-6/VM by the 91747A Datashare/1000 extended file manager.*

HP 1000-Compatible Disc Memories Capacity and Performance Summary

Product No. and Name	Packaging	Capacity/Drive (Megabytes) Fixed	Capacity/Drive (Megabytes) Removable	Disc Drives per Interface	Total Average Access Time*	Average Burst Transfer Rate	RTE Software Media Option	Additional Cartridge or Disc Pack Product No.
CS/80 DISC MEMORIES FOR HP 1000 A/L/M/E/F-SERIES SYSTEMS OPERATING UNDER RTE-A, RTE-XL, OR RTE-6/VM — Requires 12009A HP-IB interface in A/L-Series, 12821A Disc Interface in M/E/F-Series.								
7908P/R 16.5Mb Fixed Disc with integral cartridge tape backup	P = Standalone R = Rack Mtg	16.5	16.7 (tape)	4, max.	50 ms	537 kb/s	022	88140S Tape Cartridge
7911P/R 28.1Mb Fixed Disc with integral cartridge tape backup	P = Standalone R = Rack Mtg	28.1	67.0 (tape)	4, max.	35 ms	983 kb/s	022	88140L or 88140S Tape Cartridge
7912P/R 65.6Mb Fixed Disc with integral cartridge tape backup	P = Standalone R = Rack Mtg	65.6	67.0 (tape)	4, max.	35 ms	983 kb/s	022	88140L or 88140S Tape Cartridge
7914P/R/TD 132.1Mb Fixed Disc with integral cartridge tape backup	P = Standalone R = Rack Mtg	132.1	67.0 (tape)	4, max.	36 ms	983 kb/s	022	88140S Tape Cartridge
7933H 404Mb Fixed DiscΔ	Standalone	404	none	4, max.	35.1 ms	1.2 Mb/s	n/a	n/a
7935H 404Mb Removable Media DiscΔ	Standalone	none	404	4, max.	35.1 ms	1.2 Mb/s	n/a	97935A
MAC MASTER DISC MEMORIES FOR HP 1000 M/E/F-SERIES SYSTEMS OPERATING UNDER RTE-6/VM OR RTE-IVB — Requires 13175B MAC Disc Interface for first computer connected to 79xxM Disc, 13178C Interface for each of up to 7 additional computers connected to 79xxM disc.								
7906MR+020 MAC Master Cartridge Disc	Rack Mounting	9.83	9.83	8, max.‡	33.3 ms	740 kb/s	031	12940A
7906M MAC Master Cartridge Disc	Standalone	9.83	9.83	8, max.‡	33.3 ms	740 kb/s	031	12940A
7920M MAC Master Disc‡‡	Standalone	none	50.07	8, max.‡	33.3 ms	740 kb/s	032	13394A
7925M MAC Master Disc‡‡	Standalone	none	120.17	8, max.‡	36.1 ms	740 kb/s	033	13356A
MAC SLAVE DISC MEMORIES FOR HP 1000 M/E/F-SERIES SYSTEMS — Requires compatible MAC Master Disc**								
7906SR+020 MAC Slave Cartridge Disc	Rack Mounting	9.83	9.83	7 per Master‡	33.3 ms	740 kb/s	n/a	12940A
7906S MAC Slave Cartridge Disc	Standalone	9.83	9.83	7 per Master‡	33.3 ms	740 kb/s	n/a	12940A
7920S MAC Slave Disc	Standalone	none	50.07	7 per Master‡	33.3 ms	740 kb/s	n/a	13394A
7925S MAC Slave Disc	Standalone	none	120.17	7 per Master‡	36.1 ms	740 kb/s	n/a	13356A

* *Total average access time is the sum of average seek time plus average rotational delay.*

Δ *For RTE-A or RTE-6/VM operating system only. The 7933H or 7935H disc has not been tested in RTE-A.1 or RTE-L/XL based systems. In addition, the RTE-A.1 or RTE-L/XL file manager can only take advantage of half the capacity of the 7933H. Support in RTE-A or RTE-6/VM also requires a 7970B/E Magnetic Tape Subsystem.*

‡ *The total of 8 discs usable with the MAC Master disc includes the MAC Master disc and up to seven MAC Slave discs.*

‡‡ *A 7970B/E+226/236 Magnetic Tape Subsystem or an additional 7920/25M/S disc is required to provide backup and copy capability for the 7920M or 7925M disc. This requirement is satisfied if there is a second system with 7920M or 7925M disc and appropriate backup at the same site.*

** *A MAC Master Disc Controller is compatible with 7925S Slave disc memories, but if you are adding a 7925S to an existing system for the first time, the master disc controller may not be compatible with the 7925S. You can ask your HP sales representative to arrange for a compatibility test. A 7925S option 250 can be ordered for the first 7925S MAC Slave disc to establish compatibility with an older controller if that is necessary. Otherwise, all MAC Slave discs are compatible with all MAC Master discs.*

HP 1000-Compatible Disc Memories Capacity and Performance Summary, continued

Product No. and Name	Packaging	Capacity/Drive (Megabytes) Fixed	Removable	Disc Drives per Interface	Total Average Access Time*	Average Burst Transfer Rate	RTE Software Media Option	Additional Cartridge or Disc Pack Product No.
ICD AND FLEXIBLE DISC MEMORIES — Requires 12009A HP-IB Interface in A/L-Series, 12821A ICD Disc Interface in M/E/F-Series								
7906H ICD Cartridge Disc Memory	Standalone	9.83	9.83	2, max.	33.3 ms	740 kb/s	036††	12940A
9121D Dual Microfloppy Disc■	Table Mtg	none	0.540	2, max.	415 ms	41 kb/s	044▶	92191A 10-disc kit
9121S Single Microfloppy Disc■	Table Mtg	none	0.270	2, max.	415 ms	41 kb/s	044▶	92191A 10-disc kit
9133A/B Mini Winchester and Microfloppy Disc■	Rack or Table Mounting	4.6/ 9.2	0.270	2, max.	171 ms/‡	44 kb/s‡	044▶	92191A 10-disc kit
9134A/B Mini Winchester Disc■	Rack or Table Mounting	4.6/ 9.2	none	2, max.	171 ms	44 kb/s	n/a	n/a
9895A Master Dual Flexible Disc Memory	Rack or Table Mounting	none	2.3	2, max.	174 ms	23 kb/s	041▶	92195A 10-disc kit
9895A+010 Master Single Flexible Disc Memory	Rack or Table Mounting	none	1.18	2, max.	174 ms	23 kb/s	041▶	92195A 10-disc kit

* *Total average access time is the sum of average seek time plus average rotational delay.*

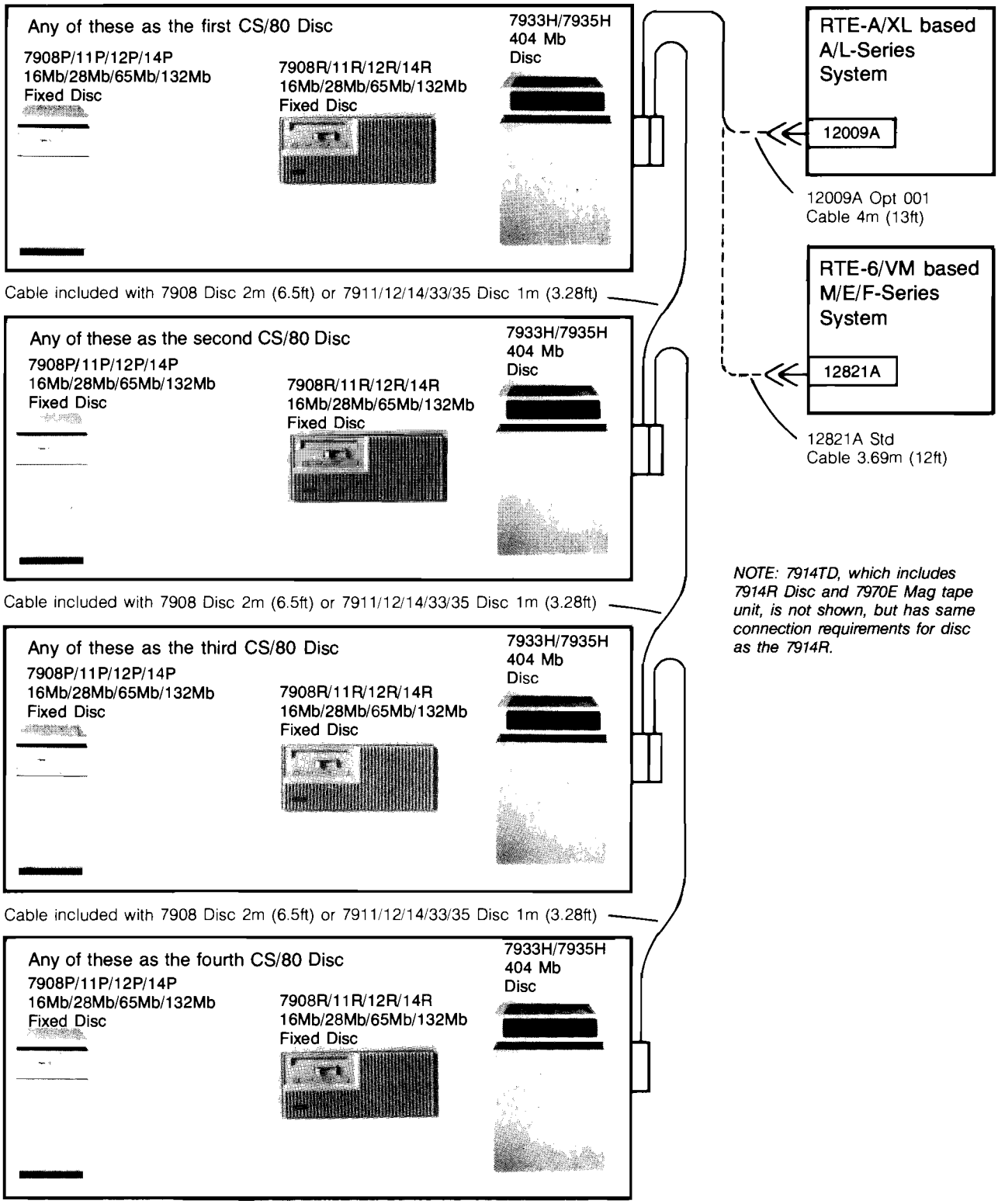
†† *For RTE-6/VM or RTE-IVB operating system only.*

▶ *For RTE-A/L/XL Operating system only.*

■ *A/L-Series only.*

‡ *Applies to Mini Winchester Disc.*

Maximum CS/80 Disc Configurations in A/L/M/E/F-Series Systems

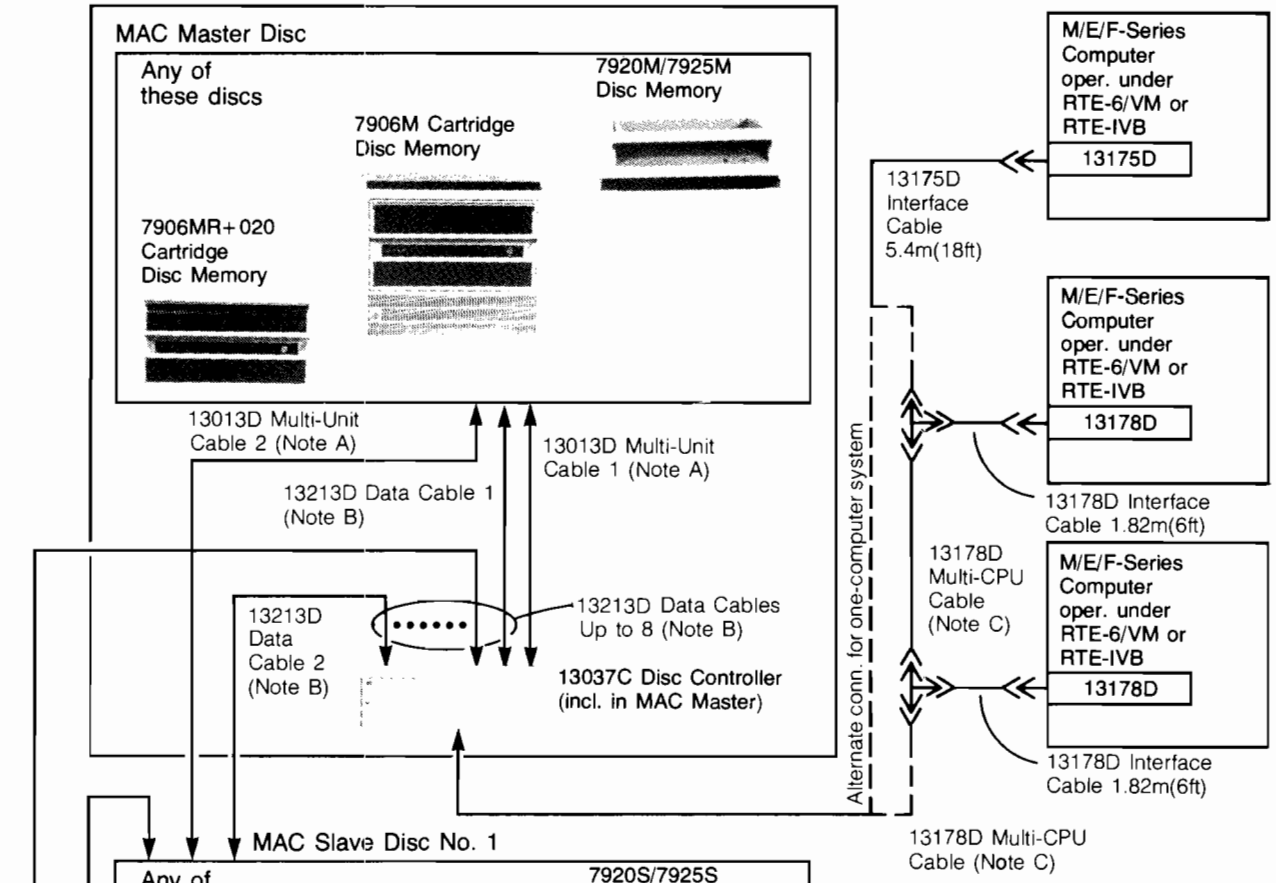


NOTE: 7914TD, which includes 7914R Disc and 7970E Mag tape unit, is not shown, but has same connection requirements for disc as the 7914R.

NOTE A: The 7933H/7935H Disc has not been tested in L-Series system operating under RTE-L/XL. The RTE-L/XL file manager can use only half of the 404 Mb capacity of the 7933H/7935H disc.

NOTE B: Discs must be string-connected as shown here and maximum total length to the fourth CS/80 Disc can not exceed 10m (30ft).

Maximum MAC Disc Configurations in M/E/F-Series Systems



Notes:

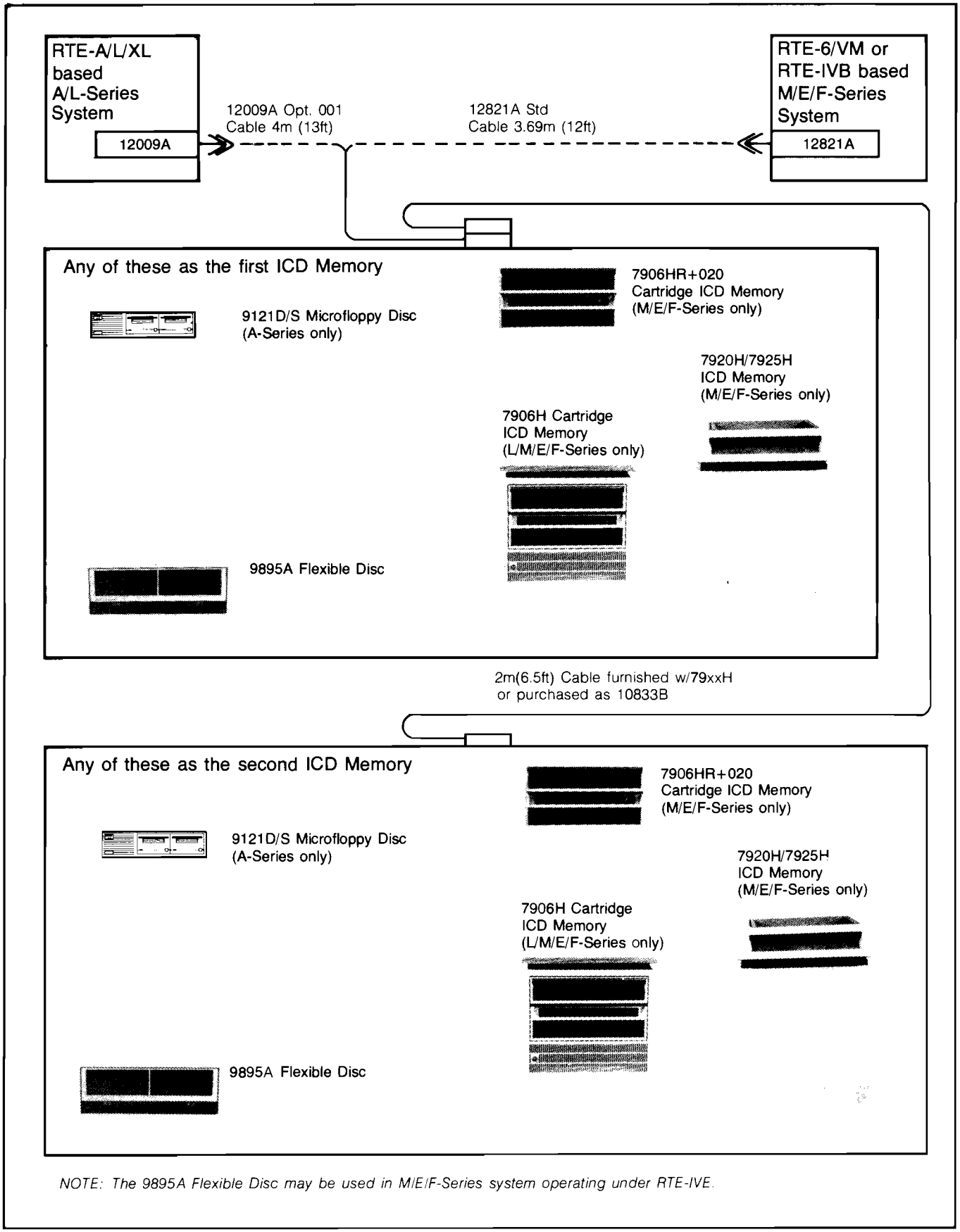
A. 13013D Multi-Unit Cable Lengths
- Std = 3.65m(12ft), supplied with 7906MR/SR
- Opt. 001 = 1.82m(6ft), supplied with 7906M/20M/25M
- Opt. 002 = 5.4m(18ft), available for separate purchase
- Opt. 003 = 2.43m(8ft), supplied with 7906S/20S/25S

B. 13213D Data Cable Lengths
- Std = 3.04m(10ft), supplied with 7906MR/SR
- Opt. 001 = 7.6m(25ft), available for separate purchase
- Opt. 002 = 15.2m(50ft), supplied with 7906S/20S/25S
- Opt. 003 = 22.8m(75ft), available for separate purchase
- Opt. 004 = 1.82m(6ft), supplied with 7906M/20M/25M

C. 13178D Multi-Unit Cable Lengths
- Std = 2.43m(8ft)
- Opt.001 = 4.87m(16ft)

D. Up to eight Computers can be connected via 13178D interfaces and their related cables in the same way as three computers are shown, above.

Maximum ICD Memory Configurations in A/L/M/E/F-Series Systems



NOTE: The 9895A Flexible Disc may be used in M/E/F-Series system operating under RTE-IVE.

HP 1000 Printers Selection Guide

Select the Appropriate Type of Printer

SELECT THE PRINTING TECHNIQUE	THERMAL For quiet operation and low initial price in applications where additional copies needed can be made on a copier.		IMPACT For multi-form printing, low cost per page (because thermal paper costing about 3.8 times as much as plain paper is not needed), paper width to 16 in., and print speeds to 1000 lines per minute.			LASER For fast, quiet operation.
SELECT THE CHARACTER FORMATION METHOD	DOT-MATRIX For greatest printing versatility, including software-selectable character sets and raster graphics (NOT software-supported in Graphics/1000-II)		DOT-MATRIX For greatest printing versatility, including software-selectable character sets and raster graphics (software-supported in Graphics/1000-II for 2608A/S only)		DAISYWHEEL For highest print quality, easy manual change of character fonts	DOT-MATRIX Great printing versatility.
SELECT OUTPUT MODE	LINE for fast printing	CHARACTER for lowest cost	CHARACTER for lowest cost	LINE for fast printing	CHARACTER (Required by daisywheel design)	PAGE for fast printing
PRINTERS CONNECTED TO SYSTEM VIA HP-IB INTERFACE	9876A Thermal Graphics Printer	2671A Printer 2671G Graphics Printer 2673A Intelligent Graphics Printer	2631B+214 Printer 82905B Impact Printer 82906A Dot-Matrix Printer 2932A+046 Printer	2608S+210/214 Line Printer 2563A+214 Line Printer	n/a	n/a
PRINTERS CONNECTED TO SYSTEM VIA PARALLEL INTERFACE	n/a	n/a		2608A+210 Line Printer	n/a	
PRINTERS CONNECTED TO SYSTEM VIA SERIAL INTERFACE	n/a	2673A+039 Intelligent Graphics Printer	2631B Printer 2932A Printer	n/a	2601A Daisywheel Printer	2687A Desktop Laser Page Printer
AUXILIARY PRINTERS FOR 262x TERMINAL (Connected via 262x Port 2; see page 4.1-9 for conn.)	n/a	2671A+040 Printer 2671G+040 Graphics Printer 2673A+040 Intelligent Graphics Printer	2631B Printer 2932A Printer	n/a	2601A Daisywheel Printer	n/a
AUXILIARY PRINTERS FOR 264x TERMINALS (see page 4.1-10 for connection)	9876A+240 Thermal Graphics Printer	2671A+240 Printer 2673A+240 Intelligent Graphics Printer	2631B+240 Printer 2932A Printer	n/a	2601A Daisywheel Printer	n/a

HP 1000 Impact Printers Capability and Performance Comparison

PRINTER PRODUCT NUMBER AND NAME	HP 1000 SOFTWARE-SUPPORTED CAPABILITIES	CHAR/IN OR NO. OF COLUMNS	MATRIX SIZE OR CHAR SET SIZE	PRINTING SPEED	PAPER TYPE	REQUIRED INTERFACE
DAISYWHEEL PRINTER FOR HP 1000 SYSTEMS OR USE AS 262x OR 264x AUXILIARY PRINTER						
2601A DAISYWHEEL PRINTER	Letter-quality character printing, using changeable plastic or metal printwheels. Top-of-form and other commands are not the same as for 2563A or 2608A/S.	10/12/15 char per inch	88, 92, or 96 char set	40 cps (plastic printwheel), 30 cps (metal printwheel)	Up to 406mm (16 in) wide; with 26010A tractors, 84-387mm (3.25-15.25 in) wide std fan-fold, edge-punched paper, up to six-part forms	FOR A/L-SERIES, use 12005B w/Opt. 003 cable OR 12040B Multiplexer channel connected via std 2601A cable FOR M/E/F-SERIES, use a 12792B Multiplexer channel connected via std 2601A cable. FOR 262x TERMINAL, connect to Port 2 via 13242G cable FOR 264x TERMINAL, connect via 13250B interface and 13232G cable
DOT-MATRIX CHARACTER PRINTERS FOR HP 1000 A/L-SERIES SYSTEMS						
82905B IMPACT PRINTER	Printing on single sheet and up to three-part forms using 128 character set. Line spacing is programmable, but VFC is not.	80 normal, 132 compressed, 40, 48, or 66 expanded	9 x 9	80 cps, bidirectional	Up to 254mm (16 in) wide fan-fold, edge-punched paper	FOR A/L-SERIES, use 1/14 of 12009A interface and 10833x cable
82906A DOT-MATRIX PRINTER	Printing on single sheet and up to three-part forms using 128 character set. Line spacing is programmable. VFC programming differs from that for 2653A or 2608A/S.	80 normal, 132 or 96 compressed, 40, 48, or 66 expanded	9 x 9	160 cps, bidirectional	Up to 254mm (16 in) wide fan-fold, edge-punched paper	FOR A-SERIES, use 1/14 of 12009A interface and 10833x cable
DOT-MATRIX CHARACTER PRINTERS FOR HP 1000 SYSTEMS OR USE AS 262x OR 264x AUXILIARY PRINTER						
2631B PRINTER	Text printing with 128 character set; 8 national character sets in normal or high density print are optional.	8.33/10/12.5/16.7 char per inch	7 x 9	180 cps	Up to 400mm (15.75 in) wide fan-fold, edge-punched paper, up to six-part forms	FOR A/L-SERIES, connect std 2631B Printer via 12040B Multiplexer channel and std 2631B cable OR 2631B Opt. 214 Printer using 1/14 of 12009A interface and 10833x cable. FOR M/E/F-SERIES, connect std 2631B Printer via a 12792B Multiplexer chan and std 2631B cable. FOR 262x TERMINAL, connect to 262x Port 2 via 13242G cable FOR 264x TERMINAL, use 2631B Opt. 240 Printer.
2932A GENERAL-PURPOSE PRINTER	Text and/or graphics printing with 128 character set. Includes 7 national languages and math and line drawing sets. 2932A is NOT supported by HP 1000 graphics software.	5/10/16.36 char per inch	9 x 12	200 cps	57-400mm (2.25-15.75 in) fan-fold, edge-punched paper, up to six-part forms	FOR A-SERIES, connect std 2932A Printer via a 12040B Multiplexer channel and 92219G cable OR 2932A Opt. 046 Printer using 1/14 of 12009A interface and 10833x cable. FOR 262x TERMINAL, connect to 262x Port 2 via 13242G cable FOR 264x TERMINAL, connect via 13250A interface and 13232G cable FOR RASTER DUMP FROM 2648A GRAPHICS TERMINAL, use 2932A Opt. 046 Printer and 13296A Shared Peripheral Interface in 2648A

HP 1000 Impact Printers Capability and Performance Comparison, continued

PRINTER PRODUCT NUMBER AND NAME	HP 1000 SOFTWARE-SUPPORTED CAPABILITIES	CHAR/IN OR NO. OF COLUMNS	MATRIX SIZE OR CHAR SET SIZE	PRINTING SPEED	PAPER TYPE	REQUIRED INTERFACE
DOT-MATRIX LINE PRINTERS FOR HP 1000 SYSTEMS						
2608S LINE PRINTER	Text and/or graphics printing using 128 character set. Ten national char sets, line drawing set, and math and large block char sets are optional. 2608S graphics output is supported by Graphics/1000-II DGL.	10 char per inch (5 double size char per inch)	5 x 7 7 x 7 5 x 9 7 x 9	400 LPM 350 LPM 320 LPM 250 LPM	130-385mm (5-15.16 in) wide fan-fold, edge-punched paper, up to six-part forms	FOR A-SERIES, use 2608S Opt. 214 Printer, 1/14 of 12009A interface*, and 10833x cable. FOR M/E/F-SERIES, use 2608S Opt. 210 Printer (includes interface).
2608A LINE PRINTER	Text and/or graphics printing using 128 character set. Ten national char sets and line drawing set are optional. 2608A graphics output is supported by Graphics/1000-II DGL.	10 char per inch (5 double size char per inch)	5 x 7 5 x 9 7 x 9	400 LPM 320 LPM 250 LPM	130-385mm (5-15.16 in) wide fan-fold, edge-punched paper, up to six-part forms	FOR M/E/F-SERIES, use 2608A Opt. 210 printer or std 2608A and 26099A interface.
2563A LINE PRINTER	Text and/or graphics printing using 128 character set. Eleven national char sets are selectable under program or operator control. Math, line drawing, large block characters, bar codes, and high density char sets are optional. HP 2563A Printer support under HP 1000 graphics software is pending.	10/16.7 char per inch	5/13 x 7 normal/ 6/18x14 high den caps, 5/13 x 9 normal/ 6/18x18 high den lower case	233-300 LPM normal/ 117-150 LPM high density	Up to 424mm (16.7 in) wide fan-fold, edge-punched paper, up to six-part forms	FOR A-SERIES, use 2563A Opt. 214 Printer, 1/14 of 12009A interface, and 10833x cable.

* Maximum of two 2608S Line Printers per 12009A interface.

HP 1000 Laser Printer Capability and Performance Summary

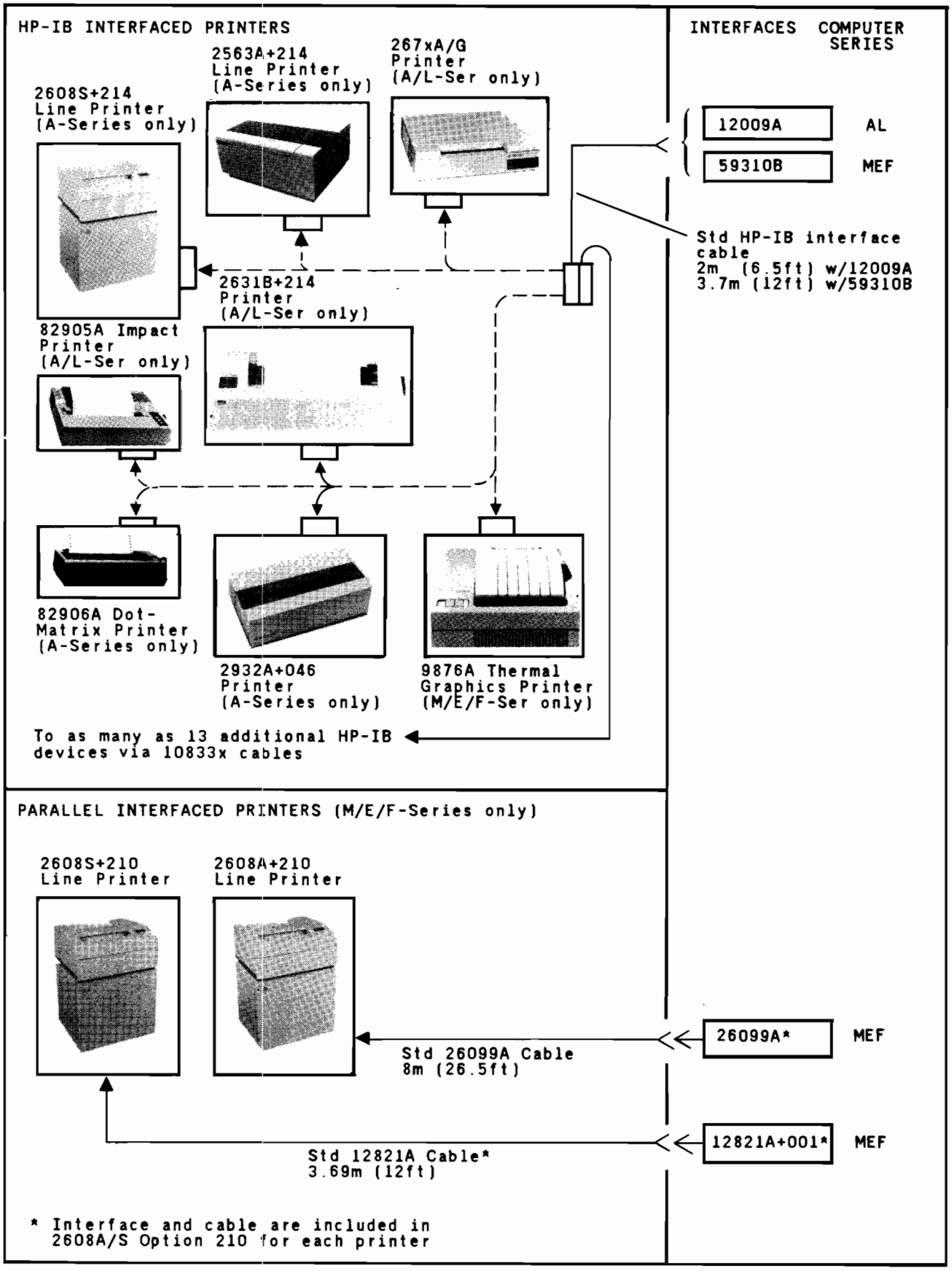
PRINTER PRODUCT NUMBER AND NAME	HP 1000 SOFTWARE-SUPPORTED CAPABILITIES	CHAR/IN OR NO. OF COLUMNS	MATRIX SIZE OR CHAR SET SIZE	PRINTING SPEED	PAPER TYPE	REQUIRED INTERFACE
2687A DESKTOP LASER PAGE PRINTER	Fast, sheet-fed page (text) printer with 250-sheet input tray and 300x300 dots per inch print resolution. Change of fonts within copy, support of proportional spacing, and change between portrait and landscape orientation of copy is acccomplished by insertion of escape sequences in the output to the printer.	10/12/15 char per inch	127 char set	3 to 12 pages per min* after <2 min warmup, <15 sec to print first page	210 x 297mm (8.5 x 11 in) copier bond paper	FOR A-SERIES, use a 12040B Multiplexer channel, connected via 92219G cable, ordered separately.

* Multi-page correspondence using fixed space printing will print at speeds approaching 12 pages per minute. However, single-page jobs or complex jobs with over 4,000 characters per page, proportional-spaced type, or margin justification will slow the page output rate significantly.

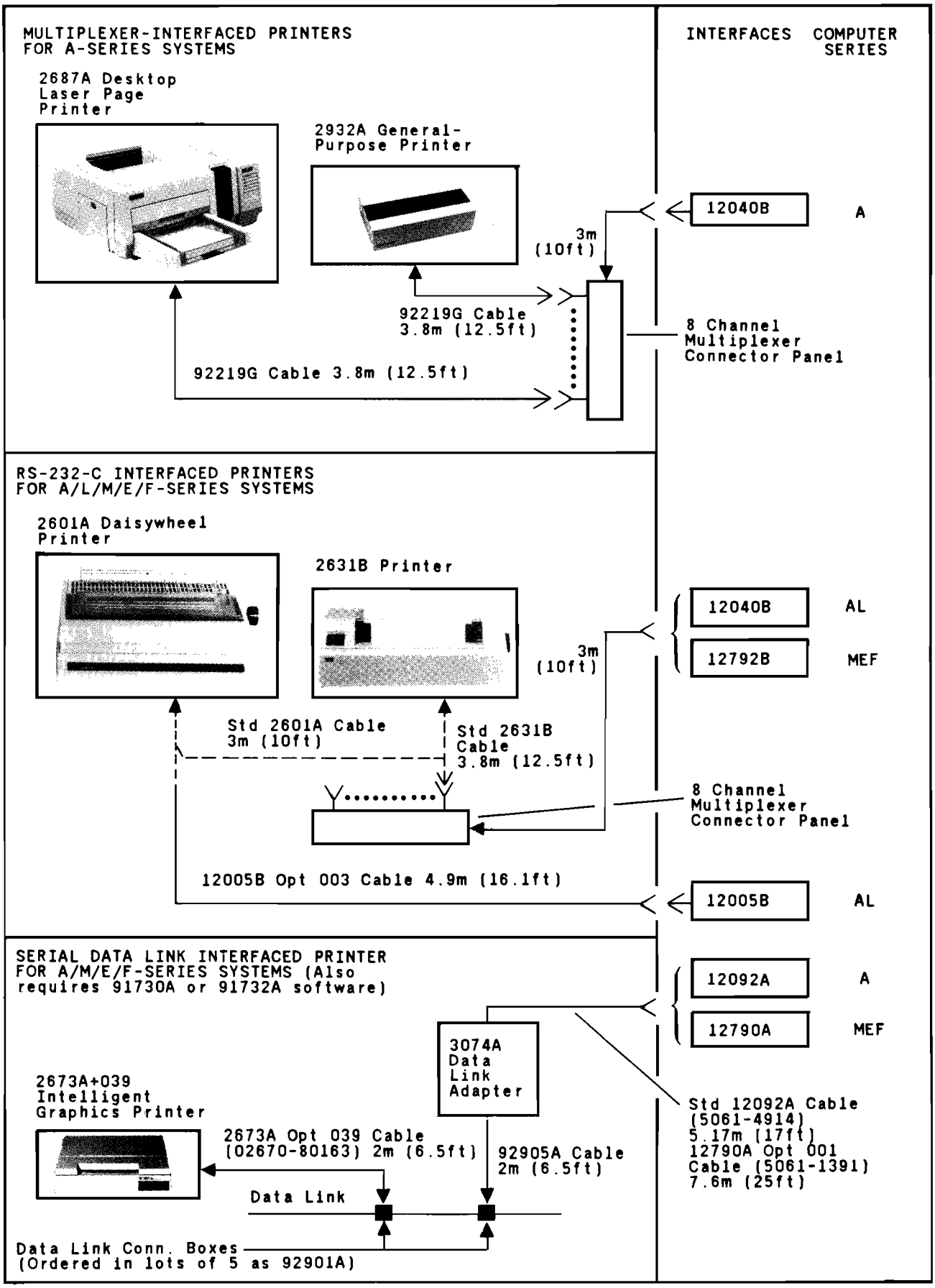
HP 1000 Thermal Printers Capability and Performance Comparison

PRINTER PRODUCT NUMBER AND NAME	HP 1000 SOFTWARE-SUPPORTED CAPABILITIES	CHAR/IN OR NO. OF COLUMNS	MATRIX SIZE OR CHAR SET SIZE	PRINTING SPEED	PAPER TYPE	REQUIRED INTERFACE
DOT-MATRIX CHARACTER PRINTERS FOR HP 1000 A/L-SERIES SYSTEMS OR USE AS 262x OR 264x AUXILIARY PRINTER						
2671A PRINTER	Dot-matrix thermal printing on fan-fold or roll-fed thermal paper using 128 char set. Also includes line drawing set	80 normal, 132 compressed	7 x 11	120 cps, bidirectional	216mm (8.5 in) wide fan-fold or roll-fed thermal paper, page-perforated or continuous	FOR A/L-SERIES, use 1/14 of 12009A interface and 10833x cable FOR 262x TERMINAL, connect 2671A Opt. 040 Printer to 262x Port 2 via 13242G cable FOR 264x TERMINAL, use 2671A Opt. 240
2671G GRAPHICS PRINTER	Dot-matrix thermal printing of text and/or graphics on fan-fold or roll-fed thermal paper using 128 char set. Includes line drawing set. 2671G Printer is NOT supported by HP 1000 graphics software	80 normal, 132 compressed	7 x 11	120 cps, bidirectional	216mm (8.5 in) wide fan-fold or roll-fed thermal paper, page-perforated or continuous	FOR A/L-SERIES, use 1/14 of 12009A interface and 10833x cable FOR 262x TERMINAL, connect 2671G Opt. 040 Printer to 262x Port 2 via 13242G cable FOR 264x TERMINAL, use 2671G Opt. 240 FOR RASTER DUMP FROM 2648A GRAPHICS TERMINAL, use 13296A Shared Peripheral Interface in 2648A
2673A INTELLIGENT GRAPHICS PRINTER	Dot-matrix thermal printing of text and/or graphics on fan-fold or roll-fed thermal paper using 128 char set. Also includes national character sets and line drawing set. 2673A Printer is NOT supported by HP 1000 graphics software.	80 normal, 132 compressed	7 x 11	120 cps, bidirectional	216mm (8.5 in) wide fan-fold or roll-fed thermal paper, page-perforated or continuous	FOR A/L-SERIES, use 1/14 of 12009A interface and 10833x cable FOR A/M/E/F-SERIES, connect 2673A Opt. 039 Printer via 12092A or 12790A interface, 3074A Data Link Adapter, Data Link Cable, and Data Link Connection Box FOR 262x TERMINAL, connect 2673A Opt. 040 Printer to 262x Port 2 via 13242G cable FOR 264x TERMINAL, use 2673A Opt. 240 FOR RASTER DUMP FROM 2648A GRAPHICS TERMINAL, use 13296A Shared Peripheral Interface in 2648A
DOT-MATRIX LINE PRINTER FOR HP 1000 M/E/F-SERIES SYSTEMS OR USE AS 264x AUXILIARY PRINTER						
9876A THERMAL GRAPHICS PRINTER	Dot-matrix thermal printing using 128 character set. Seven additional international character sets are software-selectable. 9876A is NOT supported by HP 1000 graphics software. Commands for top-of-form and other line printer functions are not the same as for 2563A or 2608A/S.	80 normal, 132 compressed	5 x 7	90-480 LPM	216 x 279mm (8.5 x 11 in) English; 210 x 297mm (8.27 x 11.69 in) Metric fan-fold thermal paper	FOR M/E/F-SERIES, use 1/14 of 59310B interface and 10833x cable FOR 264x TERMINAL, use 9876A Opt. 040 Printer FOR RASTER DUMP FROM 2648A GRAPHICS TERMINAL, use 13296A Shared Peripheral Interface in 2648A

HP-IB and Parallel-Interfaced HP 1000 System Printer Connections



Serial-Interfaced HP 1000 System Printer Connections



HP 1000 Graphics Devices capability and performance comparison

GRAPHICS DEVICE PRODUCT NO. AND NAME	HP 1000 SOFTWARE-SUPPORTED CAPABILITIES	GRAPHICS OR MEDIA AREA	ADDRESSABLE RESOLUTION	DISPLAY, PLOTTING, OR DIGITIZING SPEED*	REQUIRED INTERFACE AND GRAPHICS SOFTWARE SUPPORT
SOFT COPY DEVICES for HP 1000 A/L/M/E/F-Series Systems					
1351S GRAPHICS DISPLAY SYSTEM	High resolution Graphics Translator (1351A) with storage for 8192 vectors and/or characters in 64 addressable memory files, and 8 brightness levels, driving a 14-in (std), 17-in (Opt 517), 19-in (Opt 510), or 21-in (Opt 521) fast, direct-writing display.	Quality area is 216x216mm (8.5x8.5in) std; 254x254 mm (10x10in) Opt 517; 279x279mm (11x11in) Opt 510; 305x305mm (12x12in) Opt 521.	1021 x 1021 points	1600 Vectors/sec (DGL), 525 vectors/sec (AGP), 100 vectors/sec (GPS)	FOR M/E/F-SERIES, use 1/14 of 59310B interface and 10833x cable; supported under G and GII.
2623A GRAPHICS TERMINAL	Fast raster-scan graphics output	215 x 164mm (8.5x6.5in)	512 col x 390 rows	210 vectors/sec (DGL or AGP)	FOR A/L-SERIES, use 12040B mpxer chan conn via 13222Y cable or 12005B+005 interface; supported under GII.
2627A COLOR GRAPHICS TERMINAL	Fast raster-scan color graphics output	215 x 164mm (8.5x6.5in)	512 col x 390 rows x three color planes		FOR M/E/F-SERIES, use 12792B mpxer chan conn via 13222Y cable or 12966A+105 interface; supported under GII.
2648A GRAPHICS TERMINAL	Fast raster-scan graphics output	254 x 127mm (10x5in)	720 col x 360 rows	130 vectors/sec (DGL or AGP), 40 vectors/sec (GPS)	FOR A/L-SERIES, use 12040B mpxer chan conn via 13232Y cable or 12005B+004 interface; supported under GII. FOR M/E/F-SERIES, use 12792B mpxer chan conn via 13232Y cable or 12966A+107 interface; supported under G and GII.
HARD COPY DEVICES for HP 1000 A/L/M/E/F-Series Systems					
7220T GRAPHICS PLOTTER	RS-232-C Eight-pen plotter with HP-GL programming and programmable paper advance	285 x 400mm (11.2 x 15.75in)	0.025mm (0.001in)	360mm/sec (14 ips) along each axis; 509mm/sec (20 ips) along 45 degree vector	FOR M/E/F-SERIES, use 12966A+004 interface and 264x or 2635B+051 terminal; supported under GII.
7221T GRAPHICS PLOTTER	RS-232-C Eight-pen plotter with compacted binary programming and programmable paper advance				
7470A+002 GRAPHICS PLOTTER	Low-priced, two-pen plotter	210 x 297mm (ISO A4) or 8.5x11 in (ANSI A)	0.025mm (0.001in)	381mm/sec (15 ips), independent of vector direction	FOR A/L-SERIES, use 1/14 of 12009A interface and 10833x cable; supported under GII. FOR M/E/F-SERIES, use 1/14 of 59310B interface and 10833x cable; supported under GII.
7580B DRAFTING PLOTTER	Eight-pen plotter for fast, versatile drawing on A through D size paper.	203 x 267mm (8 x 10.5in) to 622 x 1190mm (24.5 x 46.85in)	0.25mm (0.001in)	600mm/sec (24 ips), independent of vector direction	
7585B DRAFTING PLOTTER	Eight-pen plotter for fast, versatile drawing on A through E size paper.	203 x 267mm (8 x 10.5in) to 927 x 1190mm (36.5 x 46.85in)	0.25mm (0.001in)	600mm/sec (24 ips), independent of vector direction	
9872T GRAPHICS PLOTTER	Eight-pen plotter with programmable paper advance	285 x 400mm (11.2 x 15.75 in)	0.25mm (0.001in)	360mm/sec (14 ips) along each axis; 509mm (20 ips) along 45 degree vector	

GII = Supported by the 92841A Graphics/1000-II Device-Independent Graphics Library, which is basic to all Graphics/1000-II software.

G = Supported by the 92840A Graphics/1000 Graphics Plotting Software (GPS) package.

* = These speeds are based on operation in HP 1000 F-Series computer with parity memory, use of 100 word buffers, assuming one move followed by 4000 maximum-length draws, clipping features turned off for GPS and AGP, and use of unbuffered EQTs. Device initialization and termination times are excluded. Actual speeds realized under system control will depend on the application and overall activity in the system. Speed in A700 or A900 computer with floating point should be faster than in the F-Series. A600/L/M/E-Series speeds will be slower.

HP 1000 Graphics Devices capability and performance comparison, continued

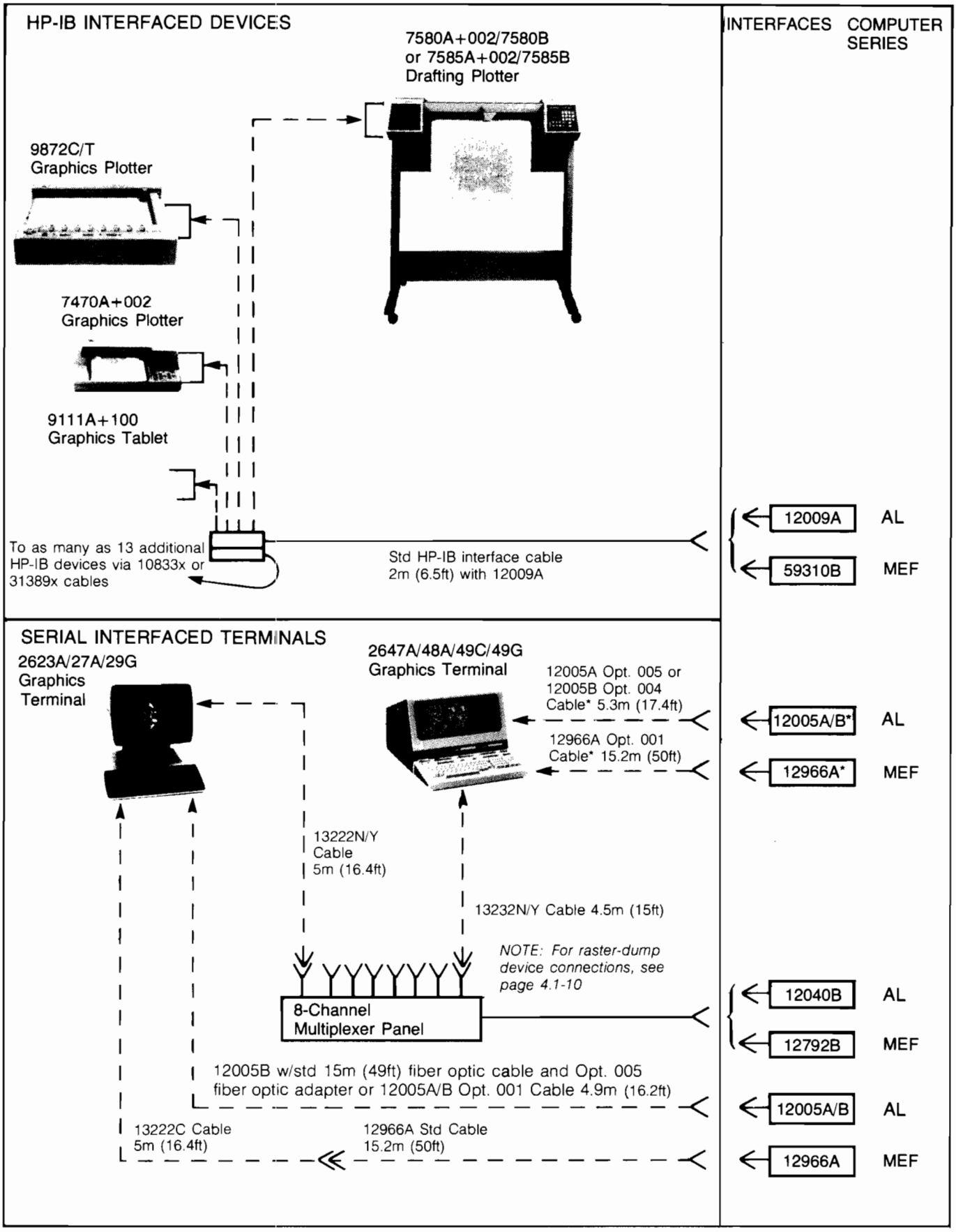
GRAPHICS DEVICE PRODUCT NO. AND NAME	HP 1000 SOFTWARE-SUPPORTED CAPABILITIES	GRAPHICS OR MEDIA AREA	ADDRESSABLE RESOLUTION	DISPLAY, PLOTTING, OR DIGITIZING SPEED*	REQUIRED INTERFACE AND GRAPHICS SOFTWARE SUPPORT
HARD COPY DEVICES for HP 1000 A/L/M/E/F-Series Systems, continued					
2608A LINE PRINTER	Dot-matrix raster graphics printing	335 x 1082mm (13.2 x 42.5 in)	0.36mm (0.014in) horizontal, 0.35mm (0.0139in) vertical	40 dot rows/second or 14mm (0.55in)/second down the full sheet width	FOR M/E/F-SERIES, use 2608A Opt. 210; supported under GII.
2608S LINE PRINTER	Dot-matrix raster graphics printing				FOR A-SERIES, use 2608S Opt 214, 1/14 of 12009A interface, & 10833x cable; two 2608S+214 Printers, maximum, per 12009A interface; supported under GII. FOR M/E/F-SERIES, use 2608S Opt 210; supported under GII.
INPUT DEVICES for HP 1000 A/L/M/E/F-Series Systems					
9111A+100 GRAPHICS TABLET	Operator entry of graphics input for interactive graphics systems	218 x 300mm (8.6 x 11.8 in)	0.1mm (0.004 in)	60 points/second	FOR A/L-SERIES, use 1/14 of 12009A interface and 10833x cable; supported under GII. Only 9111A with serial prefix 2251 or higher is supported on A/L-Series. FOR M/E/F-SERIES, use 1/14 of 59310B interface and 10833x cable; supported under GII.
17263A GRAPHICS TABLET	Operator entry of graphics input for interactive graphics systems.	295 x 225mm (11.6 x 8.84 in)	0.144mm (0.0057in)	Not applicable	FOR A/L/M/E/F-SERIES, use with 2627A Color Graphics Terminal; supported with 2627A under GII.

GII = Supported by the 92841A Graphics/1000-II Device-Independent Graphics Library, which is basic to all Graphics/1000-II software.

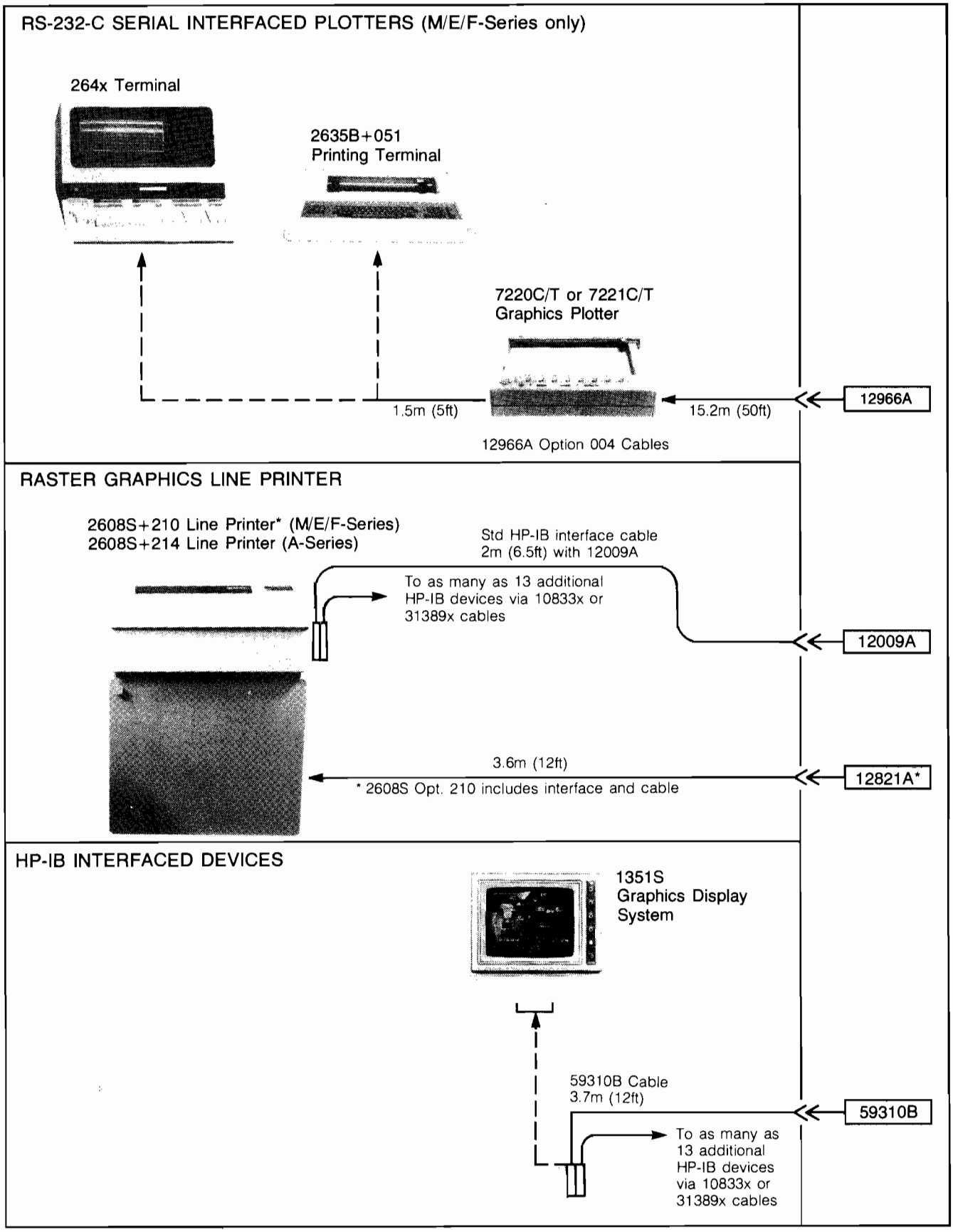
G = Supported by the 92840A Graphics/1000 Graphics Plotting Software (GPS) package.

* = These speeds are based on operation in HP 1000 F-Series computer with parity memory, use of 100 word buffers, assuming one move followed by 4000 maximum-length draws, clipping features turned off for GPS and AGP, and use of unbuffered EQTs. Device initialization and termination times are excluded. Actual speeds realized under system control will depend on the application and overall activity in the system. Speed in A700 or A900 computer with floating point should be faster than in the F-Series. A600/L/M/E-Series speeds will be slower.

Graphics device connections for HP 1000 A/L/M/E/F-Series systems



Graphics device connections for HP 1000 A/L/M/E/F-Series systems, continued



HP 1000 Measurement and Control Product Selection Guide

Measurement and Control Product Number and Name	Application	No. of M & C Points	Maximum Data Rate	Full Scale Analog I/P Range(s)	Full Scale Analog O/P Range(s)	Resolution
A/L-SERIES MEASUREMENT AND CONTROL PLUG-IN CARDS						
(Note: The following A/L-Series Interface Cards all require 25kHz ac power, which is not available in HP 1000 Model 5/6 Microsystem.)						
12060A High-Level Analog Input Card	Analog measurement where number of data points to be sampled is too small to justify purchase of a measurement and control processor	8 dif.	55k ch per sec	±1.28V to ±10.24V (4 ranges)	n/a	625μV to 5 mV
12061A Expansion multiplexer Card	Increase total input capacity of 12060A to 40 differential channels (adds 32)	32 dif.	Same as 12060A	Same as 12060A	n/a	Same as 12060A
12062A Analog Output Card	Provides four analog bipolar outputs	4	n/a	n/a	±10.23V	5 mV
12063A 16 Input/ 16 Output Isolated Digital Card	Digital I/O where number of points to be monitored and/or controlled is too small to justify purchase of a measurement and control processor. Supports input event sense interrupt	16 in and 16 out	n/a	n/a	n/a	n/a
M/E/F-SERIES MEASUREMENT AND CONTROL PLUG-IN CARDS						
91000A A/D Interface	Analog measurement where number of data points to be sampled is too small to justify purchase of a measurement and control processor	8 dif. or 16 Single ended	20k ch per sec	±10.24V (1 range)	n/a	5 mV
2240A MEASUREMENT AND CONTROL PROCESSOR FOR L/M/E/F-SERIES (See page 5.4-3 for connections))						
NOTE A: The 2250M/NIR Measurement and Control Processor systems and their function cards (listed on the next page) is to be preferred for most applications because of its more recently developed, superior technology, more flexible signal conditioning, and simplified organization and ordering.						
NOTE: B 2240A configuration details are covered in the 2240A data book and the 2240A Configuration Guide.						
2240A Measurement and Control Processor	Analog and/or digital I/O where medium capacity is needed and industrial packaging is not needed (up to 4 of 229xxx function cards listed below in 2240A, up to 4 more in 2241A Extender)	Up to 128; 256 w/ext.	See function cards	See function cards	See function cards	See function cards
22900A 16/32 Chan Analog Input function card	Measurement of 16 differential or 32 single-ended analog signals	16 dif/ 32 S.E.	20k ch per sec	±10V (1 range)	n/a	5 mV
22915C/D 16-Chan Low-Level Analog Input signal conditioning card	Amplification of 16 low-level inputs to 22900A Analog Input (Both 22915C and 22915D offer same span, but specific gains differ)	16 dif.	No effect on 22900A data rate	±20 mV to ±10V (5 ranges)	n/a	10μV to 5 mV
22901A 4-Channel Digital-to-Analog Voltage Converter function card	Four unipolar or bipolar analog voltage outputs	4	5kpps	n/a	10.23V or −10.24V to +10.22V	10 mV or 20 mV
22901B 4-Channel Digital-to-Analog Voltage and/or Current Converter function card	Four analog unipolar or bipolar outputs with each jumper-selectable for either voltage or current output	4	5kpps	n/a	10.23V or −10.24V to +10.22V OR 20.37 mA	5 mV or 2.5 mV OR 4μA
22902A 32 Channel Digital Input function card	Monitors digital input points	32	14kfps or 11kpps	n/a	n/a	n/a
22903A 16 Channel Common Interrupt function card	Monitors digital input points with interrupt on change of state of any point (also usable for digital input)	16	14kfps or 11kpps	n/a	n/a	n/a
22913C 16-Channel Isolated Digital Input signal conditioning card	Provides isolated connection of ac or digital inputs to 22902A, 22903A, and/or 22905A function cards	16	Signal cond. reduces rates	n/a	n/a	n/a
22904A 32 Channel Digital Output function card	Provides digital outputs	32	4kfps or 2.2kpps	n/a	n/a	n/a

HP 1000 Measurement and Control Product Selection Guide, continued

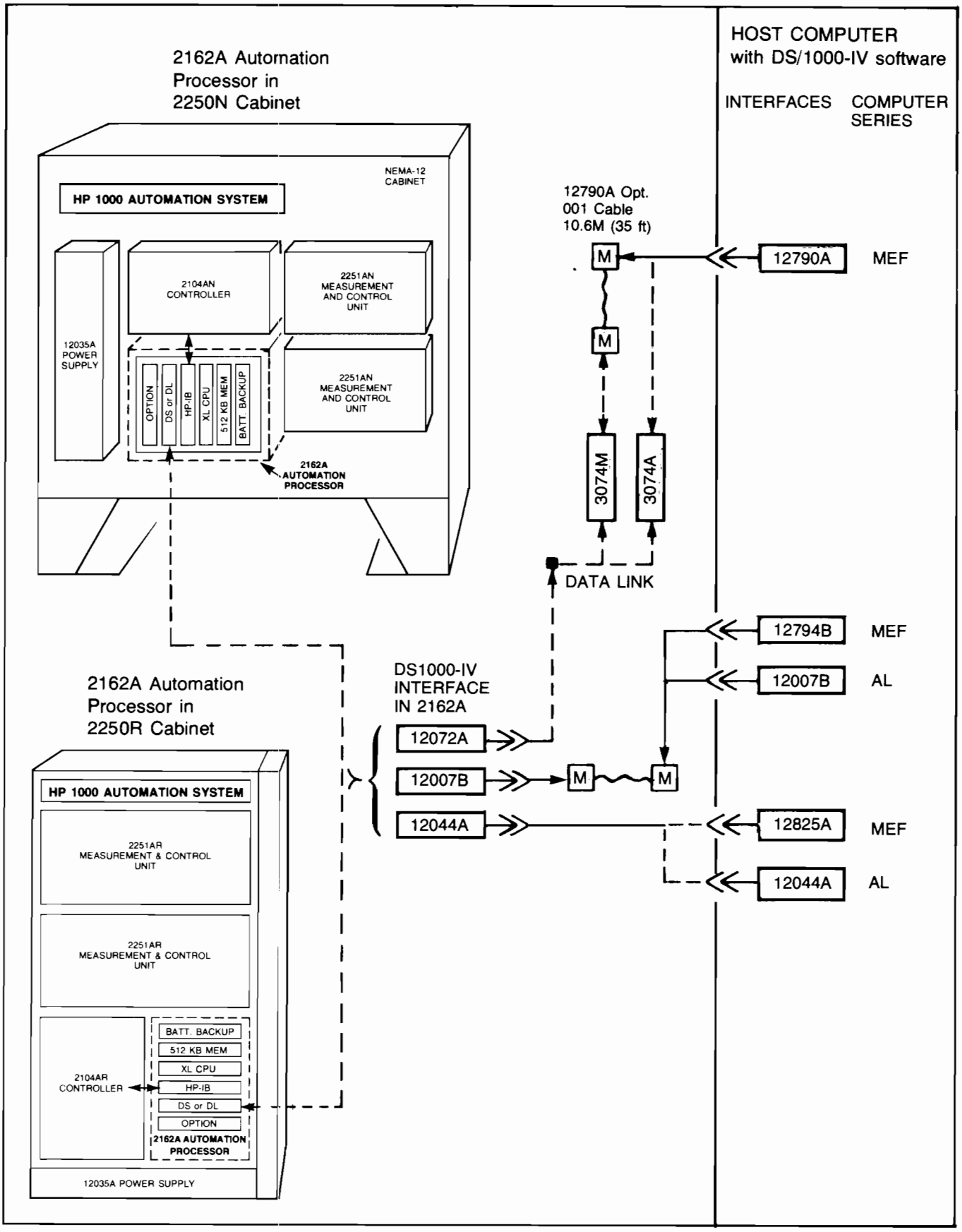
Measurement and Control Product Number and Name	Application	No. of M & C Points	Maximum Data Rate‡	Full Scale Analog I/P Range(s)	Full Scale Analog O/P Range(s)	Resolution
22912A 16-Channel Relay Output signal conditioning card	Provides isolated relay contact closure outputs for control of ac or dc loads in response to inputs from the 22904A Digital Output function card	16	100fps or 100pps	n/a	n/a	n/a
22905A 4 Channel Counter-Stepper function card	Provides independently-configurable channels each of which can be used to measure frequency or period count (totalize) events, or drive a stepper	4	500kHz (freq. or count)	n/a	n/a	n/a
2250 MEASUREMENT AND CONTROL PROCESSOR SYSTEMS FOR A/L/M/E/F-SERIES (See 5.4-3 for connections.)						
NOTE: 2250 Configuration details are covered in the 2250 data book and the Ordering Information booklet.						
2250M Mobile Measurement and Control System	Analog and/or digital I/O where medium capacity is needed in a small rollabout cabinet and industrial packaging is not needed (up to 8 of 255xxA function cards listed below)	Up to 256	See function cards	See function cards	See function cards	See function cards
2250N NEMA Panel Measurement and Control System	Analog and/or digital I/O where medium capacity and industrial packaging are needed (up to 16 of 255xxA function cards listed below, with two 2251AN Card Cages in 2250N)	Up to 256; 512 w/2nd 2251AN	See function cards	See function cards	See function cards	See function cards
2250R Rack Mounted Measurement and Control System	Analog and/or digital I/O where large capacity is needed and industrial packaging is not needed (up to 64 of 255xxA function cards listed below, eight 2251ARs in 2250R with Option 003/017)	Up to 256; 2048 w/max expansion	See function cards	See function cards	See function cards	See function cards
22501A High-Speed Analog Input function card	Measurement of 16 differential analog single-ended analog signals	16 dif.	50k ch per sec	±1.25V to ±10V (4 ranges)	n/a	156μV to 1.25 mV
25502A High-Level, Solid State Multiplexer function card	Adds 32 channels to capacity of 25501A; accommodates snap-on signal conditioning modules	32 dif.	Same as 25501A	Same as 25501A	n/a	Same as 25501A
25503A Low-Level, Solid State Multiplexer function card	Adds 32 channels with programmable gain to 25501A; accommodates snap-on signal conditioning modules	32 dif.	20k ch per sec	±12.5 mV to ±10V (12 ranges*)	n/a	1.56μV to 1.25 mV
25504A 16 Chan Wide Range Relay Multiplexer function card	Adds 16 programmable gain channels with high common mode tolerance and CMR to 25501A	16 dif.	1k chan per sec	±12.5 mV to ±100V (16 ranges*)	n/a	1.56μV to 12.5 mV
25510A 4 Channel Isolated Voltage/ Current Output function card	Four analog unipolar or bipolar outputs with each switch selectable for either voltage or current output	4	30kpps	n/a	10.23V or −10.24V to +10.23V OR 20.47 mA	2.5 mV or 5 mV OR 5μA
25511A 32-Channel Digital Input function card	Monitors digital input points with interrupt on change of state of any point; accommodates snap-on signal conditioning modules, including modules providing input isolation	22	22kfps	n/a	n/a	n/a
25513A 32-Channel Digital Output function card	Provides digital outputs; accommodates snap-on signal conditioning modules, including isolated solid state relay modules†	32	41kfps	n/a	n/a	n/a
25514A 16 Channel Relay Output function card	Provides isolated relay contact closure outputs for control of ac and dc loads; accommodates snap-on arc suppression modules	16	15ms switch time	n/a	n/a	n/a
25516A 16-Point In/ 16-Point Out Digital Multifunction card	Digital I/O that supports input event prescaling and event sense interrupt; accommodates snap-on signal conditioning modules including modules that provide input or output isolation	16 in and 16 out	22kfps input/ 41kfps output	n/a	n/a	n/a

‡ *Actual usable data rate will depend upon signal conditioning.*

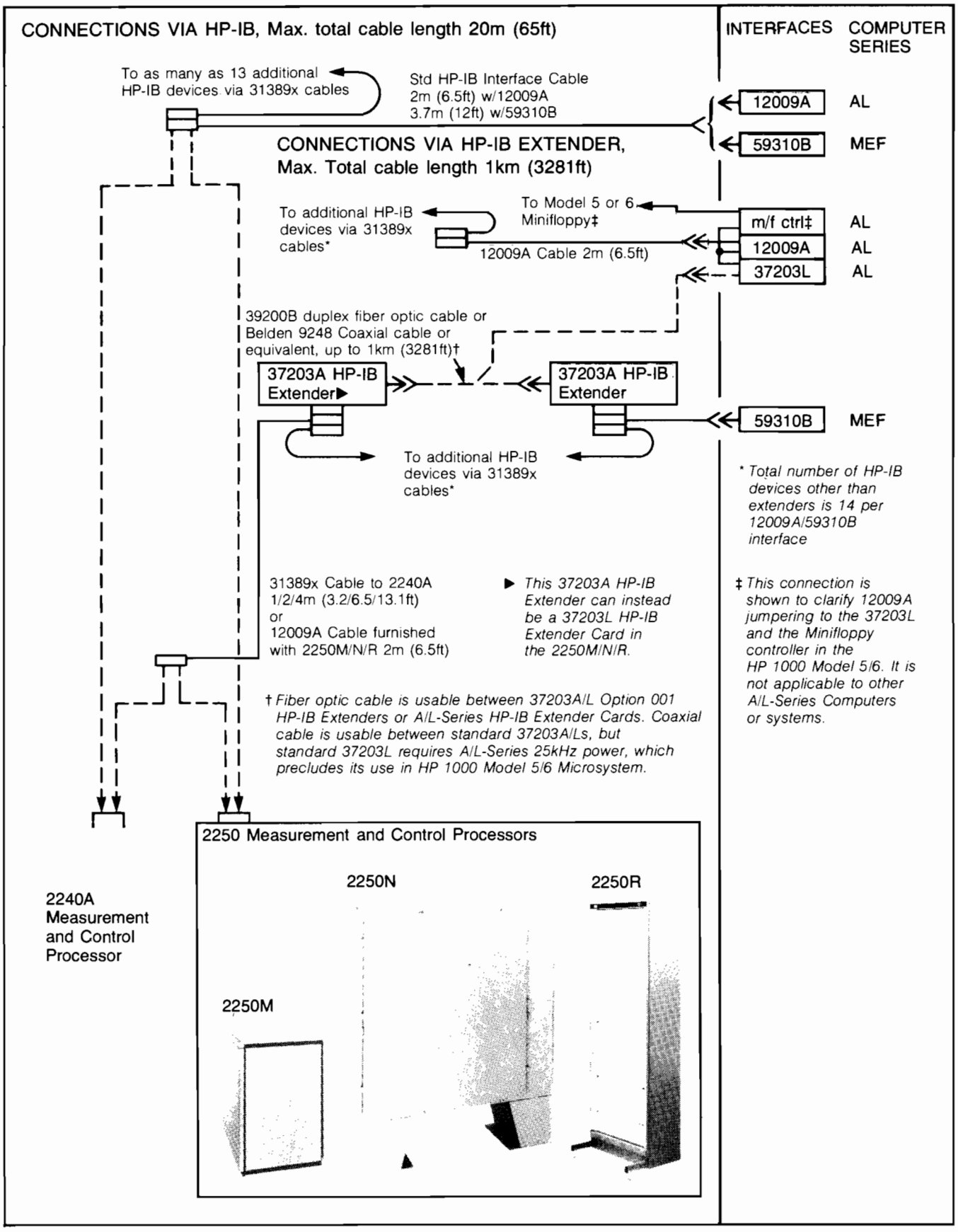
* *The ranges available are the combined result of the separate on-board amplifiers of the 25501A Analog Input Card and the 25503A/25504A Multiplexer Card used with the 25501A card.*

† Isolated solid-state relay modules reduce the number of usable points by one-half.

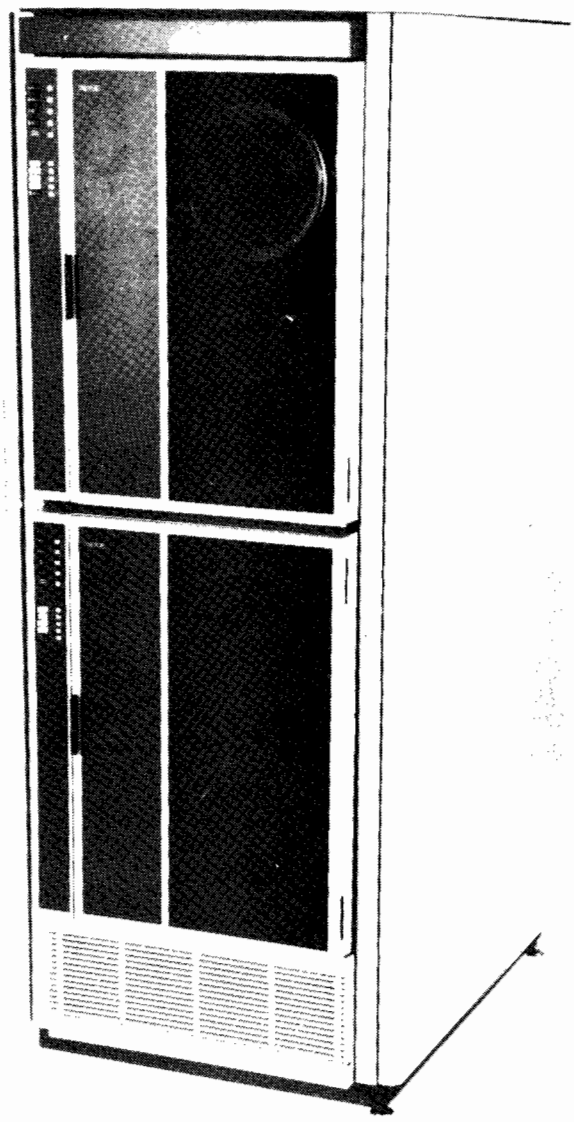
2250N/R Measurement and Control processor connections to HP 1000 A/L/M/E/F-Series Systems via DS/1000-IV link



Measurement and control processor connections to HP 1000 A/L/M/E/F-Series Systems via HP-IB



Magnetic tape units selection guide



HP 1000 A/L-Series Computer Systems operating under RTE-A.1/XL can be equipped with a 7970E 1600 bpi Phase-Encoded (P.E.) Magnetic Tape Unit interfaced via a 12009A HP-IB Interface Card.

HP 1000 M/E/F-Series Computer Systems can be equipped with 7970B 800 bpi NRZI or 7970E 1600 bpi Phase-Encoded (P.E.) Magnetic Tape Units for disc backup and other mass storage uses. These tape units are supported under the RTE-6/VM, RTE-IVB, RTE-IVE, RTE-M, and RTE-II real-time executive operating systems. They require two computer I/O channels, which can serve up to four mag tape drives. They are available one or two drives to an upright cabinet ordered as 7971A product number with appropriate options or in rack-mountable (7970B/E) configuration. The first (subsystem) drive and the required HP 1000 M/E/F-Series two-card interface plus cable and subsystem manual are ordered as a simple product number option. Each of up to three add-on drives with daisy-chair cable only is ordered in the same way.

The specifications of the 7970B/E Magnetic Tape Units are summarized in the first table below. The respective product and option numbers, and configurations of the magnetic tape units available for HP 1000 Computer Systems are summarized in the second table. Connections are shown on page 5.5-3.

Specifications	Mag Tape Product No.	
	7970B	7970E
Formats	9-track NRZI	9-track Phase-Encoded
Density	800 bpi	1600 bpi
Tape Speed	45 ips	45 ips
Max. Data Rate	36 kb/sec	72 kb/sec
Rewind Speed	160 ips	160 ips

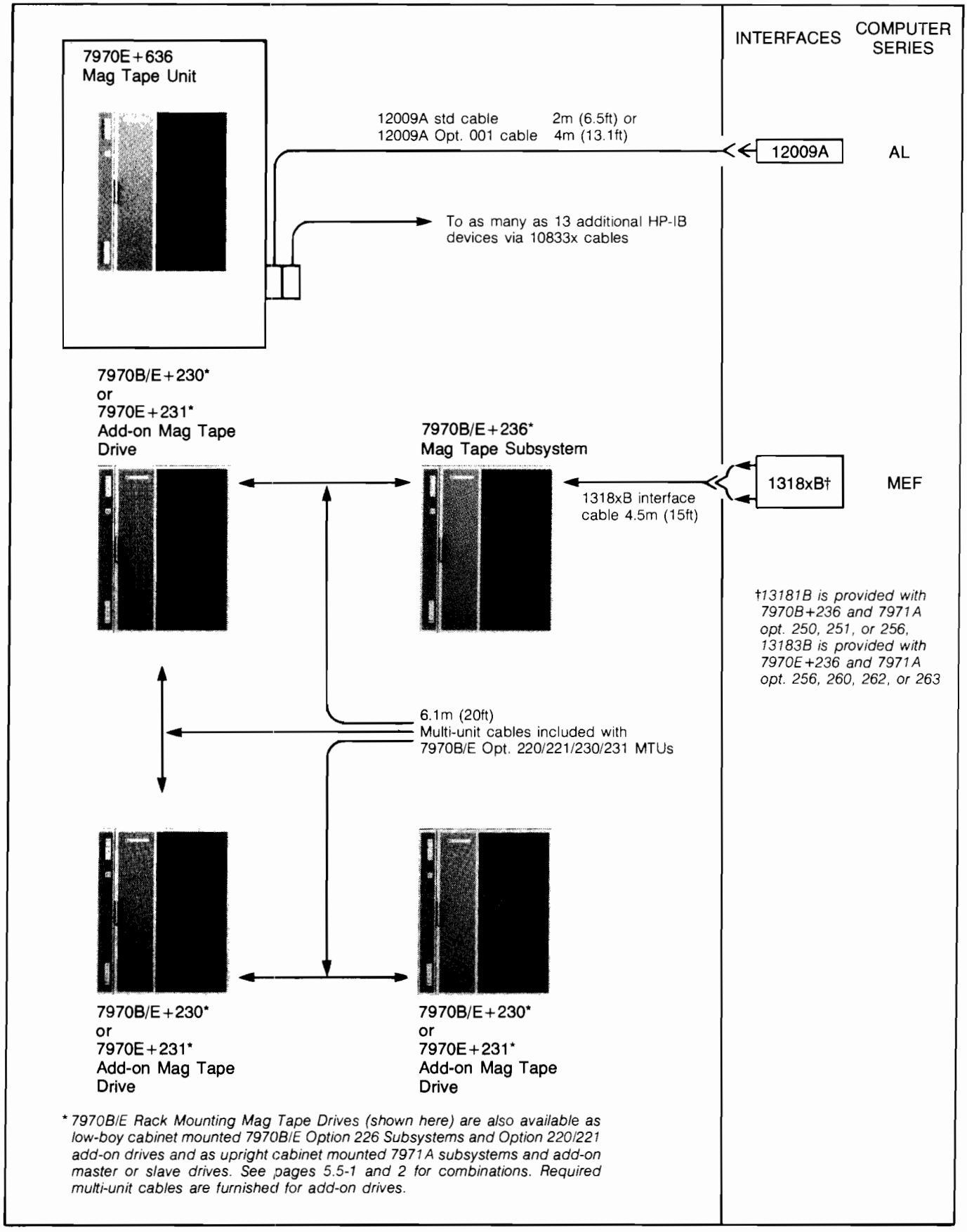
HP 1000 Magnetic Tape Configurations Summary

Product Number	Option Number	Provides
Configurations for A/L-Series Systems operating under RTE-A.1/XL		
7970E	626	1600 bpi Phase-Encoded Master HP-IB Tape Unit in low-boy cabinet; requires 1/14 of 12009A HP-IB interface
7970E	636	1600 bpi Phase-Encoded Master HP-IB Tape Unit without cabinet; requires 1/14 of 12009A HP-IB interface and user-furnished cabinet space
7971A	140	One 7970E Master HP-IB Tape Unit in upright cabinet; requires 1/14 of 12009A HP-IB interface
7971A	144	Two 7970E Master HP-IB Tape Units in upright cabinet; requires 2/14 of 12009A HP-IB interfaces

HP 1000 Magnetic Tape Configurations Summary, continued

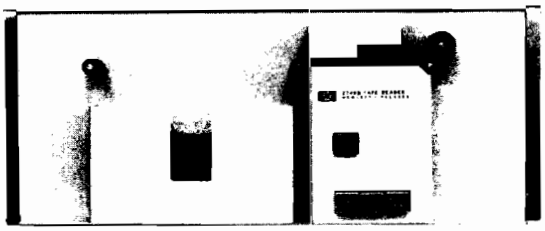
Product Number	Option Number	Provides
800 bpi Rack Mounting Configurations for M/E/F-Series Systems operating under RTE-6/VM, RTE-IVB, RTE-IVE, RTE-M, or RTE-II (these configurations require user-furnished cabinet space)		
7970B	236	800 bpi NRZI Master Magnetic Tape Subsystem with one drive and two-card 13181B interface
7970B	230	800 bpi NRZI Add-on Master Magnetic Tape Drive (max. of 4 drives per 7970B+236 subsystem)
1600 bpi Rack Mounting Configurations for M/E/F-Series Systems operating under RTE-6/VM, RTE-IVB, RTE-IVE, RTE-M, or RTE-II (these configurations require user-furnished cabinet space)		
7970E	236	1600 bpi Phase Encoded Me Encoded Magnetic Tape Subsystem with one Master drive and 13183B two-card interface
7970E	230	1600 bpi Phase Encoded Add-on Master Magnetic Tape Drive (max. of 4 drives per 7970E+236 Subsystem)
7970E	231	1600 bpi Phase Encoded Add-on Slave Magnetic Tape Drive (max. of 4 drives per 7970E+236 Subsystem)
800 and 1600 bpi Configurations in low-boy cabinet for M/E/F-Series Systems operating under RTE-6/VM, RTE-IVB, RTE-IVE, RTE-M, or RTE-II		
7970B	226	Same as 7970B with option 236, but in low-boy cabinet
7970B	220	Same as 7970B with option 230, but in low-boy cabinet
7970E	226	Same as 7970E with option 236, but in low-boy cabinet
7970E	220	Same as 7970E with option 230, but in low-boy cabinet
7970E	231	Same as 7970E with option 231, but in low-boy cabinet
Upright Cabinet Mounted 800 bpi Configurations for M/E/F-Series Systems operating under RTE-6/VM, RTE-IVB, RTE-IVE, RTE-M, or RTE-II		
7971A	250	7970B Subsystem with one master drive in upright cabinet and 13181B two-card interface
7971A	251	7970B Subsystem with two master drives in upright cabinet and 13181B two-card interface
7971A	210	One 7970B Add-on master drive in upright cabinet (max. of 4 drives per subsystem)
7971A	211	Two 7970B Add-on master drives in upright cabinet (max. of 4 drives per subsystem)
Upright Cabinet Mounted 1600 bpi Configurations for M/E/F-Series Systems operating under RTE-6/VM, RTE-IVB, RTE-IVE, RTE-M, or RTE-II		
7971A	260	7970E Subsystem with one master drive in upright cabinet and 13183B two-card interface
7971A	262	7970E Subsystem with two master drives in upright cabinet and 13181B two-card interface
7971A	263	7970E Subsystem with one master and one slave drive in upright cabinet and 13183B interface
7971A	220	One 7970E Add-on master drive in upright cabinet (max. of 4 drives per subsystem)
7971A	222	Two 7970E Add-on master drives in upright cabinet (max. of 4 drives per subsystem)
7971A	230	One 7970E Add-on slave drive in upright cabinet (max. of 4 drives per subsystem)
7971A	233	Two 7970E Add-on slave drives in upright cabinet (max. of 4 drives per subsystem)
Upright Cabinet Mounted Configurations with both 800 bpi and 1600 bpi Drives for M/E/F-Series Systems operating under RTE-6/VM, RTE-IVB, RTE-IVE, RTE-M, or RTE-II		
7971A	256	One 7970B and one 7970E Master subsystem in upright cabinet with 13181B and 13183B interfaces
7971A	212	One 7970B Add-on master drive and one 7970E add-on slave drive in upright cabinet (max. of 4 drives per subsystem)

Magnetic Tape Unit Connections

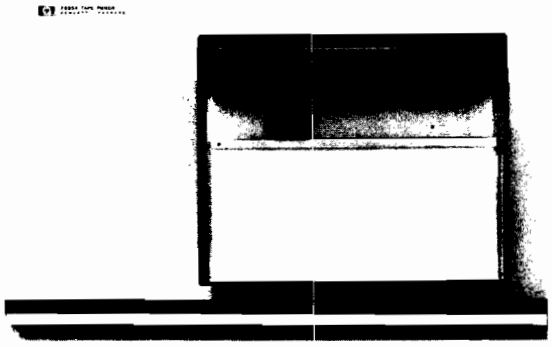


** 7970B/E Rack Mounting Mag Tape Drives (shown here) are also available as low-boy cabinet mounted 7970B/E Option 226 Subsystems and Option 220/221 add-on drives and as upright cabinet mounted 7971A subsystems and add-on master or slave drives. See pages 5.5-1 and 2 for combinations. Required multi-unit cables are furnished for add-on drives.*

Punched tape and punched card peripherals summary

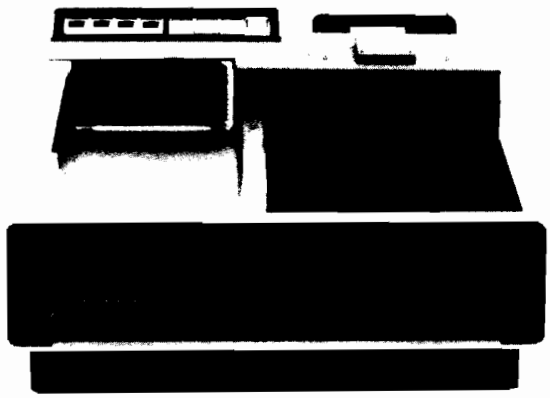


12925A Punched tape reader subsystem



12926A Tape punch subsystem

HP 1000 M/E/F-Series Systems can be equipped with any of the punched tape or punched card peripherals shown on this page. Each of these is provided as a subsystem that includes a computer interface. Performance is summarized below and connections are shown on the next page.

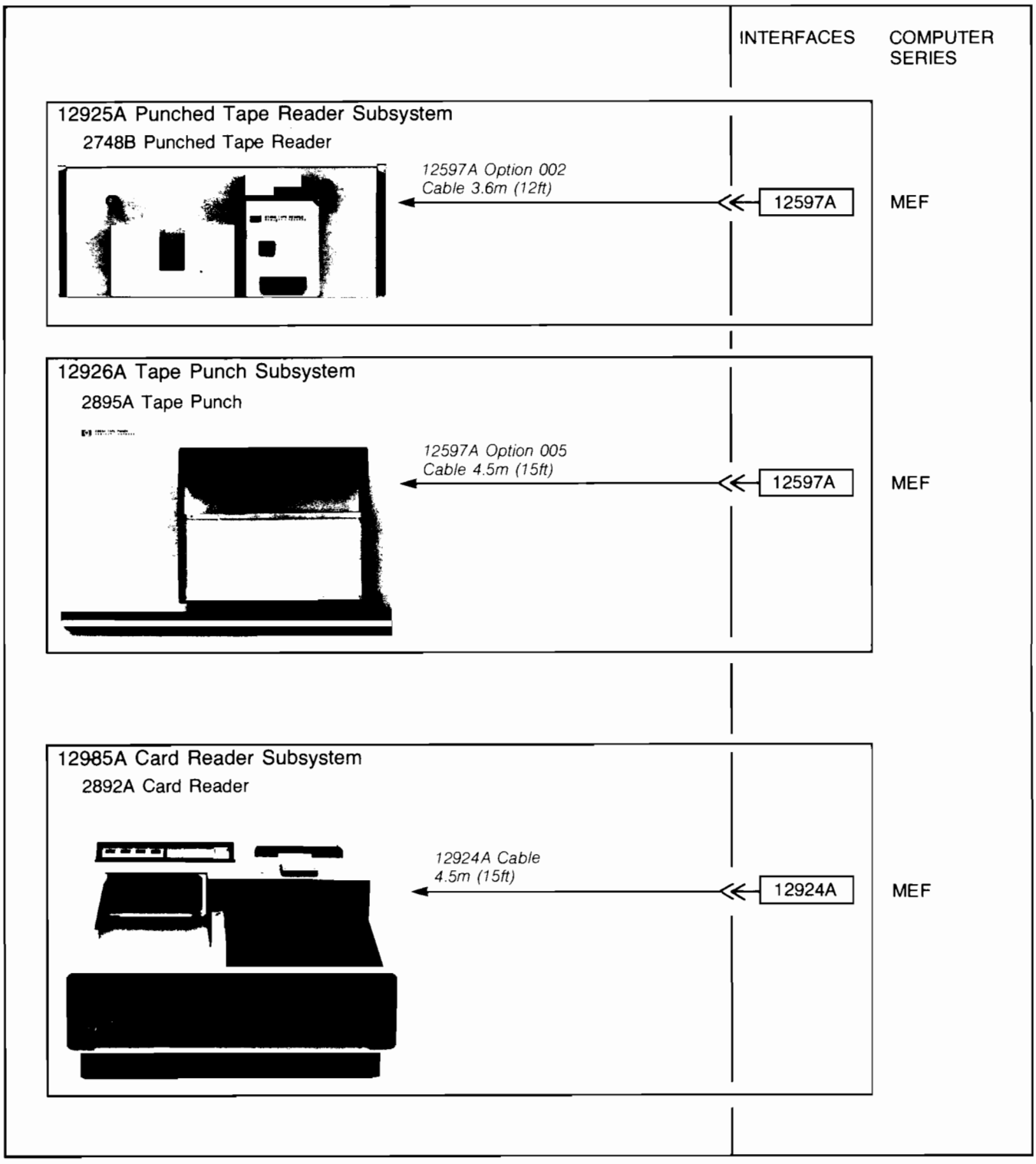


12985A Card Reader Subsystem

HP 1000 M/E/F-Series Punched Tape and Punched Card peripherals

Product No. and Name	HP 1000 Software-Supported Capabilities	Media Description	Data Rate	Other Characteristics
PUNCHED TAPE PERIPHERALS				
12925A Punched Tape Reader Subsystem	Reads 8-level code on punched tape	2.5cm (1-inch) tape with transmissivity less than 60%	500 char/sec (60 Hz), 415 char/sec (50 Hz)	Starts in less than 6 ms, stops in less than 500 ms
12926A Tape Punch Subsystem	Punches tape, either 8-level or 5-level output	2.5cm (1 in) wide paper, plastic, or mylar tape (8-level), 1.65cm (0.96 in) wide tape (5-level)	75 char/sec	Thickness: 0.08mm (0.003in) to 0.13mm (0.005in) for paper tape, to 0.1mm (0.004in) for mylar tape, to 0.11m (0.0045in) for plastic tape
PUNCHED CARD READER				
12985A Punched Card Reader Subsystem	Reads punched cards	Standard 80-column EIA tab card	600 cards/min	1000-card hopper/stacker, card life in excess of 1000 passes

Punched tape and card reader connections to HP 1000 M/E/F-Series



HP 1000 Configuration Information Locator

Power, Physical, and Environmental Characteristics

NOTE A: E/F-Series Computer Power Supply and I/O Slot Availability (+) and Requirements (−), Physical Characteristics, and Environmental Specifications of the new HP 1000 Model 40 (2176E) and Model 45 (2177F) Systems are the same as for the Model 60 (2178C) and Model 65 (2179C) Systems.

NOTE B: HP 1000 Compatibility Information has been moved to the HP 1000 Ordering and Compatibility Information booklet (5953-8730) Effective August 1, 1983 and later issues.

Power Line Voltage/Frequency Choices for HP 1000 Equipment

Product No. and Name	100V 60Hz	115V 60Hz	120V 60Hz	220V 60Hz	235V 60Hz	240V 60Hz	100V 50Hz	115V 50Hz	120V 50Hz;	220V 50Hz	230V 50Hz	240V 50Hz
	Standard and optional line voltage/frequency combinations											
HP 1000 SYSTEM PROCESSOR UNITS (SPUs) POWER LINE VOLTAGE/FREQUENCY CHOICES												
2142A/B Microsystem Processor Unit	stdT	**Std**	stdT	015T	**015**	015T	stdT	**Std**	stdT	015T	**015**	015T
217xA/C/E/F System Processor Unit	stdT	**Std**	stdT	s/pT	**s/pT**	s/p	N/S	N/S	N/S	015T	**015**	015T
2186C/D Microsystem Processor Unit	stdT	**Std**	stdT	015T	**015**	015T	stdT	**Std**	stdT	015T	**015**	015T
219xC/D System Processor Unit	stdT	**Std**	stdT	015T	**015**	015T	stdT	**Std**	stdT	015T	**015**	015T
248xA Micro 26/27/29 Syst Proc Unit	stdT	**Std**	stdT	015T	**015**	015T	stdT	**Std**	stdT	015T	**015**	015T
HP 1000 COMPUTERS POWER LINE VOLTAGE/FREQUENCY CHOICES												
2103L Microcomputer	vfsT	**Std**	vfsT	vfsT	vfsT	vfsT	vfst	**Std**	vfs	vfs	vfsT	vfsT
2108-17x Computers, except 2117F FPP	stdT	**Std***	stdT	**015**	015T	015T	stdT	**Std***	stdT	**015**	015T	015T
2117F Floating Point Processor (FPP)	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs
2122A/B Microsystem Component	stdT	**Std**	stdT	015T	**015**	015T	stdT	**Std**	stdT	015T	**015**	015T
2136C/D Microsystem Component	stdT	**Std**	stdT	015T	**015**	015T	stdT	**Std**	stdT	015T	**015**	015T
2137A Computer	stdT	**Std**	stdT	015T	**015**	015T	stdT	**Std**	stdT	015T	**015**	015T
2139A Computer	stdT	**Std**	stdT	015T	**015**	015T	stdT	**Std**	stdT	015T	**015**	015T
2156B Computer	stdT	**Std**	stdT	015T	**015**	015T	stdT	**Std**	stdT	015T	**015**	015T
243xA Micro 26/27/29 Syst Component	stdT	**Std**	stdT	015T	**015**	015T	stdT	**Std**	stdT	015T	**015**	015T
HP 1000 PERIPHERALS POWER LINE VOLTAGE/FREQUENCY CHOICES												
12925A Punched Tape Reader Subsys	N/S	**Std**	stdT	N/S	N/S	N/S	**016**	N/S	N/S	015T	**015**	015T
12926A Tape Punch Subsystem	vfs	vfs	vfsT	vfs	vfsT	vfs	vfs	vfs	vfsT	vfs	vfsT	vfs
12985A Card Reader Subsystem	N/S	**Std**	stdT	N/S	N/S	N/S	N/S	N/S	N/S	015T	**015**	015T
1351S Graphics Display System	N/S	**Std**	stdT	015T	**015**	015T	N/S	**Std**	stdT	015T	**015**	015T
224xA M&C Processor & Extender	vfsT	vfsT	vfs	vfsT	vfsT	vfs	vfsT	vfsT	vfs	vfsT	vfsT	vfs
2250x Measurement & Control System	stdT	**Std**	stdT	015T	**015**	015T	stdT	**Std**	stdT	015T	**015**	015T
238xA/B Office Display Terminal	**014**	StdT	**Std**	N/S	N/S	N/S	**016**	N/S	N/S	**015**	013T	**013**
2601A Daisywheel Printer	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs
2608A/S Line Printer	**016**	stdT	**Std**	**015**	017T	**017**	**016**	stdT	**Std**	**015**	017T	**017**
2611A Line Printer	N/S	**Std**	stdT	017T	**017**	017T	**016**	N/S	N/S	015T	015T	**015**
2619A Line Printer	N/S	**Std**	stdT	017T	**017**	017T	**016**	N/S	N/S	015T	015T	**015**
262x Terminal w/o integral printer	**014**	stdT	**Std**	N/S	N/S	N/S	**016**	N/S	N/S	**015**	013T	**013**
262x Terminal with integral printer	N/S	**Std**	stdT	N/S	N/S	N/S	N/S	**016**	016T	015T	**015**	015T
263x Printer or Printing Terminal	**016**	stdT	**Std**	**015**	017T	**017**	**016**	stdT	**Std**	**015**	017T	**017**
264x Terminals	stdT	**Std**	stdT	N/S	N/S	N/S	016T	**016**	016T	015T	**015**	015T
267x Printers	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs

* *Obsolete product listed here for reference only.*

Power Line Voltage/Frequency Choices for HP 1000 Equipment, continued

Standard and optional line voltage/frequency combinations

Product No. and Name	100V 60Hz	115V 60Hz	120V 60Hz	220V 60Hz	235V 60Hz	240V 60Hz	100V 50Hz	115V 50Hz	120V 50Hz;	220V 50Hz	230V 50Hz	240V 50Hz
HP 1000 PERIPHERALS POWER LINE VOLTAGE/FREQUENCY CHOICES, continued												
3074A/M Data Link Adapter	stdT	**Std**	stdT	015T	**015**	015T	stdT	**Std**	stdT	015T	**015**	015T
307xA Terminals	stdT	**Std**	stdT	015T	**015**	015T	stdT	**Std**	stdT	015T	**015**	015T
37203A HP-IB Extender	vfs	vfst	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs
37314A Modem Card Cage	vfs	vfs	vfs	vfs	vfs	vfs	vfs	vfs	vfs	vfs	vfs	vfs
39301A Fiber Optic Multiplexer	**210**	212T	**212**	**222**	224T	**224**	**210**	212T	**212**	**222**	224T	**224**
7220/1C/T Graphics Plotter	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs
7470A Graphics Plotter	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs
7580B/7585B Drafting Plotter	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs
7908P/R Fixed Disc	stdT	**Std***	stdT	015T	015T	015T	stdT	**Std***	stdT	015T	015T	015T
7911/7912/7914P/R Fixed Disc 7914TD *(See 7914TD NOTE, below)*	stdR	stdT	**Std**	N/S	N/S	N/S	**015**	N/S	N/S	**015**	015T	015R
79xxM/S Disc Memories	**Std**	stdT	**Std**	**015**	015T	**015**	**Std**	stdT	**Std**	**015**	015T	**015**
7933H/7935H Fixed Disc	N/S	**s/p**	120	22x	22xT	24x	N/S	s/p	120	22x	22xT	24x
7970B/E & 7971A Magnetic Tape Drives	N/S	**Std**	stdT	015T	**015**	015T	N/S	**Std**	stdT	015T	**015**	015T
82905B Impact Printer	001	002T	002	003	004T	004	001	002T	002	003	004T	004
9111A Graphics Tablet	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs
9121D/S Microfloppy Disc	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs
9133A/B Mini Winchester/Micro-floppy Disc	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs
9134A/B Mini Winchester Disc	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs
9872C/T Graphics Plotter	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs
9874A Digitizer	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs
9876A Thermal Graphics Printer	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs	vfs	vfsT	vfs
9895A Flexible Disc Memory	vfs	vfsT	vfs	vfs	vfsT	vfs	**001**	**001**	001T	**001**	001T	**001**

Std = *Standard line voltage, line frequency, or line voltage-frequency combination.*

015, 016, *etc.* = *Option number ordered to get desired line voltage, line frequency, or line voltage-frequency combination.*

s/p = *Split-phase power input to 217x System Processor Unit with two cabinet bays or to 7933H/7935H Fixed Disc.*

R = *Suffix on std (stdR) or option that denotes line voltage provided by restrapping in the field.*

T = *Suffix on std (stdT), option number (015T), s/p (s/pT) or vfs (vfsT) which denotes that the line voltage tolerance of the standard, optional, split-phase, or field settable voltage input overlaps the voltage in the column in which the T (Tolerance) suffix appears. For full range, see the power requirements table on pages 6.1-2 and 6.1-3.*

vfs = *Power line voltage that is easily selected in the field as alternate, so no line voltage option is required. Line voltage is usually preset at the factory to meet requirement of the country to which item is being shipped.*

N/S = *Power line voltage/frequency combination that is Not Supported.*

* = *Std line voltage of 2108-2117 Computers and 7908P Disc is 110V.*

NOTE: The appearance of Std, the same option number, or vfs in two or more columns on the same line signifies:

1. *The power supply and ventilation fan of the System Processor Unit, Computer, or Peripheral operate from both 50 and 60 Hz line frequencies, so line frequency need not be specified by option.*

OR

2. *Ordering the Std power supply or a power supply option determines operation from 60 Hz or 50 Hz line frequency, with any of the covered line voltages easily selected in the field, such that power line voltage need not be specified by option.*

7914TD NOTE: *The 7914TD includes both a 7914R Fixed Disc and a 7970E Magnetic Tape Drive, which have somewhat different operational power capabilities. Both the 7911/7912/7914P/R and 7970B/E entries should be checked when deciding what power option, if any, should be ordered.*

HP 1000 Systems, Computers, and Peripherals Power Requirements

PRODUCT NUMBER AND NAME	MAX. AC POWER (NOTE A)	VOLTAGE LIMITS (V)		FREQUENCY LIMITS (Hz)	
		115V	(230V)	60 Hz	50 Hz
HP 1000 SYSTEM PROCESSOR UNIT (SPU) POWER REQUIREMENTS (Excludes requirements of system console terminal and (hard) non-integrated system disc, which are ordered separately).					
2142x MODEL 5 MICROSYSTEM SPU	300W	90-138	(190-260)	48-66	(48-66)
2186x MODEL 6/6+ MICROSYSTEM SPU	300W	90-138	(190-260)	48-66	(48-66)
2176C/E MODEL 40 SPU (EMI unqualified/qualified)	800W	88-132	(176-264)	48-66	(48-66)
2177C/F MODEL 45 SPU (EMI unqualified/qualified)	1000W	90-132*	(198-264)#	48-66	(48-66)
2178A/C MODEL 60 SPU (EMI unqualified/qualified)	800W	88-132	(176-264)	48-66	(48-66)
2179A/C MODEL 65 SPU (EMI unqualified/qualified)	1000W	90-132*	(198-264)#	48-66	(48-66)
219xC MODEL 26/27/29 SPU (56-in Cabinet)	2760W@	86-138	(178-276)	48-66	(48-66)
219xD MODEL 26/27/29 SPU (22.5-in Cabinet)	1380W	86-138	(178-276)	48-66	(48-66)
248xA MICRO 26/27/29 SPU	770W	86-138	(178-276)	48-66	(48-66)
248xA Opt 110 Discs Add	80W	86-138	(178-276)	48-66	(48-66)
HP 1000 COMPUTERS POWER REQUIREMENTS					
2103L MICROCOMPUTER (L-Series w/8 I/O Channels)	500W	86-127	(195-253)	47-66	(47-66)
2108M COMPUTER (M-Series w/9 I/O Channels)	750W	88-132	(176-264)	48-66	(48-66)
2112M COMPUTER (M-Series w/14 I/O Channels)	750W	88-132	(176-264)	48-66	(48-66)
2109E COMPUTER (E-Series w/9 I/O Channels)	750W	88-132	(176-264)	48-66	(48-66)
2113E COMPUTER (E-Series w/14 I/O Channels)	750W	88-132	(176-264)	48-66	(48-66)
2111F COMPUTER (F-Series w/9 I/O Channels)	750W	88-132	(176-264)	48-66	(48-66)
2117F COMPUTER (F-Series w/14 I/O Channels)	950W	90-132*	(198-264)#	48-66	(48-66)
2122x MODEL 5 MICROSYSTEM COMPONENT	300W	90-138	(190-260)	48-66	(48-66)
2186x MODEL 6/6+ MICROSYSTEM COMPONENT	300W	90-138	(190-260)	48-66	(48-66)
2137A COMPUTER (A700 w/16 I/O Channels)	700W	86-138	(178-276)	48-66	(48-66)
2139A COMPUTER (A900 w/15 I/O Channels)	700W	86-138	(178-276)	48-66	(48-66)
2156A/B COMPUTER (A600/A600+ w/18 I/O Channels)	700W	86-138	(178-276)	48-66	(48-66)
243xA MICRO 26/27/29 SYSTEM COMPONENT	770W	86-138	(178-276)	48-66	(48-66)
243xA Opt 110 Discs Add	80W	86-138	(178-276)	48-66	(48-66)
HP 1000 PERIPHERALS POWER REQUIREMENTS					
12732A FLEXIBLE DISC SUBSYSTEM	160W	90-126**	(195-252)#	57.9-62.1	(48.3-51.7)
12733A Add-on FLEXIBLE DISC DRIVE	130W	90-126**	(195-252)#	57.9-62.1	(48.3-51.7)
12925A PUNCHED TAPE READER SUBSYSTEM (obsolete)	240W	104-126	(207-253)	57-63	(47.5-52.5)
12926A TAPE PUNCH SUBSYSTEM	225W	90-126**	(198-264)#	47.5-100	(47.5-100)
12985A CARD READER SUBSYSTEM	345W	104-126	(207-253)	58.8-61.2	(49-51)
1351S GRAPHICS DISPLAY SYSTEM	165W	108-126	(207-252)	48-66	(48-66)
2250A INDUSTRIAL MEASUREMENT AND CONTROL SYSTEM	500W	86-127	(195-253)	47-66	(47-66)
2250H MEASUREMENT AND CONTROL SYSTEM	500W	86-127	(195-253)	47-66	(47-66)
2250M MOBILE MEASUREMENT AND CONTROL SYSTEM	500W	86-127	(195-253)	47-66	(47-66)
2255H MEASUREMENT AND CONTROL SUBSYSTEM	500W	86-127	(195-253)	47-66	(47-66)
2382A OFFICE DISPLAY TERMINAL	80W	90-126**	(198-252)#	59-61	(49-51)
2563A LINE PRINTER	800W	90-126**	(198-252)#	48-66	(48-66)
2601A DAISYWHEEL PRINTER	180W	85-132*	(187-264)#	49-61	(49-61)
2608A/S LINE PRINTER	1125W	90-126**	(198-252)#	57-66	(47.5-55)
2621B INTERACTIVE TERMINAL	50W+	86-126	(173-253)#	57-63	(47.5-52.5)
2622A DISPLAY TERMINAL	120W+	90-126**	(198-252)#	57-63	(47.5-52.5)
2623A GRAPHICS TERMINAL	120W+	90-126**	(198-252)#	57-63	(47.5-52.5)
2627A COLOR GRAPHICS TERMINAL	250W	90-126**	(198-252)#	57-63	(47.5-52.5)
2624B DISPLAY TERMINAL	120W+	90-126**	(198-252)#	57-63	(47.5-52.5)
2626A DISPLAY STATION	120W+	90-126**	(198-252)#	57-63	(47.5-52.5)
2631B PRINTER	200W	88-132*	(194-264)#	48-66	(48-66)
2635B PRINTING TERMINAL	200W	88-132*	(194-264)#	48-66	(48-66)
2645A DISPLAY STATION	140W	89-126	(196-253)	58.8-61.2	(49-51)
2648A GRAPHICS TERMINAL	150W	89-126	(196-253)	58.8-61.2	(49-51)

NOTE A: Power Factor (PF) is typically about 0.75, with a range of 0.7 to 0.78. Use of a PF of 0.7 to 0.72 to estimate ac input requirements in Volt-Amps (VA) from Watts (W) is recommended to assure sufficient total input power (VA = W/PF). For estimation of ventilation or air conditioning requirements in BTU per hour, multiply Watts by 3.419. To determine heat dissipation requirements in kilogram-calories per hour, multiply Watts by 0.8598.

* Range shown for 115V here includes user-selectable choice of 100V or 120V input plus the voltage tolerance.

** Range shown for 115V here includes user-selectable choice of 100V or 120V input plus the voltage tolerance (there may be a gap between 105V and 108V).

\# Range shown for 230V here includes user-selectable choice of 220V or 240V input plus the voltage tolerance.

@ Split-phase power is required for this computer system.

\+ Option 050 integral printer adds 71VA to 262x Terminal power consumption.

HP 1000 Systems, Computers, and Peripherals Power Requirements, continued

PRODUCT NUMBER AND NAME	MAX. AC POWER (NOTE A)	VOLTAGE LIMITS (V)		FREQUENCY LIMITS (Hz)	
		115V	(230V)	60 Hz	50 Hz
HP 1000 PERIPHERALS POWER REQUIREMENTS, continued					
2671A/G PRINTER/GRAPHICS PRINTER	50W	90-126**	(198-252)#	47-66	(47-66)
2673A INTELLIGENT GRAPHICS PRINTER	75W	90-126**	(198-252)#	47-66	(47-66)
2687A DESKTOP LASER PAGE PRINTER	840W	104-126	(198-264)#	59.4-60.6	(49.5-50.5)
2932A GENERAL-PURPOSE PRINTER	207W	90-126**	(198-252)#	48-66	(48-66)
3074A/M DATA LINK ADAPTER	11W	87-126	(173-253)	48-66	(48-66)
3075A/3076A DATA CAPTURE TERMINAL	90W(t)	87-126	(173-253)	48-66	(48-66)
3077A TIME REPORTNG TERMINAL	90W(t)	87-126	(173-253)	48-66	(48-66)
37203A HP-IB EXTENDER	19W	90-126**	(198-253)#	48-66	(48-66)
37214A SYSTEMS MODEM CARD CAGE	53W	90-126**	(198-252)#	48-66	(48-66)
39301A FIBER OPTIC MULTIPLEXER	14W	90-126**	(198-252)#	48-66	(48-66)
722xT 8-pen RS-232-C GRAPHICS PLOTTERS	180W	90-126**	(198-252)#	48-66	(48-66)
7470A 2-pen PLOTTERS	25W	90-126**	(198-252)#	48-66	(48-66)
7580B/7858B 8-pen DRAFTING PLOTTERS	170W	90-126**	(198-252)#	48-66	(48-66)
7906M standalone 19.6Mb MAC MASTER CARTRIDGE DISC	740W	90-126**	(198-252)#	48-66	(48-66)
7906MR rack mtg 19.6Mb MAC MASTER CARTRIDGE DISC	720W	90-126*	(198-252)#	48-66	(48-66)
7906S standalone 19.6Mb MAC SLAVE CARTRIDGE DISC	520W	90-126**	(198-252)#	48-66	(48-66)
7906SR rack mtg 19.6Mb MAC SLAVE CARTRIDGE DISC	500W	90-126**	(198-252)#	48-66	(48-66)
7908P/R 16.5Mb CS/80 FIXED DISC w/CTU backup	400W	88-127	(180-253)	48-66	(48-66)
7911P/R 28.1Mb CS/80 FIXED DISC w/CTU backup	700W	90-126**	(198-252)#	54-66	(48-55)
7912P/R 65.6Mb CS/80 FIXED DISC w/CTU backup	700W	90-126**	(198-252)#	54-66	(48-55)
7914P/R 132.1Mb CS/80 FIXED DISC w/CTU backup	700W	90-126**	(198-252)#	54-66	(48-55)
7914TD 132.1Mb CS/80 FIXED DISC & 1600 BPI MTU	1100W	104-126	(207-252)	54-66	(48-55)
7920M standalone 50Mb MAC MASTER DISC	700W	90-126**	(198-252)#	48-66	(48-66)
7920S standalone 50Mb MAC SLAVE DISC	480W	90-126**	(198-252)#	48-66	(48-66)
7925M standalone 120Mb MAC MASTER DISC	600W	90-126**	(198-252)#	48-66	(48-66)
7925S standalone 120Mb MAC SLAVE DISC	400W	90-126**	(198-252)#	48-66	(48-66)
7933H 404Mb CS/80 Fixed DISC	1400W	90-132**	(198-264)#	48-66	(48-66)
7935H Removable Media 404Mb CS/80 DISC	1400W	90-132**	(198-264)#	48-66	(48-66)
7970B/E 800/1600 bpi MAGNETIC TAPE UNIT	400W	104-126	(207-252)	48-66	(48-66)
7971A MAGNETIC TAPE SUBSYSTEM with one drive	400W	104-126	(207-252)	48-66	(48-66)
Additional drive for 7971A mag tape subsystem	400W	104-126	(207-252)	48-66	(48-66)
82905B IMPACT PRINTER	100W	90-132*	(198-264)#	48-66	(48-66)
82906A DOT-MATRIX PRINTER	70W	90-132*	(198-264)#	48-66	(48-66)
9111A GRAPHICS TABLET	25W	90-132*	(198-264)	48-66	(48-66)
9121D/S Dual/Single MICROFLOPPY DISC	72W	86-127	(196-253)	48-66	(48-66)
9133A 4.6Mb MINI WINCHESTER/MICROFLOPPY DISC	140W	90-126**	(196-252)#	48-66	(48-66)
9133B 9.2Mb MINI WINCHESTER/MICROFLOPPY DISC	140W	90-126**	(196-252)#	48-66	(48-66)
9134A/B 4.6/9.2Mb WINCHESTER DISC	140W	90-126**	(196-252)#	48-66	(48-66)
9872C/T 8-pen GRAPHICS PLOTTER	180W	90-126**	(198-252)#	48-66	(48-66)
9876A THERMAL GRAPHICS PRINTER	110W	90-132*	(198-264)#	48-66	(48-66)
9895A FLEXIBLE DISC MEMORY	180W	90-132*	(198-264)#	58.8-61.2	(49-51)

NOTE A: Power Factor (PF) is typically about 0.75, with a range of 0.7 to 0.78. Use of a PF of 0.7 to 0.72 to estimate ac input requirements in Volt-Amps (VA) from Watts (W) is recommended to assure sufficient total input power (VA = W/PF). For estimation of ventilation or air conditioning requirements in BTU per hour, multiply Watts by 3.419. To determine heat dissipation requirements in kilogram-calories per hour, multiply Watts by 0.8598.

** Range shown for 115V here includes user-selectable choice of 100V or 120V input plus the voltage tolerance (there may be a gap between 105V and 108V).

Range shown for 230V here includes user-selectable choice of 220V or 240V input plus the voltage tolerance.

(t) = Typical power requirement, not maximum.

A/L-Series Computer Power Supply and Card Cage Slot Availability (+) and Requirements (−)

Product Number and Name	Card Cage Slots	Direct Current at +5V	Direct Current at +5(M)	Direct Current at +12V	Direct Current at -12V	25kHz ac Pwr at 39V rms	Total Power Supply
COMPUTERS AND SYSTEMS							
2103L (L-Series) Computer with 64kb memory	+8	+19.6A	+0.3A	+3.9A	+2.0A	+70W	n/s
2103L Option 011: 128kb memory instead of 64kb	nnc	-1.8A	nnc	nnc	nnc	nnc	n/s
2103L Option 012: 512kb memory instead of 64kb	nnc	-2.1A	-0.3A	nnc	nnc	nnc	n/s
2106BK (A600+) Board Computer -- CPU & 128kb Mem Cds	-2	-9.6A	-1.1A	0A	0A	0W	-53.5W
2106BK Option 012: 512kb memory instead of 128kb	nnc	-0.1A	-0.3A	nnc	nnc	n/a	- 2.0W
2107AK (A700) Board Computer -- CPU & 128kb Mem Cards	-4	-17.2A	-1.3A	0A	0A	0W	-92.5W
2107AK Option 001: Hardware Floating Point Processor	-1	-4.0A	nnc	nnc	nnc	nnc	-20.0W
2107AK Option 014: Delete 128kb Memory Array Card	+1	+1.1A	+0 9A	nnc	nnc	nnc	+10.0W
2122A (L-Series) Microsystem Component w/64kb memory	+3	+22.4A	+0.3A	+2.3A	+1.4A	0W	n/s
2122B (L-Series) Microsystem Component w/64kb memory	+5	+24.7A	+0.3A	+3.9A	+1.4A	0W	n/s
2122A/B Option 011: 128kb memory instead of 64kb	nnc	-1.8A	nnc	nnc	nnc	nnc	n/s
2122A/B Option 012: 512kb memory instead of 64kb	nnc	-2.1A	-0.3A	nnc	nnc	nnc	n/s
2136C (A600+) Microsystem Component with 128kb memory	+3	+12.6A	+4.9A	+2.5A	+1.4A	0W	n/s
2136D (A600+) Microsystem Component with 128kb memory	+5	+15.6A	+4.9A	+3.8A	+1.4A	0W	n/s
2136C/D Option 012: 512kb memory instead of 128kb	nnc	nnc	-0.1A	nnc	nnc	nnc	n/s
2137A (A700) Computer with 128kb memory	+16	+42.8A	+5.6A	+5.6A	+3.5A	0W	n/s
2137A Option 001: Hardware Floating Point Processor	-1	-4.0A	nnc	nnc	nnc	nnc	n/s
2137A Option 014: Deletes std memory array card	+1	+1.1A	+1.1A	nnc	nnc	nnc	n/s
2139A (A900) Computer with 768kb ECC memory	+15	+41.8A	+7.0A	+5.5A	+3.5A	0W	n/s
2139A Option 014: Deletes std ECC memory array card	+1	+1.0A	+2.0A	nnc	nnc	nnc	n/s
2142A Model 5 (L-Series) Microsystem w/128kb memory	+3	+20.6A	+0.3A	+2.5A	+1.4A	0W	n/s
2142B Model 5 (L-Series) Microsystem w/128kb memory	+4	+22.6A	+0.3A	+3.7A	+1.4A	0W	n/s
2142A/B Option 012: 512kb memory instead of 128kb	nnc	-0.3A	-0.3A	nnc	nnc	nnc	n/s
2156B (A600+) Computer with 128kb memory	+18	+50.4A	+5.9A	+5.6A	+3.5A	0W	n/s
2156B Option 012: 512kb memory instead of 128kb	nnc	nnc	-0.1A	nnc	nnc	nnc	n/s
2186C Model 6+ (A600+) Microsystem with 512kb memory	+3	+12.6A	+4.8A	+2.5A	+1.4A	0W	n/s
2186D Model 6+ (A600+) Microsystem with 512kb memory	+4	+13.5A	+4.8A	+3.7A	+1.4A	0W	n/s
2196C/D (Model 26) System Processor Unit w/512kb mem	+16	+46.3A	+5.8A	+5.3A	+3.4A	0W	n/s
2196C Option 070: Compatibility w/7914TD disc+MTU	-1	-2.1A	nnc	-0.1A	nnc	nnc	n/s
2197C/D (Model 27) System Processor Unit w/512kb mem	+13	+35.1A	+5.5A	+5.3A	+3.4A	0W	n/s
2197C/D Option 014: Deletes std memory array card	+1	+1.1A	+1.1A	nnc	nnc	nnc	n/s
2197C Option 070: Compatibility w/7914TD disc+MTU	-1	-2.1A	nnc	-0.1A	nnc	nnc	n/s
2197C/D Option 701: Microprogramming Pack w/2Mb mem	-1	-0.2A	-1.5A	nnc	nnc	nnc	n/s
2199C/D (Model 29) System Proc Unit w/768kb ECC mem	+12	+38.1A	+7.0A	+5.2A	+3.4A	0W	n/s
2199C/D Option 014: Deletes std ECC memory array card	+1	+1.0A	+2.0A	nnc	nnc	nnc	n/s
2199C Option 070: Compatibility w/7914TD disc+MTU	-1	-2.1A	nnc	-0.1A	nnc	nnc	n/s
2199C/D Option 101: Perf/900 pack w/768kb add'l mem	-1	nnc	-1.0A	nnc	nnc	nnc	n/s
2199C/D Option 102: Performance/900 pack w/2304kb additional memory (brings total to 3Mb)	-3	nnc	-3.0A	nnc	nnc	nnc	n/s
2436A Micro 26 System Component with 128kb memory	+12	+33.4A*	+5.9A*	+7.0A*	+3.0A*	0W	+246.5W
2436A Option 012: 512kb memory instead of 128kb	nnc	nnc	-0.1A	nnc	nnc	nnc	- 0.5W
2436A Option 110: Adds fixed & microfloppy discs	-1	-5.7A	nnc	-2.5A	nnc	nnc	-58.5W
2436E Micro 26 System Component with 512kb memory	+12	+33.4A*	+5.8A*	+7.0A*	+3.0A*	0W	+246.0W
2436E Option 110: Adds fixed & microfloppy discs	-1	-5.7A	nnc	-2.5A	nnc	nnc	-58.5W
2437A Micro 27 System Component with 128kb memory	+10	+25.9A*	+5.6A*	+7.0A*	+3.0A*	0W	+207.5W
2437A Option 001: Hardware Floating Point Processor	-1	-4.0A	nnc	nnc	nnc	nnc	-20.0W
2437A Option 014: Deletes std memory array card	+1	+1.1A	+1.1A	nnc	nnc	nnc	+11.0W
2437A Option 110: Adds fixed & microfloppy discs	-1	-5.7A	nnc	-2.5A	nnc	nnc	-58.5W
2439A Micro 29 System Component with 768kb ECC memory	+9	+26.8A*	+1.0A*	+7.0A*	+3.0A*	0W	+189.0W
2439A Option 014: Deletes std ECC memory array card	+1	+1.0A	+2.0A	nnc	nnc	nnc	+15.0W
2439A Option 110: Adds fixed & microfloppy discs	-1	-5.7A	nnc	-2.5A	nnc	nnc	-58.5W
2486A Micro 26 System Processor Unit w/512kb memory	+10	+29.7*	+5.8A*	+8.7A*	+2.9A*	0W	+222.7W
2486A Option 101/102/103/121/122/123 Package w/512kb additional memory	-1	-1.1A	-1.1A	nnc	nnc	nnc	-11.0W
2486A Option 110: Adds fixed & microfloppy discs	nnc	-3.6A	nnc	-2.4A	nnc	nnc	-46.8W
2487A Micro 27 System Processor Unit w/512kb memory	+8	+22.0A*	+5.6A*	+8.7A*	+2.9A*	0W	+184.2W
2487A Option 001: Hardware Floating Point Processor	-1	-4.0A	nnc	nnc	nnc	nnc	-20.0W
2487A Option 014: Deletes std memory array card	+1	+1.1A	+1.1A	nnc	nnc	nnc	+11.0W
2487A Option 101/102/103/121/122/123 Package w/512kb additional memory (1Mb array card instead of 512kb)	nnc	-0.2A	-0.5A	nnc	nnc	nnc	- 3.5W
2487A Option 110: Adds fixed & microfloppy discs	nnc	-3.6A	nnc	-2.4A	nnc	nnc	-46.8W
2489A Micro 29 System Processor Unit w/768kb ECC mem	+7	+23.1A*	+1.0A*	+8.7A*	+2.9A*	0W	+165.7W
2489A Option 014: Deletes std ECC memory array card	+1	+1.0A	+2.0A	nnc	nnc	nnc	+15.0W
2489A Option 101/102/103/121/122/123 Package w/768kb additional memory (brings total to 1.5Mb)	nnc	nnc	-1.0A	nnc	nnc	nnc	- 5.0W
2489A Option 110: Adds fixed & microfloppy discs	nnc	-3.6A	nnc	-2.4A	nnc	nnc	-46.8W

FOOTNOTES: n/s = not specified; nnc = no net change; n/a = not applicable

* Total power output from the 243xA/248xA power supply cannot exceed 300W, maximum; use total power supply wattage figures in the last column of the table to confirm that total power output is not exceeded.

A/L-Series Computer Power Supply and Card Cage Slot Availability (+) and Requirements (−), continued

Product Number and Name	Card Cage Slots	Direct Current at +5V	Direct Current at +5(M)	Direct Current at +12V	Direct Current at -12V	25kHz ac Pwr at 39V rms	Total Power Supply
MEMORY, INTERFACES, AND OTHER ACCESSORIES							
12002A 128kb Memory Controller (L-Series)	-1	-3.3A	-0.7A	0A	0A	0W	n/s
12002B 512kb Memory Controller (L-Series)	-1	-3.4A	-1.0A	0A	0A	0W	n/s
12003A 128kb Parity Memory Array Card (L-Series)	-1	-1.4A	-0.5A	0A	0A	0W	n/s
12005A/B Asynchronous Serial Interface	-1	-1.6A	0A	-0.2A	-0.1A	0W	-11.6W
12006A Parallel Interface	-1	-1.9A	0A	-0.2A	0A	0W	-11.9W
12007B HDLC Modem Interface to HP 1000	-1	-2.6A	0A	-0.4A	-0.2A	0W	-20.2W
12008A PROM Storage Module	-1	-2.0A	0A	-0.1A	0A	0W	-11.2W
12009A HP-IB Interface	-1	-2.1A	0A	-0.1A	0A	0W	-11.7W
12010A Breadboard Interface (NOTE A)	-1	-0.8A	0A	-0.1A	0A	0W	- 5.2W
12011A Extender Card	nnc	0A	0A	0A	0A	0W	n/a
12012A Priority Jumper Card	-1	0A	0A	0A	0A	0W	n/a
12013A Battery Backup Card for 2103L/LK, 2106BK & Microsystems	-1	0A	0A	-0.1A	0A	0W	n/s
12030A Ten-Slot Card Cage	+10	n/a	n/a	n/a	n/a	n/a	n/a
12031A Sixteen-Slot Card Cage	+16	n/a	n/a	n/a	n/a	n/a	n/a
12032A Five-Slot Card Cage	+5	n/a	n/a	n/a	n/a	n/a	n/a
12040B/12041A 8-Channel Asynchronous Multiplexer	-1	-2.5A	0A	-0.1A	-0.1A	0W	-14.9W
12042B/12043A Programmable Serial Interface	-1	-2.6A	0A	-0.4A	-0.2A	0W	-20.2W
12044A HDLC Direct Connect Interface to HP 1000	-1	-2.4A	0A	-0.3A	-0.1A	0W	-16.8W
12060A/B High-Level Analog Input Card (8 inputs)**	-1	-1.1A	0A	0A	0A	-7.3W*	-12.8W
12061A Expansion Multiplexer Card (adds 32 inputs to 12060A/B)**	-1	-0.1A	0A	0A	0A	-2.0W*	- 2.5W
12062A Analog Output Card (4 isolated outputs)**	-1	-1.2A	0A	0A	0A	-7.6W*	-13.6W
12063A 16-In/16-Out Isolated Digital I/O Card**	-1	-1.0A	0A	0A	0A	-11.4W*	-16.4W
12072A DS/1000-IV Data Link Slave I/F to HP 1000	-1	-1.5A	0A	-0.2A	-0.1A	0W	-11.1W
12073A Bisync Modem Interface to HP 3000	-1	-2.6A	0A	-0.4A	-0.2A	0W	-20.2W
12075A DSN/X.25 (LAP-B) Network Interface	-1	-2.6A	0A	-0.4A	-0.2A	0W	-20.2W
12082A Bisync Direct Connect Interface to HP 3000	-1	-2.4A	0A	-0.3A	-0.1A	0W	-16.8W
12092A A-Series Multipoint/Data Link Interface	-1	-2.6A	0A	-0.4A	-0.2A	0W	-20.2W
12103A 128kb Parity Mem Array Card (A600+/A700 oper)#	-1	-1.1A	-1.0A	0A	0A	0W	-10.5W
12103B 256kb Parity Mem Array Card (A700 only, oper)#	-1	-1.1A	-1.0A	0A	0A	0W	-10.5W
12103A/B 128/256kb Mem Array Cd (A700 only, standby)#	-1	0A	-0.5A	0A	0A	0W	- 2.5W
12103C 512kb Parity Mem Array Cd (A600+/A700, oper)#	-1	-1.1A	-1.1A	0A	0A	0W	-11.0W
12103C 512kb Memory Array Card (A700 only, standby)#	-1	0A	-0.6A	0A	0A	0W	- 3.0W
12103D 1Mb Parity Mem Array Card (A600+/A700 oper)#	-1	-1.3A	-1.6A	0A	0A	0W	-14.5W
12103D 1Mb Memory Array Card (A700 only, standby)#	-1	0A	-1.0A	0A	0A	0W	- 5.0W
12104A 512kb ECC Memory Array Card (A700 only, oper)#	-1	-1.5A	-1.4A	0A	0A	0W	-14.5W
12104A 512kb ECC Mem Array Card (A700 only, standby)#	-1	0A	-0.7A	0A	0A	0W	- 3.5W
12153A A700 Writable Control Store Card	-1	-4.1A	0A	-0.1A	0A	0W	-21.7W
12154A Battery Backup Card for 243xA/248xA Micro 1000 Systems	-2	0A	nnc	nnc	nnc	nnc	- 8.0W
12155A A700 PROM Control Store Card (fully loaded)	-1	-6.3A	0A	0A	0A	0W	-31.5W
12156A A700 Hardware Floating Point Processor Card	-1	-4.0A	0A	0A	0A	0W	-20.0W
12157A Battery Backup System for 219xC/D, 2137/9A, or 2156B	0	0A	0A	0A	0A	0W	n/s
12158A 25kHz Pwr Mod for 219xC/D, 2137/9A, or 2156B	0	0A	0A	0A	0A	+50W	n/s
12159A 25kHz Sine Wave Card for 243xA/248xA	0	0A	0A	0A	0A	+30W	n/s
12205A A900 Control Store Bd (when loaded w/2k PROMs)	-1	-4.4A	0A	0A	0A	0W	-22.0W
12220A Addressed 768kb ECC Mem Array Card (A900 only)	-1	-1.0A	-2.0A	0A	0A	0W	-15.0W
12220A Unaddr 768kb ECC Mem Array Card (A900 only)	-1	0A	-1.0A	0A	0A	0W	- 5.0W
37203L HP-IB Extender Card (coaxial cable trans)**	-1	-0.8A	0A	0A	0A	-0.8W	- 4.8W
37203L+001 HP-IB Extender Card using fiber optic cable communication	-1	-0.8A	0A	0A	0A	0W	- 4.0W
37222A Integral Modem Card	-1	-1.2A	0A	-0.1A	-0.1A	0W	- 8.4W

FOOTNOTES: n/s = not specified; nnc = no net change; n/a = not applicable

* Total power output from the 243xA/248xA power supply cannot exceed 300W, maximum; use total power supply wattage figures in the last column of the table to confirm that total power output is not exceeded.

** This card requires 25kHz power, which precludes its use in the 2122A/B, 2186C/D, 2142A/B, or 2186C/D Microsystem and requires addition of the 12158A 25kHz power module in the 2137A, 2139A, 2156B, 219xC/D or the 12159A Sine Wave Wave Card in the 243xA or 248xA.

\# In A700 systems, computers, and board computers, unaddressed memory cards draw only standby current)

NOTE A: The requirements given here for the 12010A Breadboard Interface do not include power for user-added circuits.

E/F-Series Computer Power Supply and Card Cage Slot Availability (+) and Requirements (−)

Product Number and Name	I/O Slots	Direct Current at +5V	+5V(M)	+12V	-12V	-2V
COMPUTERS, SYSTEMS, I/O EXTENDER, AND POWER FAIL RECOVERY SYSTEMS						
2109E (E-Series) Computer with 64kb memory and 12791A FEM*	+8	+29.9A*	-1.07A	+2.5A	+2.0A	+5.9A
2109E Option 003: 13304A FAB instead of 12791A FEM	+1	+3.6A	0A	0A	0A	0A
2109E Option 012: 64kb high perf memory instead of std perf	nnc	-1.4A	0A	0A	0A	0A
2109E Option 014: Deletes 64kb standard performance memory	nnc	+1.7A	+1.07A	0A	0A	+0.1A
2109EK Board Computer -- CPU and 64kb memory	0	-9.5A	-1.07A	0A	0A	-0.2A
2109EK Option 014: Deletes 64kb standard performance memory	nnc	+1.7A	+1.07A	0A	0A	0A
2113E (E-Series) Computer with 128kb memory and 12791A FEM*	+13	+24.7A*	-1.07A	+2.5A	+2.0A	+5.9A
2113E Option 003: 13304A FAB instead of 12791A FEM	+1	+3.6A	0A	0A	0A	0A
2113E Option 012: 64kb high perf mem instead of 128kb std perf	nnc	+3.8A	0A	0A	0A	+0.1A
2113E Option 013: 64kb memory instead of 128kb	nnc	+5.2A	0A	0A	0A	+0.1A
2113E Option 014: Deletes 128kb standard performance memory	nnc	+6.9A	+1.07A	0A	0A	+0.1A
2117F (F-Series) Computer with 128kb high performance memory	+13	+23.3A*	-1.21A	+2.5A	+2.0A	+5.9A
2117F Option 013: 64kb memory instead of 128kb	nnc	+5.2A	0A	0A	0A	+0.1A
2117F Option 014: Deletes 128kb high performance memory	nnc	+8.3A	+1.21A	0A	0A	+0.1A
2176C Model 40 System Processor Unit with 128kb memory	+11	+22.1A	+5.93A	+2.5A	+1.9A	+5.9A
2176C Option 014: Deletes 128kb standard performance memory	nnc	+6.9A	+1.07A	0A	0A	+0.1A
2176E Model 40 System Processor Unit with 256kb memory	+11	+17.0A	+5.29A	+2.5A	+1.9A	+5.9A
2176E Option 014: Deletes 256kb high performance memory	nnc	+8.3A	+1.71A	0A	0A	+0.1A
2176E Option 031/032/033: MAC Disc interface and media	-1	+2.5A	0A	0A	0A	0A
2177C Model 45 System Processor Unit w/128kb high perf mem	+11	+16.9A*	+5.79A	+2.5A	+1.9A	+5.9A
2177C Option 014: Deletes 128kb High performance memory	nnc	+8.3A	+1.21A	0A	0A	+0.1A
2177F Model 45 System Processor Unit w/256kb high perf mem	+11	+17.0A*	+5.29A	+2.5A	+1.9A	+5.9A
2177F Option 014: Deletes 128kb High performance memory	nnc	+8.3A	+1.71A	0A	0A	+0.1A
2177F Option 031/032/033: MAC Disc interface and media	-1	+2.5A	0A	0A	0A	0A
2178A Model 60 System Processor Unit with 256kb memory	+11	+17.9A*	+5.36A	+2.5A	+1.9A	+5.9A
2178A Option 014: Deletes 256kb std performance memory	nnc	+7.4A*	+1.64A	0A	0A	+0.1A
2178C Model 60 System Processor Unit with 256kb memory	+11	+17.0A*	+5.29A	+2.5A	+1.9A	+5.9A
2178C Option 014: Deletes 256kb high performance memory	nnc	+8.3A	+1.71A	0A	0A	+0.1A
2178A/C Option 022/060/061: CS/80 Disc interface and cartridge tape or mag tape media	-1	-3.5A	0A	0A	0A	-0.1A
2178A/C Option 031/032/033: MAC Disc interface and media	-1	-2.5A	0A	0A	0A	-0.1A
2179A Model 65 System Processor Unit w/256kb high perf mem	+11	+16.4A*	+5.22A	+2.5A	+1.9A	+5.9A
2179A Option 014: Deletes 256kb high performance memory	nnc	+8.8A*	+1.78A	0A	0A	+0.1A
2179C Model 65 System Processor Unit w/256kb high perf mem	+11	+16.4A*	+5.29A	+2.5A	+1.9A	+5.9A
2179C Option 014: Deletes 256kb high performance memory	nnc	+8.8A	+1.71A	0A	0A	+0.1A
2179A/C Option 022/060/061: CS/80 Disc interface and cartridge tape or mag tape media	-1	-3.5A	0A	0A	0A	-0.1A
2179A/C Option 031/032/033: MAC Disc interface and media	-1	-2.5A	0A	0A	0A	-0.1A
2179A/C Option 101/111/121: Value Pack with 1Mb memory	nnc	nnc	-0.7A	0A	0A	-0.4A
2179A/C Option 102/112/122: Value Pack with 2Mb memory	nnc	-2.0A	-2.0A	0A	0A	-0.4A
12979B Dual-Port I/O Extender	+16	-2.0A	0A	0A	0A	-1.4A
12944B Power Fail Recovery System for 2109E Computer	n/a	0A	+7.0A	0A	0A	0A
12991B Power Fail Recovery System for 2113E or 2117F Computer	n/a	0A	+7.0A	0A	0A	0A
INTERFACES, MEMORY, AND OTHER ACCESSORIES						
12250A DSN/X.25 Network Interface	-1	-1.9A	0A	-0.3A	-0.2A	0A
12260A Multi-Use Prog Serial Interface for DSN/MRJE 1000	-1	-1.9A	0A	-0.3A	-0.2A	0A
12261A Multi-Use Programmable Multiplexer	-1	-2.0A	0A	-0.3A	-0.4A	0A
12531C Teleprinter Interface	-1	-0.8A	0A	-0.1A	-0.1A	-0.1A
12531D Terminal Interface	-1	-0.8A	0A	-0.2A	0A	-0.1A
12551B Relay Output Register	-1	-0.6A	0A	-0.2A	0A	-0.4A
12551B Option 001: Adds read-back	nnc	-0.5A	0A	nnc	0A	-0.2A
12554A 16-Bit Duplex Register	-1	-1.1A	0A	-0.3A	-0.3A	-0.1A
12556B 40-Bit Register	-1	-0.9A	0A	-0.2A	-0.1A	-0.1A
12566C Microcircuit Interface	-1	-0.7A	0A	0A	0A	-0.1A
12597A 8-Bit Duplex Register	-1	-0.8A	0A	-0.1A	-0.1A	-0.1A
12618A Synchronous Communications Interface	-2	-2.2A	0A	-0.1A	-0.1A	-0.2A
12620A Breadboard Interface/RTE Privileged Interrupt Fence (a)	-1	-0.4A	0A	0A	0A	0A

FOOTNOTES:

nnc = no net change; n/a = not applicable

* = Available +5V current specified here is that available after provision of 5.4A for fully-loaded 12791A Firmware Expansion Module in 2109E, 2113E, or 2117F Computer or in 2176E, 2177C/F, 2178A/C, or 2179A/C SPU or that available after provision of 1.8A for fully-loaded 13304A Firmware Accessory Board in 2176C SPU.

(M) = +5V Memory current requirements for memory controller, memory modules, and fault control check bit array boards. In computer without power fail recovery system, this current is drawn from the available +5V current, reducing current available for I/O interfaces. All 217x System Processor Units include a power fail recovery system.

(a) = Does not include current required by circuits added by the user to the Breadboard Interface.

E/F-Series Computer Power Supply and Card Cage Slot Availability (+) and Requirements (−), continued

Product Number and Name	I/O Slots	Direct Current at +5V	+5V(M)	+12V	-12V	-2V
INTERFACES, MEMORY, AND OTHER ACCESSORIES, continued						
12666H 1Mb Fault Control Check Bit Array Board (operating) (b)	0	-0.5A	-0.91A	0A	0A	0A
12666H 1Mb Fault Control Check Bit Array Board (standby) (b)	0	-0.5A	-0.76A	0A	0A	0A
12699H 256kb Memory Module (operating) (b)	0	-0.5A	-1.07A	0A	0A	0A
12699H 256kb Memory Module (standby) (b)	0	-0.5A	-0.53A	0A	0A	0A
12728G E-Series Control Panel Assembly (2109EK accessory)	0	-1.5A	-1.1A	-0.1A	0A	0A
12728J 18-Slot Card Cage Kit (2109EK accessory)	+9	n/a	n/a	n/a	n/a	n/a
12731A Memory Expansion Module	0	-3.9A	0A	0A	0A	0A
12746A/H 64kb Memory Module	0	-0.5A	-0.57A	0A	0A	0A
12747A/H 128kb Memory Module	0	-0.5A	-0.57A	0A	0A	0A
12749H 512kb Memory Module (operating) (b)	0	-0.5A	-1.19A	0A	0A	0A
12749H 512kb Memory Module (standby) (b)	0	-0.5A	-0.65A	0A	0A	0A
12771A Computer Serial Interface	-1	-1.6A	0A	-0.9A	-0.1A	-0.1A
12773A Computer Modem Interface	-1	-1.6A	0A	-0.4A	0A	-0.1A
12777A Priority Jumper Card	-1	0A	0A	0A	0A	0A
12779A/H 256kb Fault Control Check Bit Array Board	0	-0.3A	-0.78A	0A	0A	0A
12780A/H 512kb Fault Control Check Bit Array Board	0	-0.3A	-0.78A	0A	0A	0A
12786A 128kb Standard Performance Parity Memory Package	0	-6.9A	-1.07A	0A	0A	-0.6A
12786B 256kb Standard Performance Parity Memory Package	0	-7.4A	-1.64A	0A	0A	-0.6A
12786C 512kb Standard Performance Parity Memory Package	0	-8.4A	-2.78A	0A	0A	-0.6A
12786D 1.0Mb Standard Performance Parity Memory Package	0	-10.4A	-5.06A	0A	0A	-0.6A
12787A 128kb Standard Performance Fault Control Memory Package	0	-9.3A	-2.03A	0A	0A	-0.5A
12787B 256kb Standard Performance Fault Control Memory Package	0	-9.8A	-2.60A	0A	0A	-0.5A
12787C 512kb Standard Performance Fault Control Memory Package	0	-10.8A	-3.74A	0A	0A	-0.5A
12787D 1.0Mb Standard Performance Fault Control Memory Package	0	-13.1A	-6.80A	0A	0A	-0.5A
12788A 128kb High Performance Parity Memory Package	0	-8.3A	-1.21A	0A	0A	-0.5A
12788B 256kb High Performance Parity Memory Package	0	-8.8A	-1.78A	0A	0A	-0.5A
12788BB 256kb High Performance Parity Memory Package	0	-8.3A	-1.71A	0A	0A	-0.5A
12788C 512kb High Performance Parity Memory Package	0	-9.8A	-2.92A	0A	0A	-0.5A
12788D 1.0Mb High Performance Parity Memory Package	0	-11.8A	-5.2A	0A	0A	-0.5A
12788E 512kb High Performance Parity Memory Package	0	-8.3A	-1.83A	0A	0A	-0.5A
12788F 1.0Mb High Performance Parity Memory Package	0	-8.8A	-2.48A	0A	0A	-0.5A
12788G 1.5Mb High Performance Parity Memory Package	0	-9.3A	-3.13A	0A	0A	-0.5A
12788H 2.0Mb High Performance Parity Memory Package	0	-9.8A	-3.78A	0A	0A	-0.5A
12789A 128kb High Performance Fault Control Memory Package	0	-9.3A	-2.04A	0A	0A	-0.5A
12789B 256kb High Performance Fault Control Memory Package	0	-9.8A	-2.61A	0A	0A	-0.5A
12789C 512kb High Performance Fault Control Memory Package	0	-10.8A	-3.75A	0A	0A	-0.5A
12789D 1.0Mb High Performance Fault Control Memory Package	0	-13.1A	-6.81A	0A	0A	-0.5A
12789E 512kb High Performance Fault Control Memory Package	0	-9.3A	-2.66A	0A	0A	-0.5A
12789F 1.0Mb High Performance Fault Control Memory Package	0	-10.1A	-4.09A	0A	0A	-0.5A
12789G 1.5Mb High Performance Fault Control Memory Package	0	-10.9A	-5.52A	0A	0A	-0.5A
12789H 2.0Mb High Performance Fault Control Memory Package	0	-11.7A	-6.95A	0A	0A	-0.5A
12789J 512kb High Performance Fault Control Memory Package	0	-9.5A	-2.79A	0A	0A	-0.5A
12789K 1.0Mb High Performance Fault Control Memory Package	0	-10.0A	-3.44A	0A	0A	-0.5A
12789L 1.5Mb High Performance Fault Control Memory Package	0	-11.0A	-4.85A	0A	0A	-0.5A
12789M 2.0Mb High Performance Fault Control Memory Package	0	-11.5A	-5.5A	0A	0A	-0.5A
12790A Multipoint Terminal/Data Link interface	-1	-3.0A	0A	0A	-0.1A	-0.1A
12791A Firmware Expansion Module	-1	(c)	0A	0A	-0.1A	-0.1A
12792B 8-Channel Asynchronous Multiplexer Interface	-1	-2.0A	0A	-0.3A	-0.4A	0A
12793B/12794B DS/1000-IV Bisync/HDLC Modem Interfaces	-1	-1.9A	0A	-0.3A	-0.2A	0A

FOOTNOTES:

nnc = no net change; n/a = not applicable

(M) = +5V Memory current requirements for memory controller, memory modules, and fault control check bit array boards. In computer without power fail recovery system, this current is drawn from the available +5V current, reducing current available for I/O interfaces. All 217x System Processor Units include a power fail recovery system.

(b) = Operating current requirement applies only to one Fault control check bit array board or memory module at a time; all others draw standby current.

(c) = 12791A uses 1.2A plus 0.525A for each ROM installed (up to 8 possible); -5.4A when fully loaded.

E/F-Series Computer Power Supply and Card Cage Slot Availability (+) and Requirements (−), continued

Product Number and Name	I/O Slots	Direct Current at +5V	+5V(M)	+12V	-12V	-2V
INTERFACES, MEMORY, AND OTHER ACCESSORIES, continued						
12821A Disc/Printer Interface	-1	-3.3A	0A	0A	0A	-0.1A
12825A DS/1000-IV Direct Connect HDLC Interface	-1	-1.8A	0A	-0.3A	-0.4A	0A
12826B Programmable Serial (Modem) Interface	-1	-1.9A	0A	-0.3A	-0.2A	0A
12834A DS/1000-IV Direct Connect Bisync Interface	-1	-1.8A	0A	-0.3A	-0.4A	0A
12845B Line Printer Interface	-1	-1.2A	0A	0A	0A	0A
12892B Memory Protect Module	0	-1.3A	0A	0A	0A	-0.5A
12897B Dual-Channel Port Controller	0	-2.4A	0A	0A	0A	-0.5A
12920B 16-Channel Asynchronous Multiplexer Interface	-3	-5.5A	0A	-0.2A	-0.5A	-0.3A
12920B Option 001 Adds hardware support for Bell 202 Dataset	-1	-1.4A	0A	-0.2A	-0.2A	-0.1A
12925A Punched Tape Reader Subsystem (12597A interface)	-1	-0.8A	0A	-0.1A	-0.1A	-0.1A
12926A Tape Punch Subsystem (12597A interface)	-1	-0.8A	0A	-0.1A	-0.1A	-0.1A
12930A Universal Interface	-1	-1.8A	0A	0A	0A	-0.1A
12930A Option 001/002 (change to TTL input)	nnc	-0.4A	0A	0A	0A	nnc
12966A Buffered Asynchronous Communications Interface	-1	-3.0A	0A	0A	-0.1A	-0.1A
12967A Synchronous Communications Interface	-1	-1.8A	0A	0A	0A	-0.1A
12968A Asynchronous Communications Interface	-1	-1.3A	0A	0A	0A	-0.1A
12979B Dual-Port I/O Extender	+16	-2.0A	0A	0A	0A	-1.4A
12985A Punched Card Reader Subsystem (12924A Interface)	-1	-1.0A	0A	0A	0A	0A
12992_ Any add'l Loader ROM (2 are incl. w/computers & SPUs)	0	-0.2A	0A	0A	0A	0A
13175B MAC Disc Interface Card	-1	-2.3A	0A	0A	0A	0A
13178C Multi-CPU Interface to MAC Disc	-1	-2.3A	0A	0A	0A	0A
13197A 1k Writable Control Store (WCS)	-1	-2.2A	0A	0A	0A	0A
13304A Firmware Accessory Board (FAB)	0	-1.8A	0A	0A	0A	0A
2102B Standard Performance Parity Memory Controller	0	-1.2A	-0.5A	0A	0A	-0.1A
2102C Standard Performance Fault Control Memory Controller	0	-3.3A	-0.68A	0A	0A	0A
2102E High Performance Parity Memory Controller	0	-2.6A	-0.64A	0A	0A	0A
2102H High Performance Fault Control Memory Controller	0	-3.3A	-0.69A	0A	0A	0A
2608A Line Printer with Option 210 (26099A interface)	-1	-0.8A	0A	0A	0A	0A
2608S Line Printer with Option 210 (12821A interface)	-1	-3.3A	0A	0A	0A	-0.1A
2611A/2617A/2619A Line Printer w/Option 100 (12845B interface)	-1	-1.2A	0A	0A	0A	0A
2631B Printer with Option 210 (12845B interface)	-1	-1.2A	0A	0A	0A	0A
59310B HP-IB Interface	-1	-3.0A	0A	0A	0A	-0.1A
7970B Mag Tape Unit w/option 226 or 236 (13181B interface) (d)	-2	-2.9A	0A	0A	0A	0A
7970E Mag Tape Unit w/option 226 or 236 (13183B interface) (d)	-2	-2.6A	0A	0A	0A	0A
91000A Plug-In 20kHz A-to-D Interface	-1	-2.4A	0A	0A	0A	-0.1A
91200B TV Interface	-1	-1.2A	0A	-0.3A	0A	-0.1A
91780A RJE/1000 Package (12618A Interface)	-2	-2.2A	0A	-0.1A	-0.1A	-0.2A

FOOTNOTES:

nnc = no net change; n/a = not applicable

(M) = +5V Memory current requirements for memory controller, memory modules, and fault control check bit boards. In computer without power fail recovery system, this current is drawn from the available +5V current, reducing current available for I/O interfaces. All 217x System Processor Units include a power fail recovery system.

(d) = This 7970B/E data also applies to 7971A Mag Tape Subsystem in upright cabinet with an equivalent option.

HP 1000 Systems, Computers, and Peripherals Physical Characteristics

Product Number and Name	Dimensions (Height x Width x Depth) Centimeters and (inches)		Approx. Floor Space Recommended metres & (feet)	Net Weight kg & (lb)
HP 1000 SYSTEM PROCESSOR UNIT (SPU) PHYSICAL CHARACTERISTICS (Excludes terminal and (hard) system disc)				
2122x/2142x Model 5 Microsystem SPU	17.5x39.3x51.1†	(6.9x15.5x20.3†)	Table mounting	14.1(31)
2186C/D Model 6+ Microsystem SPU	17.5x39.3x51.1†	(6.9x15.5x20.3†)	Table mounting	14.1(31)
Integ. 262x Opt. 090 Sys Console for Model 5/6+	+30.4x0.0x20.4	(+12x8)	Mounts on 2142x/2186x	+19.5(43)
2176C Model 40 SPU (56-in Cabinet)	163.1x53.3x76.2‡	(64.3x21x30)‡	3 x 3 (9 x 9)	138.6(305)
2176D Model 40 SPU (Desk Cabinet)	106.5x182.9x78.7	(41.8x72x31)	4 x 3 (12 x 9)	122.7(270)
2177C Model 45 SPU (56-in Cabinet)	163.1x53.3x76.2‡	(64.3x21x30)‡	3 x 3 (9 x 9)	159.1(350)
2177D Model 45 SPU (Desk Cabinet)	106.5x182.9x78.7	(41.8x72x31)	4 x 3 (12 x 9)	143.2(315)
2178A Model 60 SPU (56-in Cabinet)	163.1x53.3x76.2‡	(64.3x21x30)‡	3 x 3 (9 x 9)	138.6(305)
2178B Model 60 SPU (Desk Cabinet)	106.5x182.9x78.7	(41.8x72x31)	4 x 3 (12 x 9)	122.7(270)
2178C Model 60 SPU (56-in Cabinet)	161x63.5x81.3	(63.4x25x32)	3 x 3 (9 x 9	164.1(361)
2179A Model 65 SPU (56-in Cabinet)	163.1x53.3x76.2‡	(64.3x21x30)‡	3 x 3 (9 x 9)	159.1(350)
2179B Model 65 SPU (Desk Cabinet)	106.5x182.9x78.7	(41.8x72x31)	4 x 3 (12 x 9)	143.2(315)
2179C Model 65 SPU (56-in Cabinet)	161x63.5x81.3	(63.4x25x32)	3 x 3 (9 x 9)	173.2(381)
219xC Model 26/27/29 SPU (56-in Cabinet)	161.3x69.9x81.3	(63.4x27.5x32)	3 x 3 (9 x 9)	139.5(307.5)
219xD Model 26/27/29 SPU (22.8-in Cabinet)	72x69.9x81.3	(28.3x27.5x32)	3 x 3 (9 x 9)	94(207.5)
248xA Micro 26/27/29 SPU	17.8x48.3x64.8	(7x19x25.5)	Rack mounting	18.1(40)
248xA Micro 26/27/29 SPU in 40025A Vertical Floor Mount	67.3x34.7x64.8	(26.5x13.6x25.5)	0.5 x 1 (1.5 x 3)	23.8(52.5)
248xA Option 110 Integral Discs	No change		No change	+2.3(5)
HP 1000 COMPUTERS PHYSICAL CHARACTERISTICS				
2103L Microcomputer (L-Series w/8 I/O channels)	13.3x48.3x59.7	(5.3x19x23.5)	Rack mounting	14.1(31)
2109E Computer (E-Series w/9 I/O channels)	22.2x48.3x62.2	(8.8x19x24.5)	Rack mounting	20.4(45)
2113E Computer (E-Series w/14 I/O channels)	31.1x48.3x62.2	(12.3x19x24.5)	Rack mounting	29.5(65)
2111F Computer (F-Series w/9 I/O channels)	31.1x48.3x62.2	(12.3x19x24.5)	Rack mounting	30.0(66)
2117F Computer (F-Series w/14 I/O channels)	44.5x48.3x62.2	(17.5x19x24.5)	Rack mounting	50.0(110)
213xA Model 6+ Micro System Component	17.5x39.3x51.1†)	(6.9x15.5x20.3†)	Table mounting	14.1(31)
2137A Computer (A700 w/16 I/O channels)	26.6x48.3x61	(10.5x19x24)	Rack mounting	26.8(59)
2139A Computer (A900 w/15 I/O channels)	26.6x48.3x61	(10.5x19x24)	Rack mounting	26.8(59)
2156B Computer (A600+ w/18 I/O channels)	26.6x48.3x61	(10.5x19x24)	Rack mounting	26.8(59)
243x Micro 26/27/29 System Component	17.8x48.3x64.8	(7x19x25.5)	Rack Mounting	18.1(40)
243x Micro 26/27/29 System Component in 40025A Vertical Floor Mount	67.3x34.7x64.8	(26.5x13.6x25.5)	0.5 x 1 (1.5 x 3)	23.8(52.5)
243x Option 110 Integral Discs	No change		No change	+2.3(5)
HP 1000 PERIPHERALS PHYSICAL CHARACTERISTICS				
12925A Punched Tape Reader Subsystem	17.8x48.3x40.6	(7x19x16)	Rack mounting	19.1(42)
12926A Tape Punch Subsystem	26.7x48.3x53.8	(10.5x19x21.2)	Rack mounting	22.7(50)
12985A Card Reader Subsystem	41.3x58.6x45.7	(16.3x23.1x18)	Table mounting	40.9(90)
1351S Graphics Display System	49.8x49.5x57.8	(19.6x19.5x22.8)	Table mounting**	40(88)
2240A Measurement & Control Processor	22.2x48.3x35.6	(8.8x19x14)	Rack/table mounting	16.7(36.8)
2241A Measurement & Control Processor Extender	22.2x48.3x35.6	(8.8x19x14)	Rack/table mounting	16.0(35.2)
22920A Signal Conditioning Tray for 2240A	4.5x48.3x35.6	(1.8x19x14)	Rack mounting	1.67(3.69)
22922A Screw Termination Tray for 2240A	4.5x48.3x35.6	(1.8x19x14)	Rack mounting	1.39(3.06)
2250M Mobile Measurement & Control System	92.7x73.4x81.3	(36.5x29x32	3 x 3 (9 x 9)	100(220)
2250N NEMA Panel Ind. Meas. & Control System	182.9x122.8x50.8	(72x48x20)	3 x 3 (9 x 9)	170(375)
2251AN Add-on Meas. & Control Unit (MCU) for 2250N	54x36.8x39.4	(21.3x14.5x15.5)	Mounts in 2250N	15.5(34)
2250R Rack-mounted Measurement & Control System	163.1x53.3x76.2‡	(64.3x21x30)‡	3 x 3 (9 x 9)	111.8(246)
2250R Opt. 001 Adds cap. for 45 FWAs	163.1x53.3x76.2‡	(64.3x21x30)‡	+1 x 3 (+3 x 9)	98(215)
2250R Opt. 002/016 Adds cap. for 3 MCUs & 110 FWAs	163.1x106.6x76.2‡	(64.3x42x30)‡	+2 x 3 (+6 x 9)	158.6(349)
2250R Opt. 003/017 Adds cap. for 6 MCUs & 175 FWAs	163.1x159.9x76.2‡	(64.3x63x30)‡	+3 x 3 (+9 x 9)	244.5(538)
2251AR Add-on Meas. & Control Unit (MCU) for 2250R	35.6x48.3x43.8	(14x19x17.3)	Mounts in 2250R	15.5(34)
238xA/B Office Display Terminal	28.7x30.5x48.5	(11.3x12x19.1)	Table Mounting	10(22)

† *Not including 2.5 to 7.5 cm (1 to 3 in) for cable clearance behind the rear panel.*

‡ *Not including extender feet, which pull out of the cabinet 16.5 cm (6.5 in) at the operating site to prevent tip-over in the event units are pulled out on slides for servicing.*

* *Not including optional pedestal.*

** *The 1351S Graphics Display System consists of the 1311A Display and 1351A Graphics Translator; appropriate accessories should be ordered for table mounting; the 1350S/1351S is not approved as a rack-mountable device.*

HP 1000 Systems, Computers, and Peripherals Physical Characteristics, continued

Product Number and Name	Dimensions (Height x Width x Depth) Centimeters and (inches)		Approx. Floor Space Recommended metres & (feet)	Net Weight kg & (lb)
HP 1000 PERIPHERALS PHYSICAL CHARACTERISTICS, continued				
2601A Daisywheel Printer	25.3x61x48.1§	(10x24x19)§	Table mounting	26(57)
2608A/S Line Printer	104.2x68x55.5	(41x26.5x21.8)	1 x 3 (3 x 9)	97.7(215)
2611A Line Printer	108.5x92.7x66.1	(42.8x36.5x26)	1 x 3 (3 x 9)	239.5(528)
2619A Line Printer	108.5x92.7x66.1	(42.8x36.5x26)	2 x 3 (6 x 9)	259(570)
262x Terminals	44x38x66.5	(17.3x15x26.2)	Table mounting	22.3(49)
2631B Printer	21.5*x64x46.9	(8.5*x25.2x18.5)	1 x 2 (3 x 6)	24.1*(53*)
2635B Printing Terminal	21.5*x64x59.5	(8.5*x25.2x23.1)	1 x 2 (3 x 6)	25.9*(57*)
264x Terminals	34.3x44.5x64.8	(13.5x17.5x25.5)	Table mounting	30.5(67)
2671A/G Printer/Graphics Printer	10.5x42.8x42.4	(4.1x16.9x16.7)	Table mounting	12.7(28)
2673A Intelligent Graphics Printer	10.5x42.8x42.4	(4.1x16.9x16.7)	Table mounting	14.1(31)
3074A/M Data Link Adapter	5x25x11	2x9.9x4.4)	Table mounting	1(2.2)
3075A Data Capture Terminal	15.7x22.7x40	(6.2x10.9x15.7)	Table mounting	6.4(14)
3076A Data Capture Terminal	55x29x13	(21.7x11.4x5.1)	Wall mounting	10.5(23)
3077A Time Reporting Terminal	55x29x13	(21.7x11.4x5.1)	Wall mounting	10.5(23)
37203A HP-IB Extender	8.9x21.3x35.6	(3.5x8.4x14)	Table mounting	3.1(6.8)
37214A Systems Modem Card Cage	17.8x43.8x33	(7x17.3x13)	Rack Mounting	7.5(16.5)
39301A Fiber Optic Multiplexer	7.2x42.5x8.9	(2.9x16.8x3.5)	Table Mounting	2.2(4.8)
7220/1C Graphics Plotter	18.8x49.5x47.5	(7.4x19.5x18.7)	Table mounting	17.7(39)
7220/1T Graphics Plotter	21x85.8x47.5	(8.3x33.8x18.7)	Table mounting	30(66)
7470A (2-Pen) Plotter	12.7x43.2x34.3	(5x17x13.5)	Table mounting	5.7(12.5)
7580B Drafting Plotter	118.8x108.7x55.7	(46.8x42.8x21.9)	2 x 2 (6 x 6)	63.6(140)
7585B Drafting Plotter	118.8x139.2x55.7	(46.8x54.8x21.9)	2 x 2 (6 x 6)	70.4(155)
7906M 19.6M byte MAC Master disc in cabinet	71.8x55.3x79.1	(28.3x21.8x31.2)	1 x 3 (3 x 9)	151.8(334)
7906MR rack-mounting 19.6M byte MAC Master disc	53.4x48.3x71.1	(21x19x28)	Rack mounting	108.6(239)
7906S 19.6M byte MAC Slave disc in cabinet	71.8x55.3x79.1	(28.3x21.8x31.2)	1 x 3 (3 x 9)	134.1(295)
7906SR rack-mounting 19.6M byte MAC Slave disc	40.1x48.3x71.1	(15.8x19x28)	Rack mounting	91.8(202)
7908P Fixed disc	72x35.4x74	(28.4x14x29,1)	1 x 2 (3 x 6)	72.7(160)
7908R rack-mounting Fixed disc	17.7x48.3x68.9	(7x19x27.1)	Rack mounting	37.1(81.6)
7911P/7912P/7914P Fixed Disc	72x35.4x74	(28.4x14x29.1)	1 x 2 (3 x 6)	85.4(188)
7911R/7912R/7914R rack-mounting Fixed disc	31.1x48.3x70.5	(12.25x19x27.8)	Rack mounting	67.3(148)
7914TD Fixed disc and 1600 bpi mag tape unit	161.3x63.5x81.3	(63.4x25x32)	3 x 3 (9 x 9)	272.2(600)
7920M 50M byte MAC Master disc in cabinet	82.6x49.9x81.3	(32.5x19.7x32)	1 x 3 (3 x 9)	156.4(344)
7920S 50M byte MAC Slave disc in cabinet	82.6x49.9x8113	(3295x19.7x32)	1 x 3 (3 x 9)	137.3(302)
7925M 120M byte MAC Master disc in cabinet	82.6x49.9x81.3	(32.5x19.7x32)	1 x 3 (3 x 9)	155(341)
7925S 120M byte MAC Slave disc in cabinet	82.6x49.9x81.3	(32.5x19.7x32)	1 x 3 (3 x 9)	138.2(304)
7933H/7935H 404M byte Disc	82.5x55.2x83.4	(32.5x21.7x32.8)	1 x 3 (3 x 9)	154(339.5)
7970B/E Magnetic Tape Drive	66.7x48.3x30.4	(26.3x19x12)	Rack mounting	68.2(150)
7971A Magnetic Tape Subsystem with one drive	158.5x62.3x90.5	(62.4x24.5x35.6)	3 x 3 (9 x 9)	195(430)
Additional drive in 7971A Cabinet	no change	no change	no change	59(130)
82905A/B Impact Printer	10.7x37.4x30.5	(4.2x14.7x12)	Table mounting	5.5(12)
9111A Graphics Tablet	8.5x44x44	(3.4x17.3x17.3)	Table mounting	5.8(12.8)
9121D/S Microfloppy Disc	7.6x32.5x28.5	(3x12.8x11.2)	Table mounting	4.5(10)
9133A/B Mini Winchester/Microfloppy Disc	13x42.5x47.6	(5.1x16.7x18.7)	Table mounting	14.5(32)
9134A/B 4.6/9.2M byte Mini Winchester Disc	13x42.5x47.6	(5.1x16.7x18.7)	Table mounting	13.4(29.5)
9872C Graphics Plotter	18.8x49.5x47.5	(7.4x19.5x18.7)	Table mounting	17.7(39)
9872T Graphics Plotter	21x85.8x47.5	(8.3x33.8x18.7)	Table mounting	30(66)
9876A Thermal Graphics Printer	15.2x34.9x44.5	(6x13.8x17.5)	Table mounting	12.3(27)
9895A Flexible Disc Memory	19.2x48.3x57.5	(7.6x19x22.6)	Table/rack mounting	26.8(59)

* *Not including optional pedestal.*

§ *With 26010A Tractors, height increases to 30.4 cm (12 in).*

HP 1000 Systems, Computers, and Peripherals Environmental Specifications

Product Number and Name	Ambient temperature, °C (°F) Operating	Ambient temperature, °C (°F) Non-operating	Relative Humidity (Non condensing)	Maximum altitude, metres (feet) Operating	Maximum altitude, metres (feet) Non-operating
HP 1000 SYSTEM PROCESSOR UNIT (SPU) ENVIRONMENTAL SPECIFICATIONS (Excludes terminal and (hard) system disc)					
2122A/42A Model 5 Microsystem SPU	10-40 (50-104)	−40-60 (−40-140)	20% - 80%	3048 (10,000)	15240 (50,000)
2122B/42B Model 5 Microsystem SPU	0-55 (32-131)	−40-60 (−40-140)	5% - 80%	3048 (10,000)	15240 (50,000)
2136C/86C Model 6+ Microsystem SPU	10-40 (50-104)	−40-60 (−40-140)	20% - 80%	3048 (10,000)	15240 (50,000)
2136D/86D Model 6+ Microsystem SPU	0-55 (32-131)	−40-60 (−40-140)	5% - 80%	3048 (10,000)	15240 (50,000)
2176C/D Model 40 SPU	10-40 (50-104)	−40-65 (−40-149)	20% - 80%	3048 (10,000)	7620 (25,000)
2177C/D Model 45 SPU	10-40 (50-104)	−40-65 (−40-149)	20% - 80%	3048 (10,000)	7620 (25,000)
2178A/B/C Model 60 SPU	10-40 (50-104)	−40-65 (−40-149)	20% - 80%	3048 (10,000)	7620 (25,000)
2179A/B/C Model 65 SPU	10-40 (50-104)	−40-65 (−40-149)	20% - 80%	3048 (10,000)	7620 (25,000)
219xC/D Model 26/27/29 SPU	10-40 (50-104)	−40-75 (−40-167)	5% - 95%	4572 (15,000)	15240 (50,000)
243xA/8xA Micro 26/27/29 SPU (10,000 ft spec)	0-55 (32-131)	−40-75 (−40-167)	5% - 95%	3048 (10,000)	15240 (50,000)
243xA/8xA Micro 26/27/29 SPU (15,000 ft spec)	0-45 (32-113)	−40-75 (−40-167)	5% - 95%	4572 (15,000)	15240 (50,000)
243xA/8xA Option 110 Discs (NOTE A)	5-45 (40-113)	−40-60 (−40-140)	20% - 80%	4572 (15,000)	15240 (50,000)
HP 1000 COMPUTERS ENVIRONMENTAL SPECIFICATIONS					
2103L Microcomputer	0-55 (32-131)	−40-75 (−40-167)	5% - 95%	4572 (15,000)	15240 (50,000)
2108M/2112M Computer	0-55 (32-131)	−40-75 (−40-167)	5% - 95%	4572 (15,000)	15240 (50,000)
2109E/2113E Computer	0-55 (32-131)	−40-75 (−40-167)	5% - 95%	4572 (15,000)	15240 (50,000)
2111F/2117F Computer	0-55 (32-131)	−40-75 (−40-167)	5% - 95%	4572 (15,000)	15240 (50,000)
2137A/2139A/2156A Computer (10,000 ft. spec)	0-55 (32-131)	−40-75 (−40-167)	5% - 95%	3048 (10,000)	15240 (50,000)
2137A/2139A/2156A Computer (15,000 ft. spec)	0-45 (32-113)	−40-75 (−40-167)	5% - 95%	4572 (15,000)	15240 (50,000)
HP 1000 PERIPHERALS ENVIRONMENTAL SPECIFICATIONS					
12925A Punched Tape Reader Subsys.	10-40 (50-104)	−40-60 (−40-140)	20% - 80%	4572 (15,000)	15240 (50,000)
12926A Tape Punch Subsystem	10-40 (50-104)	−40-60 (−40-140)	20% - 80%	4572 (15,000)	15240 (50,000)
12985A Card Reader Subsystem	10-50 (50-104)	−40-57 (−40-134)	20% - 80%	4572 (15,000)	15240 (50,000)
1351S Graphics Display System	0-55 (32-131)	−40-70 (−40-158)	5% - 95%	4572 (15,000)	15240 (50,000)
2240A/2241A Meas. & Control Proc.	0-55 (32-131)	−40-75 (−40-167)	10% - 95%	4572 (15,000)	15240 (50,000)
2250M Mobile Meas. & Control System	0-40 (32-104)	−40-75 (−40-167)	5% - 95%	4572 (15,000)	15240 (50,000)
2250N Ind. Meas. & Control System	0-50 (32-122)	−40-75 (−40-167)	5% - 95%	4572 (15,000)	15240 (50,000)
2250R Racked Meas. & Control System	0-40 (32-104)	−40-75 (−40-167)	5% - 95%	4572 (15,000)	15240 (50,000)
238xA/B Office Display Terminal	0-55 (32-131)	−40-60 (−40-140)	5% - 95%	4572 (15,000)	15240 (50,000)
2601A Daisywheel Printerl	7-41 (45-105)	−29-57 (−20-135)	10% - 80%	2438 (8,000)	7620 (25,000)
2608A/S Line Printer	0-55 (32-131)	−40-75 (−40-167)	5% - 95%	4572 (15,000)	15240 (50,000)
2611A Line Printer	5-35 (40-95)	−32-51 (−25-125)	40% - 80%	4572 (15,000)	15240 (50,000)
2619A Line Printer	0-40 (32-104)	−40-60 (−40-140)	20% - 80%	4572 (15,000)	15240 (50,000)
262x Terminals without printer	0-55 (32-131)	−40-60 (−40-140)	5% - 95%	4572 (15,000)	15240 (50,000)
262x Terminals with printer	5-40 (41-104)	−40-60 (−40-140)	5% - 80%	4572 (15,000)	15240 (50,000)
2631B Printer	10-40 (50-104)	−40-75 (−40-167)	10% - 90%	4572 (15,000)	15240 (50,000)
2635B Printing Terminal	10-40 (50-104)	−40-75 (−40-167)	10% - 90%	4572 (15,000)	15240 (50,000)
2642A Enhanced Display Station	10-40 (50-104)	−10-50 (−14-122)	20% - 80%	4572 (15,000)	7620 (25,000)
Other 264x Terminal w/o Minicartridge I/O	5-40 (41-104)	−10-60 (−14-140)	5% - 95%	4572 (15,000)	7620 (25,000)
Other 264x Terminal w/Minicartridge I/O	5-40 (41-104)	−40-60 (−40-140)	20% - 80%	4572 (15,000)	7620 (25,000)
2671A/G or 2673A Printer	0-55 (32-131)	−40-75 (−40-167)	20% - 95%	4572 (15,000)	15240 (50,000)
Thermal paper for 2671A/G or 2673A	0-40 (50-104)	−40-40 (−40-104)	20% - 90%	4572 (15,000)	15240 (50,000)

NOTE A: The rate of change of temperature must not exceed 10°C (18°F) per house.

HP 1000 Systems, Computers, and Peripherals Environmental Specifications, continued

Product Number and Name	Ambient temperature, °C (°F) Operating	Non-operating	Relative Humidity (Non condensing)	Maximum altitude, metres (feet) Operating	Non-operating
HP 1000 PERIPHERALS ENVIRONMENTAL SPECIFICATIONS (continued)					
3074A/M Data Link Adapter	0-55 (32-131)	−10-75 (−40-167)	5% - 95%	4572 (15,000)	7620 (25,000)
307x Data Capture Terminals	0-55 (32-131)	−40-75 (−40-167)	5% - 95%	4572 (15,000)	7620 (25,000)
3075A/6A Opt 010/014 Bar Code Reader	0-55 (32-131)	−20-55 (−4-131)	5% - 95%	4572 (15,000)	7620 (25,000)
37203A HP-IB Extender	0-55 (32-131)	−40-75 (−40-167)	20% - 95%	4572 (15,000)	15240 (50,000)
37214A Systems Modem Card Cage	0-55 (32-131)	−40-75 (−40-167)	5% - 95%	4572 (15,000)	15240 (50,000)
39301A Fiber Optic Multiplexer	0-55 (32-131)	−40-75 (−40-167)	5% - 95%	4572 (15,000)	15240 (50,000)
7220/1C/T Graphics Plotter	0-55 (32-131)	−30-75 (−22-167)	5% - 95%	4572 (15,000)	15240 (50,000)
7470A Graphics Plotter	0-55 (32-131)	−30-75 (−22-167)	5% - 95%	4572 (15,000)	15240 (50,000)
7580A/7585A Drafting Plotter	0-55 (32-131)	−30-75 (−22-167)	5% - 95%	4572 (15,000)	15240 (50,000)
7906M/7920M/7925M MAC Disc (Notes A & B)	5-55 (41-131)	−40-75 (−40-167)	8% - 80%	4572 (15,000)	15240 (50,000)
7908P/R CS/80 Fixed Disc (Note C)	10-40 (50-104)	−40-65 (−40-149)	20% - 80%	4572 (15,000)	15240 (50,000)
7911P/R CS/80 Fixed Disc (Note C)	10-40 (50-104)	−40-65 (−40-149)	20% - 80%	4572 (15,000)	15240 (50,000)
7912P/R CS/80 Fixed Disc (Note C)	10-40 (50-104)	−40-65 (−40-149)	20% - 80%	4572 (15,000)	15240 (50,000)
7914P/R/TD CS/80 Fixed Disc (Note C)	10-40 (50-104)	−40-65 (−40-149)	20% - 80%	4572 (15,000)	15240 (50,000)
7933H/7935H Disc (Note C)	10-40 (50-104)	−40-65 (−40-149)	8% - 80%	3048 (15,000)	15240 (50,000)
7970B/E or 7971A Magnetic Tape Unit	0-55 (32-131)	−40-75 (−40-167)	20% - 80%	4572 (15,000)	15240 (50,000)
82905B Impact Printer	5-35 (41-95)	−30-65 (−22-149)	10% - 80%	3048 (10,000)	15240 (50,000)
9111A Graphics Tablet	0-55 (32-131)	−30-65 (−22-149)	5% - 90%	4572 (15,000)	15240 (50,000)
9121D/S Microfloppy Disc	5-45 (40-115)	−40-60 (−40-140)	20% - 80%	15240 (50,000)	15240 (50,000)
9133A/B Mini Winchester/Microfloppy Disc	5-45 (40-115)	−40-60 (−40-140)	20% - 80%	15240 (50,000)	15240 (50,000)
9134A/B Winchester Disc (Note C)	10-40 (50-104)	−40-60 (−40-140)	8% - 80%	3048 (10,000)	15240 (50,000)
9872C/T Graphics Plotter	0-55 (32-131)	−30-75 (−22-167)	5% - 95%	4572 (15,000)	15240 (50,000)
9874A Digitizer	10-40 (50-104)	−40-75 (−40-167)	5% - 50%	4572 (15,000)	15240 (50,000)
9876A Thermal Graphics Printer	0-55 (32-131)	−40-75 (−40-167)	20% - 95%	4572 (15,000)	15240 (50,000)
9895A Flexible Disc Memory	10-40 (50-104)	−40-60 (−40-140)	20% - 80%	4572 (15,000)	15240 (50,000)

NOTE A: Before any cartridge or disc pack is placed into operation, it must be conditioned for a minimum of two hours in the same environment in which the disc is operating. The rate of change of temperature must not exceed 20°C (36°F) per hour.

NOTE B: 7906M/7920M/7925M environmental specifications also apply to 7906S/7920S/7925S MAC Slave discs.

NOTE C: The rate of change of temperature must not exceed 10°C (18°F) per hour.

Explanation of the HP 1000 Compatibility Matrices

The HP 1000 A/L-Series and M/E/F-Series Compatibility Matrices in the remaining pages of this section summarize the functional compatibility of HP 1000 Computer Systems, plug-in accessories, peripheral devices, and software. Compliance of HP 1000 Systems, computers, and peripheral devices with FCC and FTZ Electro-Magnetic (Radio Frequency) Interference (EMI) regulations is also summarized.

Functional Compatibility

Functional compatibility is basically coded as follows:

C = Compatible (Compatible systems and peripheral devices also comply with applicable safety standards)

N = Not compatible

Nt = Not Tested

Products designated as Nt may in fact be functionally compatible, but at the time of publication of the compatibility matrix, Hewlett-Packard takes no responsibility for their degree of compatibilty. Relatively new Nt items may later be tested and designated as compatible, but until such testing has been completed and a C designation given to an item, establishing and maintaining its compatibility is the responsibility of the customer who wishes to use the Nt item.

Qualifications required for compatibility and/or further compatibility information is provided in numbered C and N footnotes and additional footnotes.

Electro-Magnetic (Radio Frequency) Interference Compliance of Products

EMI compliance is specified in the compatibility matrices by additional lower-case letters appended to the C designation of functionally-compatible items. The complete codes are:

Cz = A functionally-compatible item whose compliance with EMI regulations in Germany is attested by its having received an FTZ license. Items that do not have an FTZ license may require a special license and/or site certification for use in Europe, a costly, time-consuming procedure that seriously limits European sales of non-licensed data processing equipment.

Cc = A functionally compatible item which has demonstrated compliance with FCC Class A EMI regulations in tests at the HP factory. All systems and peripherals must comply with FCC EMI regulation to be deliverable to U.S. unless they are to be used in exempt applications.

Ccz = A functionally compatible item which meets both the Cc and Cz EMI qualifications.

Cep = A functionally compatible item whose EMI compliance is pending, either waiting for successful completion of EMI tests or the issuance of an FTZ license. This category generally indicates HP's intention to make the respective product comply with EMI regulations.

Cn = Non-compliance with FCC and FTZ EMI regulations of a functionally-compatible product. As noted above, products designated Cn can be delivered to U.S. customers only for applications that exempt from FCC EMI regulations.

FCC EMI Qualification Exempt Applications

In the United States, certain applications are exempt from FCC EMI regulations. Customers who wish to buy non-complying products for use in exempt applications must fill out a prepared form that is available through the order processing coordinator at the local HP sales office.

EMI Testing

HP 1000 Computer Systems are tested for compliance in a configuration pursuant to FCC/VDE rules and regulations. The system is also tested to confirm its compliance with FCC Class A/VDE Level A EMI standards with any of the peripherals in the table below.

HP 1000 System Models	SPU Product Numbers	Disc Product Numbers	Printer Product Numbers	Console Product Numbers
6+	2186C 2186D	7908P 7911P 7912P 7914P 7914TD 7933H 7935H	2563A+214 2608S+214 2631B+214 2671A/G 2673A 2932A 2932A+046 82905B 82906A	2621B 2622A 2623A 2624B 2627A 2635B
Micro 26 Micro 27 Micro 29	2486A 2487A 2489A	248xA Opt 110 7908P/R 7911P/R 7912P/R 7914P/R 7914TD 7933H 7935H	2563A+214 2608S+214 2631B+214 2671A/G 2673A 2932A 2932A+046 82905B 82906A	2621B 2622A 2623A 2624B 2627A 2635B
26 27 29	2196C 2196D 2197C 2197D 2199C 2199D	7908R 7911R 7912R 7914R 7914TD 7933H 7935H	2563A+214 2608S+214 2631B+214 2671A/G 2673A 2932A 2932A+046 82905B 82906A	2621B 2622A 2623A 2624B 2627A 2635B
40 45	2176E 2177F	7906M 7906MR 7920M 7925M	2608A+210 2932A	2621B 2622A 2623A 2624B 2627A 2635B
60	2178C	7906M 7906MR 7920M 7925M 7908R 7911R 7912R 7914R 7914TD+ 236 7933H 7935H	2563A+210 2608A+210 2608S+210 2932A	2645A+ 007 2647A 2648A+ 007
65	2179C			

A/L-Series Compatibility Matrix

LEGEND:
- Cc = Compatible and qualified under FCC Class A EMI standards
- Cz = Compatible and FTZ licensed
- Ccz = Compatible, qualified under FCC Class A EMI standards, and FTZ licensed
- Cep = Compatible, EMI qualification pending
- Cn = Compatible, but not EMI qualified
- C = Compatible or supported without reference to EMI qualification
- N = Not compatible
- Nt = Not tested
- I = Included hardware or software item

PRODUCT AND OPTION NUMBERS	DESCRIPTION	COMPUTERS AND SYSTEM COMPATIBILTY													OP SYSTEM COMPATIBILITY				
		2103L	2122A/B & 2142A/B	2136A/B & 2186A/B	2136A/B & 2186C/D	2137A	2139A	2156A/B	2186C/D	2197C/D	2199C/D	2436A/E & 2486A	2437A & 2487A	2439A & 2489A	RTE-A	RTE-A with VC+	RTE-XL	RTE-L	
1. HP 1000 A/L-SERIES COMPUTERS																			
2103L	L-Series Microcomputer w/64kb	Cn	N	N	N	N	N	N	N	N	N	N	N	N	N	N	C1	C	
2103LK	Board Microcomputer w/64kb mem	I	I	N	N	N	N	N	N	N	N	N	N	N	N	N	C1	C	
2106AK	A600 Bd Microcomputer w/128kb	N	N	I	N	N	N	I1	N	N	N	N	N	N	C2	C3	N	N	
2106BK	A600+ Bd Microcomputer w/128kb	N	N	N	I	N	N	I	I	N	N	I	N	N	C	C	N	N	
2107AK	A700 Board Computer w/128kb	N	N	N	N	I	N	N	N	I	N	N	I	N	C	C4	N	N	
2122A/B	Model 5 Microsys comp w/64kb	N	Ccz	N	N	N	N	N	N	N	N	N	N	N	N	N	C1	C	
2136A/B	Model 6 Microsys comp w/128kb	N	N	Ccz	N	N	N	N	N	N	N	N	N	N	C2	C3	N	N	
2136C/D	Model 6+ Microsys comp w/512kb	N	N	N	Ccz	N	N	N	N	N	N	N	N	N	C	C	N	N	
2137A	A700 Computer w/128kb memory	N	N	N	N	Cn	N	N	N	I	N	N	N	N	C	C4	N	N	
2139A	A900 Computer w/768kb ECC mem	N	N	N	N	N	Cn	N	N	N	I	N	N	N	C	C	N	N	
2156A	A600 Computer w/128kb memory	N	N	N	N	N	N	Cn	I1	N	N	N	N	N	C2	C3	N	N	
2156B	A600+ Computer w/128kb memory	N	N	N	N	N	N	Cn	I	N	N	N	N	N	C	C	N	N	
2436A	Micro 26 System comp w/128kb	N	N	N	N	N	N	N	N	N	N	Ccz	N	N	C	C	N	N	c
2436E	Micro 26 System comp w/512kb	N	N	N	N	N	N	N	N	N	N	Ccz	N	N	C	C	N	N	c
2437A	Micro 27 System comp w/128kb	N	N	N	N	N	N	N	N	N	N	N	Ccz	N	C	C	N	N	c
2439A	Micro 29 Sys comp w/768kb ECC	N	N	N	N	N	N	N	N	N	N	N	N	Ccz	C	C	N	N	
2. HP 1000 A/L-SERIES SYSTEM PROCESSOR UNITS																			
2142A/B	Model 5 Microsys w/128kb mem	N	Ccz	N	N	N	N	N	N	N	N	N	N	N	N	N	I	N	
2186A/B	Model 6 Microsys w/128kb mem	N	N	Ccz	N	N	N	N	N	N	N	N	N	N	C2	C3	N	N	
2186C/D	Model 6+ Microsys w/128kb mem	N	N	N	Ccz	N	N	N	N	N	N	N	N	N	I	C	N	N	
2196C/D	Model 26 System w/512kb memory	N	N	N	N	N	N	N	Ccz	N	N	N	N	N	I	C	N	N	
2197C/D	Model 27 System w/512kb memory	N	N	N	N	N	N	N	N	Ccz	N	N	N	N	I	I	N	N	
2199C/D	Model 29 Sys w/768kb ECC mem	N	N	N	N	N	N	N	N	N	Ccz	N	N	N	I	I	N	N	
2486A	Micro 26 System w/512kb memory	N	N	N	N	N	N	N	N	N	N	Ccz	N	N	I	C	N	N	c
2487A	Micro 27 System w/512kb memory	N	N	N	N	N	N	N	N	N	N	N	Ccz	N	I	C	N	N	c
2489A	Micro 29 Sys w/768kb ECC mem	N	N	N	N	N	N	N	N	N	N	N	N	Ccz	I	C	N	N	
3. A/L-MEMORY PRODUCTS																			
12002A	128k byte XL Memory Controller	C	C	N	N	N	N	N	N	N	N	N	N	N	N	N	C	N	
12002B	512k byte XL Memory Controller	C	C	N	N	N	N	N	N	N	N	N	N	N	N	N	C	N	
12003A	128k byte XL Memory Array Card (Used with 12002A)	C	C	N	N	N	N	N	N	N	N	N	N	N	N	N	C	N	
12103A	128k A600/A700 Memory Array Cd	N	N	C	C	C	N	C	C	C	N	C	C	N	C	C	N	N	
12103B	256kb A700 Memory Array Card	N	N	N	N	C	N	N	N	C	N	N	C	N	C	C	N	N	
12103C	512kb A600/A700 Mem Array Card	N	N	C	C	C	N	C	C	C	N	C	C	N	C	C	N	N	
12103D	1Mb A600/A700 Memory Array Cd	N	N	C	C	C	N	C	C	C	N	C	C	N	C	C	N	N	
12104A	512kb A700 ECC Memory Array Cd	N	N	N	N	C	N	N	N	C	N	N	C	N	C	C	N	N	
12220A	768kb A900 ECC Memory Array Cd	N	N	N	N	N	C	N	N	N	C	N	N	C	C	C	N	N	
4. A/L-SERIES COMPUTER AND SYSTEM ACCESSORIES																			
12008A	PROM Storage Module	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
12011A	Extender Card	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
12012A	Priority Jumper Card	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
12013A	Battery Backup Card	C	C	C5	C5	N	N	N	N	N	N	N	N	N	C	C	C	C	
12153A	A700 Writable Control Store Cd	N	N	N	N	C	N	N	N	C	N	N	C	N	C6	C6	N	N	
12154A	Batt Backup Cd for Micro/1000	N	N	N	N	N	N	N	N	N	N	C	C	N	C	C	N	N	
12155A	A700 PROM Control Store Card	N	N	N	N	C	N	N	N	C	N	N	C	N	C	C	N	N	
12156A	A700 Hardware Floating Pt Proc	N	N	N	N	C	N	N	N	C	N	N	C	N	C	C	N	N	
12157A	Batt Backup Cd for 20-slot box	N	N	N	N	C	C	C	C	C	C	N	N	N	C	C	N	N	
12158A	25kHz Power Module	N	N	N	N	C	C	C	C	C	C	N	N	N	C	C	N	N	
12159A	25kHz Sine Wave Card	N	N	N	N	N	N	N	N	N	C	C	C	C	C	C	N	N	
12205A	Control Store Board for A900	N	N	N	N	N	C	N	N	N	C	N	N	C	C6	C6	N	N	
12240A	Extender Card for A900 CPU cds	N	N	N	N	N	C	N	N	N	C	N	N	C	C	C	N	N	
40025A	Micro/1000 Vertical Floor Mt	N	N	N	N	N	N	N	N	N	C	C	C	C	C	C	N	N	

FOOTNOTES:

C1 = RTE-XL requires 128kb (2103L/LK Option 011) to 512kb memory (2103L/LK Option 012) for operation.
C2 = A600 with serial prefix earlier than 2305 will be upgraded at no charge to work with RTE-A.
C3 = Requires 12107A Upgrade Kit to work with RTE-A/VC+.
C4 = A700 with serial prefix earlier than 2326 will be upgraded at no charge to work with RTE-A/VC+.
C5 = Compatible only for battery backup support of one 128kb or 512kb memory controller card. Additional memory array cards cannot be used.
C6 = 12153A or 12205A requires the 92045A or 92049A RTE Microprogramming Package.
I1 = Included in 2156A only.

A/L-Series Compatibility Matrix, continued

LEGEND:
- Cc = Compatible and qualified under FCC Class A EMI standards
- Cz = Compatible and FTZ licensed
- Ccz = Compatible, qualified under FCC Class A EMI standards, and FTZ licensed
- Cep = Compatible, EMI qualification pending
- Cn = Compatible, but not EMI qualified
- C = Compatible or supported without reference to EMI qualification
- N = Not compatible
- Nt = Not tested
- I = Included hardware or software item

PRODUCT AND OPTION NUMBERS	DESCRIPTION	COMPUTERS AND SYSTEM COMPATIBILTY													OP SYSTEM COMPATIBILITY				
		2103L	2122A/B & 2142A/B	2136A/B & 2186A/B	2136C/D & 2186C/D	2137A	2139A	2156A/B	2196C/D	2197C/D	2199C/D	2436A/E & 2486A	2437A & 2487A	2439A & 2489A	RTE-A	RTE-A with VC+	RTE-XL	RTE-L	
5. RECOMMENDED A/L-SERIES TERMINAL INTERFACES																			
12005B	Asynchronous Serial Interface	C	C	C	I	C	C	C	I	I	I	I2	I2	I2	C	C	C	C	
37222A	Integral Modem Card	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
12040B	Eight-Chan Async Multiplexer	C	C	C	Ccz	C	C	C	Ccz	Ccz	Cep	Ccz	Ccz	Ccz	C	C	C	C	c
6. OPERATOR COMMUNICATION TERMINALS FOR A/L-SERIES SYSTEMS (Also see pages 4.1-1 through 4.1-14)																			
2382A@	Office Display Terminal	Cn	Cn	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	C	c
2621B@	Interactive Terminal w/o prtr	Cn	Ccz	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	C	c
2622A#	Display Terminal w/o printer	Cn	Cn	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	C	c
2623A#	Graphics Terminal w/o printer	Cn	Cn	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	C	c
2624B#	Display Terminal w/o printer	Cn	Cn	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	C	c
2626A#	Display Station w/o printer	Cn	Cn	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	C	c
2627A#	Color Graphics Terminal	Nt	Cn	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	C	c
2635B@	Printing Terminal	Nt	Ccz	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	C	c
2645A	Display Station	Cn	Ccz	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	C	
Option 007	Minicartridge I/O	Cn	Ccz	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	C	
2647A**	Intelligent Graphics Terminal	Cn	Ccz	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	C	
2647F	Intelligent Graphics Terminal	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	C	C	C	C	
2648A	Graphics Terminal	Cn	Ccz	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	C	
Option 007	Minicartridge I/O	Cn	Ccz	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	C	
27201A	Speech Output Module (SOM) conn via a compatible terminal (req 27203A Speech Library)	Nt	Nt	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Cep	Ccz	Ccz	Ccz	C	C	Nt	Nt	c
27203A	SOM Speech Library	Nt	Nt	C	C	C	C	C	C	C	C	C	C	C	C	C	Nt	Nt	
7. DATA CAPTURE TERMINALS																			
3075A	Desktop Data Capture Terminal	N	N	N	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	N	N	
3076A	Wall-mt Data Capture Terminal	N	N	N	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	N	N	
3077A	Time Reporting Terminal	N	N	N	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	N	N	
3078A**	Data Coupler	N	N	N	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	N	N	
8. DISC INTERFACE AND DISC MEMORIES FOR A/L-SERIES SYSTEMS (for connections see pages 5.1-4 and 5.4-6)																			
12009A	HP-IB Interface to 79xxP/R, 9895A, or 79xxH Disc	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
7906H	19.6Mb Cartridge ICD Memory	Cn	Cn	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	C	C	
7906M/S	19.6Mb MAC Master/Slave Disc	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
7908P	Standalone 16.5Mb fixed disc##	Cn	Ccz	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	N	c
7908R	Rack mtg 16.5Mb fixed disc##	Cn	N1	N1	N1	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	N	c
7910HR**	12Mb fixed disc	Cn	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	C	C	
7911P	Standalone 28.1Mb fixed disc##	Cn	Ccz	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	N	c
7911R	Rack mtg 28.1Mb fixe disc##	Cn	N1	N1	N1	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	N	c
7912P	Standalone 65.6Mb fixed disc##	Cn	Ccz	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	N	c
7912R	Rack mtg 65.6Mb fixed disc##	Cn	N1	N1	N1	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	N	c
7914P	Standalone 132.1Mb fxd disc##	Cn	Ccz	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	N	c
7914R	Rack mtg 132.1Mb fixed disc##	Cn	N1	N1	N1	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	N	
7914TD	132.1Mb fixed disc & 1600 bpi Mag Tape Unit in 83-in cabinet ## = Includes built-in cartridge tape backup.	Cn	Cn	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	N	c
7920H/7925H	50Mb/120Mb ICD Memory	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	
7920M/S	50Mb MAC Master/Slave Discs	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
7925M/S	120Mb MAC Master/Slave Discs	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
7933H	404Mb Fixed Disc	Nt	Nt	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	N	N	c
7935H	404Mb Removable Media Disc	Nt	Nt	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	N	N	c
9121D/S	572kb Dual/286kb Single Micro-floppy Disc	Nt	Cn	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	Nt	Nt	c
9133A/B	4.6/9.2Mb Mini Winchester and 286kb Single Microfloppy discs	Nt	Cn	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	Nt	Nt	c
9134A/B	4.6/9.2Mb Mini Winchester disc	C7	C7	C7	C7	C7	C7	C7	C7	C7	C7	C7	C7	C7	C	C	Nt	Nt	
9135A	4.6Mb Mini Winchester & Single Minifloppy discs	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
9138A	4.6Mb Mini Winchester & Single 1.18Mb Flexible discs	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	
9895A	2.35b Master Dual Flex Disc	Cn	Ccz	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	C	c

FOOTNOTES:

I2 = 12005B interface is included in 248xA Micro 26/27/29 SPUs, but not in 243xA Micro 26/27/29 System components.
@ = Requires 218xC/D cable Option 006 for non-integrated terminal (that does not have 262x Option 090) or 219xC/D or 248xA cable Option 006.
\# = Requires 218xC/D cable Option 005 for 262x terminal without Option 090 or 219xC/D or 248xA cable Option 005.
** = Obsolete product listed here for reference only.
N1 = Functionally compatible, but is a rack mountable version not intended for use with tabletop Microsystems.
C7 = Functionally compatible, and EMI qualified under FCC and FTZ in systems (but not computers), but also requires flexible disc or other software load or exchange device for usability.

A/L-Series Compatibility Matrix, continued

LEGEND:
Cc = Compatible and qualified under FCC Class A EMI standards
Cz = Compatible and FTZ licensed
Ccz = Compatible, qualified under FCC Class A EMI standards, and FTZ licensed
Cep = Compatible, EMI qualification pending
Cn = Compatible, but not EMI qualified
C = Compatible or supported without reference to EMI qualification
N = Not compatible
Nt = Not tested
I = Included hardware or software item

PRODUCT AND OPTION NUMBERS	DESCRIPTION	COMPUTERS AND SYSTEM COMPATIBILTY													OP SYSTEM COMPATIBILITY				
		2103L	2122A/B & 2142A/B	2136A/B & 2186A/B	2136C/D & 2186C/D	2137A	2139A	2156A/B	2196C/D	2197C/D	2199C/D	2436A/E & 2488A	2437A & 2487A	2439A & 2489A	RTE-A	RTE-A with VC+	RTE-XL	RTE-L	
9. MAGNETIC TAPE INTERFACE AND MAGNETIC TAPE UNITS FOR A/L-SERIES SYSTEMS (for connections, see page 5.5-3)																			
12009A	HP-IB I/F to 7970E+626/636 or 7971A+140/144 Mag Tape	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	N	
7970E+626	1600 bpi Mag Tape Subsystem in low cabinet	Cn	Nt	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	N	c
7970E+636	Rack-Mtg 1600 bpi Mag Tape	Cn	N1	N1	N1	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	Nt	c
7970E+226	1600 bpi Mag Tape Subsystem in low cabinet	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
7970E+236	Rack-Mtg 1600 bpi Mag Tape	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
7971A+140/144	One or two 7970E+636 Mag Tape Subsystems in Tall Cabinet	Cn	Cn	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	Nt	c
7971A+2xx	One or two 7970B/E Mag Tape Subsystems in tall cabinet	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
10. PRINTER INTERFACES AND PRINTERS FOR A/L-SERIES SYSTEMS (for connections, see pages 5.2-5 and 5.2-6)																			
12005A/B+002	Async Serial I/F to 2601A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
12009A	HP-IB I/F to 2563A+214, 2608S+214, 2631B+214, 267xA/G, 2932A, 82905A/B*, and 82906A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	c c c n
12040B	Multiplexer I/F to 2601A, 2631A, 2932A, and 2687A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	n n
2563A+214	300 lpm Line Printer	N	N	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	N	N	n
2601A	40 cps Daisywheel Printer	Cn	Ccz	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	C	
2608A+210	400 lpm Line Printer	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
2608S+210	400 lpm Line Printer	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
2608S+214	400 lpm Line Printer	N	N	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	N	N	c
2611A**	600 lpm Line Printer	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
2617A**	600 lpm Line Printer	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
2619A**	1000 lpm Line Printer	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
2631B+214	180 cps (impact) Printer	Cn	Cn	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	C	c
267xA/G	120 cps (thermal) Printer	Cn	Cn	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	C	c
2687A	Desktop Laser Page Printer	Nt	Nt	Cep	Cep	Cn	Cn	Cn	Cep	Cep	Cep	Cep	Cep	Cep	C	C	Nt	Nt	n
2932A	General-Purpose Printer	Nt	Nt	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	Nt	Nt	n
82905A/B*	80 cps Impact Printer	Cn	Ccz	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	C	c
82906A	Dot-Martrix Printer	Nt	Nt	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C	C	C	C	n
9876A	Thermal Graphics Printer	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	
11. GRAPHICS INTERFACES AND GRAPHICS/1000-II SUPPORTED GRAPHICS DEVICES FOR A/L-SERIES SYSTEMS (for connections, see page 5.3-3)																			
12005B+005	Async Serial I/F to 2623A, 2627A, or 2629G Graphics Term	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
12005A/B+001	Async Serial I/F to 2623A, 2627A, or 2629G Graphics Term	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
12005A+005	Async Serial I/F to 2647A, 2648A, 2649C, or 2649G Term	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
12009A	HP-IB I/F to 7470A, 7580B/85B, 9111A, and 9872C/T	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
1350S**/1351S	Graphics Display System	Cn	Cn	N	N	N	N	N	N	N	N	N	N	N	N	N	C8	C8	
2623A	Graphics Terminal	Cn	Ccz	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C8	C8	C8	C8	c
2627A	Color Graphics Term (NOTE A)	Cn	Ccz	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C8	C8	C8	C8	c
2647A	Intelligent Graphics Terminal	Cn	Cn	Nt	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C8	C8	C8	C8	
2648A	Graphics Terminal	Cn	Cn	Nt	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C8	C8	C8	C8	
7220C/T	RS-232 Graphic Plotter with HP/GL programming	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
7221C/T	RS-232 Graphic Plotter with compacted binary programming	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
7225B+17601A**	Graphics Plotter (one pen)	Cn	Cn	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	C8	C8	
7245B**	Plotter/Printer	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	N	N	N	N	
7470A+002	Graphics Plotter (two pens)	Cn	Ccz	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C8	C8	C8	C8	c
7580B/7585B	Drafting Plotter (eight pens)	Cn	Ccz	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C8	C8	C8	C8	c
9111A	Graphics Tablet with serial prefix 2251 or higher	Cn	Ccz	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C8	C8	C8	C8	c
9872A/B/S**	Graphics Plotter (four pens)	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C8	C8	C8	C8	
9872C/T	Graphics Plotter (eight pens)	Cn	Ccz	Ccz	Ccz	Cn	Cn	Cn	Ccz	Ccz	Ccz	Ccz	Ccz	Ccz	C8	C8	C8	C8	c
9874A**	Digitizer	Cn	Cn	N	N	N	N	N	N	N	N	N	N	N	N	N	C8	C8	

FOOTNOTES:

C8 = Requires the 92841A Graphics/1000-II Device-Independent Graphics Library.
N1 = Functionally compatible, but is a rack mountable version not intended for use with tabletop Microsystems
* = 82905B Impact Printers delivered prior to August 1983 require their own 12009A interface, but can be upgraded to permit sharing of the HP-IB bus with other devices (check with HP Customer Engineering). HP 82905B Impact Printers delivered after August 1983 will support shared use of the HP-IB bus with other devices.
** = Obsolete product listed here for reference only.

NOTE A: 17263A Data Tablet is supported as an extension of the 2627A Color Graphics Terminal.

A/L-Series Compatibility Matrix, continued

LEGEND:
Cc = Compatible and qualified under FCC Class A EMI standards
Cz = Compatible and FTZ licensed
Ccz = Compatible, qualified under FCC Class A EMI standards, and FTZ licensed
Cep = Compatible, EMI qualification pending
Cn = Compatible, but not EMI qualified
C = Compatible or supported without reference to EMI qualification
N = Not compatible
Nt = Not tested
I = Included hardware or software item

PRODUCT AND OPTION NUMBERS	DESCRIPTION	COMPUTERS AND SYSTEM COMPATIBILTY													OP SYSTEM COMPATIBILITY			
		2103L	2122A/B & 2142A/B	2136A/B & 2186A/B	2136C/D & 2186C/D	2137A	2139A	2156A/B	2196C/D	2197C/D	2199C/D	2436A/E & 2486A	2437A & 2487A	2439A & 2489A	RTE-A	RTE-A with VC+	RTE-XL	RTE-L
12. HP 1000 DSN INTERFACES, PROGRAMMABLE SERIAL INTERFACE, AND FIBER OPTIC MULTIPLEXER																		
12007A/B	DS/1000-IV HDLC Modem I/F	C	C	C	C	C	C	C	C	C	C	C	C	C	C9	C9	C9	C9
12044A	DS/1000-IV HDLC Dir Conn I/F	C	C	C	C	C	C	C	C	C	C	C	C	C	C9	C9	C9	C9
12072A	DS/1000-IV Data Link Slave I/F	C	C	C	C	C	C	C	C	C	C	C	C	C	C9	C9	C9	C9
12073A	DS/1000-IV Bisync Modem I/F	C	C	C	C	C	C	C	C	C	C	C	C	C	C9	C9	C9	N
12082A	DS/1000-IV Bisync Dir Conn I/F	C	C	C	C	C	C	C	C	C	C	C	C	C	C9	C9	C9	N
12092A	Data Link Master Interface	N	N	C	C	C	C	C	C	C	C	C	C	C	C10	C10	N	N
12075A	DSN/X.25 Network (modem) I/F to Packet Switched Networks	N	N	C	C	C	C	C	C	C	C	C	C	C	C11	C11	N	N
12042B	Prog Serial (modem) Interface	C	C	C	C	C	C	C	C	C	C	C	C	C	N3	N3	N3	N3
12043A	DSN/MRJE (modem) Interface	C	C	C	C	C	C	C	C	C	C	C	C	C	C12	C12	N	N
39301A	Fiber Optic Multiplexer (pair of 39301As and 39200B cabling are used with 12040B)	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
13. A/L-SERIES MEASUREMENT AND CONTROL INTERFACES AND PERIPHERALS (for connections, see pages 5.4-3 and 5.4-4)																		
12009A	HP-IB I/F to HP-IB instruments	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12041A	PCIF/1000 Multiplexer I/F	N	N	C	C	C	C	C	C	C	C	C	C	C	C13	C13	N	N
12060A/B	High-Level Analog Input Card	C	N	N	N	C14	C14	C14	C14	C14	C14	C14	C14	C14	C	C	C	C
12061A	32-Ch Exp Mpxer Cd for 12060A	C	N	N	N	C14	C14	C14	C14	C14	C14	C14	C14	C14	C	C	C	C
12062A	4-Channel Analog Output Card	C	N	N	N	C14	C14	C14	C14	C14	C14	C14	C14	C14	C	C	C	C
12063A	16-In/16-Out Iso Digital Card	C	N	N	N	C14	C14	C14	C14	C14	C14	C14	C14	C14	C	C	C	C
2240A	Meas & Control Proc & Access.	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C	C	C	C
2250M/N/R	Meas & Control Proc & Access.	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C	C	C	C
14. A/L-SERIES GENERAL-PURPOSE INTERFACES																		
12006A	Parallel Interface	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12010A	Breadboard Interface	C	C	C	C	C	C	C	C	C	C	C	C	C	N3	N3	N3	N3
37203L	HP-IB Extender Card	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
15. A/L-SERIES SOFTWARE (See pages 3.5-2 through 3.5-4 application requirements)																		
91732A	Data Link/Multipoint software	N	N	N	C	C	C	C	N	N	N	C	N	N	C	N	N	N
91745A	Datasafe/1000 software	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
91747A	Datashare/1000 software	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
91750A	DS/1000-IV Network software	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
91751A	DSN/X.25 Network software	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
91780A	RJE/1000 Remote Job Entry Pkg	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
91782A	MRJE/1000 Remote Job Entry Pkg	N	N	N	C	C	C	C	C	C	C	C	C	C	C	C	N	N
92045A	RTE Microprogramming Package	N	N	N	N	C	N	N	N	C	N	N	C	N	C	C	N	N
92049A	RTE Microprogramming Package	N	N	N	N	N	C	N	N	N	C	N	N	C	C	C	N	N
92069A	Image/1000	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C15	C16
92070A	RTE-L operating system	C17	C17	N	N	N	N	N	N	N	N	N	N	N	N	N	N	I
92071A	RTE-XL operating system	C17	C17	N	N	N	N	N	N	N	N	N	N	N	N	N	I	N
92076A	BASIC/1000L	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	N
92077A	RTE-A operating system	N	N	N	I	C	C	C	C	I	I	I	C	I	I	I	N	N
92078A	RTE-A VC+ Extension	N	N	N	I	C	C	C	C	I	I	I	C	I	I	I	N	N
92081A	Image/1000-II	N	N	C	C	C	C	C	C	C	C	C	C	C	C	C	N	N
92120A	PMC/1000 Proc Mon & Ctrl Pkg	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
92130A	QDM/1000 Quality Dec Mgt Pkg	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
92140A	PCL/1000-AB Prog Ctrlr Link	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
92833A	Pascal/1000	N	N	N	C	N	C	N	C	N	C	N	C	N	C	C	N	N
92834A	FORTRAN 4X	C	C	C	N	N	N	N	N	N	N	C	N	N	N	N	C	N
92835A	Signal/1000 Signal Proc Pkg	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
92836A	FORTRAN 77	N	N	N	C	C	C	C	C	C	C	C	C	C	C	C	N	N
92841A	Graphics/1000-II Device Independent Graphics Library	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
92842A	Graphics/1000-II Adv Graphics	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	N
92843X	Graphics/1000-II Skeleton Device Handler Source Product	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	N
92854A	Pascal/1000	C	C	C	N	N	N	N	N	N	N	N	N	N	N	N	C	N
92857A	BASIC/1000C	N	N	N	C	C	C	C	C	C	C	C	C	C	C	C	N	N
92860A	Symbolic Debug/1000	N	N	N	C	C	C	C	C	C	C	C	C	C	C	C	N	N
94200A/94201A	PCIF/1000 Prog Ctrlr I/F s/w	N	N	N	C	C	C	C	C	C	C	C	C	C	C	C	N	N

FOOTNOTES:

C9 = Requires 91750A DS/1000-IV Network software.
C10 = Requires 91732A Data Link software.
C11 = Requires 91751A DSN/X.25 Communications software.
C12 = Requires 91782A MRJE/1000 software.
C13 = Requires 94200A PCIF/1000 software.
C14 = Requires appropriate 25kHz power module or sine wave card in system processor unit or computer.
C15 = 92069A Image/1000 is compatible in RTE-XL with revision code 2101 or higher.
C16 = Query is not supported in RTE-L.
C17 = RTE-L is compatible in 2103L or 2122A/B with 64kb memory; RTE-XL is compatible in 2103L or 2122A/B with 128kb or more memory and is included in 2142A/B.
N3 = Support of the user-customized 12042B or 12010A interface requires user-developed software.

E/F-Series Compatibility Matrix

LEGEND:
Cc = Compatible and qualified under FCC Class A EMI stds
Cz = Compatible and FTZ licensed
Ccz = Compatible, qualified under FCC Class A EMI stds and FTZ licensed
Cep = Compatible, EMI qualification pending
Cn = Compatible, but not EMI qualified
C = Compatible or supported without reference to EMI qualification
N = Not compatible
Nt = Not tested
I = Currently included hardware

PRODUCT AND OPTION NUMBERS	DESCRIPTION	COMPATIBILITY: COMPUTERS AND SYSTEMS: 2108M/2112M	2109E/2113E	2111F/2117F	2176C	2176E	2177C	2177F	2178A	2178C	2179A	2179C	OP SYSTEM: RTE-6/VM	RTE-IVB	RTE-IVE
1. HP 1000 M/E/F-SERIES COMPUTERS															
2108M	Computer with 64kb memory, up to 2Mb avail.	Cn	N	N	N	N	N	N	N	N	N	N	C1	C	C
2108MK	Board Computer with 64kb memory	I	N	N	N	N	N	N	N	N	N	N	C1	C	C
2109E	Computer with 64kb memory, up to 2Mb avail.	N	Cn	N	N	N	N	N	N	N	N	N	C	C	C
2109EK	Board Computer with 64kb memory	N	I	N	N	N	N	N	N	N	N	N	C	C	C
2111F	Computer with 64kb memory, up to 2Mb avail.	N	N	Cn	N	N	N	N	N	N	N	N	C	C	C
2112M	Computer with 128kb memory, up to 2Mb av.	Cn	N	N	N	N	N	N	N	N	N	N	C1	C	C
2113E	Computer with 128kb memory, up to 2Mb av.	N	Cn	N	I	I	N	N	I	I	N	N	C	C	C
2117F	Computer with 128kb memory, up to 2Mb av.	N	N	Cn	N	N	I	I	N	N	I	I	C	C	C
2. HP 1000 E/F-SERIES SYSTEM PROCESSOR UNITS (SPUs)															
2176C	Model 40 SPU with 128kb memory	N	N	N	Cn	N	N	N	N	N	N	N	N	I	N
2176E	EMI-qualified Model 40 SPU w/256kb memory	N	N	N	N	Ccz	N	N	N	N	N	N	N	I	N
2177C	Model 45 SPU with 128kb memory	N	N	N	N	N	Cn	N	N	N	N	N	N	I	N
2177F	EMI-qualified Model 45 SPU w/256kb memory	N	N	N	N	N	N	Ccz	N	N	N	N	N	I	N
2178A	Model 60 SPU with 256kb memory	N	N	N	N	N	N	N	Cn	N	N	N	I	N	N
2178C	EMI-qualified Model 60 SPU w/256kb memory	N	N	N	N	N	N	N		Ccz	N	N	I	N	N
2179A	Model 65 SPU with 256kb memory	N	N	N	N	N	N	N	N	N	Cn	N	I	N	N
2179C	EMI-qualified Model 65 SPU w/256kb memory	N	N	N	N	N	N	N	N	N	N	Ccz	I	N	N
3. M/E/F-SERIES MEMORY PRODUCTS (see pages 2.4-5 through 2.4-8)															
2102B	Std Perf Mem Ctrlr (Incl. in 12784/6A-D)	C2	C	N	C	C	N	N	C	C	N	N	C2	C2	C2
2102C	Std Perf Fault Control Memory Controller (Included in 12785/7A-D)	C3	C3	N	C	C	N	N	C	C	N	N	C3	C3	C3
2102E	High Perf Mem Ctrlr (Incl. in 12788A-H)	N	C3	C3	C3	C3	C3	C3	C3	C3	C3	C3	C3	C3	C3
2102H	High Perf Fault Control Memory Controller (Included in 12789A-M)	N	C3	C3	C3	C3	C3	C3	C3	C3	C3	C3	C3	C3	C3
12666H	1Mb High Perf Fault Control Check Bit Bd*	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C	C	C
12699H	256kb High Perf Memory Module*	C5	C5	C	C5	C5	C	C	C5	C5	C	C	C	C	C
12746A	64kb Std Perf Memory Module*	C	C	N	C	C	N	N	C	C	N	N	C	C	C
12746H	64kb High Perf Memory Module*	C5	C5	C	C5	C5	C	C	C5	C5	C	C	C	C	C
12747A	128kb Std Perf Memory Module*	C	C	N	C	C	N	N	C	C	N	N	C	C	C
12747H	128kb High Perf Memory Module*	C6	C6	C6	C6	C6	C6	C6	C6	C6	C6	C6	C	C	C
12749H	512kb High Perf Memory Module*	C6	C6	C6	C6	C6	C6	C6	C6	C6	C6	C6	C	C	C
12779A	256kb Std Perf Fault Control Check Bit Bd*	C7	C7	N	C7	C7	N	N	C7	C7	N	N	C	C	C
12779H	256kb High Perf Fault Ctrl Check Bit Bd*	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C	C	C
12780A	512kb Std Perf Fault Control Check Bit Bd*	C7	C7	N	C7	N	C7	C7	C7	N	N	N	C7	C7	C7
12780H	512kb High Perf Fault Ctrl Check Bit Bd*	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C	C	C
12784A	128kb Std Perf Memory Package	I1	N	N	C	N	N	N	N	N	N	N	C	C	C
12784B-D	256kb-1024kb Std Perf Memory Packages	C8	N	N	C	N	N	N	N	N	N	N	C	C	C
12785A-D	128kb-1024kb Std Perf FC Memory Packages	C8	N	N	C	N	N	N	N	N	N	N	C	C	C
12786A	128kb Std Perf Memory Package	N	I1	N	I	N	N	N	N	N	N	N	C	C	C
12786B	256kb Std Perf Memory Package	N	C8	N	C	N	N	N	I	I	N	N	C	C	C
12786C-D	512kb-1024kb Std Perf Memory Packages	N	C8	N	C	C	N	N	C	C	N	N	C	C	C
12787A-D	128kb-1024kb Std Perf FC Memory Packages	N	C8	N	C	C	N	N	C	C	N	N	C	C	C
12788A	128kb High Perf Memory Package	N	C5	C5	C5	C5	I	C5	N	N	N	N	C	C	C
12788B	256kb High Perf Memory Package	N	C5	C5	C5	C5	C5	C5	C5	C5	C5	C5	C	C	C
12788BB	256kb High Perf Memory Package	N	C5	C5	C5	I	C5	I	C5	C5	I	I	C	C	C
12788C-H	512kb-2048kb High Perf Memory Packages	N	C8	C8	C	C	C	C	C	C	C	C	C	C	C
12789A-H	128kb-2048kb High Perf FC Memory Packages	N	C8	C8	C	C	C	C	C	C	C	C	C	C	C
12789J-M	512kb-2048kb Std Perf FC Memory Packages	N	C8	C8	C	C	C	C	C	C	C	C	C	C	C

FOOTNOTES:

C1 = 2108M and 2112M Computers are compatible with RTE-6/VM only for purposes of program transportability. Because of insufficient control store capacity, these computers cannot use the RTE-6/VM firmware and must use much slower equivalent software routines.
C2 = Memory controller w/date code 1728 or later is compatible.
C3 = Memory controller w/date code 1720 or later is compatible when used in computer with date code 1720 or later.
C4 = Requires 2102C or 2102H Fault Control Memory Controller in Computer or SPU, but high performance memory cycle time is achieved only with 2102H Memory Controller in 2109E, 2111F, 2113E, or 2117F Computer or 2176C/E, 2177C/F, 2178A/C, or 2179A/C System Processor Unit.
C5 = High performance memory can be used with any 2102x Memory Controller, but high performance cycle time is achieved only with 2102E/H Memory Controller in 2109E, 2111F, 2113E, or 2117F Computer or 2176C/E, 2177C/F, 2178A/C, or 2179A/C System Processor Unit.
C6 = Requires Memory controller with date code 1801 or later; note C5 also applies to the 12747H and 12749H Memory Modules.
C7 = Requires 2102C Fault Control Memory Controller in Computer or SPU.
C8 = 1278xD (1024kb) Memory Package will require 12990B Memory Extender when used with 2108M, 2109E, or 2111F Computer.
I1 = 12784A/12786A (128kb) Standard Performance Memory Package is included in 2112M/2113E Computer and 2176C SPU.
* = 12666H, 12699H, 12747H, 12749H, 12779A and 12780A Memory Modules and Check Bit Boards are included in various 1278x Memory packages.

E/F-Series Compatibility Matrix, continued

LEGEND:
Cc = Compatible and qualified under FCC Class A EMI stds
Cz = Compatible and FTZ licensed
Ccz = Compatible, qualified under FCC Class A EMI stds and FTZ licensed
Cep = Compatible, EMI qualification pending
Cn = Compatible, but not EMI qualified
C = Compatible or supported without reference to EMI qualification
N = Not compatible
Nt = Not tested
I = Currently included hardware

PRODUCT AND OPTION NUMBERS	DESCRIPTION	COMPATIBILITY: COMPUTERS AND SYSTEMS: 2108M/2112M	2109E/2113E	2111F/2117F	2176C	2176E	2177C	2177F	2178A	2178C	2179A	2179C	OP SYSTEM: RTE-6/VM	RTE-IVB	RTE-IVE
3. M/E/F-SERIES MEMORY PRODUCTS, continued (see pages 2.4-5 thru 2.4-8)															
12892B	Memory Protect Module (incl. in 12784x through 12789x Memory Packages)	C	C	C	C	C	C	C	C	C	C	C	C9	C9	C9
12897B	Dual-Channel Port Controller	C	C	C	C	C	C	C	C	C	C	C	C10	C10	C10
12898A	Dual-Channel Port Controller for I/O Ext.	C	C	C	C	C	C	C	C	C	C	C	C11	C11	C11
12976B	M-Series Dynamic Mapping System	C	N	N	N	N	N	N	N	N	N	N	C	C	C
+003	Adds Fast FORTRAN Processor to 12976B	C	N	N	N	N	N	N	N	N	N	N	C	C	C
12978B	M-Series Dynamic Mapping Instructions	C	N	N	N	N	N	N	N	N	N	N	C	C	C
13305A*	E/F-Series Dyn Mapping Sys for 13304A FAB	N	C12	N	N	N	N	N	N	N	N	N	C13	C13	C13
13307A*	E/F-Series Dynamic Mapping Instruction ROMs (part of 13305A)	N	C12	N	N	N	N	N	N	N	N	N	C13	C13	C13
13307B	E/F-Series Dynamic Mapping Instruction ROMs for use on 12791A or 13304A	N	I1	I1	I	I	I	I	I	I	I	I	C13	C13	C13
12731A	Memory Exp Module (incl. in 12784x-9x)	I2	I2	I2	I	I	I	I	I	I	I	I	C14	C14	C14
4. M/E/F-SERIES COMPUTER AND SYSTEM ACCESSORIES AND UPGRADES															
12539C	Time Base Generator	C	C	C	I	I	I	I	I	I	I	I	C	C	C
12620A	I/O Breadboard - RTE Priv Interrupt Fence	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12777A	Priority Jumper Card	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12791A	Firmware Expansion Module (FEM)	C	I	I	C	I	I	I	I	I	I	I	C	C	C
12823F	F-Series Firmware Upgrade Kit for computer with serial prefix 1920 or earlier	N	N	C	na	na	na	na	na	na	na	na	C	C	C
12824A	Vector Instruction Set for use in RTE-IVB	C15	C15	C	C15	C15	I	I	N	N	N	N	N	C	N
12829A	Vector Instruction Set for use in RTE-6/VM	C15	C15	C	N	N	N	N	C15	C15	I	I	C	C	C
12944B	Power Fail Recovery Sys for 2108M or 2109E	C	C	C	C	N	N	N	N	N	N	N	C	C	C
12945A	M-Series User Control Store	C	N	N	N	N	N	N	N	N	N	N	C	C	C
12977B	M-Series Fast FORTRAN Processor	C16	N	N	N	N	N	N	N	N	N	N	C	C	C
12991B	Power Fail Recovery Sys for 2111F, 2112M, 2113E, and 2117F Computers and 12990B	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12992B	RPL-compatible 7905A/79xxM Disc Loader ROM	N	C	C	C	C	C	C	C	C	C	C	na	na	na
12992C	264x Terminal Minicartridges Loader ROM	C	I	I	I	I	I	I	C	I	I	C	na	na	na
12992D	7970B/E+226/236 or equiv 7971A Mag Tape Loader ROM	C	I	I	C	C	C	C	C	C	C	C	na	na	na
12992E	12732A (9885M) Flexible Disc Loader ROM	C	C	C	C	C	C	C	C	C	C	C	na	na	na
12992F	RPL-compatible 7900 Disc Loader ROM	N	C	C	C	C	C	C	C	C	C	C	na	na	na
12992J	CS/80 Disc Loader ROM	C	C	C	C	C	C	C	C	C	C	C	na	na	na
12992K	Paper Tape Loader ROM	C	C	C	C	C	C	C	C	C	C	C	na	na	na
13197A	1k Writable Control Store (WCS) board	C	C	C	C	C	C	C	C	C	C	C	C17	C17	C17
13304A	Firmware Accessory Board (FAB)	N	C	C	I	C	C	C	C	C	C	C	C	C	C
13306A	E/F-Series Fast FORTRAN Proc for FAB mtg	N	C	N	C	N	C	C	C	N	N	N	C	C	C
13306B	E/F-Series Fast FORTRAN Proc for FEM mtg	N	C	C	C	I	C	C	C	I	I	I	C	C	C
5. M/E/F-SERIES EXTENDERS															
12781A	Dual CPU Kit for 12979B	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12979B	Dual-Port I/O Extender	C	C	C	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C	C	C
12979B+001	12979B Modified for EMI compliance	C	C	C	C	Ccz	C	Ccz	C	Ccz	C	Ccz	C	C	C
12990B*	Memory Extender	C	C	C	C	C	C	C	C	C	C	C	C	C	C

FOOTNOTES:

C9 = Memory Protect module with date code 1704 or later is compatible.
C10 = 12897B Dual-Channel Port Controller with date code 1649 or later is compatible.
C11 = 12898A Dual-Channel Port Controller with date code 1647 or later is compatible.
C12 = Requires 13304A Firmware Accessory Board, which is provided as 2109E/2113E Computer option 003.
C13 = Compatible when 13305A and/or 13307A/B includes Dynamic Mapping Instruction ROMS with part numbers 13307-80021 through 80026 or higher.
C14 = Memory Expansion Module with date code 1652 or later is compatible.
C15 = Compatibility is with software equivelents included in the 12824A/12829A Vector Instruction Set.
C16 = Compatible in 2108M/2112M Computer with "B" revision of base instruction set.
C17 = Requires 92061A RTE Microprogramming Package.
I1 = 12788A (128kb) High Performance Memory Package and 13307B Dynamic Mapping Instr. are included in 2117F Computer.
I2 = 12731A is included in 2112M, 2113E, and 2117F Computers.
na = Not Applicable
* = Obsolete product listed here for reference only.

E/F-Series Compatibility Matrix, continued

LEGEND:
Cc = Compatible and qualified under FCC Class A EMI stds
Cz = Compatible and FTZ licensed
Ccz = Compatible, qualified under FCC Class A EMI stds and FTZ licensed
Cep = Compatible, EMI qualification pending
Cn = Compatible, but not EMI qualified
C = Compatible or supported without reference to EMI qualification
N = Not compatible
Nt = Not tested
I = Currently included hardware

PRODUCT AND OPTION NUMBERS	DESCRIPTION	COMPATIBILITY: COMPUTERS AND SYSTEMS: 2108M/2112M	2109E/2113E	2111F/2117F	2176C	2176E	2177C	2177F	2178A	2178C	2179A	2179C	OP SYSTEM: RTE-6/VM	RTE-IVB	RTE-IVE
6. RECOMMENDED M/E/F-SERIES TERMINAL INTERFACES															
12790A	Multipoint/Data Link Interface	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C19	C19	C19
12792A*/B	Eight-Channel Asynchronous Multiplexer	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12920B	16-Channel Asynchronous Multiplexer	C	C	C	C	C	C	C	Nt	Nt	Nt	Nt	Nt	C20	C20
12966A	Buffered Async (1 ch pt-pt) Comm I/F	C21	C21	C21	C21	C21	C21	C21	C21	C21	C21	C21	C22	C22	C22
7. OTHER M/E/F-SERIES TERMINAL INTERFACES															
12531C	Teleprinter Current Loop Interface	C	C	C	C	C	C	C	Nt	Nt	Nt	Nt	Nt	C	C
12531D	Terminal Current Loop Interface	C	C	C	C	C	C	C	Nt	Nt	Nt	Nt	Nt	C	C
12880A*	Console Terminal Interface	C	C	C	C	C	C	C	Nt	Nt	Nt	Nt	Nt	C	C
8. M/E/F-SERIES OPERATOR COMMUNICATION TERMINALS (For configuration information, see pages 4.1-1 thru 14)															
2382A	Office Display Terminal	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C23	C23	C23
2621A*	Interactive Terminal	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C23	C23	C23
2621P*	Interactive Terminal with printer	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C23	C23	C23
2621B	Interactive Terminal	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C23	C23	C23
2622A	Display Terminal	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C23	C23	C23
2623A	Graphics Terminal	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C23	C23	C23
2624A*	Display Station	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C23	C23	C23
2624B	Display Station	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Ccz	Cc	C23	C23	C23
2626A	Display Station	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C23	C23	C23
2627A	Color Graphics Terminal	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C23	C23	C23
2635A*/B+051	Printing Terminal	Cn	Cn	Cn	Cn	Nt	Cn	Nt	Cn	Nt	Cn	Nt	C23	C23	C23
2635B	Printing Terminal	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C23	C23	C23
2645A	Display Station	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C23	C23	C23
+007	Adds Mini cartridge tape I/O	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C	C	C
2647A*	Intelligent Graphics Terminal	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C	C	C
2647F	Intelligent Graphics Terminal	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt
2648A	Graphics Terminal	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C23	C23	C23
+007	Adds Mini cartridge tape I/O	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C	C	C
2675A*+070	Thermal Printing Terminal with Mini cartridges deleted	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C	C	C
27201A	Speech Output Module conn via a compatible terminal (requires 27203A)	Cn	Cn	Cn	N	N	N	N	Cn	Cep	Cn	Cep	C	N	N
27203A	Speech Output Module Speech Library	Cn	Cn	Cn	N	N	N	N	C	C	C	C	C	N	N
9. M/E/F-SERIES DATA CAPTURE TERMINALS (See pages 4.2-1 and 2 for connections)															
3075A	Desktop Data Capture Terminal	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C24	C24	N
3076A	Wall-mounting Data Capture Terminal	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C24	C24	N
3077A	Time Reporting Terminal	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C24	C24	N
3078A	Data Coupler	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt
10. M/E/F-SERIES DISC INTERFACES AND DISC MEMORIES (for connections, see pages 5.1-4 through 8)															
12732A	Flexible Disc Memory Subsystem	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C	C	C
12821A	Interface to as many as four 7908/11/12/33/35 CS/80 Discs or as many as two 9898A and/or 7906H/20H/25H Discs	C	C	C	C	C	C	C	C	C	C	C	C	C	C
13175B*/D	Interface to 79xxM MAC Master Disc and up to seven 79xxS MAC Slave Discs	C	C	C	C	C	C	C	C	C	C	C	C	C	N
13178C*/D	Multi-CPU Interface (2nd thru 7th additional conn to 79xxM MAC Master Disc and associated 79xxS MAC Slave Discs)	C	C	C	C	C	C	C	C	C	C	C	C	C	N
7906H	19.6Mb Cartridge ICD Memory via 12821A I/F	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C	C	N
7906HR+020	19.6Mb Cartridge ICD Memory via 12821A I/F	Cn	Cn	Cn	Cn	Cn	Cn	N	Cn	Cn	N	Cn	C	C	N

FOOTNOTES:

C18 = Compatible when used with 2645A Display Stations with serial number 1747A06465 or later, 2648A Graphics Terminals with serial number 1747A00846 or later, 264x OEM versions of these terminals, the 2624B Display Terminal, 2626A Display Station, and 2629x OEM versions of these terminals when equipped with the appropriate multipoint terminal option or accessory.
C19 = Requires 91730A Multipoint Subsystem Software.
C20 = Requires 91731A Multiplexer Subsystem Software.
C21 = 12966A interface card with date code 1629 or later is compatible with 2109E, 2111F, 2113E, and 2117F Computers and 2176C/E, 2177C/F, 2178A/C, and 2179A/C System Processor Units.
C22 = 12966A is software-supported in RTE only for use with 238x, 262x, 2635A*/B, and 264x Terminals.
C23 = This terminal is usable as a system console if a 264x Terminal with Mini cartridge I/O and 12966A+107 interface or another system load device is available at the system site for loading of diagnostics and updates.
C24 = Requires 91730A Multipoint Subsystem Software and 92080A DATACAP/1000 software.
* = Obsolete product listed here for reference only.

E/F-Series Compatibility Matrix, continued

LEGEND:
Cc = Compatible and qualified under FCC Class A EMI stds
Cz = Compatible and FTZ licensed
Ccz = Compatible, qualified under FCC Class A EMI stds and FTZ licensed
Cep = Compatible, EMI qualification pending
Cn = Compatible, but not EMI qualified
C = Compatible or supported without reference to EMI qualification
N = Not compatible
Nt = Not tested
I = Currently included hardware

PRODUCT AND OPTION NUMBERS	DESCRIPTION	COMPATIBILITY: COMPUTERS AND SYSTEMS: 2108M/2112M	2109E/2113E	2111F/2117F	2176C	2176E	2177C	2177F	2178A	2178C	2179A	2179C	OP SYSTEM: RTE-6/VM	RTE-IVB	RTE-IVE
10 M/E/F-SERIES DISC INTERFACES AND DISC MEMORIES, continued															
7906M/S	19.6Mb MAC Master/Slave Cartridge Disc Memory via 13175D/13178D interface	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C	C	N
7906MR+020	19.6Mb MAC Master Cartridge Disc Memory via 13175D/13178D interface	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C	C	N
7908P	16.5Mb Fixed Disc** via 12821A interface	Cn	Cn	Cn	N	N	N	N	Cn	Ccz	Cn	Ccz	C	N	N
7908R	16.5Mb Fixed Disc** via 12821A interface	Cn	Cn	Cn	N	N	N	N	N	Ccz	N	Ccz	C	N	N
7911P	28.1Mb Fixed Disc** via 12821A interface	Cn	Cn	Cn	N	N	N	N	Cn	Ccz	Cn	Ccz	C	N	N
7911R	28.1Mb Fixed Disc** via 12821A interface	Cn	Cn	Cn	N	N	N	N	N	Ccz	N	Ccz	C	N	N
7912P	65.6Mb Fixed Disc** via 12821A interface	Cn	Cn	Cn	N	N	N	N	Cn	Ccz	Cn	Ccz	C	N	N
7912R	65.6Mb Fixed Disc** via 12821A interface	Cn	Cn	Cn	N	N	N	N	N	Ccz	N	Ccz	C	N	N
7914P	132.1Mb Fixed Disc** via 12821A interface	Cn	Cn	Cn	N	N	N	N	Cn	Ccz	Cn	Ccz	C	N	N
7914R	132.1Mb Fixed Disc** via 12821A interface	Cn	Cn	Cn	N	N	N	N	N	Ccz	N	Ccz	C	N	N
7914TD+236	132.1Mb Fixed Disc and 7970E+236 Mag Tape in 63-in cabinet w/13183A two-card I/F	Cn	Cn	Cn	N	N	N	N	Cn	Ccz	Cn	Ccz	C	N	N
7920H/7925H	50Mb/120Mb ICD Memory via 12821A interface	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C	C	N
7920M and S	50Mb MAC Master and Slave Disc Memories via 13175D/13178D interface	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C	C	N
7925M and S	120Mb MAC Master and Slave Disc Memories via 13175D/13178D interface	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C	C	N
7933H	404Mb Fixed Disc via 12821A interface	Cn	Cn	Cn	N	N	N	N	Cn	Ccz	Cn	Ccz	C25	N	N
7935H	404Mb Removable Media Disc via 12821A I/F	Cn	Cn	Cn	N	N	N	N	Cn	Ccz	Cn	Ccz	C25	N	N
9121D/S	512kb/286kb Microfloppy disc via 12821A interface	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt
9133A/B	4.6Mb/9.2Mb Fixed disc and single 286kb Microfloppy disc via 12821A interface	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt
9134A/B	4.6Mb/9.2Mb Fixed disc via 12821A I/F	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt
9135A	4.6Mb Fixed disc and single Minifloppy disc via 12821A interface	N	N	N	N	N	N	N	N	N	N	N	N	N	N
9138A*	4.6Mb Fixed disc and Flexible discs via 12821A interface	N	N	N	N	N	N	N	N	N	N	N	N	N	N
9895A	2.35Mb Master Dual Flexible Disc Drive via 12821A interface	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C	C	C
11. M/E/F-SERIES MAGNETIC TAPE SUBSYSTEMS (all include 13181B or 13183B interface; for connections, see page 5.5-3)															
7970B+226/236	800 bpi, 9-tr NRZI Mag Tape Subsystem	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C	C	C
7970E+226/236	1600 bpi, 9-tr, PE Mag Tape Subsystem	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C	C	C
7971A+2xx	One or two 7970B/E Mag Tape Subsystems in tall cabinet	Cn	Cn	Cn	C	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C	C	C
12. M/E/F-SERIES PRINTER INTERFACES AND PRINTERS (for connections, see page 5.2-4)															
12792A*/B	8-Ch Async Mpxer to 2601A or 2932A Printer multiplexer panel	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12845B	Interface to 2611A/13A*/17A*/19A/31A*+050/31B+050 Printer	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26099A	Interface to 2608A Line Printer	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2563A	300 lpm Line Printer	Cn	Cn	Cn	N	N	N	N	Cn	Ccz	Cn	Ccz	C	N	N
2601A	40 cps Daisywheel Printer via 12792A*/B interface and multiplexer panel	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C	C	C
2608A+210	400 LPM Line Printer (incl. 26099A I/F)	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C	C	C
2608S+210	400 LPM Line Printer (incl. 12821A+001 I/F)	Cn	Cn	Cn	N	N	N	N	Cn	Ccz	Cn	Ccz	C	N	N
2611A*+100	600 LPM Line Printer (incl. 12845B I/F)	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C	C	C
2613A*+100	300 LPM Line Printer (incl. 12845B I/F)	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C	C	C
2617A*+100	600 LPM Line Printer (incl. 12845B I/F)	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C	C	C
2619A*+100	1000 LPM Line Printer (incl. 12845B I/F)	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C	C	C
2631A*/B+210	180 cps (impact) Printer (incl. 12845B I/F)	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C	C	C
2671A	120 cps (thermal) Printer	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt
2671G	120 cps (thermal) Graphics Printer	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt
2673A	120 cps Intelligent Graphics Printer	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt
2687A	Desktop Laser Page Printer	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt
2932A	General Purpose Printer	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C	C	C
82905A/B	80 cps Impact Printer	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt
82906A	160 cps Dot-Matrix Printer	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt
9876A	Thermal Graphics Printer	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C	C	C

FOOTNOTES:

C25 = Requires Magnetic Tape Subsystem for bootup of system for which 7933H or 7935H is the system disc.
* = Obsolete product listed here for reference only.
** = 7908P/R, 7911P/R, 7912P/R and 7914P/R Fixed Discs include built-in cartridge tape drive for backup and software loading.

E/F-Series Compatibility Matrix, continued

LEGEND:
Cc = Compatible and qualified under FCC Class A EMI stds
Cz = Compatible and FTZ licensed
Ccz = Compatible, qualified under FCC Class A EMI stds and FTZ licensed
Cep = Compatible, EMI qualification pending
Cn = Compatible, but not EMI qualified
C = Compatible or supported without reference to EMI qualification
N = Not compatible
Nt = Not tested
I = Currently included hardware

PRODUCT AND OPTION NUMBERS	DESCRIPTION	COMPATIBILITY: COMPUTERS AND SYSTEMS: 2108M/2112M	2109E/2113E	2111F/2117F	2176C	2176E	2177C	2177F	2178A	2178C	2179A	2179C	OP SYSTEM: RTE-6/VM	RTE-IVB	RTE-IVE
13. M/E/F-SERIES GRAPHICS INTERFACES AND GRAPHICS/1000-II SUPPORTED GRAPHICS DEVICES (for connections, see pages 5.3-3 and 4)															
12966A+107	Buffered Async Interface to 264x Graphics Terminal	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12966A+004	Buffered Async Interface to 722xC/T RS-232 Plotter and required 2635A*/B+051 or 262x Terminal	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12966A+105	Buffered Async Interface to 262x Graphics Terminal	C	C	C	C	C	C	C	C	C	C	C	C	C	C
59310B	HP-IB Interface to 1350S*/1351S, 7225A* w/17601, 7245A*, 7470A, 7580A+002*/7580B, 7585A+002*/7585B, 9111A, 9872A*/B*/C/S*/†, or 9874A*	C	C	C	C	C	C	C	C	C	C	C	C	C	C
1350S*/1351S	Graphics Display System via 1/14 of 59310B Interface	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C26	C26	C26
2608A+210	Line Printer (includes 26099A interface)	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C26	C26	N
2608S+210	Line Printer (includes 12821A+001 I/F)	Cn	Cn	Cn	N	N	N	N	Cn	Ccz	Cn	Ccz	C26	N	N
2623A	Graphics Terminal via 12966A+105 I/F	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C26	C26	C26
2627A	Color Graphics Terminal via 12966A+105 I/F	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C27	C27	C27
2647A*	Intelligent Graphics Terminal via 12966A+107 interface	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C26	C26	C26
2647F	Intelligent Graphics Terminal	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt	Nt
2648A	Graphics Terminal via 12966A+107 interface	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C26	C26	C26
7220C/T	RS-232 Graphics Plotter w/8 pens & HP/GL programming via 12966A+004 I/F and 2635A*/B+051 or 264x Terminal	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C26	C26	C26
7221C/T or	RS-232 Graphics Plotter w/8 pens & compacted binary programming via 12966A+004 I/F and 2635A*/B+051 or 264x Terminal	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C26	C26	C26
7225B*+17601A*	Graphics Plotter (one pen) via 1/14 of 59310B interface	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C26	C26	C26
7245B*	Plotter/Printer via 1/14 of 59310B I/F	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C28	C28	C28
7470A+002	Graphics Plotter (two pens) via 1/14 of 59310B interface	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C26	C26	C26
7580B or 7580A*+002	Drafting Plotter (eight pens) via 1/14 of 59310B interface	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C26	C26	C26
7585B or 7585A*+002	Drafting Plotter (eight pens) via 1/14 of 59310B interface	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C26	C26	C26
9111A	Graphics Tablet via 1/14 of 59310B I/F	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C26	C26	C26
9872C/T	Graphics Plotter (eight pens) via 1/14 of 59310B interface	Cn	Cn	Cn	Cn	Ccz	Cn	Ccz	Cn	Ccz	Cn	Ccz	C26	C26	C26
9872A*/B*/S*	Graphics Plotter (four pens) via 1/14 of 59310B interface	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C26	C26	C26
9874A*	Digitizer via 1/14 of 59310B interface	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C26	C26	C26
14. OTHER PERIPHERAL DEVICES (for more information, see pages 5.6-1 and 5.6-2)															
12925A*	Punched Tape Reader Subsystem	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C	C	C
12926A	Tape Punch Subsystem	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C	C	C
12985A*	Card Reader Subsystem	Cn	Cn	Cn	Cn	Cn	Nt	Nt	Nt	Nt	Nt	Nt	Nt	C	C
15. HP 1000 DSN INTERFACES AND PROGRAMMABLE SERIAL INTERFACE (for more information, see pages 4.3-1 thru 12)															
12250A	DSN/X.25 Network (modem) I/F to Packet Switched Networks	C	C	C	C	C	C	C	C	C	C	C	C29	C29	C29
12260A	DSN/MRJE 1000 Interface	C	C	C	C	C	C	C	C	C	C	C	C30	N	N
12771A	Computer Serial Interface to HP 1000	C	C	C	C	C	C	C	C	C	C	C	C31	C31	C31
12773A	Computer Modem Interface to HP 1000	C	C	C	C	C	C	C	C	C	C	C	C31	C31	C31
12790A+001	Data Link Master Interface to HP 1000	C	C	C	C	C	C	C	C	C	C	C	C32	C32	C32

FOOTNOTES:

C26 = Requires 92841A Graphics/1000-II Device-Independent Graphics Library.
C27 = Requires 92841A Graphics/1000-II Device-Independent Graphics Library having date code 2301 or higher.
C28 = Requires 92840A Graphics/1000 Graphics Plotting (mature) Software.
C29 = Requires 91751A DSN/X.25 Communications Software.
C30 = Requires 91782A DSN/MRJE 1000 Multileaving Remote Job Entry Software.
C31 = Requires 91750A DS/1000-IV Network Software and 91740P/R DS/1000 firmware; 12773A will also require 12620A interface used as privileged fence.
C32 = Requires 91730A Multipoint Subsystem Software and 91750A DS/1000-IV Network Software.
* = Obsolete product listed here for reference only.

E/F-Series Compatibility Matrix, continued

LEGEND:
Cc = Compatible and qualified under FCC Class A EMI stds
Cz = Compatible and FTZ licensed
Ccz = Compatible, qualified under FCC Class A EMI stds and FTZ licensed
Cep = Compatible, EMI qualification pending
Cn = Compatible, but not EMI qualified
C = Compatible or supported without reference to EMI qualification
N = Not compatible
Nt = Not tested
I = Currently included hardware

PRODUCT AND OPTION NUMBERS	DESCRIPTION	COMPATIBILITY: COMPUTERS AND SYSTEMS: 2108M/2112M	2109E/2113E	2111F/2117F	2176C	2176E	2177C	2177F	2178A	2178C	2179A	2179C	OP SYSTEM: RTE-6/VM	RTE-IVB	RTE-IVE
15. HP 1000 DSN INTERFACES AND PROGRAMMABLE SERIAL INTERFACE, continued															
12793A*/B	DS/1000-IV Bisync (modem) I/F to HP 3000	C	C	C	C	C	C	C	C	C	C	C	C33	C33	C33
12794A*/B	DS/1000-IV HDLC (modem) I/F to HP 1000	C	C	C	C	C	C	C	C	C	C	C	C33	C33	C33
12825A	DS/1000-IV HDLC Dir Conn I/F to HP 1000	C	C	C	C	C	C	C	C	C	C	C	C33	C33	C33
12826A/B	Programmable Serial (modem) Interface	C	C	C	C	C	C	C	C	C	C	C	N1	N1	N1
12830A	DS/1000-IV Data Link Slave I/F to HP 1000	C	C	C	C	C	C	C	C	C	C	C	C33	C33	C33
12834A	DS/1000-IV Bisync Dir Conn I/F to HP 3000	C	C	C	C	C	C	C	C	C	C	C	C33	C33	C33
12889A	Hardwired Serial I/F to HP 3000 Ser II/III	C	C	C	C	C	C	C	C	C	C	C	C33	C33	C33
16 OTHER M/E/F-SERIES DATA COMMUNICATIONS INTERFACES															
12261A	Multi-Use Prog Mpxer for PCL/1000-AB	C	C	C	C	C	C	C	C	C	C	C	C34	N1	N1
12587B	Asynchronous Communications Interface	C	N	N	N	N	N	N	N	N	N	N	Nt	N1	N1
12589B	Automatic Calling Unit Interface	C	N	N	N	N	N	N	N	N	N	N	Nt	N1	N1
12618A	Sync Data Set I/F w/send & receive cards	C	C	C	C	C	C	C	C	C	C	C	C35	C35	N
12967A	Synchronous Communications Interface	C	C	C	C	C	C	C	C	C	C	C	N1	N1	N1
12968A	Asynchronous Communications Interface	C	C	C	C	C	C	C	C	C	C	C	N1	N1	N1
39301A	Fiber Optic Multiplexer (pair of 39301As and 39200B cabling are used with 12792B)	C	C	C	C	C	C	C	C	C	C	C	C	C	C
17. M/E/F-SERIES MEASUREMENT AND CONTROL INTERFACES AND PERIPHERALS (for connections, see pages 5.4-3 and 5.4-4)															
59310B	HP-IB I/F for 2240/2250 & other HP-IB Inst	C	C	C	C	C	C	C	C	C	C	C	C	C	C
91000A	Plug-in A-to-D Interface Subsystem	C	C	C	C	C	C	C	C	C	C	C	Nt	C36	C36
2240A*	Measurement & Control Processor & Access.	C	C	C	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C	C	C
2250M/N/R	Measurement & Control Processor & Access.	C	C	C	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	C	C	C
2313B*	Analog I/O Subsystem (includes interface)	C	C	C	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Nt	C36	C36
18. M/E/F-SERIES GENERAL-PURPOSE INTERFACES															
12551B	16-Bit Relay Output Register	C	C	C	C	C	C	C	C	C	C	C	N1	N1	N1
12554A	16-Bit Duplex Register	C	C	C	C	C	C	C	C	C	C	C	N1	N1	N1
12556B	40-Bit Output Register	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12560A*	Incremental Digital Plotter Interface	C	C	C	C	C	C	C	C	C	C	C	Nt	Nt	Nt
12566B*/C	Microcircuit Duplex Register	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12604B	Data Source Interface	C	N	N	N	N	N	N	N	N	N	N	C	C	C
12620A	Breadboard Interface/RTE Priv Inter Fence	C	C	C	C	C	C	C	C	C	C	C	C37	C37	C37
91200B	TV Interface	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19. M/E/F-SERIES SOFTWARE (See pages 2.4-1 through 2.4-4 for application requirements)															
91730A	Multipoint Interface Subsystem Software (used with 12790A interface)	C	C	C	C	C	C	C	C	C	C	C	C	C	C
91731A	Asynchronous Multiplexer Software (used with 12920B interface)	C	C	C	C	C	C	C	Nt	Nt	Nt	Nt	Nt	C	C
91740A**	DS/1000 Network software-firmware	C	N	N	N	N	N	N	N	N	N	N	N	C	C
91740P	DS/1000 Network firmware and right to copy 91740A software to one system	C	N	N	N	N	N	N	N	N	N	N	N	C	C
91740B**	DS/1000 Network software-firmware	N	C	C	C	C	C	C	C	C	C	C	N	C	C
91740R	DS/1000 Network firmware and right to copy 91740B software to one system	N	C	C	C	C	C	C	C	C	C	C	N	C	C
91741A**	DS/1000 S/W Enhancement for HP 3000 comm.	C	C	C	C	C	C	C	C	C	C	C	N	C	C
91745A	Datasafe/1000 on-line disc cartridge duplication software	C38	C38	C	N	N	N	N	C	C	C	C	N	C	N
91747A	Datashare/1000 multi-CPU file sharing s/w	C39	C39	C39	N	N	N	N	C39	C39	C39	C39	N	C	N
91750A	DS/1000-IV Network Software	C	C	C	C	C	C	C	C	C	C	C	C	C	C

FOOTNOTES:

C33 = Requires 91750A DS/1000-IV Network software.
C34 = Requires 92140A PCL/1000-AB Programmable Controller Link software.
C35 = Requires 91780A RJE/1000 (which includes the 12618A interface).
C36 = Requires 92066A RTE Measurement and Control Software.
C37 = Compatible as RTE Privileged Interrupt Fence; support as user-developed interface requires user-developed software.
C38 = Compatible in 2108/2112 Computer with Serial Prefix 1810 or later, 2109/2113 Computer with Serial Prefix 1812 or later, and all 2108/2109/2112/2113 Computers that have been upgraded for use with RTE-IV/IVB or RTE-6/VM.
C39 = Compatible only in system with 79xxM MAC Discs and computer that meets the criteria of C38, above.
N1 = Support of this interface requires user-developed software.
* = Obsolete product listed here for reference only.
** = Inactive software product listed here for reference only.

E/F-Series Compatibility Matrix, continued

LEGEND:
Cc = Compatible and qualified under FCC Class A EMI stds
Cz = Compatible and FTZ licensed
Ccz = Compatible, qualified under FCC Class A EMI stds and FTZ licensed
Cep = Compatible, EMI qualification pending
Cn = Compatible, but not EMI qualified
C = Compatible or supported without reference to EMI qualification
N = Not compatible
Nt = Not tested
I = Currently included hardware

PRODUCT AND OPTION NUMBERS	DESCRIPTION	COMPATIBILITY: COMPUTERS AND SYSTEMS: 2108M/2112M	2109E/2113E	2111F/2117F	2176C	2176E	2177C	2177F	2178A	2178C	2179A	2179C	OP SYSTEM: RTE-6/VM	RTE-IVB	RTE-IVE
19. M/E/F-SERIES SOFTWARE, continued															
91751A	DSN/X.25 Communications software	C	C	C	C	C	C	C	C	C	C	C	C	N	N
91780A	RJE/1000 Remote Job Entry Package	C	C	C	C	C	C	C	C	C	C	C	C	C	N
91782A	DSN/MJRE 1000 Multileaving Remote Job Entry Package	C	C	C	N	N	N	N	C	C	C	C	C	N	N
92001B**	RTE-II Operating System	C	C	N	N	N	N	N	N	N	N	N	N	N	N
92060A**	RTE-III Operating System	C	C	N	N	N	N	N	N	N	N	N	N	N	N
92061A	RTE Microprogramming Package	C40	C40	C40	C40	C40	C40	C40	C40	C40	C40	C40	C	C	C41
92063A**	Image/1000 with Query	C	C	C	C	C	N	N	N	N	N	N	C	N	N
92064A**	RTE-M Operating System	C	C	C	N	N	N	N	N	N	N	N	N	N	N
92065A**	BASIC/1000M	C	C	C	N	N	N	N	N	N	N	N	N	N	N
92066A	RTE Meas and Control Software Package	C	C	C	C	C	C	C	C	C	C	C	C	C	C
92067A**	RTE-IV Operating System	C42	C42	C	N	N	N	N	N	N	N	N	N	N	N
92068A	RTE-IVB Operating System	C42	C42	C	I	I	I	I	N	N	N	N	N	C	N
92068E	RTE-IVE Operating System	C42	C42	C	C	C	N	N	N	N	N	N	N	N	C
92069A	Image/1000 with Query	C	C	C	C	C	C	C	C	C	C	C	C	C	N
92073A**	Image/1000 without Query	C	C	C	C	C	C	C	C	C	C	C	C	C	N
92080A	DATACAP/1000-II	C	C	C	C	C	C	C	C	C	C	C	C	C	N
92081A	Image/1000-II with Query	C	C	C	N	N	N	N	C	C	C	C	C	N	N
92082A**	ACCEL/1000 software	C	C	C	C	C	C	C	C	C	C	C	C	C	N
92083A	RTE Profile Monitor	C	C	C	C	C	C	C	C	C	C	C	C	C	N
92084A	RTE-6/VM Operating System	C42	C42	C	N	N	N	N	I	I	I	I	C	N	N
92091A	HPSPICE Circuit Simulation Program	N	N	C	N	N	N	N	C	C	C	C	C	N	N
92101A	BASIC/1000D	C	C	C	C	C	C	C	C	C	C	C	C	C	N
92120A	HP Process Monitoring and Control/1000 S/W	N	C	C	N	N	N	N	N	N	C	C	C	N	N
92130A	HP Quality Decision Management/1000 S/W	N	N	C	N	N	N	N	N	N	C	C	C	N	N
92140A	PCL/1000-AB Prog Controller Link S/W	N	C	C	N	N	N	N	C	C	C	C	C	N	N
92400A	Sensor-based DAS Utility Package	C	C	C	C	C	C	C	C	C	C	C	C	C	C
92832A	Pascal/1000	C	C	C	C	C	C	C	N	N	N	N	C	N	N
92833A	Pascal/1000	C	C	C	N	N	N	N	C	C	C	C	C	N	N
92834A	FORTRAN 4X	C	C	C	C	C	C	C	N	N	N	N	N	C	N
92835A	Signal/1000 Digital Signal Processing Pkg	N	N	C	N	N	C	C	N	N	C	C	C	C	N
92836A	FORTRAN 77	C	C	C	N	N	N	N	C	C	C	C	C	N	N
92840A	Graphics/1000 Graphics Plotting Software	C	C	C	C	C	C	C	Nt	Nt	Nt	Nt	Nt	C	N
92841A	Graphics/1000-II Device-Independent Graphics Library	C	C	C	C	C	C	C	C	C	C	C	C	C	C
92842A	Graphics/1000-II Advanced Graphics Package	C	C	C	C	C	C	C	C	C	C	C	C	C	N
92843X	Graphics/1000-II Skeleton Device Handler Source Product	C	C	C	C	C	C	C	C	C	C	C	C	C	N
92857A	BASIC/1000C	C	C	C	N	N	N	N	C	C	C	C	C	N	N
92860A	Symbolic Debug/1000	C	C	C	N	N	N	N	C	C	C	C	C	N	N

FOOTNOTES:

C40, = Requires 13197A 1k Writable Control Store board.
C41 = Only WCS Driver and WCS Load Utility are supported in RTE-IVE.
C42 = Compatible in 2108/2112 Computer with Serial Prefix 1810 or later, 2109/2113 Computer with Serial Prefix 1812 or later, and 2108/2109/2112/2113 Computers having earlier serial prefixes that have been upgraded for use with RTE-IV/IVB/IVE or RTE-6/VM.
** = Inactive software product listed here for reference only.

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