HP 9000 Configuration Information and Order Guide

HEWLETT PACKARD
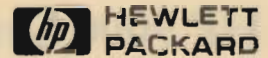
The purpose of this guide is to help you select the appropriate HP 9000 configuration for your application and document what HP 9000 configurations are available.

Additional information on the HP 9000 is available from the following HP publications:

- **HP 9000 Technical Data Sheet**
  Contains all hardware technical data, specifications, operating requirements and characteristics for the HP 9000 Model 20, 30 and 40.

  HP Pub. No. 5953-9401

- **HP 9000 BASIC Language System Technical Supplement**
  Contains specifications and characteristics of the BASIC system software and BASIC Language for the HP 9000 Model 20.

  HP Pub. No. 5953-4617

- **HP 9000 HP-UX Operating System Technical Supplement**
  Contains specifications and characteristics of the HP-UX system software plus information on FORTRAN, C and HP Pascal languages for the HP 9000 Models 20, 30 and 40.

  HP Pub. No. 5953-9402

- **HP 9000 Pricing Information (U.S. only)**
  A listing of HP 9000 part numbers and their corresponding prices. Does not include any configuration information. To be used only as a guideline, contact your local HP Sales Office for current prices and delivery schedule.

  HP Pub. No. 5953-9400D

Configuring the HP 9000

HP 9000 Computers offer you a broad range of configuration choices – from a computer-in-a-box to a fully equipped workstation and from single-user solutions to multi-user systems. The family consists of three generic model (packaging) classifications: the Model 20 (9020), Model 30 (9030) and the Model 40 (9040). Under each classification are specific systems combining models with hardware and software options (i.e. 9020B, C or S etc.).

The Model 20 is an integrated desktop version, the Model 30 is provided in an HP System II instrument rack enclosure and the Model 40 features a desk-height minicabinet.

Model 20

- keyboard, CRT, mass storage in one unit
- optional, built-in 10 Mbyte Fixed Disc
- optional, built-in internal thermal printer

Model 30

- fits standard instrument rack
- diagnostic display panel
- requires peripheral terminal and mass storage

Model 40

- table height
- diagnostic display panel
- requires peripheral terminal and mass storage

The Configuration Steps

There are six steps you must follow to ensure that your system is properly configured:

1. Choose the operating system and software capabilities.
2. Choose the packaging type.
3. Determine memory requirements and mass storage.
4. Choose the external peripherals.
5. Determine I/O, datacomm and cabling requirements.
6. Pick support products, training, consultation, etc.

HP 9000 System Descriptions

Model 20 Standard Features

The standard HP 9000 Model 20 features a CRT display, 5¼" Flexible Disc drive, ASCII keyboard, power supply, Memory/Processor Module, 4 I/O slots on the backplane, single CPU and I/O Processors, 512 Kbytes of RAM and optional thermal printer all built into a single, desktop-size mainframe. It can be ordered in the B, C, S or T configurations. The Model B and S versions (9020B, 9020S) include the monochrome CRT. The Model C and T designations (9020C, 9020T) refer to the high performance color CRT. The S and T versions (9020S, 9020T) are "bundled" systems (i.e. several hardware and software options are included at a discounted price).

The operating voltage, frequency and power cord type for the Model 20 are determined by shipping address. Each unit includes an Installation and Test Manual (HP Part No. 09020-90010).

Choice of CRT

You must distinguish between the 9020B/S and 9020C/T by designating the preferred CRT display. The 12.2" monochrome CRT for the 9020B/S features 17 shades of green and 455 X 560 pixel resolution. The 13" color CRT features 8 pure colors (4,913 dithered), three memory planes and 455 X 560 pixel resolution.

Light Pen

The Light Pen is available for use with the Model 20 BASIC Language Systems only. It is orderable as Opt. No. 775 or as a Field Installed Upgrade (Prod. No. 98775A).

Internal Peripherals

The 9020B and 9020C may be ordered with the following mass storage and printer options:

Product No.*	Opt. No.	Description
97093A	605	5¼" Flexible Disc Drive
	610	10 Mbyte Fixed Disc Drive, non-removeable media. (This is IN ADDITION to the standard 5¼" Flexible Disc).
97090A	590	Thermal Line Printer (8½" X 11" paper, 480 lpm, text and graphics capability)
	591	Thermal Line Printer (same as above with 210mm paper)

Keyboard Options

If other than the ASCII standard keyboard is required, you may choose from the following keyboards and character sets: French (Opt. 810), Spanish (Opt. 820), German (Opt. 830), Katakana (Opt. 840) and Swedish/Finnish (Opt. 850).

If no keyboard option is specified, ASCII standard is shipped.

HP 9020 Bundled Systems

Several software products are bundled into the 9020S and 9020T configurations. It should be noted that these are single-user systems only. Although the 9020S and T will run multi-user software, it is more cost effective to configure a multi-user system around a 9020B or C which do not automatically include single-user software.

The 9020S and 9020T systems include:

- a 455 X 560 pixel CRT display (color CRT for the 9020T, monochrome for the 9020S)
- ASCII standard keyboard
- 1 Mbyte RAM
- single I/O Processor with eight DMA channels (four slots used for the system, four available for user I/O)
- 5¼" Flexible Disc Drive (256 Kbytes)
- 10 Mbyte Winchester Fixed Disc Drive
- Thermal Line Printer (you must specify paper size)
- Power Supply
- BASIC Language System
- 2D-3D Graphics (BASIC)
- HP-UX Operating System (single-user)
- FORTRAN Compiler (single-user)
- Pascal Compiler (single-user)
- GRAPHICS/9000 – Device-independent Graphics Language plus the Advanced Graphics Package (HP-UX single-user)
- Appropriate manuals

* These numbers are used for Field Installed Upgrades only.

HP Computer Museum
www.hpmuseum.net

Model 30 and 40 Standard Features

The Model 30 represents the rack-mountable "box" configuration of the HP 9000. Currently, only one Model 30 system is available (the 9030A). The Model 40 is the minicabinet version and is available as either the 9040A or the 9040S. The 9040S is a multi-user "bundled" system.

The Model 30 and 40 standard features are:

- Rack-mountable, 19 inch "box" (9030A) or minicabinet enclosure (9040A/S)
- 512 Kbytes of RAM
- Single I/O Processor with eight DMA channels. (Seven of these channels are available for I/O interfacing.)
- Real Time Clock
- Power Supply
- Installation and Test Manual

Model 30 and 40 Required Peripherals (minimum):

- One terminal: HP 2622A, 2623A, 2626A, 2627A, or 2647F.
- An HP 27128A Asynchronous Serial Interface or 27130A 8-Channel Multiplex Card for the terminal (not required for the 9040S because the 27130A Card is included).
- A system disc with integrated system back-up: HP 7908P, 7911P, 7912P or 7914P (support tape distribution media).
- An HP 27110A HP-IB Interface for the system disc (also included with the 9040S).

The 9040S Bundled System

Several software and hardware products are bundled into the 9040S while none is included with the 9030A or 9040A. The Model 30 and 40 are available only with the HP-UX Operating System which must be loaded from a mass storage device at power-up. The 9040S includes multi-user software and, although the 9040S will run the single-user software, it is more cost-effective to configure a single-user system around the 9030A or 9040A as these systems do not automatically include multi-user software.

The 9040S Bundled System includes:

- 1 Mbyte RAM
- HP-UX Operating System (multi-user)
- FORTRAN Compiler (multi-user)
- Pascal Compiler (multi-user)
- GRAPHICS/9000 (AGP & DGL multi-user)

- HP 27110A HP-IB Interface Card
- HP 27130A 8-Channel Multiplex Interface Card
- Appropriate manuals

Memory/Processor Module

The Memory/Processor Module is the critical building block of the HP 9000 system. It is where the Central Processing Unit, RAM and I/O Processor boards reside. The Module consists of 12 board slots into which the various components are inserted. Each CPU, RAM and I/O Processor board utilizes one of these slots.
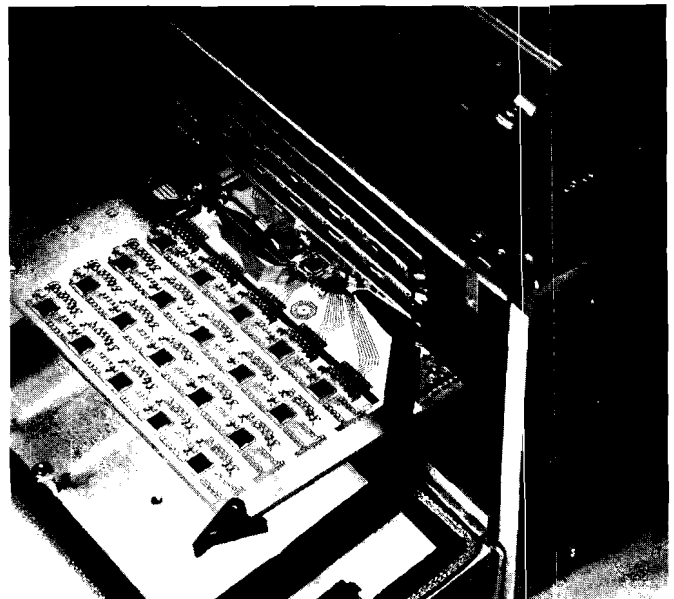
The following table shows the minimum and maximum Module configuration allowed. The "minimum" figures refer to the least number of boards needed for an operable system. The "maximum" figures refer to the total CPU, I/O Processor and RAM boards allowed, NOT TO EXCEED THE 12 BOARD LIMIT.

	# of boards	
	Min.	Max.
CPUs	1	3
I/O Processors	1	3
RAM Boards	2	10

Random Access Memory

HP 9000 Random Access Memory is configured in 256 Kbyte increments not to exceed the maximum allowable configuration limits. You must order multiples of the 256 Kbyte option to obtain the desired amount. Each RAM board is ordered as Option 240 (or 97040A, if Field Installed).

Here is an example of how to configure an HP 9000 memory:

Problem: Configure a 9020B or C, a 9030A or a 9040A to contain 2 Mbytes of RAM.

Solution: Standard RAM (provided) = .5 Mbytes
     Required RAM increment = 1.5 Mbytes

           Total 2 Mbytes

Order: 6 ea. Opt. 240 (6 X 256 Kbytes) = 1.5 Mbytes

Note that only 1.5 Mbytes of RAM had to be added because the standard configuration already contains 512 Kbytes. Therefore, the RAM expansion consumes 6 Memory/Processor Module slots, the standard system RAM uses 2 slots and the CPU and I/O Processor each use a slot for a total of 10 slots of the available 12. Therefore, you have 2 slots left for further system expansion.

Data Communications

The current HP 9000 Data Communications capability under the HP Distributed System Network (HP-DSN) is the Interactive Systems Link. This capability provides a software Asynchronous Terminal Emulator to communicate with a remote host computer. Terminals connected to the HP 9000 (w/ HP-UX) are routed through the HP 9000 to a remote host and appear to this host as though they were directly connected.

HP 9000 BASIC does not support terminals except as simple I/O devices. In the BASIC case, the HP 9000 is connected directly to the remote host and appears to that host as a terminal.

Under BASIC, file transfer capability exists and can be accomplished as a background task thus freeing the keyboard and screen for other jobs.

The following chart lists the software and hardware required for HP 9000 Data Communications:

Capability	Software BASIC	HP-UX	Hardware
DSN/ISL	Async. Term. Emulator		Async. Serial Interface
	97056A	97076A	97128A

HP 9000 Operating Systems

Early in the configuration process, you must choose the operating system and the languages you need. The HP 9000 can be configured with the HP BASIC Language System (available only on the Model 20) and/or with HP-UX, a UNIX*-based system. Both systems are specially enhanced for the engineering environment.

The HP-UX Operating System supports FORTRAN 77, HP Pascal and C Compilers. Device-independent Graphics Language (DGL) and an Advanced Graphics Package (AGP) are combined in GRAPHICS/9000 to provide 2D and 3D graphics capabilites. IMAGE Data Base Management and Asynchronous Communications Software are also available as software options.

The BASIC Language System provides 2D-3D Graphics, IMAGE/QUERY Data Base Management and an Asynchronous Terminal Emulator as software options.

Note: Graphics capability (2D or 3D) is not automatically included with the BASIC Language System. To access any graphics features, the 2D-3D Graphics System (97052A) must be installed.

Manuals are included with each operating system, language and software option.

System Software

The Model 20 can be configured with the BASIC Language System, the HP-UX Operating System or both systems.

All HP 9000 Operating Systems are RAM-based and must be loaded at power up. Consequently, the configuration must have sufficient mass storage and memory capability to support the operating system and all system software.

BASIC is a memory-based system and it must be loaded from a disc (integrated Flexible, integrated Fixed or external). HP-UX is a disc-based system which must reside on the integrated Fixed Disc or on an external disc. Use of an external disc with the HP-UX system will result in maximum performance. Also, due to the loader design, both operating systems cannot reside on the same disc.

The BASIC System supports single-user applications only. The HP-UX Operating System can support single- or multi-user capability and the desired software must be so designated.

Software Distribution Media

The BASIC Language System and all BASIC software is supplied ONLY on the 5¼" Flexible Disc (Opt. 042). The HP-UX Operating System and system software are available on either a 5¼" Flexible Disc (Opt. 042) or on a ¼" Tape Cartridge (Opt. 022) which is compatible with the HP 7908/11/12/14 Fixed Discs and can only be specified if the system includes one of these discs. Make sure you specify which Distribution media is desired.

The 9020S/T includes BASIC and BASIC 2D-3D Graphics on a 5¼" Flexible Disc. You must specify Opt. 022 or 042 to identify the media for HP-UX software. The 9040S includes all HP-UX software on ¼" tape cartridge so it's unnecessary to specify a media option.

Memory Requirements

Because neither HP 9000 operating system is ROM-based, you must make sure your configuration has adequate physical memory (in excess of the memory-resident portion of the Operating System) to include your application.

The BASIC Language System requires 512 Kbytes of memory. This includes Advanced Programming, BASIC Compiler, SDF directory format, internal and external hard disc drivers, an HP-IB driver, self-test code, operating system code and dynamically allocated memory.

In addition, several binaries (tape drivers, error messages, I/O, etc.) and separate products (2D-3D Graphics, IMAGE, etc.) may be individually loaded. These binaries and separate products will require an additional 256 Kbytes. Therefore, to accommodate minimum user applications will require at least 1 Mbyte (4 boards) of memory.

The recommended minimum RAM configuration (the minimum RAM needed to support both the system and the user software) for an HP-UX System is 1.5 Mbyte.

* UNIX is a trademark of Bell Laboratories, Inc.

Model 20 Configuration Table

9020 Standard Features

- Single CPU (Opt. 500)*
- Single I/O Processor
- 5¼" Flexible Disc (Opt. 605)§
- Power Supply
- 512 Kbytes of RAM
- ASCII keyboard
- 4 I/O slots
- Integrated packaging
- Real time clock
- Manuals set

Plus

Choice of CRT

9020B/S	9020C/T
• 13" high performance monochrome display 455 x 560 pixel	• 13" high performance color display 455 x 560 pixel

Equals

Memory/Processor Module Configuration

.... single CPU ....
.... single I/O Processor ....
.... 256 Kbyte Memory ....
.... 256 Kbyte Memory ....

.... OPTIONAL ....
.... OPTIONAL ....
.... OPTIONAL ....
.... OPTIONAL ....
.... OPTIONAL ....
.... OPTIONAL ....
.... OPTIONAL ....
.... OPTIONAL ....
.... OPTIONAL ....

Available M/PM Slots

Four I/O Slots
(Backplane)

Interface Cards (see Cabling Guide, page 11)

HP-IB
27110A (IEEE-488)

Hard Discs	Flexible Discs (not system disc)	Magnetic Tape	Printers
7908P† 7912P†	82901M 9895A (dual)	7971A Opt. 840 (single)	2608S
7911P† 7933H	82902M 9895A Opt. 010 (single)	7971A Opt. 844 (dual)	2631B Opt. 046
7914†(HP-UX)			2631G

8-Channel Multiplex
27130A (HP-UX only, RS-232-C)

Note: *A complete list of supported peripherals appears on pages 15 and 16.*

Async. Serial
27128A (RS-232-C)

Terminals‡
2623A
2627A

GPIO
27112A

Flexible Disc
(not system disc)
9885M/S

* You must specify Opt. 500 (single CPU) on all HP 9000 orders.

† Has built-in tape drive for Opt. 042 software distribution media

‡ BASIC is single-user only. Terminals attached to a BASIC system can only perform rudimentary I/O using the I/O ROM; they do not support programming or high-level graphics

Base System 9020B/C	or	Bundled System 9020S/T
Standard Features only **Options**	**Part or Option Nos.** (Field Installed Part No.)	**Standard Features plus:** • 512 Kbytes RAM (For 1 Mbyte total)
• Winchester fixed disc	§610 (97093A)	• Winchester fixed disc
• Thermal Printer	**590, 591 (97090A)	• Thermal Printer
• BASIC Lang. Syst.	97050A	• BASIC Lang. Sys.
• 2D-3D Graphics (BASIC)	97052A	• 2D-3D Graphics (BASIC)
• HP-UX Op. Sys. (includes C Compiler)	97070A single-user 97080A multi-user	• HP-UX Op. Sys. (single-user) (includes C Compiler)
• FORTRAN Compiler	97071A single-user 97081A multi-user	• FORTRAN Compiler (single-user)
• Pascal Compiler	97072A single-user 97082A multi-user	• Pascal Compiler (single-user)
• GRAPHICS/9000 AGP (HP-UX)	97074A single-user 97084A multi-user	• GRAPHICS/9000 AGP (HP-UX) (single-user)
• GRAPHICS/9000 DGL (HP-UX)	97075A single-user 97085A multi-user	• GRAPHICS/9000 DGL (HP-UX) (single-user)
		Options
• Add'l memory (up to 2.5 Mbyte)	240 (97040A)	• Add'l memory (up to 2.5 Mbyte)
• Multiple I/OPs	241 (2nd) - 242 (3rd) or (97041A) or (97042A)	• Multiple I/OPs
• I/O Expander	97098A	• I/O Expander
• IMAGE/QUERY DBM (BASIC)	97053A	• IMAGE/QUERY DBM (BASIC)
• IMAGE DBM (HP-UX)	97073A single-user 97083A multi-user	• IMAGE DBM (HP-UX)
• Light Pen (BASIC only)	775 (98775A)	• Light Pen (BASIC only)
• Async. Term. Emulator BASIC and HP-UX	97056A (BASIC) 97076A (HP-UX)	• Async. Term. Emulator BASIC and HP-UX
• Localized lang. keyboards and character sets	810 (French), 820 (Spanish), 830 (German), 840 (Katakana), 850 (Swedish/Finnish)	• Localized lang. keyboards and character sets

M/PM Configuration

Base System	or	Bundled System
................memory (opt)............		................memory (std)............
................memory (opt)............		................memory (std)............
................memory (opt)............		................memory (opt)............
................memory (opt)............	or	................memory (opt)............
......CPU2†† or memory (opt)......		......CPU2†† or memory (opt)......
......CPU3†† or memory (opt)......		......CPU3†† or memory (opt)......
......I/OP2 or memory (opt)......		......I/OP2 or memory (opt)......
......I/OP3 or memory (opt)......		......I/OP3 or memory (opt)......

— I/O Expander .... 8 add'l slots .... I/O Expander —

— I/O Expander .... 8 add'l slots .... I/O Expander —

Graphics Devices
9111A
7470A Opt. 002
7580B
7585B
9872C/T

Software Distribution Media
Opt. 042 = On 5¼" Flexible Disc (BASIC available only as Opt. 042)
Opt. 022 = On ¼" Tape Cartridge (7908, 11, 12, 14)

Support Services (see page 13)
  • Software Support
  • Training
  • Documentation
  • Service/Maintenance Requirements
  • Software Consulting
  • Site Preparation and Installation

§ You must specify either Opt. 605 (the 5¼" Flexible Disc) or Opt. 610
  (the Flexible Disc AND the 10 Mbyte Fixed Disc) on all 9020B and 9020C orders.

** Option 590 is the Thermal Printer with 8½" x 11" paper. Option 591 is
  the Thermal Printer with 210 mm paper. You must specify which you want on
  the 9020S/T Bundled System.

†† Available in the future.

Model 30/40 Configuration Table

9030/40 Standard Features

- Single CPU (Opt. 500)*
- Single I/OP
- Power Supply
- 512 Kbytes of RAM
- 7 I/O slots
- Real time clock
- Diagnostic Display Panel
- Manuals set

Plus

Choice of Packaging

9030A	9040A/S
• 19" Rack-mount enclosure (System II)	• Desk-height minicabinet

Equals

Memory Processor Module Configuration

.... single CPU ....
.... single I/O Processor ....
.... 256 Kbyte Memory ....
.... 256 Kbyte Memory ....

.... OPTIONAL ....
.... OPTIONAL ....
.... OPTIONAL ....
.... OPTIONAL ....
.... OPTIONAL ....
.... OPTIONAL ....
.... OPTIONAL ....
.... OPTIONAL ....

Available M/PM Slots

Seven I/O Slots
(Backplane)

Interface Cards (see Cabling Guide, page 11)

HP-IB
27110A (IEEE-488)

8-Channel Multiplex
27130A (RS-232-C)

Async. Serial
27128A (RS-232-C)

GPIO
27112A

Flexible Disc
(not system disc)
9885M/S

Hard Discs	Flexible Discs	Magnetic Tape	Printers
7908P† 7912P†	(not system discs)	7971A Opt. 840	2608S
7911P† 7933H	82901M 9895A (dual)	(single)	2631B Opt. 046
7914†	82902M 9895A Opt. 010	7971A Opt. 844	2631G
	(single)	(dual)	

Note: A complete list of supported peripherals appears on pages 15 and 16.

Terminals
2622A
2623A
2626A
2627A
2647F

* You must specify Opt. 500 (single CPU) on all HP 9000 orders.

† Has built-in tape for Software Distribution Media.

‡ Available in the future.

Base System 9030A-9040A	or	Bundled System 9040S
Standard Features only **Options**	**Part or Option Nos.** (Field Installed Part No.)	**Standard Features plus:** • 512 Kbyte RAM (For 1 Mbyte total)
• HP-UX Op. Sys. (includes C Compiler)	97079A single-user 97089A multi-user	• HP-UX Op. Sys. (multi-user) (includes C Compiler)
• FORTRAN Compiler	97071A single-user 97081A multi-user	• FORTRAN Compiler (multi-user)
• Pascal Compiler	97072A single-user 97082A multi-user	• Pascal Compiler (multi-user)
• GRAPHICS/9000 AGP (HP-UX)	97074A single-user 97084A multi-user	• GRAPHICS/9000 AGP (multi-user)
• GRAPHICS/9000 DGL (HP-UX)	97075A single-user 97085A multi-user	• GRAPHICS/9000 DGL (multi-user)
• HP-IB Interface	27110A	• HP-IB Interface
• 8-Channel Multiplex Interface	27130A	• 8-Channel Multiplex Interface
		Options
• Add'l memory (up to 2.5 Mbyte)	240 (97040A)	• Add'l memory (up to 2.5 Mbyte)
• Multiple I/OPs‡		• Multiple I/OPs‡
• I/O Expander‡	97098A	• I/O Expander‡
• IMAGE DBM (HP-UX)	97073A single-user 97083A multi-user	• IMAGE DBM (HP-UX)
• Async. Comm. Software	97076A	• Async. Comm. Software

M/PM Configuration	or	**M/PM Configuration**
.... memory (opt)...............		.... memory (std)...............
.... memory (opt)...............		.... memory (std)...............
.... memory (opt)...............		.... memory (opt)...............
.... memory (opt)...............		.... memory (opt)...............
.... CPU2‡ or memory (opt)		.... CPU2‡ or memory (opt) ....
.... CPU3‡ or memory (opt)		.... CPU3‡ or memory (opt) ....
.... I/OP2‡ or memory (opt).......		.... I/OP2‡ or memory (opt).......
.... I/OP3‡ or memory (opt).......		.... I/OP3‡ or memory (opt).......

--I/O Expander .... 8 add'l slots .... I/O Expander--
--I/O Expander .... 8 add'l slots .... I/O Expander--

Graphics Devices
9111A
7470A Opt. 002
7580B
7585B
9872C/T

Software Distribution Media
Opt. 022 = On ¼" Tape Cartridge (7908, 11, 12, 14)

• Software Support
• Training
• Documentation
• Service/Maintenance Requirements
• Software Consulting
• Site Preparation and Installation

Note: You must order at least one terminal and one mass storage disc (7908, 11, 12 or 14) to make the 9030/40 system operable.

HP 9000 Channel I/O

All HP 9000 Configurations	Required Parts		Resulting No. of I/O Channels		Memory/Processor Module Slots Used
	I/O Proc.	I/O Expand.	9020	9030/40	
Base system with single I/O Proc.	Std.	NA	4	7	1
Base system plus 1st add. I/O Proc.	Opt. 241*	97098A	12	15	2
Base system plus 2nd add. I/O Proc.	Opt. 242*	97098A	20	23	3

I/O Expansion

All HP 9000 standard systems include a single I/O Processor which provides 4 peripheral interface channels (slots) for the Model 20 and 7 for the Models 30 and 40. To expand this I/O capability, two optional products are available: additional I/O Processor(s) to increase the number of channels available and I/O Expanders to increase the number of I/O slots available.

The table above shows HP 9000 I/O expansion capability and the corresponding options required. These options may be factory installed if specified at the time of order or they may be field installed at a later date. The latter would require special field installation assistance and is ordered as a Field Installed Upgrade.

* The first and second additional I/O Processors each require different internal cabling and thus require different option numbers. You must specify which I/O Processor is desired when ordering expansions. These option numbers refer to 9020 configurations only. Multiple I/OPs for 9030/40 will be available in the future.
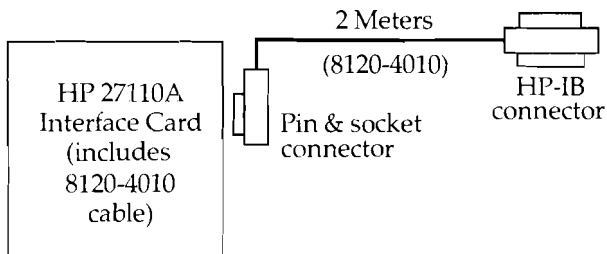
HP-CIO Interface Cards

There are several interface cards available for the HP 9000. These cards allow you to connect the Models 20, 30 or 40 to a broad range of peripheral devices. Except where noted, these cards are supported on all HP 9000 configurations. The 9040S configuration includes the 27110A HP-IB Card and 27130A 8-Channel Multiplex Card.
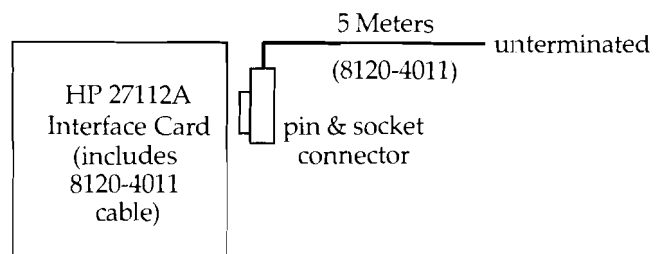
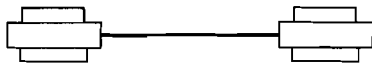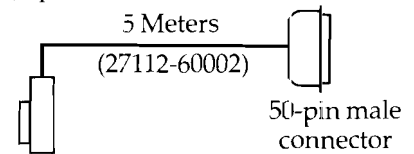| Part No./ Prod. No.	Description	System Support	
		BASIC	HP-UX
27110A	Standard HP-IB (IEEE 488-1978)	x	x
27112A	GP-IO 16-bit Parallel	x	x
27128A	Asynchronous Serial Interface (I/O to RS-232-C serial devices)	x	x
27130A	8-Channel (RS-232-C) Multiplex Interface (Provides 8 Async. I/O channels)		x

HP 9000 Cabling Guide

HP 27110A HP-IB Interface*

```
                        2 Meters
┌──────────────┐  ┌─  ──────────── ──┌─┐
│  HP 27110A   │  │   (8120-4010)     │ │
│ Interface Card│ │                  HP-IB
│  (includes   │  │   Pin & socket  connector
│  8120-4010   │  │   connector
│   cable)     │
└──────────────┘
```

HP-IB Cables

```
┌─┐───────────────┌─┐
│ │               │ │
└─┘               └─┘
```

HP Prod. or Part Number	Length in Meters	Comments
10833D	0.5	
10833A	1.0	
10883B	2.0	Carefully compute and observe max. system cable length before using.
10833C	4.0	
5060-9459	6.0	
5060-9460	8.0	

* For more information on HP-IB systems consult your local HP Sales Office.

HP 27112A GPIO Interface

```
                        5 Meters
┌──────────────┐  ┌─  ──────────── ── unterminated
│  HP 27112A   │  │   (8120-4011)
│ Interface Card│ │
│  (includes   │  │   pin & socket
│  8120-4011   │  │   connector
│   cable)     │
└──────────────┘
```

Option 001 Cable (replaces 8120-4011 cable)

```
                 5 Meters        ┌─┐
              ┌── ────────────   │ │
              │   (27112-60002)  │ │
              │                  └─┘
              │                50-pin male
                                connector
```
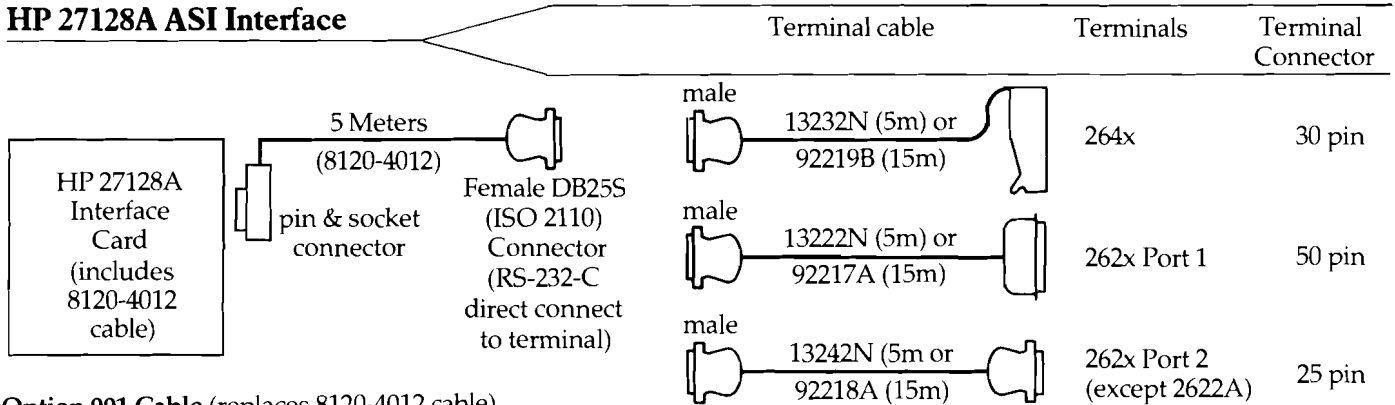
Note: The HP9885M/S Flexible Disc uses the HP27112A Opt. 001 Card. Strapping information for the HP9885 is in the I/O Resources section of the BASIC Language Reference Manual (HP Part No. 97050-90005).
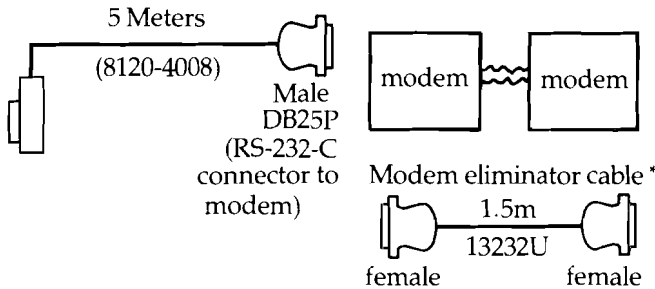
HP 27128A ASI Interface

HP 27128A Interface Card (includes 8120-4012 cable)

5 Meters (8120-4012) — pin & socket connector — Female DB25S (ISO 2110) Connector (RS-232-C direct connect to terminal)

	Terminal cable	Terminals	Terminal Connector
male	13232N (5m) or 92219B (15m)	264x	30 pin
male	13222N (5m) or 92217A (15m)	262x Port 1	50 pin
male	13242N (5m or 92218A (15m)	262x Port 2 (except 2622A)	25 pin

Option 001 Cable (replaces 8120-4012 cable)

5 Meters (8120-4008) — Male DB25P (RS-232-C connector to modem)
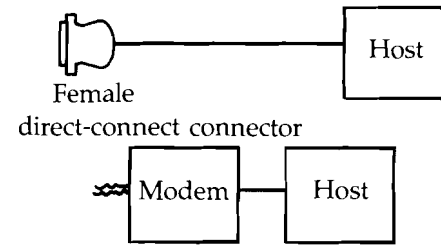
modem ≈≈≈ modem

Modem eliminator cable *

1.5m 13232U

female — female

* This cable replaces a pair of actual modems in the direct connect environment. Modems and eliminator cables must be ordered separately.
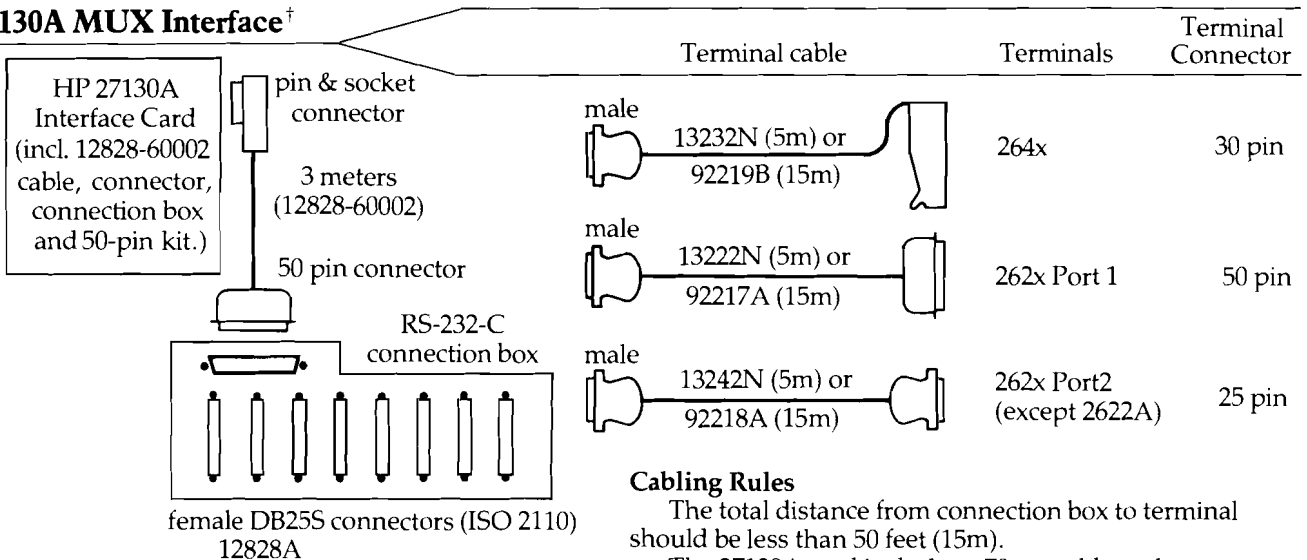
HP 9000 Terminal Emulator to Host

Female direct-connect connector — Host

≈≈ Modem — Host

Cabling Rules

The total distance from interface to terminal should be less than 50 feet (15m).

HP 27130A MUX Interface[†]

HP 27130A Interface Card (incl. 12828-60002 cable, connector, connection box and 50-pin kit.)

pin & socket connector

3 meters (12828-60002)

50 pin connector

RS-232-C connection box

female DB25S connectors (ISO 2110) 12828A

	Terminal cable	Terminals	Terminal Connector
male	13232N (5m) or 92219B (15m)	264x	30 pin
male	13222N (5m) or 92217A (15m)	262x Port 1	50 pin
male	13242N (5m) or 92218A (15m)	262x Port2 (except 2622A)	25 pin

Cabling Rules

The total distance from connection box to terminal should be less than 50 feet (15m).

The 27130A card includes a 70 cm cable and a distribution connector.

[†] Cannot be used to direct-connect to a host or to connect to a modem.

Accessories and Support

HP 9000 Documentation

HP prides itself on the quality and clarity of its documentation. The following table lists those manuals provided with the HP 9000 products and those that can be ordered separately. When ordering separately, make sure you specify the appropriate Manual Part Number.

Manual Part No.	Manual Title/Description	Shipped with
97050-90090	Where Do I Start? (BASIC)	97050A
09020-90010	Installation and Test (Model 20)	All 9020 products
09040-90040	Preparing For Your HP 9000	
97050-90000	BASIC Programming Techniques	97050A (Mod. 20)
97050-90005	BASIC Language Reference	97050A (Mod. 20)
97052-90000	BASIC Graphics Programming Techniques	97052A (Mod. 20)
97053-90000	IMAGE/Data Base Programming Techniques	97053A (Mod. 20)
97053-90001	QUERY User's Guide (Model 20)	97053A (Mod. 20)
97053-90002	Data Base Design Kit	97053A (Mod. 20)
97050-80030	BASIC Manual Package (incl. all BASIC & Graphics Manuals above)	97053A (Mod. 20)
97056-90000	BASIC Async. Term. Emulator	97056A
97089-90001	User Guide to the UNIX System by Thomas & Yates	97079A, 97089A
97098-90000	The C Programming Language by Kernighan & Ritchie	97070A, 97080A, 97079A, 97089A
97098-90020	I/O Expander Installation and Service	97098A
27110-90001	HP 27110 Installation Manual (HP-IB)	27110A
27110-90002	HP 27110 Reference Manual	27132A
27128-90001	HP 27128A Installation Manual (ASI)	27128A
27128-90002	HP 27128A Reference Manual	27128A

Hardware Support

Two levels of coverage are available:

- Standard System Maintenance (SMMC)
- Basic System Maintenance (BMMC)

Complete terms are described in publication #5953-3318 "HP Computer Systems Support Services Data Book."

Customers who prefer to employ HP service on a time-and-materials basis may take advantage of HP's Per-Call service. Your HP Sales Representative can assist you in tailoring a maintenance plan to meet your needs.

General Software Consulting

General Software Consulting services for the HP 9000 provide on-site assistance by a qualified HP Systems Engineer for specific customer applications. This Consulting service is provided on a daily or hourly basis. Contact your HP Sales Representative for full details.

Description	HP Prod. No.
General Consulting (hourly basis)	35021B
General Consulting (daily basis)	35032B

Software Support

The following HP 9000 software support services are available:

	HP Part Number
Customer Support Service (CSS)	Replace Prod. No. suffix "A" with "T" or "R" with "V"
Software Information Service (SIS)	Replace Prod. No. suffix with "K"
Software Subscription Service (SSS)	Replace Prod. No. suffix "A" with "S" or "R" with "W"
Manual Update Service (MUS)	Replace Prod. No suffix "A" with "Q"
Software Notification Service (SNS)	97008A
Additional Phone-In Consulting Service (PICS)	97050P

Contact your local HP Sales Office for options and prices.

HP 9000 Site Preparation and Installation

The HP 9000 has been designed for the office environment. If an external fixed disc is ordered with your HP 9000 as a coordinated shipment, site planning and installation visits are included at no extra charge. In this case, when your system purchase order is received by Hewlett-Packard, an HP Customer Engineer will contact you to arrange an on-site joint meeting. At this meeting, site planning and preparation requirements will be discussed. The HP Representative will advise you on technical site planning, preparation and installation activities related your system, site and application.

"Preparing For Your HP 9000" (Part No. 09040-90040), available from your HP Sales Representative, characterizes the physical, electrical and environmental requirements of your system.

As one part of the Site Planning service, the HP Customer Engineer will evaluate the power source and electrical wiring at your site. Normally, only an isolated-ground, dedicated circuit is required. In some cases however, additional equipment may be necessary.

HP 9000 Training

HP 9000 Customer Training is divided into specialized classes for the HP-UX and BASIC operating systems and software.

Description	HP Prod. No.
BASIC Class HP 9000 BASIC Language Extensions (5 days) This course is taught as a seminar extension to the HP 9826/36 BASIC Language Operating and Programming class. You must take both classes. HP-UX Classes To be announced	97005A

Supported Peripherals

Product No.	Opt. No.	Description	Cable Incl.	Interface Type
Mass Storage				
7908P		16.5 Mbyte Disc Drive w/ integral 16.7 Mbyte tape cartridge (88140S), controller, power supply, stand-alone cabinet. Supports ¼" Tape Distribution Media	2 m	HP-IB
	015	220/240VAC, 48-66Hz option		
	140	Delete cart. tape drive		
7911P		28.1 Mbyte Disc Drive w/ integral 67 Mbyte tape cartridge (88140L), controller, power supply, stand-alone cabinet. Supports ¼" Tape Distribution Media	1 m	HP-IB
	015	220/240VAC, 48-66Hz option		
	140	Delete cart. tape drive		
7912P		65.6 Mbyte Disc Drive w/ integral 67 Mbyte tape cartridge (88140L), controller, power supply, stand-alone cabinet. Supports ¼" Tape Distribution Media	1 m	HP-IB
	015	220/240VAC, 48-66 Hz option		
	140	Delete cart. tape drive		
7914P		132.1 Mbyte Disc Drive w/integral cartridge tape drive, two 67 Mbyte tape cartridges, controller, power supply, stand-alone cabinet. Supports ¼" tape Software Distribution Media.	2 m	HP-IB
	015	220/240 VAC, 48-66 Hz operation		
	140	Delete cartridge tape drive		
7933H		404 Mbyte Disc Drive w/ integrated controller, power supply, stand-alone cabinet. Standard 208 VAC power cord is hardwired. Has no system Dist. media.	1 m	HP-IB
	120	120VAC operation		
	200	200VAC (Japan)		
	221	220VAC (U.S./Canada)		
	222	220VAC (Cont. Europe)		
	223	220VAC (Denmark)		
	241	240VAC (U.K.)		
	242	240VAC (Australia and New Zealand)		
82901M		5¼" Flexible Disc Drive 540 Kbyte, dual drive, master. Doesn't support HP 9000 software dist. media.	No	HP-IB
82902M		5¼" Flexible Disc Drive 270 kbyte, single drive, master. Doesn't support HP 9000 software dist. media.	No	HP-IB
9885M		8" Flexible Disc Drive 0.5 Mbyte single drive, master. Does not support HP 9000 software dist. media.	No	GP-IO (Opt.001)
	001	50Hz Operation		
	002	Rack Mounts		
9885S		8" Flexible Disc Drive 0.5 Mbyte single drive, slave. Does not support HP 9000 software dist. media.	1 m	I/O inter-connect

Product No.	Opt. No.	Description	Cable Incl.	Interface Type
9895A		8″ Flexible Disc Drive 2.4 Mbyte dual drive, master. Does not support HP 9000 software dist. media.	No	HP-IB
	001	50Hz Operation		
	002	Rack mounts		
	010	Single drive master		
7971A	840	9-track Tape Drive, 1600bps ½″ tape, single 7970E master.	6 m	HP-IB
	844	Dual 7970E master		
Printers/Plotters				
2608S	290	Line Printer, 400 lpm, 128 char. ASCII set, graphics capability (HP-UX only), open stand, paper jam detection, 120VAC, 50/60 Hz. (see 2608S Data Sheet for complete list of additional options)	4 m	HP-IB
2631B	046	Dot Matrix Impact Printer, 180 cps, 128 char. ASCII set, 120VAC, 48-66 Hz, power supply, ribbon cart & power cord. (see 2631B Data Sheet for complete list of additional options)	No	HP-IB
2631G		Dot Matrix Impact Printer, 180 cps, text & graphics capability, 128 char. ASCII set, ribbon cartridge, power cord.	No	HP-IB
	001-009	Local language character sets (see current 2631A/B Data Sheet)		
	010	Math character set		
	011	Line Draw character set		
	012	High density print character set		
	015	220VAC 48-62Hz		
	016	100VAC, 48-62Hz		
	017	240VAC, 48-62Hz		
	715	Service documentation		
7470A	002	2-Pen Plotter	No	HP-IB
7580B		Drafting Plotter, 8-pen, D size	No	HP-IB
7585B		Drafting Plotter, 8-pen, E size	No	HP-IB
9872C/T		8-Pen Plotter	No	HP-IB
Terminals		*Note: see specific Terminal Data Sheets for option listings*		
2622A		Data Entry Terminal, switch selectable block mode	No	ASI
2623A		Graphics Display Terminal w/graphics hardcopy	No	ASI
2626A		Multi-window Display Terminal w/ partitioning	No	ASI
2627A		Color Graphics Terminal, 13″ CRT, block mode	No	ASI
2647F		Intelligent Graphics Terminal	No	ASI
Miscellaneous				
9111A		Data Tablet	No	HP-IB
97098A		I/O Expander		