Owner's Guide

K Class

HP9000 Enterprise Servers

A2375-90003

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Legal Notices

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Warranty. A copy of the specific warranty terms applicable to your Hewlett- Packard product and replacement parts can be obtained from your local Sales and Service Office.

Printing History

New editions of this manual incorporate all material updated since the previous edition. The manual printing date and part number indicate its current edition. The printing date changes when a new edition is printed. (Minor corrections and updates which are incorporated at reprint do not cause the date to change.) The manual part number changes when extensive technical changes are incorporated.

January 1995 ..... Edition 1

September 1995 ..... Edition 2

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July 1997 ..... Edition 4 (Not distributed)

July 1997 ..... Edition 5

January 1998 ..... Edition 6

June 1998 ..... Edition 7

Change Narrative

- Edition 7 technical changes include:
  a. The addition of HP9000/K360 information where applicable in Chapter 2.
  b. Minor changes and updates as required.
- Edition 6 technical changes include:
  a. The addition of HP9000/K380/K580 information where applicable.
  b. Minor changes and updates throughout the manual.

NOTE Reader Comments. We welcome your comments about our documentation. If you have editorial suggestions or recommend improvements for this document, please write to us. You can reach us through e-mail at: hardwaredocs@cup.hp.com or by sending your letter to: Documentation Manager, M/S 5657, Hewlett-Packard Company, 8000 Foothills Blvd., Roseville, CA 95747-5657 USA. Please include the following information in your message:

- Title of the manual you are referencing.
- Manual part number (from the title page).
- Edition number or publication date (from the title page).
- Your name.
- Your company's name.

SERIOUS ERRORS, such as technical inaccuracies that may render a program or a hardware device inoperative, should be reported to your HP Response Center or directly to a Support Engineer.

FCC Statement (USA Only)

- The United States Federal Communications Commission has specified that the following notice be brought to the attention of users of this product:
- FCC rules part 15, subpart A, Class A devices.
- Information to User (section 15.105)

WARNING **This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.**

Hewlett-Packard's system certification tests were conducted with HP-supported peripheral devices and HP shielded cables, such as those you receive with your computer. Changes or modifications not expressly approved by Hewlett-Packard could void the user's authority to operate the equipment. Cables used with this device must be properly shielded to comply with the requirements of the FCC.

FCC Telecommunications Regulatory Information

- This equipment complies with Part 68 of the FCC rules. On the outside surface of this equipment is a label that contains among other information, the FCC registration, the FCC registration number and ringer equivalence number (REN). If requested, this information must be provided to the telephone company.
- This equipment uses the following Universal Service Code (USOC) jacks: RJ11C or RJ11W (single line).
- The REN equivalence number (REN) is used to determine the quantity of devices which may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to the line, as determined by the total RENs, contact the telephone company to determine the maximum REN for the calling area.
- If this equipment causes harm to the telephone network, the telephone company will, where practicable, notify you in advance that temporary discontinuance of service may be required. If advance notice isn’t practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.
- The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make the necessary modifications in order to maintain uninterrupted service.

- If trouble is experienced with this equipment, please contact Hewlett-Packard in the USA for repair and/or warranty information. If the trouble is causing harm to the telephone network, the telephone company may request you remove the equipment from the network until the problem is resolved.
- No repairs are to be made by you. Repairs are to be made only by Hewlett-Packard or its licensees. Unauthorized repairs void registration and warranty.
- This equipment cannot be used on telephone company-provided coin service. Connection to Party Line Service is subject to state tariffs. (Contact the state public utility commission, public service commission, or corporation commission for information.)
- If so required, this equipment is hearing-aid compatible.

Notice for Canada: DOC Requirements

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Reglement sur le matériel brouilleur du Canada.

DOC Terminal Equipment Warnings

NOTE	The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunication network protective operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfactions.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be make by an authorized Canadian maintenance facility designated by supplier. Any repair or alteration made by the user to this equipment or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connection of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

The Load Number (LN) assigned to each terminal devise denotes the percentage of total load to be connected to a telephone loop which is used by the device to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the LD of all the devices does not exceed 100. The load number for this product is 33.

CAUTION	Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Notice for Sweden: National Post and Telecommunications Agency Statement

The LAN Interface shall be connected to SELV (max. 42,4 V peak, or 60 VDC etc.) according to EN 60 950.

Notice for Australia: AUSTEL Statement (Telecommunications)

When setting the number of automatic redial for the modem, ensure the following:

The number of automatic redials that the modem performs should be limited to a maximum of 9 redials plus the original call. If the above retries are unsuccessful, no further attempts should be made the same number for a minimum period of 5 minutes.

Failure to set the modem, and any communications software used with the modem to the values contained in the listing will result in the modem being operated in a non-compliant manner. Consequently, there would be no permit in force for this equipment and the Telecommunications Act 1991 prescribes a penalty of $12,000 for the connection of non-permitted equipment.

Notice for New Zealand: New Zealand Teleco Statement

When using an application software that allows the setting of automatic redialing the following guidelines should be followed:

- Not more than five call attempts to the same number within a one hour period.
- A minimum of 60 seconds between each attempt.
- Not more than a total of 10 call attempts to the same number.
- Any setting that violates the above guidelines will cause the equipment to go out of compliance, and thus no Telepermit will be enforced for this equipment which will make it subject to penalties.
- The operation of this equipment on the same line as telephones or other equipment with audible warning devices or automatic ring detectors will give rise to bell tinkle or noise and may cause false tripping of the ring detector. Should such problems occur, the user is not to contact Telecom Faults Service.

Australian EMI Approval.

UK General Approval (United Kingdom only)

Pursuant to section 22 of Telecommunications Act of 1984, this product is approved for indirect connection to Public Telecommunications systems within the United Kingdom under the general Approval number NS/G/1234/J/100003.

EMI Statement (European community only)

This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

Acoustics (Germany)

Lärmangabe (Schalldruckpegel LpA) gemessen an Arbeitsplatz bei normalem Betrieb nach DIN 45635, Teil 19:

Acoustic Noise (A-weighted sound Pressure Level LpA) measured at operator's position, normal operation, to ISO7779.

HP9000 Kxxx: LPA < 64 dB, no prominent tones at 22×C

European Declaration of Conformity

DECLARATION OF CONFORMITY
according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name: Hewlett-Packard Company

Manufacturer's Address: 8000 Foothills Blvd.
Roseville, CA 95747
USA

declares, that the product

Product Name: PA-RISC Computer System

Model Number(s): HP 9000, Model Kxxx-yy (x is any number 0–9, y is any letter A-Z)

Product Options: V.32bis modem card (A2991-60022)

conforms to the following Product Specifications:

Safety: IEC 950:1991 + A1, A2, A3 / EN 60950:1992 + A1, A2, A3

EMC: CISPR 22:1993 / EN 55022:1994 - Class A[1]

EN 50082-1:1992, Generic Immunity, including:

IEC 801-2:1991 / prEN 55024-2:1992, 4 kV CD, 8 kV AD

IEC 801-3:1984 / prEN 55024-3:1991, 3 V/m

IEC 801-4:1988 / prEN 55024-4:1992, 0.5 kV Signal Lines
1 kV Power Lines

IEC 1000-3-2:1995 / EN 61000-3-2:1995, Class A, harmonics

IEC 1000-3-3:1994 / EN 61000-3-3:1995, flicker

Supplementary Information:

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC and carries the CE marking accordingly.

1) The Product was tested in a typical configuration with Hewlett-Packard computer peripherals.

Roseville, July 1, 1997

Frank D. Dembski Jr., Quality Manager

European Contact: Your local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Department TRE, Herrenberger Straße 130, D-71034 Böblingen (FAX: + 49-7031-14-3143)

Radio Frequency Interference Statement (Japan only)

この装置は，情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Power Line Harmonics Conformance (Japan only)

ulop201

Safety

This product has not been evaluated for connection to an "IT" power system (AC distribution system having no direct connection to earth according to IEC 950).

Locate the AC outlet near the computer. The AC power cord is this product's main AC disconnect device and must be easily accessible at all times.

To reduce the possibility of an electric shock from the telephone network, plug the computer into the AC outlet prior to connecting to the network. Also, disconnect the network before unplugging the computer from the AC power outlet.

This product is designed to operate at the AC line voltages of 100, 120-127, or 200-240 V±10%. Contact your HP Sales Office if your line voltage is outside this range.

Battery Notices

This product may contain a Lithium battery. Replace only with the same type and part number. Recycle used batteries.

WARNING **Fire, explosion and severe burn hazard! Do not crush, disassemble, heat, incinerate or expose the battery to water.**

CD-ROM Drives

The following warnings apply to those products that support CD-ROM drives. Please also refer to the documentation provided with the CD-ROM drive.

Laser Safety Statement (US only)

The CD-ROM mass storage system contains a laser system classified as a "Class 1 Laser Product" under a U.S. Department of Health and Human Services (DHHS) Radiation Performance standard according to the Radiation Control for Health and Safety Act of 1968.

To ensure proper use of this product, please read the CD-ROM instruction manual carefully and retain for future reference. Should the unit ever require maintenance, contact an authorized service location.

WARNING **Use of controls, adjustments or performance procedures other than those specified herein may result in hazardous radiation exposure. To prevent direct exposure to laser beam, do not try to open the enclosure.**

Finland (only)

LASERTURVALLISUUS

LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT

HP 9000 Series Kxxx -tietokoneisiin on asennettu laitteensisäinen CD-ROM-lukulaite (9164-0393), joka on laserlaite.

Kyseinen CD-ROM-lukulaite on käyttäjän kannalta turvallinen luokan 1 laserlaite. Normaalissa käytössä lukulaitteen suojakotelo estää lasersäteen pääsyn laitteen ulkopuolelle. Laitteen turvallisuusluokka on määritetty standardin EN 60825-1 (1994) mukaisesti.

Tiedot CD-ROM-lukulaitteessa käytettävän laserdiodin säteilyominaisuuksista:

Aallonpituus	790 nm
Teho	0,3 mW

Germany

Dieses Gerät ist ein Laser Klasse 1 nach IEC 825. Beachten Sie die Bedienungsanleitung und verwahren Sie diese für späteren Gebrauch.

Gerät nicht öffnen. Lassen Sie Instandhaltungsarbeiten durch vertragswerkstätten durchführen.

WARNING VORSICHT

Führen sie Einstellungen and Prüfungen entsprechend den hier beschriebenen Anleitungen durch, um Gef öchtdungen durch den Laserstrahl zu vermeiden.

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1 System Overview

Using this Manual

Hardware Installation

This manual is intended to help you complete the installation of your HP9000 Model Kxx0 computer. The explanations in this manual assume you have followed the instructions in the *HP9000 Installation Guide* that was shipped with your computer. The installation guide explains how to physically connect all the different components of your system. If you have not completed the instructions in the Installation Guide, please do that before you continue with the instruction in this Owner's Guide. If you do not have the Installation Guide you can use *Appendix B — Hardware Installation Review* of this manual to complete the hardware installation.

Site Preparation

It is important that you verify that you have the proper electrical and environmental conditions in which to operate this computer. Review *Appendix A — Site Preparation* in this manual before you actually apply electrical power to your computer. Your computer and peripherals could be damaged if they are not operated within the environmental and electrical tolerances listed in Appendix A.

Computer Orientation

Review *Chapter 2 - Exploring Your Hardware* to familiarize yourself with the components of your computer. Since this manual tends to leverage information available in other books, you should also have at hand, for reference, the other manuals that came with your computer, such as:

- *Installing HP-UX 10.x*
- *HP9000/Kx00 Internal Peripherals Upgrade Guide*
- *Using HP-UX*

Turning on Your Computer

When you have connected the hardware, verified that the physical and electrical environments are appropriate for your computer, and familiarized yourself with the components of your computer, follow the steps in *Chapter 3 — Turning On Your Computer* to launch your operating system. Use some of the hints in *Chapter 4 — Troubleshooting* if the launching does not proceed as expected. If the computer still does not seem to run properly, contact your HP representative.

Administering Your Computer

Proceed with Chapters 5 through 8 to configure and backup your system.

Other Information

Other Information in this Manual

The Table of Contents should help you locate information on specific topics. A Glossary is provided to help familiarize you with terms used in this manual

There is an appendix that contains internal address path information. You may need to refer to this appendix when you need to configure or reconfigure your system.

Other Information not in this Manual

There are other Hewlett-Packard manuals that may be useful. Although the names of these manuals may change from one HP-UX release to another, the titles will relate to the following topics:

- Configuring HP-UX for, or Installing, Peripherals
- HP-UX System Administration Tasks
- HP-UX Reference

The HP-UX manuals online-manual page lists the HP-UX manuals available from Hewlett-Packard. At the prompt, type

```
man manuals
```

You can order these manuals from HP Direct, toll-free, at 1-800-637-7748 in the United States, or you can contact your nearest HP Sales and Support office

You will also need one set of operating system tapes, per site, in case your pre-loaded operating system becomes corrupted and you are unable to boot up (start) your operating system. You can order the operating system tapes from Hewlett-Packard.

Available HP Support Classes

Hewlett-Packard provides optional support directly to you using a support modem which connects your computer to HP through the telephone line. Two available support programs are: HP ResponseLine and HP TeamLine.

Hewlett-Packard's support programs provide HP customer's with help in implementing and operating HP software solutions. They deliver different levels of assistance and problem-solving, and can be customized for your needs. For more information on the support services that are available to you, contact your local HP Sales and Service Office.

Hewlett-Packard's Customer Education services provide high-quality training solutions worldwide to help you maximize the value of your investment. HP training courses enable you to enhance your problem-solving abilities, use your hardware and software capabilities fully, and eliminate trial-and-error learning. HP provides specific courses on many aspects of both HP-UX and HP-UX Systems Administration. As a requirement of the software support agreement, which allows access to the Response Center for telephone assistance, authorized callers must attend appropriate training.

For a catalog of courses or for detailed information on Hewlett-Packard's Customer Education services, in the U.S. please call (800) HP-CLASS, in Canada please call (416) 678-9430, and elsewhere, please call your local Hewlett-Packard Customer Education Center.

2 Exploring Your Hardware

Hewlett Packard 9000 Computer Systems

This section provides general specifications and information describing the HP 9000 computer systems.

Table 2-1 HP 9000 General Specifications

Specifications	Physical Specification
Core System Hardware	The components that comprise the core system, System Processor Unit (SPU), Uninterruptible Power System (UPS) and system console
Removable Media Peripherals	Controls and indicators for standard internal peripherals

NOTE Detailed Environmental and Electrical specifications are available in *Appendix A — Site Preparation*.

Physical Specifications

Table 2-2 Model K Physical Specifications

Physical Characteristic	Stand-alone Specifications	Packaged Specifications
Height	63.50cm (25in)	87.00cm (34.25in)
Width	43.18cm (17in)	88.90cm (35in)
Depth	69.85cm (27.5in)	77.47cm (30.5in)
Weight	59kg (131lb)[a]	76.66kg (169lbs)[a]

a. Kx50/Kx60/Kx70/Kx80 models slightly heavier

Core System Hardware

The HP 9000/K100, K2x0, K3x0, K4x0, and K5x0 are a new family of PA-RISC computer systems from Hewlett Packard. There are two basic classes of systems, multiprocessors (more than one processor) and uniprocessor (single processor system).

Multiprocessor Systems

6 - Way Processor Systems. The HP9000 K370/K380 and K570/K580 models are available with 1 - to 6 - way processors.

K370	Product A3663A, single processor system with 128 MBytes ECC memory, 200MHz clock speed.
	Up to five additional processors (Product A3669A).
K380	Product A4869A, single processor system with 128 MBytes ECC memory, 240 MHz clock speed.
	Up to five additional processor (Product A4872A).
K570	Product A3641A, single processor system with 256 MBytes ECC memory, 200MHz clock speed.
	Up to five additional processors (Product A3669A).
K580	Product A4837A, single processor system with 128 MBytes ECC memory, 240 MHz clock speed.
	Up to 5 additional processors (Product A4872A).

4 - Way Processor Systems. The HP9000/K2x0 and K4x0 models are multiprocessor systems. They are available with 1 to 4 way processors.

K460	Product A3284A, single processor system with 128M Bytes ECC memory, 180 MHz clock speed.
	Up to three additional processors (Product A3261A), no additional memory.
K450	A3464A single processor - 128M Bytes ECC memory, 160 MHz clock speed
	Up to three additional processors (Product A3498A), no additional memory
K420	A3454A single processor - 128M Bytes memory, 120 MHz clock speed
	Up to three additional processors (Product A3452A), no additional memory
K410	A3283A single processor - 128M Bytes memory, 120 MHz clock speed
	Up to three additional processors (Product A2995A), no additional memory
K400	A3181A single processor - 128M Bytes memory, 100 MHz clock speed
	Up to three additional processors (Product A2993A), no additional memory
K360	A5140A one to four 180 MHz PA-8000 RISC processors - 128 M Bytes memory.
K260	A3205A single processor - 128M Bytes memory, 180 MHz clock speed
	Up to three additional processors (Product A3261A), no additional memory
K250	A3463A single processor - 128M Bytes memory, 180 MHz clock speed
	Up to three additional processors (Product A3498A), no additional memory, 160 MHz clock speed

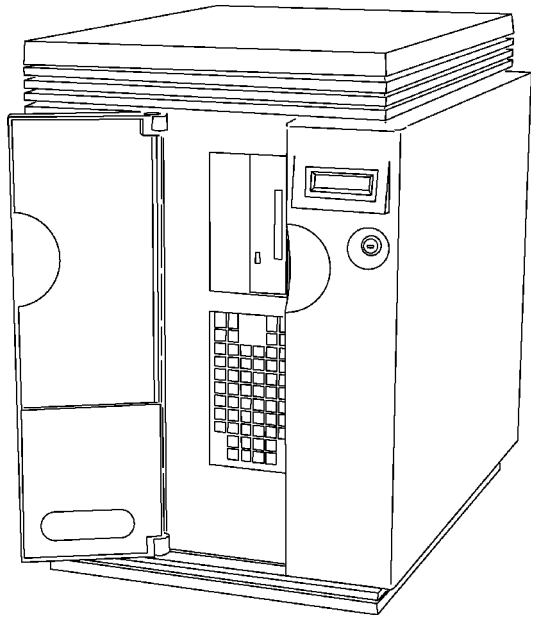
K220	A3453A single processor - 128M Bytes memory, 120 MHz clock speed
	Up to three additional processors (Product A3452A), no additional memory
K210	A3281A single processor - 64M Bytes memory, 100 MHz clock speed A3282A single processor - 128M Bytes memory, 100 MHz clock speed
	Up to three additional processors (Product A2995A), no additional memory
K200	(A3060A) single processor - 64M Bytes memory, 100 MHz clock speed, OR (A3061A) single processor - 128M Bytes memory, 100 MHz clock speed
	Up to three addition processors (Product A2993A), no additional memory

Uniprocessor

The HP 9000/K100 operates at 100 MHz clock speed. It has one processor. The rear of the K100 SPU has no processor slots.

K100	A3038A single processor - 32M Bytes memory
	A3039A single processor - 128M Bytes memory

Figure 2-1 Model K100 SPU

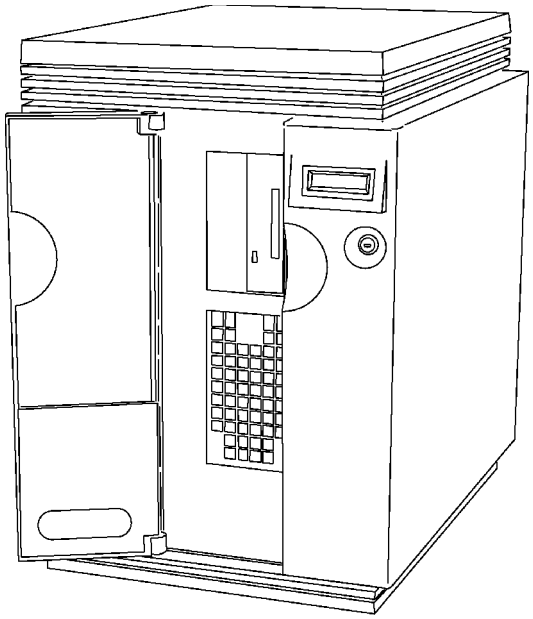


All models of the Model K are identical from the front, with the exception of the name plate.

HP 9000 Series 800 Model K Hardware Overview

A core system includes the System Processing Unit (SPU), system console and optional external Uninterruptible Power System (UPS). A system can be operated without a UPS or local system console.

Figure 2-2 SPU with Front Door Open



Rack Mounting

A rack mount version of all models is available. Most rack mount systems are assembled at the factory but a field upgrade rack kit is available.

System Identification Information

Your SPU Serial Number and other information for the unit are located on the inside of the front door.

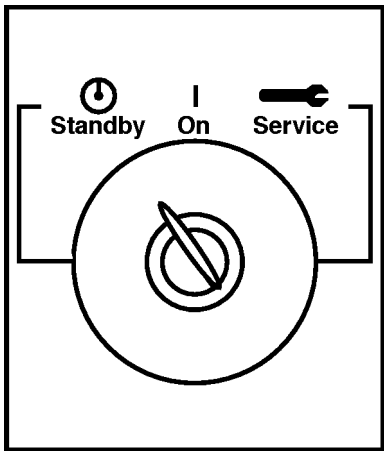
System Processing Unit Controls

The System Processing Unit (SPU) has one front panel control, a Key Switch and the Liquid Crystal Display (LCD) on the right side.

Table 2-3 Key Switch Functions

Function	Description
Standby	A warm up mode where DC power is applied to the LCD display and internal components. The processor does not function.
ON	The standard mode for full operation
Service	The mode for checking the status of system components and functions and for running system diagnostics.

Figure 2-3 Key Switch



Fully counter-clockwise - “Standby”

Middle position - “on”

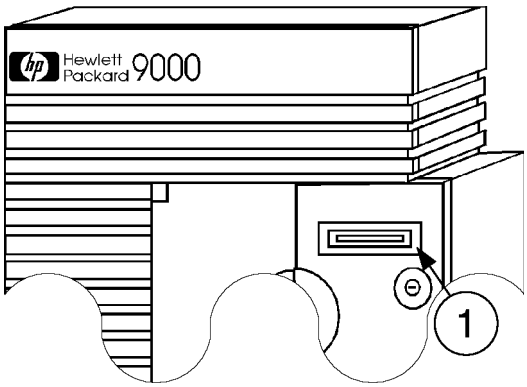
Fully clockwise - “Service”

WARNING **With the key switch in the STANDBY position, hazardous voltages exist inside the computer. To remove AC power from the computer, unplug the power cord from the back of the SPU.**

Liquid Crystal Display Panel

The LCD Panel (See Figure 2-4) shows system status information and power-on indication. The various LCD Panel messages and their meanings are explained in the start-up procedure. A typical message that would appear in the panel when your Model K is booted and running is shown in Figure 2-5.

Figure 2-4 LCD Panel



1. LCD Panel Location

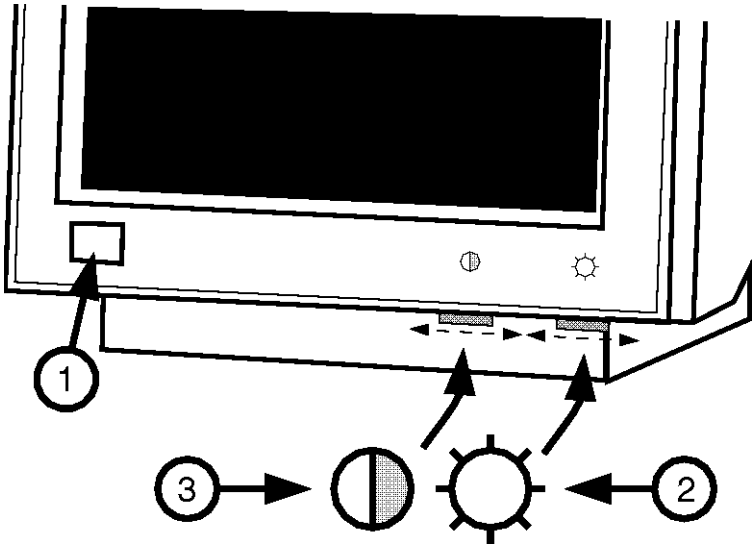
Figure 2-5 LCD Panel Message

```
RUNFXYF
CPU 01
```

System Console Controls

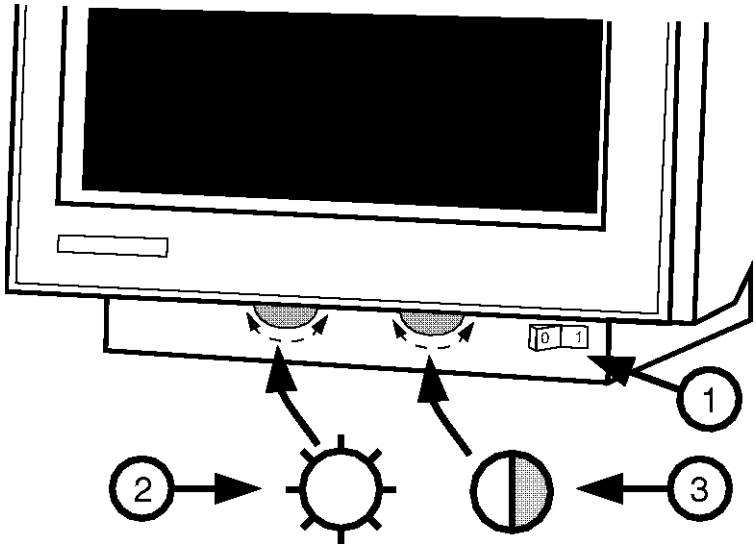
The System Console can be a graphics or text monitor, depending on your system. The console controls will conform to something similar to the controls in Figure 2-6 for the HP700/96 and similar terminals, or like the controls in Figure 2-7 for some of the graphics monitors.

Figure 2-6 Typical Text Console Controls



1. ON/OFF Switch
2. Brightness Control
3. Contrast Control

Figure 2-7 Typical Graphic Console Control

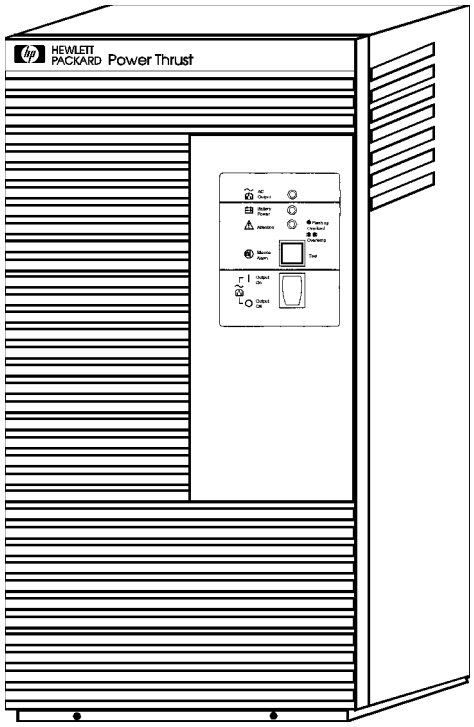


1. ON/OFF Switch
2. Brightness Control
3. Contrast Control

Uninterruptible Power System (UPS)

A UPS is optional on HP 9000 Systems. In a power outage, it provides AC power to the SPU and console for approximately 15 minutes (depending on system peripherals), allowing time for orderly system shut downs.

Figure 2-8 UPS Front View

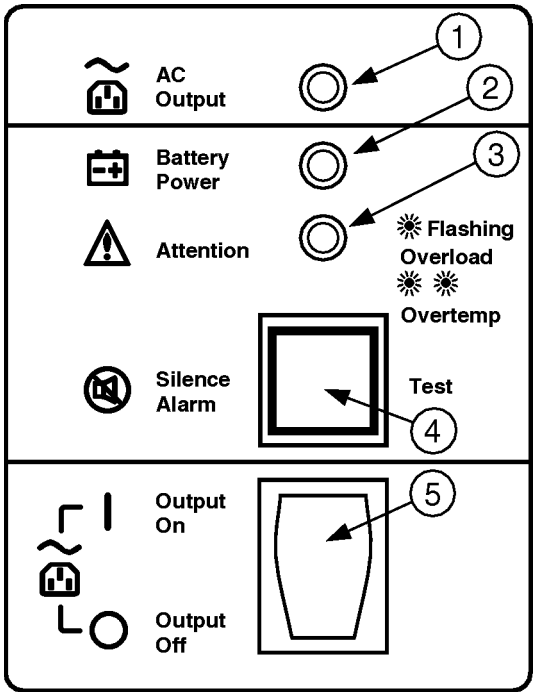


The UPS is connected to the SPU via the dedicated UPS port on the Core I/O card. The SPU sends signals to the UPS and passes messages to the operating system of AC power conditions.

UPS Controls

Figure 2-9 shows the controls and indicators for a typical UPS:

Figure 2-9 UPS Controls



1. AC Output Light
2. Battery Power Light
3. Attention Light
4. Silence Alarm/Test
5. ON/OFF Switch

The UPS Lights and Switches are:

1. AC Output (Green) Light - Indicates AC power is being supplied to the plugs at the rear of the UPS unit
2. Battery Power (Yellow) Light - Indicates UPS is supplying power during abnormal AC power conditions.
3. Attention (Yellow) Light - Indicates that the UPS needs attention.
4. Silence Alarm/Test Switch - Lets user silence the alarm when activated an alarm condition, is also be used to test the UPS alarm system under normal operating conditions.
5. ON/OFF Switch - Controls power to output receptacles on rear of UPS.

NOTE Refer to your UPS PowerTrust Manual for complete front panel lights, switches, and operation information.

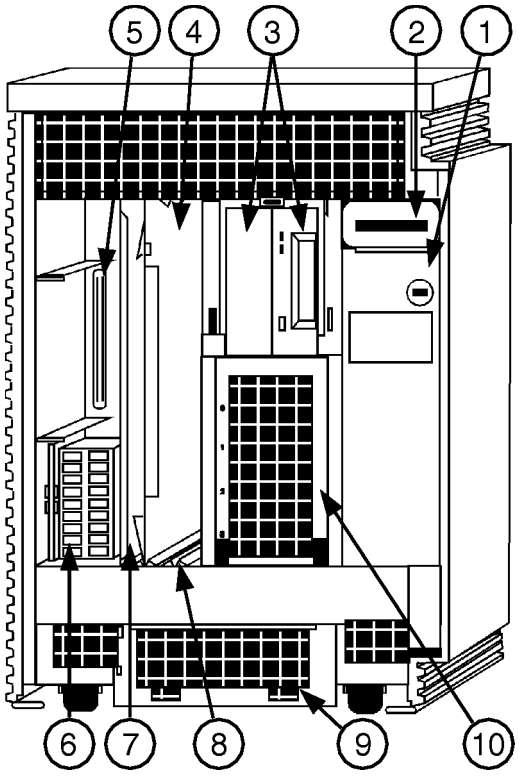
SPU Major Components

Front View of SPU

Figure 2-10 shows the HP 9000 Model K4xx with the Front Bezel and Memory Bulkhead removed. At the top right is the LCD panel and SPU key switch. The LCD panel displays selftest and other system messages.

Figure 2-10 K4xx With Front Panels Removed.

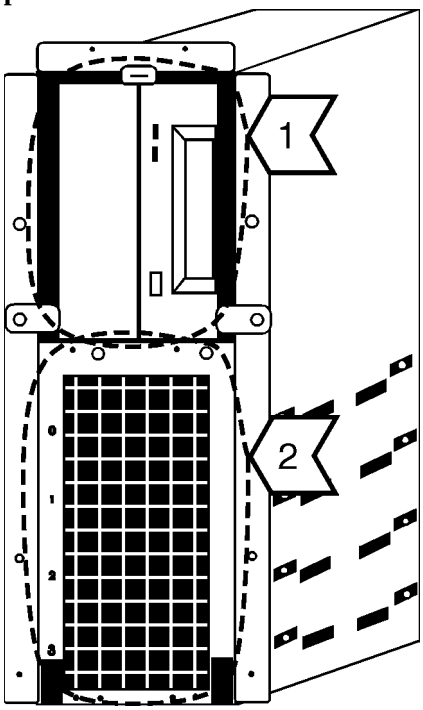
1. SPU key switch
2. LCD Panel
3. Removable media slots
4. Processor 0 card
5. Slot for Memory Carrier 1
6. Memory Carrier 0
7. Power Monitor Card
8. Slot for Processor 1 card
9. Front Cooling Fan
10. Hard Disk slots



Peripheral Drawer

To the left of the display panel is the Peripheral Drawer which contains two vertical slots for single-ended SCSI removable media devices and four horizontal slots for fast/wide/differential SCSI disk drives. These slots will accommodate 1/2 inch or 1 inch high hard drives.

Figure 2-11 Peripheral Drawer Removed from Cabinet



1. Upper peripheral bay for removable devices.

2. Lower peripheral bay for fixed hard disks.

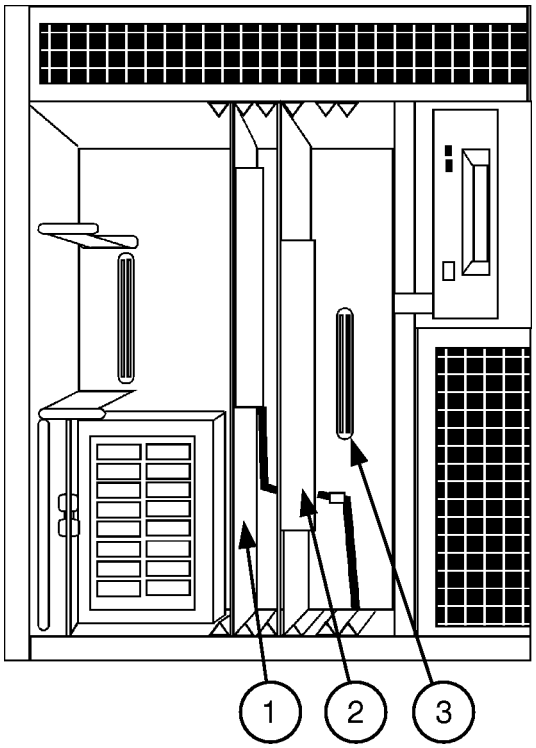
Processors and Power Monitor Card

Models K370/K380 and K570/K580 each have two front slots and four rear slots for the installation of SPU processors. The processors/slots are numbered 0 through 5. All SPUs are configured with the first processor in (front) slot zero (0). Processor 1, if installed, goes in the vacant front slot between slot 0 and the peripheral bay. See Figure 2-12. (Processors 2 through 5, if installed, go in slots at the rear).

Model K2x0, K360, and K4x0 each have two front slots and two rear slots for the installation of SPU processors. The processors/slots are numbered 0 through 3. All SPUs are configured with the first processor in (front) slot zero (0). Processor 1, if installed, goes in the vacant front slot between slot 0 and the peripheral bay. See Figure 2-12. (Processors 2 and 3, if installed, go in slots at the rear).

The Power Monitor plug-in card is mounted in the slot to the left of the Processors. See callout 1 in Figure 2-12 below.

Figure 2-12 Front Processors and Power Monitor Card



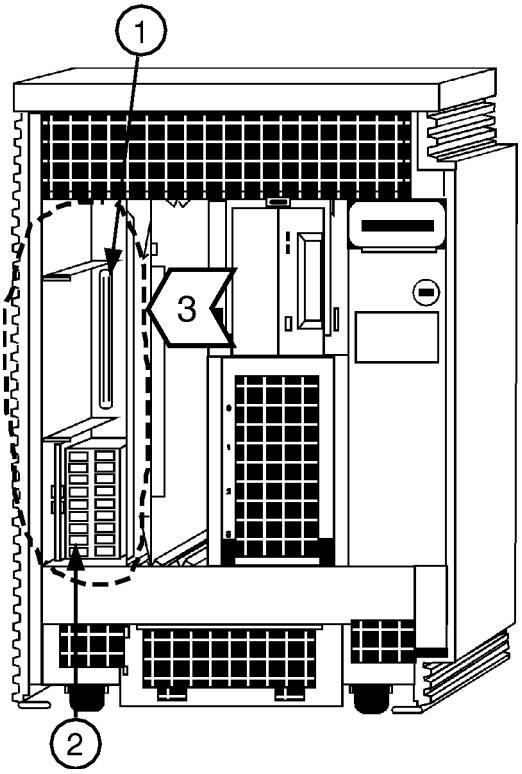
1. Power Monitor Card
2. Processor 0 (Zero)
3. Vacant connector for Processor 1

Memory

Memory for models K2x0, K3x0, K4x0, and K5x0 is located in one or more memory carriers. See number 1 and 2 in Figure 2-13 below. Memory for Model K100 (not shown) is located, on the system card, inside the rear of the chassis.

Memory is available as 16, 32, 64, 128, 256, or 512 MByte error correcting Single In-line Memory Modules (SIMMs). The SIMMs must be installed in pairs, called modules. Single processor SPUs can address up to 512 Mbytes or Random Access Memory (RAM). Multiprocessor systems can address up to 8GBytes of RAM.

Figure 2-13 Memory Carrier Bay



1. Slot for Memory Carrier 1
2. Memory Carrier 0
3. Memory Carrier Bay

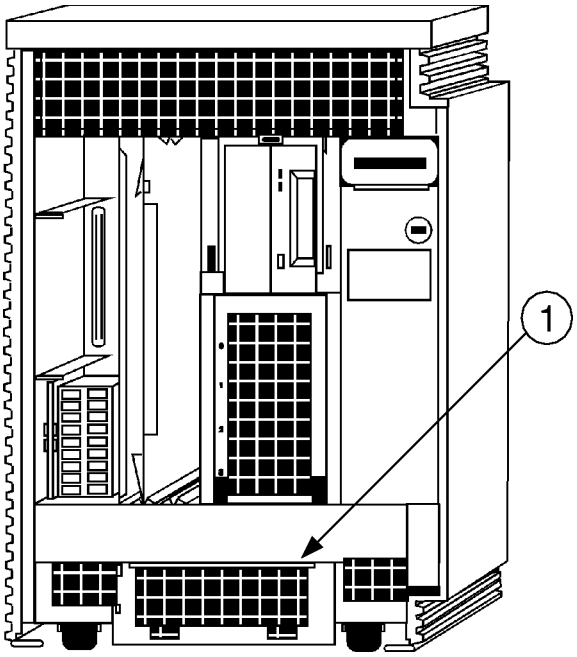
Cooling Fans

Two variable speed fans supply cooling air to the SPU chassis. They are mounted at the bottom of the SPU cabinet (see callout 1 in Figure 2-14. One may be accessed from the front of the SPU cabinet and one from the rear.

The speed of the fans is controlled by the power monitor card. When ambient temperature inside the SPU cabinet rises, the speed of the fans increases, moving more cooling air.

To maintain adequate air flow and control RFI/EMI generated noise, all covers and bezels must be installed during normal operation.

Figure 2-14 Front Cooling Fan Location

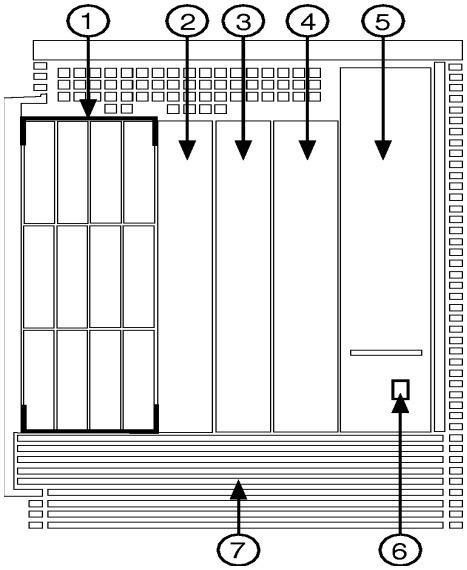


Rear View of SPU

The UPS, System Console, Networks and some external peripherals connect to the system via the Core I/O. The HP-PB panels also provide connectors to external peripherals.

Figure 2-15 shows the rear view of a Model K400/K410/K420. Models K100 and K200/K210/K220 are identical except that the Core I/O panel for the Model K100 is positioned two vertical slots to the left.

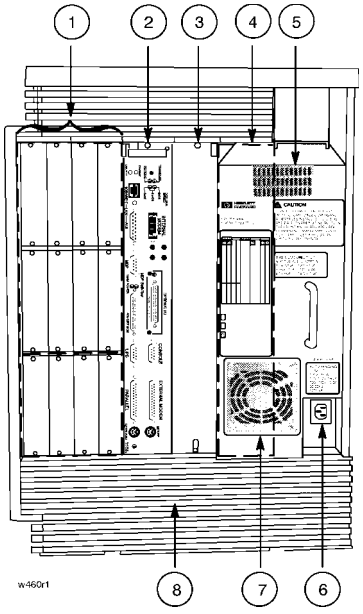
Figure 2-15 Model K400/K410/K420 Rear View



1. HP-PB
2. Core I/O
3. HP-HSC Expansion I/O
4. Rear processor bulkhead
5. Power supply sub-assembly
6. AC Power Input Socket
7. Rear fan access panel

Figure 2-16 shows the rear view of a model K250/K260/K360/K450/K460. Note that the power supply is larger than other models and that the power supply bulkhead extends across the back of the rear processor slots.

Figure 2-16 Model K250/K260/K360/K450/K460 Rear View



1. HP-PB
2. Core I/O
3. HP-HSC Expansion I/O
4. Rear processor locations (behind pwr supply flange)
5. Power Supply Subassembly
6. AC Power Input Socket
7. Pwr Supply Fan Assembly
8. Rear Fan Access Panel (behind the bottom panel)

The rear view for models K370/K380 and K570/580 show a different configuration. Note the following differences compared to the K250/K450/K260/K360/K460 models (refer to Figure 2-17 and Figure 2-18):

- The Core I/O board now occupies two slots formerly used for HP-PBs.
- The HSC Expansion I/O occupies the slot used for the Core I/O.
- Two slots formerly used for the HSC Expansion I/O are now used for additional processors. Alternatively, these slots may house a Dual Bus 4-slot HSC Expansion I/O for extended I/O capability (see Figure 2-18).

All rear mounted system components are accessible without removing cabinet "skins" except for the rear processors that are located behind the Rear Processors Bulkhead and the rear fan that is located behind the bottom panel.

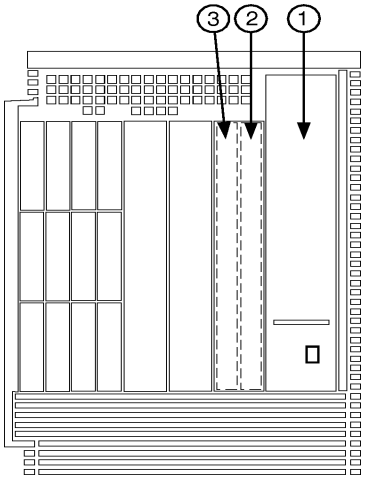
Power Supply

At the far right of the SPU (callout 5, Figure 2-15 or callout 7, Figure 2-16) is the power supply, which is a removable assembly. Near the bottom of the power supply is the AC power input socket (callout 6, Figure 2-15 or callout 6, Figure 2-16).

HP9000/K2x0 and K4x0 Rear Processors

To the left of the power supply are the slots for the rear processors. See Figure 2-17. On models Kx50/Kx60/Kx70Kx80 the power supply bulkhead extends across the face of the slots for processors 02 and 03 (see Figure 2-16).

Figure 2-17 Model K2x0/K4x0 Rear Processor Slots

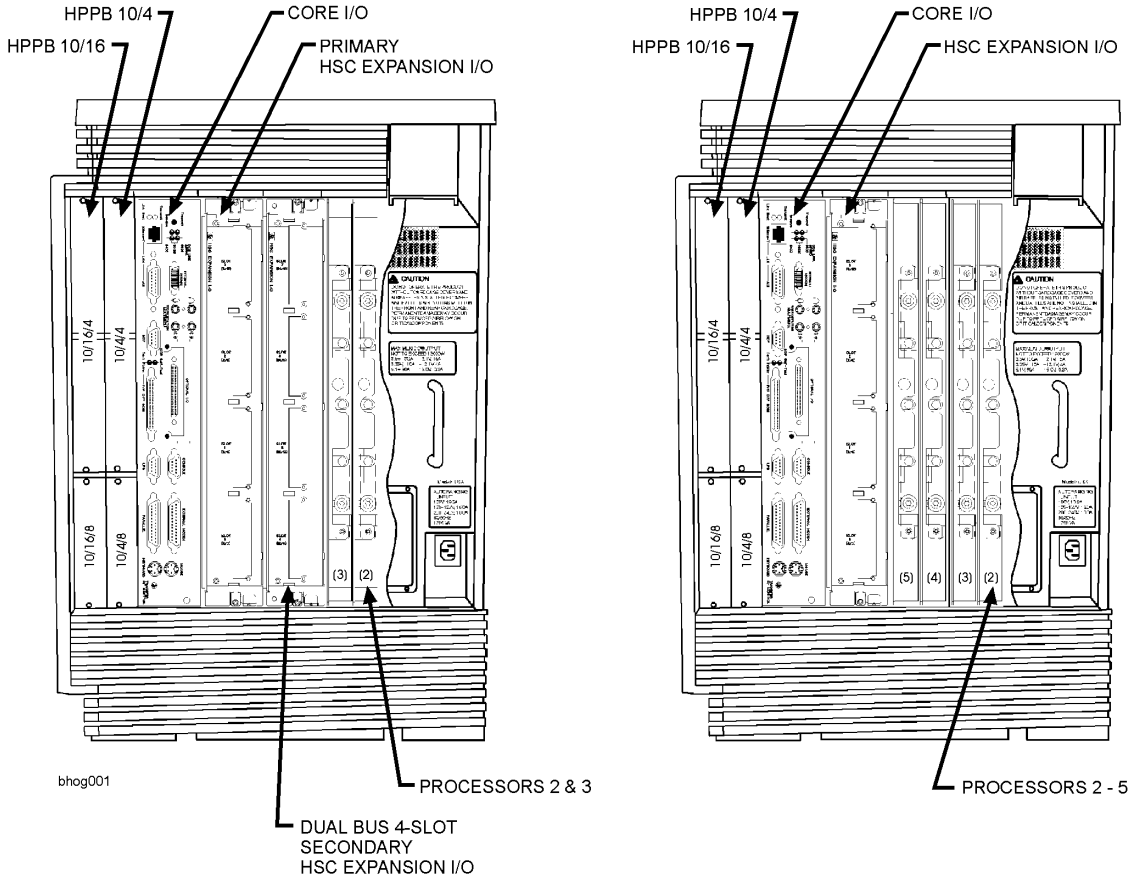


1. Power Supply Assembly
2. Slot for Processor 02
3. Slot for Processor 03

HP9000/K370/K380 and K570/K580 Rear Processors

To the left of the power supply are slots for the rear processors. See Figure 2-17. On models K370/K380 and K570/K580, the power supply bulkhead extends across the face of the slots for processors 02 and 03 (see Figure 2-16). Depending on the system configuration, additional slots are available for processors 04 and 05 and for installation of a Dual Bus 4-slot Expansion I/O (see Figure 2-18).

Figure 2-18 Model K370/K380 and K570/K580 Rear Processors



NOTE The Dual Bus 4-slot Expansion I/O configuration is not available on K370 or K380 models.

HP-HSC Expansion I/O

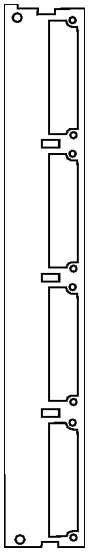
There is space for an optional I/O carrier to the left of the processor slots (callout 3, Figure 2-15). The optional I/O expansion slot can be used for either a 2- or 4-slot HSC I/O expansion module.

The 4-slot I/O Expansion module is available only for the HP 9000/K4x0/K570/K580 Systems.

The 2-slot HSC I/O Expansion module is available for the HP9000 K370/K360/K380/K4x0/K570/K580 system.

HP9000 K2x0 systems do not support any HSC I/O Expansion modules.

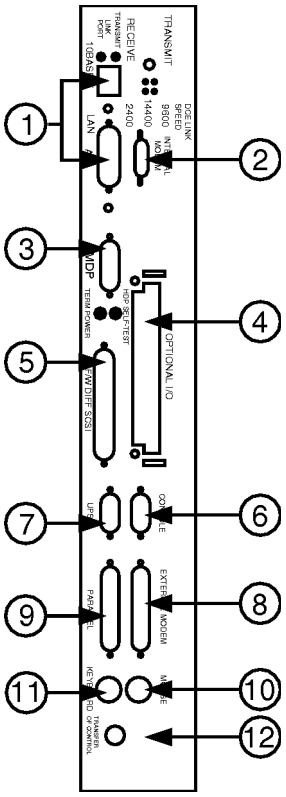
Figure 2-19 Expansion I/O



Core I/O

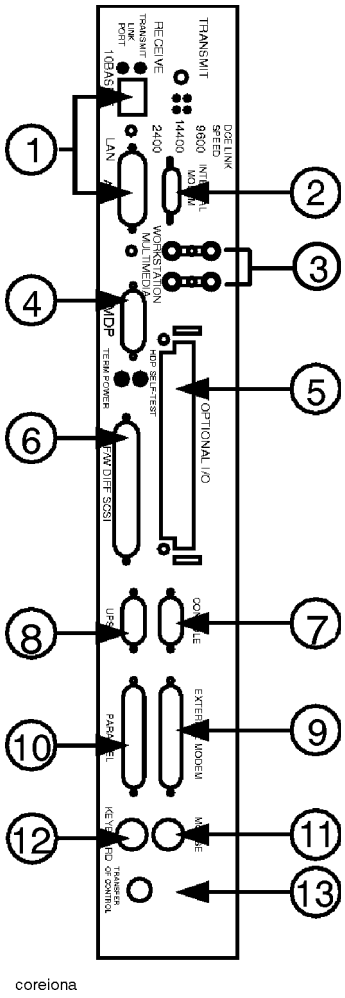
The Core I/O is the main connector panel for the console, UPS, most external peripheral devices and network devices.

Figure 2-20 Core I/O (K100/K200/K210/K220/K400/K410/K420)



1. LAN 802.3 via 10 Base-T or AUI
2. Internal modem port
3. Modem distribution panel connect
4. Expansion slot for single-wide, snap-in adaptors
5. Fast/wide SCSI for external devices
6. Console RS-232 direct connect
7. UPS RS-232 control connect
8. Remote console RS-232 modem connect
9. Parallel (Centronics)
10. PS/2 mouse
11. PS/2 keyboard
12. Transfer of Control (TOC) switch.

Figure 2-21 Core I/O (K250/K260/K360/K370/K380/K450/K460/K570/K580)



1. LAN 802.3 via 10 Base-T or AUI
2. Internal modem port
3. Multimedia I/O jacks
4. Modem distribution panel connect
5. Expansion slot for single-wide, snap-in adaptors
6. Fast/Wide SCSI for external devices
7. Console RS-232 direct connect
8. UPS RS-232 control connect
9. Remote console RS-232 modem connect
10. Parallel (Centronics)
11. PS/2 mouse
12. PS/2 keyboard
13. Transfer of Control (TOC) switch

The expansion slot (Figure 2-18) will accept the following adapters:

- Fast/Wide SCSI adapter
- Graphics adapter
- High speed system connect (HP-HSC) to HP-PB bus adapter

Core I/O Card Status LEDs

Core I/O cards have LED status indicators on the bulkheads. This section shows the location and interpretation of each Core I/O LED. To determine the status of a particular function on a card, locate and identify the LED (e.g., LINK Status, SCSI Selftest, etc.). Match the LED pattern with the descriptions in this section.

Table 2-4 Internal Modem Transmit/Receive LEDs

Internal Modem LED	Data Activity
Transmit Callout (1)	If blinking (or on) data is being transmitted
Receive Callout (2)	If blinking (or on) data is being received

Figure 2-22 Internal Modem Transmit/Receive LEDs

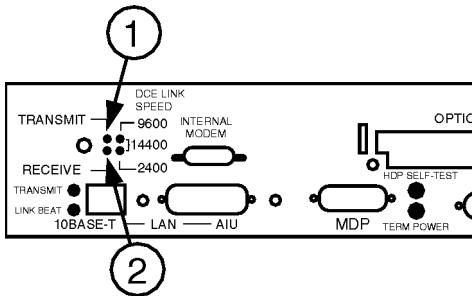


Table 2-5 Internal Modem DCE Link Speed LEDs

Internal Modem LED	14400bps	9600 bps	2400 bps	Other speed or no connect
9600 xxx (1)	ON	ON	OFF	OFF
2400 xxx (2)	ON	OFF	ON	OFF

Figure 2-23 Internal Modem DCE Link Speed LEDs

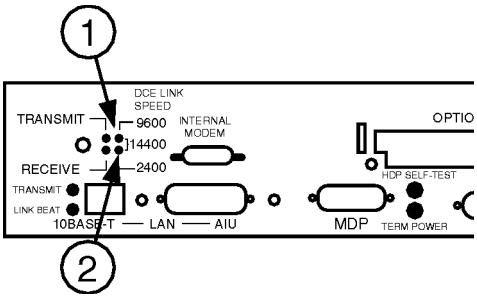


Table 2-6 LAN LEDs

LAN LED	Description	Function
Transmit xxx (1)	Transmit LED	Indicates transmit status of 10 Base-T or AUI port. Turns on to indicate transmission. Blinks at a rate dependent on the level of the transmit activity.
Link Beat xxx (2)	Receive LED	Indicates receive status of 10 Base-T or AUI port. Turns on to indicate reception. Blinks at a rate dependent on the level of the receive activity.

Figure 2-24 Internal Modem LAN LEDs

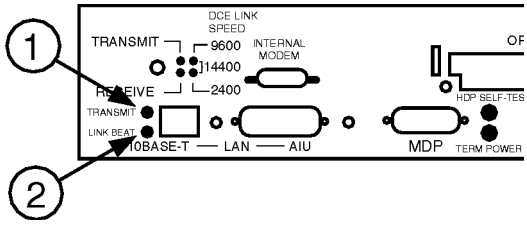


Table 2-7 F/W SCSI/Diff SCSI Term Power LED

Term Power LED State (1)	Function
On	Indicates that the F/W SCSI circuitry is supplying termination power.
Off	The termination power fuse is blown, replace fuse.

Figure 2-25 F/W SCSI Diff SCSI Term Power LED

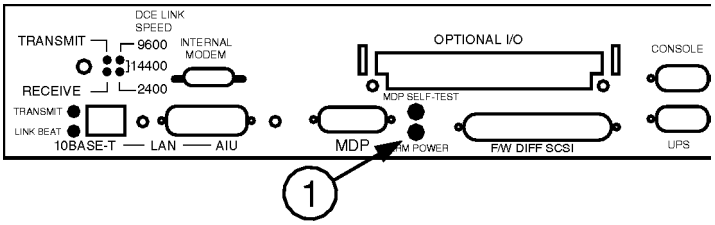
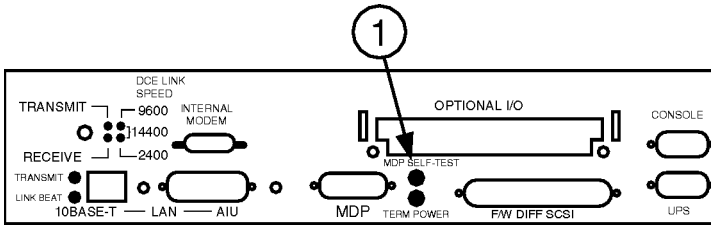


Table 2-8 MDP Selftest LED

MDP LED State (1)	Function
Off	LED will go off after a successful selftest.
Blinking	LED blinks during the selftest.
On	LED stays on during a hard reset or if selftest fails.

Figure 2-26 MDP Selftest LED

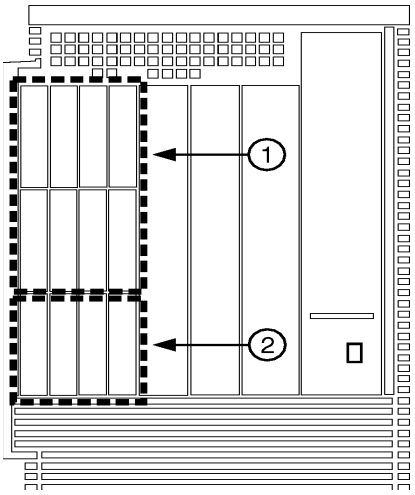


HP-PB Slots

The Hewlett-Packard Precision Bus (HP-PB) slots are for connecting a wide range of external devices. The HP9000 K-class systems have double high slots and single high slots. The K4x0 has four double high and four single high slots, for a maximum of eight I/O cards. The K570/K580, K360, K370/K380, K2x0 and K100 have two double high and two single high slots, for a maximum of 4 I/O cards.

NOTE Double high slots can be used for either double high or single high I/O cards. For instance, if a K4x0 used no double high cards it could accommodate 8 single-high I/O cards; if it used 1 double high card it could accommodate 7 single high cards.

Figure 2-27 HP-PB Standard and Optional Slot (K4x0)



1. Double-high or single high slots
2. Single high slots

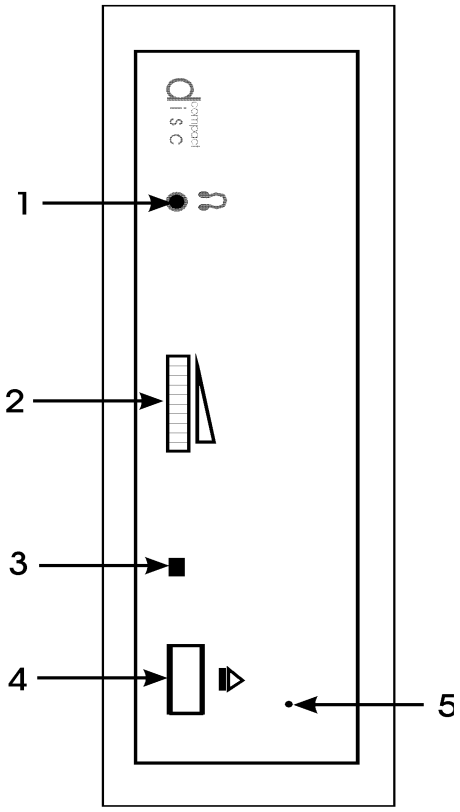
Internal Peripherals

The internal peripherals include the following:

- DDS Tape Drive
- 1, 2, 4, or 9 Gigabyte SCSI-2 Fast/Wide Disk Drives
- CD-ROM Drive

As listed above, the workstation comes with one internally mounted CD-ROM drive. Figure 2-29 shows the CD-ROM drive front panel. The eject button is pressed to open or close the tray for installation or removal of a disc. Table 2-9 shows the conditions indicated by the busy indicator.

Figure 2-28 CD-ROM Drive



1. Headphone Jack
2. Volume Control
3. Activity Indicator
4. Eject Button
5. Emergency Eject Hole

NOTE Pressing the Eject button ejects the CD within five seconds. This button does not work if there is no power or if the software application has disabled the drive's eject operation. If the button is not working or disabled, you can still eject a CD via the Emergency Eject Hole. (Insert a straightened paper clip into the hole and push.)

Table 2-9 CD-ROM Drive Status Indicator

Busy Indicator	Condition
Off	CD Caddy ejected.
Fast Blink (0.2 Sec.)	Indicates data transfer.
Fast Blink (0.8 Sec.)-Turns Off	Ready for data read.
Fast Blink (0.8 Sec.)-Turns On	Drive is inoperative.
Slow Blink (3.2 Sec.)	Disk is dirty.
Slow Blink (1.6 Sec.)	Audio playback.

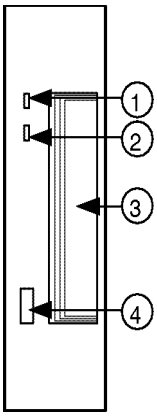
If the Busy indicator shows that the drive is inoperative, some possible causes are:

- No disk is inserted in the CD caddy.
- Disk is loaded with the label side facing downward in the caddy.

DDS Tape Drive

The optional DDS tape drive is located in the Peripheral Bay of your computer. Figure 2-29 shows the DDS tape drive.

Figure 2-29 DDS Tape Drive



1. Cassette Light
2. Drive Light
3. Cassette Slot
4. Unload Button

There are two indicator lights on the front of the DDS tape drive. The upper light (callout 1) is the cassette light, and it indicates the status of the DDS tape cassette. The lower light (callout 2) is the drive light, and it indicates the status of the DDS tape drive. Each light is capable of displaying two colors: yellow or green.

DDS Indicator Light Tables

Table 2-10, Table 2-11, Table 2-12, and Table 2-13 illustrate the describe the various combinations of DDS tape lights and what each condition means.

Table 2-10 Tape Drive: No Cassette

Cassette Light (Left)	Drive Light (Right)	Condition
Off	Off	No cassette loaded or power off.
Off	Pulsing Green	No power or no cassette
Flash Yellow	Flash Yellow	Selftest in progress.
Steady Green	Flash Green	No cassette, SCSI activity.

Table 2-11 DDS Tape Drive: Tape Write-Enabled

Cassette Light (Left)	Drive Light (Right)	Condition
Steady Green	Steady Green	Cassette is loading and on line.
Steady Green	Pulse Green	Cassette is loaded and SCSI activity.
Pulse Green	Pulse Green	Loading, unloading, or ejecting
Steady Green	Off	Drive off line.

Table 2-12 DDS Tape Drive: Write-Protected

Cassette Light (Left)	Drive Light (Right)	Condition
Steady Yellow	Steady Green	Cassette is loaded and on line.
Steady Yellow	Flash Green	Cassette is loaded and SCSI activity.
Steady Yellow	Off	Drive off line.

Table 2-13 DDS Tape Drive: Error States

Cassette Light (Left)	Drive Light (Right)	Condition
Steady Green	Pulse Green/Yellow	Caution (Media Warning).
Steady Yellow	Steady Yellow	Condensation detected, or no termination resistors.
Pulse Yellow	Steady Yellow	Fault (Diagnostic Failure).

DDS Tape Cautions

NOTE Do not try to insert a DDS tape while the drive is conducting the selftest or the selftest will fail and the drive will not operate.

If the error states lights indicate a caution, it means that the DDS tape drive is having to correct an excessive number of errors when using the cassette. This can mean that the tape heads need cleaning, or that the DDS tape is nearing the end of its useful life.

When you see a caution signal, first clean the DDS tape heads. If the signal occurs again, you should copy the data from the DDS tape onto a new DDS tape as follows:

1. Copy the data from the DDS tape onto the hard disk.
2. Copy the data from the hard disk onto a new DDS tape.
3. Discard the old DDS tape.

Handling and Storing Data Cassettes

Environmental conditions can affect the reliability of data stored on cassette tapes. It is recommended that you use only cassettes marketed by Hewlett-Packard, which meet high standards.

To ensure data integrity for your cassettes, follow these guidelines:

- Do not touch the tape, nor attempt to clean the tape path or tape guides inside the cassette.
- Do not leave cassette tapes in excessively dry or humid conditions.
- Do not leave cassette tapes in direct sunlight or in places where magnetic fields are present (for example, under telephones or near transformers).
- Do not drop cassettes, nor handle them roughly.
- Do not stick more than one label onto cassettes; extra labels could cause the cassettes to jam in the DDS tape drive.
- Store cassettes in their plastic cases when not in use.
- Always store the cassettes in a clean environment.
- Do not use cassettes when the caution signal is displayed by the cassette (upper) light, located on the front panel. The light shows a repeating pattern of: green for 4.5 seconds, then off for 0.5 seconds. If the light pattern appears, it means that the tape heads need cleaning or that the DDS tape is nearing the end of its useful life.

NOTE Insert the DDS tape with the arrow on the tape pointing towards the drive.

3 Starting Your Computer

This section of the manual covers the steps necessary to make full use of the HP 9000 System immediately prior to and after applying power. The steps are:

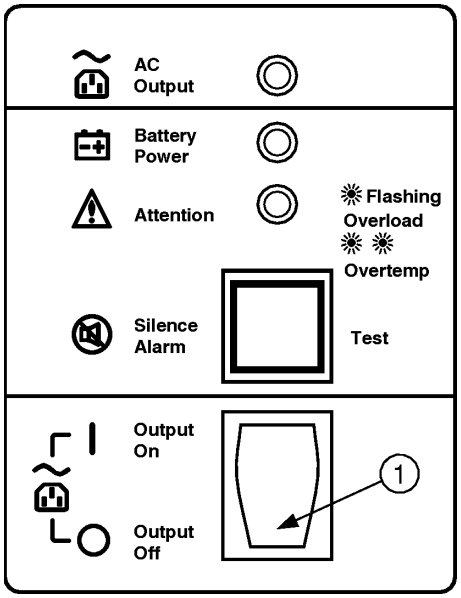
- Setting Core System Component Switches prior to applying power.
- Modifying Firmware settings after applying power
- Turning over control to the operating system.

Setting Core System Component Switches Prior to Applying Power

Uninterruptible Power Supply

Place the UPS Power Switch in the down position (OFF). See Figure 3-1.

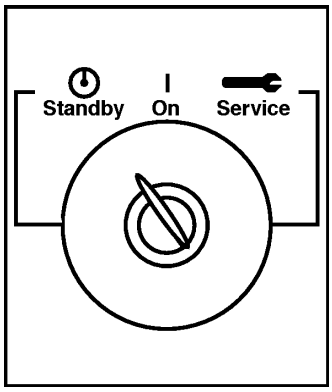
Figure 3-1 UPS Power Switch in the "OFF" Position



SPU

Turn the key switch to the "Standby" position.

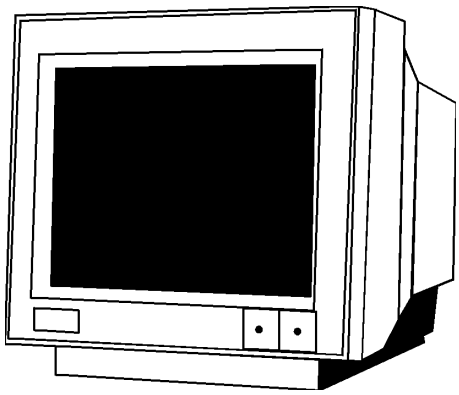
Figure 3-2 Key Switch in the "Standby" Position



System Console

Push the On-Off switch so that the switch is in the Off position, flush with the front panel.

Figure 3-3 System Console in the OFF Position



Power On Sequence

Turn the system on in the following order:

1. Turn on the UPS. Push the top of the switch in.
2. Turn on the System Console. Push the ON/OFF switch in.
3. Adjust the Contrast and Brightness for a visible cursor display.
4. Set the System Console mode.
5. Turn on all connected peripherals and ensure that they are running with no error indications.
6. Turn on the SPU by placing the key switch in the "ON" position.

The following actions occur simultaneously:

- The UPS LED indicators light up
- The LCD on the SPU displays system messages
- The System console displays the progress of the boot process

System Console Modes

The System console is a general purpose terminal that can be used in many different ways. There are two ways that it can be used as a System Console:

- Direct Mode
- Remote Mode

Direct Mode Operation

The console is directly connected to the HP 9000 SPU via the Core I/O card console connection.

Remote Mode Operation

The console is connected via a modem to the remote console connection on the Core I/O cord.

UPS Status

The UPS displays status conditions via a combination of LED status indicators (see Figure 3-4) as follows:

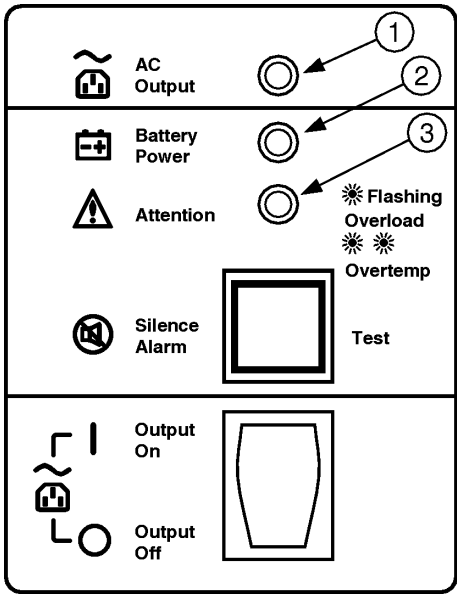
1. AC Output Indicates that normal AC power is being supplied to the receptacles in the back. (Green)

2. Battery Power Indicates the unit is supplying power during abnormal power (AC) conditions. (Yellow)

3. Attention Light Indicates that the UPS needs attention. It also works in conjunction with the audible alarm. (Yellow)

NOTE Refer to your UPS PowerTrust Manual for complete front panel lights, switches, and operation discussion.

Figure 3-4 UPS Status Indicator



LCD System Status Messages

The LCD panel displays messages during the boot process. A series of key words, generically called OSTAT in Table 3-1, appear in the LCD panel as the system does its selftest. Table 3-1 explains what you see in the LCD panel during selftest.)These OSTAT values in column 1 of Table 3-1 can be any one of the following:

OSTAT Value	Meaning
OFF	key switch in Standby position
FLT	fault
TEST	selftest
INIT	initialize
SHUT	shutdown
WARN	warning
RUN	normal operation
ALL	

After this sequence has finished, the system prompt will appear on your console to indicate that the sequence is complete and the Operating System has been successfully loaded. At the system prompt you will configure your system, set your root password, add users and groups, etc.

Table 3-1 LCD Panel Messages

Panel Message	Environment	Observations
[blank]	Key switch in Standby. No power cord.	Blank display. LCD Panel backlight is off.
`SWITCH OFF xxx`	Key switch in Standby. Power cord installed.	AC power installed, LCD panel back light is off. Front panel displays SWITCH OFF.
`PROCEEDING TO xxx TURN DC ON`	Key switch is ON	Display panel shows message, LCD panel back light comes on 1 to 2 seconds after display starts.
`OSTAT XXXX xxx`	Key switch is ON. Processor Dependent Code (PDC) is loading.	Ostats and chassis codes are being displayed at the panel and console banner. Chassis codes may range from 0000 (hex) to CDFF.
`OSTAT XXXX xxx CPU ZZZZ`	Key switch is On. ISL is running.	System initialization codes are being displayed. OS or Diag loading can be started. Codes may range from CE00 (hex) to CEDF. `CPU ZZZZ` shows processors installed.
`OSTAT XXXX xxx CPI ZZZZ`	Key switch is On. OS load in process.	OS is loading from disk or tape. Codes may range from CEE0 to CFFF.
`RUN FXYF xxx CPU ZZZZ`	Key switch is On. OS load is complete. OS is running.	The OS is finished loading. The 'X' after RUN = CPU utilization. The 'Y' = the number of processors.

System Console Displays at Power-On

The SPU internally checks itself and displays the test results.

The SPU executes firmware code that tests all internal major functions and displays all test results.

The SPU reads firmware code default settings initially set at the factory. On subsequent boots, the SPU executes user settings if default settings are modified.

The firmware code turns control of the System to the Operating System.

NOTE You may not be able to read all screens because of the speed at which they change. You can review all screen displays at the conclusion of the boot process.

Viewing/Changing Firmware Choices

CAUTION Be very careful about making changes via the PDC menus, especially with the Configuration and Service menus, as those changes may disable your computer.

Introduction to Firmware Configuration

Firmware is system configuration instructions which are embedded in hardware. Firmware is modified by commands from the keyboard which are retained in semiconductor memory when power is removed. Firmware is not as easily modified as software nor as permanent as hardware, hence the term firmware.

- Firmware as implemented on HP systems:
- Can be automatically configured by "reading" the parameters of drives such as hard disks
- Defaults to standard configurations established during manufacturing
- Can be modified by users
- Retains the last user choices when the system is rebooted or power is interrupted.

Entering Configuration Menus from HP-UX

Once the HP-UX operating system is operational, you need to perform the following steps to enter the configuration menus. These procedures will halt all system functions and reset the computer, use caution while performing these procedures.

1. Log onto the system as root, and enter reboot -r. This command will shutdown the operating system and reboot the computer.

2. If AUTOBOOT is on, you will receive the following message:

Process is starting autoboot process To discontinue, press any key within 10 seconds

At this point, press ANY KEY within 10 seconds to interrupt the booting process.

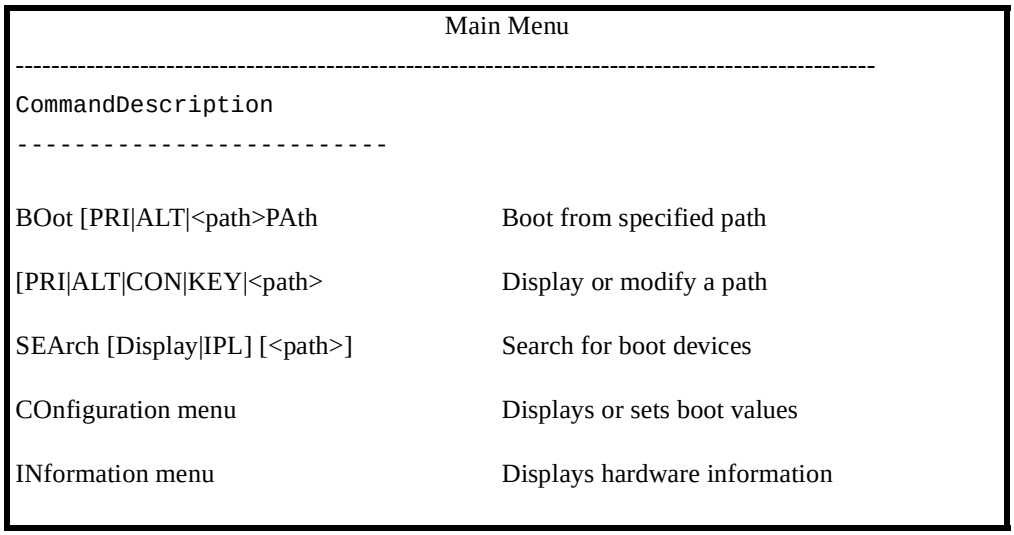
CAUTION If you DO NOT interrupt the boot process within the 10 second window, you MUST allow the computer to complete the bootup process, then go back to step 1 and repeat the interrupt procedure.

3. The MAIN MENU is displayed. A prompt will appear as

MAIN MENU: Enter command or menu

The Main Menu displays:

Figure 3-5 Main Menu



Main Menu

The Main Menu is divided into three sections:

- System Commands
- Menus
- Display and Help Commands

To use a command, type the characters shown in capital letters and press **[RETURN]**. For example, to boot from the primary boot path, type: BO and press **[RETURN]**. You can use the upper or lower case (bo or BO).

NOTE The Menus and Helps shown in these examples will vary slightly on HP9000 K250/K260/K450/K460 systems due to new firmware features.

Configuration Help

The help command is used with any other command to guide you in using the command correctly. For example to get help with the Boot Command you type:

HE BO

The following information is presented:

Figure 3-6 Boot Help Information

```
BOOT Continues the boot sequence
from the specified path.

The primary boot path is normally the
disk containing the operation system.
The alternate path is normally a tape device.
BOot                          Boot from primary path
BOot PRImary                  Boot from primary path
BOot ALTernate                Boot from alternate path
BOot INSTALL                  Boot from HP-UX Install server
                              using Core LAN station
BOot    %<path>               Boot from specified mode
        %<path>               is either in I/O notation,
```

PATH displays the system path from Stable Storage. PATH is also used to set a named path in Stable Storage.

Figure 3-7 Path Help Information

```
PAth                                          Display paths in
                                              Stable Storage
PAth              <path type>                 Display named path
PAth              <path                       Set named path in
                  type>%<path>                Stable Storage
                  <path type>                 PRImary, ALTernate,
                                              CONsole or KEYboard
                  <path>                      is in I/O notation,
                                              such as 1/2/3.4/5/6
Short Command for PAth                        PA
```

NOTE The Keyboard path cannot be modified.

Figure 3-8 Search Help Information

```
SEArchSearch for all
potential boot
devices
SEArch <path>Search specified
path for
potential boot
devices
SEArch IPLSearch for all
bootable devices
with IPL
SEArch IPL <path>Search specified
path for
bootable devices
with IPL
SEArch DIsplayDisplay the
results of the
previous search

<path> is a module path defined
in I/O notation, such as 1/2/3/
or 8 (layers are ignored).

The first 20 devices found
will be displayed.

The devices found will have a path label
such as P0, P1, .  .  .  p19 that may be
referred to in the BOot  command or will
be displayed on a SEArch DIsplay
command.

Short Command for SEArch SEA
```

Figure 3-9 Display Help Information

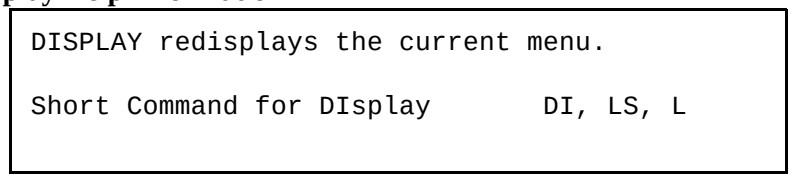


Figure 3-10 Help Help Information

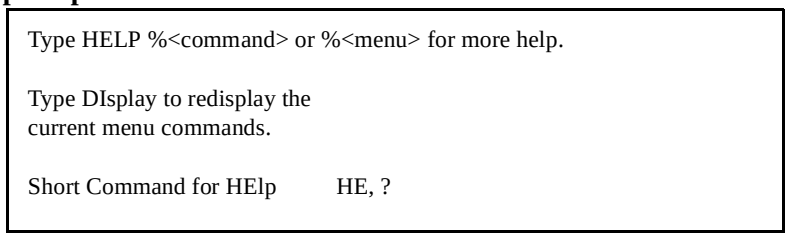
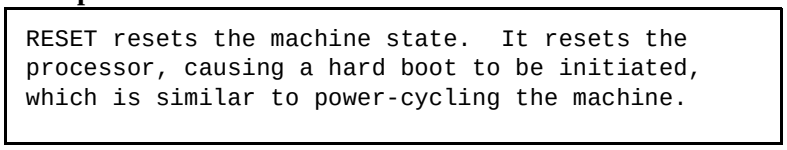


Figure 3-11 Reset Help Information



Changing Menus: To access the other menus, simply type the capital letters and **[RETURN]**. For example to access the Configuration Menu, type:

CO **[RETURN]**

Configuration Menu

The Configuration Menu is divided into two sections:

- Configuration Commands
- Boot Display and Help Commands

Configuration Commands

These commands are used to display or change basic system parameters.

Boot/Display and Help Commands

You can reboot, redisplay the current menu or get Help on any of the Configuration Commands.

Figure 3-12 AUTO Help

```
AUTO displays or sets the AUTOBOOT and
AUTOSEARCH flags in Stable Storage.
These flags control the automatic
boot sequence.

If the AUTOBOOT flag is set,
the operating system is
automatically loaded
after a power-up or reset.

If the AUTOSEARCH flag is set,
the system searches for
all possible boot devices.

AU                      Short Command for AUto
AUto                    Display the state of
                        AUTOBOOT/AUTOSEARCH
                        flags
AUto SEArch ON          Turn on AUTOSEARCH
AUto SEArch OFF         Turn off AUTOSEARCH
AUto BOot ON            Turn on AUTOBOOT
AUto BOot OFF           Turn off AUTOBOOT
```

Figure 3-13 BOOTINFO Help

```
BOOTINFO displays system configuration
information related to booting that is
stored in non-volatile memory.

Short Command for BootInfo      BI
```

Figure 3-14 FAST BOOT Help

```
FASTBOOT speeds up system boot time by
executing a quick memory test which only
reads memory (rather than writing to memory)
and skipping selected other tests.

FastBoot            Display current setting of
                    Fastboot
FastBoot ON         Turn Fastboot on
FastBoot OFF        Turn Fastboot off

Short Command for FastBoot      FB
```

NOTE The recommended setting is OFF.

Figure 3-15FAN Help

```
FAN changes the fan speed to high
or normal speed setting.  This setting
is saved in eeprom and will remain set
even if the system is rebooted.  Only if
the speed is changed again will the
setting be altered.

FAn                 Display the current
                    fan speed
FAn HIgh            Set the fan speed to
                    HIGH speed
FAn NORmal          Set the fan speed to
                    vary with temperature

Short Command for FAn           FA
```

Figure 3-16 DEFAULT Help

```
DEFAULT initializes system
Stable Storage values to
their defaults based on the
system configuration.

The DEFAULT command sets
the following values:

   Primary Path      10/0.6

   Alternate Path    10/12/5.0

   Console Path      10/4/0.0

   Keyboard Path     10/12/7.0

   Autoboot          off

   Autosearch        off

Short Command for DEfault        DE
```

Figure 3-17 LANADDRESS Help

```
LANADDRESS command displays the Core LAN
Station Address.

LanAddress        Display the Core
                  LAN station address

Short Command for LanAddress     LA
```

Turning Over Control to the Operating System

NOTE If your graphics console is not working at this point, see "Your Graphics Console Doesn't Work" in Chapter 4.

Operating System Wasn't Pre-installed

If your computer has preloaded software (HP VUE and the HP-UX operating system are loaded on the hard disk at the factory), the computer is shipped with a yellow sticker covering the power switch. If there was such a yellow sticker, then skip to "You Have a Login Prompt on Your Console".

The HP9000 Series 800 Model K normally comes with the operating system pre-installed on an internal hard-disk drive. If you have ordered your system without the internal disk drive, or if you chose to re-install the operating system, you will need to follow the instructions presented in Installing HP-UX 10.xx.

Essentially, you will type a BO command at the PDC main menu prompt and specify which drive you are booting from. There will be a delay between typing the installation command and the time that you will notice any disk activity. This delay could be between two and three minutes. Do not turn off the power, or try to cancel the installation process during this period.

The media on which you received your operating system requires no code word to install the operating system. Code words may be required, however, for accessing and installing other software.

You Have a Login Prompt on Your Console

You have reached the final step of your installation.

Getting Required Information

Before you can complete your installation, you should know the following information. The system needs this information so that it can configure certain system and networking parameters.

NOTE If you do not have some of this information now, such as the host name or Internet address, you can add or modify it later. Such modifications should be made as soon as possible after initial installation. For instructions, see "Modifying System Parameters".

- The host name of your computer (sometimes called the system name). The host name can be a simple name or an Internet fully-qualified name. Get the host name from your system administrator.
- `Host name:` _____
- If you are connecting your computer to a local area network, you need to know your computer's Internet Protocol address (IP or Internet address). This is a four-part code (for example, 15.15.232.18) that uniquely identifies your computer among all those located on your network or any other network. Obtain this address from your system administrator.
- `IP Address:` _____

- The time zone where your computer is located (for example, Mountain Daylight Savings Time). You don't need to know the standard abbreviation.
- `Time zone: _____`
- The root password. Be sure to write it down in a secure place. You will use this password when you log in as superuser later in this chapter. If you choose not to select a superuser password, you may do so later.

NOTE The root user, or superuser, is a special user. When logged in as the superuser, you have the permission required to perform all system administration tasks. Normally, the system administrator is the only one who logs in as the superuser. The user name for the superuser is root.

However, the very first time you (or anyone else) log into your new workstation, you must do so as root because no other user accounts have been created yet. Once accounts have been created for other users, you should log out as superuser, then log back in as one of those users.

For more information if you are using HP-VUE on a Graphics Monitor, see HP VUE's online help. Click the Help Manager control (the books and question mark icon) on the Front Panel at the bottom of your screen. Then click HP-VUE Help, then click "General Configuration", then click "Network Font Server". Also see the `mk_fnt_clnt(1)` and `mk_fnt_srvr(1)` manual reference pages.

Entering the Required Information

A series of windows appear that prompt you for the information about your computer that you gathered in the previous section, such as your host name, IP address, time zone, and root password. Enter this information as it is requested.

If you do not set a host name now and instead accept the default host name of unknown, you will get an error message when you log in.

NOTE If you do not have the information when prompted for it, press **[ENTER]**. HP-UX then uses its default value for that question, and you can add or modify the information later. Such modifications should be made as soon as possible after initial installation. For instructions, see "Modifying System Parameters".

- When you have finished answering the questions, the computer completes its startup sequence.
- Once your computer is running, it will display one of two ways to log in the HP VUE login screen or a command line prompt. In either case, enter your login name and then your password.

Modifying System Parameters

Use this section only if you need to add or modify the system parameter information described in "Getting Required Information".

Log in as the superuser and type the following command in a **terminal window:**

/sbin/set_parms option[ENTER]

Where *option* is one of the following:

Option Command	Modifies or Sets
`hostname`	System host name
`timezone`	Time Zone
`ip_address`	Internet Protocol address
`addl_network`	Additional network parameters (see pate 1-7)
`font_c-s`	Network font service

If you are running HP-VUE on a graphics monitor, you can set network parameters or network font service using the icons labeled `SetNetworking` and `FontClientSrvr`, located in the General Toolbox in the System_Admin subdirectory.

Any changes you make in `set_parms` will take effect after rebooting the system.

You can also use SAM to add or change most of this information.

4 Troubleshooting

What if something doesn't work correctly?

- The first step should always be to go back to the installation guide and double-check that every connection location is correct, and that you have used the correct cables for each connection. There are some cables that look the same and have the same connectors, but are wired differently internally; so you must use the cable with the correct part number.
- If you are not getting power to your SPU, make sure that the outlet you are using is active. You might do this by plugging in a table lamp to see if it works. Some outlets are controlled by wall switches. Other outlets may have been inactivated at a breaker box. Check with your facilities engineer about getting power to your computer. Make sure all power cables are firmly attached to the computer and UPS as well as the wall outlet.
- Check the indicator LEDs on the UPS and the Core I/O to see if they are indicating that there is any inappropriate hardware behavior. Check status indicators on all internal and external peripherals. Information about diagnostic indicators and display messages can be found in *UPS Controls, Core I/O Card Status LEDs,* and *DDS Indicator Light Tables* in Chapter 2, in *Appendix D- UPS Error Messages*, in your PowerTrust manual, and in the manuals that come with your peripherals.
- Contact your HP Sales Engineer or an HP Support person via the number on your service contract. Your HP representative may want to know the status of the led indicators, or may want you to connect your computer's internal modem to a phone line. See I*nternal Modem Random Access* later in this chapter.

Internal Modem Remote Access

This section provides the information on enabling or disabling the remote access through the internal modem.

NOTE The HP50759A|B modem cannot be used to dial in to the internal modem.

The following procedures are applicable only if HP Predictive has not been installed. If HP Predictive is installed, use Predictive to configure the internal modem for remote access. Refer to the Predictive Support User's Guide (part number 50779-90018).

Enabling and Disabling Remote Access

The remote access process is provided through a script called dialin. The syntax for running the dialin script is:

```
>dialin [-bbaud] action
```

Where:

`dialin` Is the HP-UX script

`[-baud]` Can be used to specify a baud rate (Do NOT change the default baud rate)

`action` Is one of three choices: enable, disable, status

Example of enable remote access:

`>dialin enable` Enables remote access and uses the default baud rate or dialin status
Displays current status, either disabled or enabled

`>dialin status` Displays current status, either disabled or enabled

CAUTION Do not use a baud rate other than the default of 19200 KBS. Other baud rates could cause the dialin process to malfunction.

The system then displays messages similar to the following:

```
Created device:/dev/cul0p7
Created device:/dev/ttyd0p7
Created device:/dev/cua0p7
Dialin enable
```

To disable remote access, use the disable action with the dialin command. The status action will display the current state of either enabled or disabled for remote access.

Your Graphics Console Doesn't Work

If you have just attached a graphics console to your Core I/O card and you get no response from it, check for the following:

- The graphics console is not turned on.
- The cable connected between the Core I/O card and the graphics console is not the correct cable. (The graphics console uses a different cable from the normal terminal console. Refer to the Installation Guide.)
- The graphics console is on, but the brightness or contrast on the graphics console are not adjusted correctly, and the display is too dim to see.
- The console address path is incorrect for your console I/O card. See the "Incorrect Graphics Console Address Path" section that follows.

Incorrect Graphics Console Address Path

If the internal address path is incorrect, you can change it by rebooting your computer and then, during the PDC processing, setting the console address path to the location of your graphics card. The default location for this card is the Optional I/O (HSC) connector. The internal address for this HSC connector location is:

Model	Address Path
K100	8/8.0
K2x0/K4x0	10/8.0

Change the path by:

1. Attaching a non-graphics terminal, such as an HP700/60 terminal.
2. Rebooting.
   - Turn the SPU key to the Standby position.
   - Turn the SPU key to the On position.
3. Halting the boot process at the PDC Main Menu.
   - Watch the bootup messages carefully.
   - There will be a message that says you have 10 seconds to press any key to stop the boot process; press any key.
   - The PDC main menu will appear.
4. Changing the console address path.
   - Find out what the correct address path should be; some defaults are mentioned in the list above, or you can look in Appendix C - Model K Address Paths

- At the PDC Main Menu prompt type: pa con 10/8.0 (for K400 default)

5. Resetting your computer.
   - At the PDC Main Menu prompt type: reset
   - Your computer will reboot and, if everything has worked correctly, you should start seeing messages on the graphics console.

If you have followed all the above suggestions and your graphics console still does not work, please contact your Hewlett-Packard representative.

Maintaining Your DDS Tape Drive

Your tape drive heads should be cleaned after each twenty hours of tape read/write operation.

5 Adding Peripherals and Working With File Systems

NOTE See *HP9000/Kxx0 Internal Peripheral Upgrade Guide,* P/N A2375-90008 for adding/installing internal peripherals such as CD-ROMs, DDS Tape Drives, or SCSI Disk Drives. (See *Internal Peripherals* in Chapter 2 for a description of internal peripheral products.)

NOTE Connecting a graphics console requires that you first boot your Model Kxxx with a standard RS232-type terminal attached, change the address path (use the **pa** command from the main PDC menu) to the location where your graphics console is connected, and then reboot. Address paths are listed in *Appendix C - Model K Address Paths*.

The following two steps are required to add peripherals:

- Connecting the peripheral to your computer.
- Configuring your operating system to recognize the peripheral.

Peripherals include terminals, modems, printers, and a UPS, and are connected to your computer through three I/O panels on the back of the SPU: Core I/O, Expansion I/O, and HP-PB. The Core I/O panel is labeled to identify the function of each of its connectors. Printers, for instance, are usually parallel devices and attach to the parallel (Centronics) connector on the Core I/O panel.

Terminals

Connecting a Terminal

Terminals will be connected to your computer differently depending on the model of the terminal. However, you must complete the following three steps for all terminals:

- Connect the monitor and keyboard together with the appropriate cable.
- Connect the data cable from the monitor to an appropriate connector on the Core I/O.
- Connect the power cord from the monitor to the power outlet or UPS.

You must set the default operating parameters on each terminal to match the requirements of your computer before you can use it.

Configuring the Operating System for a Terminal or Modem

Make sure that the terminal or modem is physically connected to a port on your computer's serial interface before continuing.

Use the System Administration Manager (SAM), to configure your terminals and modems. Start the SAM by typing `[s a m]` (in lower case) at the superuser prompt. Press **[CTR] [K]** for help information about the SAM.

Choosing items from the "Help" menu gives you information about:

- the current functional area.
- keyboard navigation within the SAM.
- using the SAM help system.
- displaying the release of the SAM that you are currently running.

Use the Help menu to get information about the attributes and tasks you can perform from the currently displayed screen.

Pressing the **[F1]** key gives you context-sensitive information for the field at the location of the cursor. Exit the SAM by activating the **Exit SAM** button from the SAM main screen. If you have performed tasks that require the generation of a new kernel, the SAM will prompt you to regenerate the kernel and reboot the system.

To configure HP-UX for a new terminal:

Use the arrow keys to move the highlight to the desired option the Press the **[RETURN]** key to display a list of available options or select an option. You can press **[F1]** for additional information (Help screen) about these fields. Press **[F5]** to close the Help screen.

1. Log on as `root`.
2. Type `sam.`
3. Highlight `Peripheral Devices` and press **[RETURN]**.

4. Highlight `Terminals and Modems` and press **[RETURN]**.
5. At the `Terminals and Modems` screen, use [Tab] to go to the menu bar.
6. Use the arrow keys to move the highlight the `Actions menu` then press **[RETURN]**.
7. Highlight the `Add Terminal` option and press **[RETURN]**.
8. In the "`Add Terminal (Hardwired Device)`" screen, set or select the following parameters:
   a. *Hardware path* sets the path to the serial interface to be used by this terminal.
   b. The *port number* to be used by this terminal. When Port Number is highlighted, press **[RETURN]** to see a list of available ports.)
   c. The *speed (baud rate)* to be used by this terminal. The most common rate is 9600. When `Speed,` is highlighted on the screen, press **[RETURN]** to see a list of available baud rates.
   d. Whether or not this will be a *UUCP connection*. When `Use for UUCP Connection` is highlighted, successive presses of **[RETURN]** will select the UUCP choice.

   When you finish setting the parameters, activate OK. (Either press **[F5]** or tab to OK and press **[RETURN].**)
9. You will receive a series of messages indicating the progress of the task. When you receive the message, `The terminal has been added.`, activate OK.
10. Exit the SAM by pressing **[F8]** /**Exit**, and then **[F8]**/**Exit Sam**, or by tabbing to the File menu and selecting successively **Exit** and **Exit Sam.**

To configure HP-UX for a new modem:

1. Log on as `root`.
2. Type `sam`.
3. Highlight `Peripheral Devices` and press **[RETURN]**.
4. Highlight `Terminals and Modems` and press **[RETURN]**.
5. At the `Terminals and Modems` screen, press **[Tab]** to go to the menu bar.
6. Use the arrow and **[RETURN]** keys to select the `Actions` menu.
7. Use the down arrow key to highlight `Add Modem` and press **[RETURN]**.
8. In the `Add Modem` screen, set or select the following parameters:
   a. The *hardware path* to the serial interface to be used by this modem.
   b. The *port number* to be used by this modem. (When Port Number…is highlighted, press Return to see a list of available ports.)
   c. The *speed (baud rate)* to be used by this modem. When `Speed (Baud Rate)` is highlighted, press **[RETURN]** to see a list of available baud rates.)
   d. Whether of not this modem will be used for calling out from your system. (Press **[RETURN]** to turn the Calling Out selection on/off.)

e. Whether or not this will be a *UUCP connection*, and which modem type you will use. Press **[RETURN]** to turn the UUCP selection on/off. If you specify a UUCP connection, a list of modem types will appear for selection. To select a modem type, **[Tab]** to the `Modem Type:` area of the screen and then use the arrow keys to highlight your choice. Then **[Shift-Tab]** to return to the `Receive Incoming Calls` item.

f. Whether or not this modem will *receive incoming calls*. Press **[RETURN]** to turn the `Calling In` selection on/off.

g. Select whether or not this is a *CCITT Modem* (European standard modems). Press **[RETURN]** to turn the *CCITT Modem* selection on/off.

When you finish setting parameters, activate OK by pressing **[F5]** or tabbing to OK and pressing **[RETURN].**

9. You will receive a series of messages indicating the progress of the task.

When you receive the message:

```
This modem has been added
```

activate OK.

10. Exit the SAM by pressing **Exit [F8]** then **Exit Sam [F8]** or by tabbing to the File menu and selecting first **Exit** then **Exit Sam**.

Adding Printers

To add a printer to your computer:

- Physically connect the printer to the computer.
- Configure the operating system to recognize the printer.

Connecting a Printer

Printers are connected to your computer differently depending on the model. Refer to the instruction manual for your printer. You must complete the following steps for all models:

- Connect the data cable from the printer to a connector on the distribution cable or data distribution panel for a serial printer, or directly to the computer for a parallel printer.
- Connect the power cord from the printer to the power outlet.
- Load paper into the printer.
- Turn on the printer.
- Put the printer on-line.

Configuring the Operating System for a Printer

Use the System Administration Manager (SAM), to configure your printer. Start the SAM by typing `sam` (in lower case) at the superuser prompt. Pressing **[Ctrl-K]** gives you help information about the SAM.

Choosing items from the `Help` menu gives you information about:

* The current functional area.

* Keyboard navigation within the SAM.

* Using the the SAM help system.

* Displaying the release of the SAM you are currently running.

Activating the Help button when it is available gives you information about the attributes and tasks you can perform from the currently displayed screen.

Pressing the **[F1]** key gives you context-sensitive help for the field at the cursor location. If you have no **[F1]** key you can type [**Ctrl-F]** to access context-sensitive help.

Exit the SAM by pressing the **Exit SAM** button on the SAM main screen.

If you have performed tasks that require the generation of a new kernel, the SAM will prompt you to regenerate the kernel and reboot the system.

To add a local printer:

1. Physically connect the printer(s) to your system. Refer to the instructions shipped with your printer. Some printers have to be set for serial or parallel operation. If you need additional configuration information, refer to the *Installing Peripherals* manual.

2. Gather the following information:
   - The name you are giving to this printer or plotter. Printer names can be up to 14 characters in length, and the characters must be from the set (A-Z, a-z, 0-9). The underscore (_) character is also allowed in printer names.
   - The name of the device file that the printer or plotter will use.The SAM creates the device file for you. The SAM uses the default device file named lp_printer-name. You can override the default device file name by specifying your device file name when filling in the printer information.
   - The model script from the /usr/lib/lp/model directory, for example, uses laserjet4Si for the HP LaserJet 4 Si.
   - The print request priority for this printer. The default is zero (0).
   - The class to which the printer/plotter will be added (optional). Printer class names can be up to 14 characters in length, and the characters must be from the set (A-Z, a-z, 0-9). The underscore (_) character is also allowed in printer class names.
3. Type sam.
4. Highlight Printers and Plotters -> and press **[RETURN]**.
5. Highlight Printers and Plotters and press **[RETURN]**.
6. Choose, `Add Local Printer/Plotter` from the Actions menu, and then choose the sub-menu item associated with the printer interface type that you will be using.

In addition, decide whether or not to make this printer your system's default printer.

NOTE The printer driver must be part of the kernel to add the printer. If the printer driver is not currently configured into the kernel, the SAM prompts you to add the driver(s) and reboot the system.

* Highlight the interface to which you connected the printer, fill in any additional information (port number or bus address), and activate the OK button.

If there are no I/O cards listed, activate the **Diagnose Missing Card** button and follow the instructions provided on the screens.

1. Fill in the `add a local printer` dialog box fields, choose from the menu button values, and select check box values by pressing the **[RETURN]** key.
2. Activating the **Help** button, or pressing [**Ctrl-K]**, gives you information about the attributes and tasks you can perform from the currently displayed screen.
3. Pressing the **[F1]** key gives you context-sensitive information for the object field at the location of the cursor. If you have no **[F1]** key you can type **[Ctrl-F]** to get context-sensitive information.
4. Press the **OK** button and respond appropriately to any dialog about the spooler, or about connecting and powering up the printer.
5. the SAM will return you to the, `Printers and Plotters` screen.

Exit the SAM by selecting **Exit** from the File menu on the current screen, and then **Exit SAM** from the File menu on the next screen.

Configuring the Operating System for the Optional UPS

If you have the optional UPS, you must configure the operating system to recognize the port on the Core I/O where the UPS data cable is connected.

The SAM can be used to configure the operating system for the UPS. Type `sam` at the prompt to start the SAM. Select `Peripheral Devices->` and then `UPS`. Follow the instructions on the screen for configuring your UPS.

If your site commonly experiences momentary power interruptions greater than one minute, consider increasing the value of `shutdown_delay_mins` from its default value of one minute.

The default time for `shutdown_timeout_mins` is five minutes. If shutdown is longer or shorter than this time, consider changing the default time.

If a system shutdown has been initiated by the UPS, you must wait for the UPS to turn itself off before attempting to reboot your system.

Adding Other Peripherals

The procedure for adding additional peripherals to your computer is different for each peripheral. Follow the instructions which come with each new peripheral. For assistance, refer to the *HP-UX Reference* for information on commands, or to the manuals that discuss the following topics:

* System Administration Tasks or Concepts

* Configuring or Installing Peripherals

* See the on-line manuals page for ordering information. You can access this page by typing:

```
man manuals
```

Working with the File System

At a later time, you may need to make changes or additions to your file system. Before you do this, study the manuals listed below and carefully analyze your computer system, and your present and future needs.

HP-UX supports the Logical Volume Manager, which provides you with great flexibility in disk space management.

For assistance, refer to the *HP-UX Reference* for information on commands, or to manuals that discuss the following topics:

- System Administration Tasks or Concepts
- Installing or Updating HP-UX

See the on-line manuals page for ordering information. You can access this page by typing:

```
man manuals
```

Chapter 6, Adding and Modifying Users and Groups provides instructions for adding users and groups.

6 Adding and Modifying Users and Groups

Adding and Modifying Users and Groups

Before anyone can be given access to the computer, they must be identified to the operating system as users. When a user is first added to the computer, you will assign a specific home directory. Users are organized into groups with other users who have similar requirements for operating system resources, or who regularly share programs or files.

Using the SAM

Use the System Administration Manager (SAM), to add users and groups. Start the SAM by typing sam (in lower case) at the superuser prompt. Pressing **[Ctrl-K]** gives you help information about the SAM.

Choosing items from the Help menu gives you information about:

- The current functional area.
- Keyboard navigation within the SAM.
- Using the SAM help system.
- Displaying the release of the SAM you are currently running.

Activating the Help button when it is available gives you information about the attributes and tasks you can perform from the currently displayed screen.

Pressing the **[F1]** key gives you context-sensitive information for the field at the location of the cursor. If you don't have a [F1] you can access context-sensitive help with the **[Ctrl-F]** key combination.

`Exit the SAM` by pressing the `Exit SAM` button on the SAM main screen.

If you have performed tasks that require the generation of a new kernel, the SAM will prompt you to regenerate the kernel and reboot the system.

Adding Users

1. Ensure that you have superuser capabilities.
2. Type `sam`.
3. Using the arrow keys, highlight the `Accounts for Users and Groups` option and press **[RETURN]**. This displays the Accounts for Users and Groups sub-area.
4. Highlight `Users` and press **[RETURN]**. This takes you to the `Accounts for Users` screen.
5. Choose `Add` from the Actions menu.
6. Fill in the `Add a User Account` screen fields and press the **Apply** button.
7. Enter a starting password and press **[RETURN]** or press the **OK** button.
8. When prompted, re-enter the password and press **[RETURN]** to verify the initial password. You will be returned to the `Add a User Account` screen.
9. When you are finished adding users, tab down to the **Cancel** button and press **[RETURN]** to select it. You will be returned to the `Accounts for Users and Groups` screen.

You have now completed adding users.

To return to the `Accounts for Users and Groups` functional sub-area, choose `Exit` from the File menu and press **[RETURN]**.

To return to the `Functional Area List`, highlight go up and press **[RETURN]**.

To exit the SAM, highlight the `Exit SAM` item under the File menu and press **[RETURN]**.

Removing a User

From the `Accounts for Users and Groups` screen:

1. Ensure that you have superuser capabilities.
2. Type sam.
3. Highlight `Accounts for Users and Groups` and press **[RETURN]**. This takes you to the `Accounts for Users and Groups` functional sub-area.
4. Highlight `Users` and press **[RETURN]**. This takes you to the `Accounts for Users` screen.
5. Highlight the user you want to remove. You can remove only one user at a time.
6. Choose `Remove` from the Actions menu and press **[RETURN]**.
7. Highlight the check box, in the `Remove a User` dialog box, that describes what you want to do with the removed user's files and directories then select the **OK** button.
8. If you want to continue with the user removal as specified in the Confirmation dialog box, activate the **Yes** button. This will return you to the `Accounts for Users` screen.
9. If you do not want to continue with the user removal as specified, activate the **No** button, select the correct removal choice and activate the **OK** button. This will return you to the beginning of this step.
10. If you do not want to continue with the removal at all, activate the **No** button, and then activate the **Cancel** button in the `Remove a User` dialog box. This will return you to the `Accounts for Users` screen.
11. If you want to remove another user, return to step 1 of this procedure.

To return to the `Accounts for Users and Groups` functional sub-area, choose `Exit` from the File menu. To return to the functional area list, highlight `[go up]` and press **[RETURN]**.

To exit the SAM, choose `Exit SAM` on the File menu.

Displaying/Modifying a User's Account Information

1. Ensure that you have superuser capabilities.
2. Type sam.
3. Highlight Accounts for Users and Groups and press **[RETURN]**.
4. Highlight Users and press **[RETURN]**.
5. Highlight the user account to modify in the object list.
6. Choose Modify…from the Actions menu. This will open the Modify a User dialog box. This dialog box lists the information about the selected user.
   a. Viewing Only: After you have finished collecting information about a user, activate the Cancel button.
   b. Modifying: Fill in the new information in the Modify a User dialog box. You can modify the following information:
      - Login name (user_name)
      - Password
      - User identification number (user_ID)
      - Primary group identification number (group_ID)
      - Comment
      - Login directory
      - Start up program
   c. When you have completed your modifications, activate the OK button. A Note dialog box will confirm the modification.
   d. Activate the OK button in the Note dialog box. This will return you to the Accounts for Users and Groups screen.

To return to the Accounts for Users and Groups functional sub-area, choose Exit from the File menu. To return to the functional area list, highlight go up and press **[RETURN]**.

To exit the SAM, choose the `Exit SAM` item under the File menu.

Adding a Group

1. Ensure that you have superuser capabilities.
2. Type sam.
3. Highlight Accounts for Users and Groups-> and press **[RETURN]**.
4. Highlight Groups and press Return.
5. Choose Add from the Actions menu.
6. Fill in the new group name and optionally highlight the users to be members of the newly created group.

If you have more groups to add, activate the Apply button. You will be returned to the Add a New Group screen to add an additional group.

If this is the last group you are adding, activate the OK button. This will return you to the Groups sub-area of the Accounts for Users and Groups screen.

To return to the Accounts for Users and Groups functional sub-area, choose Exit from the File menu.

To return to the functional area list, highlight go up and press **[RETURN]**.

To exit the SAM, choose the `Exit SAM` item under the File menu.

Removing a Group

1. Ensure that you have superuser capabilities.
2. Type sam.
3. Highlight the `Accounts for Users and Groups` and press **[RETURN]**.
4. Highlight `Groups` and press **[RETURN]**.
5. Highlight the name of the group you want to remove.
6. Choose `Remove from the Actions` menu.
7. Choose group file reassignment. (You can assign the group's files to another group, otherwise, the SAM will reassign the group's files to the primary group of each of the file's owners.)
8. Activate the **OK** button. the SAM then displays a dialog box confirming the removal of the group and the reassignment of files.
9. Activate the **OK** button. You will be returned to the `Groups` sub-area screen of `Accounts for Users and Groups`.
10. To remove additional groups, continue at step 5 above.

You have now completed removing a group or groups.

To return to the `Accounts for Users and Groups` functional sub-area, choose `Exit` from the File menu.

To return to the functional area list, highlight go up and press **[RETURN]**.

To exit the SAM, choose the `Exit SAM` item under the File menu.

NOTE Chapter 7 - *Configuring Your Network Software* describes how to configure your network software.

7 Configuring Your Network Software

Configuring Your Network Software

Configuring your network consists of entering information about the following network software:

- LAN (Local Area Network).
- IS (Internet Services) (formerly ARPA).
- NFS (Network File System).

If you have purchased the optional X.25 networking product, see the two included X.25 manuals for information on configuring this product.

Network Configuration

You enter the configuration information using the System Administration Manager (SAM), a tool that automates the configuration process. You must log in as a super-user (root) to use the SAM.

For additional information on these networking products, order the following manuals:

- Installing and Administering LAN/9000
- Installing and Administering Internet Services
- Installing and Administering NFS Services

Executing man manuals will retrieve the HP-UX on-line reference page listing manual names and part numbers.

The following is an overview of the steps required to configure your network software:

- Complete the configuration worksheets shown on the following pages.This step is very important. Don't continue until you've gathered all the information you need to be successful in configuring your network. If there is a network administrator in your company, check with that person for help in completing the worksheets.

NOTE Some responses in the worksheet require entering the appropriate data/values while others require checking a Yes or No checkbox.

- Configure your computer's LAN card and "subnetwork" information (Configuring LAN/9000 software).

- Configure your computer to communicate with other computers (Configuring ARPA Services software). The computer you use (called the "local host" computer) can send information to, and receive information from, other computers (called "remote host" computers). Set this up by configuring system-to-system connectivity.
- Configure your computer to transfer files between computers (Configuring NFS software). This step may not apply to you; check with your network administrator. If necessary for your needs, you may configure your local computer to access files on remote computers as if they were on your local computer, and give remote computers access to your local files.
- Reboot the operating system. Rebooting the operating system will put into effect all the configuration changes you have made.

Table 7-1 Local, Remote, and Gateway Worksheet

Category of Information	SAM Window To Use	Type of Information	Your Configuration Information
Local Host Computer	Note: This information is requested when starting the computer	Internet (IP) Address	
		Host name	
	Configure LAN Card	Configure subnetwork mask	[] yes [] no
		Subnet Mask	
Remote Host Computer	Add Internet Connectivity	Remote Internet (IP) Address	
		Remote System Name (Host name)	
Gateway Computer	Modify Default Gateway	Default Gateway Internet (IP) Address	
		Default Gateway Name (Host name)	

Table 7-2 NFS Client and Server Worksheet

Category of Information	Category of Information	Type of Information	Your Configuration Information
NFS Client: Mount Remote File Systems	Add Remote File System	Local Directory Name	
		Remote Directory Name	
		Remote Server Name	
		When To Mount	[] now [] on boot
		Access Permissions	[] read only [] read/write
		Allow Set UID execution	[] yes [] no
NFS Server: Export Local File Systems	Add Exported File System	Local Directory Name	
		Choose option for the unknown userid	[] Use uid 'nobody' [] Disable unknown UID access []Specify uid for unknown user
		Allow Asynchronous Writes	[] Yes [] No
		Specify Access	All Systems: [] Read-only [] Read-Write [] Read-Mostly Selected Systems: [] Read-only [] Read-Write [] Read-Mostly
		Specify Root User Access	Remote System Name

Using the System Administration Manager

Use the SAM to configure your network software. Start the SAM by typing sam (in lower case) at the superuser prompt. Pressing **[Ctrl-K]** gives you help information about the SAM.

Choosing items from the Help menu gives you information about:

- The current functional area
- Keyboard navigation within the SAM
- Using the SAM help system

Displaying the release of the SAM you are currently running

Activating the Help button, when available, gives you information about the attributes and tasks you can perform from the currently displayed screen.

Pressing the **[F1]** key gives you context-sensitive help for the field at the location of the cursor.

Exit the SAM by activating the **Exit SAM** button from the SAM main screen.

If you have performed tasks that require the generation of a new kernel, the SAM will prompt you to regenerate the kernel and reboot the system.

Identifying LAN Card and Subnetwork Information (Configuring LAN/9000)

The first step in configuring your network is to define LAN card and subnetwork information.

NOTE **Configuration Guidelines**

1. Some system configurations can compete for I/O bus usage with the built-in 802.3 LAN interface on the standard multifunction I/O (CoreI/O). The result is a slow down in LAN performance due to an increase in CRC errors (LAN retries). An add-in 802.3 LAN card should be used as the primary LAN interface when using four or more Kx70 or Kx80 processors with less than 1.5GB of memory, or when using the VISUALIZE 2-D graphics card in the optional H-HSC I/O slot on the multifunction I/O.
2. If a 100BT I/O card (NIO or GSC) is installed, DO NOT USE LASI LAN.
3. A minimum of 1.5GB of main memory must be configured so that there are eight banks or greater in at least one memory interleave group. Memory module sizes should be limited to 32MB (64MB pair) of Double In-line Memory Modules (DIMMs) or larger. For best performance, it is recommended that memory be configured over two memory carriers.

The LAN hardware card is already installed on your computer as LAN 0. The LAN/9000 software has also been pre-installed. LAN/9000 provides network connections for the ARPA and NFS network services you will configure later in this chapter.

If you are connecting this LAN card to a subnetwork, you need to enter the "subnet mask," an address that allows you to communicate with computers on other LANs.

Check with your network administrator to see if you need to perform this task. If not, skip to the next section, Communicating with Other Computers.

To configure your subnetwork mask, do the following:

1. Go to the SAM main window
2. Type: sam
3. Go to the "Networking and Communications" screen. Press the down arrow key to highlight Networking and Communications Press **[RETURN].**
4. Go to the Network Interface Cards screen. Press down arrow key to highlight Network Interface Cards Press **[RETURN].**
5. Go to the Configure LAN Card screen. Press down arrow key to move the cursor to your LAN card, lan0, in the object list. Press [RETURN] to highlight your LAN card. Press **[Tab]** to move up to the menu bar, and then press the right arrow key to move the highlight to the Actions menu. Press **[RETURN]** to pull down the Actions menu, and press the down arrow key to highlight Configure. Press **[RETURN]** the SAM displays the Configure LAN Card screen.
6. Fill in the fields in the Configure LAN Card using the information in the Local Host Computer section of the configuration worksheet. Use the SAM help system for information about filling in the fields.
7. Go back to the object list Press **[Tab]** to highlight the OK button Press **[RETURN]** to perform the task and return to the object list. The SAM updates the list to include the subnet mask you configured for your LAN card. Make sure the status of your LAN card is Enabled.
8. When you are finished, go back to the `Networking and Communications` screen.

Press **[Tab]** to highlight the File menu; press **[RETURN]** to pull down the File menu.

Press the down arrow key to highlight Exit and press **[RETURN]** to return to the Networking and Communications screen.

By performing the steps above, you have identified which subnetwork your LAN card (lan0) is connected to. After completing this task, continue to Communicating with Other Computers.

Communicating with Other Computers (Configuring Internet Services)

The next step in configuring your network is to tell your computer about other computers you wish to communicate with. Internet Services lets your computer communicate on a LAN with other computers. When you configure Internet Services, you identify the "remote" computers with which your computer will communicate.

To add information about other computers, including the default gateway, do the following:

1. At the `Networking and Communications` menu, highlight `Internet Addresses` and press **[RETURN]**. The SAM displays an object list with the IP addresses and remote system names that are already configured.
2. Choose Add from the Actions menu The SAM displays the `Add Internet Connectivity` screen.
3. Fill in the fields using the information in the Remote Host Computer section of the configuration worksheet. Use the SAM help system for information about filling in the fields.
4. Activate the **OK** button to perform the task and return to `Internet Addresses` screen. The SAM displays the gateway name and internet (IP) address you specified as the default gateway.
5. Choose `Modify default gateway` from the `Actions` menu. The SAM displays the `Modify Default Gateway` screen.
6. Fill in the fields using the information in the `Gateway Computer` section of the configuration worksheet. Use the SAM help system for information about filling in the fields.
7. Activate the **OK** button to perform the task and return to the object list. The SAM updates the list to include the remote computer system you configured.
8. Repeat steps 3 through 7 to add information about more computers.
9. Choose `Exit` from the File menu to return to the `Networking and Communications` screen, and then activate the (go up) entry to return to the SAM main screen.

By performing the steps above, you have identified another computer or computers you want to communicate with. This might include a corporate computer you wish to share data with, or other computers in your building. You have also set up the default gateway (if required). A gateway connects two or more networks together and routes information among the networks to which it is connected.

NOTE The next step in configuring your network software is to configure NFS; however, you may not need to perform this step. Check with your network administrator. If you don't wish to configure NFS, skip to the section, Rebooting Your Computer. Once you've completed that section, you're done configuring your network.

Transferring Files Between Computers (Configuring NFS)

NOTE Configuring NFS will allow you to access file systems on remote computers and remote computers to access file systems on your local computer. Check with your network administrator to see if you need this capability. If not, skip this section and continue with the section on Rebooting Your Computer. Once you've completed that section, you're done configuring your network.

- Allowing this computer access to remote file systems via NFS (mounting a remote file system).
- Allowing remote computers access to local file systems via NFS (exporting a local file system).
- Viewing or modifying remote procedure call (RPC) services' security.

This section will help you configure your computer to be able to transfer files between your computer and other computers. This is called "creating an NFS client and server."

When you access files on a remote computer, your local computer is called the "client" and the remote computer, which supplies the files, is called the "server." When a remote computer accesses files on your local computer, the remote computer is the "client" and the local computer is the "server." In this way, your local computer can be defined as both a client and a server at the same time.

By identifying your local computer as a client, you are telling the operating system that you wish to have access to files on remote computers. By identifying your local computer as a server, you are telling the operating system that you wish to make files on your computer available to remote computers.

NOTE NFS is not supported over the X.25 link product.

Allowing Your Computer Access to Remote File Systems via NFS

(Mounting a Remote File System)

1. Go to the Networking and Communication screen
   a. At the SAM main screen, highlight `Networking and Communications.`
   b. Press: **[RETURN]**.
2. Go to the `Networked File Systems` screen
   a. Highlight `Networked File Systems`
   b. Press: **[RETURN]**
3. Go to the Mounted Remote File Systems screen
   a. Highlight `Remote File Systems Mounted`
   b. Press: **[RETURN]**
4. Go to the `Add Remote File System` screen
   a. Press: **[Tab]** to get to the menu bar
   b. Press: the right arrow key to get to the `Action` menu
   c. Press: **[RETURN]** to pull down the `Action` menu
   d. Press: down arrow key to highlight `Add Remote File System`
   e. Press: **[RETURN]** to show the sub-menu
   f. Press the arrow key to highlight `Using NFS`
   g. Press: **[RETURN]** to get to the `Add Remote File System` screen

5. Fill in the fields using the information in the `NFS Client: Mount Remote File Systems` section of the configuration worksheet. Use the SAM help system for information about filling in the fields.
6. Activate the **OK** button to perform the task and return to the object list. The SAM updates the list to include the remote systems and directories you configured.
7. Repeat steps 4 through 6, for each system that you need to access.
8. If the SAM displays the NFS Client status as Disabled, choose `Enable NFS Client` from the `Actions` menu.
9. Go to the next section, `Allowing Remote Computers Access to Your File System via NFS` (Exporting a Local File System).

By performing these steps, you have identified which file systems you wish to access on remote computers.

Allowing Remote Computers Access to Your File System via NFS

(Exporting a Local File System)

1. Go to the Networked File Systems screen
   a. From the SAM main screen go to `Networking and Communications` screen
   b. From `Networking and Communications` screen go to `Networked File Systems` screen
2. Choose `Exported Local File Systems` from the object list. The SAM displays the `Exported Local File Systems` screen.
3. Choose `Add Exported File System` from the `Actions` menu. The SAM displays the `Add Exported File System` screen.
4. Fill in the fields using the information in the `NFS Server: Export Local File Systems` section of the configuration worksheet. Use the SAM help system for information about filling in the fields.
5. Activate the **OK** button to perform the task and return to the `Exported Local File Systems` object list. The SAM updates the list to include the local directory or directories you configured.
6. Repeat steps 3 through 5 for each remote file system that you wish to access.
7. If the SAM displays the NFS Server status as Disabled, choose `Enable NFS Server` from the Actions menu.
8. Choose `Exit` from the List menu. The SAM returns you to the `Networked File Systems` screen.

By performing these steps, you have identified which local file systems may be accessed by remote computers.

This completes the NFS configuration portion. To implement the changes into the operating system, go to the Rebooting Your Computer section.

Rebooting Your Computer

CAUTION Before rebooting, be sure no one is logged onto your computer. If you do not reboot the operating system when you exit the SAM, NFS Services will not run with the configurations you just made.

After you've configured LAN, IS, or NFS, you need to reboot the computer to make those changes effective. A message appears to let you know that a kernel regeneration and reboot are necessary. When this happens:

1. Finish all your NFS configuration tasks.
2. Activate the **Exit SAM** button to exit the SAM.
3. When the kernel regeneration and reboot message appears, choose kernel regeneration.
4. When the kernel regeneration is complete and the reboot message appears, reboot your computer.

After rebooting, you've completed configuring your network.

Chapter 8 - Backing Up the Operating System and Ending Your Work Session describes how to back up your operating system.

8 Backing Up the Operating System

Backing Up the Operating System

You have put a lot of time and effort into installing and customizing your operating system. This work can easily be lost by a hardware failure, an operating system crash, or accidental removal or corruption of a file. It is critically important that you fully backup all files before the computer is first put on line, and that you establish and maintain a periodic backup schedule.

It is essential that you purchase one set of HP-UX operating system tapes per site. You will not be able to boot your computer from your backup tape. This backup tape will, however, allow you to reclaim your system customization, such as restoring the users you have added.

Backing up all of your files will take about one and one-half hours.

Backup

First, load a tape into your tape drive.

You can use the SAM to back up your system. Determine the device file for the device on which to create your backup. All configured HP-UX devices have a device file associated with them that tells HP-UX the hardware address of the device and the driver to use when communicating with the device. For more information about device files and drivers, see the HP-UX System Administration Tasks manual or the Configuring HP-UX for Peripherals manual.

Start the SAM by typing **`sam`** (in lower case) at the superuser prompt. Pressing **[Ctrl-K]** gives you help information about the SAM.

Choosing items from the Help menu gives you information about:

- The current functional area.
- Keyboard navigation within the SAM.
- Using the SAM help system.
- Displaying the release of the SAM you are currently running.

Activating the Help button, when available, gives you information about the attributes and tasks that you can perform from the currently displayed screen.

Pressing the **[F1]** key gives you context-sensitive information for the field at the location of the cursor. If you have no [F1] key you can type **[Ctrl-F]** to get context-sensitive information.

Exit the SAM by activating the **Exit SAM** button from the SAM main screen.

NOTE If you have performed tasks that require the generation of a new kernel, the SAM will prompt you to regenerate the kernel and reboot the system.

To back up your system:

1. Type **sam** (all lowercase)
2. Highlight Backup and Recovery and press **[RETURN]**.
3. Highlight Interactive Backup and Recovery and press **[RETURN]**.
4. Highlight the backup device from the object list.
5. Choose `Backup Files Interactively` from the `Actions` menu.
6. Highlight `Select Backup Scope` and press **[RETURN]**.
7. Highlight `Specified Files` and press **[RETURN]**.
8. Highlight `Local File Systems Only (no NFS)` and press **[RETURN]**.
9. Activate the **OK** button.

NOTE If you are using an Autochanger device you will need to select Specify Tape Drive Options…and choose appropriate options. See the HP-UX System Administration Tasks manual for instructions.

Activate the **OK** button to begin the backup process.

Confirmation messages will appear. Activate the **OK** button to proceed in each case.

NOTE If you created an index log, the information displayed will appear in the index log.

10. Exit the SAM by selecting `Exit` from the File menu on the current screen, and then **Exit SAM** from the File menu on the next screen.

Ending Your Work Session

When you are finished working on your computer.

CAUTION DO NOT turn your computer off! You computer is a multi-user system and other people may be using it. If you turn it off, you will deny them access to the computer, and may cause them to lose some of their work.

If you have to turn off your computer, see System Administration Tasks for information on properly shutting down your computer.

Ending Your Work Session:

When you are finished working with your computer, perform the following steps to end your work session:

1. Exit your application software.

2. Type exit and press **[RETURN]** to exit to the login prompt

NOTE	If you have several work sessions (shells) opened, you may have to perform step 2 several times before you are returned to the login prompt.

This leaves you at the login prompt, and the computer is ready for the next user.

Timer Controlled Power On and Off

If you have the optional UPS, you may preset times for your computer to automatically turn off and back on.

Commands are sent to the UPS telling it when to turn off and when to start up again. These same commands also gracefully shut down the operating system. This process can be automated using the cron command.

The command power_onoff(1M) is used to perform this function. See HP-UX Reference, or the manpages, for information on using these commands.

Appendix A: Site Preparation

Site Preparation Requirements

This appendix details site preparation requirements for installing your computer. Your computer is designed to operate under environmental conditions suitable for an office environment. The operating specifications listed in the following tables are within the normal range of an office environment.

If you are unsure of the electrical and environmental conditions in the area that the computer is to be installed, here are some suggestions for verification:

Contact the building maintenance department to verify the specifications.

Hire a licensed electrical contractor familiar with the local electrical codes to verify the specifications.

Contact your local HP sales representative to hire an HP field engineer to verify the specifications.

NOTE Make sure that the electrical installation complies with all local and national electrical codes and regulations.

UPS Issues

This power requirement will also affect the use of UPS systems and rackmount configurations. The 1.8 kVA, 3kVA, and 5.5kVA Power Trust UPSs are the only UPS systems supported on HP 9000 K250/K260/K450/K450 computers. 1.3 kVA and 1.6kVA Power Trust UPSs do not have a 20 amp receptacle and cannot provide sufficient current.

Special Power Requirements

The following K Class computers require a 20 amp services, as compared to 15 amp service for earlier K Class family products:

K250	K450	K370	K380
K260	K460	K570	K580

Ensure that the appropriate power is available for these systems, either through dedicated circuits for stand-alone units, or through the 1.8 kVA and 3.0kVA Power Trust UPSs in rack-mounted systems.

Verifying Environmental and Electrical Specifications

Review the environmental and electrical requirements in this section of the manual prior to applying power.

The HP 9000 operates from a wide range of voltages and on commonly available frequencies of 50 and 60 Hz. Check your local power source to determine if you have sufficient current available for your particular configuration. The systems automatically adjust to alternating current of 100, 120-127 or 200-240 volts.

Table A-1 Environmental Specifications — Kx00/Kx10/Kx20 Systems

Description	Specification
Operating Temperature	5 to 40°C (41 to 104°F)
Non-operating Temperature	-40 to 65°C (-40 to 149°F) (with no internal tape media device) -40 to 45°C (-40 to 113°F) (with internal tape media device)
Temperature Rate of Change	20°C (36°F)/hr. (with no internal tape media device) 10°C (18°F)/hr. (with internal tape media device)
Over Temperature Warning	35°C (95°F)
Over Temperature Second Warning	40°C (104°F)
Over Temperature Shutdown	43°C (109°F)
Operating Humidity	15% to 80% RH non-condensing, max wet bulb (at 26°C (79°F) with internal tape media device)
Non-operating Humidity	5% to 80% RH non-condensing (at 65°C (149°F)) (rate of change, 30% RH/hr)
Operating Altitude	0 to 3000 meters (0 to approx. 10,000 ft)
Non-operating Altitude	0 to 4500 meters (0 to approx. 15,000 ft)

Description	Specification
Heat Dissipation	4263 BTU/hr. (maximum load)
Acoustics	Data measured in 24°C (75.2°F) ambient temperature. Acoustic performance and fan speeds vary with temperature between 18 °C (64.4°F) and 40°C (104°F). NPT = No Prominent Tone. **Deskside (LwA):** Tape Backup Mode = %<5.8 Bels Normal Operating Mode = %<5.7 Bels **Operator Position:** Tape Backup Mode = %<46 dB-LpA, NPT Normal Operating Mode = %<45 dB-LpA, NPT **Racked System (LwA):** Tape Backup Mode = %<6.5 Bels Normal Operating Mode = %<6.5 Bels **Operator Position:** Tape Backup Mode = %<52 dB-LpA, NPT Normal Operating Mode = %<52 dB-LpA, NPT
Safety	UL Listed to UL1950 CSA Certified to CSA C22-2 No. 950 TUV GS Mark, compliant with IEC 950, EN60950, and EN41003

Table A-2 Environmental Specifications — Kx50/Kx60/Kx70/Kx80 Systems

Description	Specification
Operating Temperature	5 to 40°C (41 to 104°F) for Kx70 5 to 35° C (41 to 95°F) for Kx80
Non-operating Temperature	-40 to 65°C (-40 to 149°F) (with no internal tape media device) -40 to 45°C (-40 to 113°F) (with internal tape media device)
Temperature Rate of Change	20°C (36°F)/hr. (with no internal tape media device) 10°C (18°F)/hr. (with internal tape media device)
Over Temperature Warning	35°C (95°F)
Over Temperature Second Warning	40°C (104°F)
Over Temperature Shutdown	43°C (109°F)
Operating Humidity	15% to 80% RH non-condensing, max wet bulb (at 26°C (79°F) with internal tape media device)
Non-operating Humidity	5% to 80% RH non-condensing (at 65°C (149°F)) (rate of change, 30% RH/hr)
Operating Altitude	0 to 3000 meters (0 to approx. 10,000 ft)
Non-operating Altitude	0 to 4500 meters (0 to approx. 15,000 ft)

Description	Specification
Heat Dissipation	5846 BTU/hr. (maximum load)
Acoustics	Data measured in 24°C (75.2°F) ambient temperature. Acoustic performance and fan speeds vary with temperature between 18 °C (64.4°F) and 40°C (104°F). NPT = No Prominent Tone. **Deskside (LwA):** Tape Backup Mode = %<5.8 Bels Normal Operating Mode = %<5.7 Bels **Operator Position:** Tape Backup Mode = %<46 dB-LpA, NPT Normal Operating Mode = %<45 dB-LpA, NPT **Racked System (LwA)**: Tape Backup Mode = %<6.5 Bels Normal Operating Mode = %<6.5 Bels **Operator Position:** Tape Backup Mode = %<52 dB-LpA, NPT Normal Operating Mode = %<52 dB-LpA, NPT
Safety	UL Listed to UL1950 CSA Certified to CSA C22-2 No. 950 TUV GS Mark, compliant with IEC 950, EN60950, and EN41003

Table A-3 Electrical Specifications — Kx00/Kx10/Kx20

Description	Specification
AC Input Voltage Range	100, 120-127, or 200-240 VAC, 10%
AC Input Line Frequency[a]	50 - 60 Hz
AC Input Current	12.5 A (max load at 100 VAC) 10.5 A (max load at 120 VAC) 6.0 A (max load at 200 - 240 VAC)
AC Inrush Current	16 A peak, one cycle
AC Input Power	1250 watts maximum, 450 watts typical[b]
Power Supply Output	925 watts DC continuous maximum
Holdup without system reset	20ms at 50/60Hz (1 cycle, or 500ms)
Battery Backup Time	15 minutes (with optional external PowerTrust UPS, without optional UPS there is no battery backup)
Branch Circuit Rating	minimum 15A, individual branch circuit rating

a. The power supply auto-ranges to the AC voltage and frequency. It does not have to be reconfigured to operate over its rated operating ranges.
b. The typical AC input power rating is based on a configuration of 3 CPUs, 3 internal disks, 1 memory controller, 288 MBytes of memory, 2 HP-HSC expansion cards, 1 HP-PB FDDI and 1 F/W SCSI card.

Table A-4 Electrical Specifications — Kx50/Kx60/Kx70

Description	Specification
AC Input Voltage Range	100, 120-127, or 200-240 VAC, 10%
AC Input Line Frequency[a]	50 - 60 Hz
AC Input Current	19.5 A (max load at 100 VAC) 16.0 A (max load at 120 VAC) 10.0 A (max load at 200 - 240 VAC)
AC Inrush Current	48.65 A @ 140VAC/60Hz 58.26 A @ 264VAC/50Hz
AC Input Power	2400 watts maximum,
Power Supply Output	1200 watts DC continuous maximum. 550 watts typical[b]
Holdup without system reset	20ms at 50/60Hz (1 cycle, or 500ms)
Battery Backup Time	15 minutes (with optional external PowerTrust UPS, without optional UPS there is no battery backup)
Branch Circuit Rating	minimum 20A, individual branch circuit rating

a. The power supply auto-ranges to the AC voltage and frequency. It does not have to be reconfigured to operate over its rated operating ranges.
b. The typical AC input power rating is based on a configuration of 3 CPUs, 3 internal disks, 1 memory controller, 288 MBytes of memory, 2 HP-HSC expansion cards, 1 HP-PB FDDI and 1 F/W SCSI card.

CAUTION Failure to ensure that the computer site complies with the listed specifications could cause possible data loss, equipment damage, and void the HP warranty for the computer.

DO

- Provide sufficient electrical outlets for the Core System plus any additional external devices. If you use the optional UPS, you will need only one (1) outlet for the Core System UPS external power connector. External peripherals such as printers are typically not connected to the UPS; they require a separate outlet.
- Remote cables should be routed to avoid obstructions for personnel.
- Allow at least twelve (12) inches of ventilation space in front of and behind the computer for the front and rear mounted cooling fans.
- Provide a desk or table next to the computer for the console and keyboard. The distance from the console to the computer is determined by the length of the connecting cable.
- Provide a storage cabinet for computer supplies (tapes, disks, printer supplies, etc.)
- Provide a dedicated telephone outlet close to the computer (for a data modem).
- Be sure the computer site is well ventilated and adequate lighting is available.
- Plan peripheral installation in accordance with cable length.

DON'T

- Do not install the computer next to open windows or doorways where heavy traffic is likely.
- Do not plug the computer or computer peripherals into outlets that are controlled by a switch. If the outlets that are controlled by a switch, cover or protect the switch from accidental de-activation.
- Do not plug non-office type equipment into the same outlet with the computer. This would include things such as: coffee pots, heaters, fans, radios, or TVs.
- Do not use extension cords.
- Do not use SPU as a plant stand (or coffee table).

Appendix B: Hardware Installation

Hardware Installation Review

This appendix is not an exact duplicate of your Installation Guide but it does provide a second source for the same information. If the installation guide is not handy when you need to review some part of the installation procedure, use this appendix.

In this appendix the steps are not re-explained with each illustration. If you want to do your installation or reinstallation using this appendix, follow the steps starting on the next page. For each step, refer the illustration page with the same heading.

The Core I/O board shown in the illustrations do not reflect the audio and headset jacks present in the K250/K260/K450/K460 Core I/O board. For a review of those features see Figure 2-20. Also, refer to see "Special Power Requirements" on page 3 of Appendix A.

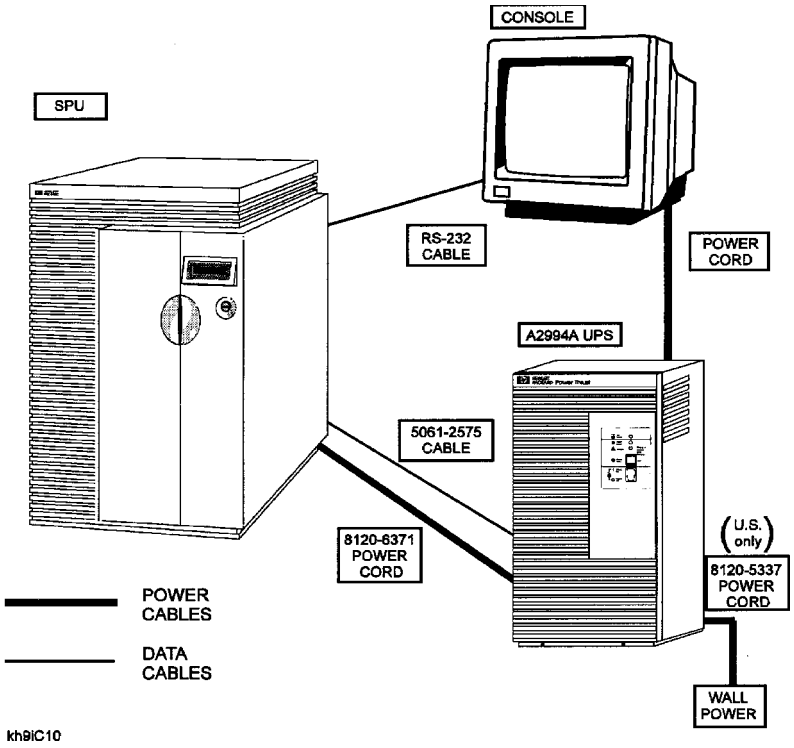
Introduction

This installation guide illustrates the procedures for installing all HP9000 K-class servers. The contents of this guide include:

1. Overview of System Power/Data Cabling - A reference figure showing the basic power and data connections for the core system (System Processing Unit and Console).
2. System Installation Steps - a brief description of each step of the installation procedure.
3. Installation Illustrations - A series of figures showing each step in the installation process.

Overview of System Power and Data Cabling

The figure below shows an overview of the power and data cabling for the SPU, console, and the optional UPS, and is intended for reference only. To proceed with actual installation of the system, start at the page titled "Standard Console, Keyboard, and Optional UPS."



System Installation Steps

STEP 1: Standard Console, Keyboard, and Optional Uninterruptible Power System (UPS)

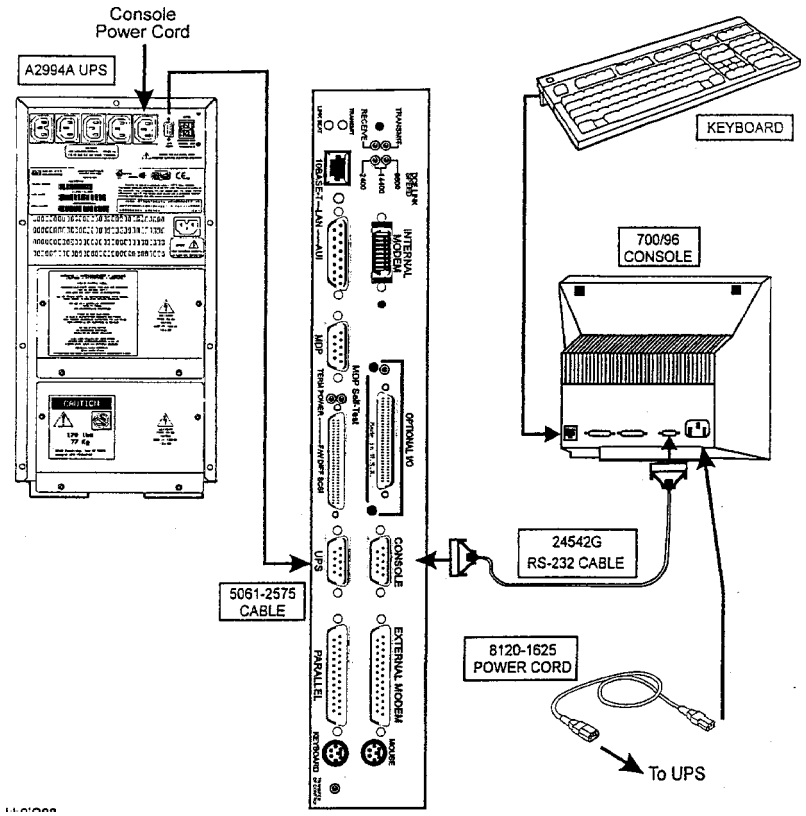
If you want to install a graphics console instead of the standard console, skip to STEP 1A.

1. Connect the standard console data cable to the "Console" port on the Core I/O board of the SPU.
2. Plug the standard console power cable into a UPS power receptacle.
3. Connect the keyboard cable to the keyboard connector on the console.
4. Connect the UPS data cable between the "UPS" connector on the SPU and the appropriate data connector on the UPS.

NOTE Do not plug the UPS into a power receptacle at this time.

Skip to STEP 2.

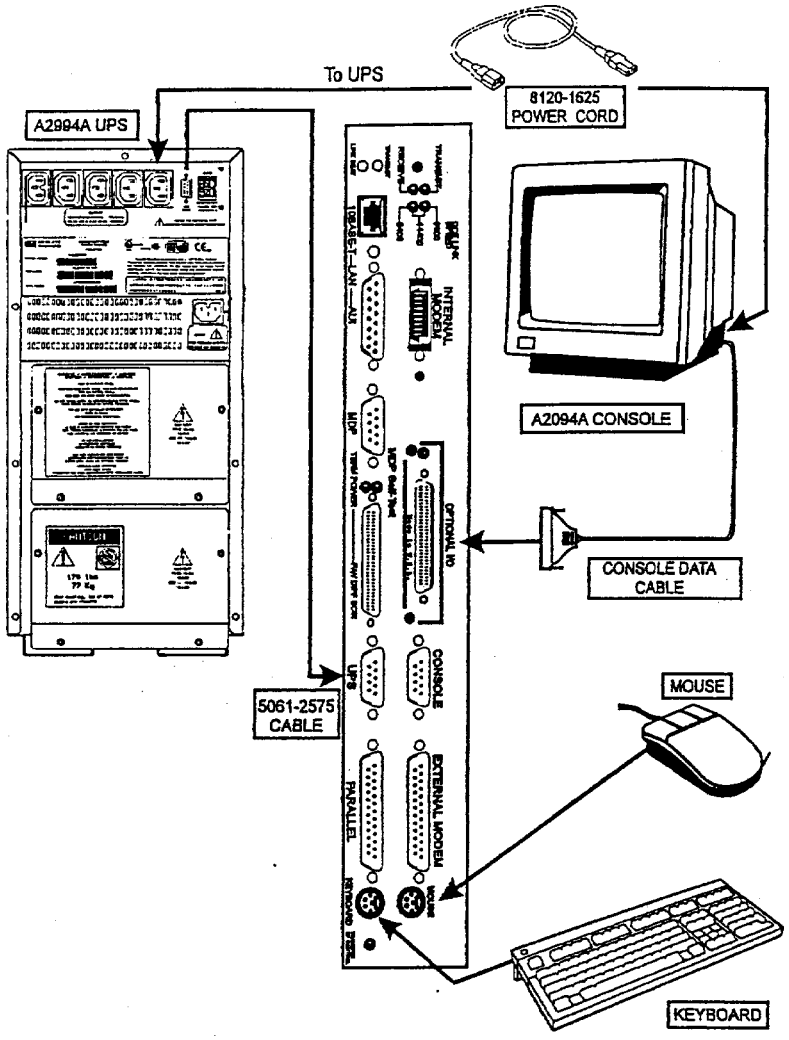
Standard Console, Keyboard, and Optional UPS



STEP 1A: Optional Graphics Console: A2094A Graphics Display with Keyboard, Mouse, and Optional UPS

1. Connect the graphics console data cable to the "OPTIONAL I/O" port on the SPU Core I/O card.
2. Plug the graphics console power cable in a UPS power receptacle.
3. Connect the keyboard cable to the keyboard connector on the Core I/O card of the SPU.
4. Connect the mouse cable to the connector labeled "MOUSE" on the SPU core I/O card.
5. Connect the UPS data cable between the "UPS" connector on the SPU and the appropriate data connector on the UPS.

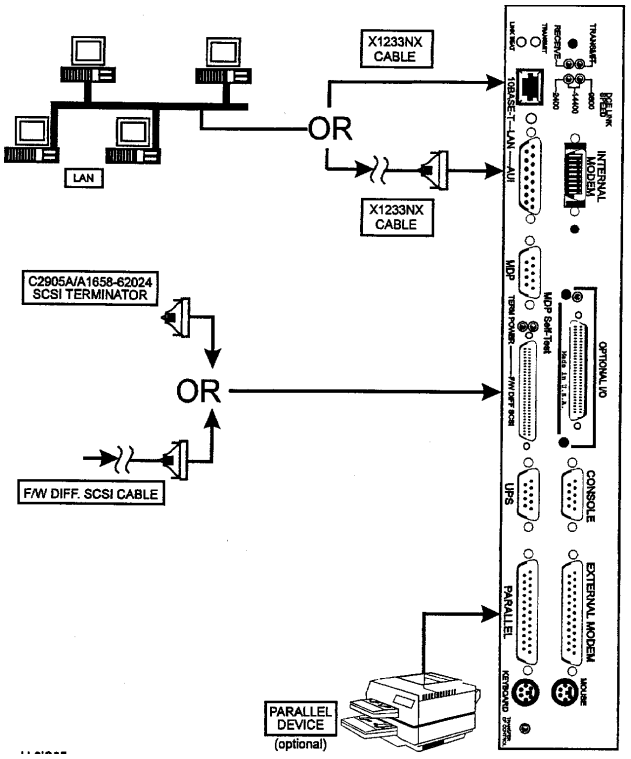
Optional Graphics Console: A2094A Graphics Display with Keyboard, Mouse and Optional UPS



STEP 2: Local Area Network (LAN), Fast/Wide Differential SCSI, and Parallel Device Cabling

1. Connect the LAN to either the "10BASE-T" or the "AUI" connector on the Core I/O card.
2. Connect the Fast/Wide cable or terminator to the "F/W DIFF. SCSI" connector on the Core I/O card.
3. Connect an optional parallel device (such as a printer) to the connector labeled "PARALLEL" on the Core I/O card.

Local Area Network (LAN), Fast/Wide Differential SCSI, and Parallel Device Cabling



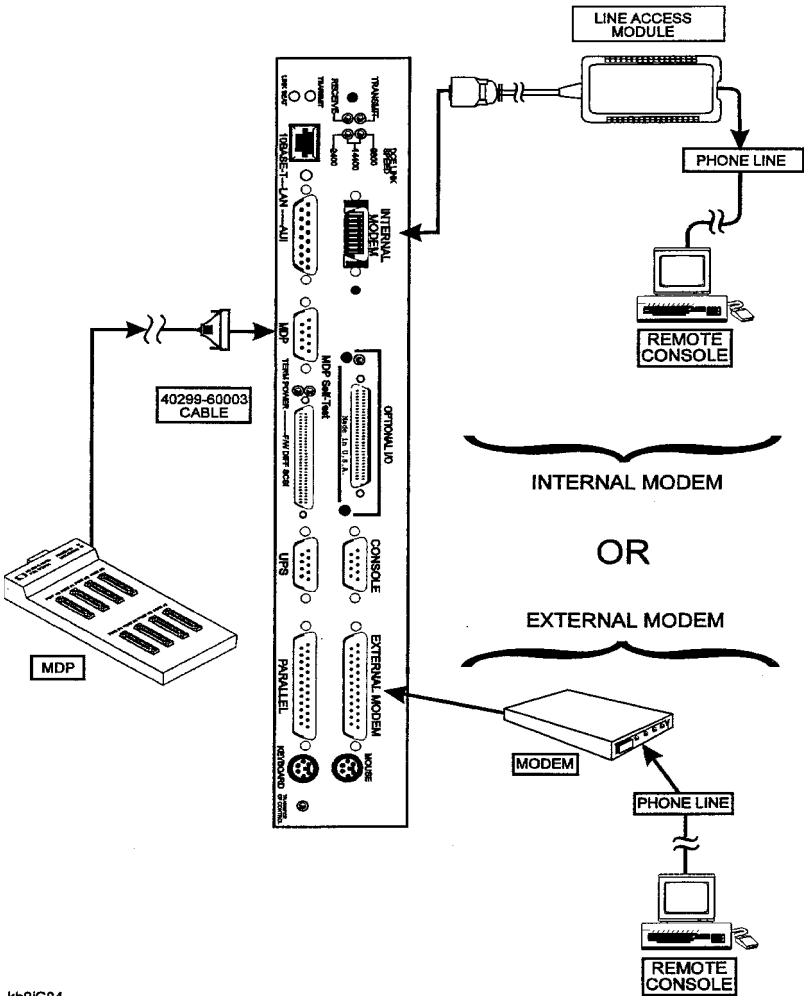
NOTE **Configuration Guidelines**

1. Some system configurations can compete for I/O bus usage with the built-in 802.3 LAN interface on the standard multifunction I/O (CoreI/O). The result is a slow down in LAN performance due to an increase in CRC errors (LAN retries). An add-in 802.3 LAN card should be used as the primary LAN interface when using four or more Kx70 or Kx80 processors with less than 1.5GB of memory, or when using the VISUALIZE 2-D graphics card in the optional H-HSC I/O slot on the multifunction I/O.
2. If a 100BT I/O card (NIO or GSC) is installed, DO NOT USE LASI LAN.
3. A minimum of 1.5GB of main memory must be configured so that there are eight banks or greater in at least one memory interleave group. Memory module sizes should be limited to 32MB (64MB pair) of Double In-line Memory Modules (DIMMs) or larger. For best performance, it is recommended that memory be configured over two memory carriers.

STEP 3: Internal or External Modem, and MDP

1. Connect the LAM (HP A2991-xxxxx Line Access Module) to the "INTERNAL MODEM" connector on the Core I/O card. If using an internal modem, do not connect an external modem, skip to Step c. below.
2. If not using the internal modem, connect the external modem to the "EXTERNAL MODEM" connector on the core I/O card.
3. Connect the Modem Distribution Panel (MDP) to the "MDP" connector on the Core I/O card.

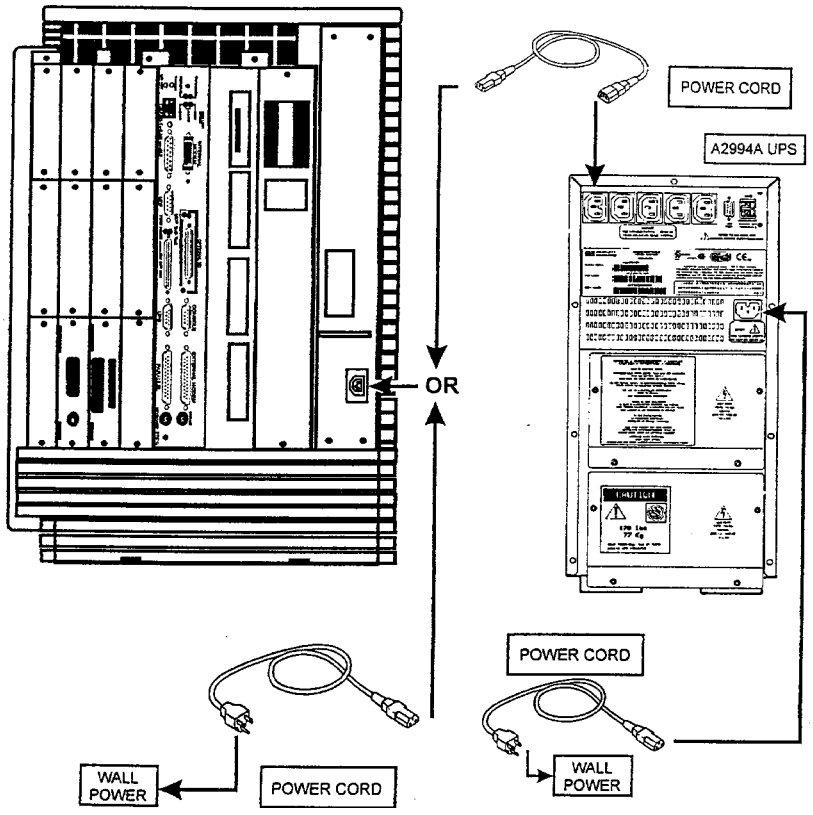
Internal or External Modem and MDP



STEP 4: Power Connections

1. If you are using an Uninterruptible Power System (UPS), plug the SPU power cable into the power receptacle at the upper-left corner of the UPS, then plug the UPS power cable into wall power.
2. If not using the UPS, connect the SPU power cable directly to wall power.

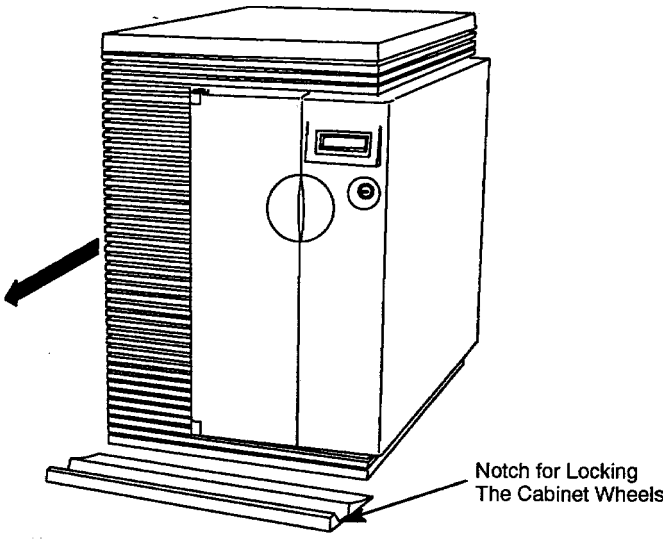
Power Connections



STEP 5: Stabilizer Block

Roll the SPU cabinet onto the stabilizer block in the desired location to prevent the SPU from being inadvertently moved around.

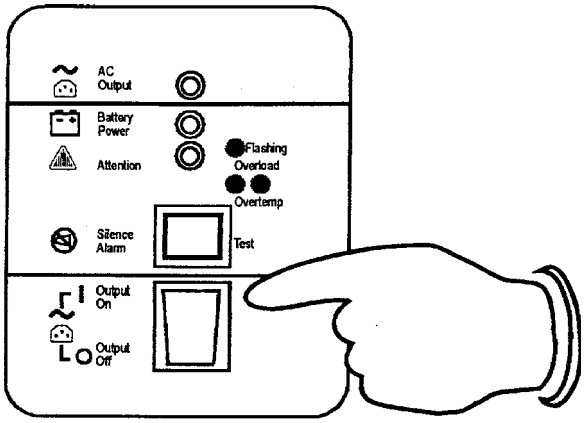
Stabilizer Block

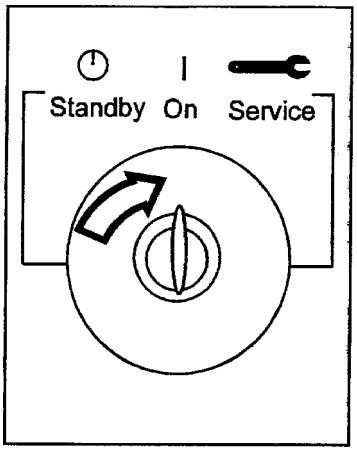


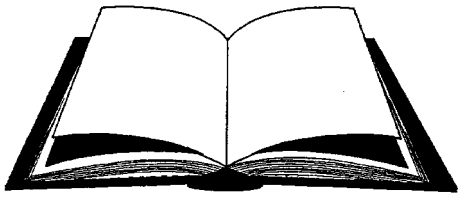
STEP 6: Power On

Refer to Chapter 2, *Exploring Your Hardware*, for hardware familiarization and instructions about turning on your computer.

Power On

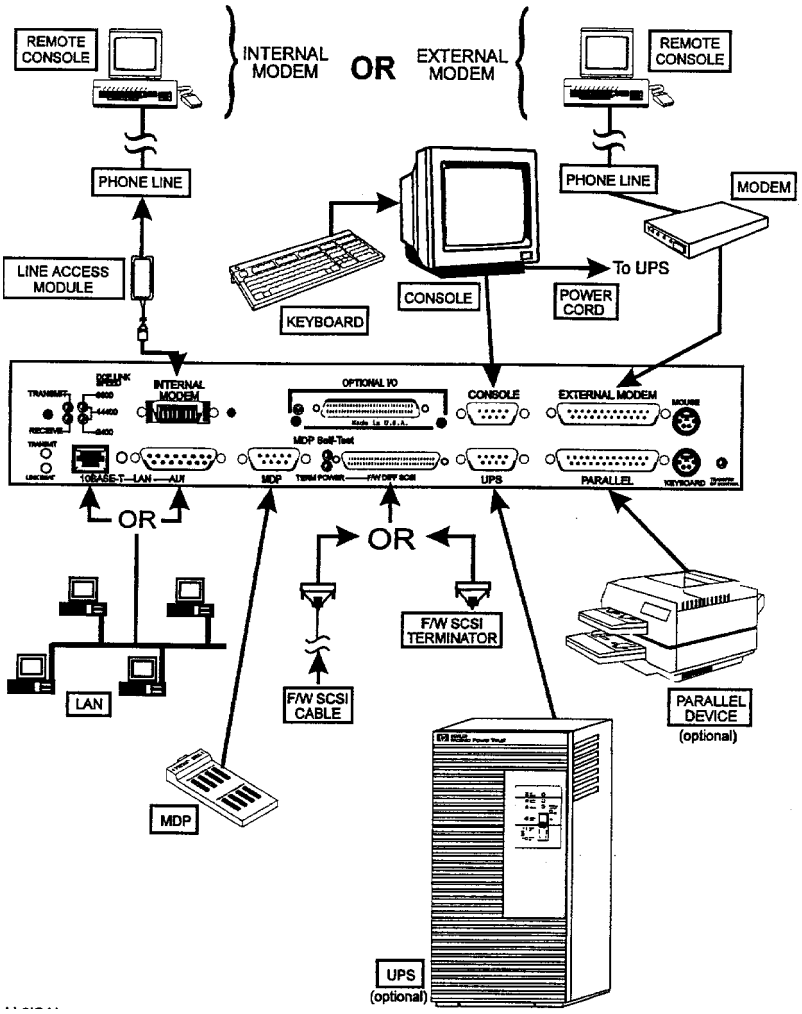






OWNER'S GUIDE

Summary of System Connections



Appendix C: Computer Addressing

Computer Addressing for Model K100

Table C-1 K100 Internal Address Paths - Core I/O

Location/Description	Device Type	Address Path (Dec)[a]
FW DIFF SCSI connector	FW DIFF SCSI devices	8/0.(da)
Console connector (MDP port 0)	HP700/96 system console	8/4/0.0
UPS connector (MDP port 1)	1300VA PowerTrust (UPS)	8/4/0.1
MDP connector: (ports 2, 3, 4, 5, 6)	A Modem Distribution Panel (MDP) is connected to the Core I/Oconnector. Supported devices are then connected to the MDP.	8/4/0.2 8/4/0.3 8/4/0.4 8/4/0.5 8/4/0.6
Internal or external modem connector (MDP port 7)	HP LAM for Internal modem or an external modem	8/4/0.7
Optional I/O (HSC) connector	Graphics console	8/8.0
Parallel connector	Supported parallel device	8/12/0
10 base or AUI connector	Appropriate LAN cable	8/12/6
Keyboard connector	graphics option keyboard	8/12/7
Mouse connector	graphics option mouse	8/12/8

a. (da)=(device address)

Table C-2 K100 Internal Address Paths - Internal Peripherals

Location/Description	Device Type	Address Path (Dec)
Slot A	SE SCSI CD-ROM	8/12/5.2
Slot B	SE SCSI DDS Drive	8/12/5.0
Slot C (boot disk)	FW SCSI disk drive	8/0.6
Slot D	FW SCSI disk drive	8/0.5
Slot E	FW SCSI disk drive	8/0.4
Slot F	FW SCSI disk drive	8/0.3

Table C-3 K100 Internal Address Paths - HP-PB 0

Location/Description	Device Type	Address Path (Dec)
Slot 1	HP-PB I/O card	8/4/4.(da)
Slot 2	HP-PB I/O card	8/4/8.(da)
Slot 3	HP-PB I/O card	8/4/12.(da)
Slot 4	HP-PB I/O card	8/4/16.(da)

Computer Addressing for Model K2x0/K4x0

Table C-4 K2x0/K4x0 Internal Address Paths - Core I/O

Location/Description	Device Type	Address Path (Dec)[a]
FW DIFF SCSI connector	FW DIFF SCSI devices	10/0.(da)
Console connector (MDP port 0)	HP700/96 system console	10/4/0.0
UPS connector (MDP port 1)	1300VA PowerTrust (UPS)	10/4/0.1
MDP connector: (ports 2, 3, 4, 5, 6)	A Modem Distribution Panel (MDP) is connected to the Core I/Oconnector. Supported devices are then connected to the MDP.	10/4/0.2 10/4/0.3 10/4/0.4 10/4/0.5 10/4/0.6
Internal or external modem connector (MDP port 7)	HP LAM for Internal modem or an external modem	10/4/0.7
Optional I/O (HSC) connector	Graphics console	10/8
Parallel connector	Supported parallel device	10/12/0
10 base or AUI connector	Appropriate LAN cable	10/12/6
Keyboard connector	graphics option keyboard	10/12/7
Mouse connector	graphics option mouse	10/12/8

a. (da)=(device address)

Table C-5 K2x0/K4x0 Internal Address Paths - Internal Peripherals

Location/Description	Device Type	Address Path (Dec)[a]
Slot A	SE SCSI CD-ROM	10/12/5.2
Slot B	SE SCSI DDS Drive	10/12/5.0
Slot C (boot disk)	FW SCSI disk drive	10/0.6
Slot D	FW SCSI disk drive	10/0.5
Slot E	FW SCSI disk drive	10/0.4
Slot F	FW SCSI disk drive	10/0.3

a. (da)=(device address)

Table C-6 K2x0/K4x0 Internal Address Paths - HP-PB

Location/Description	Device Type	Address Path (Dec)[a]
HP-PB 0 Slot 1	HP-PB I/O card	10/4/4.(da)
Slot 2	HP-PB I/O card	10/4/8.(da)
Slot 3	HP-PB I/O card	10/4/12.(da)
Slot 4	HP-PB I/O card	10/4/16.(da)
HP-PB 1 Slot 1	HP-PB I/O card	10/16/4.(da)
Slot 2	HP-PB I/O card	10/16/8.(da)
Slot 3	HP-PB I/O card	10/16/12.(da)
Slot 4	10/16/16.(da)	HP-PB I/O card

a. (da)=(device address)

Table C-7 K4x0 Internal Address Paths - HSC I/O Expansion

Location/Description	Device Type	Address Path (Dec)[a]
Slot 0	HSC I/O card	8/0.(da)
Slot 1	HSC I/O card	8/4.(da)
Slot 2	HSC I/O card	8/8.(da)
Slot 3	HSC I/O card	8/12.(da)

a. (da)=(device address)

Computer Addressing for Model K3x0/K5x0

Table C-8 K3x0/K5x0 Internal Address Paths - Core I/O

Location/Description	Device Type	Address Path (Dec)[a]
FW DIFF SCSI connector	FW DIFF SCSI devices	10/0
Console connector (MDP port 0)	HP700/96 system console	10/4/0.0
UPS connector (MDP port 1)	1300VA PowerTrust (UPS)	10/4/0.1
MDP connector: (ports 2, 3, 4, 5, 6)	A Modem Distribution Panel (MDP) is connected to the Core I/Oconnector. Supported devices are then connected to the MDP.	10/4/0.2 10/4/0.3 10/4/0.4 10/4/0.5 10/4/0.6
Internal or external modem connector (MDP port 7)	HP LAM for Internal modem or an external modem	10/4/0.7
Optional I/O (HSC) connector	Graphics console	10/8
Parallel connector	Supported parallel device	10/12/0
10 base or AUI connector	Appropriate LAN cable	
Keyboard connector	graphics option keyboard	10/12/7.0
Mouse connector	graphics option mouse	10/12/8.0

a. (da)=(device address)

Table C-9 K3x0/K5x0 Internal Address Paths - Internal Peripherals

Location/Description	Device Type	Address Path (Dec)[a]
Slot A	SE SCSI CD-ROM	10/12/5.2
Slot B	SE SCSI DDS Drive	10/12/5.0
Slot C (boot disk)	FW SCSI disk drive	10/0.6
Slot D	FW SCSI disk drive	10/0.5
Slot E	FW SCSI disk drive	10/0.4
Slot F	FW SCSI disk drive	10/0.3

a. (da)=(device address)

Table C-10 K3x0/K5x0 Internal Address Paths - HP-PB

Location/Description	Device Type	Address Path (Dec)[a]
HP-PB 0 Slot 1	HP-PB I/O card	10/4/4
Slot 2	HP-PB I/O card	10/4/8
HP-PB 1 Slot 1	HP-PB I/O card	10/16/4
Slot 2	HP-PB I/O card	10/16/8

a. (da)=(device address)

Table C-11 K5x0 Internal Address Paths - HSC I/O Expansion

Location/Description	Device Type	Address Path (Dec)[a]
Primary Four Slot HP-HSC Expansion I/O		
Slot 0	HSC I/O card	8/0
Slot 1	HSC I/O card	8/4
Slot 2	HSC I/O card	8/8
Slot 3	HSC I/O card	8/12
Secondary Four Slot HP-HSC Expansion I/O		
Slot 0	HSC I/O card	12/0
Slot 1	HSC I/O card	12/12
Slot 2	HSC I/O card	14/8
Slot 3	HSC I/O card	14/12

a. (da)=(device address)

Appendix D: UPS Error Messages

This appendix lists the messages that may be displayed by the UPS Monitor daemon (ups_mond) to indicate PowerTrust status or error conditions. The UPS Monitor daemon monitors the conditions of all PowerTrust units in an HP-UX system, and notifies the system operator via console messages of any PowerTrust alarm conditions and of system power failures.

WARNING **This appendix is intended for qualified service-trained personnel only. Actions to be taken in response to a given error message are intended to be performed only by service-trained personnel.**

NOTE The term "UPS" (Uninterruptible Power System) is used in all error messages to refer to the PowerTrust unit. The term "UPS Monitor" refers to the software utility (ups_mond) that monitors PowerTrust operation.

Normal Operation Messages

The messages in this section may appear during normal operation.

ups_mond: UPS Monitor daemon starting; using configuration file <filename>	
Severity	Information. Start-up processing program message.
Meaning	UPS Monitor process creation and activation daemon has successfully begun execution.
Cause	ups_mond has launched the UPS Monitor process successfully, using the data contained in the PowerTrust configuration file.
Action	None.

ups_mond: UPS <tty special file name> OK: AC Power back on.	
Severity	Information. A previous critical, error, or warning condition related to AC input power has been corrected.
Meaning	The PowerTrust device configured as <tty special file name>informed the UPS Monitor that its input AC power has returned to normal following a power failure. The PowerTrust unit is now supplying normal power, not battery reserve power.
Cause	Corrective action succeeded, and normal power has been restored.
Action	None.

ups_mond: AC Power to all recognized, system critical UPSs OK! System will not shutdown.	
Severity	Information. A previous critical or warning condition related to AC input power has been corrected.
Meaning	Following an AC power failure affecting one or more critical PowerTrust units on the system, normal AC power has been restored to all critical PowerTrust units before either exhaustion of the battery reserve power, or a graceful shutdown, occurs. The system has recovered from the power failure.
Cause	The system has recovered from an AC power failure that was short enough not to exhaust the PowerTrust unit's battery reserve, nor cause a graceful shutdown.
Action	None.

Timer Controlled Power On/Off Messages

The following messages relate to the Timer Controlled Power On/Off utility.

ups_mond: Timer Controlled On/Off information invalid; ignored	
Severity	Error. Request to turn off the system (with a later turn on) is ignored.
Meaning	The power_onoff utility sent an invalid turn-on time to ups_mond.
Cause	Internal error in power_onoff.
Action	Ensure that the requested turn-on date and time are valid, and within range of the PowerTrust unit's capability.

ups_mond: mknod error: <error number> for Timed On/Off fifo file /timed_off; continuing without	
Severity	Error.
Meaning	Could not create fifo (also known as a "pipe") for communication between power_onoff and ups_mond.
Cause	File system problem.
Action	Refer to mkfifo(3C) for more information on the error.

ups_mond: open error: <error number> for Timed On/Off fifo file /timed_off; continuing without	
Severity	Error.
Meaning	Could not open fifo (also known as a "pipe") for reading request from the power_onoff utility.
Cause	File system problem.
Action	Refer to mkfifo(3C) for more information on the error.

ups_mond: Timer Controlled On value exceeds UPS <tty special file name> maximum. The maximum value of <value> will be used for this UPS.	
Severity	Warning. Turn-on date and time will be earlier than requested.

ups_mond: Timer Controlled On value exceeds UPS <tty special file name> maximum. The maximum value of <value> will be used for this UPS.	
Meaning	The PowerTrust hardware does not support the requested length of time for delay.
Cause	The entered Timer Controller On value was outside the range of the PowerTrust unit's capability.
Action	Ensure that the requested turn-on date and time are within the range of the PowerTrust unit's capability.

ups_mond: Power Off request active; performing graceful shutdown.	
Severity	Warning.
Meaning	The PowerTrust unit has begun a graceful shutdown of the system.
Cause	An entered Timer Controller date and time setting for powering off the PowerTrust unit has been reached, and the PowerTrust unit has begun to gracefully shutdown the system.
Action	None.

Exit ups_mond Daemon Messages

The messages in this section precede the exiting of the ups_mond daemon. The UPS Monitor will not be running, thus the PowerTrust unit(s) will not be monitored.

usage: ups_mond [-f configfile] [-s]	
Severity	Error.
Meaning	Incorrect parameter when invoking ups_mond.
Cause	An incorrect parameter was used when invoking ups_mond.
Action	Correct the parameter according to the syntax shown in the usage message above. If ups_mond was invoked from /etc/inittab,edit that file to correct the parameter.

ups_mond: cannot exec/etc/ups_mond -f <filename> -e ups_mon child due to <error number>	
Severity	Error.
Meaning	Cannot execute ups_mond's child process.
Cause	Specific cause denoted by <error number> in the message.
Action	Ensure that ups_mond exists in the /etc directory, and is executable.

ups_mond: permission denied; must be super user	
Severity	Error.
Meaning	Must be super user to execute ups_mond.
Cause	An attempt was made to start ups_mond without super user capability.
Action	ups_mond is designed to be started from /etc/inittab by init, which is super user.

ups_mond: exiting; unable to lock process in memory: <error number>	
Severity	Error.

ups_mond: exiting; unable to lock process in memory: <error number>	
Meaning	An attempt to lock failed.
Cause	The specific cause is denoted by the <error number> in the message.
Action	Refer to plock(2) for more information on the error.

ups_mond: aborted, configfile <filename> open received error: <error number>	
Severity	Error.
Meaning	Could not open the ups_mond configuration file.
Cause	The specific cause is denoted by the <error number> in the message.
Action	Ensure that the configuration file named in the message exists, and is readable.

ups_mond: aborted, configfile <filename> fseek error: <error number>	
Severity	Error.
Meaning	ups_mond could not "seek" through the configuration file due to the cause denoted by the <error number> in the messages.
Cause	File system problem.
Action	Refer to fseek(3S) for more information on the error.

ups_mond: terminated by signal <decimal value>	
Severity	Information.
Meaning	The signal received by ups_mond caused termination.
Cause	The signal denoted by <decimal value> in the message was received. The most common cause is a kill of the ups_mond process.
Action	None, if done on purpose.

ups_mond: aborted, malloc error: <error number>	
Severity	Information.
Meaning	A memory allocation error caused termination.
Cause	The memory allocation error denoted by <error number> in the message caused the ups_mond process to terminate.
Action	Refer to malloc(3C) for more information.

shutdown(1M) Messages

The messages in this section may precede an /etc/shutdown(1M) attempt, depending on the particular PowerTrust configuration in the system.

ups_mond: UPS <tty special file name> AC POWER FAILURE - running on UPS battery	
Severity	Warning. AC power failure. The PowerTrust unit is supplying battery reserve power for up to a maximum of 15 minutes, after which critical PowerTrust units will cause a graceful shutdown of the system.
Meaning	The PowerTrust device configured as <tty special filename> informed the UPS Monitor that its AC input power has failed. The PowerTrust unit is now supplying reserve power from its internal battery. Depending on the battery's state of charge, there are from 0 to 15 minutes of full-load reserve power available before the AC output from the PowerTrust unit shuts off.
Cause	AC source power failure, detected by a PowerTrust unit.
Action	Locate the AC power source for the PowerTrust unit reporting the power failure, and try to restore power before the PowerTrust battery becomes exhausted. If this is an isolated, brief power transient failure, no action is needed; the system will recover automatically when AC power returns to normal.

If power is not returned within previously configured time period, your system will automatically go to graceful shutdown.	
Severity	Warning. Critical (not MSG-ONLY) PowerTrust units have lost AC power.
Meaning	One or more critical PowerTrust units are supplying reserve power from their internal batteries. If power has not been restored (after the delay specified in the configuration file), a graceful shutdown of the system will occur.
Cause	Loss of AC power to one or more critical PowerTrust units.
Action	Restore AC power source for PowerTrust units reporting power failure. Otherwise, allow shutdown of system to occur.

reboot(2) Messages

The messages in this section may precede a reboot(2), depending on the particular PowerTrust configuration in the system.

ups_mond: UPS <tty special file name> battery low	
Severity	Critical. The system is operating on insufficient reserve power.
Meaning	The PowerTrust device configured as <tty special file name> informed the UPS Monitor that while it was operating on its internal battery to supply reserve power, the battery drained down to a state of low charge.The PowerTrust unit has only about two minutes of battery power remaining, after which the PowerTrust output power will fail. If the specified PowerTrust unit is a critical PowerTrust unit, then the system will reboot.
Cause	The PowerTrust unit detected a loss of AC power, and switched over to its internal battery reserve power to supply power to the system. The battery then drained down to the point at which a "low charge" condition was detected, or the battery had already been depleted by a previous AC power failure, and had not had enough time to recharge.
Action	Locate the AC power loss problem, and restore that power to the system before the battery becomes exhausted.

ups_mond: UPS <tty special file name> no output - either switch setting wrong on UPS or bad UPS	
Severity	Critical. No power output from the PowerTrust device configured as<tty special file name>.
Meaning	No output voltage from PowerTrust unit. If the specified PowerTrust unit is a critical PowerTrust unit, then the system will reboot.
Cause	The cause may be one of the following: The Output switch setting on the PowerTrust unit is incorrect, The PowerTrust unit has been turned off programmatically. The PowerTrust unit is faulty.
Action	Toggle the Output switch on the suspect PowerTrust unit. If the output voltage is not restored by toggling the switch, replace the PowerTrust unit.

ups_mond: UPS <tty special file name> failed - requires repair	
Severity	Critical. PowerTrust hardware has failed, and PowerTrust output power has been lost. Some system component(s) now without power.
Meaning	The PowerTrust device configured as <tty special file name> is faulty.If the specified PowerTrust unit is a critical PowerTrust unit, then the system will reboot.
Cause	The PowerTrust unit is faulty.
Action	Replace the faulty PowerTrust unit.

ups_mond: UPS <tty special file name> current overload; UPS turned itself off - either UPS bad or too many devices connected	
Severity	Critical. PowerTrust hardware has failed, and PowerTrust output power has been lost. Some system component(s) now without power.
Meaning	The PowerTrust device configured as <tty special file name> informed the UPS Monitor that it detected an excessive demand for output power from its AC power outlet (greater than 100% of allowable output power), and has consequently shut off its output.
Cause	Improper system installation has put too much load on the PowerTrust unit, or a hardware malfunction in the system equipment being powered by the PowerTrust unit has increased the power demand to the point of overload. If the specified PowerTrust unit is a critical PowerTrust unit, then the system will reboot.
Action	Correct the improper system hardware installation, or repair the faulty system hardware that is overloading the PowerTrust unit.

ups_mond: UPS <tty special file name> ambient temperature too high; UPS turned itself off - reduce heat in area	
Severity	Critical. PowerTrust hardware has failed, and PowerTrust output power has been lost. Some system component(s) now without power.
Meaning	The PowerTrust device configured as <tty special file name> informed the UPS Monitor that it detected an excessive ambient temperature that makes further operation of the PowerTrust unit inadvisable, and has consequently shut off its output. If the specified PowerTrust unit is a critical PowerTrust unit, then the system will reboot.
Cause	The computer room became so hot that the operating temperature limit of the PowerTrust unit was exceeded.
Action	Reduce the temperature in the computer room.

ups_mond: UPS <tty special file name> output voltage too high; UPS turned itself off - requires repair	
Severity	Critical. PowerTrust hardware has failed, and PowerTrust output power has been lost. Some system component(s) now without power.
Meaning	The PowerTrust device configured as <tty special file name> informed the UPS Monitor that its output voltage is too high, making further operation of the PowerTrust unit inadvisable, and has consequently shut off its output. If the specified PowerTrust unit is a critical PowerTrust unit, then the system will reboot.
Cause	The PowerTrust unit is faulty.
Action	Replace the faulty PowerTrust unit.

ups_mond: UPS <tty special file name> output voltage too low; UPS turned itself off - requires repair	
Severity	Critical. PowerTrust hardware has failed, and PowerTrust output power has been lost. Some system component(s) now without power.
Meaning	The PowerTrust device configured as <tty special file name> informed the UPS Monitor that its output voltage is too low for correct system operation, and has consequently shut off its output. If the specified PowerTrust unit is a critical PowerTrust unit, then the system will reboot.
Cause	The PowerTrust unit is faulty.
Action	Replace the faulty PowerTrust unit.

ups_mond: cannot reboot due to <error number> returned by exec().	
Severity	Error.
Meaning	A reboot system call failed.
Cause	The specific cause is denoted by the <error number> in the message.
Action	Refer to exec(2) for more information on the error.

ups_mond: cannot exec shutdown due to <error number> returned by exec().	
Severity	Error.
Meaning	Cannot execute shutdown process.
Cause	The specific cause is denoted by the <error number> in the message.
Action	Ensure that shutdown exists in the /etc directory, and that it is executable.

NOTE All of the reboot(2) messages will be followed by:

ups_mond: reboot -halt invoked due to UPS error cited in previous syslog message.

Glossary

A-B

absolute pathname The full pathname of a file, including all the directories leading to it, starting with the root directory ("/") and ending with the filename itself. See also file, filename, pathname.

access permissions Settings that allow a user or group of users to read, write, or execute files. See also file access permissions.

active window The window that is receiving input from the keyboard at the present time. If there is no active window, anything you type is lost. Only one window can be active at a time. The active window is said to have the "keyboard focus."

ANSI The American National Standards Institute, a non-profit organization, made up of various expert committees, that publishes standards for use by national industries. ANSI has adopted the IEEE standards for local area networks.

argument The part of a command line that identifies the file or directory to be acted on.

attachment unit interface (AUI) A transceiver cable that conforms to IEEE 802.3 specifications.

back up v. To make a copy of the file system on a tape or disk that can be stored separately from the original files. Also called "backing up the system" or simply "system backup."

bitmap Generally speaking, an array of data bits used for graphic images. Strictly speaking, a pixmap of depth one, capable of representing 2-color images.

boot Short for bootstrap service. A service provided by a short program, stored in the read-only memory of your workstation, that loads the operating system (or any complex program) into main memory. Partner workstations provide bootstrap service to diskless workstations. See also boot ROM.

boot console interface The interactive firmware that enables you to interact with the hardware of your workstation before the workstation boots the operating system. The boot console interface allows you to perform special tasks, display information, and set certain system parameters.

boot ROM A read-only memory that is incorporated into a workstation for the purpose of starting the operating system, testing the terminal, and producing a standard display.

bootstrap service See boot.

byte A fundamental character-code unit, usually consisting of 8 bits.

C-D

CD-ROM Compact Disc Read-Only Memory. See also CD-ROM disc, CD-ROM drive.

CD-ROM disc CD-ROM discs are identical to the audio compact discs (CDs) used to record stereo music, except that they store data. CD-ROM discs are 120 mm (4.7 inches) in diameter, and use one data surface with a capacity of 600 MB. The data surface contains pits and flat spots arranged in a continuous spiral track, which is read at a constant speed.

CD-ROM drive A random-access, read-only, mass-storage device that uses removable CD-ROM discs. The drive contains a semiconductor laser for reading data optically and an embedded controller with a SCSI interface.

Central Processing Unit (CPU) The part of a workstation that interprets and executes instructions.

child directory See subdirectory.

click To press and release a mouse button. The term comes from the fact that pressing and releasing most mouse buttons makes a clicking sound.

cluster A group of workstations connected via a Local Area Network (LAN). One workstation, the cluster server, performs as a file-system server for the cluster clients. See also cluster client, cluster node, cluster server.

cluster client A cluster node that does not have a local HP-UX file system. Its file system resides on the cluster server. See also cluster, cluster node, cluster server.

cluster node A member of a group of workstations connected via a Local Area Network (LAN). One workstation, the cluster server, performs as a server to the cluster. See also cluster, cluster client, cluster server.

cluster server A workstation that provides file access, login access, file transfer, printing, and other services across a network to a defined cluster of systems (cluster nodes) connected via a LAN. See also cluster, cluster client, cluster node, host.

command An instruction that you enter into the system at a prompt, to execute a program or perform a task. See also shell command.

command argument Information you provide on a command line to describe the object (usually a file or directory) to be operated on by the command.

command interpreter A program that reads lines of text from standard input (typed at the keyboard or read from a file) and interprets them as requests to execute other programs. An HP-UX command interpreter is called a shell. See also shell.

command option Information you provide on a command line to indicate any special action you want the command to take. See also default.

configuration The arrangement of a workstation or network as defined by the nature, number, and chief characteristics of its functional units. More specifically, the term configuration may refer to a hardware configuration or a software configuration.

control key sequence A keystroke combination used as a shorthand way of specifying commands. To enter a control key sequence, you hold down the control key while pressing another key.

cpu See Central Processing Unit.

CRX color graphics Expanded graphics capability offering 24-plane color, 24-plane Z-buffered color, or 48-plane Z-buffered color capability.

current directory See current working directory.

current session The work and processes that have been created since you logged into the system (and before you log out again). See also session.

current working directory The directory in which a relative path name search begins, as well as the directory in which you are currently working. It is also called the working directory or current directory.

cursor The small blinking box displayed in whatever screen is active at a particular time. The cursor marks your current typing position on the screen and indicates which program (HP VUE terminal window or shell) will receive your commands.

daisy-chaining A method of connecting devices where the signal passes from one device to the next in serial fashion along a bus.

DDS tape drive A device that stores data on Digital Data Storage (DDS) cassettes.

default Most commands give you a choice of one or more options. If you don't specify an option, the command automatically assigns one. This automatic option is called the default. See also command option.

dialog box A special type of HP VUE screen that is called by the user from a window. Dialog boxes contain controls and settings. To display an example of a dialog box, click the Style Manager button on the Workspace, then click on Color.

directory A special type of object that contains information about the objects beneath it in the HP-UX organizational structure. Basically, it is a file that stores names and links to files and other directories. See also file.

disk A thin, round plate with a magnetic surface coating on which data is stored by magnetic recording. See also floppy diskette, hard disk, CD-ROM disc.

disked workstation A workstation that has its own hard disk drive. See also diskless workstation, node, partner node, workstation.

diskette See floppy diskette.

diskless booting Loading the operating system into local memory from the disk of a partner workstation.

diskless workstation A workstation that has no disk. A diskless workstation can use the disk of its partner workstation or other workstations. If necessary, it can also use the computational services of the partner workstation or other workstations. A diskless workstation boots from its partner workstation. See also disked workstation, node, partner node, workstation.

double click To press and release a mouse button twice in rapid succession.

drag To press and hold down a mouse button while moving the mouse (and the pointer on the screen). See also drop.

drive See CD-ROM drive, DDS tape drive, floppy drive, hard disk drive.

drop To release an icon that has been "dragged" to a new position. See also drag.

E-H

EISA (Extended Industry Standard Architecture) An industry standard bus architecture based on and compatible with that used by IBM in their AT series computers.

environment The conditions under which your commands are executed. These conditions include your workstation characteristics, home directory, and default search paths. See also environment variables.

environment variables The set of defined shell variables (some of which are PATH, TERM, SHELL, EXINIT, HOME) that define the conditions under which your commands are executed. These conditions include your workstation characteristics, home directory, and default search paths. See also environment.

ETHERNET The LAN developed jointly by Digital Equipment Corporation, Intel, and Xerox Corporation, upon which the IEEE 802.3 network is based.

fast, differential SCSI An 8-bit wide bus with high-power receivers and drivers, which allows a cable length of up to 25 meters and a speed of up to 10 MB per second. See also fast-wide SCSI, single-ended standard SCSI, Small Computer System Interface.

fast-wide SCSI A 16-bit wide bus with high-power receivers and drivers, which allows a cable length of up to 25 meters and a speed of up to 20 MB per second. See also fast, differential SCSI, single-ended standard SCSI, Small Computer System Interface.

file The basic named unit of data stored on disk. See also directory, filename.

file access permissions The access rights given to a particular file or directory. Every file and directory has a set of access permissions, a code that determines whether a process can perform a requested operation on the file (such as opening the file or writing to it). See also access permissions.

File Manager The HP VUE application that allows you to manage your files and directories, and to set viewing preferences.

filename The name given to a particular file. See also absolute pathname, file, pathname.

file server A workstation whose primary task is to control the storage and retrieval of data from hard disks. Any number of other workstations can be linked to the file server in order to use it to access data.

file system The organized set of files and directories on a hard disk.

firmware The control software that is embedded in ROM and is always resident despite the status of the operating system. It handles the booting of the system, initialization of I/O, and starts the loading of the operating system.

floppy diskette A thin, record-shaped plate that stores data on its magnetic surfaces. The system uses heads (similar to heads in tape recorders) to read and write data on concentric disk tracks.

floppy drive A device that stores data on a flexible diskette.

hard disk A type of disk that is rigid as opposed to a floppy diskette, which is flexible.

hard disk drive A device that stores data on a hard disk. The hard disk is a permanent part of the drive and cannot be removed.

HCRX color graphics Accelerated 8-plane or 24-plane graphics. See also CRX color graphics.

Help Manager The HP VUE application that provides online help.

$HOME The environment variable representing the home directory. This is the directory in which you are placed after you log in. Typically, this is /users/login, where login is your username. See also home directory.

home directory A shorthand way of referring to a frequently used directory, almost always the login directory.

host See cluster server.

host name See internet protocol address.

HP-UX cluster See cluster node, cluster server.

HP Visual User Environment A user interface that draws a graphical layer over the complexities of the other layers of the system (the hardware, operating system, and X Window system), enabling you to control your workstation by directly manipulating graphical objects instead of by typing commands at a command-line prompt.

HP VUE See HP Visual User Environment.

I-L

icon A small, graphic representation of an object. Objects can be "iconized" (turned into icons) to clear a cluttered workspace. Icons can be restored to their original appearance when needed. Whatever processes are executing in an object continue to execute when the object is iconized.

iconify See iconize.

iconize To turn a window or shell into an icon. See also icon.

Initial System Loader The program that actually controls the loading of the operating system.

input device Any of several pieces of hardware equipment used to give information to a system. Examples are the keyboard and the mouse. See also output device.

input window The window that displays a program's prompt and any commands typed but not yet executed.

internet protocol address (IP address) A string of characters that uniquely identifies a workstation in a network. Also referred to as the IP address, the system name, and the host name.

invisible filename A filename in which the first character is a dot (.). Invisible filenames are not displayed by the listing commands such as ls and ll without add options, such as -a.

IP address See internet protocol address.

ISL See Initial System Loader.

kernel The part of the operating system that is an executable piece of code responsible for managing the computer's resources. The kernel controls the rest of the operating system.

LAN See local area network.

LAN station address See local area network station address.

link n. A special object that contains the name of another object. When you specify a link as a pathname or part of a pathname, the system substitutes the pathname that the link contains.

v. To join together two or more objects.

local area network (LAN) A data communications system that allows a number of independent devices to communicate with each other. The systems and clusters that share data, hardware, and software resources via Networking Services software.

local area network system address The label that uniquely identifies the local area network (LAN) connection for your workstation at the hardware level.

log in To initially sign on to the system so that you may begin to use it. This creates your first user process. See also username.

login directory The directory in which you are placed when you log in, usually your home directory. See also home directory.

Login Manager The program that controls the initial startup of HP VUE and accepts the user's username and password.

login script The shell program that runs at each login, and sets the login environment for your system.

M-Q

menu bar An area at the top or bottom of a window that contain the titles of the pull-down or pop-up menus for that application.

minimize button In HP VUE, a push button on the window frame that turns a screen into an icon. See also icon, iconize.

mouse pointer See pointer.

name A character string associated with a file, directory, or link. A name can include various alphanumeric characters, but never a slash (/) or null character. See also pathname.

network Two or more workstations sharing information. See also cluster, workstation.

network controller A printed circuit board that passes bit streams between the network and the main memory of the workstation. Coupled with the network transceiver, the controller also handles signal processing, encoding, and network media access.

node A network computer (workstation). Each node in the network can use the data, programs, and devices of other network nodes. Each node contains main memory and has its own disk or shares one with another node. See also disked workstation, diskless workstation, workstation.

node name A unique identifying name given to a workstation in a cluster. See also cluster, node.

nonvolatile memory System memory that retains its contents even after workstation power is turned off.

object Any file, directory, or link in the network. See also directory, file, link, pathname.

operating system The program that supervises the execution of other programs on your workstation. For example, the entire HP-UX system, including the kernel and all HP-UX commands. See also kernel.

option See command option.

output device Any of several pieces of hardware used for receiving messages from the workstation. Display screens and printers are examples of output devices. See also input device.

output window The window that displays a process response to your command.

parent directory A directory that contains other directories, each of which is then called a subdirectory. See also subdirectory.

partner node A workstation that shares its disk with a diskless node. See also diskless workstation.

password The word you enter next to the password prompt at login time. Keep your password secret and change it occasionally in order to protect your account from unauthorized use. See also user account.

path The hardware address of a device that is attached to the I/O system of your workstation.

pathname A series of names separated by slashes that describe the path of the operating system from some starting point in the network to a destination object. Pathnames begin with the name of the starting point, and include every directory name between the starting point and the destination object. A pathname ends with the name of the destination object. See also name, object.

permissions A set of rights (read, write, execute) associated with an object in the file system. Determines who may use the object.

PID Process Identification. Also referred to as a process ID. See also process ID.

pointer Sometimes called the "mouse pointer," the pointer shows the mouse location on the screen. The pointer's shape depends on its location. In the HP VUE Workspace, the pointer is an X. On a window frame, the pointer is an arrow.

process A computing environment in which you may execute programs; a program currently running in the system.

process ID A unique identification number assigned to all processes by the operating system. Also referred to as a PID. See also PID.

program A unit of executable code, in binary or "source" form. Most HP-UX commands and routines consist of programs.

prompt A message or symbol displayed by the system to let you know that it is ready for your input.

push button A graphic control that simulates a real-life push button. Use the pointer and mouse to push the button and immediately start an action.

R-Z

RAM Random access memory.

ROM Read-only memory.

root See superuser.

scroll bar A vertical or horizontal bar located on the side or bottom of a window that allows the user to view information that does not fit within the window.

SCSI See Small Computer System Interface.

server A program that controls all access to input and output devices.

session The time between when you log in and when you log out. Also called a work session or a login session. See also current session.

shell A command-line interpreter program used to invoke utility programs. Some examples of HP-UX shells are the Bourne, Korn, Key, and C shells. Sometimes referred to as a command interpreter. See also command interpreter.

shell command An instruction you give the system to execute a utility program or shell script. See also shell script, utility program.

shell script A file that contains commands that the system can interpret and run in a shell.

shutdown The process of taking the system from multi-user state to system administration state.

SIMM See Single In-line Memory Module.

single-ended standard SCSI An 8-bit wide SCSI bus with standard receivers and drivers, which limits total cable length to 6 meters. See also fast, differential SCSI, fast-wide SCSI, Small Computer System Interface.

Single In-line Memory Module A memory board.

slider One of the components of a scroll bar. The slider is the object that is dragged along the scroll area to cause a change.

Small Computer System Interface (SCSI) An IEEE standard for interfacing a computer to multiple, disparate high-speed peripherals such as a floppy disk or a CD-ROM, singly or in combination. See also fast, differential SCSI, fast-wide SCSI, single-ended standard SCSI.

standalone A workstation that is not part of a cluster. See also cluster.

Style Manager The HP VUE application that provides the ability to customize various aspects of your system, including colors, fonts, the keyboard, the mouse, session startup and termination behavior, and access to other workstations.

subdirectory A directory that is located in, or anywhere on a path below, another directory. The directory above the subdirectory is called the parent directory. The subdirectory is also referred to as the child directory. See also parent directory.

superuser A user with permission to enter the top-level directory and make changes to files and programs that users are not allowed to change. To "become superuser" or "become root" means to let the system know that you are now assuming the role of system administrator. You can do this either by logging into the system as root, or by typing su at a command-line prompt. You must know the root password to become root.

system administrator The person responsible for system and network installation, updating, maintenance, and security at your site.

system call Invocation of a kernel process by a user program.

system name See internet protocol address.

workstation A compact, graphics-oriented computer having high speed and high memory capacity. A workstation usually includes a keyboard, a monitor, and a system unit. See also node, disked workstation, diskless workstation.