HP 3000 Series 9X8LX/RX PA-RISC Computer System

Installation and Configuration Guide

Series 9X8LX/RX Family

HEWLETT PACKARD

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Printing History

New editions are complete revisions of the manual. Update packages, which are issued between editions, contain additional and replacement pages to be merged into the manual by the customer. The dates on the title page change only when a new edition or a new update is published. No information is incorporated into a reprinting unless it appears as a prior update; the edition does not change when an update is incorporated.

Many product updates and fixes do not require manual changes and, conversely, manual corrections may be done without accompanying product changes. Therefore, do not expect a one-to-one correspondence between product updates and manual updates.

First Edition .... October 1993

List of Effective Pages

The List of Effective Pages gives the date of the current edition and of any pages changed in updates to that edition. Within the manual, any page changed since the last edition is indicated by printing the date the changes were made on the bottom of the page. No information is incorporated into a reprinting unless it appears as a prior update.

All .... October 1993

Safety and Regulatory Information

For your protection this product has been tested to various national and international regulations and standards. The scope of this regulatory testing includes electrical/mechanical safety, radio frequency interference, ergonomics, acoustics, and hazardous materials. Where required, approvals obtained from third-party test agencies are shown on the product label. In addition, various regulatory bodies require some information under the following headings.

FCC Statement (USA only)

The United States Federal Communications Commission (in Subpart J, of Part 15, Docket 20780) has specified that the following notice be brought to the attention of the users of this product:

Warning

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested for compliance with the limits of Class A computing devices pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference.

Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Japanese Radio Frequency Interference

この装置は，第一種情報装置（商工業地域において使用されるべき情報装置）で商工業地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（VCCI）基準に適合しております。

従って，住宅地域またはその隣接した地域で使用すると，ラジオ，テレビジョン受信機等に受信障害を与えることがあります。

取扱説明書に従って正しい取り扱いをして下さい。

Japanese Radio Frequency Notice

Finland (only)

LASERTURVALLISUUS

LUOKAN 1 LASERLAITE KLASS 1 LASER APPARAT

HP 3000 Series 9x8LX/RX -tietokoneisiin voidaan asentaa lisävarusteena muistilaitteeksi laitteensisäinen CD-ROM-levyasema, joka on laserlaite.

Kyseinen CD-ROM-levyasema on käyttäjän kannalta turvallinen luokan 1 laserlaite. Normaalissa käytössä levyaseman suojakotelo estää lasersäteen pääsyn laitteen ulkopuolelle.

CD-ROM-levyaseman on tyyppihyväksynyt Suomessa laserturvallisuuden osalta Työministeriön työsuojeluosasto. Laitteen turvallisuusluokka on määritetty valtioneuvoston päätöksen N:o 472/1985 ja standardin SFS-EN 60825 (1992) mukaisesti.

Tiedot CD-ROM-levyasemassa käytettävän laserdiodin säteilyominaisuuksista:

```
Aallonpituus 790 nm
Teho         1,1 µW
Luokan 1 laser
```

Acoustics (Germany only)

Laermangabe (Schalldruckpegel LpA) gemessen an Arbitplatzbei normalen Betrieb nach DIN 45635, teil 19:

Acoustic noise (A-weight sound pressure level LpA) measured at operator's position, normal operation, to ISO7779:

```
HP 300 9X8LX/RX:
59dB bis (up to) 37&deg;C, 62dB ueber (above) 37&deg;C
```

Safety Considerations

This product and related documentation must be reviewed for familiarization with safety markings and instructions before operation. The following figure shows some of the safety symbols used on the product to indicate various safety considerations.

Warning	The WARNING sign denotes a hazard. It calls attention to a procedure, practice, of the like, which if not done correctly or adhered to, could result in injury. Do not proceed beyond a WARNING sign until the indicated conditions are fully understood and met.
Caution	The CAUTION sign denotes a hazard. It calls attention to an operating procedure, practice, of the like, which if not done correctly or adhered to, could damage or destroy part or all of the product. Do not proceed beyond a CAUTION sign until the indicated conditions are fully understood and met.

Preface

This manual is intended for use by trained and experienced Hewlett-Packard field maintenance personnel. This edition of the *Installation and Configuration Guide* contains technical information about the HP 3000 Series 9X8LX/RX Family of computers listed in the table below.

Computer Type	Description
HP 3000 928LX	2 slot I/O chassis with a 48MHz CPU
HP 3000 928RX	4 slot I/O chassis with a 48MHz CPU
HP 3000 968LX	2 slot I/O chassis with a 64MHz CPU
HP 3000 968RX	4 slot I/O chassis with a 64MHz CPU

Other Documents Referenced in this Guide:

Part Number	Title
A1707-90016	*HP 3000 and HP 9000 CE Handbook*
5958-5859	*Computer Products Site Preparation Resources Guide*
5958-2370	*HP CEO Site Preparation Handbook*
50779-90012	*HP Predictive Support User's Guide*

DECLARATION OF CONFORMITY

according to ISO/IEC Guide 22 and EN 45014

Manufacture's Name: Hewlett-Packard
                             8000 Foothills Blvd.
                             Roseville CA. 95747, U.S.A.

declares, that the product:

    Product Name: PA-RISC Computer System

    Model Number(s):   HP3000 908LX
                       HP3000 918LX/RX
                       HP3000 928LX/RX
                       HP3000 968LX/RX
                       HP3000 978RX

                       HP9000 E25 (806)
                       HP9000 E35 (816)
                       HP9000 E45 (826)
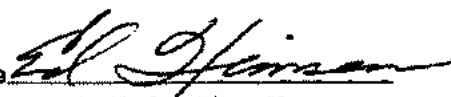
Conform to the following Product Specifications:

    Safety: IEC950: 1986+A1+A2/EN 60950:1988+A1+A2

    EMC: CISPR-22: 1985/EN55022:1988-Class A
                       IEC801-2: 1991/prEN55024-2: 1992 -3kV CD, 8kV AD
                       IEC801-3: 1991/prEN55024-3: 1991 3V/m
                       IEC801-4: 1988/prEN55024-4: 1992 0.5kV Signal Lines,
                                                        1KV Power Lines
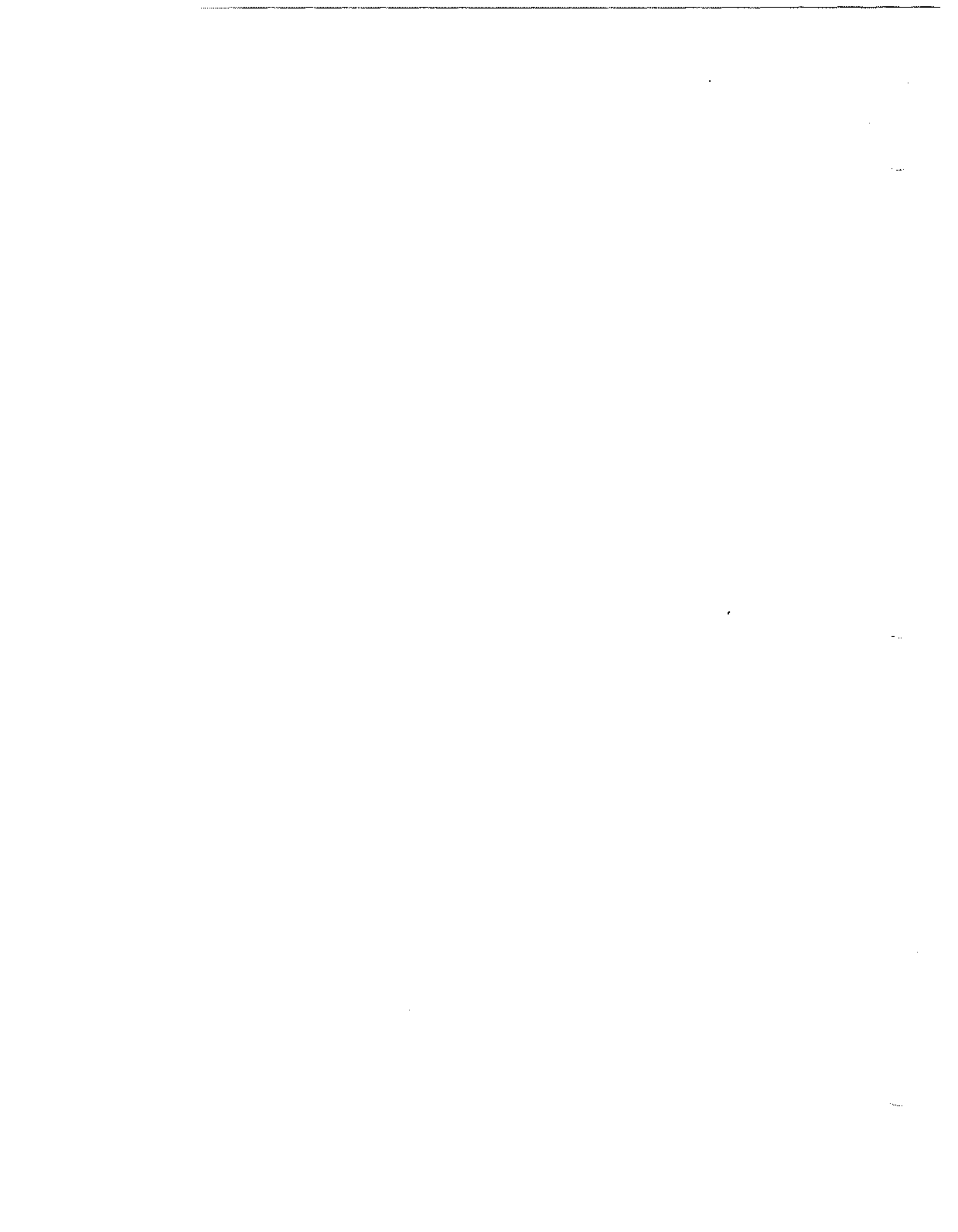
Supplementary Information:

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

Roseville   9/30/93
Ed Heinsen, NCMO Quality Manager

Quality Department NCMO, Roseville, California, U.S.A.

European Contact: Your local Hewlett-Packard sales and service
office or Hewlett-Packard GmbH, department ZQ/Standards Europe,
Herrenberger Straße 130, D-71034 Böblingen FAX: +49-7031-14-3143

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About This Manual

This manual contains the installation instructions for the HP 3000 Series 9X8/LX/RX Family Computer Systems.

This manual also contains information for installing the Distributed Terminal Subsystem and for configuring modems for remote support. This manual does not include instructions for installing networks.

This manual is organized as follows:

Chapter 1 About This Manual. Introduces the manual and describes its organization.

Chapter 2 Site Considerations. This chapter defines HP organizations and lists site preparation responsibilities.

Chapter 3 Receiving The System. This chapter provides information on receiving the system, instructions for unpacking the system, and putting it into position.

Chapter 4 Installation. Contains installation procedures and configuration information.

Chapter 5 Starting the Computer System. Provides instructions for turning on the equipment, booting MPE/iX, and running the verification program.

Appendix A Support Link Modem Configuration. Provides configuration information on a number of modems that can be used for the support link modem.

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Site Considerations

The HP 3000 9X8LX/RX family of computers are office environment computer systems that do not require special environmental controls. For this reason, no specific site preparation is required before the system is installed. Even though the computer does not require any site preparation, there are some site considerations and responsibilities that need to be addressed.

This chapter provides the environmental and electrical specifications for the HP 3000 9X8LX/RX systems. These specifications are provided to ensure the installation site is within the limits for the system. This chapter also lists the HP organizations and services available for site preparation for the HP 3000 9X8LX/RX family computers. It also lists and describes the responsibilities of the customer.

Site Preparation Considerations

The HP 3000 Series 9X8LX/RX computers are primarily designed to be used in commercial office environments. Except for verifying the environment and AC power, very little site preparation is required. When the computer is configured into a larger system employing numerous peripherals and mass storage devices, you should study and become more familiar with the contents of this chapter.

The CE or Site Preparation Specialist provides peripheral equipment power and environmental specifications contained in the *HP CEO Site Preparation Handbook* and the *HP 3000 and HP 9000 CE Handbook*.

It is the customers responsibility to ensure that the facility conditions are maintained in accordance with the information and specifications contained in this chapter.

This allows Hewlett-Packard to provide support services in accordance with the *Customer Support Services Agreement*.

Physical Considerations

Since the HP 3000 9X8LX/RX is a small physical package (refer to physical specs Table 2-5 it can be located next to a desk or placed in a dedicated computer room. Allow room for cables and access to the front and rear of the computer cabinet.

Be sure to allow for the peripheral equipment that comes with a computer system, such as peripheral cabinets, PowerTrust UPS, terminals, printers and other supporting equipment. Also allow for computer materials storage.

Electrical Considerations

Be sure the final installation site has enough AC outlets to support the computer and the peripherals located close to it. Be sure the outlets are grounded and are protected by a circuit breaker. Be very sure the AC power available meets the electrical specifications. Refer to Table 2-2 for the exact electrical specifications.

Specifications

Table 2-1. Environmental Specifications

Description	Specification
Operating Temperature	5°C to 40°C (41°F to 104°F)
Non-operating Temperature	-40°C to 65°C (-40°F to 149°F) (without internal DDS-format drive) -40°C to 45 °C (-40°F to 113°F) (with internal DDS-format drive - tape media limit)
Maximum Rate of Temperature Change	20°C (36°F)/hour (without tape media) 10°C (18°F)/hour (with tape media)
High Speed Fan (Activated)	30°C to 38°C (86°F to 100.4°F)
Overtemp Warning	40°C to 48°C (104°F to 118.4°F)
Overtemp Hardware Shutdown	Overtemp Warning +2°C ($\approx$3°F)
Operating Humidity	20% to 80% RH max wet bulb = 26°C, non-condensing
Non-operating Humidity	5% to 80% RH, non-condensing, less than 30% RH/hr rate of change
Operating Altitude	0 to 3048 meters (10,000 ft)
Nonoperating Altitude	0 to 4573.2 meters (15,000 ft)
Heat Dissipation (max load)	1300 BTU/hr
Operating Vibration (random)	0.0001 g^2/Hz, 5 to 350 Hz -6dB/Octave, 350-500 Hz 0.00005 g^2/Hz, 500 Hz ($\approx$ 0.21 G$_{rms}$)
Non-operating Vibration (sine)	0.5g (peak), 5 to 500 Hz
Shock (nonoperating)	Edge drop from 2.5 in. above floor
Sound Power	< 37°C = < 45 dB(A) sound pressure at operator's position. < 5.5 bels(A) sound pressure > 37°C = < 50 dB(A) sound pressure at operator's position. < 6.0 bels(A) sound pressure

Table 2-2. 2-Slot and 4-slot Chassis Power Specifications

Description	Specification
AC Input Voltage Range[1]	90 to 132 VAC and 180 to 264 VAC
AC Input Current[2]	6.5 A maximum load @ 100 VAC 3.5 A maximum load @ 240 VAC 2.4 A typical load @ 100 VAC & 50 Hz 2.1 A typical load @ 120 VAC & 60 Hz 1.3 A typical load @ 208 VAC & 60 Hz 1.3 A typical load @ 220 VAC & 50 Hz 1.2 A typical load @ 240 VAC & 50 Hz
AC Inrush Current	50 amperes peak, one cycle
AC Input Power	380 watts maximum, 230 watts typical
Power Supply Output Rating	240 watts DC continuous
AC Input Line Frequency	47 to 63 Hz

Transient Tolerance:
 	
    Low Energy
    High Energy
	
	3000 volts, 10μs, 500 ns rise/fall
	1000 volts, 1.2μs rise

Holdup without System Reset	20 ms @ 50 Hz (1 cycle)
Battery Backup Time	15 minutes with optional 600 VA PowerTrust UPS

Note [1] The power supply is an auto-ranging power supply. It does not have to be reconfigured to operate over its rated operating ranges. However, the system should not be operated at voltages between the two input voltage ranges.

[2] Typical load assumes 192MB memory, two internal disk drives, two peripherals, PSI I/O card, 802.3 LAN, and a 64MHz CPU.

The power supply can provide power for up to three internal peripherals.

Table 2-3. 2-Slot and 4-Slot Chassis DC Power Specifications [3]

Nominal Voltage	Minimum Current	Maximum Current	Minimum Voltage	Maximum Voltage	P-P Ripple
+5V[4]	3A	27A	+5.10V	+5.25V	50 mV
+5V_S	0A	5A	+5.10V	+5.25V	100 mV
+12V	0A	6.67A	+11.69V	+12.36V	100 mV
-12V	0A	2A	-11.69V	-12.60V	100 mV

Note

[3] Total power must not exceed 240 watts.

[4] +5V current includes +5V_S current.

Table 2-4. Electromagnetic Susceptibility Specifications

Radiated	3V/m, 28 MHz to 1 GHz
Conducted	3V rms, 30 Hz to 100 MHz 1V rms, 100 MHz to 400 MHz
Radiated Magnetic Field Immunity	1 gauss p-p, 48 Hz to 198 kHz
Electrostatic Air Discharge	5 kV - no effect 25 kV - no hardware failure
Electrostatic Contact Discharge	4 kV

Table 2-5. 2-Slot and 4-Slot Chassis Physical Specifications

Description	Specification
Width	222 mm (8.74 in.)
Height	430 mm (16.93 in.)
Depth	533 mm (20.98 in.)
Weight	31.8 kg (70 lbs)

Hewlett-Packard Responsibilities

Each member of the Hewlett-Packard service organization is dedicated to making sure that each customer realizes the maximum benefit from their computer system. HP is responsible for the installation and initial verification of the computer system. Table 2-6 summarizes a number of site preparation technical tasks and lists the personnel who should be responsible for completing each task.

Third Party Service

If an HP 3000 Series 9X8LX/RX Computer system and/or applications software is purchased from a "third party vendor", that third party is responsible for providing consultation services on the system operation and applications software.

In the situation of a third party purchase, a maintenance agreement for hardware and Account Management Service (AMS) for software are available directly from Hewlett-Packard.

Table 2-6. Technical Tasks/Personnel

Technical Task	Person Responsible
Line voltage measured	Electrician and HP CE
Power line frequency measured	HP CE
Power line noise levels measured	HP CE
Neutral to ground levels measured	HP CE
Safety and ground connections verified	Electrician and HP CE
Advice on correct circuit breakers and wire sizes	Electrician and HP CE
Verification that maintenance power outlets (those used for floor cleaning, etc.) are on separate circuits from the computer system.	Electrician
Recommendations about lightning protection	HP CE
Measurements and recommendations on radiated interference	HP CE
Answers to questions concerning modems and modem options	HP CE
Thermal load of HP equipment	HP CE
Thermal load of non-HP equipment	Customer/Vendor
Total air conditioning required	Customer/Contractor

Customer Responsibilities

The customer is responsible for scheduling, planning, and preparing a suitable environment for the complete computer system. The Hewlett-Packard CE will be available to assist the customer throughout the planning and preparation for and the installation of the system.

In the *Computer Products Site Preparation Resource Guide*, read the Site Planning and Warranty Information (Section 1) and the On-Site Customer Documents (Section 2). Pay particular attention to the contents of the Customer Responsibilities page in Section 1 and the forms contained in Section 2. (The forms in Section 2 will be completed as the site planning preparation and equipment installation progresses.)

Local Codes

Special local codes exist in some locations regulating the installation of computer equipment. The customer is responsible for making sure the system is in compliance with all local laws, regulations, and codes for mechanical, building, and electrical distribution systems prior to system installation.

Data Communications Equipment

The customer is responsible for ordering and installing all required data communications equipment such as:

- Modems (Consult with CE for Hewlett-Packard requirements.)
- Telephone equipment
- Equipment supplied by companies other than Hewlett-Packard
- Any hardware or cables for connection or installation

Receiving The System

This chapter contains information for unpacking and inspecting the computer, taking inventory of shipped goods, filing claims, repacking, and storing the system.

Unpacking and Inspection

The computer and its accessories may be shipped in more than one container. First, check to ensure that all the containers ordered by the customer are present, as specified in the carrier's Bill of Lading. Inspect each container for evidence of mishandling during transit. If any of the containers are damaged, request that the carrier's agent be present when the container is opened.

Unpack the shipping containers and inspect each item for damage. Look for damage such as broken controls and connectors, dented corners, scratches, bent panels, and loose components. Check the rigid foam packing material for signs of damage, which could indicate rough handling during transit.

Unpack the HP 3000 9X8LX/RX Computer

The unpacking of the computer is shown on the flap of the shipping box. To remove the computer from the shipping box, perform the following steps:

Warning	*DO NOT* try to lift the computer out of the shipping box. The shipped weight of the computer exceeds 70 pounds (32 kg). If the computer is dropped it could cause injury and will cause damage to the internal components of the computer.

1. Remove all loose parts inside the shipping box, and the inside shock absorbing packing materials. See Figure 3-1.
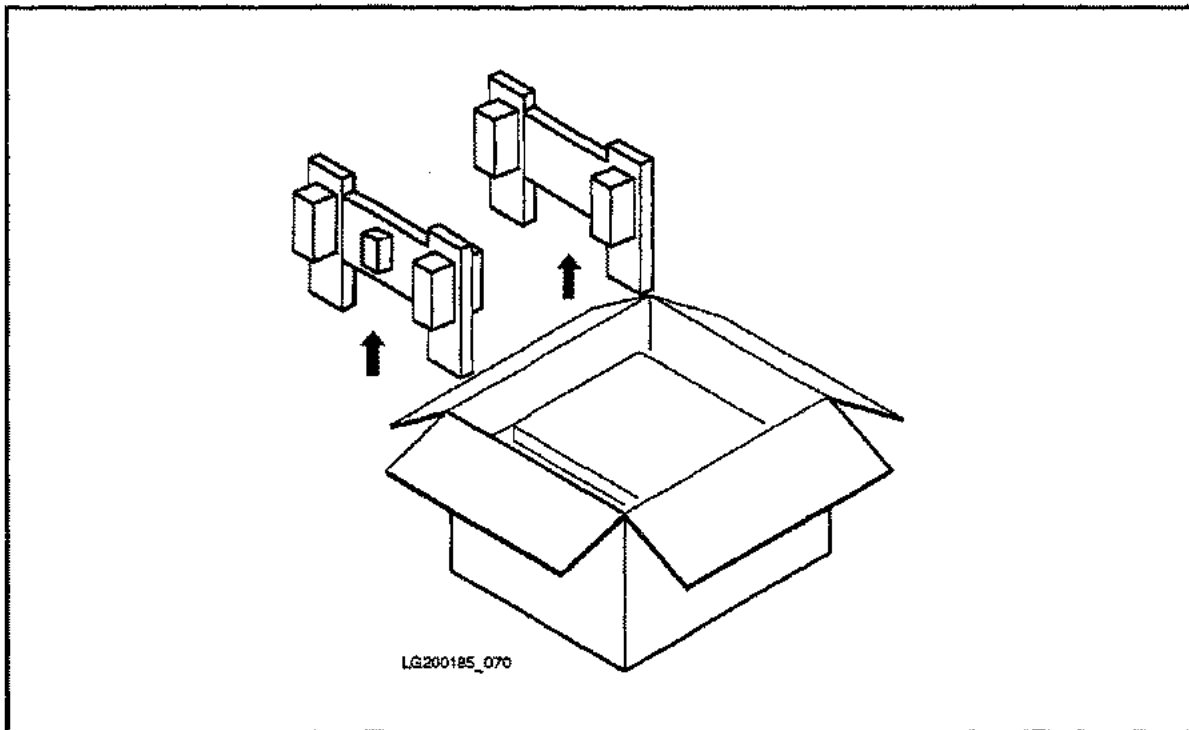
Figure 3-1. Removing Loose Parts

2. Close the flap with the handles cut in it, the other three flaps should be open.

3. Position yourself so that you must reach across the box to grasp the handles. See Figure 3-2.
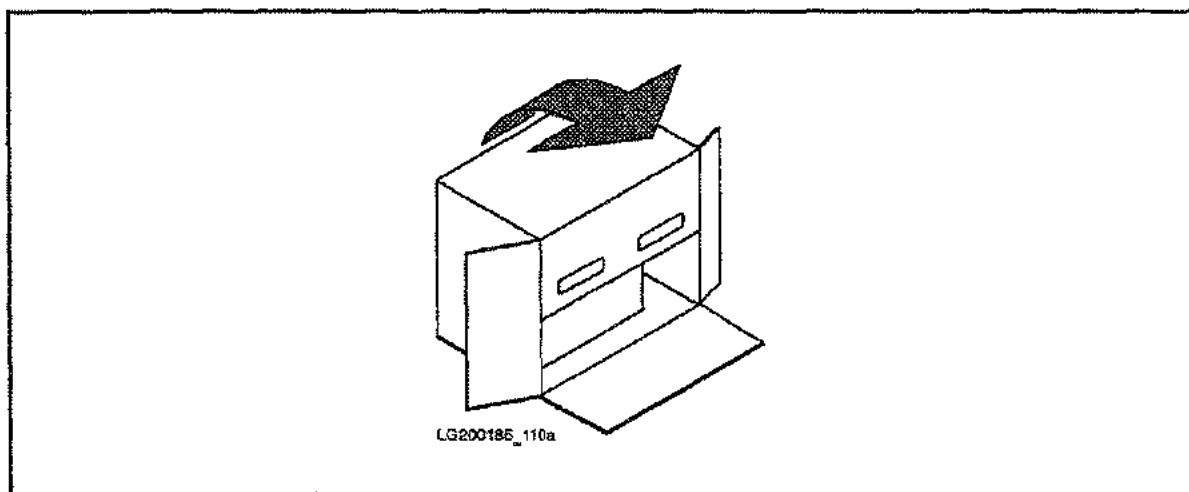
Figure 3-2. Positioning the Shipping Box

4. Grasp the handles and carefully pull the shipping box toward yourself until the shipping box rests on its side, with the handles on top. This positions the computer in an upright position, resting on its feet. See Figure 3-2.

Note	The feet on the bottom of the computer slide easily on cardboard. They should also slide easily over hard floors or carpets.

5. Open the top flap. See Figure 3-3. Reach into the shipping box and grasp the computer on the left and right side.
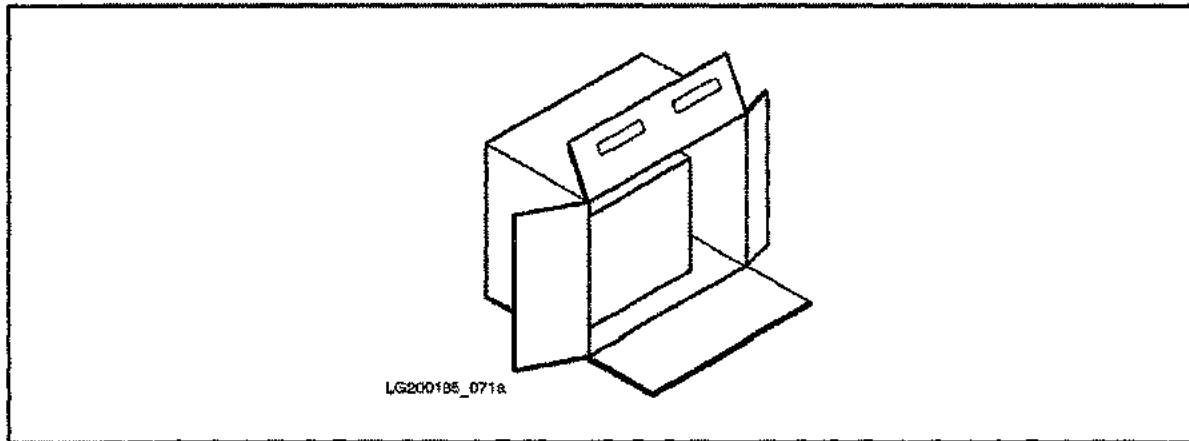
Figure 3-3. Raising the Flap

6. Pulling alternately with your left and right hand, slowly slide the computer out of the shipping box. See Figure 3-4. Save the shipping box and packing materials in case the computer needs to be moved to another location.
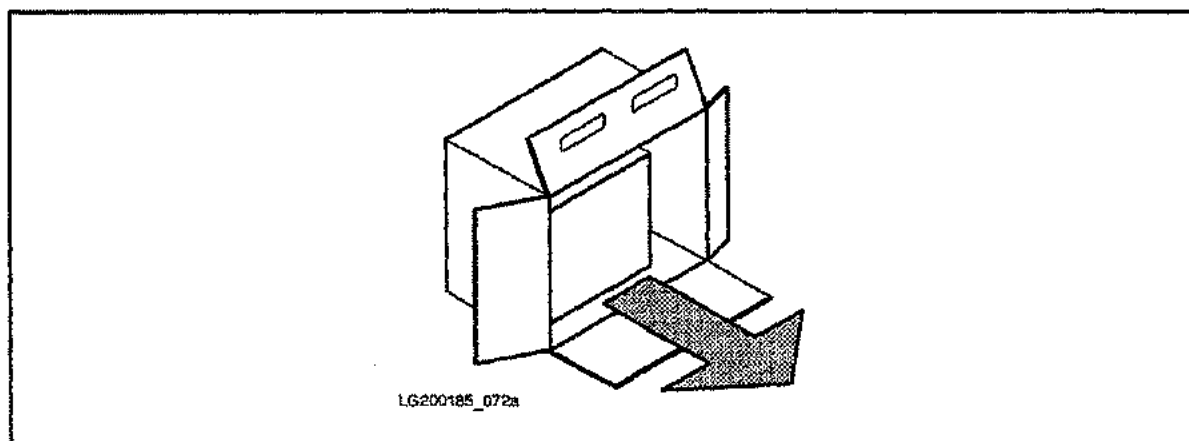
Figure 3-4. Removing the Computer from the Box

In Case of Damage

If damage is observed, refer to the claims Procedures section later in this chapter.

Physical Inventory

When the shipping containers is opened, locate the picklist which contains a list of equipment supplied. Compare the product and option numbers on the picklist with the purchase order to verify that the shipment is correct.

Manuals

Ensure that all of the manuals listed have been received. If any of the manuals are damaged or missing, refer to the Claims Procedure section.

Equipment

Ensure that all of the equipment on the list has been received. If any of the equipment is damaged or missing, refer to the Claims Procedures section.

Computer

Ensure that the model and serial numbers are identical to those specified on the picklist. The model and serial numbers are printed on a general information label, located on the back of the computer.

The computer comes with some peripherals embedded in the SPU cabinet. Check that these peripherals are integrated and that they match the equipment list. The general information label contains the serial numbers of the embedded peripherals, along with regulatory approvals and electrical ratings.

Claims Procedures

Notify the nearest Hewlett-Packard Sales and Service Office if the shipment is incomplete, damaged, or fails to meet specifications. If damage occurred in transit, notify the carrier as well.

Hewlett-Packard will arrange for replacement or repair without waiting for settlement of claims against the carrier. In the event of damage in transit, retain the packing container and packing materials for inspection.

Repacking

When computers must be reshipped, use the original shipping and packing materials, if available. Contact the local Hewlett-Packard Sales and Service Office for repacking information and materials.

Storage Requirements

Hewlett-Packard computer equipment can be stored or shipped in environments that fall within the following limits:

- Storage Temperature (with tape media): -40° to 45° C (-40° to 113° F)

- Storage Temperature (without tape media): -40° to 65° C (-40° to 149° F)

- Rate of change (with tape media): <10° C/hr.

- Rate of change (without tape media): <20° C/hr.

- Non-operating humidity; 5% to 80% non-condensing

- Humidity rate of change: <30% RH/hr.

Caution	The computer and components should be protected from environmental extremes that can cause condensation within the equipment. When installing the equipment, allow time for the temperature of the equipment to stabilize to the site environment.

4

Installation

This chapter contains information for installing the HP 3000 Series 9X8LX/RX Family Computer systems. All installation tasks should be performed by trained and experienced personnel only. The installation tasks are as follows:

- System Processor Unit (SPU) Installation

- System Console Installation

- Peripheral or Optional Equipment consisting of:

    Datacommunication Terminal Controller (DTC) Installation
    PowerTrust UPS Installation
    External Disk Cabinet Installation

Warning	Be sure the SPU is not plugged into a wall outlet or PowerTrust UPS before starting the Installation Procedures.

Installation Procedures

Tools required: Standard CE hand tool set, plus a #10 Torx driver.

SPU Installation

To install the SPU, perform the following steps:

1. Observe all ESD precautions while performing installation procedures on any electronic equipment.

2. Remove the I/O RFI covers from the slots that will hold any I/O cards to be installed.

Note	Refer to the *CE Handbook* (part number A2051-90003) for specific details on I/O card slot loading and configuration information.

3. Install optional I/O cards into an appropriate I/O slot. Make a note of the type of card inserted into the I/O slot, as well as the slot number. This information will be used during system configuration.

4. Connect all external peripherals to the appropriate I/O connector at the back of the SPU.

a. The top connector on the multifunction I/O card is for SCSI peripherals. If there are no additional SCSI peripherals to connect, install a SCSI terminator (part number 1252-3932) to the SCSI connector.
b. Refer to the documentation that came with the peripheral device for specific installation instructions for that device.
c. Use only the cables that come with the peripheral device.

Note	SCSI cable part numbers are listed in *Chapter 8* of the *CE Handbook*. *Chapter 4* of the *CE Handbook* has external SCSI cabling and configuration information.

d. Make a note of all device addresses that apply to system configuration, along with the slot number that they are connected to. Refer to the note in step 1.
e. Connect a BNC T connector to the **ThinLAN** connector on the Multifunction I/O card.

Note	The **ThinLAN** connector is enabled at the factory, and the **AUI LAN** connector is disabled. If the **AUI LAN** connector needs to be enabled, the Multifunction I/O card has to be removed and jumper block W1 needs to be repositioned. Refer to the *CE Handbook, Chapter 4* for more configuration information.

f. Do not leave any open I/O slots after all I/O cards are installed. This would violate the RFI specifications accommodated by the I/O slot covers.

5. Plug one end of the line cord into the AC receptacle at the rear of the SPU.

Note	Be sure the appropriate localized line cord (refer to Table 4-1 for line cord selection) is available with the SPU.
	Also, if the computer comes with a PowerTrust UPS, the UPS has to be installed before the SPU is powered up. The lime cord that comes with the SPU is used as the AC line cord for the UPS, and the SPU connects to the UPS with one of the convenience cords that come with the UPS.

Table 4-1. A2941A Line Cord Options

Part Number	Country	Male Type
8120-1351	United Kingdom	BS1363
8120-1369	Australia	AS3112
8120-1689	Europe	CEE7/VII
8120-1751	US 120V	5-15P
8120-3996	US 240V	6-15P
8120-2104	Swiss	SEV type 12
8120-2956	Denmark	DHCR
8120-4211	South Africa	SABS
8120-4753	Japan	JIS C 8303

System Console Installation

The recommended system console terminal for the HP 3000 9X8LX/RX family of computers is the HP 700/96 terminal. If the customer uses any other type of terminal for the system console, refer to the documentation that comes with the equipment for any installation information.

HP 700/96 System Console

1. Connect the system console cable (part number A1703-63003) to the Multifunction I/O card connector labeled **Console**, on the rear of the SPU.

2. Connect the other end of the system console cable to the console connector labeled **DATACOMM.**, located on the back of the console. Refer to the documentation that came with the console for specific installation instructions that apply to the device being used as the system console.

3. The HP 700/96 terminal default settings match the system requirements for terminal configuration.

Peripheral Equipment

Be sure to refer to the documentation that comes with any peripheral equipment for specific installation instructions.

DTC Installation

There may be multiple DTCs to be installed on the system. Repeat the installation instructions for each DTC installed on the system.

1. The DTC is connected to the SPU through the LAN link.

2. Connect another BNC T connector (part number 92227N) to the connector labeled **LAN Interface** on the back of the DTC.

3. Connect the LAN cable (all ready connected to the SPU) to the DTC BNC T connector.

4. If there is another DTC, connect a LAN cable from the other end of the BNC T connector to the next DTC.

5. On the last DTC installed, connect a LAN terminator (part number 92227P) to the remaining side of the BNC T connector assembly.

6. Cover all the BNC T connector assemblies with the fabric anti-static cover that came with the T connector.

7. Refer to the documentation that came with the DTC for complete installation and configuration instructions.

Note	Be sure that each end of the system LAN link has a BNC LAN Terminator (part number 92227P) installed.

PowerTrust UPS

To connect the PowerTrust UPS to the SPU, perform the following steps:

1. Locate the PowerTrust System Guide (part number 5961-8383).

2. Take the time to thoroughly read and understand all the necessary procedures outlined in the PowerTrust Guide. The PowerTrust requires recharge time before it is considered ready for normal operation.

Note	The line cord for the computer is used as the line cord for the UPS. The computer is connected to the UPS with a convenience cord supplied with the UPS. Be sure the appropriate localized line cord is used with the UPS (refer to Table 4-1).

External Disk Cabinet

To connect the external disk cabinet to the SPU, perform the following steps:

1. Be sure the disk cabinet ON/OFF switch is in the OFF (0) position.

2. Plug the power cord into the back of the disk cabinet, just below the ON/OFF switch.

3. Connect the end of the SCSI cable (part number 5062-3383 or K2296) to the bottom SCSI connector on the back of the disk cabinet.

4. Connect the other end of the SCSI cable to the top connector labeled SCSI on the computer back panel. Be sure the connector is securely fastened to the computer back panel.

5. Connect the external disk SCSI terminator (part number 1252-3920 or K2291) to the top connector on the back of the disk cabinet.

6. Plug the disk cabinet power cord into an appropriate ac wall outlet.

7. This completes the hardware installation of the external disk cabinet. Refer to the documentation that comes with the disk cabinet for any additional information.

Installation Completion

1. Make sure all (SPU and peripheral devices) power switches are in the OFF position.

2. Connect the SPU power cord to an appropriate AC outlet, or PowerTrust UPS outlet.

3. Connect all peripheral device power cords to appropriate AC outlets.

The computer system should now be ready for initial power up selftest, and system configuration. Continue to *Starting the Computer System* Chapter 5.

5

Starting the Computer System

The procedures listed in this chapter show you how to interact with the computer to get you to the ISL (Initial Software Load) prompt (ISL>_). When the ISL prompt is displayed, the command to load the MPE/iX operating system software can be issued.

Turning On the Computer System

The computer and its external equipment contain built in selftest programs. These programs automatically run each time the computer and the equipment are turned off and then turned on again.

Remember, depending on how much internal memory the computer has, the computer selftest can take up to approximately 2 to 5 minutes to complete.

Caution	*Do not* move the computer or disk cabinet while the power is on. Moving the equipment while power is on can cause disk damage and loss of data.

Initial Power On

When turning on the computer system (this includes all equipment) be sure to follow the sequence listed below:

Caution	If any of the external equipment has been OFF due to any environmental problem, such as heating or air conditioning failure, allow approximately 30 minutes for the temperature of the equipment to stabilize before turning on the computer.

1. Turn on all the external equipment (except the DTC) connected to the computer first. The DTC will be turned on later.

2. Check all READY or ONLINE indicator lights on the external equipment to be sure that they indicate being powered up and ready.

3. When all external equipment indicate READY or ONLINE by their particular indicator lights, press the computer ON/OFF switch to the ON position.

Power On Selftest and PDC Displays

The primary display for the computer is the system console in conjunction with the status display lights on the front of the computer.

1. The first thing displayed on the computer console is a line of messages along the bottom of the console screen indicating the selftest programs are running:

```
TEST nnnn REMOTE: disabled inactive multiple ACCESS FAULT: yy
```

While this display is active the amber Attention light should be on. This indicates that a test is being performed.

2. When selftest is complete, the console displays a screen similar to the following:

```
---------------------------------------------------------------------------
    xx MB of memory configured and tested.
    Primary boot path:    56/52.6  (dec)
    Alternate boot path:  56/52.0  (dec)

---- Main Menu -------------------------------------------------------------

    Command                          Description
    --------                         -----------


    BOot [PRI|ALT|<path>]            Boot from specified path
    PAth [PRI|ALT] [<path>]          Display or modify a path
    SEArch [DIsplay|IPL] [<path>]    Search for boot devices

    COnfiguration menu               Displays or sets boot values
    INformation menu                 Displays hardware information
    SERvice menu                     Displays service commands

    DIsplay                          Redisplay the current menu
    HElp [<menu>|<command>]          Display help for menu or command
    RESET                            Restart the system
--------
Main Menu: Enter command or menu>  __
```

The xx MB indicates the amount of memory in the system. Within the main menu, the commands or menu can be entered with the letters in capitals, for example; booting from the primary boot path would be:

```
Main Menu: Enter command or menu>BO PRI (Enter)
```

or a menu request would be:

```
Main Menu: Enter command or menu>IN (Enter)
```

Where the IN entry would display the system hardware information.

3. At the `Main Menu: Enter command or menu>` prompt, enter the boot from primary boot path command (**BO PRI**).

4. The system returns a query of:

```
Interact with IPL Y/N?>  __
```

Type Y (Enter). The HP 3000 9X8LX/RX systems do not have the autoboot function enabled, you must interact with the Initial Program Loader (IPL) software. An N entry will still put you into IPL.

5. At this point the Initial System Loader (ISL) prompt (ISL>) is displayed. The system should be waiting for your response to the ISL> prompt.

6. Respond to the ISL> prompt with the START command, (or any of the applications available in ISL). The START command launches the MPE/iX operating system software.

```
ISL> START (Enter)
```

7. After a few minutes, you are prompted to confirm the date and time as shown below. *If you do not respond within 15 seconds, the system accepts the displayed date and time by default, and continues with the start-up process.*

   a. If the date and time displayed are accurate, type Y and press (Return), or wait for the time out.

   b. If they are not, type N and press (Return) within the 15 seconds allowed.

   Enter the correct date and time when prompted. Time must be entered in 24-hour format (for example, 5:00 pm, is entered as 17:00). Seconds default to 00 if not specified.

```
MPE/iX launch facility
Initialize_genesis - Version : <<870204.1552>>
TUE, AUG 11, 1993, 10:20:03 AM (y/n)? Y

[TMUX_DAM] n n n n
Initialize genesis completed.
```

The fundamental operating software is starting.

During the launch of the MPW/iX operating system ERROR and WARNING messages will be displayed on the console telling you that unconfigured devices are attached to the system. These messages are normal during the first boot up. They appear during the first boot up because the final configuration is not done. Among the messages you may see are these:

```
DCC warning  103-5, Add ldev to class failure (HLIO status FF6A00BD,.

DCC warning  103-5, Add ldev to class failure (HLIO status FF6A00BD,.

DCC STARTUP - ERROR
```

The system is making many internal checks and is reporting that the configuration is not complete. When this checking process is complete a welcome message is displayed on the console. You are automatically logged on to the system as OPERATOR.SYS.

8. When the system prompt (:) is displayed, all the system selftests are complete. At this time, turn on the DTC(s). The configuration process can begin.

Installation Verification

Once the configuration is complete, the system installation can be verified by the use of the *Verifier* program.

The Verifier program usually resides in the DIAG group of the SYS account. However, a command file named VERIFY.PUB.SYS is provided to setup the proper environment for Verifier operation.

To invoke MPE/iX Verifier log on as Manager.Sys (or any log on with SM, OP or DI capability) and enter the following:

VERIFY

Follow the program prompts on the console screen. Verifier performs more than one task at one time. For this reason, you will frequently see messages for assorted devices interspersed with one another, this is normal.

Verifier global status messages

When Verify is finished it prints one of three status messages indicating:

If everything verified as *okay* a message similar to the following appears:

```
System verification is complete. Everything is okay.
Proceed with the next operation...
```

If something needs *attention*, a message similar to the following appears:

```
ATTENTION: System verification indicates that noncritical
devices are not all working.
```

This message indicates a problem with a *noncritical* device. A noncritical device is everything *except*: system disks, nonsystem (private volume) disks and tape drive logical device 7.

If there is an *error*, a message similar to the following appears:

```
ERROR: System verification failed. Critical devices are
not functional.  Do not continue to use the system.
```

This message indicates a *critical* device failed. You should not attempt to use the system until the problem has been corrected. *Critical* devices are all system disks, all non-system (private volume) disks and tape drive logical device 7.

Verifier log file

In addition to the messages described above, MPE/iX Verifier creates a log file named VERLOG. This file contains a detailed history of the verification actions and status messages and a system I/O map which shows the current status of each device and the overall system status.

VERLOG is created in the group and account from which Verifier is invoked. However, a file equation can be used to redirect it to another location.

A

Remote Support Modem Configuration

This section contains information for connecting specific modems to the HP 3000 9X8LX/RX Family Computer System. This section also discusses the signal line behavior of the Multifunction I/O modem interface to aid in configuring modems that are not listed.

General rules for configuring modems:

- The modem must be set up to respond to DTR.

- CTS should follow RTS.

- DSR must follow OH, not DCD.

- For Bell mode, the modem should disregard RTS.

- Set both local and remote modems to either:

  - the same compression mode, OR
  - to NO data compression.

    If problems occur connecting two modems, usually the fault is that one is enabled for some MNP level and the other modem is set for no data compression.

If the modem sends up-modem dialog with all of the signals asserted, it is possible for the user to be logged off immediately when a password is enabled for the Access Port. This can be corrected by setting the modem so it does not report connection status via the data path.

Note	V.22bis/V.25bis modes are not supported on the A1703-60003 or A1703-60022 Multifunction I/O interfaces.

Quick Reference

Table A-1 is a quick reference table for the supported modems for remote support. For detailed information, refer to the appropriate section of this appendix.

Table A-1. Settings for Remote Support Modem (Quick Reference)

Modem Model	Settings
HP50759A (Support Link)	X1, X2, X3, X4, and S8: Down S1, S3, S4, S5, and S6: Up S2 and S7: Do not care
Hayes Smartmodem 2400	S3, S9, and S10: Down S1, S4, S5, S6, and S7: Up S2: Do not care
Black Box V.32 Plus (2.01.01)	AT&D2&S1&C1&R (See Black Box V.32 section for details)
Multitech MT224EH7	X1, X4, S3, S7, and S8: Down X2, X3, S1, S2, S4, S5, and S6: Up
HP 37212B	S1, S2, S4, S5, S6, S7, and S10: Down (0) S3, S8, S9, S11, and S12: Up (1)

HP Support Link (HP50759A)

Supported modes:

- Bell
- CCITT_OM
- CCITT_AM
- CCITT_BIS_OM
- CCITT_BIS_AM

Supported cables:

- HP 92219Q - Bell, CCITT_OM, CCITT_AM
- A1703-63006 - CCITT_BIS_OM, CCITT_BIS_AM

Auto-dial modes: Hayes

This modem is the standard HP Support Link. It supports V.22bis line discipline, but does not support V.25bis auto-dialing. In order for V.22bis answer mode to work properly, DSR must follow OH. Data Compression should be set *OFF*. Setting data compression *ON* can cause problems when connecting to other modems that do not have data compression.

Table A-2. 8-Position DIP Switch Option Settings (Set S)

Switch	Position	Description	Option Command
S1	up	DTR Normal	&D2
S2	xx	Verbose Responses	V1
S3	up	Suppress Responses	&Q0
S4	up	Enable Echo of commands	E1
S5	up	Enable Auto-Answer	S0=1
S6	up	DCD/DSR Normal	&C1 &S1
S7	xx	Depends on phone line	
S8	down	Enable Command Mode	

Note

xx means do not care.

Table A-3. 4-Position DIP Switch Option Settings (Set X)

Switch	Position	Description	Option Command
X1	down	CTS Normal	&R0
X2	down	DSR Follows OH	&S1
X3	down	Use HP Defaults	&E0 &E3 &E6 &E10 &E14 $BA1
X4	down	No ENQ/ACK Pacing	&E8

Note

An AT15I7 command should have the following output:

B0 E1 M1 Q0 V1 X0 &E0 &E3 &E6 &E8 &E10 &E14 &Q0
$MB2400 $SB2400 $BA1 &W1

&A0 $A0 &B0 &BS1 &C1 &D2 $D0 $F1 &G0 &I0 &M0 $MI0 &R0 $R0 &S1 &T5
&V1 &W1

OK

Hayes Smartmodem 2400

Supported modes:

- Bell
- CCITT_OM
- CCITT_AM

Supported cables:

- Must use 92219Q modem cable.

Auto-dial modes: Hayes.

This modem drives circuit 111 (Pin 23) instead of using it as an input. With either cable (92219Q or A1703-63006), the Multifunction I/O PCA and the modem, drive the same line.

Caution	This modem should not be used because all HP cables connect circuit 111 to the modem. If this modem is connected, both the Multifunction I/O PCA and the modem drive circuit 111. This modem has been used in the past with the CIO based AP card and had the same problem.

Turn off all data compression modes.

The Hayes defaults for the modem lines must be changed to the following:

Table A-4. Switch Option Settings

Switch	Position	Description	Option Command
S1	up	DTR normal	AT&D3&W
S2	xx		
S3	down	Result codes disabled	ATQ1&W
S4	up	Characters echoed	ATE1&W
S5	up	Auto-Answer enabled	ATS0=1&W
S6	up	Detect Carrier	AT&C1&S1&W
S7	up	RJ-11	AT&J0&W
S9	down	CCITT	ATB0&W
S10	down	Return to command state	AT&D3&W

Note	xx means do not care.

Black Box V.32 Plus (Version 2.01.01)

Supported modes:

- Bell
- CCITT_OM
- CCITT_AM

Supported cables:

- Must use 92219Q modem cable.

Auto-dial modes: Hayes.

This modem does not work with v.22bis because it does not supply 112 and because the sense of 111 is backwards (TRUE means low speed, FALSE means high speed). The fact that 111 is backwards is not too big a problem because the modem can be configured to ignore 111. Change so that DTE Fallback is *Disabled*. This is the factory default. Not supplying 112 means that the Multifunction I/O PCA always thinks it is running at the lower speed. If you set the speed for twice the desired speed, then it will work at the desired speed. It is best not to use this modem with any of the CCITT bis protocols.

The Black Box defaults for all of the modem lines are incorrect and must be changed before this modem will work properly. To do this from the front panel, go into the Change DTE Parameters and set the following:

Responds to DTR
DSR is Normal
DCD is Normal
CTS follows RTS

This can be done with the following AT command: AT&D2&S1&C1&R

For Hayes dialing, make certain that the AT command set is enabled. It is normally good to disable status messages to the host by using the ATQ1 command.

The current configuration can become the power-on configuration by using the AT&W command.

This modem does not do any rate shifting. So the DTE rate and the DCE rate must be the same.

This modem seems to work in AP mode with the protocol set to either Bell or CCITT. It does not work with the modem protocol set to CCITT_BIS. Make certain to configure the modem to ignore 111, or configure the Access Port to set FS low. It also seems to work fine in normal mode (i.e. under host control).

Multitech MT224EH7

Supported modes:

- Bell
- CCITT_OM
- CCITT_AM
- CCITT_BIS_OM
- CCITT_BIS_AM

Supported cables:

- HP 92219Q - Bell, CCITT_OM, CCITT_AM
- A1703-64006 - CCITT_BIS_OM, CCITT_BIS_AM

Auto-dial modes: Hayes, V.25bis.

Note	The version of the modem has a problem when dialing with V.25bis where if the number that is dialed is busy, DSR does not drop. This same problem causes V.25bis error indications to be improperly decoded, meaning that the modem time-out timer must expire before we know that the attempt failed. This also means that multiple dialing attempt will always fail. If the DSR jumper is set so that DSR follows DCD, this problem goes away.

The configuration of the hardware switches on the modem are:

8-position DIP-Switch (S switches):

```
Switch:    1    2    3    4    5    6    7    8
---------------------------------------------------
           UP   UP   DOWN UP   UP   UP   DOWN DOWN
```

4-position DIP-Switch (X switches):

```
Switch:    1    2    3    4
----------------------------------
           DOWN UP   UP   DOWN
```

For Hayes mode to work correctly, AT&R0 must be set so that it drops CTS when the connection goes down. For Hayes, AT$V0 must be set. For V.25bis dialing, VT$V1 and AT$BA1 must be set.

Hayes dialing parameters:

```
B0 E1 M1 Q0 R0 V1 X0 &E1 &E4 &E6 &E8 &E10 &E13 &E15
$MB2400 $SB2400 $BA1 &W0


S0    S2    S3    S4    S5    S6    S7    S8    S9    S10   S11   S12   S24   S25   S30
001   043   013   010   008   002   030   002   006   007   070   050   020   000   000


$A0 &A0 &B0 &BS1 &C1 $D0 &D2 #DB0 $EB0 $F1 &G0 #L0 $MI0 &M0
&P0 #P2 &Q0 &Q3 $R0 &R1 &S1 $T1 &T4 $V0 $VD0 &X0 Y0
$MB2400 $SB2400 $BA1 &W0


OK
```

For V.22bis auto-answer, internal jumper DSR must be set so that DSR follows OH. The factory default is for DSR to follow CD. This is different from the Support Link where the factory default was for DSR to follow OH. There does not seem to be an AT command that does this.

V.25bis dialing parameters:

```
BO E1 M1 QO RO V1 XO &E1 &E4 &E6 &E8 &E10 &E13 &E15
$MB2400 $SB2400 $BA1 &WO


SO   S2   S3   S4   S5   S6   S7   S8   S9   S10  S11  S12  S24  S25  S30
001  043  013  010  008  002  030  002  006  007  070  050  020  000  000


$AO &AO &BO &BS1 &C1 $DO &D2 #DBO $EBO $F1 &GO #LO $MIO &MO
&PO #P2 &QO &Q3 $RO &R1 &S1 $T1 &T4 $V1 $VDO &XO YO
$MB2400 $SB2400 $BA1 &WO
VAL
```

To modify a MT224E7B:

- Open modem and change the DSR jumper.
- Set switches on the bottom of the box to above.
- Send AT&R0
- For Hayes dialing, send AT$VO.
- For V.25bis dialing, send AT$V1.

HP 37212B

Supported modes:

- Bell
- CCITT_OM
- CCITT_AM
- CCITT_BIS_OM
- CCITT_BIS_AM

Supported cables:

- HP 92219Q - Bell, CCITT_OM, CCITT_AM
- A1703-64006 - CCITT_BIS_OM, CCITT_BIS_AM

Auto-dial modes: None

It is best to use this modem in CCITT mode because it causes the Access Port to hang up if used in Bell mode at 1200 baud. It can be used in Bell mode at 2400 baud, or either 1200 or 2400 in CCITT mode. This modem can not be dialed with either Hayes or V.25BIS auto-dial protocols. Table A-5 describes the switch settings.

Table A-5. HP 37212B Switch Configuration

Switch	Position	Description
S1	down	
S2	down	Computer mode operation (HP command set)
S3	up	
S4	down	Primary channel
S5	down	1 start, 8 data and 1 stop
S6	down	
S7	down	Error correction disabled
S8	up	No Flow control
S9	up	
S10	down	DSR/CTS/CD to RS-232-C definition
S11	up	
S12	up	DTR behaves to RS-232-C definition

Note

Although this modem claims to be able to dial using V.25bis, it only uses the V.25bis line discipline. The command set does not match the set specified in the V.25bis specification.

Modem Cable Pin-out

Table A-6 list the pin-outs for the 92219Q cable, which is most often used to connect the Access Port to the support modem.

Table A-6. 92219Q Cable Pin-out

Computer End	Signal Name	Modem End
2	TD	3
3	RD	2
8	RTS	4
22	CTS	5
20	DSR	6
6	DTR	20
9	RI	22
4 and 5	DCD	8
23	FS	23
7	GROUND	7

The pin-out for the A1703-63006 cable is the same except that pin 9 on the computer end is routed to pin 12 on the modem end and that Line functions as Rate Select (RS). This cable is only used with the A1703-60003 SCSI/Console/LAN Multifunction I/O interface for V.22bis/V.25bis applications.

Multifunction I/O PCA Modem Line Behavior

CCITT Mode AP protocol 0

This protocol is known as HP-UX CCITT. The card waits for RI before raising DTR. It also raises RTS when it raises DTR. If DSR does not come up within 25 seconds, DTR goes back down. The connection also depends on CTS and DCD. DCD can drop for up to 400ms before the connection will drop. CTS must stay high always. Once CTS drops, the connection starts to drop. A new connection cannot occur until DSR, DCD and CTS all drop. FS can be programmed to either state via the CA command.

Bell Mode AP protocol 1

This is sometimes called Bell simple protocol. It raises DTR when it can accept a connection. The connection is valid when it sees DCD. It drives RTS whatever it was when Remote is enabled (usually, RTS is low) and does not look at DSR or CTS. When a disconnect is done, DCD must drop before a new connection can be made (i.e. it will not raise DTR until DCD drops).

CCITT_BIS Mode AP protocol 2

This protocol is CCITT V.22bis. It requires the special cable A1703-63006 which is just like the 92219Q cable with the exception that pin 9 on the computer end is routed to pin 12 (RS) rather than pin 22 (RI). DTR is raised whenever a connection is allowed. RTS follows DSR. A connection is established when DSR is high. CTS can drop for an indefinite amount of time without dropping the connection. The card will not send data to the modem when CTS is low. DCD can drop for up to 400ms before the connection is dropped. Once the connection is dropped, DSR, DCD and CTS must all go low before a new connection can be made. RS controls what speed the card sends to the modem. If RS is high, the programmed baud rate is used. If RS is low, half of the programmed baud rate is used. If you use the 92219Q cable, the baud rate will most certainly be half the programmed baud rate, since RI will almost always be down. FS can be programmed to either state via the CA command.

Modem Settings (HP Predictive Support)

The *HP Predictive Support User's Guide for HP 3000 Series 900* (p/n 50779-90012) contains additional information on HP predictive support modem settings. Table A-7 contains a quick reference description of the modem switch settings for autodial modems connected to the LAN/Console port.

Note	Some of the settings in Table A-7 are different than those described in the first part of the Appendix. This is true for modems connected to a DTC or manually dialed modems. Please refer to HP Predictive Support on-line help for proper switch settings. Also be aware that the modems listed here are not necessarily recommended or supported as Remote Support Modems.

Table A-7. Predictive Support Modems and Switch Settings

Modem Type	Switch Settings[1]
HP 50759A (Support Link)	X1, X2, X4, S4, and S8; Down All others; Up
HP 50759B	S2, S3, S4, S7, S8, S9, S12, and S16; Down All others; Up
HP 37212A	All switches; Open
HP 37212B	S3, S11, and S12; Up All others; Down
Hayes Smartmodem	S4, S8, and S10; Down
Support Link I	Option 1: Code 3 Option 1: Code 2 Option 8: Code 2 Option 15: Code 2 Option 16: Code 2 Option 22: Code 1 for pulse Option 22: Code 2 for tone Option 22: Code 3 for autoselect Option 24: Code 2
Support link II	Option 1: Code 3 Option 1: Code 2 Option 8: Code 2 Option 15: Code 2 Option 16: Code 2 Option 22: Code 1 for autoselect Option 22: Code 2 for tone Option 22: Code 3 for pulse

Note

[1] The switch settings are for autodial modems connected to the LAN/Console port.