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Installing Peripherals

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Introduction

This manual describes how to add many devices to your HP Series 300 and/or HP Apollo 9000 computer system and is intended to be read by system administrators. You should locate and have available the following manuals:

- *How HP-UX Works: Concepts for the System Administrator*, HP part number B1852-90005
- *System Administration Tasks Manual*, HP part number B1862-90008

Note	If your system is part of an HP-UX cluster you should additionally locate and have available the <i>Managing Clusters of HP-UX Computers</i> , HP part number B1862-90010.
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References will be made to these manuals where necessary. You should also have the documentation that was shipped with your device available.

Manual Organization

The two volume *Installing Devices* set has a “paired” chapter organization. For each type of device you will find the following:

- | | |
|------------------------------|--|
| An “Installing ... ” chapter | containing the hardware installation procedures, |
| followed by; | |
| A “Setting-Up ... ” chapter | containing the HP-UX configuration instructions. |

The “Setting-Up ... ” chapters focus on providing the necessary HP-UX values, in the form of tables, for setting up your device using SAM (System Administration Manager). If SAM is not available, use the final chapter of each volume to learn how to set up HP-UX for devices using commands. If you use commands, refer to the HP-UX values provided in the “Setting-Up ... ” chapter for your device type to complete the set up task.

This book, *Installing Peripherals, Volume 2*, contains the hardware installation and HP-UX software set up instructions for:

- printers
- plotters
- graphic devices
- computer accessories

Installing Peripherals, Volume 1 contains the hardware installation and HP-UX software set up instructions for:

- | | |
|------------------------|--------------------|
| ■ interface cards | ■ graphic displays |
| ■ accessory cards | ■ disk drives |
| ■ terminals and modems | ■ tape drives |

Installing Peripherals, Volume 1 also contains instructions for installing memory and I/O Expanders.

1-2 Introduction

Overview of Adding a Peripheral

There are 10 basic steps required to add peripheral devices to your system. The following is a generic, cookbook procedure, highlighting the major steps for installing a peripheral. Consult the *Installing Peripherals* manual for detailed information related to the following steps.

1. Play it safe.
 - a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.

In the case of SCSI devices and interface cards this step is required. For all other cases it is recommended but not required.
2. Determine the hardware address or location of the peripheral. The best location to connect your peripheral depends on the shared sets of I/O resources and the expected usage. For example, you would not want to connect a plotter to the same HP-IB interface as your root disk. This would substantially degrade your disk performance. A better location for the plotter would be on a separate HP-IB interface with other slower devices.
3. Install the peripheral. This can involve two steps: (1) installing an interface card and (2) connecting the peripheral to the interface card. Consult the documentation that came with the peripheral and the section in the *Installing Peripherals* manual dedicated to the particular interface and/or peripheral.
4. Reconnect the power cord to your computer and turn it on. This will cause your system to reboot. This is not necessary if you did not turn your system off in step 1.
5. Determine how the peripheral is to be accessed: block or character (raw) mode. A device file must exist for each type of access to the peripheral.

6. Determine the device driver necessary to communicate with the peripheral.
7. Determine if the device driver necessary to communicate with the peripheral is part of the current kernel configuration. You can use SAM for this or look at the the system configuration file `/etc/conf/dfile`.
8. If the device driver is not part of the current kernel configuration, you will need to edit the system configuration file to add the device driver and regenerate the kernel. You can use SAM for this entire process or edit the files and regenerate the kernel using HP-UX commands. Refer to *System Administration Tasks Manual* Chapter 2: "Constructing an HP-UX System" for regenerating your kernel.
9. Determine if the device file necessary to communicate with the peripheral device already exists on your HP-UX system. Device files are located in the `/dev` directory. The device files shipped with your system are shown in Table 1-1. If you do not wish to use these device names, you can link them to the name you wish. However, do not link the file `/dev/dsk/0s0` to another filename.
10. If the appropriate device file does not exist for the newly installed peripheral, you must create one. If you are using SAM to add your device, SAM will create the device file. If you are not using SAM, use the `mknod` command to creat the device file.

Note

If your system is a cluster, you must execute SAM or HP-UX commands on the cluster node to which the device connects.

Device Files

The HP-UX operating system requires the existence of special files, called **device files**, to perform I/O to peripheral devices. Each peripheral on your system needs a device file associated with it in order for HP-UX to communicate with the peripheral. Device files are created using the **mknod(1M)** command. If you are using SAM, SAM will automatically create the device file for you when you add the peripheral to your system. If you are not using SAM, you must directly execute **mknod** to create the device file. Adding your peripheral using the **mknod(1M)** command is described in *Installing Peripherals, Volume 1* Chapter 9: "Setting Up Devices Using HP-UX Commands" and *Installing Peripherals, Volume 1* Chapter 7: "Setting Up Devices Using HP-UX Commands". Device files contain the encoding the following peripheral attributes:

Select Code	All peripherals connect to an interface card, either built-in or optional. The interface card has switch settings on it that identify the interface card on the DIO bus. These switch settings are referred to as the select code . Each interface card must have a unique select code.
Bus Address or Port Number	There are interfaces to which more than one device can connect. For these interfaces (HP-IB, SCSI, RS-232C multiplexers, etc.) the device is assigned a number. This number is the bus address for HP-IB and SCSI interfaces and port number for RS-232C interfaces that have more than one port like multiplexers.
Device Type	Each device can be classified as a block device or a character device depending on the method used to transfer data to and from the device.
Device Driver	Each device has a software module that arbitrates communication between HP-UX and the device called a device driver . The device drivers are listed in the /etc/master file. The driver must be included in the kernel configuration file, /etc/conf/dfile .
Device Information	Additional device information is device and driver specific. This information controls the device behavior. For example, a tape drive can be instructed to rewind or not rewind after an access.

There are four parameters to the `mknod(1M)` command:

- device filename (absolute or relative)
- file type
- major number
- minor number

The device file type parameter contains the device type attribute.

The file type parameter may specify a block or character device type.

The major number specifies the driver in numeric form. The `lsdev(1M)` command will display major numbers for all the device drivers. To find out what drivers are necessary to use your peripherals, look in `/etc/master` for the list of available drivers and a product number/driver alias table. Look up your product number in the alias table; you will need the associated driver number. For example, if you look up 9122, you will see that you need a `cs80` driver.

The minor number parameter contains the select code, bus address or port number, and the additional device information encoded in a 6 digit hexadecimal number, for example `0xFaF201`. The minor number format varies from device type to device type. The minor number format for each device type is described in *Installing Peripherals, Volume 1* Chapter 9: "Setting Up Devices Using HP-UX Commands" and *Installing Peripherals, Volume 2* Chapter 7: "Setting Up Devices Using HP-UX Commands".



Miscellaneous Device Files

The miscellaneous device class includes the device files that the system needs to run properly. Each HP-UX installation must have the device files `/dev/null`, `/dev/console`, `/dev/mem`, `/dev/kmem`, `/dev/dsk/0s0`, `/dev/swap` and `/dev/tty`. The device file `/dev/null` is a null file (a “bit bucket”) used by many HP-UX commands. The device file `/dev/console` identifies the system console and the device file `/dev/tty` is a synonym for the control terminal associated with a process group.

These miscellaneous device files are copied to your system when HP-UX is installed. *They should not be changed or modified.* If one or more of these files is accidentally deleted or otherwise destroyed, you can recreate it with the `mknod` command using the character/blocked designation, major, and minor numbers given in Table 1-1.

Although there are additional device files created when HP-UX is installed, only the ones listed in Table 1-1 are vital to booting and running HP-UX.

Table 1-1. Default Device Files

Device File	File Type	Major Number	Minor Number	Device Description
<code>/dev/console</code>	c	0	0x000000	System message port
<code>/dev/syscon</code>	c	0	0x000000	System console (linked to console)
<code>/dev/systty</code>	c	0	0x000000	System tty (linked to console)
<code>/dev/tty</code>	c	2	0x000000	Process group control terminal
<code>/dev/null</code>	c	3	0x000002	Null file (“bit bucket”)
<code>/dev/mem</code>	c	3	0x000000	Physical memory image
<code>/dev/kmem</code>	c	3	0x000001	Kernel virtual memory image
<code>/dev/swap</code>	c	8	0x000000	Swap device
<code>/dev/dsk/0s0</code>	b	255	0xffffffff	Root pseudo device file

Note The `/dev/dsk/0s0` device file (the root device) *must not* be removed from the system or linked to another file name, if HP-UX is to operate properly.

There needs to be a `/dev/systty` (which is linked to `/dev/console`), and a `/dev/syscon` (which is linked to some terminal—usually the console). This is explained in *init(1M)*.

HP-IB Device Guidelines

The following list provides some guidelines for HP-IB interfaces.

- DO NOT connect or disconnect an HP-IB device while the system is running, or turn power on or off to an HP-IB device while connected to a powered-up system. This could result in bad data on the HP-IB bus.
- If you should need to change the bus address switch settings on an HP-IB device, be sure to perform the task in the following sequence:
 1. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
 2. TURN OFF the computer and unplug the power cord.
 3. Change the switch settings on the device.
 4. Turn on the device.
 5. Turn on your system.
- The system root device (hard disk) is usually located at select code 14, bus address 0 on a (high-speed) HP 98625A, HP 98625B, HP 98262A high-speed disk interface card, or SCSI interface card (HP 98265A).
- The built-in (internal) HP-IB is always at select code 7.
- The system printer (if present) should be on a low-speed HP-IB interface, separate from the system root device. A bus address of 1 is typical.
- An HP 7971 9-track tape must be placed on a low speed HP-IB. A bus address of 3 is typical.
- An HP 7974 or 7978 9-track tape drive should be placed on a high-speed disk HP-IB, if possible. A bus address of 3 is typical.
- Avoid putting flexible disk drives, cartridge tape drives, or 9-track tape drives on the same interface as the root device.
- Plotters and the HP 9111 graphics tablet should be placed on separate low-speed HP-IB interfaces when possible. Typical bus addresses are 5 and 6 for plotters and graphics tablets, respectively.

RS-232C Cabling Guidelines

Terminology and Background

The type of connect that a device (SPU or peripheral) provides is usually one of, or a variant of:

DCE	Data Communications Equipment
DTE	Data Terminal Equipment
DQE	Nominally wired DCE, but with DTE hidden on pins unused by EIA.

Historically, DCEs were modems, and DTEs were whatever “terminated” the data path, typically an actual terminal and one end, and the computer at the other. A pair of DCEs were always assumed to be in the link, and they used something other than RS-232 to communicate with each other. The generalized circuit was:

```
Computer[DTE]---{ DCE~~phone lines~~DCE }---[DTE] terminal
```

The connectors and pin-outs at the DCE (“-{}” above) are specified. The cable termination at the DTE itself is not, and in the early days, the cable was hard-wired right into the device (typically an ASR-33 TTY).

When the EIA created RS-232, it failed to adequately describe the case of direct computer-peripheral connection. This is the now-common configuration of DTEs connecting directly to other DTEs, with no DCEs in sight. This may be what you are trying to do, and why you are reading this document. Today’s devices, and their serial connectors, often do not clearly fall under DTE or DCE, and they provide a dismaying assortment of connector genders, styles and pin counts.

Although nominally a 25-pin connection, HP systems typically provide a maximum of 9-pins, sometimes 7, and all that is really required for a device-device direct connection is 3 pins.

Despite this potential confusion, the terms DTE and DCE still have their uses. For our purposes, when normalized to 25 pins:

DCE:

- Transmits on pin 3
- Receives on pin 2
- Monitors pins 4 (RTS), 20 (DTR), if present
- Asserts pins 5 (CTS), 6 (DSR), 8 (CD), 22 (RI), if present

DTE:

- Transmits on pin 2
- Receives on pin 3
- Asserts pins 4 (RTS), 20 (DTR), if present
- Monitors pins 5 (CTS), 6 (DSR), 8 (CD), 22 (RI), if present

DQE: Wired for DCE-25F, but convertible to DTE-25M with 92219Q cable.

Pin 7 is signal ground for both DCE and DTE.

Pin Counts

When there are fewer than 25 pins (especially 9-pin), the actual pin numbers vary. The type of connector implied by the counts listed in this guide are:

50	Amp "blue ribbon" D-style
25	DB-25 subminiature D-style
9	DB-9 subminiature D-style
4	USOC RJ-11C (same as on contemporary consumer telephones)

Connector Gender

Actual DCEs, such as modems, are still usually 25-pin female. No particular connector gender is common to DTEs. The abbreviations used in this guide are:

M	Male
F	Female

The following tables are intended to be a quick-reference to to selection of RS-232 cables for connecting serial devices directly to an HP 9000 Series 300/400 workstation. It does not cover RS-422. It does not cover the case of direct CPU-CPU connections, as LAN has replaced RS-232 in this application.

Table 1-2. RS-232-C Interconnections

Host Type	Device Type	Cable Suggested
DTE-4F	DCE-25F	Not recommended for actual DCEs. Use 92219T + 17255=D otherwise.
DTE-4F	DTE-25F	92219T
DTE-4F	DTE-25M	92219T plus 92224F adaptor
DTE-9F	DCE-25F	92221M, or 98561-61604 plus 40242M
DTE-9F	DTE-25F	92221P, or 98561-61604 plus 40242G
DTE-9F	DTE-25M	98561-61604 plus 40242C
DTE-9M	DCE-25F	24542M, or 98574-61606 plus 92221M, or 98574-61606 + 98561-61604 + 40242M
DTE-9M	DTE-25F	24542G, or 98574-61606 plus 92221P, or 98574-61606 + 98561-61604 + 40242G
DTE-9M	DTE-25M	24542H, or 98574-61606 + 98561-61604 + 40242C
DCE-25F	DCE-25F	40242G
DCE-25F	DTE-25F	40242M, or 92224M adaptor, if cables present
DCE-25F	DTE-25M	40242C, or simply directly interconnect, if cables present
DQE-25F	DCE-25F	92219Q
DTE-25F	DCE-25F	40242M, or 92224M adaptor, if cables present
DTE-25F	DTE-25F	40242G
DTE-25F	DTE-25M	17255D
DTE-50F	DCE-25F	5061-4215
DTE-50F	DTE-25F	5061-4216 plus 92224M
DTE-50F	DTE-25M	5061-4216

Table 1-3. RS-232C Host Connector Types

Host	Type of Connector	Cable Included
Model 310 built-in	DTE-25F	<i>none</i>
Model 318 built-in	DTE-25F	<i>none</i>
Model 319 built-in	DTE-25F	<i>none</i>
Model 320 built-in	see 98561-6653x	-
Model 330 built-in	see 98562-6653x	-
Model 332 built-in	DTE-25F	<i>none</i>
Model R/332 built-in	DTE-25F	<i>none</i>
Model 340 built-in	DTE-25F	<i>none</i>
Model 345 built-in	DTE-25F	<i>none</i>
Model 350 built-in	see 98562-6653x	-
Model 360 built-in	see 98562-6653x	-
Model V/360 built-in	DTE-9F	<i>none</i>
Model 370 built-in	see 98562-6653x	-
Model 375, 380 built-in without 98574-61606 with 98574-61606 w/98574-61606 + 98561-61604	- DTE-9M DTE-9F DTE-25F	- - 0.3m 0.3m
Model 400 built-in without K2292 with K2292	- DTE-25F 3x DTE-25F	- <i>none</i> 0.3m
98561-6653x without 98561-61604 with 98561-61604	- DTE-9F DTE-25F	- - 0.3m
98562-6653x without 98561-61604 with 98561-61604	- DTE-9F DTE-25F	- - 0.3m
98626A with #001 (5061-4215) with #002 (5061-4216)	DTE-50F DTE-25M DCE-25F	<i>none</i> 4.9m 4.9m
98628A with #001 (5061-4215) with #002 (5061-4216)	DTE-50F DTE-25M DCE-25F	<i>none</i> 4.9m 4.9m
98638A (standard) or may be considered	8x DCE-25F 8x DQE-25F	<i>none</i> <i>none</i>
98642A, port 0 with 92219S cable	DTE-25F DTE-25M	<i>none</i> 15m
98642A, port 1 with 92219T cable	DTE-4F DCE-25M	<i>none</i> 15m

Table 1-4. Peripheral Types

Type	HP Peripheral Products
DCE-25F	These devices are all modems, and require that the host provide at least a 9-pin DTE connection. K1489, K1492, K1494, K1498, 37212A/B, 39301A, 50759A, 92203A, 92205A/B
DTE-25F	C1001, C1002, C1003, C1006, C1010, C1200A, C1202A#1A9, C1600A, C1601A, C1602A#1AX, C1620A, C1625A, C1627A, C1629A, C1631A, C2106A, HP150, 2225D, 2227A, 2228A, 2235, 2276A, 2277A, 2382A, 2390-series, 2560-series (#049), 2601A, 2602A, 2603A, 2620-series (port 2), 2631B, 2684A (w/26843A), 2686, 2687A, 2930-series, 3082A/B, 33440A, 33447A, 33449A, 33459A, 33471A, 3630A#001, 41063A, 45810, 45850, 7440A#001, 7475A#001, 7570A, 7575A, 7576A, 7580, 7585, 7586B, 7595, 7596A, 7599A, 9666A 9807
DTE-25M	C1004, C1007, C1017, 7510A, 7550A
unknown	7550B

Installing Printers

Introduction

This chapter contains the hardware installation procedures for the following printers:

- HP 2225A *ThinkJet* Printer
- HP 2227A/B *QuietJet Plus* Printer
- HP 2228A/B *QuietJet* Printer
- HP 2563B, 2564B, and 2566B Printers
- HP 2684A/D/P *LaserJet* 2000 Printer
- HP 2686A/D *LaserJet* Printer
- HP 33440A *LaserJet-II* Printer
- HP 33447A *LaserJet-IIID* Printer
- HP 33449A *LaserJet Series III* Printer
- HP 33459A *LaserJet Series IIID* Printer
- HP 2932A and 2934A Printers
- HP 3630A *PaintJet* Printer
- HP C1602A PaintJet XL Printer
- HP 2563/64/66/67C Impact Printers

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

HP 2225A *ThinkJet* Printer

The HP 2225A *ThinkJet* printer connects to the computer through the HP-IB interface.

Refer to the "HP-IB Device Guidelines" in Chapter 1: "Introduction" before connecting this device to your system.

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

Installing the HP 2225A *ThinkJet* Printer

Refer to the manual(s) that came with your printer to:

- Unpack the printer.
- Check the line voltage.

Perform the following tasks to install this printer:

1. *Play it safe.*
 - a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
2. *Select your interface.*

Select one of the following standard-speed HP-IB interfaces:

- HP 98624A standard-speed HP-IB interface card
- Built-in standard-speed HP-IB interface

Avoid placing the *ThinkJet* on the same interface used by your disk or tape drives, if possible.

3. *Set the HP-IB bus address.*

Note

You should familiarize yourself with the HP-IB addresses that are currently in use on your system. Determine the available HP-IB address(es). Use the foldout worksheet at the end of this book to note already-used addresses.

You are limited to eight devices per HP-IB card, addresses 0 through 7.

If this is the first (or only) printer you are connecting to the interface, you can skip to the next step. The HP-IB bus address is preset to 1 and need not be changed.

- a. Find the set of switches to the left of the HP-IB connector. Switches A1 through A5 in this group determine the address.

HP 2225A ThinkJet Printer

- b. Set the address switches to 4 as shown in Figure 2-1, unless address 4 has been used elsewhere. Refer to the manual that came with the printer if you need additional switch settings.

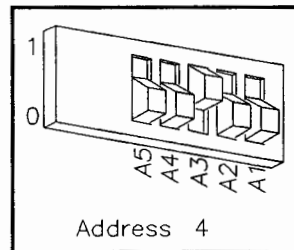


Figure 2-1.
Address 4

4. *Ensure that the LISTEN ALWAYS switch is off.*
5. *Connect the printer to the computer.*

If you need to replace your HP-IB cable for any reason, the following list contains the available HP-IB cables and their lengths.

HP 10833A 1.0 meter HP-IB cable
 HP 10833B 2.0 meter HP-IB cable
 HP 10833C 4.0 meter HP-IB cable
 HP 10833D 0.5 meter HP-IB cable

- a. Connect one end of an HP-IB cable to the HP-IB connector on the back of the printer. Tighten the thumb screws to secure the connection.
- b. Connect the other end of the HP-IB cable to the HP-IB interface or the last device on the chain.

If the HP-IB interface already has one or more devices connected to it, connect the cable from your new device to the last device on the chain as in Figure 2-2. A close up of the “piggy-backed” HP-IB connectors on the previously last device on the chain is provided in Figure 2-3.

2-4 Installing Printers

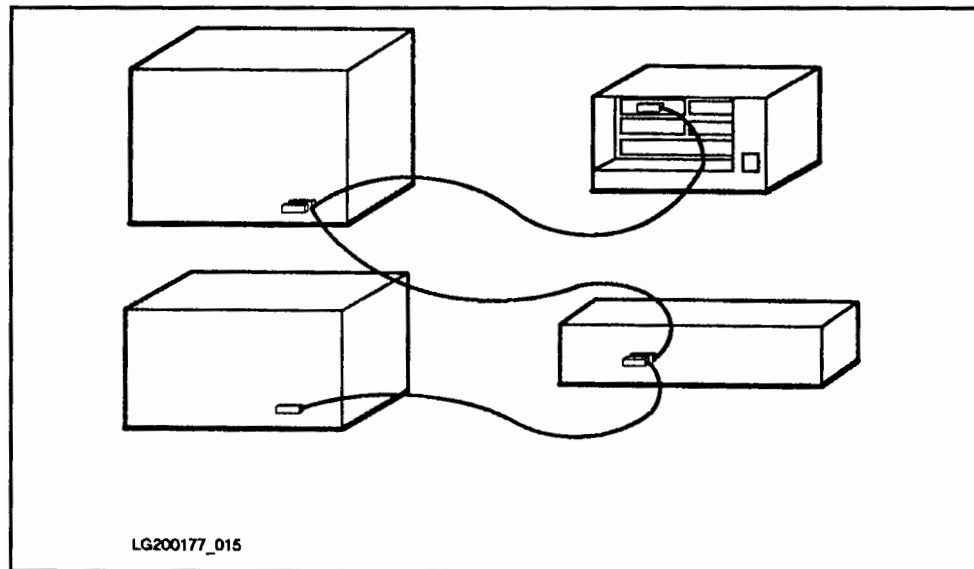
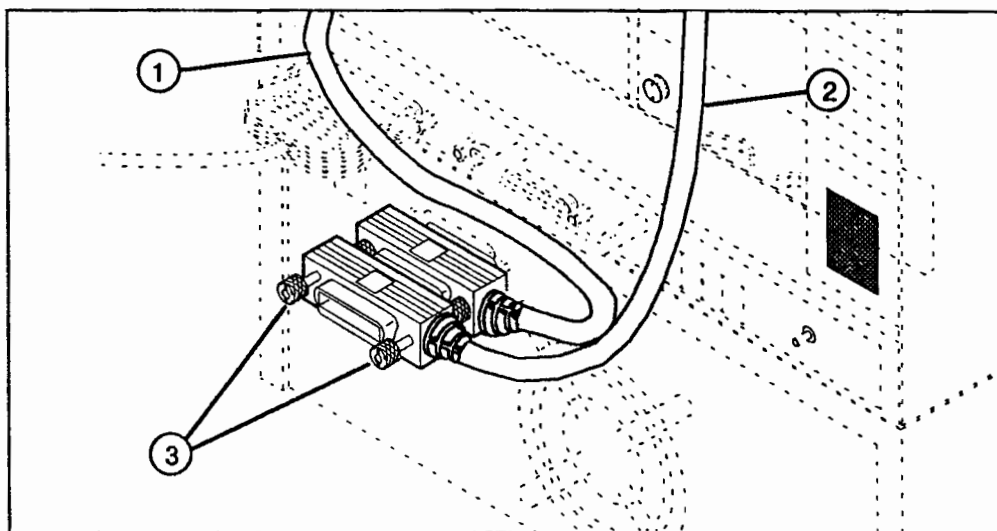


Figure 2-2. Daisy-Chained HP-IB Devices



LG200177_006

Figure 2-3. "Piggy-Backed" HP-IB Connectors

- ① Cable to the interface or previous device.
- ② Cable to the printer.
- ③ Thumb screws to be tightened.

6. *Record the HP-IB bus address.*

Make a note that the HP-IB bus address you selected has been used and is no longer available on the interface you selected. Use the foldout worksheet at the end of this book for this purpose.

7. *Ensure that the printer power switch is in the OFF position.*

8. *Connect the printer power cord.*

Connect the female end of the printer power cord to the power socket on the back of the printer, and connect the other end to your power outlet.

9. *Turn on the printer.*

10. *Reconnect the power cord to the computer.*

11. *Turn on the computer.*

Hardware Installation Complete!

Refer to your printer's manual(s) to:

- Load the print head cartridge.
- Load the paper.
- Perform the printer's self-test.

HP 2225A *ThinkJet* Printer

HP-UX Set Up Information

The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Table 2-1.
HP 2225A *ThinkJet*
Connected to an HP-IB Interface

Device Name	Path Name ¹	File Type	Major Number	Device Driver	Select Code	Minor Number ²
HP 2225A <i>ThinkJet</i>	/dev/lp2225	c	7	printer	7 ³	0x070n00
HP 2225A <i>ThinkJet</i>	/dev/r1p2225	c	21	hpib	7 ³	0x070n00
HP 2225A <i>ThinkJet</i>	/dev/lp2225	c	7	printer	8 ⁴	0x080n00
HP 2225A <i>ThinkJet</i>	/dev/r1p2225	c	21	hpib	8 ⁴	0x080n00

1 Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

2 *n* represents the HP-IB bus address. Replace *n* with a 1 if the bus address was set to 1, use 4 if the bus address was set to 4, and so on.

3 Built-in HP-IB interface.

4 HP 98624 HP-IB Interface.

2-8 Installing Printers

HP 2227A/B *QuietJet Plus* and HP 2228A/B *QuietJet* Printers

The HP 2227A *QuietJet Plus* and 2228A *QuietJet* printers both connect to the computer via an RS-232-C interface.

The HP 2227B *QuietJet Plus* and 2228B *QuietJet* printers connect to the computer via an HP-IB interface.

Refer to the "HP-IB Device Guidelines" in Chapter 1: "Introduction" before connecting this device to your system.

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

HP 2227A/B *QuietJet Plus* and HP 2228A/B *QuietJet* Printers

Installing the HP 2227A/B *QuietJet Plus* and HP 2228A/B *QuietJet* Printers

Refer to the manual(s) that came with your printer to:

- Unpack the printer.
- Connect the Power Module 1.

Connecting the Printer to an RS-232-C Interface

Perform the following tasks to install this printer:

1. *Play it safe.*
 - a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.

2. *Select your interface.*

Select one of the following RS-232-C interfaces:

- The built-in RS-232-C interface.
- HP 98626A RS-232-C Interface.
- HP 98628A Datacomm Interface.
- HP 98642A 4-Channel Multiplexer Interface
- HP 98638A 8-Channel Multiplexer Interface
- HP 98644A RS-232-C Serial Interface.

Note	If you have more than one serial port, you need to know the address of your port. You need this information for testing communications and for configuring your software.
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Caution	Many computer systems have both parallel and RS-232-C ports. These ports frequently appear identical. Make sure you plug your cable into the correct port or you could damage your device.
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3. *Connect the printer to your computer.*

Refer to the "RS-232C Cabling Guidelines" section in Chapter 1: "Introduction".

4. *Ensure that the printer power switch is in the OFF position.*
5. *Connect the printer power cord.*

Connect the female end of the printer power cord to the power socket on the back of the printer, and connect the other end to your power outlet.

6. *Ensure that the printer power switch is in the OFF position.*
7. *Turn on the printer.*
8. *Reconnect the power cord to the computer.*
9. *Turn on the computer.*

Hardware Installation Complete!

Refer to your printer manual(s) to:

- Prime and install the print cartridge.
- Load and adjust paper.
- Run the printer's self-test.

Continue to the "HP-UX Set Up Information" section for software configuration instructions about this printer.

HP 2227A/B *QuietJet Plus* and HP 2228A/B *QuietJet* Printers

Connecting the Printer to an HP-IB Interface

Perform the following tasks to install this printer:

1. *Play it safe.*

- a. Follow the computer “shut down” procedure. See *System Administration Tasks Manual* Chapter 3: “Starting and Stopping HP-UX” for specific instructions.
- b. TURN OFF the computer and unplug the power cord.

2. *Select your interface.*

Select one of the following standard-speed HP-IB interfaces:

- HP 98624A standard-speed HP-IB interface card
- Built-in standard-speed HP-IB interface

Avoid placing the printer on the same interface used by your disk or tape drives, if possible.

3. *Set the HP-IB bus address.*

Note

You should familiarize yourself with the HP-IB addresses that are currently in use on your system. Determine the available HP-IB address(es). Use the foldout worksheet at the end of this book to note already-used addresses.

You are limited to eight devices per HP-IB card, addresses 0 through 7.

The printer HP-IB bus address is preset to 1.

- a. Find the two banks of switches located inside the front cover.
- b. If the preset bus address of 1 is already used, refer to the manual that came with the printer to change the address to one that is currently unused.
- c. Make a note that the HP-IB bus address you selected has been used and is no longer available on the interface you selected. Use the foldout worksheet at the end of this book for this purpose.

2-12 Installing Printers

4. *Connect the printer to your computer.*

If you need to replace your HP-IB cable for any reason, the following list contains the available HP-IB cables and their lengths.

HP 10833A 1.0 meter HP-IB cable
HP 10833B 2.0 meter HP-IB cable
HP 10833C 4.0 meter HP-IB cable
HP 10833D 0.5 meter HP-IB cable

- a. Connect one end of the HP-IB cable to the HP-IB connector on the back of the printer. Tighten the thumb screws to secure the connection.
- b. Connect the other end of the HP-IB cable to the interface or the last device on the chain.

If the HP-IB interface already has one or more devices connected to it, connect the cable from your new device to the last device on the chain as in Figure 2-4. A close up of the “piggy-backed” HP-IB connectors on the previously last device on the chain is provided in Figure 2-5.

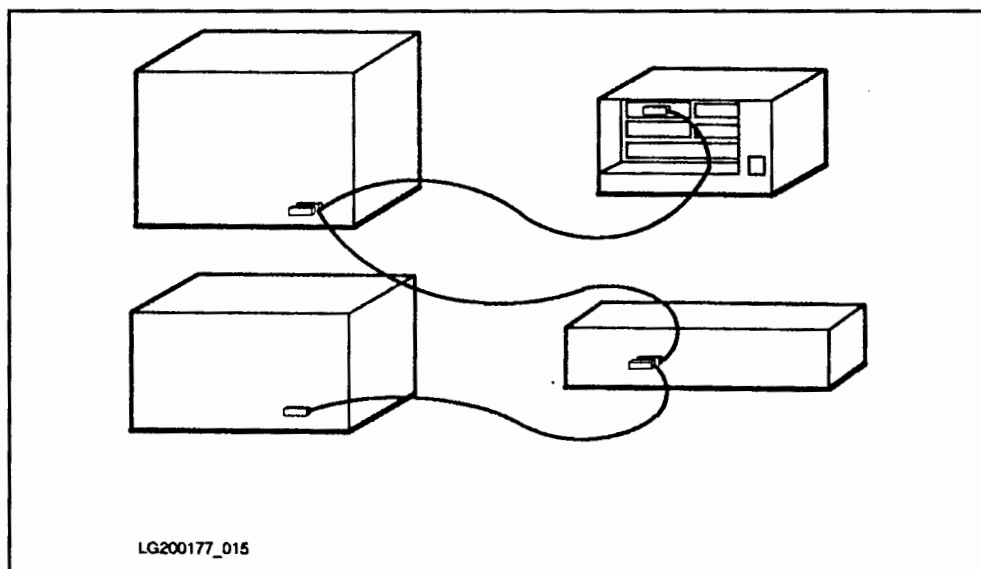


Figure 2-4. Daisy-Chained HP-IB Devices

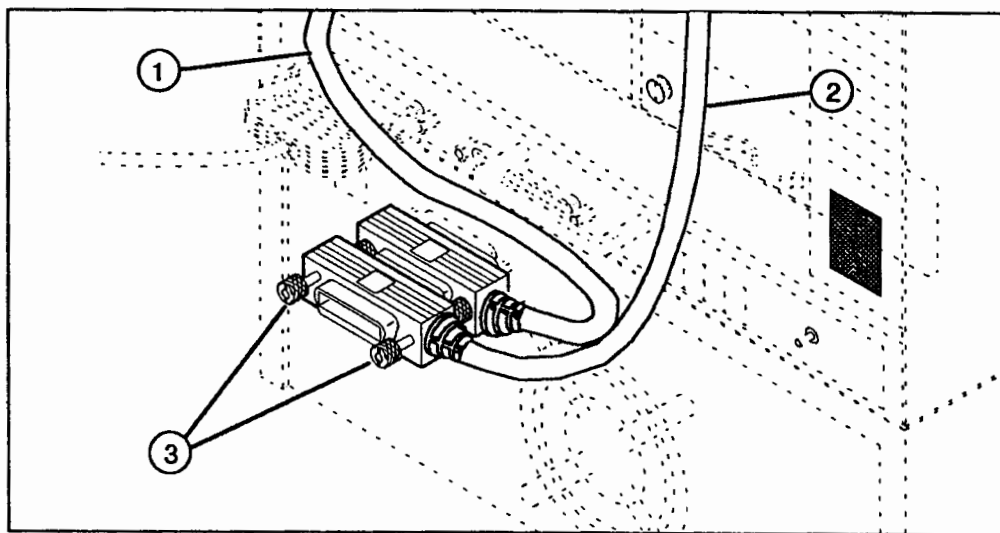


Figure 2-5. "Piggy-Backed" HP-IB Connectors

- ① Cable to the interface or previous device.
- ② Cable to the printer.
- ③ Thumb screws to be tightened.

5. *Ensure that the printer power switch is in the OFF position.*

6. *Connect the printer power cord.*

Connect the female end of the printer power cord to the power socket on the back of the printer, and connect the other end to your power outlet.

7. *Turn on the printer.*

8. *Reconnect the power cord to the computer.*

9. *Turn on the computer.*

Hardware Installation Complete!

Refer to your printer manual(s) to:

- Prime and install the print cartridge.
- Load and adjust paper.
- Run the printer's self-test.

Continue to the "HP-UX Set Up Information" section for software configuration instructions about this printer.

HP-UX Set Up Information

The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Table 2-2.
HP 2227A/28A
Connected to RS-232-C Interfaces

Device Name	Path Name ¹	File Type	Major Number	Device Driver	Select Code	Minor Number
HP 2227A/28A	/dev/lp2227a	c	1	98626	9 ²	0x090004
HP 2227A/28A	/dev/lp2227a	c	1	98626	9 ³	0x090004
HP 2227A/28A	/dev/lp2227a	c	1	98628	20 ⁴	0x140004
HP 2227A/28A, port 0	/dev/lp2227a	c	1	98642	13 ⁵	0x0d0004
HP 2227A/28A, port 1	/dev/lp2227a	c	1	98642	13 ⁵	0x0d0104
HP 2227A/28A, port 2	/dev/lp2227a	c	1	98642	13 ⁵	0x0d0204
HP 2227A/28A, port 3	/dev/lp2227a	c	1	98642	13 ⁵	0x0d0304
HP 2227A/28A, port 0	/dev/lp2227a	c	1	98642	28 ⁶	0x1c0004
HP 2227A/28A, port 1	/dev/lp2227a	c	1	98642	28 ⁶	0x1c0104
HP 2227A/28A, port 2	/dev/lp2227a	c	1	98642	28 ⁶	0x1c0204
HP 2227A/28A, port 3	/dev/lp2227a	c	1	98642	28 ⁶	0x1c0304
HP 2227A/28A, port 4	/dev/lp2227a	c	1	98642	28 ⁶	0x1c0404
HP 2227A/28A, port 5	/dev/lp2227a	c	1	98642	28 ⁶	0x1c0504
HP 2227A/28A, port 6	/dev/lp2227a	c	1	98642	28 ⁶	0x1c0604
HP 2227A/28A, port 7	/dev/lp2227a	c	1	98642	28 ⁶	0x1c0704

¹ Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

² Built-in RS-232-C port.

³ HP 98626A RS-232-C Interface.

⁴ HP 98628A Datacomm Interface.

⁵ HP 98642A 4-Channel Multiplexer Interface.

⁶ HP 98638A 8-Channel Multiplexer Interface

HP 2227A/B *QuietJet Plus* and HP 2228A/B *QuietJet* Printers

Table 2-3.
HP 2227B
Connected to HP-IB Interfaces

Device Name	Path Name ¹	File Type	Major Number	Device Driver	Select Code	Minor Number ²
HP 2227B <i>QuietJet Plus</i>	/dev/lp2227b	c	7	printer	7 ³	0x070n00
HP 2227B <i>QuietJet Plus</i>	/dev/rlp2227b	c	21	hpib	7 ³	0x070n00
HP 2227B <i>QuietJet Plus</i>	/dev/lp2227b	c	7	printer	8 ⁴	0x080n00
HP 2227B <i>QuietJet Plus</i>	/dev/rlp2227b	c	21	hpib	8 ⁴	0x080n00

¹ Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

² *n* represents the HP-IB bus address. Replace *n* with a 1 if the bus address was set to 1, use 4 if the bus address was set to 4, and so on.

³ Built-in HP-IB Interface.

⁴ HP 98624A Standard-Speed HP-IB Interface.

HP 2563B, 2564B, and 2566B Printers

The HP 2563B, 2564B, and 2566B are dot-matrix impact printers. They connect to your computer system via the HP-IB or RS-232-C interfaces.

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

Refer to the "HP-IB Guidelines" section in Chapter 1: "Introduction" before connecting this printer via the HP-IB interface.

HP 2563B, 2564B, and 2566B Printers

Installing the HP 2563B, 2564B, and 2566B Printers

Note	These printers are installed by an HP Customer Engineer. Make arrangements for installation with your nearest HP Sales and Service office.
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Refer to the manual(s) that came with your printer to:

- Load the ribbon cartridge.
- Load and adjust paper.
- Set the printer configuration.

Connecting the Printer to an RS-232-C Interface

Perform the following tasks to install this printer:

1. *Play it safe.*
 - a. Contact your HP Customer Engineer to have your printer installed. Installation is included in the price of the printer.
 - b. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
 - c. TURN OFF the computer and unplug the power cord.
2. *Select your interface.*

Select one of the following RS-232-C interfaces:

- The built-in RS-232-C interface.
- HP 98626A RS-232-C Interface.
- HP 98628A Datacomm Interface.
- HP 98642A 4-Channel Multiplexer Interface
- HP 98638A 8-Channel Multiplexer Interface
- HP 98644A RS-232-C Serial Interface.

Note If you have more than one serial port, you need to know the address of your port. You need this information for testing communications and for configuring your software.

Caution Many computer systems have both parallel and RS-232-C ports. These ports frequently appear identical. Make sure you plug your cable into the correct port or you could damage your device.

3. *Connect the printer to your computer.*

Refer to the "RS-232C Cabling Guidelines" in Chapter 1: "Introduction"

- a. Connect one (male) end of the printer's cable to the connector on the printer. Lock the connection in place with the screws.
- b. If your interface connection requires one or more additional cables, connect the remaining cable(s) to the interface.

4. *Ensure that the printer power switch is in the OFF position.*

5. *Connect the printer power cord.*

Connect the female end of the printer power cord to the power socket on the back of the printer, and connect the other end to your power outlet.

6. *Turn on the printer.*

7. *Reconnect the power cord to the computer.*

8. *Turn on the computer.*

Hardware Installation Complete!

Continue to the "HP-UX Set Up Information" section for software configuration information.

HP 2563B, 2564B, and 2566B Printers

Connecting the Printer to an HP-IB Interface

Perform the following tasks to install this printer:

1. *Play it safe.*
 - a. Contact your HP Customer Engineer to have your printer installed. Installation is included in the price of the printer.
 - b. Follow the computer “shut down” procedure. See *System Administration Tasks Manual* Chapter 3: “Starting and Stopping HP-UX” for specific instructions.
 - c. TURN OFF the computer and unplug the power cord.

2. *Select your interface.*

Select one of the following standard-speed HP-IB interfaces:

- HP 98624A standard-speed HP-IB interface card
- Built-in standard-speed HP-IB interface

Avoid placing the printer on the same interface used by your disk or tape drives, if possible.

3. *Connect the printer to your computer.*

If you need to replace your HP-IB cable for any reason, the following list contains the available HP-IB cables and their lengths.

HP 10833A 1.0 meter HP-IB cable
HP 10833B 2.0 meter HP-IB cable
HP 10833C 4.0 meter HP-IB cable
HP 10833D 0.5 meter HP-IB cable

- a. Connect one end of the HP-IB cable to the HP-IB connector on the back of the printer. Tighten the thumb screws to secure the connection.
- b. Connect the other end of the HP-IB cable to the interface or the last device on the chain.

If the HP-IB interface already has one or more devices connected to it, connect the cable from your new device to the last device on the chain as in Figure 2-6. A close up of the “piggy-backed” HP-IB connectors on the previously last device on the chain is provided in Figure 2-7.

2-22 Installing Printers

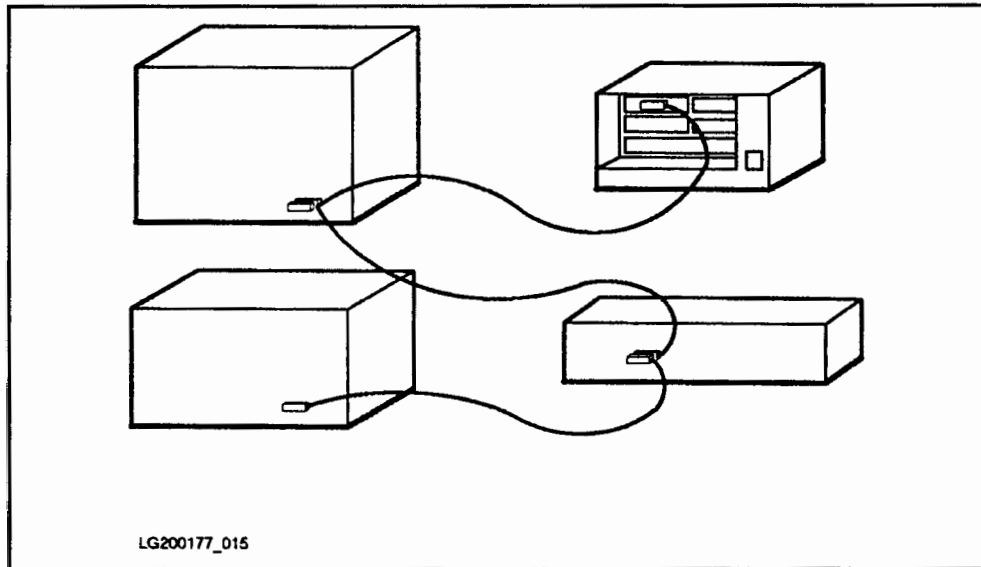
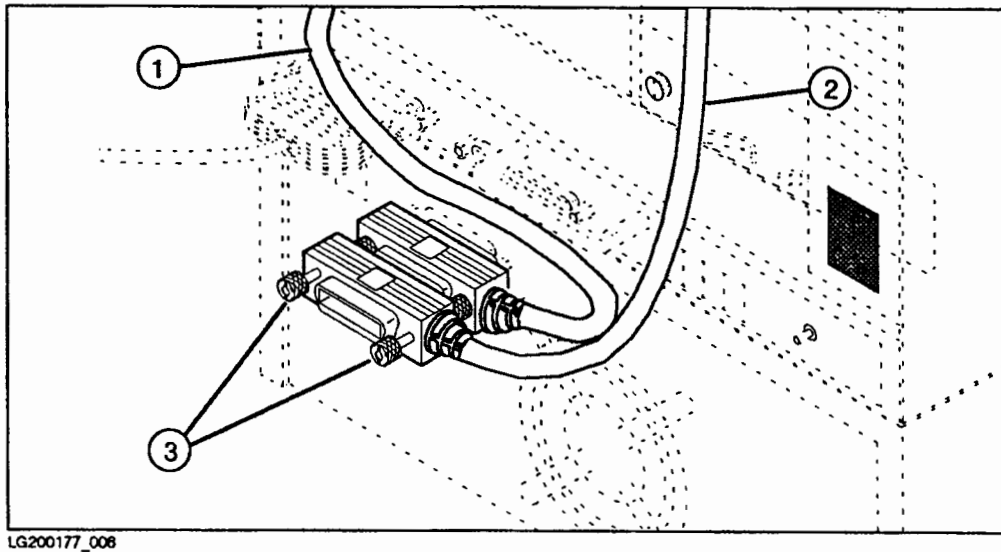


Figure 2-6. Daisy-Chained HP-IB Devices



LG200177_008

Figure 2-7. "Piggy-Backed" HP-IB Connectors

- ① Cable to the interface or previous device.
- ② Cable to the printer.
- ③ Thumb screws to be tightened.

4. *Ensure that the printer power switch is in the OFF position.*
5. *Connect the power cord.*

Connect the female end of the power cord to the power socket on the back of the printer, and connect the other end to your power outlet.

6. *Set the HP-IB bus address.*

Note

You should familiarize yourself with the HP-IB addresses that are currently in use on your system. Determine the available HP-IB address(es). Use the foldout worksheet at the end of this book to note already-used addresses.

You are limited to eight devices per HP-IB card, addresses 0 through 7.

The printer HP-IB bus address is preset to 1.

- a. Turn your printer on.
- b. Press the ON LINE key until the ON LINE indicator light turns off.
- c. Press the CONFIG key and the FINE ADJ. keys simultaneously until the number 20 appears in the display, then release them.
- d. The current address will appear in the display. Set the address as follows:
 - If this is the first (or only) printer you are connecting to the interface, press the FINE ADJ. key until the number 1 appears in the display, unless address 1 has been used elsewhere.
 - If this is the second printer you are connecting to the interface, press the FINE ADJ. key until the number 4 appears in the display, unless address 4 has been used elsewhere. If it has, select any unused address.
- e. Press the ENTER key to enter the new address and return the printer to normal operation.

7. *Record the HP-IB bus address.*

Make a note that the HP-IB bus address you selected has been used and is no longer available on the interface you selected. Use the foldout worksheet at the end of this book for this purpose.

8. *Reconnect the power cord to the computer.*
9. *Turn on the computer.*

Hardware Installation Complete!

Continue to the “HP-UX Set Up Information” section for software configuration information.

HP 2563B, 2564B, and 2566B Printers

HP-UX Set Up Information

The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Table 2-4.
HP 2563/64/66B
Connected to Built-in HP-IB Interface (Select Code 7)

Device Name	Path Name ¹	File Type	Major Number	Device Driver	Minor Number ²
HP 2563/64/66B Opt. 200 non-CIPER	/dev/lp2563	c	7	printer	0x070n00
HP 2563/64/66B Opt. 200 non-CIPER	/dev/r1p2563	c	7	printer	0x070n01
HP 2563/64/66B Opt. 850 CIPER	/dev/lp2563	c	26	ciper	0x070n00
HP 2563/64/66B Opt. 850 CIPER	/dev/r1p2563	c	26	ciper	0x070n01

¹ If you have an HP 2564B or HP 2566B, substitute 2564 or 2566 for 2563 in the path name. Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

² n represents the HP-IB bus address. Replace n with a 1 if the address was set to 1, use 4 if the address was set to 4, and so on.

Table 2-5.
HP 2563/64/66B
Connected to HP 98624 HP-IB Interface (Select Code 8)

Device Name	Path Name ¹	File Type	Major Number	Device Driver	Minor Number ²
HP 2563/64/66B Opt. 200 non-CIPER	/dev/lp2563	c	7	printer	0x080n00
HP 2563/64/66B Opt. 200 non-CIPER	/dev/rlp2563	c	7	printer	0x080n01
HP 2563/64/66B Opt. 850 CIPER	/dev/lp2563	c	26	ciper	0x080n00
HP 2563/64/66B Opt. 850 CIPER	/dev/rlp2563	c	26	ciper	0x080n01

¹ If you have an HP 2564B or HP 2566B, substitute 2564 or 2566 for 2563 in the path name. Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

² n represents the HP-IB bus address. Replace n with a 1 if the address was set to 1, use 4 if the address was set to 4, and so on.

HP 2684A/D/P *LaserJet* 2000 Printer

HP 2684A/D/P *LaserJet* 2000 Printer

Note Your authorized dealer or HP Service Representative will assist in the initial set-up and configuration of your printer.

The HP 2684A/D/P connects to the computer via an RS-232/422 or parallel interface.

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

Installing the HP 2684A/D/P *LaserJet* 2000 Printer

Refer to the manual(s) that came with your printer to:

- Unpack the printer.
- Assemble printer components.
- Load toner.
- Load paper.
- Run a self test.

Connecting the Printer to an RS-232-C Interface

Perform the following tasks to install this printer:

1. *Play it safe.*
 - a. Follow the computer “shut down” procedure. See *System Administration Tasks Manual* Chapter 3: “Starting and Stopping HP-UX” for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
2. *Select your interface.*

Select one of the following RS-232-C interfaces:

- The built-in RS-232-C interface.
- HP 98626A RS-232-C Interface.
- HP 98628A Datacomm Interface.
- HP 98642A 4-Channel Multiplexer Interface
- HP 98638A 8-Channel Multiplexer Interface
- HP 98644A RS-232-C Serial Interface.

Note

If you have more than one serial port, you need to know the address of your port. You need this information for testing communications and for configuring your software.

Caution

Many computer systems have both parallel and RS-232-C ports. These ports frequently appear identical. Make sure you plug your cable into the correct port or you could damage your device.

3. *Set the Printer's Switches.*

Refer to the *LaserJet 2000 Technical Reference Manual* for the appropriate configuration switch settings.

HP 2684A/D/P LaserJet 2000 Printer*4. Connect the printer to the computer.*

Refer to the "RS-232C Cabling Guidelines" in Chapter 1: "Introduction".

- a. Connect one (male) end of the printer cable to the connector on the back of the printer. Lock the connector in place with the screws.
- b. Connect the interface cable to the interface.
- c. Connect the printer cable to the interface cable.

*5. Ensure that the printer power switch is in the OFF position.**6. Connect the printer power cord.*

Connect the female end of the printer power cord to the power socket on the back of the printer, and connect the other end to your power outlet.

*7. Turn on the printer.**8. Reconnect the power cord to the computer.**9. Turn on the computer.***Hardware Installation Complete!**

Refer to the "HP-UX Set Up Information" section for software configuration instructions about this printer.

Connecting the Printer to a Parallel Interface

Perform the following tasks to install this printer:

1. *Play it safe.*
 - a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
2. *Select your interface.*

Locate the built-in parallel interface on the back of the computer. It should be labeled PARALLEL.

Caution	Many computer systems have both parallel and RS-232-C ports. These ports frequently appear identical. Make sure you plug your cable into the correct port or you could damage your device.
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3. *Set the Printer's Switches.*

Refer to the *LaserJet 2000 Technical Reference Manual* for the appropriate configuration switch settings.

4. *Connect the printer to the computer.*
 - a. Attach one end of the parallel cable to the computer.
 - b. Attach the other end of the parallel cable to the printer.
5. *Ensure that the printer power switch is in the OFF position.*
6. *Connect the printer power cord.*

Connect the female end of the printer power cord to the power socket on the back of the printer, and connect the other end to your power outlet.

7. *Turn on the printer.*
8. *Reconnect the power cord to the computer.*
9. *Turn on the computer.*

Hardware Installation Complete!

Continue to the "HP-UX Set Up Information" section for software configuration information.

HP-UX Set Up Information

The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Table 2-6.
HP 2684A/D
Connected to RS-232-C Interfaces

Device Name	Path Name ¹	File Type	Major Number	Driver Name	Select Code	Minor Number
HP 2684A/D/P	/dev/lp2684	c	1	98626	9 ²	0x090004
HP 2684A/D/P	/dev/lp2684	c	1	98628	20 ³	0x140004
HP 2684A/D, port 0	/dev/lp2684	c	1	98642	13 ⁴	0x0d0004
HP 2684A/D, port 1	/dev/lp2684	c	1	98642	13 ⁴	0x0d0104
HP 2684A/D, port 2	/dev/lp2684	c	1	98642	13 ⁴	0x0d0204
HP 2684A/D, port 3	/dev/lp2684	c	1	98642	13 ⁴	0x0d0304
HP 2684A/D, port 0	/dev/lp2684	c	1	98642	28 ⁵	0x1c0004
HP 2684A/D, port 1	/dev/lp2684	c	1	98642	28 ⁵	0x1c0104
HP 2684A/D, port 2	/dev/lp2684	c	1	98642	28 ⁵	0x1c0204
HP 2684A/D, port 3	/dev/lp2684	c	1	98642	28 ⁵	0x1c0304
HP 2684A/D, port 4	/dev/lp2684	c	1	98642	28 ⁵	0x1c0404
HP 2684A/D, port 5	/dev/lp2684	c	1	98642	28 ⁵	0x1c0504
HP 2684A/D, port 6	/dev/lp2684	c	1	98642	28 ⁵	0x1c0604
HP 2684A/D, port 7	/dev/lp2684	c	1	98642	28 ⁵	0x1c0704

¹ Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

² Built-in RS-232-C Interface and HP 98626A RS-232-C Interface.

³ HP 98628A Datacomm Interface.

⁴ HP 98642A 4-Channel Multiplexer Interface

⁵ HP 98638A 8-Channel Multiplexer Interface



Table 2-7.
HP 2684A/D
Connected to a Parallel Interface

Device Name	Path Name ¹	File Type	Major Number	Driver Name	Select Code	Minor Number
HP 2684A/D	/dev/lp2684	c	21	parallel ²	23 ³	0x170000

1 Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

2 The parallel driver requires the "hplib" driver to be part of the kernel configuration.

3 Built-in Parallel Interface.

HP 2686A/D *LaserJet*
HP 33440A *LaserJet-II*
HP 33447A *LaserJet-IID* Printer

The HP 2686A/D *LaserJet*, HP 33440A *LaserJet-II*, and HP 33447A *LaserJet-IID* printers connect to the computer via an RS-232-C or parallel interface. Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

Installing the *LaserJet*, *LaserJet-II*, and *LaserJet-IID*

Refer to the manual(s) that came with your printer to:

- Unpack the printer.
- Install the electrophotographic (EP) cartridge.
- Install the fusing roller cleaning pad.
- Install the paper trays.
- Load the paper.
- Configure the printer.

Connecting the Printer to an RS-232-C Interface

Perform the following tasks to install this printer:

1. *Play it safe.*
 - a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
2. *Select your interface.*

Select one of the following RS-232-C interfaces:

- The built-in RS-232-C interface.
- HP 98626A RS-232-C Interface.
- HP 98628A Datacomm Interface.
- HP 98642A 4-Channel Multiplexer Interface
- HP 98638A 8-Channel Multiplexer Interface
- HP 98644A RS-232-C Serial Interface.

Note	If you have more than one serial port, you need to know the address of your port. You need this information for testing communications and for configuring your software.
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Caution	Many computer systems have both parallel and RS-232-C ports. These ports frequently appear identical. Make sure you plug your cable into the correct port or you could damage your device.
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3. *Select Your Cable(s).*

Refer to the "RS-232C Cabling Guidelines" section in Chapter 1: "Introduction".

4. *Refer to the documentation shipped with your printer to configure the printer for serial RS-232-C interface parameters.*

Configuration of this interface is not covered in this guide. Refer to the computer's installation manual to set the baud rate switches to 9600 baud (switches 1, 2 and 3 to OPEN, switch 4 to not-OPEN). Set the handshake type switches to XON/XOFF (switch 1 to not-OPEN, switch 2 to OPEN). The remaining switches are preset to the correct values for the HP 2686A/D; check them only if you have changed them.

5. *Connect the printer to the computer.*

- a. Connect one (male) end of the printer's cable to the connector on the printer. Lock the connection in place with the screws.
- b. If your interface connection requires one or more additional cables, connect the remaining cable(s) to the interface.
- c. Connect the other end of the printer's cable either directly to the interface or to cable(s) connected to the interface.

6. *Ensure that the printer power switch is in the OFF position.*

7. *Connect the printer power cord.*

Connect the female end of the printer power cord to the power socket on the back of the printer, and connect the other end to your power outlet.

8. *Turn on the printer.*

9. *Reconnect the power cord to the computer.*

10. *Turn on the computer.*

Hardware Installation Complete!

Continue to the "HP-UX Set Up Information" section for software configuration information.

Connecting the Printer to a Parallel Interface

Perform the following tasks to install this printer:

1. *Play it safe.*
 - a. Follow the computer “shut down” procedure. See *System Administration Tasks Manual* Chapter 3: “Starting and Stopping HP-UX” for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
2. *Select your interface.*

Locate the built-in parallel interface on the back of the computer. It should be labeled PARALLEL.

Caution	Many computer systems have both parallel and RS-232-C ports. These ports frequently appear identical. Make sure you plug your cable into the correct port or you could damage your device.
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3. *Refer to the documentation shipped with your printer to configure the printer for parallel interface parameters.*
4. *Connect the printer to the computer.*

Refer to the “HP 28655A HP-PB Small Computer System Interface (SCSI)/Parallel Adapter” section of Chapter 2: “Installing Interface Cards” for parallel cable pin-outs and parallel cable diagrams.

 - a. Attach one end of the parallel cable to the computer.
 - b. Attach the other end of the parallel cable to the printer.

5. *Ensure that the power switch is in the OFF position.*

6. *Connect the printer power cord.*

Connect the female end of the printer power cord to the power socket on the back of the printer, and connect the other end to your power outlet.

7. *Turn on the printer.*

8. *Reconnect the power cord to the computer.*

9. *Turn on the computer.*

Hardware Installation Complete!

Continue to the "HP-UX Set Up Information" section for software configuration information.

HP-UX Set Up Information

The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

HP 2686A/D *LaserJet*
 HP 33440A *LaserJet-II*
 HP 33447A *LaserJet-IID Printers*

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Table 2-8.
HP 2686A/D, 33440A or 33447A
Connected to RS-232-C Interfaces

Device Name	Path Name ¹	File Type	Major Number	Driver Name	Select Code	Minor Number
HP 2686A/D and 33440A/47A	/dev/lp2686	c	1	98626	9 ²	0x090004
HP 2686A/D and 33440A/47A	/dev/lp2686	c	1	98628	20 ³	0x140004
HP 2686A/D and 33440A/47A, port 0	/dev/lp2684	c	1	98642	13 ⁴	0x0d0004
HP 2686A/D and 33440A/47A, port 1	/dev/lp2684	c	1	98642	13 ⁴	0x0d0104
HP 2686A/D and 33440A/47A, port 2	/dev/lp2684	c	1	98642	13 ⁴	0x0d0204
HP 2686A/D and 33440A/47A, port 3	/dev/lp2684	c	1	98642	13 ⁴	0x0d0304
HP 2686A/D and 33440A/47A, port 0	/dev/lp2684	c	1	98642	28 ⁵	0x1c0004
HP 2686A/D and 33440A/47A, port 1	/dev/lp2684	c	1	98642	28 ⁵	0x1c0104
HP 2686A/D and 33440A/47A, port 2	/dev/lp2684	c	1	98642	28 ⁵	0x1c0204
HP 2686A/D and 33440A/47A, port 3	/dev/lp2684	c	1	98642	28 ⁵	0x1c0304
HP 2686A/D and 33440A/47A, port 4	/dev/lp2684	c	1	98642	28 ⁵	0x1c0404
HP 2686A/D and 33440A/47A, port 5	/dev/lp2684	c	1	98642	28 ⁵	0x1c0504
HP 2686A/D and 33440A/47A, port 6	/dev/lp2684	c	1	98642	28 ⁵	0x1c0604
HP 2686A/D and 33440A/47A, port 7	/dev/lp2684	c	1	98642	28 ⁵	0x1c0704

1 Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

2 Built-in RS-232-C Interface and HP 98626A RS-232-C Interface.

3 HP 98628A Datacomm Interface.

4 HP 98642A 4-Channel Multiplexer Interface

5 HP 98638A 8-Channel Multiplexer Interface

HP 33449A *LaserJet Series III* Printer

The HP 33449A *LaserJet Series III* printer contains the following features:

- built-in scalable typefaces and additional fonts
- faster graphics printing with integrated HP-GL/2 vector graphics
- PCL 5 printer language with enhanced page formatting features
- HP *LaserJet II* compatibility
- memory capacity up to 5 Megabytes (with additional memory boards)
- quick, quiet eight page-per-minute printing
- PostScript cartridge and Epson FX/IBM Proprinter personality cartridge
- envelope printing

The printer supports RS-232-C and parallel interfaces. Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

HP 33449A LaserJet Series III Printer**Installing the HP 33449A LaserJet Series III Printer**1. *Play it safe.*

- a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
- b. TURN OFF the computer and unplug the power cord.

2. *Select your interface.*

Select one of the following RS-232-C interfaces:

- The built-in RS-232-C interface.
- HP 98626A RS-232-C Interface.
- HP 98628A Datacomm Interface.
- HP 98642A 4-Channel Multiplexer Interface
- HP 98638A 8-Channel Multiplexer Interface
- HP 98644A RS-232-C Serial Interface.

Note

If you have more than one serial port, you need to know the address of your port. You need this information for testing communications and for configuring your software.

Caution

Many computer systems have both parallel and RS-232-C ports. These ports frequently appear identical. Make sure you plug your cable into the correct port or you could damage your device.

or

Locate the built-in parallel interface on the back of the computer. It should be labeled PARALLEL.

3. *Refer to the documentation shipped with your printer to connect the printer to your system.*

4. *Ensure that the printer power switch is in the OFF position.*
5. *Connect the printer power cord.*

Connect the female end of the printer power cord to the power socket on the back of the printer, and connect the other end to your power outlet.
6. *Turn on the printer.*
7. *Reconnect the power cord to the computer.*
8. *Turn on the computer.*

Hardware Installation Complete!

Refer to your printer manual(s) to:

- Prime and install the print cartridge.
- Load and adjust paper.
- Run the printer's self-test.

Continue to the "HP-UX Set Up Information" section for software configuration instructions about this printer.

HP-UX Set Up Information

The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

HP 33449A LaserJet Series III Printer

Table 2-9.
HP 33449A LaserJet Series III Printer
Connected to a Parallel Interface

Device Name	Path Name ¹	File Type	Major Number	Driver Name	Select Code	Minor Number
HP 33449A <i>LaserJet III</i>	/dev/lp33449A	c	21	parallel ²	23 ³	0x170000

1 Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

2 The parallel driver requires the "hpib" driver to be part of the kernel configuration.

3 Built in parallel interface.

Table 2-10.
HP 33449A LaserJet Series III Printer
Connected to RS-232-C Interfaces

Device Name	Path Name ¹	File Type	Major Number	Driver Name	Select Code	Minor Number
HP 33449A LaserJet III	/dev/lp33449A	c	1	98626	9 ²	0x090004
HP 33449A LaserJet III	/dev/lp33449A	c	1	98628	20 ³	0x140004
HP 33449A LaserJet III, port 0	/dev/lp33449A	c	1	98642	13 ⁴	0x0d0004
HP 33449A LaserJet III, port 1	/dev/lp33449A	c	1	98642	13 ⁴	0x0d0104
HP 33449A LaserJet III, port 2	/dev/lp33449A	c	1	98642	13 ⁴	0x0d0204
HP 33449A LaserJet III, port 3	/dev/lp33449A	c	1	98642	13 ⁴	0x0d0304
HP 33449A LaserJet III, port 0	/dev/lp33449A	c	1	98642	28 ⁵	0x1c0004
HP 33449A LaserJet III, port 1	/dev/lp33449A	c	1	98642	28 ⁵	0x1c0104
HP 33449A LaserJet III, port 2	/dev/lp33449A	c	1	98642	28 ⁵	0x1c0204
HP 33449A LaserJet III, port 3	/dev/lp33449A	c	1	98642	28 ⁵	0x1c0304
HP 33449A LaserJet III, port 4	/dev/lp33449A	c	1	98642	28 ⁵	0x1c0404
HP 33449A LaserJet III, port 5	/dev/lp33449A	c	1	98642	28 ⁵	0x1c0504
HP 33449A LaserJet III, port 6	/dev/lp33449A	c	1	98642	28 ⁵	0x1c0604
HP 33449A LaserJet III, port 7	/dev/lp33449A	c	1	98642	28 ⁵	0x1c0704

¹ Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

² Built-in RS-232-C Interface and HP 98626A RS-232-C Interface.

³ HP 98628A Datacomm Interface.

⁴ HP 98642A 4-Channel Multiplexer Interface

⁵ HP 98638A 8-Channel Multiplexer Interface

HP 33459A *LaserJet Series IIID* Printer

The HP 33459A *LaserJet Series III* printer contains the following features:

- built-in scalable typefaces and additional fonts
- faster graphics printing with integrated HP-GL/2 vector graphics
- PCL 5 printer language with enhanced page-formatting features
- HP *LaserJet II* compatibility
- quick, quiet 8 page-per-minute printing
- memory capacity up to 4.6 Megabytes (with additional memory board)
- PostScript cartridge and Epson FX/IBM Proprinter personality cartridge
- envelope printing
- automatic duplex printing

The printer supports RS-232-C and parallel interfaces.

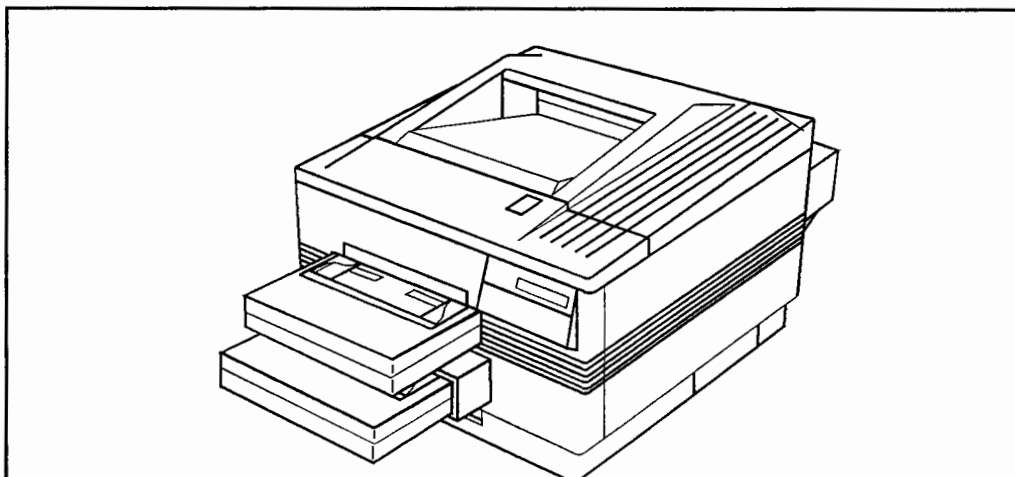


Figure 2-8. HP 33459A *LaserJet Series IIID* Printer

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

Installing the HP 33459A LaserJet Series IID Printer

Refer to the documentation shipped with your printer to connect the printer to your system.

Connecting the Printer to an RS-232-C Interface

1. *Play it safe.*
 - a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
2. *Select your interface.*

Select one of the following RS-232-C interfaces:

- The built-in RS-232-C interface.
- HP 98626A RS-232-C Interface.
- HP 98628A Datacomm Interface.
- HP 98642A 4-Channel Multiplexer Interface
- HP 98638A 8-Channel Multiplexer Interface
- HP 98644A RS-232-C Serial Interface.

Note	If you have more than one serial port, you need to know the address of your port. You need this information for testing communications and for configuring your software.
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Caution	Many computer systems have both parallel and RS-232-C ports. These ports frequently appear identical. Make sure you plug your cable into the correct port or you could damage your device.
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Refer to the "RS-232-C Cabling Guidelines" in Chapter 1: "Introduction".

HP 33459A LaserJet Series IID Printer

3. *Refer to the documentation shipped with your printer to connect the printer to your system.*
4. *Ensure that the printer power switch is in the OFF position.*
5. *Connect the printer power cord.*

Connect the female end of the printer power cord to the power socket on the back of the printer, and connect the other end to your power outlet.

6. *Turn on the printer.*
7. *Reconnect the power cord to the computer.*
8. *Turn on the computer.*

Hardware Installation Complete!

Refer to your printer manual(s) to:

- Prime and install the print cartridge.
- Load and adjust paper.
- Run the printer's self-test.

Continue to the "HP-UX Set Up Information" section for software configuration instructions about this printer.

Connecting the Printer to a Parallel Interface

1. *Play it safe.*
 - a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
2. *Select your interface.*

Locate the built-in parallel interface on the back of the computer. It should be labeled PARALLEL.

Caution	Many computer systems have both parallel and RS-232-C ports. These ports frequently appear identical. Make sure you plug your cable into the correct port or you could damage your device.
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3. *Refer to the documentation shipped with your printer to connect the printer to your system.*
4. *Ensure that the printer power switch is in the OFF position.*
5. *Connect the printer power cord.*

Connect the female end of the printer power cord to the power socket on the back of the printer, and connect the other end to your power outlet.
6. *Turn on the printer.*
7. *Reconnect the power cord to the computer.*
8. *Turn on the computer.*

Hardware Installation Complete!

HP 33459A *LaserJet Series IIID* Printer

Refer to your printer manual(s) to:

- Prime and install the print cartridge.
- Load and adjust paper.
- Run the printer's self-test.

Continue to the "HP-UX Set Up Information" section for software configuration instructions about this printer.

HP-UX Set Up Information

The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Table 2-11.
HP 33459A *LaserJet Series IIID* Printer
Connected to a Parallel Interface

Device Name	Path Name ¹	File Type	Major Number	Driver Name	Select Code	Minor Number
HP 33459A <i>LaserJet IIID</i>	/dev/ptrxxxx	c	21	parallel ²	23 ³	0x170000

¹ Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

² The parallel driver requires the "hplib" driver to be part of the kernel configuration.

³ Built in parallel interface.

Table 2-12.
HP 33459A LaserJet Series IIID Printer
Connected to RS-232-C Interfaces

Device Name	Path Name ¹	File Type	Major Number	Driver Name	Select Code	Minor Number
HP 33459A LaserJet IIID	/dev/lp33459A	c	1	98626	9 ²	0x090004
HP 33459A LaserJet IIID	/dev/lp33459A	c	1	98628	20 ³	0x140004
HP 33459A LaserJet IIID port 0	/dev/lp33459A	c	1	98642	13 ⁴	0x0d0004
HP 33459A LaserJet IIID, port 1	/dev/lp33459A	c	1	98642	13 ⁴	0x0d0104
HP 33459A LaserJet IIID, port 2	/dev/lp33459A	c	1	98642	13 ⁴	0x0d0204
HP 33459A LaserJet IIID, port 3	/dev/lp33459A	c	1	98642	13 ⁴	0x0d0304
HP 33459A LaserJet IIID, port 0	/dev/lp33459A	c	1	98642	28 ⁵	0x1c0004
HP 33459A LaserJet IIID, port 1	/dev/lp33459A	c	1	98642	28 ⁵	0x1c0104
HP 33459A LaserJet IIID, port 2	/dev/lp33459A	c	1	98642	28 ⁵	0x1c0204
HP 33459A LaserJet IIID, port 3	/dev/lp33459A	c	1	98642	28 ⁵	0x1c0304
HP 33459A LaserJet IIID, port 4	/dev/lp33459A	c	1	98642	28 ⁵	0x1c0404
HP 33459A LaserJet IIID, port 5	/dev/lp33459A	c	1	98642	28 ⁵	0x1c0504
HP 33459A LaserJet IIID, port 6	/dev/lp33459A	c	1	98642	28 ⁵	0x1c0604
HP 33459A LaserJet IIID, port 7	/dev/lp33459A	c	1	98642	28 ⁵	0x1c0704

¹ Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

² Built-in RS-232-C Interface and HP 98626A RS-232-C Interface.

³ HP 98628A Datacomm Interface.

⁴ HP 98642A 4-Channel Multiplexer Interface

⁵ HP 98638A 8-Channel Multiplexer Interface

HP 2932A and 2934A Printers

The HP 2930 Series of printers provide features for several levels of printer categories. However, installation for all printers in the series is common. These printers connect to your system via the HP-IB interface.

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

Refer to the "HP-IB Device Guidelines" in Chapter 1: "Introduction" before connecting this device to your system.

Installing the HP 2932A and 2934A Printers

Refer to the manual(s) that came with your printer to:

- Unpack the printer.
- Check the voltage setting.
- Install the fuse.
- Install the ribbon.
- Adjust the print head gap.
- Load the paper.

Connecting the Printer to an HP-IB Interface

Perform the following tasks to install this printer:

1. *Play it safe.*
 - a. Follow the computer “shut down” procedure. See *System Administration Tasks Manual* Chapter 3: “Starting and Stopping HP-UX” for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
2. *Select your interface.*

Select one of the following standard-speed HP-IB interfaces:

- HP 98624A standard-speed HP-IB interface card
- Built-in standard-speed HP-IB interface

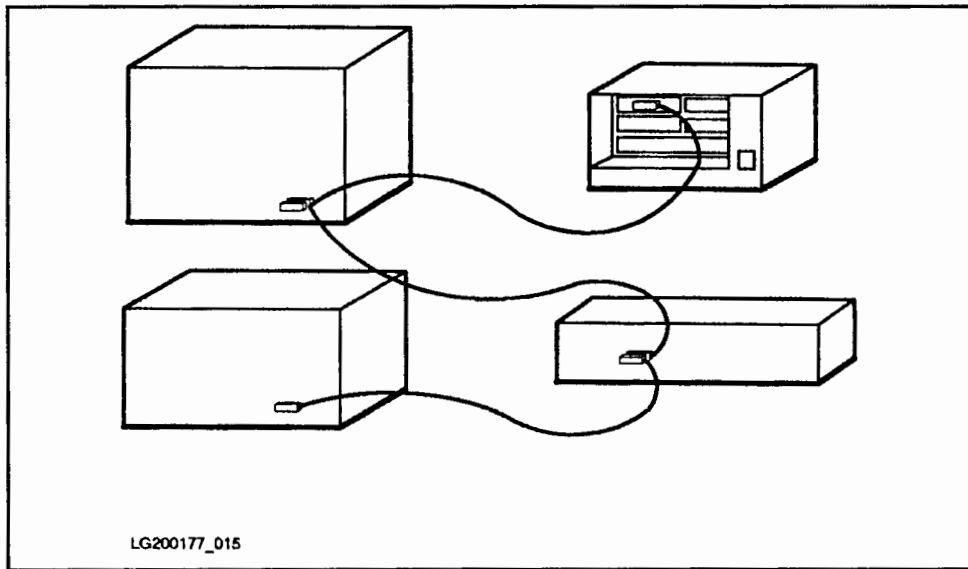
3. *Connect the printer to the computer.*

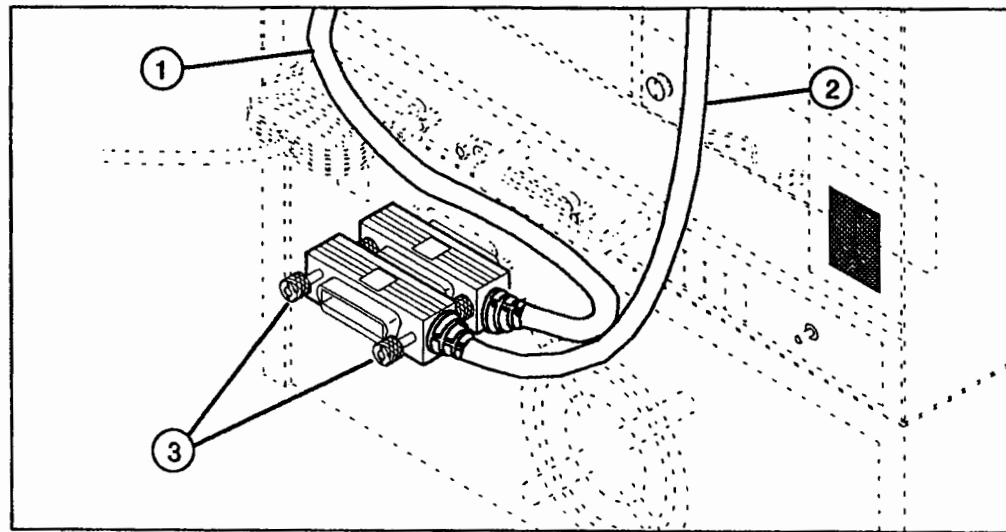
If you need to replace your HP-IB cable for any reason, the following list contains the available HP-IB cables and their lengths.

HP 10833A 1.0 meter HP-IB cable
HP 10833B 2.0 meter HP-IB cable
HP 10833C 4.0 meter HP-IB cable
HP 10833D 0.5 meter HP-IB cable

- a. Connect one end of an HP-IB cable to the HP-IB connector on the back of the printer. Tighten the thumb screws to secure the connection.
- b. Connect the other end of the HP-IB cable to the HP-IB interface or the last device on the chain.

If the HP-IB interface already has one or more devices connected to it, connect the cable from your new device to the last device on the chain as in Figure 2-9. A close up of the “piggy-backed” HP-IB connectors on the previously last device on the chain is provided in Figure 2-10.

HP 2932A and 2934A Printers**Figure 2-9. Daisy-Chained HP-IB Devices**



LG200177_008

Figure 2-10. "Piggy-Backed" HP-IB Connectors

- ① Cable to the interface or previous device.
- ② Cable to the printer.
- ③ Thumb screws to be tightened.

4. *Ensure that the printer power switch is in the OFF position.*
5. *Connect the printer power cord.*

Connect the female end of the printer power cord to the power socket on the back of the printer, and connect the other end to your power outlet.

HP 2932A and 2934A Printers

6. Set the HP-IB bus address.

Note You should familiarize yourself with the HP-IB addresses that are currently in use on your system. Determine the available HP-IB address(es). Use the foldout worksheet at the end of this book to note already-used addresses.

You are limited to eight devices per HP-IB card, addresses 0 through 7.

If this is the first (or only) printer you are connecting to the interface, you can skip to the next step. The address is preset to 1 and need not be changed.

- a. Turn the printer on. The power switch is in the back above the printer power cord.
- b. Press the SELECT button on the top of the printer, then press the VIEW button. The printer will respond by printing its SETTINGS options.
- c. Press the right arrow button until the print head is under the MODIFY INTERFACE option (that is, under the word "INTERFACE" on the right side of the paper.
- d. Press the SELECT button. The printer will print the MODIFY INTERFACE - HP-IB options.
- e. Press the right arrow button until the print head is under the ADDRESS option, then press the SELECT button.
- f. The printer will print a list of numbers. Press the right arrow button until the print head is under the number 4 and press the SELECT button, unless you have used address 4 elsewhere. If you have, choose any unused address.

Note If the printer asks you to select a FIRST DIGIT and a SECOND DIGIT, position the print head under 0 for the FIRST DIGIT and press the SELECT button, then position the print head under 4 for the SECOND DIGIT and press the SELECT button.

- g. Press the VIEW button to exit SETTINGS mode.

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7. *Enable the AMIGO Protocol.*

Note If there will be no other devices on the interface besides the HP 2932/34A printer, skip to step 7.

- a. Turn the printer on, if it is not already on.
- b. Press the SELECT button on the top of the printer, then press the VIEW button. The printer will respond by printing its SETTINGS options.
- c. Press the right arrow button until the print head is under the MODIFY INTERFACE option (that is, under the word "INTERFACE" on the right side of the paper).
- d. Press the SELECT button. The printer will print the MODIFY INTERFACE - HP-IB options.
- e. The print head should be under the SECONDARY COMMANDS option on the left side of the paper. If it isn't, use the arrow buttons to position the print head under that option.
- f. Press the SELECT button. The printer will print the SECONDARY COMMANDS options.
- g. Use the arrow buttons to position the print head under the "on" option and press the SELECT button. This enables the AMIGO protocol, which allows HP-UX to pace the printer (time-share the bus with other devices on the interface) if the printer's address is in the range 0 to 7.
- h. Press the VIEW button to exit SETTINGS mode.

HP 2932A and 2934A Printers

8. *Record the HP-IB bus address.*

Make a note that the HP-IB bus address you selected has been used and is no longer available on the interface you selected. Use the foldout worksheet at the end of this book for this purpose.

9. *Reconnect the power cord to the computer.*

10. *Turn on the computer.*

Hardware Installation Complete!

Refer to your printer's manual(s) to:

- Set print margins.
- Run the printer's self-test

Continue to the "HP-UX Set Up Information" section for software configuration information.

HP-UX Set Up Information

The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Table 2-13.
HP 2932/34A
Connected to HP-IB Interfaces

Device Name	Path Name ¹	File Type	Major Number	Driver Name	Select Code	Minor Number ²
HP 2932/34A	/dev/lp2932	c	7	printer	7 ³	0x070n00 ⁴
HP 2932/34A	/dev/r1p2932	c	7	printer	7 ³	0x070n01 ⁵
HP 2932/34A	/dev/lp2932	c	7	printer	8 ⁶	0x080n00 ⁴
HP 2932/34A	/dev/r1p2932	c	7	printer	8 ⁶	0x080n01 ⁵

¹ If you have an HP 2934A, substitute 2934 for 2932 in the path name. Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

² n represents the HP-IB bus address. Replace n with a 1 if the bus address was set to 1, use 4 if the bus address was set to 4, and so on.

³ Built-in HP-IB Interface.

⁴ Amigo HP-IB protocol—minor number bit 0 not set.

⁵ Non-protocol—minor number bit 0 set.

⁶ HP 98624 HP-IB Interface

HP 3630A *PaintJet* Printer

The HP 3630A *PaintJet* printer connects to your computer through an HP-IB or RS-232-C interface.

Refer to the "HP-IB Device Guidelines" in Chapter 1: "Introduction" before connecting this device to your system via the HP-IB interface.

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

Installing the HP 3630A *PaintJet* Printer

Refer to the manual(s) that came with your printer to:

- Unpack the printer.
- Install the help card.
- Connect the power module.
- Install the print cartridges.
- Load paper.
- Run the self test.

Connecting the Printer to an HP-IB Interface

Perform the following tasks to install this printer:

1. *Play it safe.*
 - a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.

2. *Select your interface.*

Select one of the following standard-speed HP-IB interfaces:

- HP 98624A standard-speed HP-IB interface card
- Built-in standard-speed HP-IB interface

Avoid placing the *PaintJet* on the same interface used by your disk or tape drives, if possible.

3. *Set the HP-IB bus address.*

Note

You should familiarize yourself with the HP-IB addresses that are currently in use on your system. Determine the available HP-IB address(es). Use the foldout worksheet at the end of this book to note already-used addresses.

You are limited to eight devices per HP-IB card, addresses 0 through 7.

If this is the first (or only) printer you are connecting to the interface, you can skip to the next step. The HP-IB bus address is preset to 1 and need not be changed.

- a. Find the bank of switches to the left of the HP-IB connector on the rear panel of the printer. The three right-most switches (labeled A1 through A3) in Figure 2-11) determine the address.
- b. Set the address to 4 as shown in Figure 2-11, unless address 4 has been used elsewhere. Refer to the manual that came with the printer if you need additional switch settings.

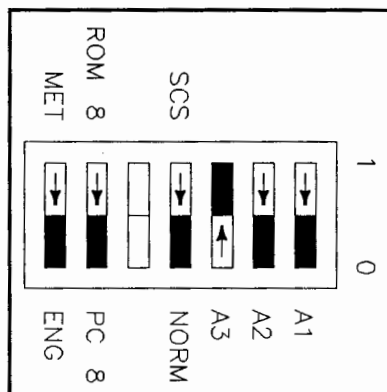


Figure 2-11.
Address 4

4. *Connect the printer to the computer.*

If you need to replace your HP-IB cable for any reason, the following list contains the available HP-IB cables and their lengths.

- HP 10833A 1.0 meter HP-IB cable
- HP 10833B 2.0 meter HP-IB cable
- HP 10833C 4.0 meter HP-IB cable
- HP 10833D 0.5 meter HP-IB cable

- a. Connect one end of an HP-IB cable to the HP-IB connector on the back of the printer. Tighten the thumb screws to secure the connection.
- b. Connect the other end of the HP-IB cable to the HP-IB interface or the last device on the chain.

If the HP-IB interface already has one or more devices connected to it, connect the cable from your new device to the last device on the chain as in Figure 2-12. A close up of the “piggy-backed” HP-IB connectors on the previously last device on the chain is provided in Figure 2-13.

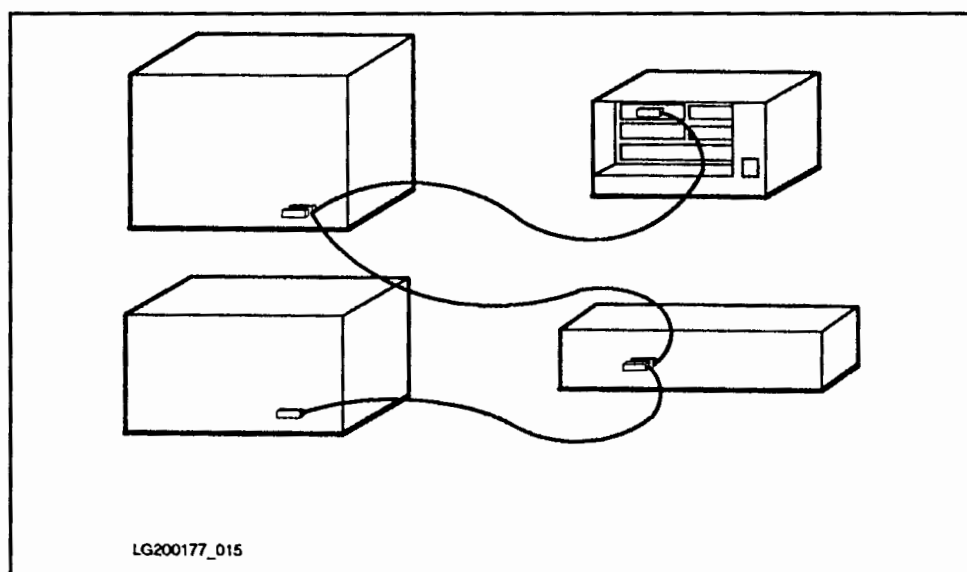
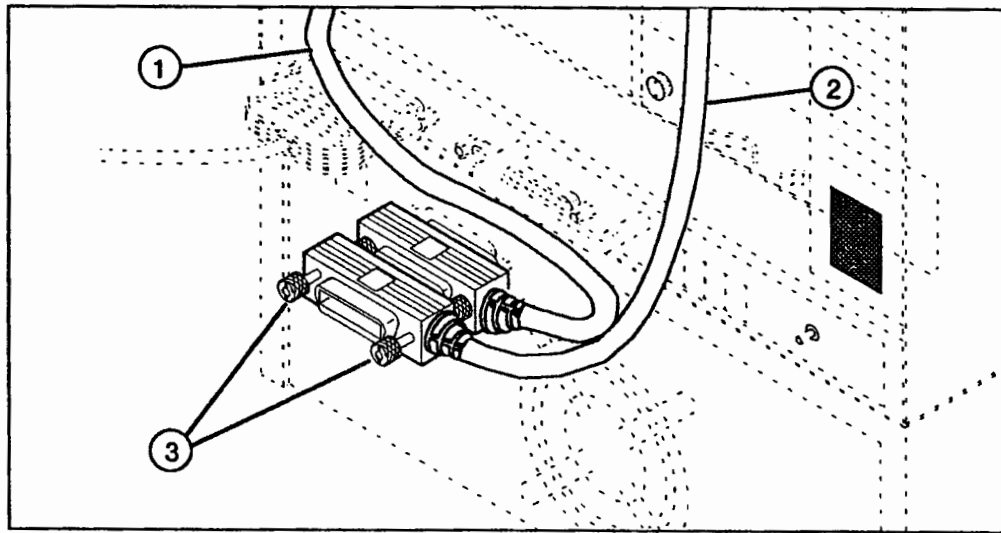


Figure 2-12. Daisy-Chained HP-IB Devices



LG200177_008

Figure 2-13. "Piggy-Backed" HP-IB Connectors

- ① Cable to the interface or previous device.
 - ② Cable to the printer.
 - ③ Thumb screws to be tightened.
5. *Ensure that the printer power switch is in the OFF position.*
 6. *Connect the printer power cord.*
 Connect the female end of the printer power cord to the power socket on the back of the printer, and connect the other end to your power outlet.
 7. *Record the HP-IB bus address.*
 Make a note that the HP-IB bus address you selected has been used and is no longer available on the interface you selected. Use the foldout worksheet at the end of this book for this purpose.
 8. *Ensure that the printer power switch is in the OFF position.*
 9. *Connect the printer power cord.*

Connect the female end of the printer power cord to the power socket on the back of the printer, and connect the other end to your power outlet.

10. *Turn on the printer.*
11. *Reconnect the power cord to the computer.*
12. *Turn on the computer.*

Hardware Installation Complete!

Refer to your printer manual(s) to:

- Prime and install the print cartridge.
- Load and adjust paper.
- Run the printer's self-test.

Continue to the "HP-UX Set Up Information" section for software configuration instructions about this printer.

HP 3630A PaintJet Printer**Connecting the Printer to an RS-232-C Interface**

Perform the following tasks to install this printer:

1. *Play it safe.*

- a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
- b. TURN OFF the computer and unplug the power cord.

2. *Select your interface.*

Select one of the following RS-232-C interfaces:

- The built-in RS-232-C interface.
- HP 98626A RS-232-C Interface.
- HP 98628A Datacomm Interface.
- HP 98642A 4-Channel Multiplexer Interface
- HP 98638A 8-Channel Multiplexer Interface
- HP 98644A RS-232-C Serial Interface.

Note

If you have more than one serial port, you need to know the address of your port. You need this information for testing communications and for configuring your software.

Caution

Many computer systems have both parallel and RS-232-C ports. These ports frequently appear identical. Make sure you plug your cable into the correct port or you could damage your device.

Refer to the "RS-232-C Cabling Guidelines" in Chapter 1: "Introduction".

3. *Refer to the documentation shipped with the printer to connect it to your system.*

Refer to the documentation to set any switches related to baud rate, parity, or handshake.

4. *Ensure that the printer power switch is in the OFF position.*

5. *Connect the printer power cord.*

Connect the female end of the printer power cord to the power socket on the back of the printer, and connect the other end to your power outlet.

6. *Turn on the printer.*

7. *Reconnect the power cord to the computer.*

8. *Turn on the computer.*

Hardware Installation Complete!

Refer to your printer manual(s) to:

- Prime and install the print cartridge.
- Load and adjust paper.
- Run the printer's self-test.

Continue to the "HP-UX Set Up Information" section for software configuration instructions about this printer.

HP 3630A *PaintJet* Printer

HP-UX Set Up Information

The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Table 2-14.
HP 3630A *PaintJet*
Connected to HP-IB Interfaces

Device Name	Path Name ¹	File Type	Major Number	Driver Name	Select Code	Minor Number ²
HP 3630A <i>PaintJet</i>	/dev/lp3630	c	7	printer	7 ³	0x070n00
HP 3630A <i>PaintJet</i>	/dev/rlp3630	c	21	hpib	7 ³	0x070n00
HP 3630A <i>PaintJet</i>	/dev/lp3630	c	7	printer	8 ⁴	0x080n00
HP 3630A <i>PaintJet</i>	/dev/rlp3630	c	21	hpib	8 ⁴	0x080n00

1 Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

2 *n* represents the HP-IB bus address. Replace *n* with a 1 if the bus address was set to 1, use 4 if the bus address was set to 4, and so on.

3 Built-in HP-IB Interface.

4 HP 98624 HP-IB Interface.

Table 2-15.
HP 3630A *PaintJet* Printer
Connected to RS-232-C Interfaces

Device Name	Path Name ¹	File Type	Major Number	Driver Name	Select Code	Minor Number
HP 3630A <i>PaintJet</i>	/dev/l3630A	c	1	98626	9 ²	0x090004
HP 3630A <i>PaintJet</i>	/dev/lp3630A	c	1	98628	20 ³	0x140004
HP 3630A <i>PaintJet</i> port 0	/dev/lp3630A	c	1	98642	13 ⁴	0x0d0004
HP 3630A <i>PaintJet</i> port 1	/dev/lp3630A	c	1	98642	13 ⁴	0x0d0104
HP 3630A <i>PaintJet</i> port 2	/dev/lp3630A	c	1	98642	13 ⁴	0x0d0204
HP 3630A <i>PaintJet</i> port 3	/dev/lp3630A	c	1	98642	13 ⁴	0x0d0304
HP 3630A <i>PaintJet</i> port 0	/dev/lp3630A	c	1	98642	28 ⁵	0x1c0004
HP 3630A <i>PaintJet</i> port 1	/dev/lp3630A	c	1	98642	28 ⁵	0x1c0104
HP 3630A <i>PaintJet</i> port 2	/dev/lp3630A	c	1	98642	28 ⁵	0x1c0204
HP 3630A <i>PaintJet</i> port 3	/dev/lp3630A	c	1	98642	28 ⁵	0x1c0304
HP 3630A <i>PaintJet</i> port 4	/dev/lp3630A	c	1	98642	28 ⁵	0x1c0404
HP 3630A <i>PaintJet</i> port 5	/dev/lp3630A	c	1	98642	28 ⁵	0x1c0504
HP 3630A <i>PaintJet</i> port 6	/dev/lp3630A	c	1	98642	28 ⁵	0x1c0604
HP 3630A <i>PaintJet</i> port 7	/dev/lp3630A	c	1	98642	28 ⁵	0x1c0704

¹ Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

² Built-in RS-232-C Interface and HP 98626A RS-232-C Interface.

³ HP 98628A Datacomm Interface.

⁴ HP 98642A 4-Channel Multiplexer Interface

⁵ HP 98638A 8-Channel Multiplexer Interface

HP C1602A PaintJet XL Printer

The HP C1602A PaintJet XL printer is a high-speed color printer suited for a shared, high-volume user environment. Some of the features offered by the HP C1602A are:

- Presentation mode for highest quality graphics on paper; transparency mode for top-quality printing on overhead transparency film.
- Eight primary colors with many shades and hues available.
- Unattended, fast print speed (167 characters per second at 10 pitch) operation.
- Large standard buffer for downloadable fonts.
- Automatic sheet feed for standard paper and transparency sizes; manual feed capability for non-standard media sizes.
- RS-232-C, Centronics parallel and HP-IB interfaces available.

Refer to the "HP-IB Device Guidelines" in Chapter 1: "Introduction" before connecting this device to your system. Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

Installing the HP C1602A PaintJet XL Printer

If you use graphics software, check your software documentation (or software supplier) for specific computer hardware and memory requirements. When you install your software, you may have to **configure** the graphics software.

Refer to the documentation that came with your printer to:

- Unpack the printer.
- Check the line voltage.

HP C1602A PaintJet XL Printer

Connecting the Printer to an RS-232-C Interface

Perform the following tasks to install this printer:

1. *Play it safe.*
 - a. Follow the computer “shut down” procedure. See *System Administration Tasks Manual* Chapter 3: “Starting and Stopping HP-UX” for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
2. *Select your interface.*

Select one of the following RS-232-C interfaces:

- The built-in RS-232-C interface.
- HP 98626A RS-232-C Interface.
- HP 98628A Datacomm Interface.
- HP 98642A 4-Channel Multiplexer Interface
- HP 98638A 8-Channel Multiplexer Interface
- HP 98644A RS-232-C Serial Interface.

Note	If you have more than one serial port, you need to know the address of your port. You need this information for testing communications and for configuring your software.
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Caution	Many computer systems have both parallel and RS-232-C ports. These ports frequently appear identical. Make sure you plug your cable into the correct port or you could damage your device.
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Use Figure 2-14 to help you identify the RS-232-C serial interface on the printer. Figure 2-14 also illustrates the rear panel switches for the RS-232-C interface.

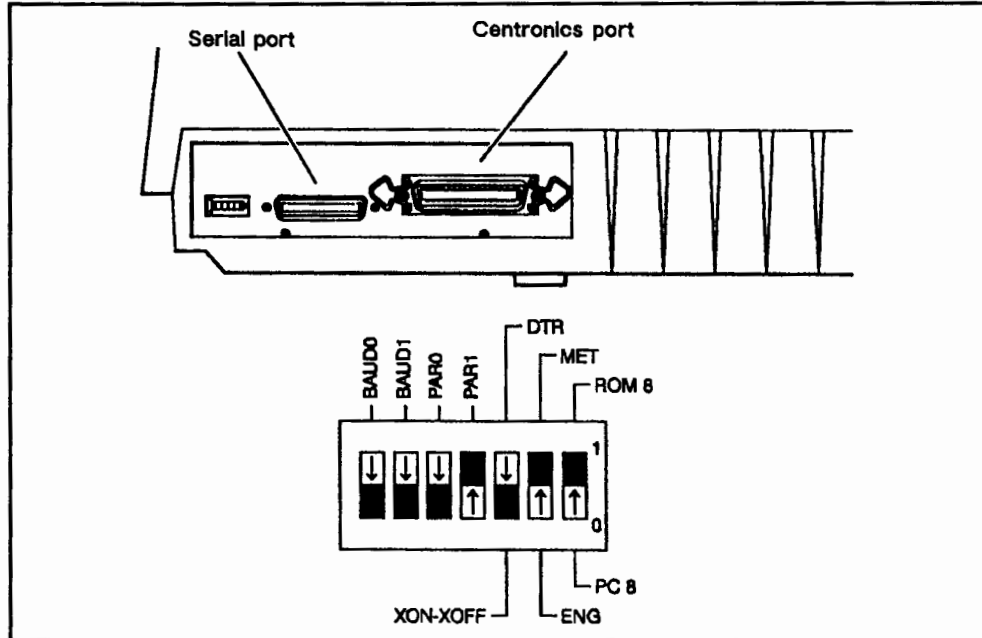


Figure 2-14. PaintJet XL Serial/Parallel Interface and Rear Panel Switches

HP C1602A PaintJet XL Printer**3. *Set the rear panel switches.***

For the RS-232-C interface set the following switch values:

- symbol set
- media size
- baud rate
- parity
- handshake

Note

As soon as you set the switches correctly, do not reset them unless you change your computer/printer system setup.

a. Select a symbol set.

You must select either the Roman8 or PC8 symbol set to be the default set for your printer. The Roman8 symbol set includes the standard U.S. ASCII set (printing characters are decimal codes 32-127) and the Roman Extensions, an eight-bit set of European characters and special symbols (decimal codes 160-255). Of the nonprinting control codes, only decimal codes 8, 10, 12, 13, 14, 15, and 27 are executed; all other decimal codes are ignored. You can look up all other control codes and the symbol sets in the appendix of the accompanying printer installation manual.

The lower half of the PC-8 set is the same as the U.S. ASCII set except that decimal codes 1-32 have special printing characters. The upper half is an eight-bit set containing some European symbols and graphic symbols for mathematics and line drawing.

- Setting the ROM8/PC8 switch on establishes the Roman8 symbol set as shown in Figure 2-15.
- Setting the ROM8/PC8 switch off establishes the PC8 symbol set.

Use a pen or pencil to push the ROM8/PC8 switch to the desired position.

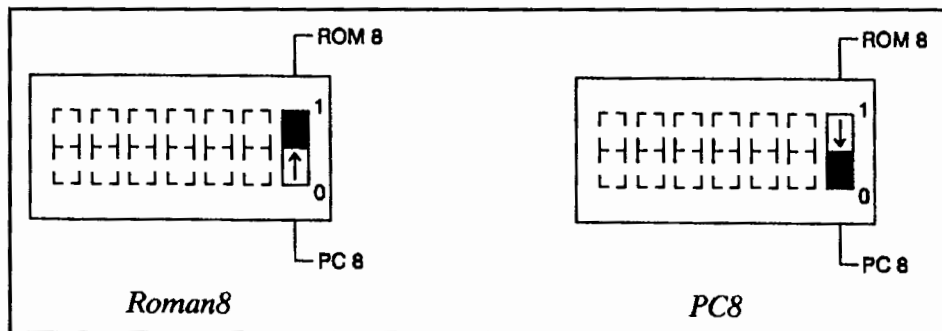


Figure 2-15. Switch Settings for Roman8 and PC8 Character Sets

HP C1602A PaintJet XL Printer

b. Select the media sizes.

The PaintJet XL printer is designed to use both metric and English paper or transparency film in the following standard sizes:

- ANSI A and B
- ISO A4 and A3

Table 2-16.

English (ANSI)	Metric (ISO)
A (8# X 11 in.)	A4 (210 X 297 mm)
B (11 X 17 in.)	A3 (297 X 420 mm)

- Setting the MET/ENG switch to ON establishes metric media sizes.
- Setting the MET/ENG switch to OFF establishes English media sizes.

Use a pen or pencil to push the MET/ENG switch to the desired position.

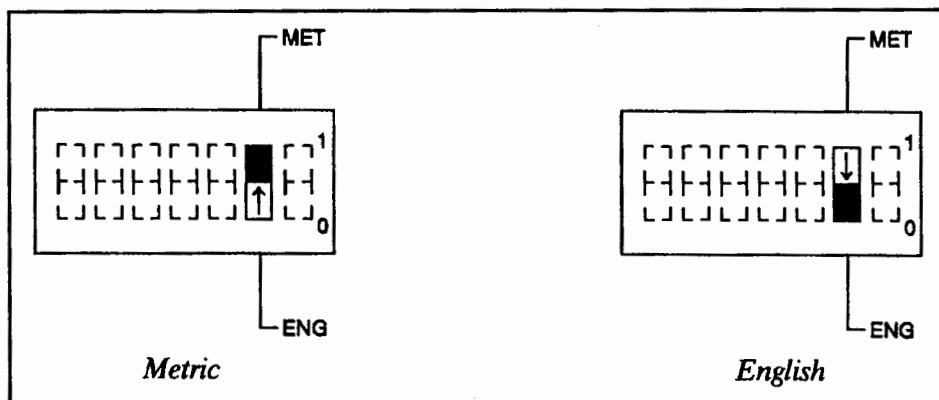


Figure 2-16. Switch Settings for Metric and English Media Sizes

c. Select the baud rate.

The combined settings of the two baud rate switches set the baud rate. The printer sends one stop bit for all of these baud rates. Your computer and printer do not have to use the same number of stop bits.

Default 9600 baud

Options 1200, 4800, 9600, and 19,200

Figure 2-17 and Figure 2-18 show how to set the switches for the available baud rates. Use a pen or pencil to push the BAUD0 and BAUD1 switches to the desired position.

Baud Rate	Switch Settings
1200	
4800	

Figure 2-17. Baud Rate Settings

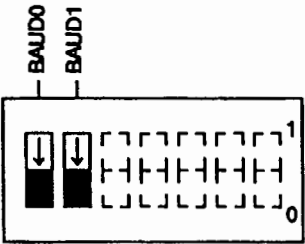
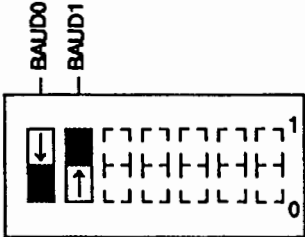
Baud Rate	Switch Settings
9600	
19 200	

Figure 2-18. Baud Rate Settings

d. Select parity.

If you plan to access any of the symbols in the upper half of either symbol set (decimal codes 128-255), you must set parity to space (none). Otherwise, the special characters do not print.

The combined settings of the two parity switches set the parity. If you will be using any of the higher bits from the symbol sets, you must set parity to Space (off).

Default	Space (Off, parity bit 0)
Options	Space (0), Mark (1), Odd, Even

Figure 2-19 and Figure 2-20 show how to set the switches for parity.

Note	If your software uses eight-bit character sets (for example, ISO sets), it requires NO (space) parity as the eighth bit must be available for data.
-------------	---

Use a pen or pencil to set the PAR0 and PAR1 switches to the desired position.

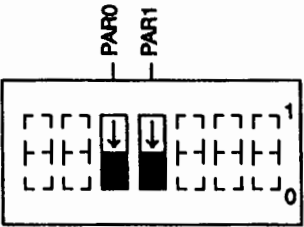
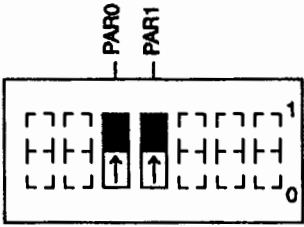
Parity	Switch Settings
Space (bit 8 transmitted as 0)	
Mark (bit 8 transmitted as 1)	

Figure 2-19. Parity Switch Settings

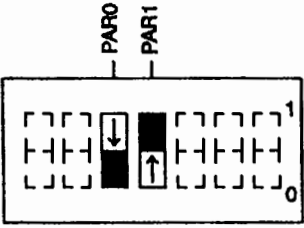
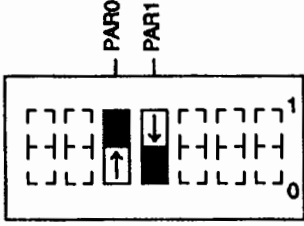
Parity	Switch Settings
Even	
Odd	

Figure 2-20. Parity Switch Settings

e. Select a handshake.

Use a pen or pencil to set the XON-XOFF/DTR switch to the desired position.

Default Xon-Xoff

Options Xon-Xoff and Hardwire (DTR)

- Setting the XON-XOFF/DTR switch to OFF establishes an Xon-Xoff handshake.
- Setting the XON-XOFF/DTR switch to ON establishes a hardwire handshake.

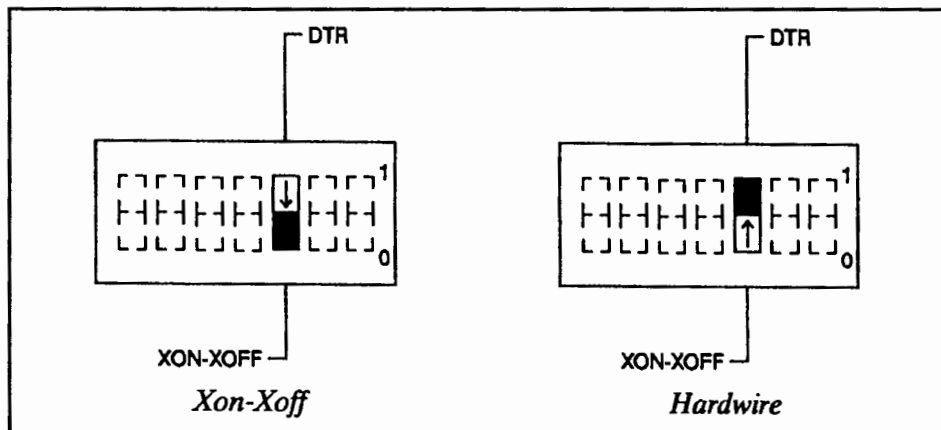


Figure 2-21. Handshake Switch Settings



HP C1602A PaintJet XL Printer

4. *Connect the printer to your computer.*

Refer to the “RS-232C Cabling Guidelines” section in Chapter 1: “Introduction”.

- a. Attach one end of the RS-232-C (serial) cable to the computer.
- b. Attach the other end of the RS-232-C (serial) cable to the printer.

5. *Ensure that the power switch is in the OFF position.*

6. *Connect the printer power cord.*

Connect the female end of the power cord to the power socket on the back of the printer, and connect the other end to your power outlet.

7. *Turn on the printer.*

8. *Reconnect the power cord to the computer.*

9. *Turn on the computer.*

Hardware Installation Complete!

Refer to the manuals that came with your printer to:

- load the pens
- load the media

Continue to the “HP-UX Set Up Information” section for software configuration information.

Connecting the Printer to an HP-IB Interface

Perform the following tasks to install this printer:

1. *Play it safe.*
 - a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
2. *Select your interface.*

Select one of the following standard-speed HP-IB interfaces:

- HP 98624A standard-speed HP-IB interface card
- Built-in standard-speed HP-IB interface

HP C1602A PaintJet XL Printer

Use Figure 2-22 to help you identify the HP-IB interface on the printer. Figure 2-22 also illustrates the rear panel switches for the the HP-IB interface.

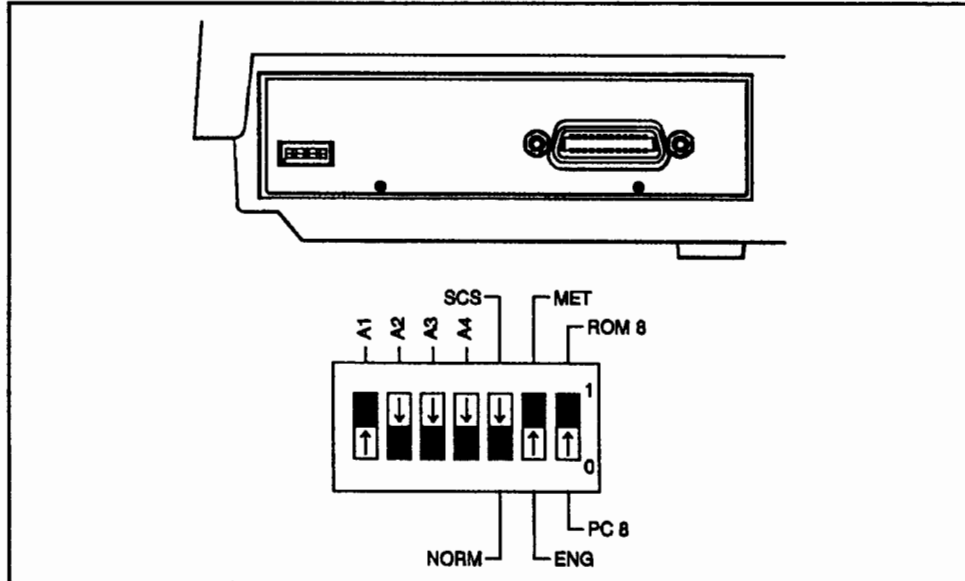


Figure 2-22. PaintJet XL HP-IB Interface and Rear Panel Switches

3. Set the rear panel switches.

For the HP-IB interface set the following switch values:

- symbol set.
- media size.

Note

As soon as you set the switches correctly, do not reset them unless you change your computer/printer system setup.

a. Select a symbol set.

You must select either the Roman8 or PC8 symbol sets to be the default set for your printer. The Roman8 symbol set includes the standard U.S. ASCII set (printing characters are decimal codes 32-127) and the Roman Extensions, an eight-bit set of European characters and special symbols (decimal codes 160-255). Of the nonprinting control codes, only decimal codes 8, 10, 12, 13, 14, 15, and 27 are executed; all other decimal codes are ignored. You can look up all other control codes and the symbol sets in the appendix of the accompanying installation manual.

The lower half of the PC-8 set is the same as the U.S. ASCII set except that decimal codes 1-32 have special printing characters. The upper half is an eight-bit set containing some European symbols and graphic symbols for mathematics and line drawing.

- Setting the ROM8/PC8 switch on establishes the Roman8 symbol set as shown in Figure 2-23.
- Setting the ROM8/PC8 switch off establishes the PC8 symbol set.

Use a pen or pencil to push the ROM8/PC8 switch to the desired position.

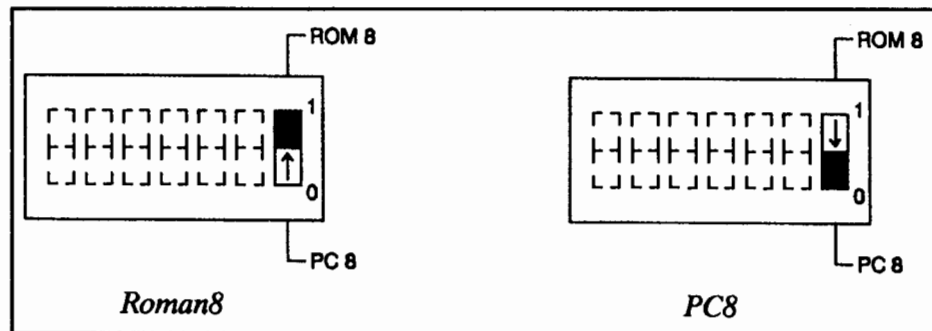


Figure 2-23. Switch Settings for Roman8 and PC8 Character Sets

HP C1602A PaintJet XL Printer

b. Select the media sizes.

The PaintJet XL printer is designed to use both metric and English paper or transparency film in the following standard sizes:

- ANSI A and B
- ISO A4 and A3

Table 2-17.

English (ANSI)	Metric (ISO)
A (8# X 11 in.)	A4 (210 X 297 mm)
B (11 X 17 in.)	A3 (297 X 420 mm)

- Setting the MET/ENG switch to ON establishes metric media sizes.
- Setting the MET/ENG switch to OFF establishes English media sizes.

Use a pen or pencil to push the MET/ENG switch to the desired position.

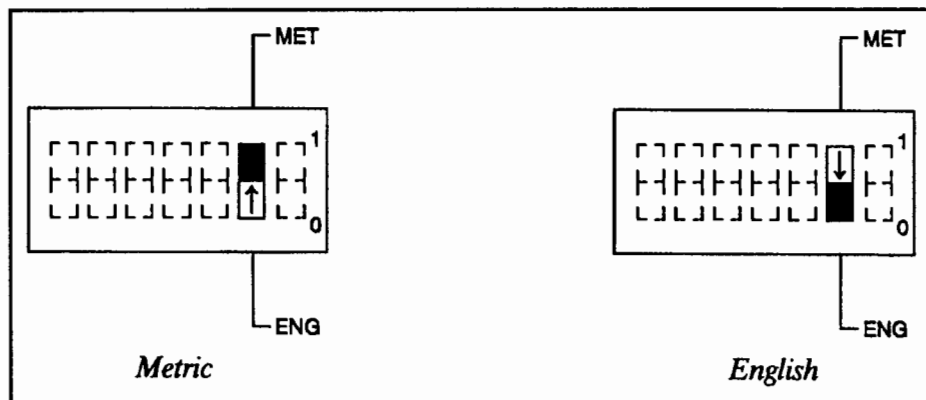


Figure 2-24. Switch Settings for Metric and English Media Sizes

4. *Set the HP-IB bus address.*

Note

You should familiarize yourself with the HP-IB addresses that are currently in use on your system. Determine the available HP-IB address(es). Use the foldout worksheet at the end of this book to note already-used addresses.

You are limited to eight devices per HP-IB card, addresses 0 through 7.

Switches A1 through A4 set the HP-IB bus address.

HP C1602A PaintJet XL Printer**5. Connect the printer to your computer.**

If you need to replace your HP-IB cable for any reason, the following list contains the available HP-IB cables and their lengths.

- HP 10833A 1.0 meter HP-IB cable
- HP 10833B 2.0 meter HP-IB cable
- HP 10833C 4.0 meter HP-IB cable
- HP 10833D 0.5 meter HP-IB cable

- a. Connect one end of the HP-IB cable to the HP-IB connector on the back of the printer. Tighten the thumb screws to secure the connection.
- b. Connect the other end of the HP-IB cable to the interface or the last device on the chain.

If the HP-IB interface already has one or more devices connected to it, connect the cable from your new device to the last device on the chain as in Figure 2-25. A close up of the “piggy-backed” HP-IB connectors on the previously last device on the chain is provided in Figure 2-26.

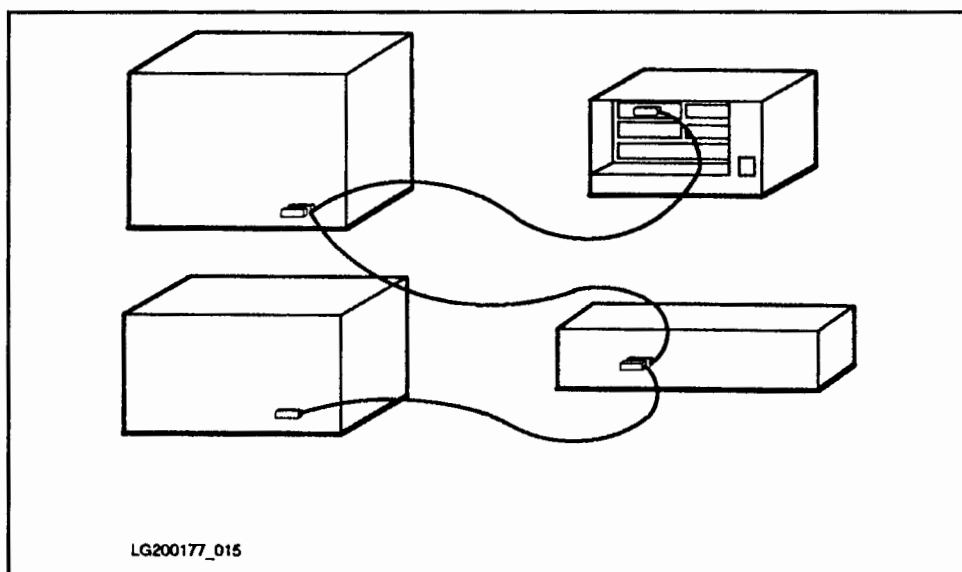
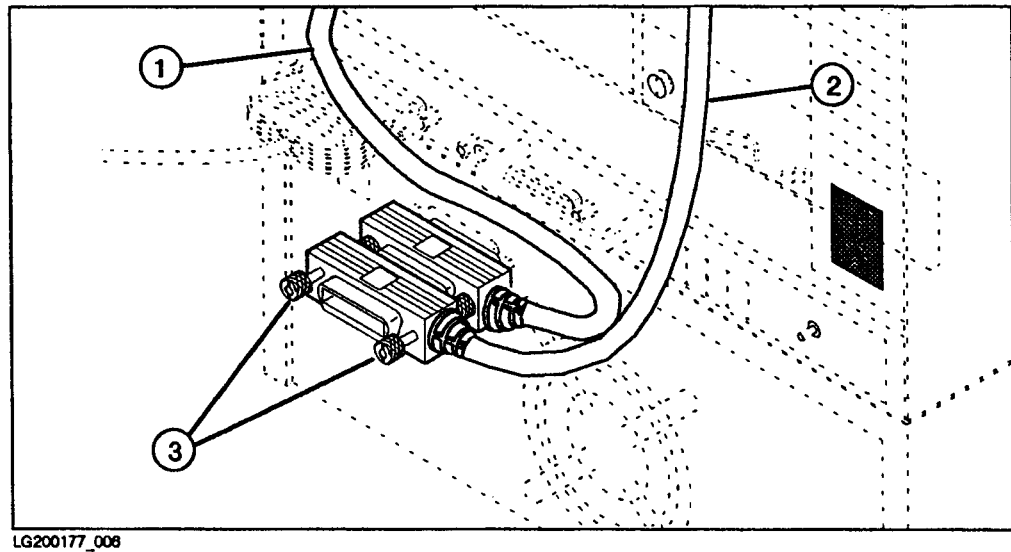


Figure 2-25. Daisy-Chained HP-IB Devices



LG200177_008

Figure 2-26. "Piggy-Backed" HP-IB Connectors

- ① Cable to the interface or previous device.
- ② Cable to the printer.
- ③ Thumb screws to be tightened.

HP C1602A PaintJet XL Printer**6. *Record the HP-IB bus address.***

Make a note that the HP-IB bus address you selected has been used and is no longer available on the interface you selected. Use the foldout worksheet at the end of this book for this purpose.

7. *Ensure that the printer power switch is in the OFF position.***8. *Connect the printer power cord.***

Connect the female end of the power cord to the power socket on the back of the printer, and connect the other end to your power outlet.

9. *Turn on the printer.***10. *Reconnect the power cord to the computer.*****11. *Turn on the computer.*****Hardware Installation Complete!**

Refer to the manuals that came with your printer to:

- load the pens
- load the media

Hardware Installation Complete!

Continue to the “HP-UX Set Up Information” section for software configuration information.

HP-UX Set Up Information

The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Table 2-18.
HP C1602A PaintJet XL Printer
Connected to HP-IB Interfaces

Device Name	Path Name ¹	File Type	Major Number	Driver Name	Select Code	Minor Number ²
HP C1602A Printer	/dev/lp1602A	c	21	hpib	7 ³	0x070n00
HP C1602A Printer	/dev/lp1602A	c	21	hpib	8 ⁴	0x080n00

¹ Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

² *n* is a number that identifies the bus address. Replace *n* with a 5 if the address was set to 5, use 7 if the address was set to 7, and so on.

³ Built-in standard-speed HP-IB interface.

⁴ HP 98624A standard-speed HP-IB interface.

HP C1602A PaintJet XL Printer

Table 2-19.
HP C1602A PaintJet XL Printer
Connected to a Parallel Interface

Device Name	Path Name ¹	File Type	Major Number	Driver Name	Select Code	Minor Number
HP C1602A Printer	/dev/ptrxxxx	c	21	parallel ²	23 ³	0x170000

¹ Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

² The parallel driver requires the "hpib" driver to be part of the kernel configuration.

³ Built in parallel interface.

Table 2-20.
HP C1602A PaintJet XL Printer
Connected to RS-232-C Interfaces

Device Name	Path Name ¹	File Type	Major Number	Driver Name	Select Code	Minor Number
HP C1602A Printer	/dev/lp1602A	c	1	98626	9 ²	0x090004
HP C1602A Printer	/dev/lp1602A	c	1	98628	20 ³	0x140004
HP C1602A Printer port 0	/dev/lp1602A	c	1	98642	13 ⁴	0x0d0004
HP C1602A Printer port 1	/dev/lp1602A	c	1	98642	13 ⁴	0x0d0104
HP C1602A Printer port 2	/dev/lp1602A	c	1	98642	13 ⁴	0x0d0204
HP C1602A Printer port 3	/dev/lp1602A	c	1	98642	13 ⁴	0x0d0304
HP C1602A Printer port 0	/dev/lp1602A	c	1	98642	28 ⁵	0x1c0004
HP C1602A Printer port 1	/dev/lp1602A	c	1	98642	28 ⁵	0x1c0104
HP C1602A Printer port 2	/dev/lp1602A	c	1	98642	28 ⁵	0x1c0204
HP C1602A Printer port 3	/dev/lp1602A	c	1	98642	28 ⁵	0x1c0304
HP C1602A Printer port 4	/dev/lp1602A	c	1	98642	28 ⁵	0x1c0404
HP C1602A Printer port 5	/dev/lp1602A	c	1	98642	28 ⁵	0x1c0504
HP C1602A Printer port 6	/dev/lp1602A	c	1	98642	28 ⁵	0x1c0604
HP C1602A Printer port 7	/dev/lp1602A	c	1	98642	28 ⁵	0x1c0704

¹ Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

² Built-in RS-232-C Interface and HP 98626A RS-232-C Interface.

³ HP 98628A Datacomm Interface.

⁴ HP 98642A 4-Channel Multiplexer Interface

⁵ HP 98638A 8-Channel Multiplexer Interface

HP 2563/64/66/67C Impact Printers

The HP 2563C is a high-speed (420 lpm) line printer for high-volume system printing applications, replacing the 2563B printer.

The HP 2564C is a high-speed (840 lpm) line printer for high-volume system printing applications, replacing the 2564B printer.

The HP 2566C is a high-speed (1200 lpm) line printer for high-volume system printing applications, replacing the 2566B printer.

The HP 2567C is a high-speed (1600 lpm) line printer for high-volume system printing applications, replacing the 2567B printer.

These printers support the following interfaces:

- HP-IB
- RS-232-C
- Parallel

Refer to the "HP-IB Device Guidelines" in Chapter 1: "Introduction" before connecting this device to your system. Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

Installing the HP 2563/64/66/67C Impact Printers

Refer to the documentation shipped with your printer to connect the printer to your system.

Connecting the Printer to an HP-IB Interface

Perform the following tasks to install this printer:

1. *Play it safe.*
 - a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.

2. *Select your interface.*

Select one of the following standard-speed HP-IB interfaces:

- HP 98624A standard-speed HP-IB interface card
- Built-in standard-speed HP-IB interface

3. *Set the HP-IB bus address.*

Note

You should familiarize yourself with the HP-IB addresses that are currently in use on your system. Determine the available HP-IB address(es). Use the foldout worksheet at the end of this book to note already-used addresses.

You are limited to eight devices per HP-IB card, addresses 0 through 7.

Refer to the documentation shipped with your printer to set the HP-IB bus address.

HP 2563/64/66/67C Impact Printers**4. *Connect the printer to the computer.***

If you need to replace your HP-IB cable for any reason, the following list contains the available HP-IB cables and their lengths.

- HP 10833A 1.0 meter HP-IB cable
- HP 10833B 2.0 meter HP-IB cable
- HP 10833C 4.0 meter HP-IB cable
- HP 10833D 0.5 meter HP-IB cable

- a. Connect one end of an HP-IB cable to the HP-IB connector on the back of the printer. Tighten the thumb screws to secure the connection.
- b. Connect the other end of the HP-IB cable to the HP-IB interface or the last device on the chain.

If the HP-IB interface already has one or more devices connected to it, connect the cable from your new device to the last device on the chain as in Figure 2-27. A close up of the “piggy-backed” HP-IB connectors on the previously last device on the chain is provided in Figure 2-28.

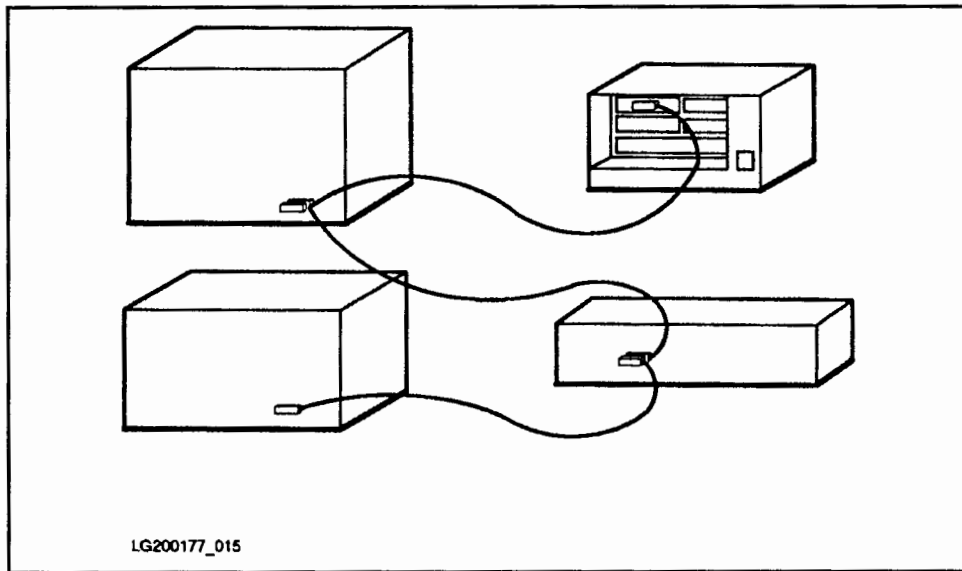
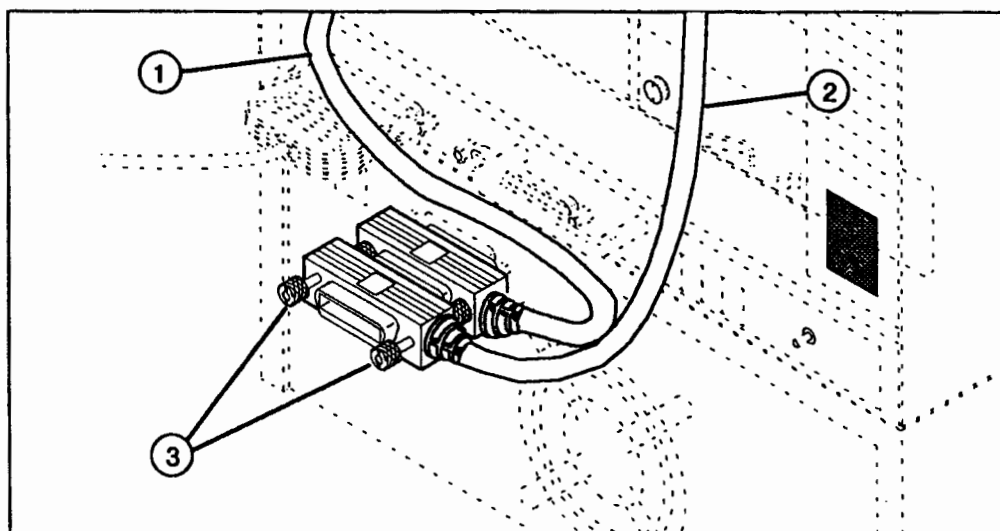


Figure 2-27. Daisy-Chained HP-IB Devices



LG200177_008

Figure 2-28. "Piggy-Backed" HP-IB Connectors

- ① Cable to the interface or previous device.
- ② Cable to the printer.
- ③ Thumb screws to be tightened.

HP 2563/64/66/67C Impact Printers

5. *Ensure that the printer power switch is in the OFF position.*
6. *Connect the printer power cord.*

Connect the female end of the printer power cord to the power socket on the back of the printer, and connect the other end to your power outlet.

7. *Record the HP-IB bus address.*

Make a note that the HP-IB bus address you selected has been used and is no longer available on the interface you selected. Use the foldout worksheet at the end of this book for this purpose.

8. *Ensure that the printer power switch is in the OFF position.*
9. *Connect the printer power cord.*

Connect the female end of the power cord to the power socket on the back of the printer, and connect the other end to your power outlet.

10. *Turn on the printer.*
11. *Reconnect the power cord to the computer.*
12. *Turn on the computer.*

Hardware Installation Complete!

Continue to the “HP-UX Set Up Information” section for software configuration information.

Connecting the Printer to an RS-232-C Interface

Perform the following tasks to install this printer:

1. *Play it safe.*
 - a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
2. *Select your interface.*

Select one of the following RS-232-C interfaces:

- The built-in RS-232-C interface.
- HP 98626A RS-232-C Interface.
- HP 98628A Datacomm Interface.
- HP 98642A 4-Channel Multiplexer Interface
- HP 98638A 8-Channel Multiplexer Interface
- HP 98644A RS-232-C Serial Interface.

Note	If you have more than one serial port, you need to know the address of your port. You need this information for testing communications and for configuring your software.
-------------	---

Caution	Many computer systems have both parallel and RS-232-C ports. These ports frequently appear identical. Make sure you plug your cable into the correct port or you could damage your device.
----------------	--

Refer to "RS-232-C Cabling Guidelines" in Chapter 1: "Introduction".

Refer to the documentation that was shipped with your printer to connect the printer to your system. Also refer to the documentation to set switches for parity, baud rate, or handshake.

HP 2563/64/66/67C Impact Printers

3. *Ensure that the printer power switch is in the OFF position.*
4. *Connect the printer power cord.*

Connect the female end of the power cord to the power socket on the back of the printer, and connect the other end to your power outlet.

5. *Turn on the printer.*
6. *Reconnect the power cord to the computer.*
7. *Turn on the computer.*

Hardware Installation Complete!

Continue to the “HP-UX Set Up Information” section for software configuration information.

Connecting the Printer to a Parallel Interface

Perform the following tasks to install this printer:

1. *Play it safe.*
 - a. Follow the computer “shut down” procedure. See *System Administration Tasks Manual* Chapter 3: “Starting and Stopping HP-UX” for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
2. *Select your interface.*

Locate the built-in parallel interface on the back of the computer. It should be labeled PARALLEL.

Caution	Many computer systems have both parallel and RS-232-C ports. These ports frequently appear identical. Make sure you plug your cable into the correct port or you could damage your device.
----------------	--

3. *Refer to the documentation that was shipped with your printer to connect the printer to your system.*
4. *Ensure that the printer power switch is in the OFF position.*
5. *Connect the printer power cord.*

Connect the female end of the power cord to the power socket on the back of the printer, and connect the other end to your power outlet.
6. *Turn on the printer.*
7. *Reconnect the power cord to the computer.*
8. *Turn on the computer.*

Hardware Installation Complete!

Continue to the “HP-UX Set Up Information” section for software configuration information.

HP 2563/64/66/67C Impact Printers

HP-UX Set Up Information

The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Table 2-21.
HP 2563/64/66/67C Impact Printers
Connected to HP-IB Interfaces

Device Name	Path Name ¹	File Type	Major Number	Driver Name	Select Code	Minor Number ²
HP 256XC Printers	/dev/lp256xC	c	21	hpib	7 ³	0x070n00
HP 256XC Printers	/dev/lp256xC	c	21	hpib	8 ⁴	0x080n00

1 Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

2 *n* is a number that identifies the bus address. Replace *n* with a 5 if the address was set to 5, use 7 if the address was set to 7, and so on.

3 Built-in standard-speed HP-IB interface.

4 HP 98624A standard-speed HP-IB interface.

Table 2-22.
HP 2563/64/66/67C Impact Printers
Connected to a Parallel Interface

Device Name	Path Name ¹	File Type	Major Number	Driver Name	Select Code	Minor Number
HP 256XC Printers	/dev/ptr256xC	c	21	parallel ²	23 ³	0x170000

¹ Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

² The parallel driver requires the "hpib" driver to be part of the kernel configuration.

³ Built in parallel interface.

HP 2563/64/66/67C Impact Printers

Table 2-23.
HP 2563/64/66/67C Impact Printers
Connected to RS-232-C Interfaces

Device Name	Path Name ¹	File Type	Major Number	Driver Name	Select Code	Minor Number
HP 256XC Printers	/dev/lp256xC	c	1	98626	9 ²	0x090004
HP 256XC Printers	/dev/lp256xC	c	1	98628	20 ³	0x140004
HP 256XC Printers port 0	/dev/lp256xC	c	1	98642	13 ⁴	0x0d0004
HP 256XC Printers port 1	/dev/lp256xC	c	1	98642	13 ⁴	0x0d0104
HP 256XC Printers port 2	/dev/lp256xC	c	1	98642	13 ⁴	0x0d0204
HP 256XC Printers port 3	/dev/lp256xC	c	1	98642	13 ⁴	0x0d0304
HP 256XC Printers port 0	/dev/lp256xC	c	1	98642	28 ⁵	0x1c0004
HP 256XC Printers port 1	/dev/lp256xC	c	1	98642	28 ⁵	0x1c0104
HP 256XC Printers port 2	/dev/lp256xC	c	1	98642	28 ⁵	0x1c0204
HP 256XC Printers port 3	/dev/lp256xC	c	1	98642	28 ⁵	0x1c0304
HP 256XC Printers port 4	/dev/lp256xC	c	1	98642	28 ⁵	0x1c0404
HP 256XC Printers port 5	/dev/lp256xC	c	1	98642	28 ⁵	0x1c0504
HP 256XC Printers port 6	/dev/lp256xC	c	1	98642	28 ⁵	0x1c0604
HP 256XC Printers port 7	/dev/lp256xC	c	1	98642	28 ⁵	0x1c0704

¹ Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

² Built-in RS-232-C Interface and HP 98626A RS-232-C Interface.

³ HP 98628A Datacomm Interface.

⁴ HP 98642A 4-Channel Multiplexer Interface

⁵ HP 98638A 8-Channel Multiplexer Interface

2-104 Installing Printers

Setting Up HP-UX for Printers

The following sequence of SAM menus from the main menu **System Administration Manager** will display the screen on which you will enter information specific to your printer.

```
Peripheral Devices ->  
↓  
Printer and Plotters ->  
↓  
Add a Local Printer ...
```

If you are adding a remote printer select **Add a Remote Printer ...**.

Enter the following information about your printer:

- printer name
- printer model/interface
- printer device file name
- printer priority (optional)
- system default option (optional)
- printer class (optional)
- printer connected to terminal running tsm(1) option (optional)

HP 2563/64/66/67C Impact Printers

Use the **Tab** key to move from field to field as you fill in information on this screen. If you need additional information about a particular field, position the cursor on the field and press **Help** **F1**.

3

When you have filled in all of the information press **Perform Task** **F4**.

SAM will create the device file needed to communicate with the printer.

The device driver is already part of the kernel configuration and therefore a regeneration of the kernel is not necessary.

Installing Plotters and Graphic Devices

Introduction

This chapter contains the hardware installation procedure for the following plotters and graphic devices:

- HP Plotter (HP-IB Interface)
- HP 7550B Plus Plotter
- HP C1600A/01A 7600 Series Models 240D and 240E Plotters
- HP C1620A Series 7600 Model 355 Electrostatic Plotter
- HP C1625A/27A Series 7600 Models 250 and 255 Plotters
- HP 7575/76A DraftPro DXL/EXL Plotters
- HP 9111A Graphics Tablet
- HP 45911A/C Graphics Tablet
- HP 46087/88A Digitizers and HP 46089A Cursor
- HP 98627A Color Output Interface
- HP 13279B Color Monitor
- HP 98556A 2D Integer Based Graphics Accelerator Accessory Card
- HP 98548/49/50A High Resolution Graphics Interface
- HP A1416A High Resolution Color Graphics Interface
- HP 98287A Graphics Display Controller Interface
- HP 98700 CX Graphics Display Controller
- HP 98724A/25A Local Graphics Bus Interface
- HP 98720A SRX Graphics Display Controller
- HP 98726A Local Graphics Bus Interface
- HP 98730A *TurboSRX* Graphics Display Controller
- HP 98702A Graphics Address and Data Bus Interface
- HP 98705A/B/C Graphics Display Controllers
- HP 98735-66580 Physical DMA Interface
- HP 98735-66581 Virtual DMA Interface
- HP 98735A/36A/36B Graphics Display Controllers

HP Plotter (HP-IB Interface)

All HP plotters connect to your computer via the standard-speed HP-IB interface.

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

Installing the HP Plotter

Note

If your system is configured as an HP-UX cluster, please refer to the *Managing Clusters of HP-UX Computers* Chapter 13: "Adding Peripherals to a Cluster" before adding this device to your system.

Plotters may be added in a cluster environment to your client or server.

Before installing your HP Plotter refer to the documentation that was shipped with the plotter to:

- unpack the plotter
- check the line voltage

Perform the following tasks to install this plotter:

1. *Play it safe.*
 - a. Follow the computer “shut down” procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
2. *Select your interface.*

Select one of the following standard-speed HP-IB interfaces:

- HP 98624A standard-speed HP-IB interface card
- Built-in standard-speed HP-IB interface

Avoid placing the plotter on the same interface used by your disk or tape drives. A dedicated HP 98624A standard-speed HP-IB Interface is recommended. Placing a plotter on the same standard-speed HP-IB interface as your disk or tape drive could substantially affect the performance of your disk or tape drive.

HP Plotter

3. Set the HP-IB address.

Note

You should familiarize yourself with the HP-IB addresses that are currently in use on your system. Determine the available HP-IB address(es). Use the foldout worksheet at the end of this book to note already-used addresses.

You are limited to eight devices per HP-IB card, addresses 0 through 7.

4

The bus address is preset to 5. If bus address 5 is already assigned to another device on the HP-IB bus, refer to the foldout worksheet at the end of this book to choose an unused bus address ranging from 0 to 6.

- Find the set of HP-IB address switches near the HP-IB connector.
- Set the HP-IB bus address according to Table 4-1. An example of setting the HP-IB bus address to 7 is shown in Figure 4-1.

Table 4-1. HP-IB Switch Settings

HP-IB Bus Address	Switch 1	Switch 2	Switch 3
0	0	0	0
1	0	0	1
2	0	1	0
3	0	1	1
4	1	0	0
5	1	0	1
6	1	1	0

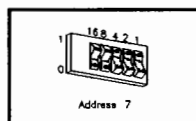


Figure 4-1. Address 7

- Connect the plotter to the computer.

4-4 Installing Plotters and Graphic Devices

- a. Locate a standard-speed HP-IB cable.

If you need to replace your HP-IB cable for any reason, the following list contains the available HP-IB cables and their lengths.

HP 10833A 1.0 meter HP-IB cable

HP 10833B 2.0 meter HP-IB cable

HP 10833C 4.0 meter HP-IB cable

HP 10833D 0.5 meter HP-IB cable

- b. Connect one end of the HP-IB cable to the HP-IB connector on the back of the plotter. Tighten the thumb screws to secure the connection.
- c. Connect the other end of the HP-IB cable to the interface or the last device on the chain. If the HP-IB interface already has one or more devices connected to it, connect the cable from your new device to the last device on the chain as in Figure 4-2.

A close up of the “piggy-backed” HP-IB connectors on the previously last device on the chain is provided in Figure 4-3.

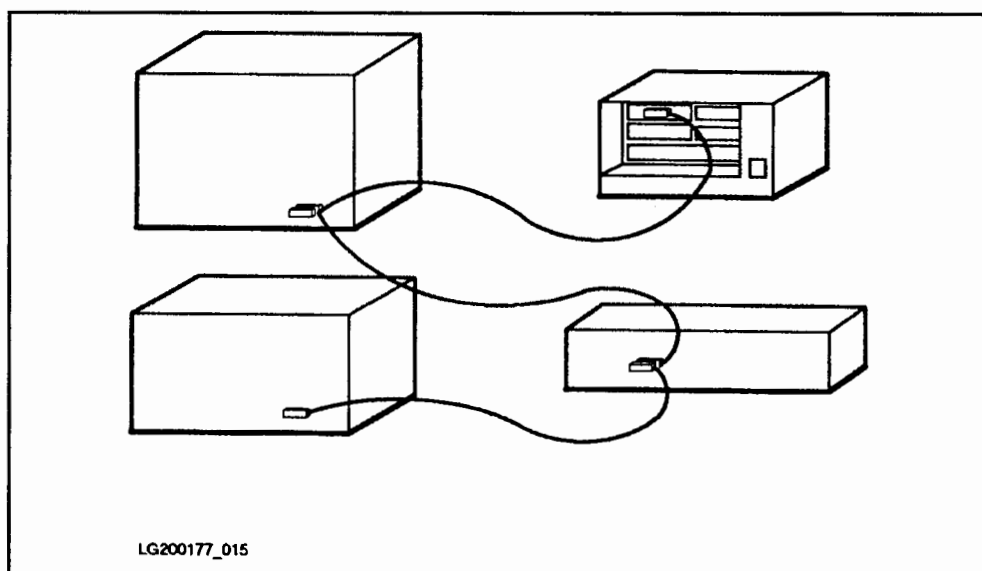
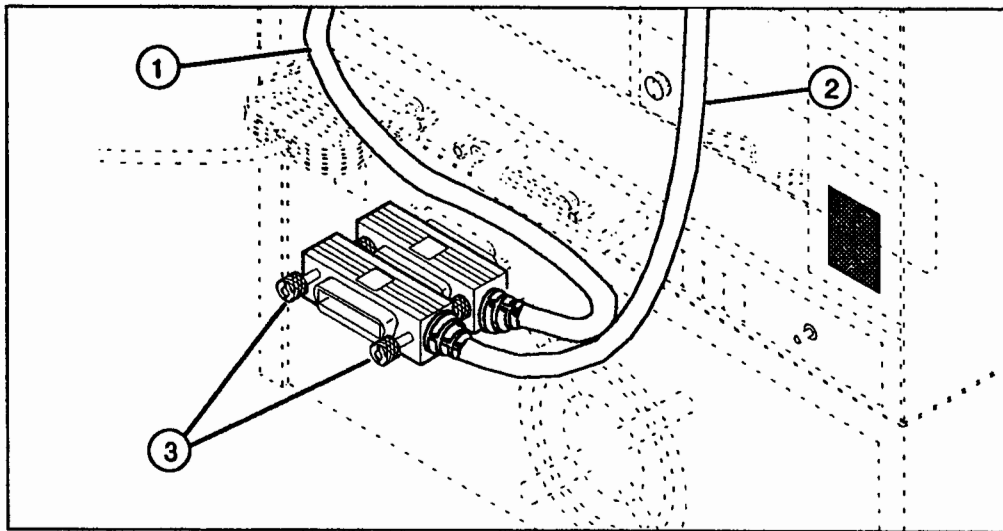


Figure 4-2. Daisy-Chained HP-IB Devices

HP Plotter



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Figure 4-3. "Piggy-Backed" HP-IB Connectors

- ① Cable to the interface or previous device.
- ② Cable to the plotter.
- ③ Thumb screws to be tightened.

4-6 Installing Plotters and Graphic Devices

5. *Ensure all power switches are in the OFF position.*

6. *Connect the Power Cord.*

Connect the female end (the small end if using an HP 7440A) of the power cord to the power socket on the back of the plotter, and connect the other end to your power outlet.

7. *Record the HP-IB address.*

Make a note that the HP-IB bus address you selected has been used and is no longer available on the interface you selected. Use the foldout worksheet at the end of this book for this purpose.

8. *Turn on the plotter.*

9. *Turn on the computer.*

Hardware Installation Complete!

Refer to your plotter's manual(s) to:

- Load the pens.
- Load the paper or medium.
- Perform the Confidence Test.

Continue on to "HP-UX Set Up Information" for software configuration information.

HP Plotter

HP-UX Set Up Information

The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Refer to Chapter 7: "Setting Up Devices Using HP-UX Commands" for software configuration information.

Table 4-2.

Plotter

Connected to Built-in HP-IB Interface

Device Name	Path Name ¹	File Type	Major Number	Driver Name	Select Code	Minor Number ²
Plotter	/dev/lpxxxx	c	21	hpib	7 ³	0x070n00
Plotter	/dev/lpxxxx	c	21	hpib	8 ⁴	0x080n00

1 Replace "xxxx" with the model number of the plotter.

2 n is a number that identifies the bus address. Replace n with a 5 if the address was set to 5, use 7 if the address was set to 7, and so on.

3 Built-in standard-speed HP-IB interface.

4 HP 98624A standard-speed HP-IB interface.

4-8 Installing Plotters and Graphic Devices

HP 7550B Plus Plotter

The HP 7550B Plus plotter is a desktop color plotter with the following features:

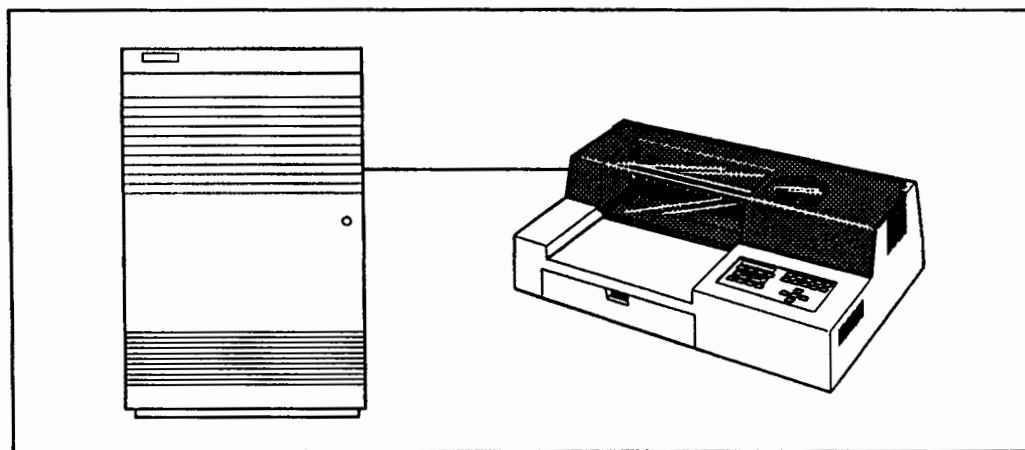
- High-quality graphics enhanced by a curved-line generator (addressable resolution of 0.025 mm and mechanical resolution of 0.006 mm).
- Unattended operation with automatic sheet feed (150 sheets paper capacity and 100 sheets transparency capacity).
- Compatible with HP-GL and HP-GL/2 languages.
- Maximum through-put of 6 g. acceleration; maximum pen speed 80 cm/s.
- Additional 1- or 2-megabyte board option allows user to download plot files to plotter and regain control of computer.
- Eight-pen carousel automatically sets optimal pen force and speed and senses paper size to determine proper plot margins.

The HP 7550B Plus plotter has two back panel configuration options:

- RS-232-C and parallel option
- RS-232-C and HP-IB option

One option of the HP 7550B Plus plotter has a parallel and an RS-232-C (serial) interface. For optimum data transmission speed, use the Centronics instead of the RS-232-C interface.

The other option of the HP 7550B Plus plotter has a parallel (HP-IB) and two RS-232-C (serial) connectors.



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Figure 4-4. HP 7550B Plus Plotter

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

4-10 Installing Plotters and Graphic Devices

Installing the HP 7550B Plus Plotter

Perform the following tasks to install this plotter:

1. *Select a location and unpack.*

- a. Select a location that is level and smooth.
- b. Avoid locations near air conditioners, exposed to direct sunlight, or subject to high humidity.
- c. Keep the plotter at least 60 cm (24 in.) from the closest wall. Additionally, be careful not to restrict the ventilation at the back of the unit, or stack anything on top of the plotter.
- d. After selecting and preparing a location for your plotter, unpack and move the plotter to its new location.
- e. Inspect the plotter.
- f. Locate the documentation shipped with your plotter, specifically HP part numbers:

07550-90051	HP 7550 Plus Plotter User's Guide
07550-90052	HP 7550 Plus Plotter Computer Information
- g. Call your local HP Sales and Support Office for a certified representative to install and set up your plotter.

A list of worldwide HP offices is included in your accessories box that accompanies the plotter.

Your plotter and its accessories were inspected before being shipped and should be in good condition. Compare your accessories with those listed. If any are missing, contact your local HP Sales and Support Office. If any are damaged, notify your HP Sales and Support Office and file a claim with the carrier.

HP 7550B Plus Plotter

2. Play it safe.

- Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
- TURN OFF the computer and unplug the power cord.

3. Familiarize yourself with the plotter.

Refer to the User's Guide to identify the major features of the plotter.

4. Familiarize yourself with the front panel.

Figure 4-5, Figure 4-6, Figure 4-7, and Figure 4-8 illustrate the front panel features, function buttons, pen select buttons, and cursor control buttons respectively. Refer to the User's Guide for a full description of the front panel operation.

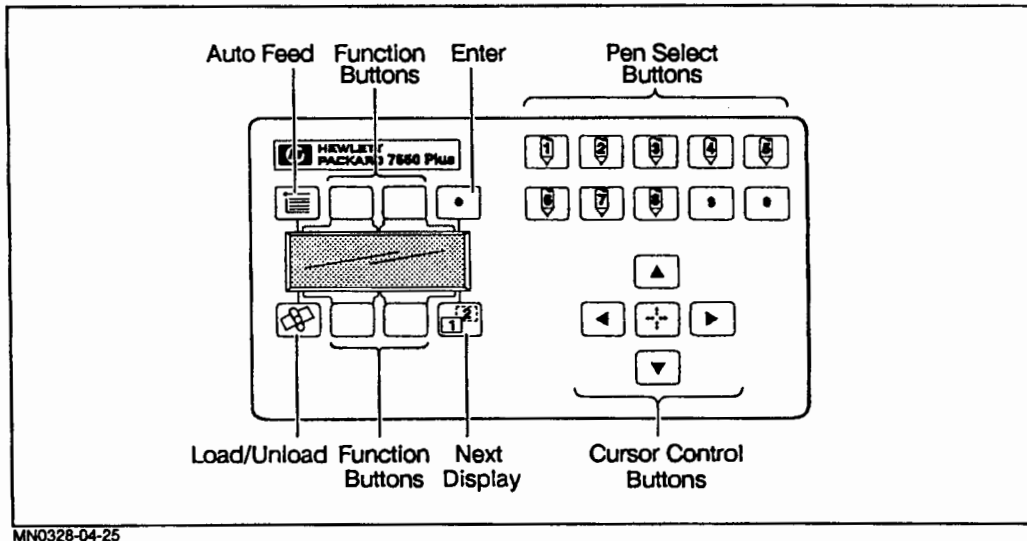


Figure 4-5. HP 7550B Front Panel

4-12 Installing Plotters and Graphic Devices

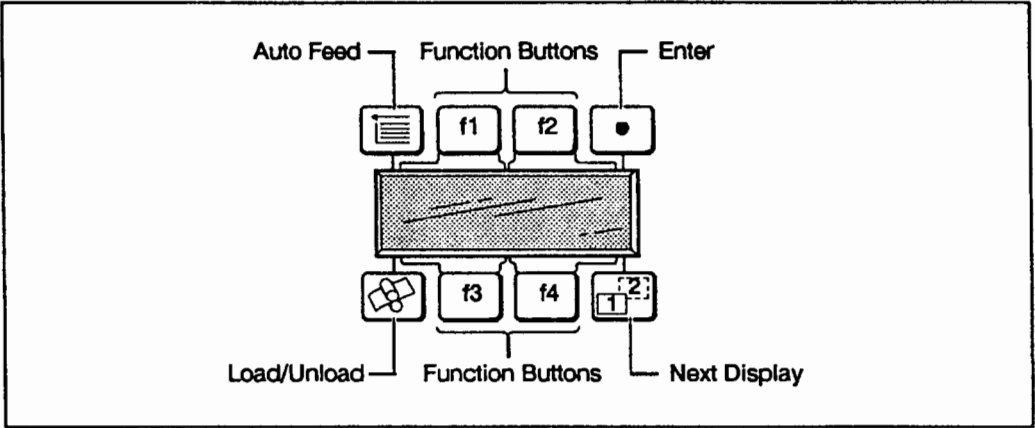


Figure 4-6. HP 7550B Function and Menu Control Buttons

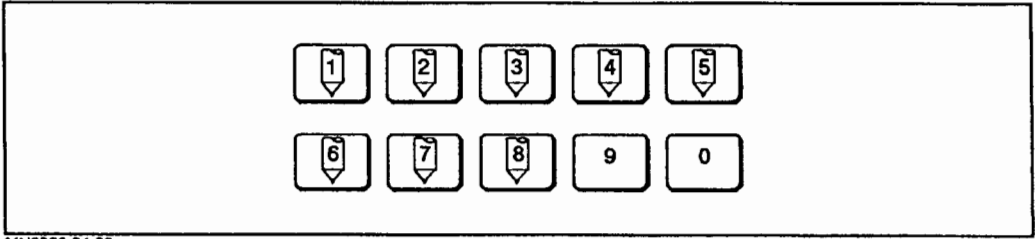


Figure 4-7. HP 7550B Pen Select Buttons

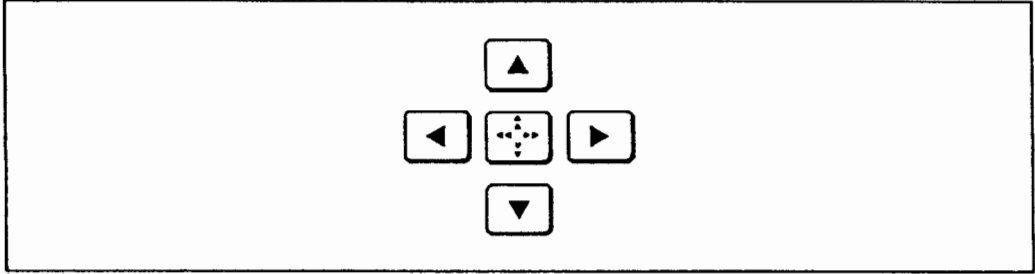
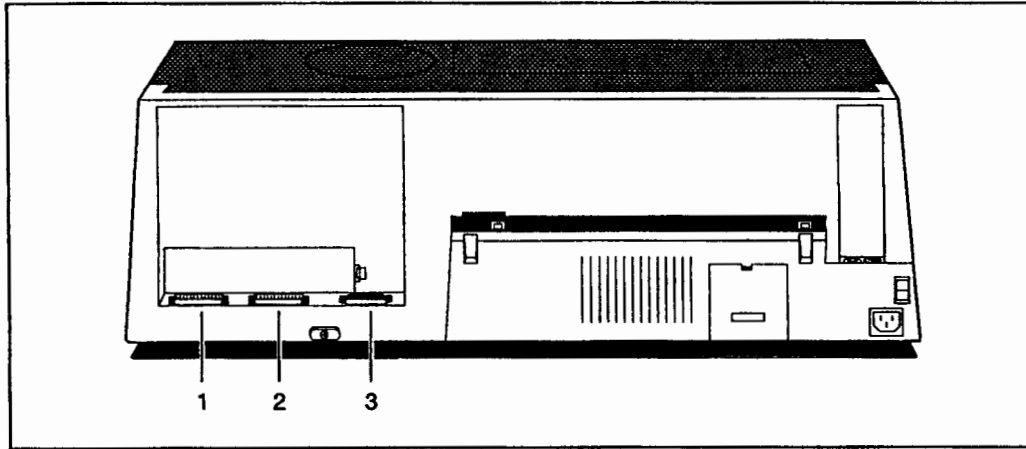


Figure 4-8. HP 7550B Cursor Control Buttons

HP 7550B Plus Plotter

5. *Identify the plotter interface connector.*

Figure 4-9 illustrates the HP-IB and RS-232-C ports on the HP-IB/RS-232-C combination plotter. Figure 4-10 illustrates the parallel and RS-232-C ports on the parallel/RS-232-C combination plotter.



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Figure 4-9. HP 7550B Plus Plotter HP-IB and RS-232-C Ports

- ① Terminal Port (Eavesdrop)
- ② Computer/Modem Port (RS-232-C Serial)
- ③ HP-IB Port

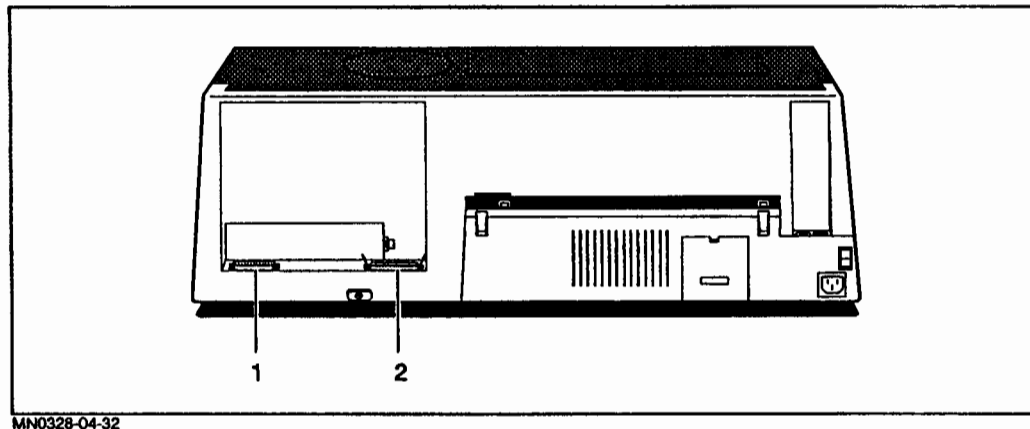


Figure 4-10. HP 7550B Plus Plotter HP-IB and RS-232-C Ports

- ① Computer/Modem Port (RS-232-C serial)
- ② Parallel port

The following section describes connecting and configuring your plotter according to the interface. Read the section corresponding to your interface type and then continue on to “HP-UX Setup Information.”



HP 7550B Plus Plotter

Connecting and Configuring the Plotter for an HP-IB Interface

1. *Select your computer interface.*

Select one of the following standard-speed HP-IB interfaces:

- HP 98624A standard-speed HP-IB interface card
- Built-in standard-speed HP-IB interface

2. *Connect your plotter to your computer.*

a. Locate a standard-speed HP-IB cable.

If you need to replace your HP-IB cable for any reason, the following list contains the available HP-IB cables and their lengths.

- HP 10833A 1.0 meter HP-IB cable
- HP 10833B 2.0 meter HP-IB cable
- HP 10833C 4.0 meter HP-IB cable
- HP 10833D 0.5 meter HP-IB cable

b. Connect the end of the HP-IB cable to the interface or the last device on the chain. If the HP-IB interface already has one or more devices connected to it, connect the cable from your new device to the last device on the chain as in Figure 4-11.

A close up of the “piggy-backed” HP-IB connectors on the previously last device on the chain is provided in Figure 4-12.

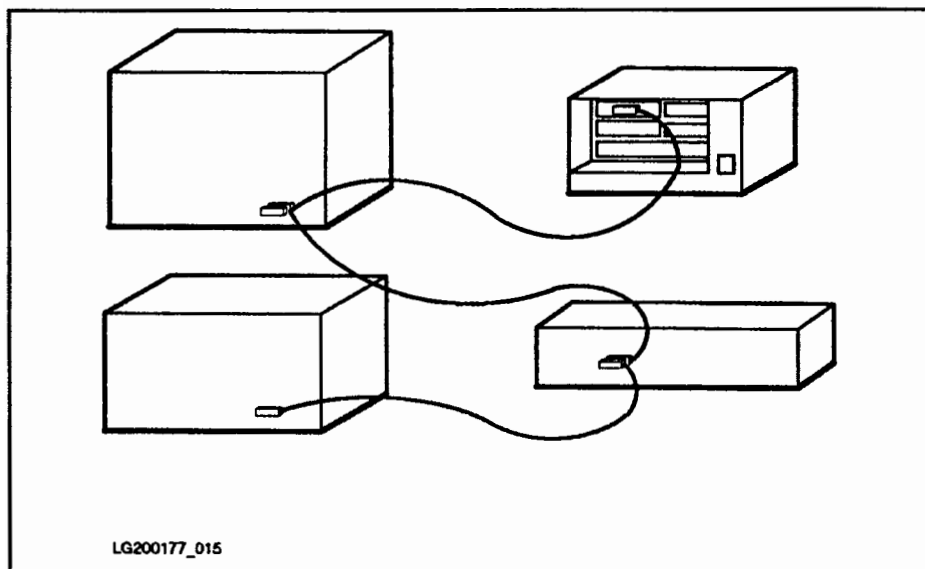
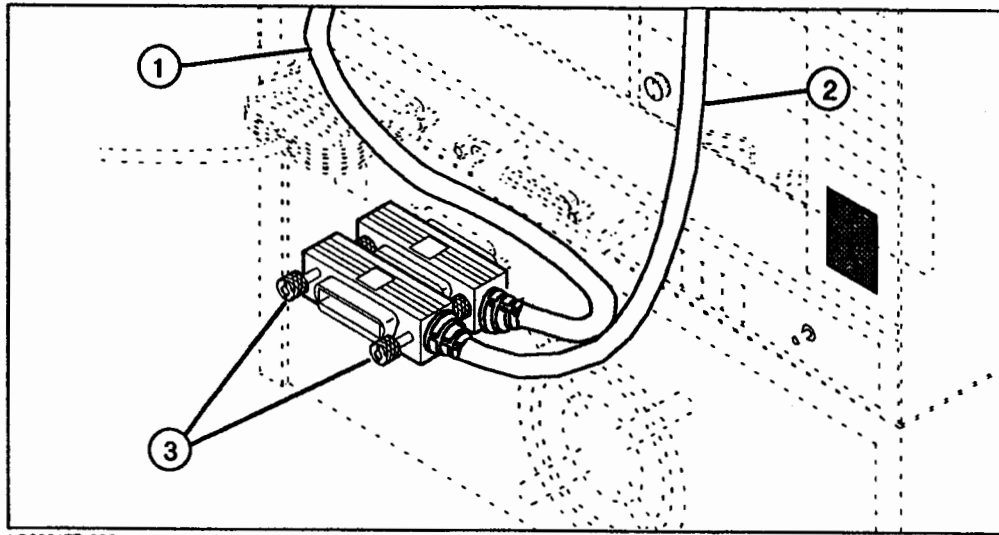


Figure 4-11. Daisy-Chained HP-IB Devices

HP 7550B Plus Plotter



LG200177_008

Figure 4-12. "Piggy-Backed" HP-IB Connectors

- ① Cable to the interface or previous device.
 - ② Cable to the plotter.
 - ③ Thumb screws to be tightened.
- c. Connect the other end of the HP-IB to the plotter. Figure 4-13 illustrates the location of the HP-IB connector at ③.

HP 7550B Plus Plotter

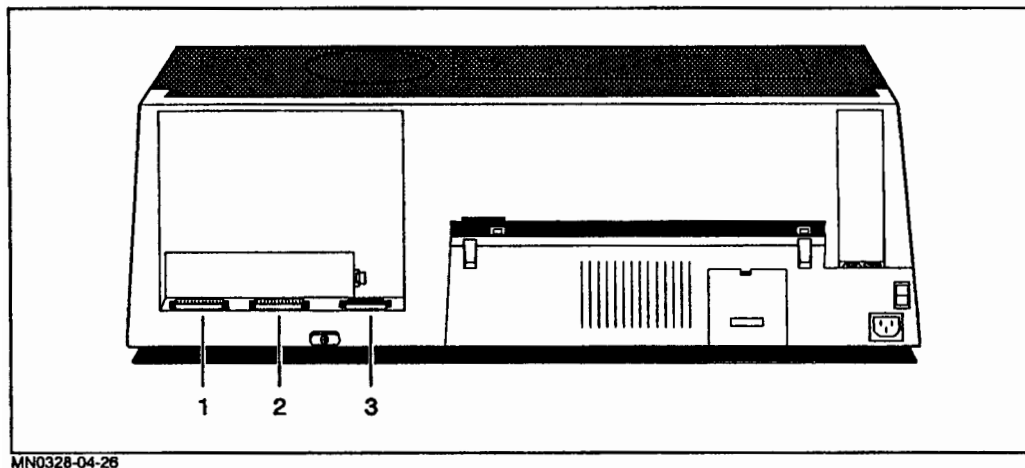


Figure 4-13. HP 7550B HP-IB Connector

Figure 4-14 illustrates the plotter connects to a Series 300 computer via the HP-IB interface cable.

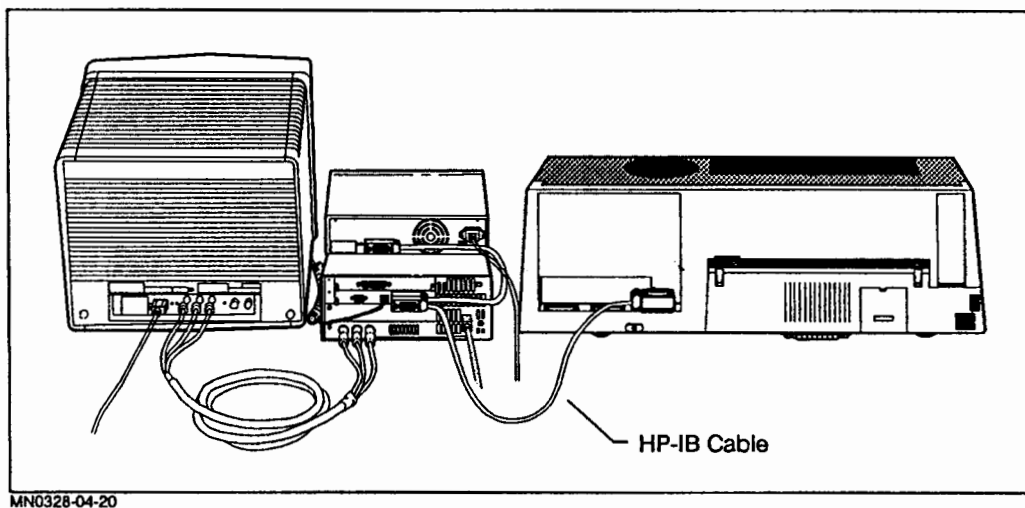


Figure 4-14. HP 7550B Plus Plotter Connected to a Series 300 Computer

HP 7550B Plus Plotter

3. *Tighten the screws on both ends of the cable.*
4. *Ensure that the plotter power switch is in the OFF position.*
5. *Connect the power cord to the plotter.*
6. *Turn ON the plotter.*
7. *Set the HP-IB address.*

Note

You should familiarize yourself with the HP-IB addresses that are currently in use on your system. Determine the available HP-IB address(es). Use the foldout worksheet at the end of this book to note already-used addresses.

You are limited to eight devices per HP-IB card, addresses 0 through 7.

Note

The HP-IB address is preset to 5.

- a. Press **Next Display** until HP-IB appears.
- b. Press **f3** (HP-IB) to view the address submenu.
- c. Select an address (0 through 31 or LISTEN ONLY).

Press **f4** to increase the address number and **f3** to decrease the address number.

- d. Press **Enter** to select the chosen address that is displayed.

Note

To exit without changing the setting, press **Next Display**.

If you select LISTEN ONLY, the plotter will listen to all data transmitted on the interface but cannot respond to computer inquiries. This mode is useful in a system that has no controller but, instead, has a dedicated talker (such as a magnetic tape driver or other mass storage unit) transmitting information to the plotter.

8. *Record the HP-IB address.*

Make a note that the HP-IB bus address you selected has been used and is no longer available on the interface you selected. Use the foldout worksheet at the end of this book for this purpose.

9. *Reconnect power cord to computer.*

10. *Turn ON computer.*

Hardware Installation Complete

Go to the accompanying plotter manual to perform the following tasks:

1. Load media
2. Load toner
3. Verify communication

Refer to “HP-UX Setup Information” for this plotter to continue with software configuration information.

HP 7550B Plus Plotter

Connecting and Configuring the Plotter for a Parallel Interface

1. *Select your computer interface.*

Locate the built-in parallel interface on the back of the computer. It should be labeled PARALLEL.

Caution Many computer systems have both parallel and RS-232-C ports. These ports frequently appear identical. Make sure you plug your cable into the correct port or you could damage your device.

2. *Ensure that the plotter power switch is in the OFF position.*
3. *Connect your plotter to your computer.*
 - a. Connect one end of the parallel interface cables to your computer.

Caution Many computer systems will have both parallel and RS-232-C ports. These ports frequently appear identical. Make sure you plug your cable into the parallel port (it should be labeled PARALLEL) or you might damage you plotter.

- b. Clip the connector into place.
 - c. Connect the other end of the cable to the plotter.
 - d. Clip the connector into place.
4. *Reconnect the power cable to your computer.*
 5. *Turn on the computer.*

Hardware Installation Complete

For plotter and parallel cable pinouts, refer to the Computer Information manual shipped with your plotter.

Go to the accompanying plotter manual to perform the following tasks:

1. Load media
2. Load pens
3. Verify communication

Refer to “HP-UX Setup Information” for this plotter to continue with software configuration information.

4-22 Installing Plotters and Graphic Devices

Connecting and Configuring the Plotter for an RS-232-C Interface1. *Select your computer interface.*

Select one of the following RS-232-C interfaces:

- The built-in RS-232-C interface.
- HP 98626A RS-232-C Interface.
- HP 98628A Datacomm Interface.
- HP 98642A 4-Channel Multiplexer Interface
- HP 98638A 8-Channel Multiplexer Interface
- HP 98644A RS-232-C Serial Interface.

Note	If you have more than one serial port, you need to know the address of your port. You need this information for testing communications and for configuring your software.
-------------	---

Caution	Many computer systems have both parallel and RS-232-C ports. These ports frequently appear identical. Make sure you plug your cable into the correct port or you could damage your device.
----------------	--

HP 7550B Plus Plotter

2. Determine the type of connection.

There are three types of RS-232-C connection configurations:

- standalone
- eavesdrop
- local and remote operation

The plotter front panel menu refers to the connection configuration as Dataflow.

The parallel/RS-232-C combination printer only supports standalone configuration.

The HP-IB/RS-232-C combination printer supports eavesdrop, local, and remote configurations. You may use an RS-422-A interface and cable with this plotter. Figure 4-15 illustrates the eavesdrop configuration.

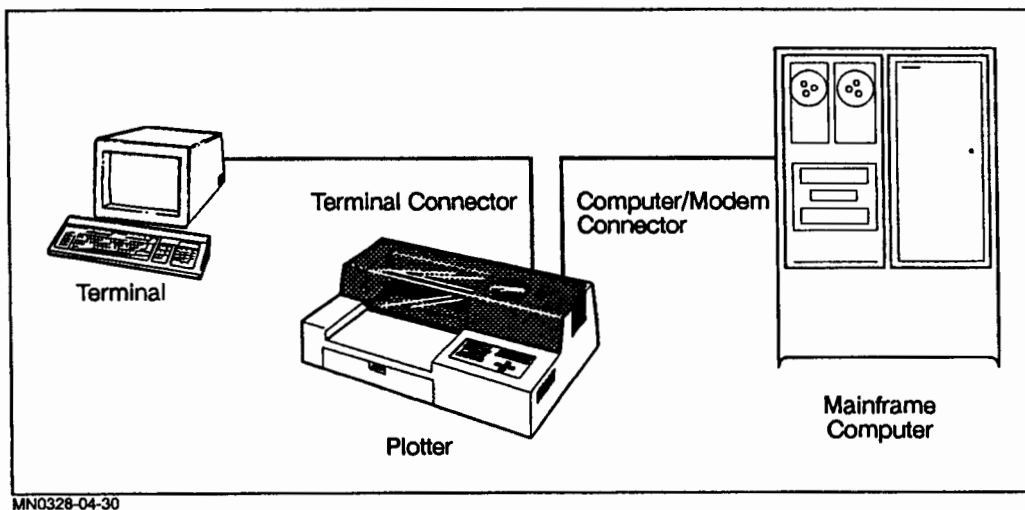


Figure 4-15. HP 7550B Plus Plotter in Eavesdrop Configuration

Figure 4-16 illustrates the HP-IB/RS-232-C combination plotter connectors for local and remote configurations.

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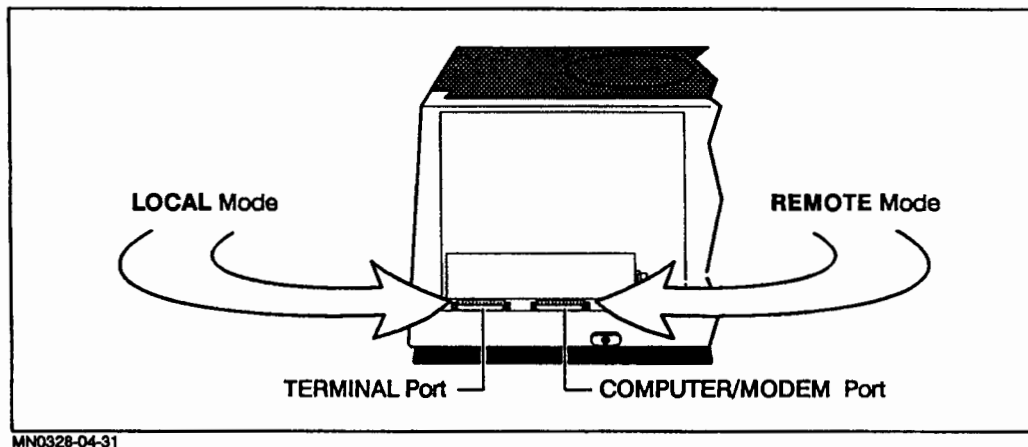


Figure 4-16. HP 7550B Plus Plotter Local and Remote Ports

Refer to the Computer Information manual shipped with your plotter for further information on RS-232-C configurations.

3. *Connect the plotter to the computer.*
 - a. Connect one end of the RS-232-C cable to the RS-232-C port of the plotter.
 - b. Connect the other end of the RS-232-C cable to the RS-232-C port of the computer.
 - c. If you have the HP-IB/RS-232-C combination plotter and are not using standalone configuration, connect the other RS-232-C cable to the other RS-232-C plotter port.
 - d. Make sure the connectors are firmly seated.
 - e. The RS-232-C plotter and cable pinouts are described in the Computer Information manual shipped with your plotter.

HP 7550B Plus Plotter

4. *Configure the plotter RS-232-C parameters using the front panel.*

After correctly connecting your plotter and computer, use the plotter's front panel to tell it which configuration you are using. Additionally, you must set the plotter to match your computer's baud rate and parity. To work together, your plotter and computer must use the same settings.

The following list defines the plotter default settings for the RS-232C interface.

Parameter	Default Settings
configuration	REMOTE/STANDALONE
baud rate	9600
parity	0
handshake	Hardwire: ON or XON/XOFF: ON

Note	The plotter generates 1 stop bit when set to a baud rate of 150 or greater; it generates 2 stop bits when set to a baud rate less than 150. Most computers also use 1 stop bit as a default or at high baud rates and will not need to be reset.
-------------	--

- a. Set the Data Flow (connection configuration).

Note Highlighted options display only the HP-IB/RS-232-C plotter version.

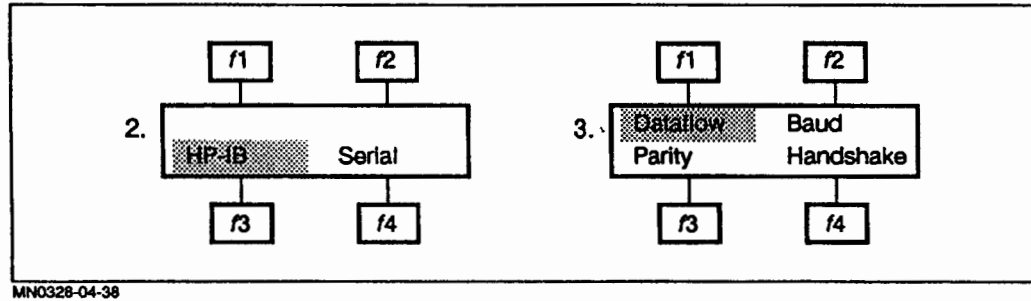


Figure 4-17. HP 7550B Plus Plotter Dataflow Configuration

- i. Press the Next Display button until the Serial menu is displayed.
- ii. Press f4 (Serial) to display the Dataflow menu.
- iii. Press f1 (Dataflow) to display the Dataflow submenu.

Use the Dataflow menu to set the following two options:

- Configuration mode
- Operating mode

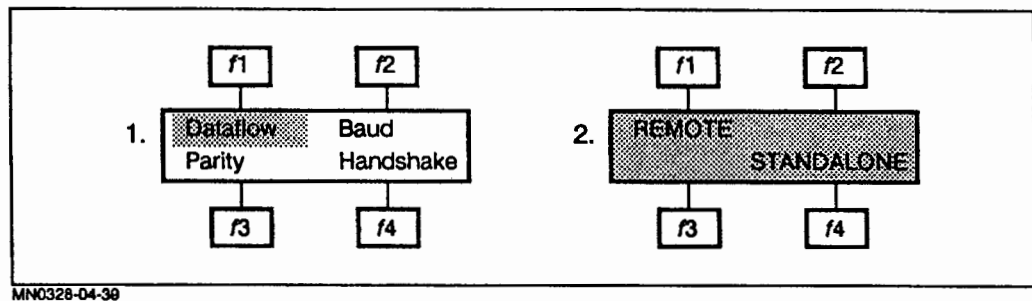


Figure 4-18. HP 7550B Plus Plotter Dataflow Configuration (cont)

HP 7550B Plus Plotter

- iv. Press **(f1)** to view each of the configuration options (REMOTE, LOCAL, and STANDBY).
- or
- Press **(f4)** to view each of the operating mode options (STANDALONE and EAVESDROP).
- v. Press **(Enter)** when both the desired configuration and operating mode are displayed to store the selection. All selections except REMOTE, LOCAL and STANDBY are stored in the plotter's continuous memory.

Note To exit without changing the values, press the **(Next Display)** button.

In standby mode, the plotter ignores all information received from both the COMPUTER/MODEM and workstation ports. If you suspect that the plotter is interfering with the information you are sending between the computer and workstation, standby mode lets you “unhook” the plotter temporarily, without disconnecting cables or interfering with data transmission between the computer and terminal. Since standby is a temporary tool, it cannot be stored in the plotter's continuous memory.

b. Set the baud rate.

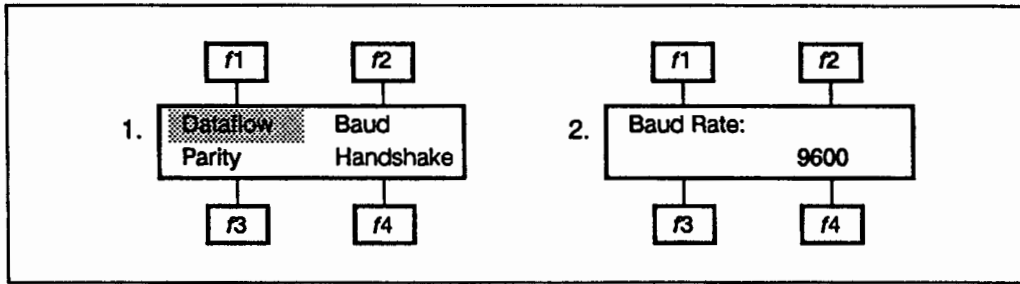
Use Baud to set your plotter to the same baud rate that your computer uses.

DEFAULT: 9600

The following options are available:

- 75
- 150
- 300
- 600
- 1200
- 2400
- 4800
- 9600
- 19200
- External

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Figure 4-19. HP 7550B Plus Plotter Baud Rate Configuration

- i. Press **f2** (Baud) to display the Baud Rate submenu.
- ii. Press **f3** and **f4** to cycle through the baud options.
Pressing **f4** increases the number; pressing **f3** decreases the number.
- iii. Press **Enter** when the option you want is displayed to store the setting in continuous memory. The setting remains in memory until you change it, even if you turn the plotter off.

Note To exit without changing the baud rate, press the **Next Display** button.

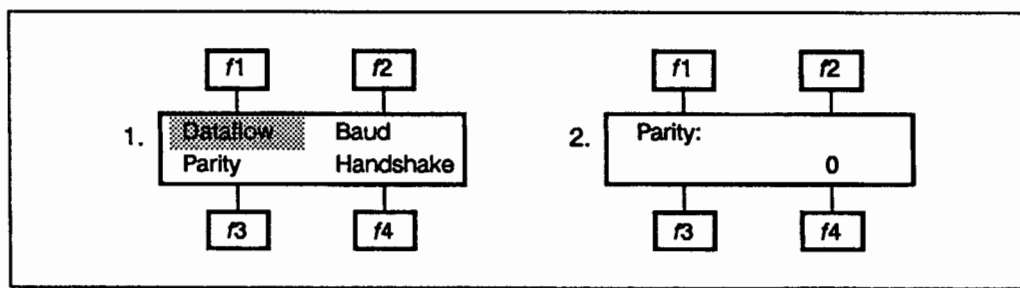
c. Set parity.

Use **Parity** to set your plotter to the same parity that your computer uses. The following settings are available:

Default 0 (Off, parity bit 0)
Options 0, 1, EVEN, ODD

If your software uses higher bits from the symbol sets or 8-bit character sets (for example, ISO sets), it requires NO (0 or space) parity because the eighth bit must be available for data.

4



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Figure 4-20. HP 7550B Plus Plotter Parity Configuration

- i. Press **Parity** (f3) to display the **Parity** submenu.
- ii. Press (f4) to cycle through the parity options.
- iii. Press (f2) to view the previous option.
- iv. Press **Enter** when the option you want is displayed to store the setting in continuous memory. The setting is stored in memory until you change it, even if you turn the plotter off.

Note

To exit without changing the setting, press the **Next Display** button.

Setting parity to 0 sets the parity to OFF, parity bit 0 (also known as space parity). Setting parity to 1 sets the parity to ON, parity bit 1 (also known as mark parity). If your computer requires parity, set the parity to ODD or EVEN, according to your computer's requirements.

HP 7550B Plus Plotter

- d. Select a handshake.

Use Handshake to select a handshake. Select a handshake setting that is compatible with your computer and software package.

The following settings are available:

Default ON
Options ON, OFF

4

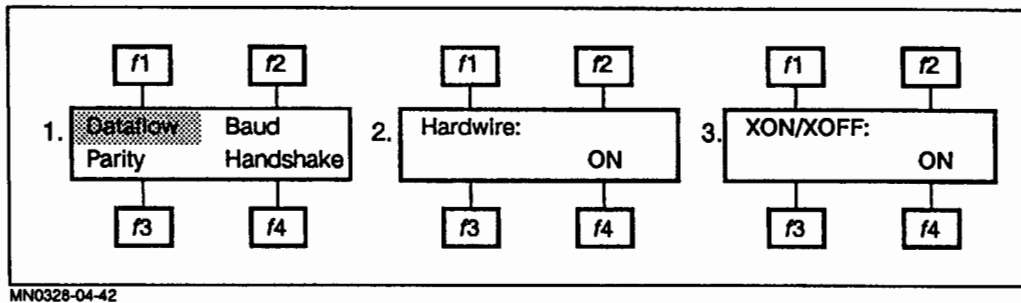


Figure 4-21. HP 7550B Plus Plotter Handshake Configuration

- i. Press Handshake (f4) to display the Handshake submenu.
- ii. Press (f4) to toggle Hardwire ON and OFF.
- iii. Press (Enter) when the option you want is displayed to store the setting in continuous memory.
- iv. To exit without changing the setting, press the Next Display button.

The XON/XOFF submenu displays when you exit the Hardwire submenu.

- v. Press (f4) to toggle XON/XOFF ON and OFF.
- vi. Press (Enter) when the option you want is displayed to store the setting in continuous memory. The setting is stored in memory until you change it, even if you turn the plotter off.

Note The plotter's handshake must be compatible with the computer's handshake.

In addition to hardwire and Xon/Xoff handshakes, the plotter can use the enquire/acknowledge handshake, and a software checking handshake. If your computer supports one of these handshakes, set the plotter to Hardwire: OFF. Use Hardwire: OFF if your software controls the handshake or if you are using a modem. To set up an Enquire-Acknowledge or software checking handshake programmatically, refer to the accompanying plotter manual for the programming instructions.

Go to the accompanying plotter manuals to perform the following tasks:

1. Use the advanced features of the plotter
2. Load media
3. Load toner
4. Verify communication

Return to this manual to modify the HP-UX operating system to add this plotter.

If SAM is resident on your system, go to Chapter 5: "Setting Up HP-UX for Plotters and Graphic Devices" to perform this task. If SAM is not resident on your system or you choose not to use SAM, go to read the following sections in this chapter and then continue to Chapter 7: "Setting Up Devices Using HP-UX Commands".

HP 7550B Plus Plotter

HP-UX Set Up Information

The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Refer to Chapter 7: "Setting Up Devices Using HP-UX Commands" for software configuration information.

Table 4-3.
HP 7550B Plotter
Connected to Built-in HP-IB Interface

Device Name	Path Name	File Type	Major Number	Driver Name	Select Code	Minor Number ¹
HP 7550B Plotter	/dev/lp7550B	c	21	hpib	7 ²	0x070n00
HP 7550B Plotter	/dev/lp7550B	c	21	hpib	8 ³	0x080n00

1 *n* is a number that identifies the bus address. Replace *n* with a 5 if the address was set to 5, use 7 if the address was set to 7, and so on.

2 Built-in standard-speed HP-IB interface.

3 HP 98624A standard-speed HP-IB interface.

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Table 4-4.
HP 7550B Plotter
Connected to a Parallel Interface

Device Name	Path Name	File Type	Major Number	Driver Name	Select Code	Minor Number
HP 7550B Plotter	/dev/lp7550B	c	21	parallel ¹	23 ²	0x

1 The parallel driver requires the "hpib" driver to be part of the kernel configuration.

2 Built in parallel interface.

Table 4-5.
HP 7550B Plotter
Connected to an RS-232-C Interface

Device Name	Path Name	File Type	Major Number	Driver Name	Select Code	Minor Number
HP 7550B Plotter	/dev/lp7550B	c	1	98626	9 ¹	0x090004
HP 7550B Plotter	/dev/lp7550B	c	1	98628	20 ²	0x140004

1 Built in RS-232-C interface and HP 98626A RS-232-C Interface.

2 HP 98628A Datacomm Interface

HP C1600A/01A 7600 Series Models 240D and 240E Plotters

The HP C1600A/01A are monochrome electrostatic plotters intended for use in a computer-aided design (CAD) environment. Some of the features of these models are:

- 406 dots per inch.
- Fast print speed (plotting time for a typical full-size drawing is less than one minute).
- Extra wide plot width capability. Model 240D accepts media up to 609 mm (24 in.) wide; Model 240E accepts media up to 914 mm (36 in.) wide.
- Built-in 40 megabyte hard disk automatically stores current drawing.
- Special front-panel features available to create bolder lines and darker black areas.
- Compatible with HP-GL and HP-GL/2 languages.
- Support RS-232-C, Centronics and HP-IB interfaces.

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

Pen plotters are vector devices. Vectors are straight line segments that form images such as squares, circles, or other polygons. Electrostatic plotters are raster devices. A raster device creates an image using an array of dots to form an image.

Most graphics software programs send data in vector formats. Your electrostatic plotter has a vector-to-raster converter (VRC) to convert the vector data to raster data. After creating your design on your computer system, you send the vector data from your computer to the plotter. The plotter stores the data on an internal 40-megabyte disk. At the appropriate signal (either internally or from the plotter's control-panel), the VRC rasterizes the vector data.

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Using the raster data, the plotter produces a series of high voltage electric pulses along the writing head. This, in turn, forms a latent image pattern on the surface of the media. As the plotter continues to draw the media across the writing head, toner particles cling to the charged area and the result is a hardcopy black and white raster plot.

The HP 7600 Series plotter uses the next generation of the HP-GL command language, HP-GL/2. However, you can transfer many plots created for HP pen plotters to your HP 7600 Series plotter. The plotter provides a 7586B emulation mode for plots designed for older HP plotters.

HP C1600A 7600 Series Plotter Models 240D and 240E

Installing the HP C1600A 7600 Series Plotter Models 240D and 240E

Perform the following tasks to install this plotter:

1. *Select a location and unpack.*
 - a. Select a location that is level and smooth.
 - b. Avoid locations near air conditioners, exposed to direct sunlight, or subject to high humidity.
 - c. Keep the plotter at least 60 cm (24 in.) from the closest wall. Additionally, be careful not to restrict the ventilation at the back of the unit, or stack anything on top of the plotter.
 - d. After selecting and preparing a location for your plotter, unpack and move the plotter to its new location.
 - e. Inspect the plotter.
 - f. Call your local HP Sales and Support Office for a certified representative to install the vector-to-raster converter (VRC) and set up your plotter. The installer will install the VRC, load toner and media, and ensure the plotter is operating properly.

A list of worldwide HP offices was included in your accessories box that accompanies the plotter.

Caution

Do not install the VRC or set up the plotter yourself. Defects that result from customer setup invalidate the plotter's warranty.

HP C1600A 7600 Series Plotter Models 240D and 240E

Your plotter and its accessories were inspected before being shipped and should be in good condition. Compare your accessories with those in the following list. If any are missing, contact your local HP Sales and Support Office. If any are damaged, notify your HP Sales and Support Office and file a claim with the carrier.

The following items are shipped with the plotter:

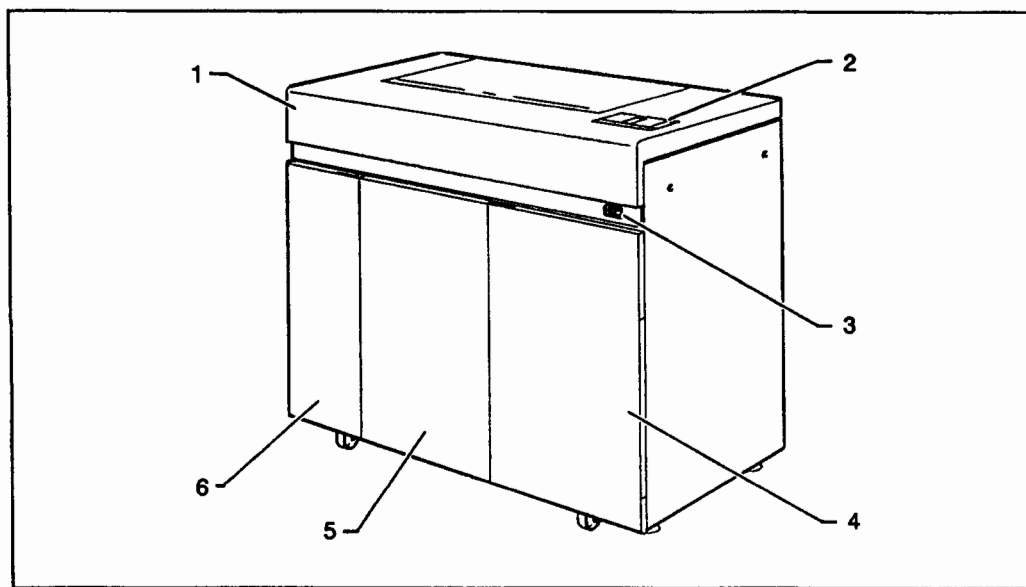
- HP 7600 Series, Models 240D and 240E Documentation (User's Guide and Programmer's Reference)
- Plotter power cable
- Roll of premium grade electrostatic paper
- Toner (premixed)
- Writing head cleaner
- Writing head polish
- Cleaning wipes
- Media cutting knife
- Empty 5-liter (1.3 gal) bottle; shipped inside toner compartment

Additional accessories include a supplies guide and sales and service information. The VRC and its power cable, and the media deflector, which attaches to the back of the plotter, are shipped in separate boxes.

HP C1600A 7600 Series Plotter Models 240D and 240E

2. *Familiarize yourself with the plotter.*

Figure 4-22 and Figure 4-23 illustrate the front and rear features of the HP C1600/01 Models 240D and 240E plotters.



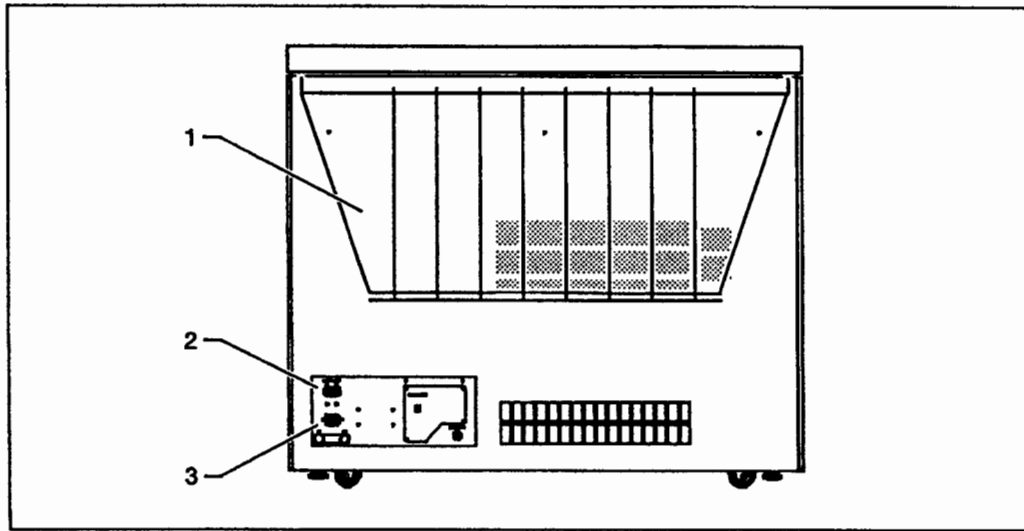
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Figure 4-22. HP C1600/01 Models 240D and 240E Front View

HP C1600A 7600 Series Plotter Models 240D and 240E

- ① **Top Cover**
Covers the frame, writing head, developer, and roll media.
- ② **Control Panel**
Contains the buttons and lights (LEDs) used to manually control and monitor various plotter functions.
- ③ **On/Off Switch**
Turns the plotter on and off.
- ④ **Test-Panel Door**
Covers the test panel switches and VRC/plotter interface connectors.
- ⑤ **VRC Cover**
Covers the vector-to-raster converter (VRC), configuration switches, and computer interface ports.
- ⑥ **Toner Compartment**
Contains the replaceable toner bottle.

HP C1600A 7600 Series Plotter Models 240D and 240E



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Figure 4-23. HP 1600/01 Models 240D and 240E Rear View

- ① **Media Deflector.**
Allows media to stack up neatly behind the plotter.
- ② **Power Breaker**
Turns on power to the plotter.
- ③ **Power Socket**
Accepts the plug from the power cable.

Note Your plotter is shipped with the power cable appropriate for your area's power requirements. Your certified installer is responsible for setting the voltage for your area.

HP C1600A 7600 Series Plotter Models 240D and 240E

3. *Open the test panel and toner compartment doors.*
4. *Remove the VRC cover (center panel).*
5. *Identify the plotter interfaces.*

The following list indicates the four interfaces your plotter supports.

- Parallel
- HP-IB
- SCS (HP-IB with Secondary Command Support)
- RS-232-C

Note	The Series 300/400 computers only support the HP-IB interface.
-------------	--

HP C1600A 7600 Series Plotter Models 240D and 240E

6. *Set the interface select switches.*

To select your interface (parallel, HP-IB, SCS, or RS-232) you must set the interface switches. You can set only one of the four interface switches.

The plotter reads the switches from right to left and selects the first active interface switch. For example, if all of the switches were in the ON position, the plotter would assume you are using an HP-IB interface because it is the first active switch found from the right. If all switches are set to OFF, the plotter uses the RS-232-C interface as the default setting.

On the VRC front panel, the legend indicating the setting for each of the switches is removed from the switches themselves.

- The raised portion of any switch is shown in black.
- The arrow shows the direction to push the switch.

7. Set the VRC configuration switches.

The plotter checks the switch settings only when you turn it on. Setting the switches while the plotter is on is not advised and will have no effect until you power off and restart the plotter.

- a. Open the test panel door.
- b. Open the toner compartment door.
- c. Remove the VRC cover. The VRC cover is the center panel of your plotter front.
- d. Use a pencil or pen to push the switches to the desired position.

The configuration switches for your plotter are on the front panel of the vector-to-raster converter (VRC). The following sections describe setting the VRC configuration switches for the different interfaces available on the plotter and supported by your computer.

HP C1600A 7600 Series Plotter Models 240D and 240E

Setting the VRC Switches for an HP-IB (IEEE-488) Plotter

This section includes information for the HP-IB and SCS (HP-IB with Secondary Command Support) interfaces. The Hewlett-Packard Interface Bus (HP-IB) is an interface system consisting of an HP-IB cable linking your computer to your plotter. The HP-IB is a parallel interface, also known as IEEE-488.

HP-IB with Secondary Command Support avoids monopolizing the bus in a multiuser environment. When this protocol is selected, listen-only mode and the service request are automatically disabled.

Set the VRC configuration switches to the following values:

- HP-IB or SCS (depending on your interface type)
- LISTEN ONLY (HP-IB only)
- ADDRESS (refer to Appendix A)
- HP-GL/2 or 7586B EMULATE
- A0 or A1 depending on your plotter model.
 - A0 for Model 240E
 - A1 for Model 240D

The plotter ignores all other switch settings.

Note	If you select LISTEN ONLY, the plotter listens to all data transmitted on the interface. This mode is useful in a system that has no controller, but instead has a dedicated talker (such as a magnetic tape driver or other mass storage unit) transmitting information to the plotter.
-------------	--

For more detailed information about how either the HP-IB interface or the HP-IB with Secondary Command Support interface works, refer to Appendix A in the accompanying plotter manual.

8. *Play it safe.*
 - a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
9. *Select your interface.* Select one of the following standard-speed HP-IB interfaces:
 - HP 98624A standard-speed HP-IB interface card
 - Built-in standard-speed HP-IB interface
10. *Connect the interface cable to the computer and plotter.*
 - a. Feed the interface cable from your computer under the back of the plotter.
 - b. Guide the cable up through the hole in the plotter floor at the front of the plotter.
 - c. Connect the cable to the appropriate interface port on the front of the VRC.

Note	You can connect the plotter in a standalone configuration only. You cannot connect the plotter in an eavesdrop configuration.
-------------	--

11. *Put the VRC cover back on the plotter.*
12. *Ensure that the plotter power switch is in the OFF position.*

HP C1600A 7600 Series Plotter Models 240D and 240E

13. *Connect the power cable.*

Be sure that the front and rear plotter power switches are off before you start. The power cable is a three-wire line with a three-terminal polarized plug. The grounding terminal of the plug is grounded to the plotter chassis to comply with safety codes.

Warning **Only use the power cable with a properly grounded receptacle to avoid electrical shock.**

4

- a. Push the prongless (female) end of the power cable into the power socket on the back of the plotter.
- b. Insert the wall power plug (male) into a grounded power outlet.
- c. Pull up the plotter's power breaker (above the plotter's power socket). This turns on the main power to the plotter.
- d. Turn on your plotter using the ON/OFF switch on the front of the plotter.

Note To turn ON the plotter, press the end marked I; press the end marked O to turn the plotter OFF.

When you turn on the plotter, the control panel LEDs flash as the plotter performs a series of internal self-test routines. This initialization process is finished when no other LEDs except the Power and Media LEDs are lit and flashing.

HP C1600A 7600 Series Plotter Models 240D and 240E

Go to the accompanying plotter manual to perform the following tasks:

1. Load media
2. Load toner
3. Draw a demonstration plot
4. Verify communication

Then return to this manual to modify the HP-UX operating system to add this plotter.

If SAM is resident on your system, continue on to Chapter 5: "Setting Up HP-UX for Plotters and Graphic Devices" to perform this task. If SAM is not resident on your system, continue on to Chapter 7: "Setting Up Devices Using HP-UX Commands".

HP-UX Set Up Information

The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Refer to Chapter 7: "Setting Up Devices Using HP-UX Commands" for software configuration information.

HP C1600A 7600 Series Plotter Models 240D and 240E

Table 4-6.
HP C1600A/01A Plotters
Connected to Built-in HP-IB Interface

Device Name	Path Name	File Type	Major Number	Driver Name	Select Code	Minor Number ¹
HP C1600A Plotter	/dev/lp1600A	c	21	hpib	7 ²	0x070n00
HP C1600A Plotter	/dev/lp1600A	c	21	hpib	8 ³	0x080n00

1 *n* is a number that identifies the bus address. Replace *n* with a 5 if the address was set to 5, use 7 if the address was set to 7, and so on.

2 Built-in standard-speed HP-IB interface.

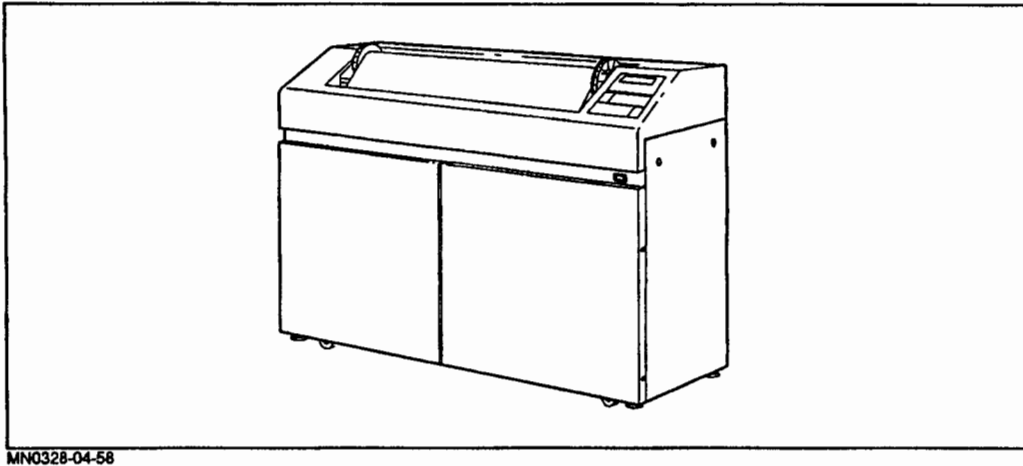
3 HP 98624A standard-speed HP-IB interface.

HP C1620A Series 7600 Model 355 Electrostatic Plotter

The HP C1620A is a color electrostatic plotter. Some of the features of this model are:

- 406 dots per inch.
- Multiple plotting modes support fast print speeds (plotting time for a typical full-size color drawing is less than eight minutes, less than one minute for a monochrome drawing).
- Over 2000 user-selectable colors.
- Supports complete media set and range of sizes up to 914 mm (36 in.) wide and long axis plots up to 15.3 M (50 ft.).
- Front panel access to plotting features allows you to store multiple user-defined palettes and setups.
- Plot queuing and nesting.
- Rasterizer and built-in 40 megabyte hard disk provide simultaneous rasterization and printing.
- Compatible with HP-GL/2 and PCL-based raster graphics input.
- Supports RS-232-C, Centronics and HP-IB interfaces.

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.



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Figure 4-24. HP C1620A Series 7600 Model 355 Electrostatic Plotter

Pen plotters are vector devices. Vectors are straight line segments that form images such as squares, circles, or other polygons. Electrostatic plotters are raster devices. A raster device creates an image using an array of dots to form an image.

Most graphics software programs send data in vector formats. Your electrostatic plotter has a vector-to-raster converter (VRC) to convert the vector data to raster data. After creating your design on your computer system, you send the vector data from your computer to the plotter. The plotter stores the data on an internal 40-megabyte disk. At the appropriate signal (either internally or from the plotter's control-panel), the VRC rasterizes the vector data.

Using the raster data, the plotter produces a series of high voltage electric pulses along the writing head. This, in turn, forms a latent image pattern on the surface of the media. As the plotter continues to draw the media across the writing head, toner particles cling to the charged area and the result is a hardcopy black and white raster plot.

The HP 7600 Series plotter uses the next generation of the HP-GL command language, HP-GL/2. However, you can transfer many plots created for HP pen plotters to your HP 7600 Series plotter. The plotter provides a 7586B emulation mode for plots designed for older HP plotters.

HP C1620A Series 7600 Model 355 Electrostatic Plotter

Installing the HP C1620A Series 7600 Model 355 Electrostatic Plotter

Perform the following tasks to install this plotter:

1. *Select a location and unpack.*
 - a. Select a location that is level and smooth.
 - b. Avoid locations near air conditioners, exposed to direct sunlight, or subject to high humidity.
 - c. Locate the plotter within cable length of your computer interface.
 - d. Keep the plotter at least 24 in. (60 cm) from the closest wall.
Additionally, be careful not to restrict the ventilation at the back of the unit, or stack anything on top of the plotter.
 - e. After selecting and preparing a location for your plotter, unpack and move the plotter to its new location.
 - f. Inspect the plotter.
 - g. Call your local HP Sales and Support Office for a certified representative to install the vector-to-raster converter (VRC) and set up your plotter. The installer will install the VRC, load toner and media, and ensure the plotter is operating properly.

A list of worldwide HP offices was included in your accessories box that accompanies the plotter.

Caution	Do not install the VRC or set up the plotter yourself. Defects that result from customer setup invalidate the plotter's warranty.
----------------	---

HP C1620A Series 7600 Model 355 Electrostatic Plotter

Your plotter and its accessories were inspected before being shipped and should be in good condition. Compare your accessories with those in the following list. If any are missing, contact your local HP Sales and Support Office. If any are damaged, notify your HP Sales and Support Office and file a claim with the carrier.

The following items are shipped with the plotter:

- Documentation with the following HP part numbers and titles:

C1620-90001 HP 7600 Series Model 355 User's Guide

C1620-90002 HP 7600 Series Model 355 Reference Guide

- Plotter power cable
- Roll of premium grade electrostatic paper
- Toner (premixed)
- Writing head cleaner
- Writing head polish
- Cleaning wipes
- Media cutting knife
- Empty five-liter (1.3 gal) bottle; shipped inside toner compartment



Additional accessories include a supplies guide and sales and service information. The VRC and its power cable, and the media deflector, which attaches to the back of the plotter, are shipped in separate boxes.

2. *Familiarize yourself with the plotter.*

Refer to the User's Guide, Chapter 1: "Getting Started", shipped with your plotter to identify all of the plotter features.

Note

Your plotter is shipped with the power cable appropriate for your area's power requirements. Your certified installer is responsible for setting the voltage for your area.

HP C1620A Series 7600 Model 355 Electrostatic Plotter

3. *Play it safe.*

- a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
- b. TURN OFF the computer and unplug the power cord.

4. *Select your computer interface.*

Select one of the following standard-speed HP-IB interfaces:

- HP 98624A standard-speed HP-IB interface card
- Built-in standard-speed HP-IB interface

5. *Connect your interface cable to the connector on your computer interface.*

6. *Open the plotter front, left door.*

One cable will be attached from the VRC to the middle, back connector.

7. *Identify the plotter interface connectors.*

The following list indicates the four interfaces your plotter supports.

- Parallel
- HP-IB
- SCS (HP-IB with Secondary Command Support)
- RS-232-C

HP C1620A Series 7600 Model 355 Electrostatic Plotter

Figure 4-25 illustrates the interface ports and VRC cable connectors.

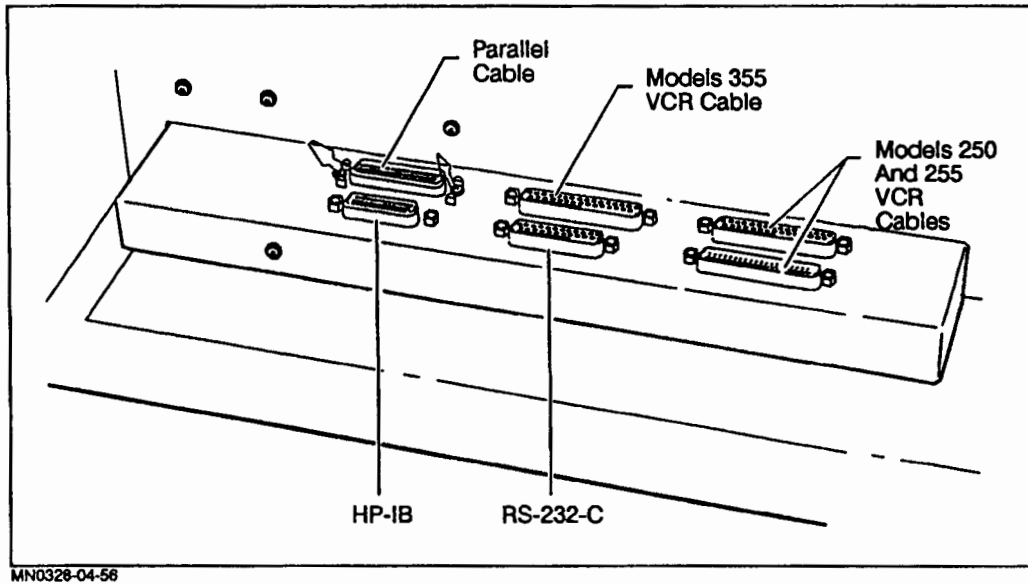


Figure 4-25. HP C1620A Model 355 Interface Ports and VRC Connectors

Note

The Series 300/400 computers only support the HP-IB interface.

HP C1620A Series 7600 Model 355 Electrostatic Plotter

8. *Connect the interface cable to the plotter.*
 - a. Feed the interface cable under the back of the plotter.
 - b. Guide the cable up through the hole in the plotter floor at the front of the plotter.
 - c. Connect the cable to the appropriate interface port on the front of the VRC.

Figure 4-26 illustrates connecting the HP-IB cable to the plotter.

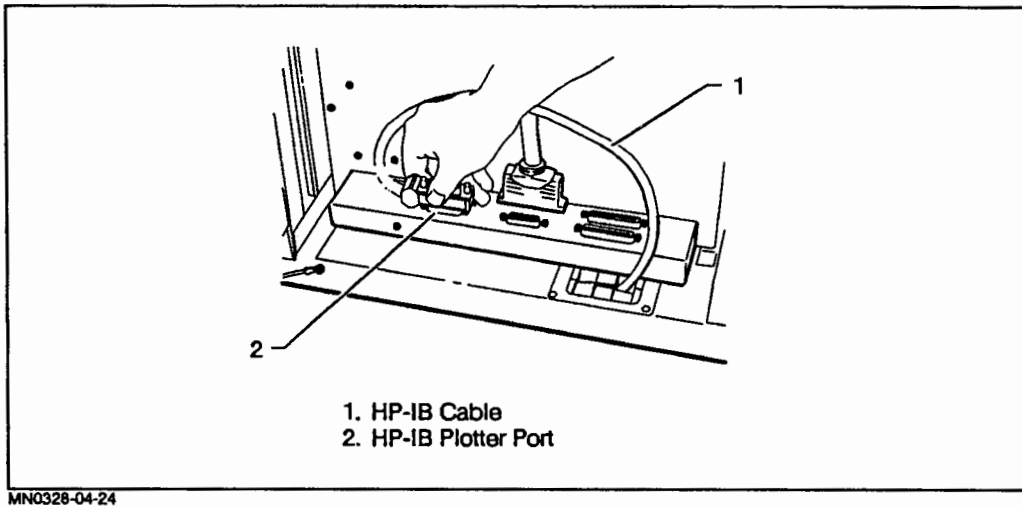


Figure 4-26.
Connecting the HP-IB Cable to the HP C1620A Model 355 Plotter

HP C1620A Series 7600 Model 355 Electrostatic Plotter

9. *Ensure that the plotter power switch is in the OFF position.*
10. *Connect the power cable.*

Be sure that the front and rear plotter power switches are off before starting. The power cable is a three-wire line with a three-terminal polarized plug. The grounding terminal of the plug is grounded to the plotter chassis to comply with safety codes.

Warning	Only use the power cable with a properly grounded receptacle to avoid electrical shock.
----------------	--

- a. Push the prongless (female) end of the power cable into the power socket on the back of the plotter.
- b. Insert the wall power plug (male) into a grounded power outlet.
- c. Pull up the plotter's power breaker (above the plotter's power socket). This turns on the main power to the plotter.
- d. Turn on your plotter using the ON/OFF switch on the front of the plotter.

Note	To turn ON the plotter, press the end marked I; press the end marked O to turn the plotter OFF.
-------------	---

When you turn on the plotter, the control panel LEDs flash as the plotter performs a series of internal self-test routines. This initialization process is finished when no other LEDs except the Power and Media LEDs are lit and flashing.

11. *Familiarize yourself with the front panel and its operation.*

Locate the front panel and flip open the cover; see Figure 4-27.

HP C1620A Series 7600 Model 355 Electrostatic Plotter

4

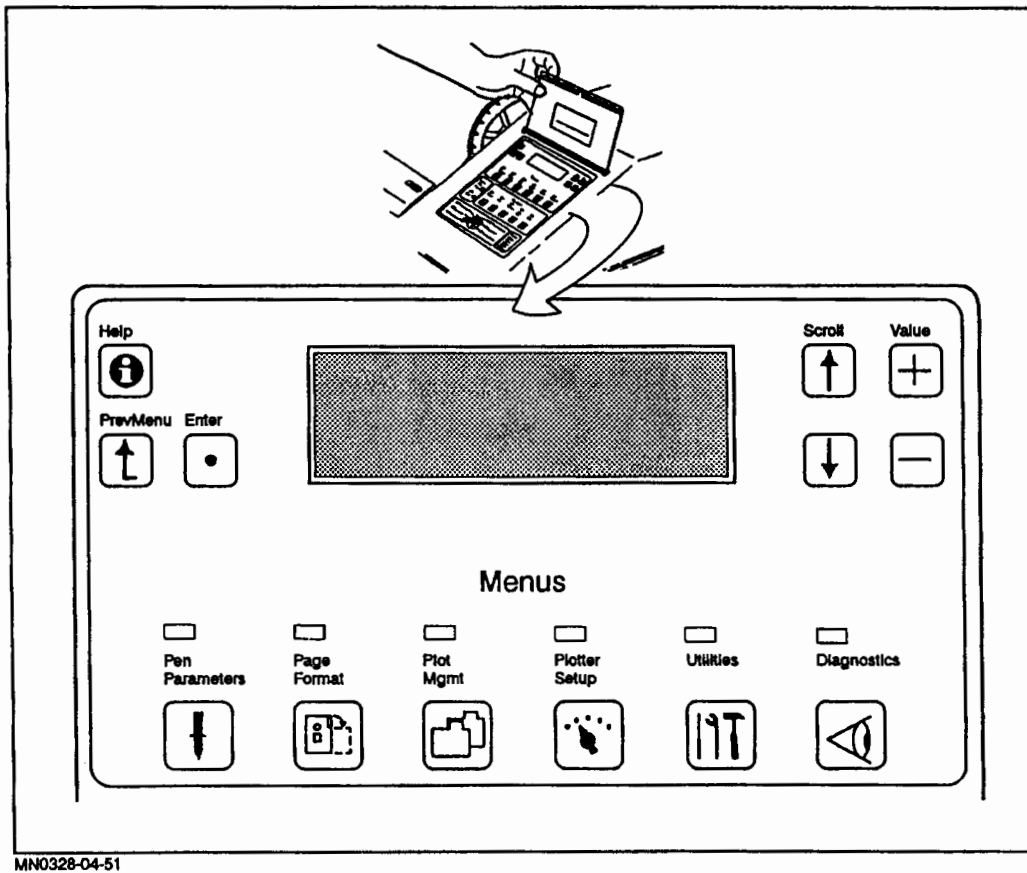


Figure 4-27.

HP C1620A Series 7600 Model 355 Cover and Front Panel

Menu buttons for configuring your plotter are located on the top half of the front panel under the cover, see Figure 4-28.

HP C1620A Series 7600 Model 355 Electrostatic Plotter

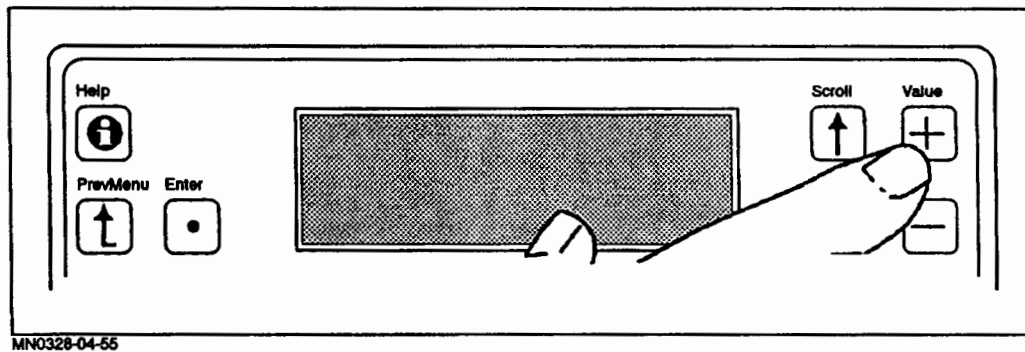


Figure 4-28. HP C1620A Series 7600 Model 355 Menu Buttons

For a full description of the front panel menu operation, refer to the User's Guide for this plotter.

The following section provides a quick review of using the front panel menus. If you need more detailed information, refer to the User's Guide that accompanied your plotter. Figure 4-27 is a diagram of the front panel.

- a. Press the **Online** button to take the plotter offline. The **Online** light goes out.

Note	You can look through the menus while the plotter is online, but you cannot change any values.
-------------	---

HP C1620A Series 7600 Model 355 Electrostatic Plotter

Press the button for the menu you want to use. For example, press the **Plotter Setup** button. The **Plotter Setup** light goes on and the **Plotter Setup** menu is displayed:

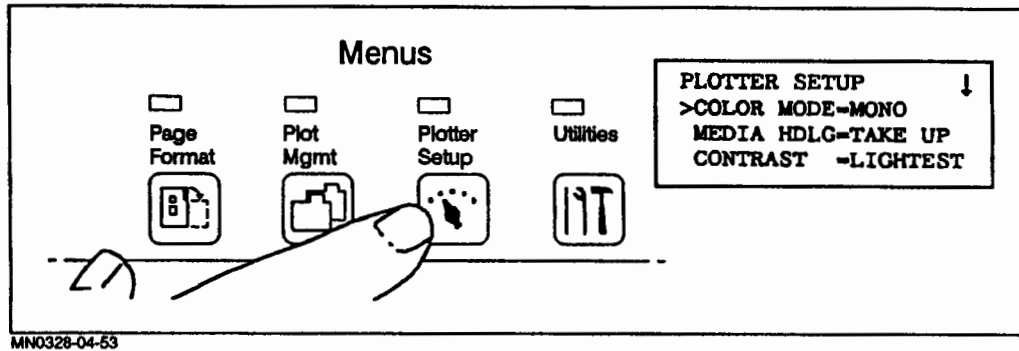


Figure 4-29. HP C1620A Plotter Setup Menu

Note that the first line of the menu tells you which menu you selected.

HP C1620A Series 7600 Model 355 Electrostatic Plotter

- b. Press the  (Scroll Up) and  (Scroll Down) buttons to move the left arrow to the menu you want to use.

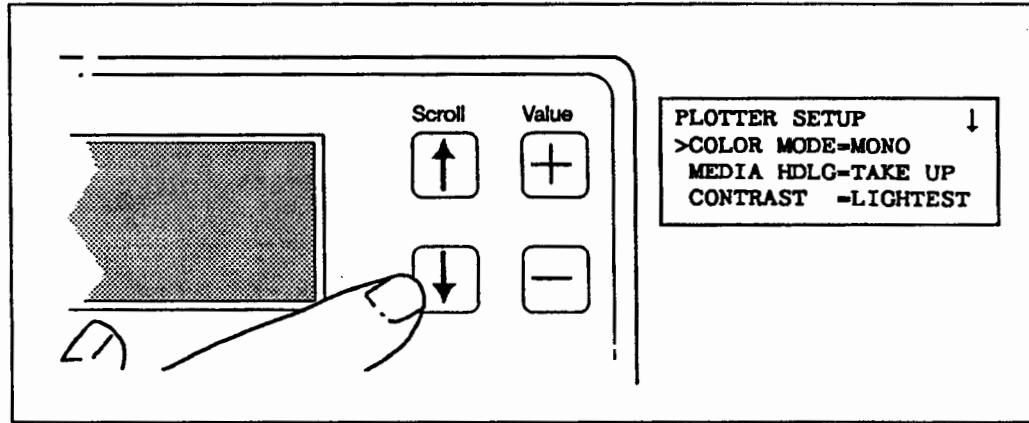


Figure 4-30.

HP C1620A Plotter Scroll Up and Scroll Down Buttons

- c. Use the  and  (Value) buttons to scroll through the values on a particular menu selection. When you move to a new value, the new value flashes to indicate that it is not active. When you press Enter to accept the value, it stops flashing.
12. *Use the front panel to configure interface parameters.*
Start the configuration from the Plotter Setup menu.
13. *Turn the power switch OFF.*

HP C1620A Series 7600 Model 355 Electrostatic Plotter

Connecting and Configuring the Plotter for an HP-IB Interface

1. *Ensure that the power switch is in the OFF position.*
2. *Connect your HP-IB interface cable to your computer.*

- a. Locate a standard-speed HP-IB cable.

If you need to replace your HP-IB cable for any reason, the following list contains the available HP-IB cables and their lengths.

HP 10833A 1.0 meter HP-IB cable

HP 10833B 2.0 meter HP-IB cable

HP 10833C 4.0 meter HP-IB cable

HP 10833D 0.5 meter HP-IB cable

- b. Connect the end of the HP-IB cable to the interface or the last device on the chain. If the HP-IB interface already has one or more devices connected to it, connect the cable from your new device to the last device on the chain as in Figure 4-31.

A close up of the “piggy-backed” HP-IB connectors on the previously last device on the chain is provided in Figure 4-32.

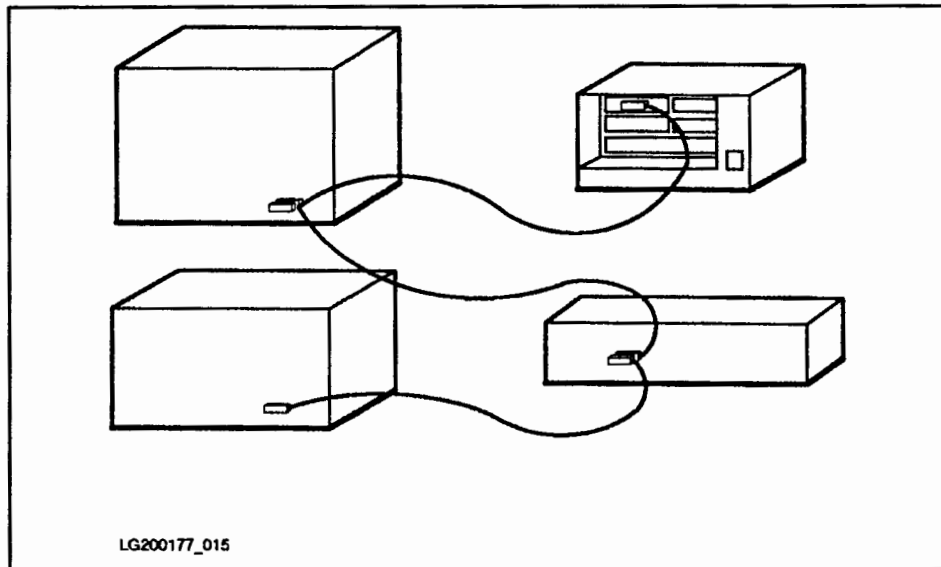
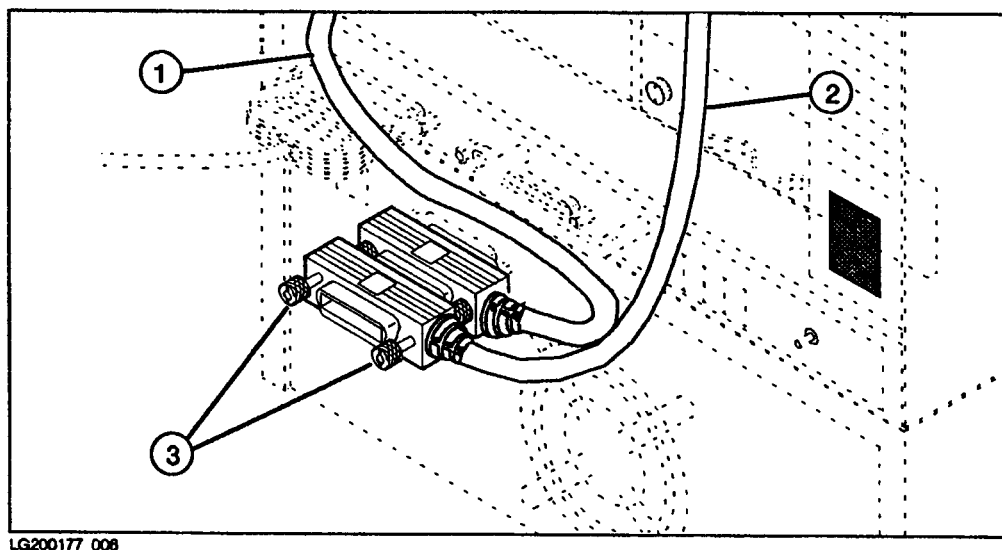


Figure 4-31. Daisy-Chained HP-IB Devices

HP C1620A Series 7600 Model 355 Electrostatic Plotter



LG200177_008

Figure 4-32. "Piggy-Backed" HP-IB Connectors

- ① Cable to the interface or previous device.
- ② Cable to the plotter.
- ③ Thumb screws to be tightened.

Figure 4-33 illustrates the plotter connects to a Series 300 computer via the HP-IB interface cable.

HP C1620A Series 7600 Model 355 Electrostatic Plotter

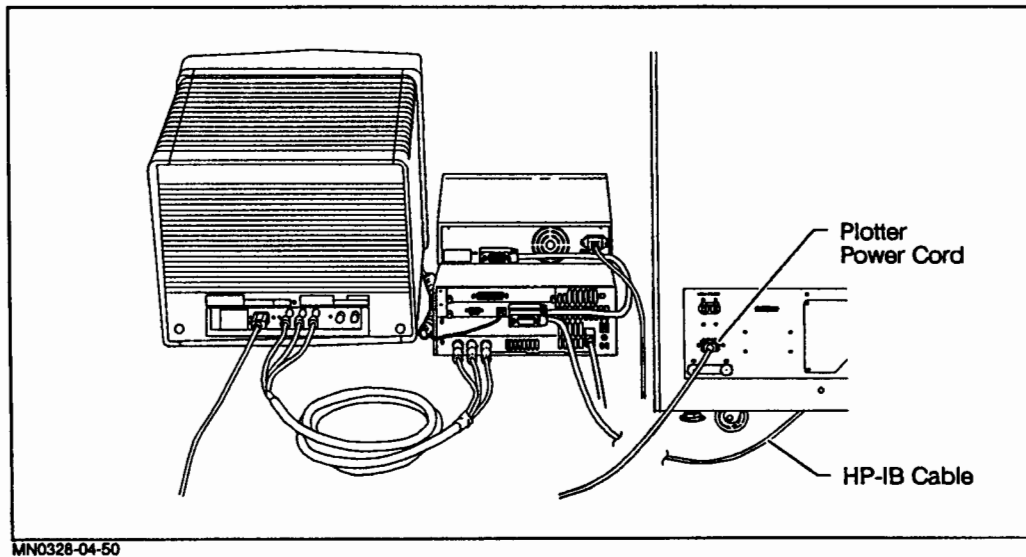


Figure 4-33. HP C1620A Model 355 Connected to a Series 300 Computer

Note

You can connect the plotter in a standalone configuration only.
You cannot connect the plotter in an eavesdrop configuration.

- c. Turn ON the plotter.

HP C1620A Series 7600 Model 355 Electrostatic Plotter

The following section includes configuration information for the HP-IB and SCS (HP-IB with Secondary Command Support) interfaces. The Hewlett-Packard Interface Bus (HP-IB) is an interface system consisting of an HP-IB cable linking your computer to your plotter. The HP-IB is a parallel interface, also known as IEEE-488.

HP-IB with Secondary Command Support avoids monopolizing the bus in a multiuser environment. When this protocol is selected, listen-only mode and the service request are automatically disabled.

Note	If you select LISTEN ONLY, the plotter listens to all data transmitted on the interface. This mode is useful in a system that has no controller, but instead has a dedicated talker (such as a magnetic tape driver or other mass storage unit) transmitting information to the plotter.
-------------	--

4

Use the **Plotter Setup** menu to configure your plotter. Once you set the interface conditions, you will not need to reset them unless you change your computer/plotter system so that it requires a different configuration.

```
PLOTTER SETUP
COLOR MODE=4-PASS
MEDIA HDLG=TAKE-UP
MEDIA TYPE=NON-FILM
GRAPH LANG=HP-GL/2
I/O CONFIG=HP-IB
CDI MODE  =OFF
PANEL LANG=ENGLISH
ADVANCED SETUP
```

Figure 4-34. C1620A Series 7600 Model 355 Plotter Setup Menu

HP C1620A Series 7600 Model 355 Electrostatic Plotter

Go to the I/O CONFIG menu line, select HP-IB, and press **Enter**.

```
PLOTTER SETUP
I/O CONFIG:  HP-IB
ADDRESS=  5
SCS      =OFF
```

Figure 4-35. C1620A Series 7600 Model 355 Plotter HP-IB Menu

Go to the ADDRESS menu line, select the address setting you want and press **Enter**.

Note The default HP-IB bus address is set to 5.

If you want to use Secondary Command Support, go to the SCS menu line, select ON.

Go to the accompanying plotter manual to perform the following tasks:

1. Load media
2. Load toner
3. Draw a demonstration plot
4. Verify communication

Then return to this manual to modify the HP-UX operating system to add this plotter. If SAM is resident on your system or you choose not to use SAM, continue on to Chapter 5: "Setting Up HP-UX for Plotters and Graphic Devices" If SAM is not resident on your system, continue on to Chapter 7: "Setting Up Devices Using HP-UX Commands"

If SAM is resident on your system, continue on to Chapter 5: "Setting Up HP-UX for Plotters and Graphic Devices" If SAM is not resident on your system, continue on to Chapter 7: "Setting Up Devices Using HP-UX Commands".

4-68 Installing Plotters and Graphic Devices

HP-UX Set Up Information

SAM uses the naming convention `lp_XXXX` for device files. If you wish to use the device files shipped with your system (`plt_parallel`) you may specify the shipped device file name on the SAM screen for adding a plotter. The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Refer to Chapter 7: "Setting Up Devices Using HP-UX Commands" for software configuration information.

Table 4-7.
Plotter
Connected to Built-in HP-IB Interface

Device Name	Path Name	File Type	Major Number	Driver Name	Select Code	Minor Number ¹
HP C1620A Plotter	/dev/lp1620A	c	21	hpib	7 ²	0x070n00
HP C1620A Plotter	/dev/lp1620A	c	21	hpib	8 ³	0x080n00

¹ *n* is a number that identifies the bus address. Replace *n* with a 5 if the address was set to 5, use 7 if the address was set to 7, and so on.

² Built-in standard-speed HP-IB interface.

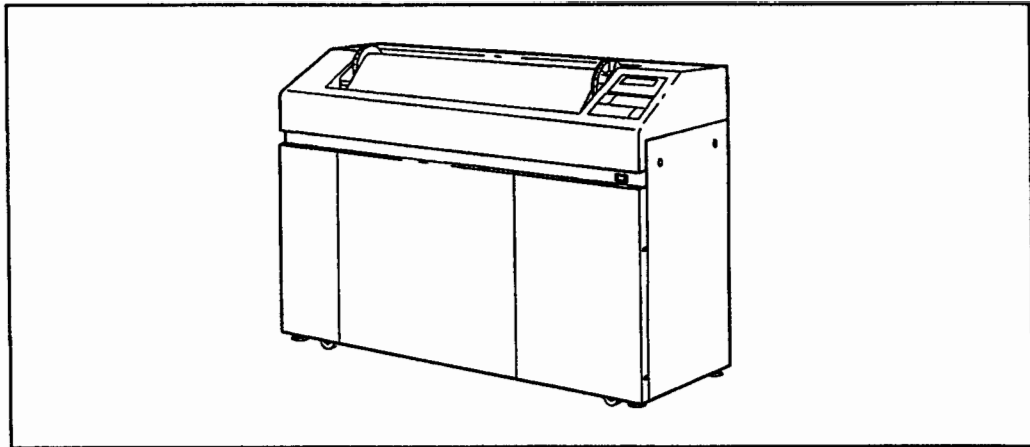
³ HP 98624A standard-speed HP-IB interface.

HP C1625A/27A Series 7600 Models 250 and 255 Plotters

The HP C1625A/27A are monochrome electrostatic plotters. Some of the features of these models are:

- 406 dots per inch.
- Fast print speed (plotting time for a typical full-size drawing is less than one minute) with variable plotting speed capability.
- 64 shades of gray.
- Complete media set support up to a width of 609 mm (24 in.) for Model 250 and 914 mm (36 in.) for model 255; long axis plots up to 15.3 M (15 ft.) for both.
- Front panel access to plotting features allows you to store multiple user-defined palettes and setups. Mirror image and rotate features also available from front panel.
- Plot queuing and nesting.
- Rasterizer and built-in 40 megabyte hard disk provide simultaneous rasterization and printing.
- Compatible with HP-GL/2 and PCL-based raster graphics input.
- Supports RS-232-C, Centronics and HP-IB interfaces.

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.



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Figure 4-36. HP C1625A/27A Series 7600 Model 355 Electrostatic Plotter

HP C1625A/27A Series 7600 Models 250 and 255 Electrostatic Plotters

Pen plotters are vector devices. Vectors are straight line segments that form images such as squares, circles, or other polygons. Electrostatic plotters are raster devices. A raster device creates an image using an array of dots to form an image.

Most graphics software programs send data in vector formats. Your electrostatic plotter has a vector-to-raster converter (VRC) to convert the vector data to raster data. After creating your design on your computer system, you send the vector data from your computer to the plotter. The plotter stores the data on an internal 40-megabyte disk. At the appropriate signal (either internally or from the plotter's control-panel), the VRC rasterizes the vector data.

Using the raster data, the plotter produces a series of high voltage electric pulses along the writing head. This, in turn, forms a latent image pattern on the surface of the media. As the plotter continues to draw the media across the writing head, toner particles cling to the charged area and the result is a hardcopy black and white raster plot.

The HP 7600 Series plotter uses the next generation of the HP-GL command language, HP-GL/2. However, you can transfer many plots created for HP pen plotters to your HP 7600 Series plotter. The plotter provides a 7586B emulation mode for plots designed for older HP plotters.

Installing the HP C1625A/27A Series 7600 Models 250 and 255 Electrostatic Plotters

Perform the following tasks to install this plotter:

1. *Select a location and unpack.*
 - a. Select a location that is level and smooth.
 - b. Avoid locations near air conditioners, exposed to direct sunlight, or subject to high humidity.
 - c. Place the plotter within cable length of your computer interface.
 - d. Keep the plotter at least 60 cm (24 in.) from the closest wall.
Additionally, be careful not to restrict the ventilation at the back of the unit, or stack anything on top of the plotter.
 - e. After selecting and preparing a location for your plotter, unpack and move the plotter to its new location.
 - f. Inspect the plotter.
 - g. Call your local HP Sales and Support Office for a certified representative to install the vector-to-raster converter (VRC) and set up your plotter. The installer will install the VRC, load toner and media, and ensure the plotter is operating properly.

A list of worldwide HP offices is included in your accessories box that accompanies the plotter.

Caution	Do not install the VRC or set up the plotter yourself. Defects that result from customer setup invalidate the plotter's warranty.
----------------	---

HP C1625A/27A Series 7600 Models 250 and 255 Electrostatic Plotters

Your plotter and its accessories were inspected before being shipped and should be in good condition. Compare your accessories with those in the following list. If any are missing, contact your local HP Sales and Support Office. If any are damaged, notify your HP Sales and Support Office and file a claim with the carrier.

The following items are shipped with the plotter:

- Documentation with the following HP part numbers and titles:
 - C1625-90001 HP 7600 Series Models 250 and 255 User's Guide
 - C1625-90002 HP 7600 Series Models 250 and 255 Reference Guide
- Plotter power cable
- Roll of premium grade electrostatic paper
- Toner (premixed)
- Writing head cleaner
- Writing head polish
- Cleaning wipes
- Media cutting knife
- Empty 5-liter (1.3 gal) bottle; shipped inside toner compartment

Additional accessories include a supplies guide and sales and service information. The VRC and its power cable, and the media deflector, which attaches to the back of the plotter, are shipped in separate boxes.

2. *Familiarize yourself with the plotter.*

Refer to the User's Guide, Chapter 1: "Getting Started", shipped with your plotter to identify all of the plotter features.

Note	Your plotter is shipped with the power cable appropriate for your area's power requirements. Your certified installer is responsible for setting the voltage for your area.
-------------	---

HP C1625A/27A Series 7600 Models 250 and 255 Electrostatic Plotters

3. *Play it safe.*

- a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
- b. TURN OFF the computer and unplug the power cord.

4. *Select your computer interface.*

Select one of the following standard-speed HP-IB interfaces:

- HP 98624A standard-speed HP-IB interface card
- Built-in standard-speed HP-IB interface

5. *Connect your interface cable to the connector on your computer interface.*

6. *Open the plotter front left door.*

One cable will be attached from the VRC to the middle, back connector.

7. *Identify the plotter interface connectors.*

The following list indicates the four interfaces your plotter supports.

- Parallel
- HP-IB
- SCS (HP-IB with Secondary Command Support)
- RS-232-C

HP C1625A/27A Series 7600 Models 250 and 255 Electrostatic Plotters

Figure 4-37 illustrates the interface ports and VRC cable connectors.

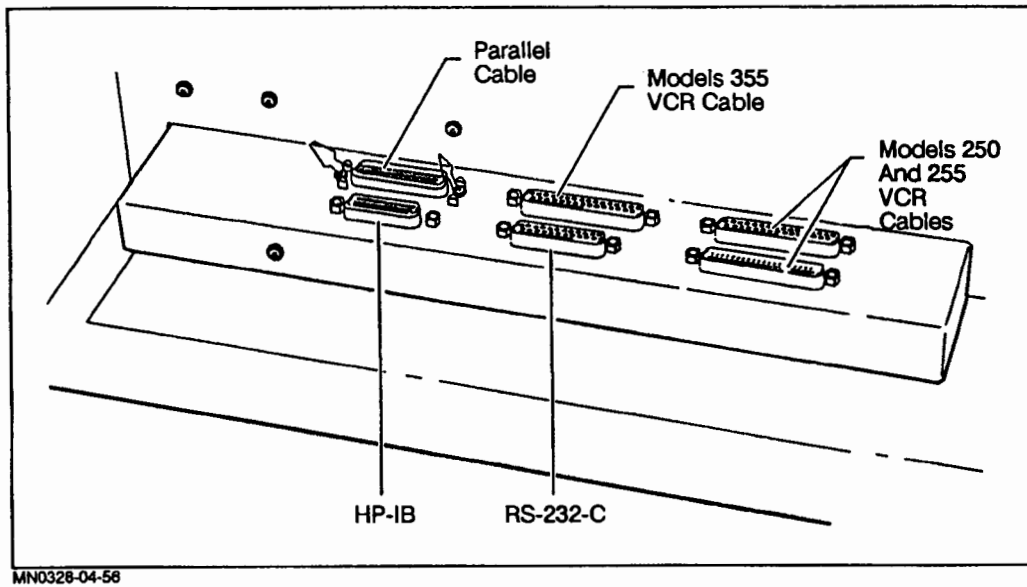


Figure 4-37. HP C1625A/27A Model 355 Interface Ports and VRC Connectors

Note The Series 300/400 computers only support the HP-IB interface.

HP C1625A/27A Series 7600 Models 250 and 255 Electrostatic Plotters

8. *Connect the interface cable to the plotter.*
 - a. Feed the interface cable under the back of the plotter.
 - b. Guide the cable up through the hole in the plotter floor at the front of the plotter.
 - c. Connect the cable to the appropriate interface port on the front of the VRC.

Figure 4-38 illustrates connecting the HP-IB cable to the plotter.

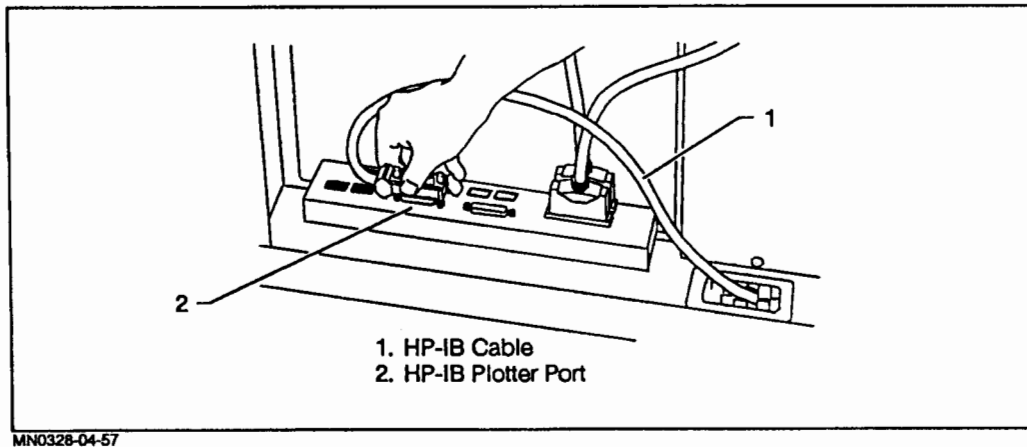


Figure 4-38.

Connecting the HP-IB Cable to the HP C1625A/27A Model 355 Plotter

9. *Ensure that the plotter power switch is in the OFF position.*

HP C1625A/27A Series 7600 Models 250 and 255 Electrostatic Plotters

10. *Connect the power cable.*

Be sure front and rear plotter power switches are off before starting. The power cable is a three-wire line with a three-terminal polarized plug. The grounding terminal of the plug is grounded to the plotter chassis to comply with safety codes.

Warning	To avoid electrical shock, only use the power cable with a properly grounded receptacle.
----------------	---

- a. Push the prongless (female) end of the power cable into the power socket on the back of the plotter.
- b. Insert the wall power plug (male) into a grounded power outlet.
- c. Pull up the plotter's power breaker (above the plotter's power socket). This turns on the main power to the plotter.
- d. Turn on your plotter using the ON/OFF switch on the front of the plotter.

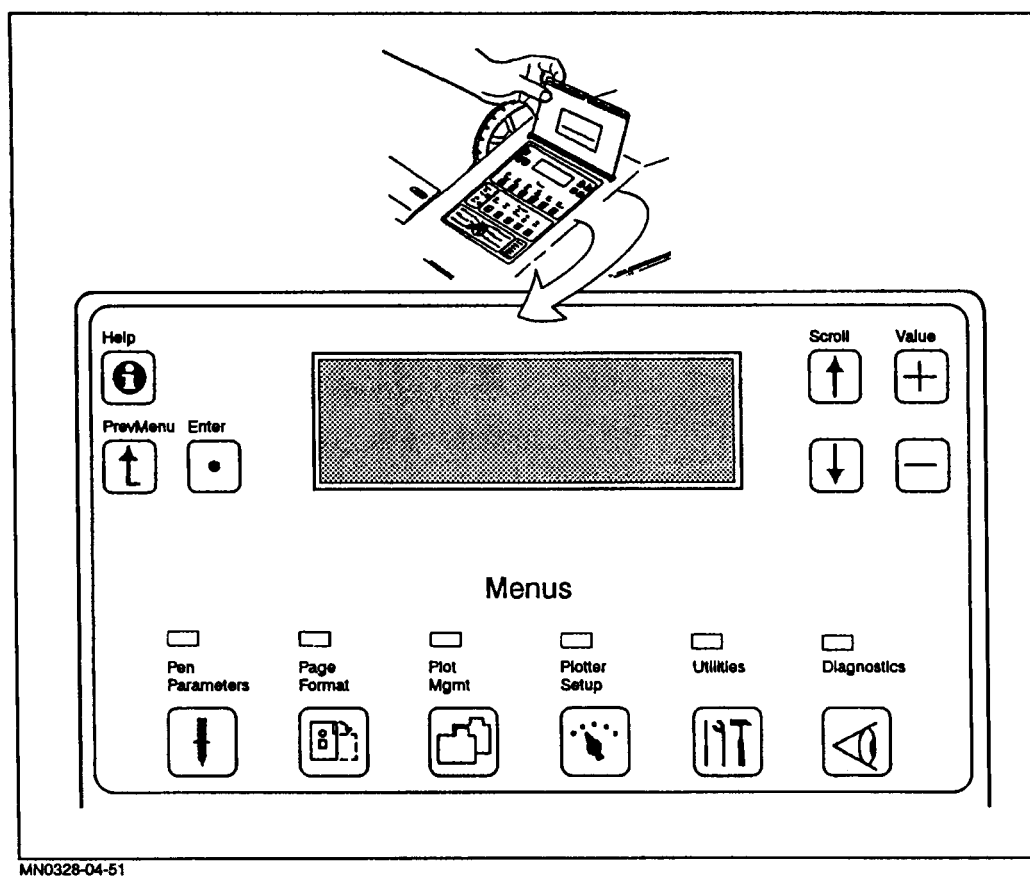
Note	To turn ON the plotter, press the end marked I; press the end marked O to turn the plotter OFF.
-------------	---

When you turn on the plotter, the control panel LEDs flash as the plotter performs a series of internal self-test routines. This initialization process is finished when no other LEDs except the Power and Media LEDs are lit and flashing.

11. *Familiarize yourself with the front panel and its operation.*

Locate the front panel and flip open the cover; see Figure 4-39.

HP C1625A/27A Series 7600 Models 250 and 255 Electrostatic Plotters



MN0328-04-51

Figure 4-39.
HP C1625A/27A Series 7600 Models 250 and 255 Cover and Front Panel

Menu buttons for configuring your plotter are located on the top half of the front panel under the cover, see Figure 4-40.

HP C1625A/27A Series 7600 Models 250 and 255 Electrostatic Plotters

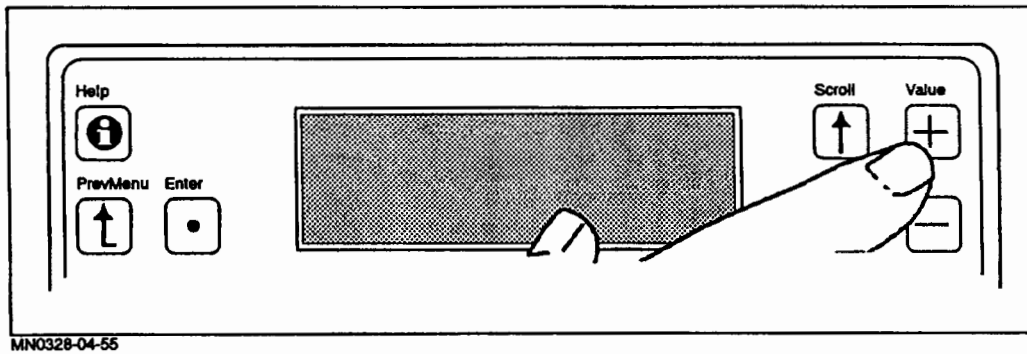


Figure 4-40.

HP C1625A/27A Series 7600 Models 250 and 255 Menu Buttons

For a full description of the front panel menu operation, refer to the User's Guide for this plotter.

The following section provides a quick review of using the front panel menus. If you need more detailed information, refer to the User's Guide that accompanied your plotter. Figure 4-39 is a diagram of the front panel.

- a. Press the **Online** button to take the plotter offline. The **Online** light goes out.

Note	You can look through the menus while the plotter is online, but you cannot change any values.
-------------	---

HP C1625A/27A Series 7600 Models 250 and 255 Electrostatic Plotters

- b. Press the button for the menu you want to use. For example, press the **Plotter Setup** button. The **Plotter Setup** light goes on and the Plotter Setup menu is displayed:

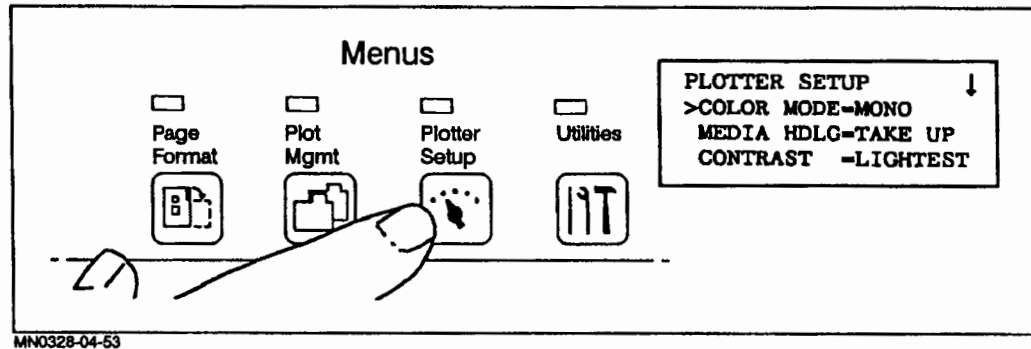


Figure 4-41. HP C1625A/27A Plotter Setup Menu

Note that the first line of the menu tells you which menu you selected.

- c. Press the  (Scroll Up) and  (Scroll Down) buttons to move the left arrow to the menu you want to use.

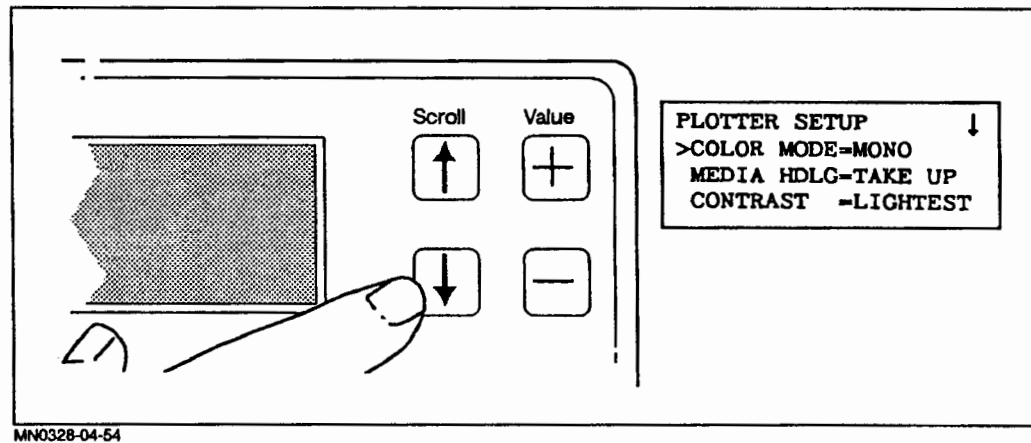


Figure 4-42.
HP C1625A/27A Plotter Scroll Up and Scroll Down Buttons

HP C1625A/27A Series 7600 Models 250 and 255 Electrostatic Plotters

- d. Use the  and  (Value) buttons to scroll through the values on a particular menu selection. When you move to a new value, the new value flashes to indicate that it is not active. When you press Enter to accept the value, it stops flashing.

12. *Use front panel to configure interface parameters.*

Start the configuration from the **Plotter Setup** menu.

13. *Turn the power switch OFF.*

HP C1625A/27A Series 7600 Models 250 and 255 Electrostatic Plotters

Connecting and Configuring the Plotter for an HP-IB Interface

1. *Ensure that the power switch is in the OFF position.*
2. *Connect your HP-IB interface cable to your computer.*
 - a. Locate a standard-speed HP-IB cable.

If you need to replace your HP-IB cable for any reason, the following list contains the available HP-IB cables and their lengths.

HP 10833A 1.0 meter HP-IB cable

HP 10833B 2.0 meter HP-IB cable

HP 10833C 4.0 meter HP-IB cable

HP 10833D 0.5 meter HP-IB cable

- b. Connect the end of the HP-IB cable to the interface or the last device on the chain. If the HP-IB interface already has one or more devices connected to it, connect the cable from your new device to the last device on the chain as in Figure 4-43.

A close up of the “piggy-backed” HP-IB connectors on the previously last device on the chain is provided in Figure 4-44.

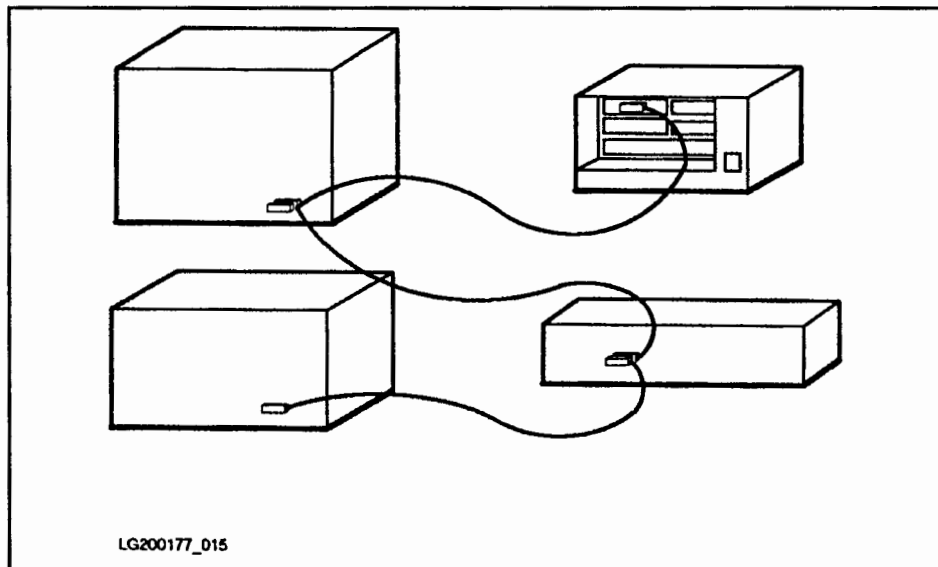
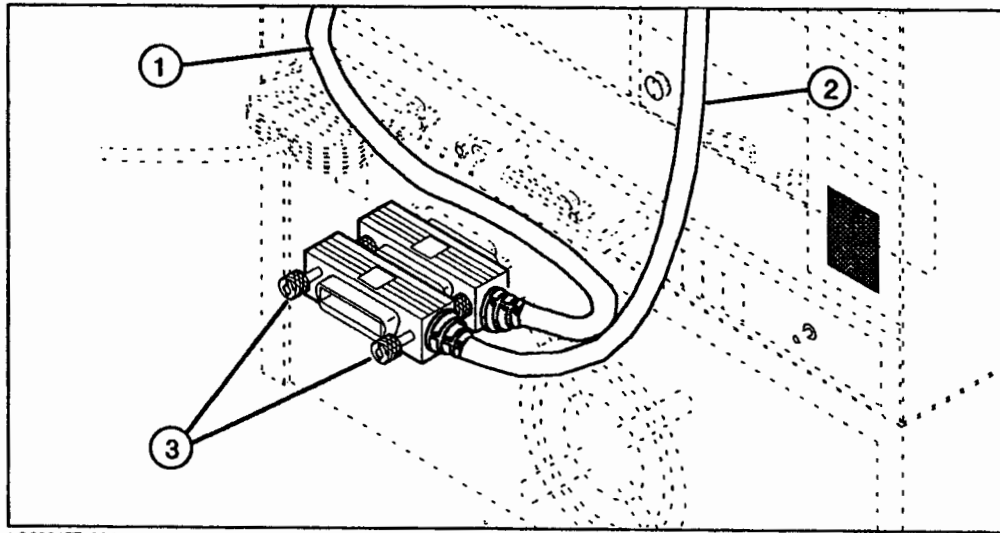


Figure 4-43. Daisy-Chained HP-IB Devices



LG200177_008

Figure 4-44. "Piggy-Backed" HP-IB Connectors

- ① Cable to the interface or previous device.
- ② Cable to the plotter.
- ③ Thumb screws to be tightened.

Figure 4-45 illustrates the plotter connects to a Series 300 computer via the HP-IB interface cable . In this illustration, the plotter is the only HP-IB device connected to the HP-IB interface card.

HP C1625A/27A Series 7600 Models 250 and 255 Electrostatic Plotters

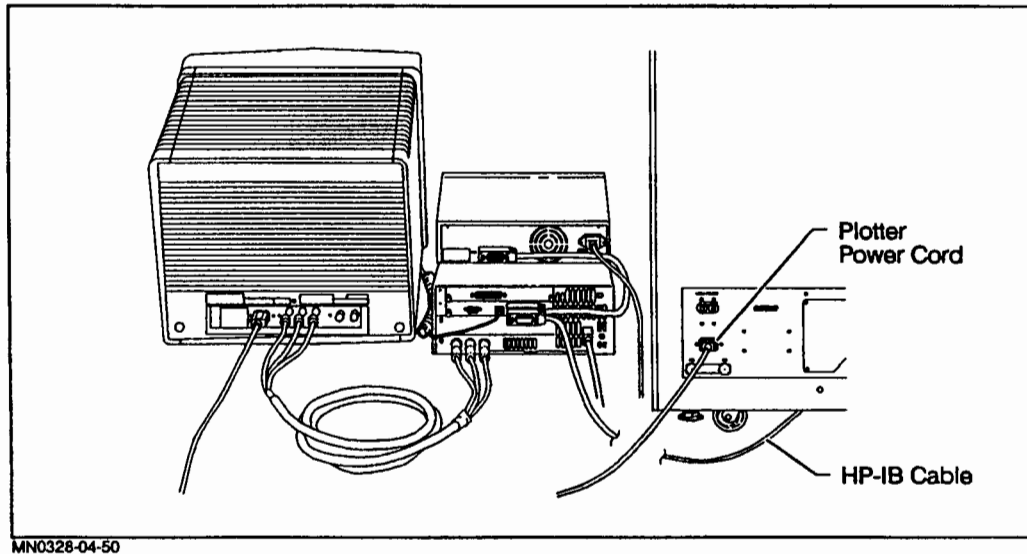


Figure 4-45.

HP C1625A/27A Model 355 Connected to a Series 300 Computer

Note

You can connect the plotter in a standalone configuration only.
You cannot connect the plotter in an eavesdrop configuration.

- c. Turn ON the plotter.

HP C1625A/27A Series 7600 Models 250 and 255 Electrostatic Plotters

The following section includes configuration information for the HP-IB and SCS (HP-IB with Secondary Command Support) interfaces. The Hewlett-Packard Interface Bus (HP-IB) is an interface system consisting of an HP-IB cable linking your computer to your plotter. The HP-IB is a parallel interface, also known as IEEE-488.

HP-IB with Secondary Command Support avoids monopolizing the bus in a multiuser environment. When this protocol is selected, listen-only mode and the service request are automatically disabled.

4

Note

If you select LISTEN ONLY, the plotter listens to all data transmitted on the interface. This mode is useful in a system that has no controller, but instead has a dedicated talker (such as a magnetic tape driver or other mass storage unit) transmitting information to the plotter.

Use the **Plotter Setup** menu to configure your plotter. Once you set the interface conditions, you will not need to reset them unless you change your computer/plotter system so that it requires a different configuration.

```
PLOTTER SETUP
COLOR MODE=4-PASS
MEDIA HDLG=TAKE-UP
MEDIA TYPE=NON-FILM
GRAPH LANG=HP-GL/2
I/O CONFIG=HP-IB
CDI MODE  =OFF
PANEL LANG=ENGLISH
ADVANCED SETUP
```

Figure 4-46. C1625A/27A Series 7600 Model 355 Plotter Setup Menu

HP C1625A/27A Series 7600 Models 250 and 255 Electrostatic Plotters

Go to the **I/O CONFIG** menu line, select **HP-IB**, and press **Enter**.

```
PLOTTER SETUP
I/O CONFIG:  HP-IB
ADDRESS=  5
SCS      =OFF
```

Figure 4-47. C1625A/27A Series 7600 Model 355 Plotter HP-IB Menu

Go to the **ADDRESS** menu line, select the address setting you want and press **Enter**.

Note The default HP-IB bus address is set to 5.

If you want to use Secondary Command Support, go to the **SCS** menu line, select **ON**.

Go to the accompanying plotter manual to perform the following tasks:

1. Load media
2. Load toner
3. Draw a demonstration plot
4. Verify communication



Then return to this manual to modify the HP-UX operating system to add this plotter. If SAM is resident on your system or you choose not to use SAM, continue on to Chapter 5: "Setting Up HP-UX for Plotters and Graphic Devices" If SAM is not resident on your system, continue on to Chapter 7: "Setting Up Devices Using HP-UX Commands"

HP C1625A/27A Series 7600 Models 250 and 255 Electrostatic Plotters

HP-UX Set Up Information

The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Refer to Chapter 7: "Setting Up Devices Using HP-UX Commands" for software configuration information.

Table 4-8.
Plotter
Connected to Built-in HP-IB Interface

Device Name	Path Name	File Type	Major Number	Driver Name	Select Code	Minor Number ¹
HP C1625A Plotter	/dev/lp1625A	c	21	hpib	7 ²	0x070n00
HP C1625A Plotter	/dev/lp1625A	c	21	hpib	8 ³	0x080n00

1 *n* is a number that identifies the bus address. Replace *n* with a 5 if the address was set to 5, use 7 if the address was set to 7, and so on.

2 Built-in standard-speed HP-IB interface.

3 HP 98624A standard-speed HP-IB interface.

HP 7575/76A DraftPro DXL/EXL Plotters

The HP 7575A DraftPro DXL plotter is an A and D size plotter. The HP 7576A DraftPro EXL plotter is an A and E size plotter.

The plotters support HP-IB, HP-IB Secondary Command Support, and RS-232-C interfaces and offer a mechanical resolution of 0.0125 mm and an addressable resolution of 0.025 mm. The HP7575/76A support the standard HP-GL language and a one- or two-megabyte buffer option which will allow you to download an entire plot, freeing your computer.

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

HP 7575/76A DraftPro DXL/EXL Plotters

Installing the HP 7575/76A EXL DraftPro Plotter

Refer to the *HP DraftPro DXL/EXL Plotters User's Guide*, HP part number 07575-90009, to perform the following tasks to install this plotter:

■ *Select a location and unpack.*

1. Select a location that is level and smooth.
2. Avoid locations near air conditioners, exposed to direct sunlight, or subject to high humidity.
3. Keep the plotter at least 60 cm (24 in.) from the closest wall. Additionally, be careful not to restrict the ventilation at the back of the unit, or stack anything on top of the plotter.
4. After selecting and preparing a location for your plotter, unpack and move the plotter to its new location.
5. Inspect the plotter.
6. Locate the documentation shipped with the plotter
 - a. *HP DraftPro DXL/EXL Plotters User's Guide*, HP part number 07575-90009.

■ *Play it safe.*

1. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
2. TURN OFF the computer and unplug the power cord.

■ *Familiarize yourself with the plotter.*

Connecting and Configuring the Plotter for an HP-IB Interface

1. *Identify the plotter HP-IB interface connector.*
2. *Set the interface switches.*
 - a. You need to set the switch that determines HP-IB or HP-IB with Secondary Command Support protocol
 - b. Set the HP-IB bus address.

Note

You should familiarize yourself with the HP-IB addresses that are currently in use on your system. Determine the available HP-IB address(es). Use the foldout worksheet at the end of this book to note already-used addresses.

You are limited to eight devices per HP-IB card, addresses 0 through 7.

The bus address is preset to 5. If bus address 5 is already assigned to another device on the HP-IB bus, refer to the foldout worksheet at the end of this book to choose an unused bus address ranging from 0 to 6.

- a. Find the set of HP-IB address switches near the HP-IB connector.
- b. Set the HP-IB bus address according to Table 4-9.

Table 4-9. HP-IB Switch Settings

HP-IB Bus Address	Switch 2	Switch 1	Switch 0
0	0	0	0
1	0	0	1
2	0	1	0
3	0	1	1
4	1	0	0
5	1	0	1
6	1	1	0

HP 7575/76A DraftPro DXL/EXL Plotters

3. *Connect the interface cable to the computer and plotter.*

a. Locate a standard-speed HP-IB cable.

If you need to replace your HP-IB cable for any reason, the following list contains the available HP-IB cables and their lengths.

HP 10833A 1.0 meter HP-IB cable

HP 10833B 2.0 meter HP-IB cable

HP 10833C 4.0 meter HP-IB cable

HP 10833D 0.5 meter HP-IB cable

b. Connect one end of the HP-IB cable to the HP-IB connector on the back of the plotter. Tighten the thumb screws to secure the connection.

c. Connect the other end of the HP-IB cable to the interface or the last device on the chain. If the HP-IB interface already has one or more devices connected to it, connect the cable from your new device to the last device on the chain as in Figure 4-48.

A close up of the “piggy-backed” HP-IB connectors on the previously last device on the chain is provided in Figure 4-49.

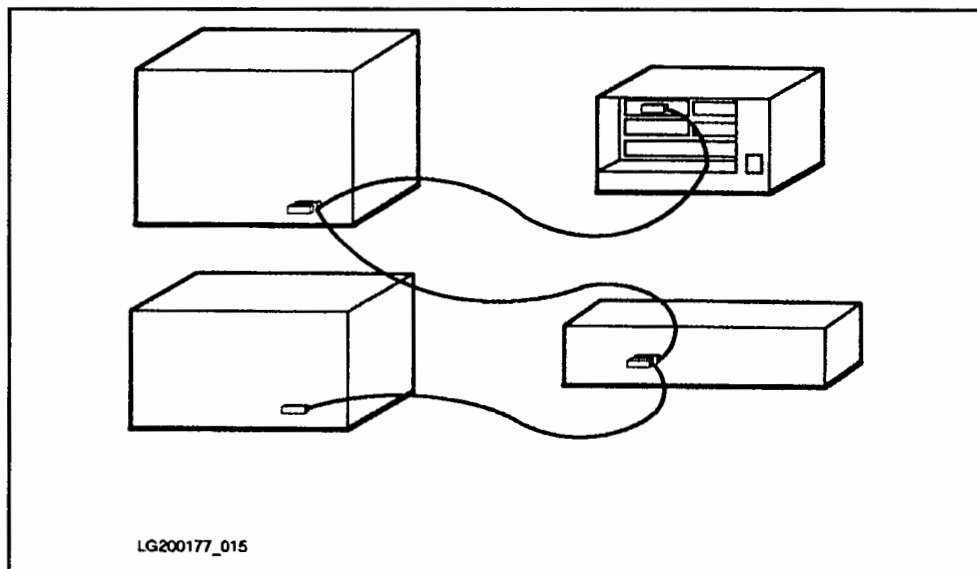


Figure 4-48. Daisy-Chained HP-IB Devices

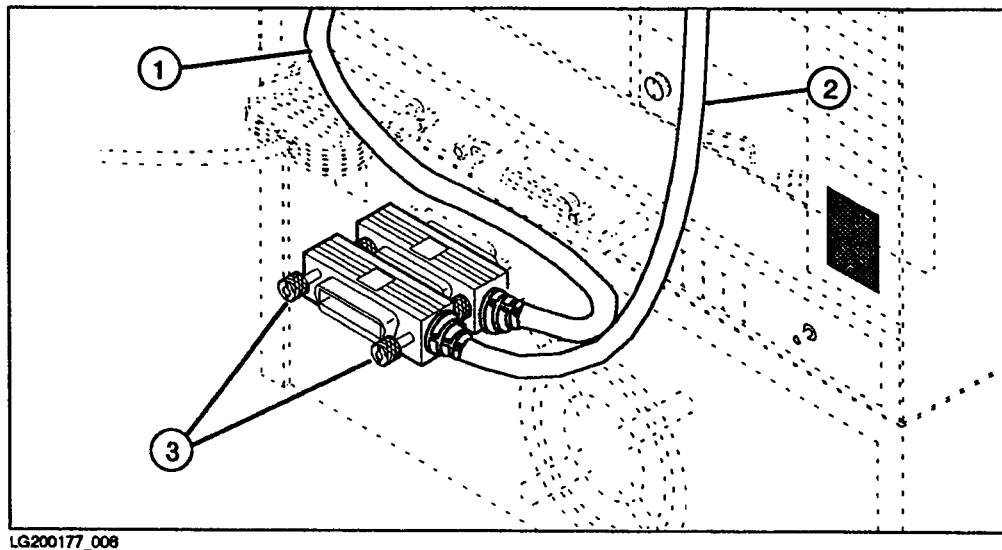


Figure 4-49. "Piggy-Backed" HP-IB Connectors

- ① Cable to the interface or previous device.
 - ② Cable to the plotter.
 - ③ Thumb screws to be tightened.
4. *Ensure that the plotter power switch is in the OFF position.*

HP 7575/76A DraftPro DXL/EXL Plotters

5. *Connect the power cable.*

Be sure the front and rear plotter power switches are off before starting. The power cable is a three-wire line with a three-terminal polarized plug. The grounding terminal of the plug is grounded to the plotter chassis to comply with safety codes.

Warning	Only use the power cable with a properly grounded receptacle to avoid electrical shock.
----------------	--

4

- a. Push the prongless (female) end of the power cable into the power socket on the back of the plotter.
- b. Insert the wall power plug (male) into a grounded power outlet.
- c. Turn on your plotter using the ON/OFF switch on the front of the plotter.

Note	To turn ON the plotter, press the end marked I; press the end marked O to turn the plotter OFF.
-------------	---

Go to the accompanying plotter manual to perform the following tasks:

1. Load media
2. Load toner
3. Draw a demonstration plot
4. Verify communication

Refer to “HP-UX Setup Information” for this plotter to continue with software configuration information.

Connecting and Configuring the Plotter for an RS-232 Interface

1. *Identify the plotter RS-232-C interface connector.*

2. *Set the interface switches.*

You will need to set the following values:

- a. eavesdrop
- b. parity
- c. baud rate

3. *Connect the interface cable to the computer and plotter.*

Refer to the "RS-232-C Cabling Guidelines" in Chapter 1: "Introduction".

- a. Connect one end of the RS-232-C cable to the RS-232-C port of the plotter.
- b. Connect the other end of the RS-232-C cable to the RS-232-C port of the computer.
- c. Make sure the connectors are firmly seated.
- d. The RS-232-C plotter and cable pinouts are described in the User's Guide shipped with your plotter.

4. *Ensure that the plotter power switch is in the OFF position.*

HP 7575/76A DraftPro DXL/EXL Plotters

5. *Connect the power cable.*

Be sure front and rear plotter power switches are off before starting. The power cable is a three-wire line with a three-terminal polarized plug. The grounding terminal of the plug is grounded to the plotter chassis to comply with safety codes.

Warning	Only use the power cable with a properly grounded receptacle to avoid electrical shock.
----------------	--

4

- a. Push the prongless (female) end of the power cable into the power socket on the back of the plotter.
- b. Insert the wall power plug (male) into a grounded power outlet.
- c. Turn on your plotter using the ON/OFF switch on the front of the plotter.

Note	To turn ON the plotter, press the end marked I; press the end marked O to turn the plotter OFF.
-------------	---

Go to the accompanying plotter manual to perform the following tasks:

1. Load media
2. Load toner
3. Draw a demonstration plot
4. Verify communication

Then return to this manual to modify the HP-UX operating system to add this plotter. If SAM is resident on your system, continue on to Chapter 5: "Setting Up HP-UX for Plotters and Graphic Devices" to perform this task. If SAM is not resident on your system, continue on to Chapter 7: "Setting Up Devices Using HP-UX Commands".

HP-UX Set Up Information

The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Refer to Chapter 7: "Setting Up Devices Using HP-UX Commands" for software configuration information.

Table 4-10.
HP 7575/76A DraftPro DXL/EXL Plotters
Connected to Built-in HP-IB Interface

Device Name	Path Name	File Type	Major Number	Driver Name	Select Code	Minor Number ¹
HP 7575A Plotter	/dev/lp7575	c	21	hpib	7 ²	0x070n00
HP 7575A Plotter	/dev/lp7575A	c	21	hpib	8 ³	0x080n00

¹ *n* is a number that identifies the bus address. Replace *n* with a 5 if the address was set to 5, use 7 if the address was set to 7, and so on.

² Built-in standard-speed HP-IB interface.

³ HP 98624A standard-speed HP-IB interface.

HP 7575/76A DraftPro DXL/EXL Plotters

Table 4-11.
HP 7575/76A DraftPro DXL/EXL Plotters
Connected to RS-232-C Interfaces

Device Name	Path Name	File Type	Major Number	Driver Name	Select Code	Minor Number
HP 7575A Plotter	/dev/lp7575A	c	1	98626	9 ¹	0x090004
HP 7575A Plotter	/dev/lp7575A	c	1	98628	20 ²	0x140004

1 Built in RS-232-C interface and and HP 98626A RS-232-C Interface.

2 HP 98628A Datacomm Interface

HP 9111A Graphics Tablet

The HP 9111A Graphics Tablet connects to your computer via the standard-speed HP-IB interface.

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

HP 9111A Graphics Tablet

Installing the HP 9111A Graphics Tablet

Before you install this graphics tablet, refer to the manual(s) that came with your graphics tablet to:

- Unpack the graphics tablet.
- Check the line voltage setting.
- Check the fuse.

4

1. *Play it safe.*

- a. Follow the computer “shut down” procedure. See *System Administration Tasks Manual* Chapter 3: “Starting and Stopping HP-UX” for specific instructions.
- b. TURN OFF the computer and unplug the power cord.

2. *Select Your Interface.*

Select one of the following standard-speed HP-IB interfaces:

- HP 98624A standard-speed HP-IB interface card
- Built-in standard-speed HP-IB interface

Avoid placing the tablet on the same interface used by your disk or tape drives. A dedicated HP 98624A HP-IB Interface is recommended. Placing a tablet on the same HP-IB interface as your disk or tape drive could substantially affect the performance of your disk or tape drive.

3. *Set the HP-IB Address.***Note**

You should familiarize yourself with the HP-IB addresses that are currently in use on your system. Determine the available HP-IB address(es). Use the foldout worksheet at the end of this book to note already-used addresses.

You are limited to eight devices per HP-IB card, addresses 0 through 7.

The bus address is preset to 6. If bus address 6 is already assigned to another device on the HP-IB bus, refer to the foldout worksheet at the end of this book to choose an unused bus address ranging from 0 to 6.

- a. Find the set of five HP-IB address switches near the HP-IB connector.
- b. Set the HP-IB bus address according to Table 4-12. An example of setting the HP-IB bus address to 7 is shown in Figure 4-50.

Table 4-12. HP-IB Switch Settings

HP-IB Bus Address	Switch 4	Switch 2	Switch 1
0	0	0	0
1	0	0	1
2	0	1	0
3	0	1	1
4	1	0	0
5	1	0	1
6	1	1	0

HP 9111A Graphics Tablet

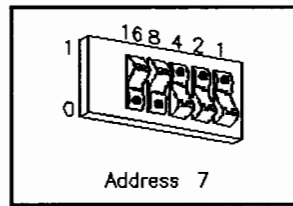


Figure 4-50.
Address 7

4

4. *Connect the HP 9111A to the computer.*

- a. Locate an HP-IB cable.
- b. Connect one end of the HP-IB cable to the HP-IB connector on the back of the graphics tablet. Tighten the thumb screws to secure the connection.
- c. Connect the other end of the HP-IB cable to the interface.

If the HP-IB interface already has one or more devices connected to it, connect the cable from your new device to the last device on the chain as in Figure 4-51

A close up of the “piggy-backed” HP-IB connectors on the previously last device on the chain is provided in Figure 4-52.

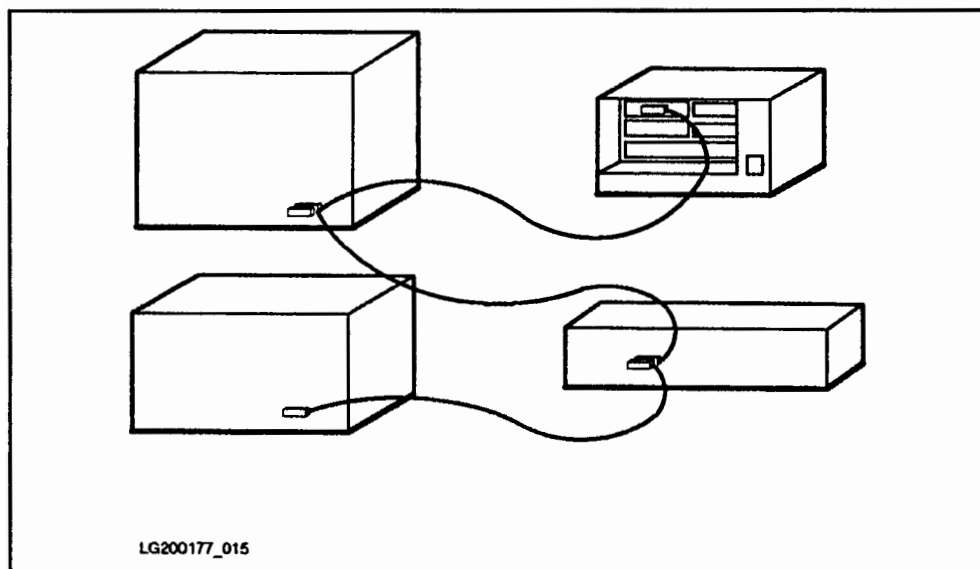
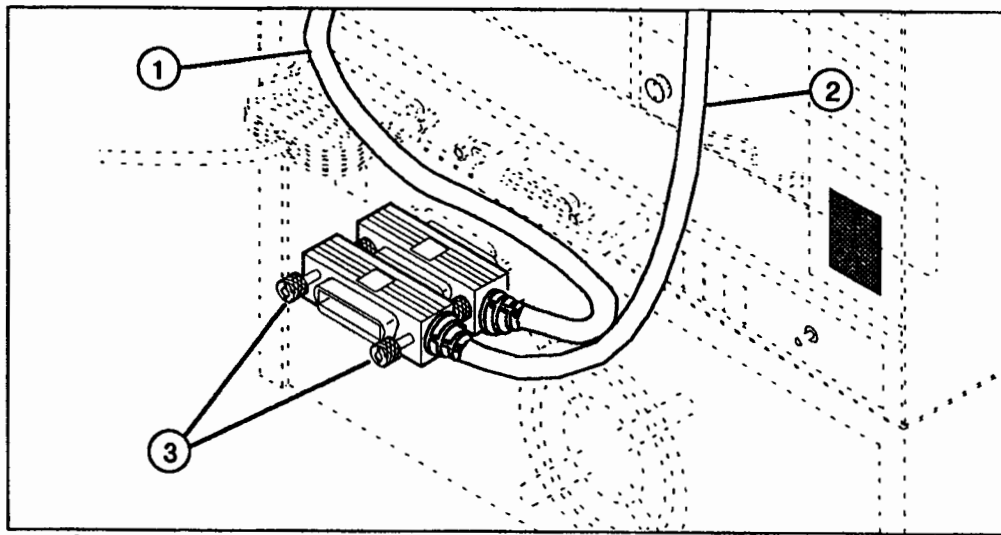


Figure 4-51. Daisy-Chained HP-IB Devices



LG200177_006

Figure 4-52. "Piggy-Backed" HP-IB Connectors

- ① Cable to the interface or previous device.
- ② Cable to the tablet.
- ③ Thumb screws to be tightened.

5. *Ensure all power switches are in the OFF position.*

6. *Connect the power cord.*

Connect the female end of the power cord to the power socket on the back of the graphics tablet, and connect the other end to your power outlet.

7. *Record the HP-IB Bus Address.*

Make a note that the HP-IB bus address you selected has been used and is no longer available on the interface you selected. Use the foldout worksheet at the end of this book for this purpose.

- 8. Turn on the tablet.
- 9. Turn on the computer.

Hardware Installation Complete!

HP-UX Set Up Information

The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Refer to Chapter 7: "Setting Up Devices Using HP-UX Commands" for software configuration information.

Table 4-13.
HP 9111A
Connected to Built-in HP-IB Interface

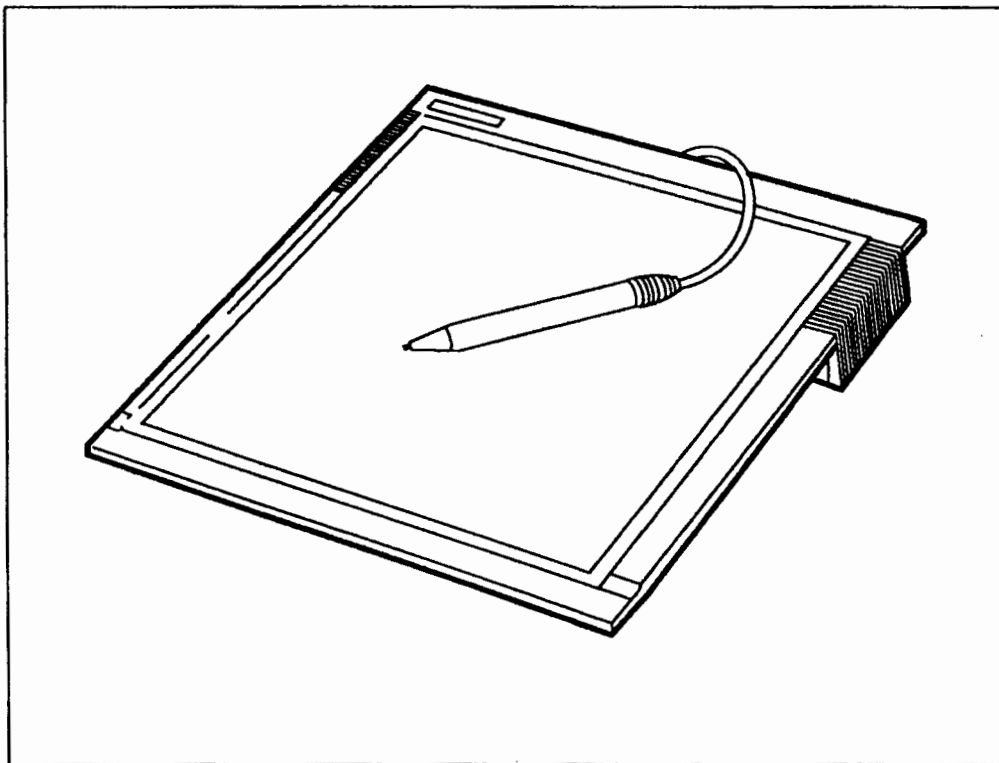
Device Name	Path Name	File Type	Major Number	Select Code	Minor* Number
HP 9111A	/dev/dig9111	c	21	7	0x070n00
HP 9111A	/dev/dig9111	c	21	8	0x080n00
* n is a number that identifies the address (set in step 3 of the Installation Procedure). Replace n with a 6 if the address was set to 6, use 7 if the address was set to 7, and so on.					

HP 45911A/C Graphics Tablet

The HP 45911A/C Graphics Tablet is shipped with the following four elements:

- a tablet
- a stylus
- a protective plastic overlay sheet
- a one-meter HP-HIL (Hewlett-Packard Human Interface Link) cable.

4



LG200177_001

Figure 4-53. HP 45911C Graphics Tablet

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

4-106 Installing Plotters and Graphic Devices

Installing the HP 45911C Graphics Tablet

1. *Play it safe.*
 - a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
2. *Connect the tablet to your system.*

Caution

To avoid damage to your computer:

- a. DO NOT insert the one-dot end of the HP-HIL cable into a connector marked with two dots, and DO NOT insert the two-dot end of the HP-HIL cable into a connector marked with one dot. The ends of the cable are not interchangeable.
 - b. DO NOT connect the HP-HIL cable, the stylus, or the tablet to a telephone system.
-

- a. Locate the two-dot connector on the keyboard.

If the keyboard does not have a two-dot connector, look for it on the back of the computer. If an HP-HIL accessory is already plugged into the two-dot connector on the keyboard (or computer), disconnect it.

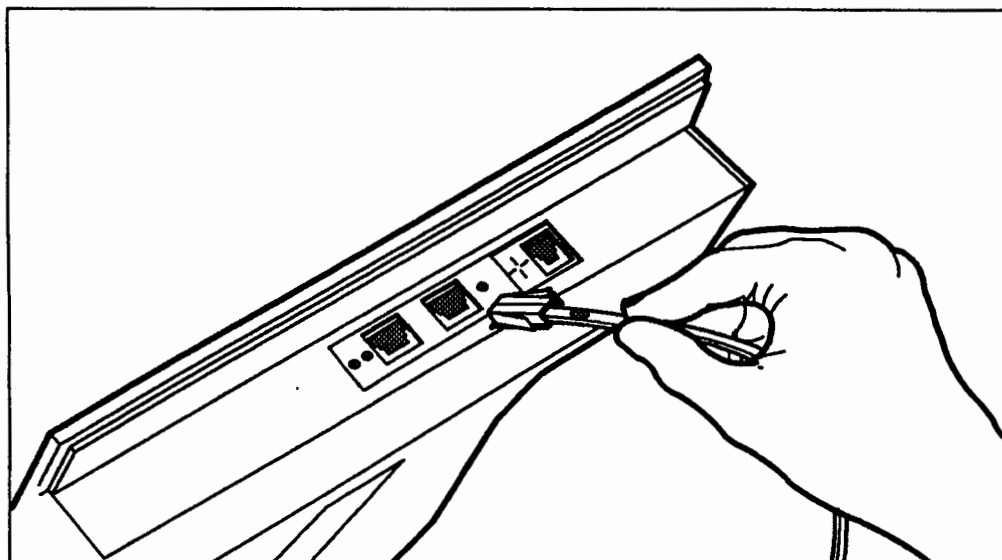
- b. Locate the HP-HIL cable shipped with the tablet.

Note that one end of the cable has a one-dot mark and the other end has a two-dot mark.

- c. Connect the one-dot end of the supplied HP-HIL cable to the tablet.

Plug the one-dot end of the HP-HIL cable into the one-dot connector on the tablet; refer to Figure 4-54.

HP 45911A/C Graphics Tablet



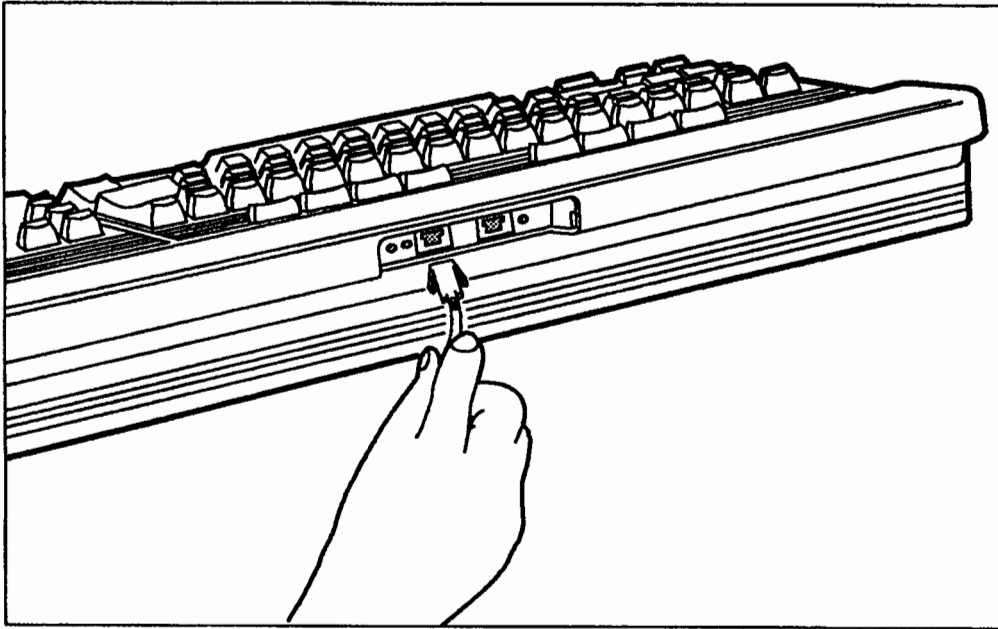
LG200177_002

Figure 4-54. Connecting the Cable to the Tablet

HP 45911A/C Graphics Tablet

- d. Connect the two-dot end of the supplied HP-HIL cable to the keyboard or computer.

Plug the two-dot end of the HP-HIL cable into the two-dot connector on the keyboard (or computer). Refer to Figure 4-55 for connecting two-dot to the keyboard and Figure 4-56 for connecting two-dot to the computer.



LG200177_003

Figure 4-55. Connecting the Tablet to the Keyboard

HP 45911A/C Graphics Tablet

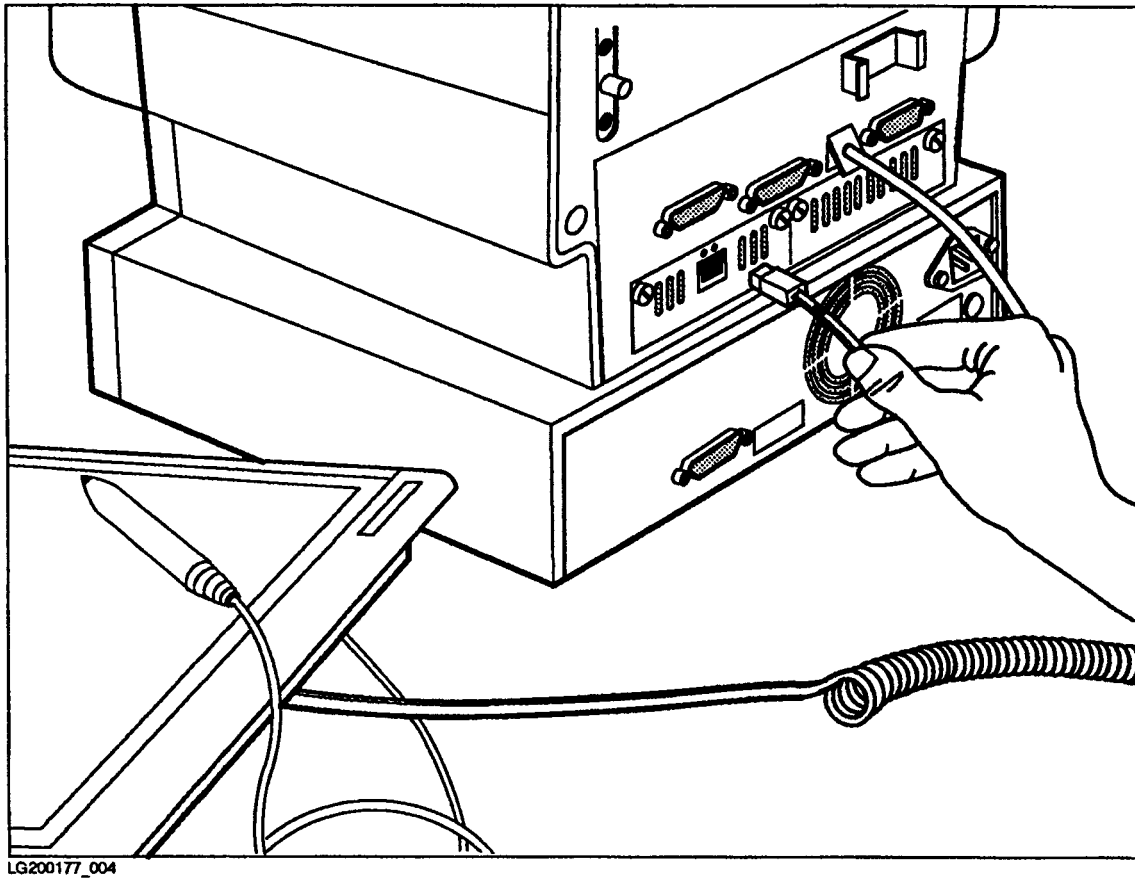
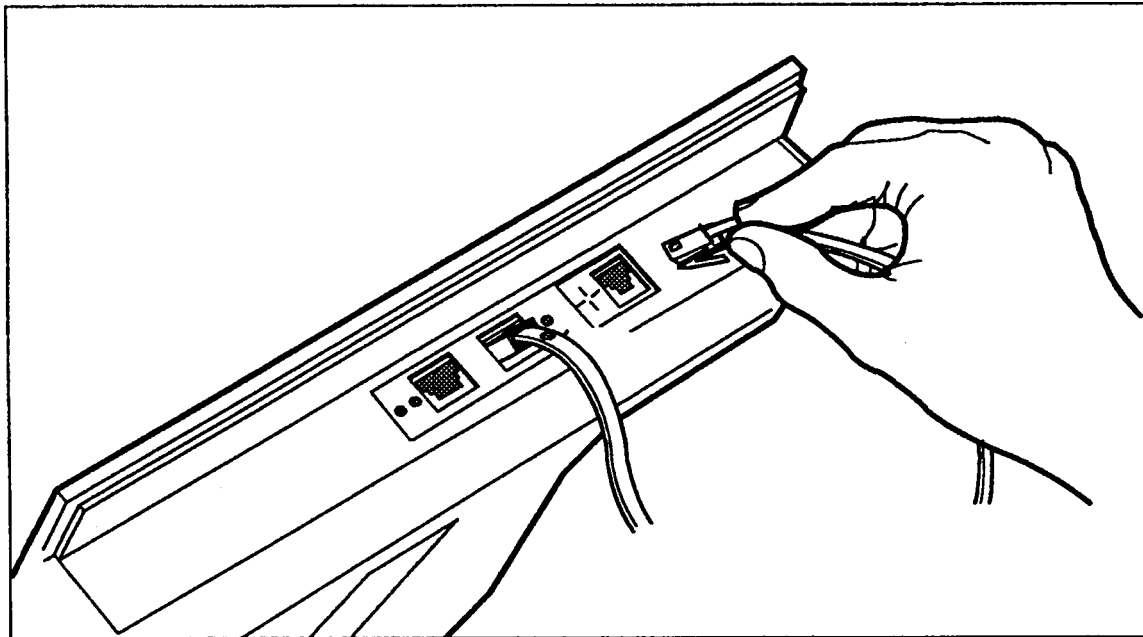


Figure 4-56. Connecting the Tablet to the Computer

3. *Connect the stylus to the tablet.*

Plug the stylus into the special connector on the tablet. The special connector is marked by a crosshair symbol; refer to Figure 4-57.



LG200177_005

Figure 4-57. Connecting the Stylus to the Tablet

If you disconnected an HP-HIL accessory in Step 2 above, and you want to use that accessory with the tablet, plug the two-dot end of the accessory's cable into the two-dot connector on the tablet.

4. *Turn on the computer.*

Hardware Installation Complete!

The tablet is designed for use with many different software applications. The reference manual for each software application will indicate how the tablet is to be used.

Note

The HP-HIL bus is sensitive to interrupts. If you experience cursor movement problems, the following steps can restore operation after a bus interrupt:

1. Ensure the connectors are firmly inserted.
2. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
3. Restart system. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.

HP-UX Set Up Information

Note

HP-HIL devices can be added to or removed from the HP-HIL interface without affecting the HP-UX operating system. However, if your application requires the use of a particular device and you remove the device from the link, open the link to the device, or open the link to add a new device, your application might not recognize the change and may not work as expected.

The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Table 4-14. HP 45911A/C Graphics Tablet Setup Values

Device Name	Path Name	File Type	Major Number	Minor Number
HP 45911A/C Tablet	/dev/r8042 ¹	c	23	0x000000
HP 45911A/C Tablet	/dev/hiln ²	c	24	0x0000n0 ²

1 This device file must exist in addition to a separate device file for each HP-HIL device on the bus.

2 Replace *n* with the bus address of the device.

4



HP 46087/88A Digitizers and HP 46089A Cursor

The HP 46087A and 46088A are low-cost, high-resolution digitizers suitable for menu/object picking, free-hand graphics entry and digitizing. The HP 46087A is ANSI A/ISO A4 size. The HP 46088A is ANSI B/ISO A3. Both digitizers include a stylus with tip switch and a platen overlay. Both digitizers connect to your computer via the HP-HIL interface.

4

The HP 46089A four-button, cross-hair cursor is available separately or as digitizer Option 001. The cursor is recommended for digitizing existing drawings, artwork or other hard-copy images. It uses no additional power and occupies no HP-HIL addresses.

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

Installing the HP 46087/88A Digitizers and HP 46089A Cursor

Note Connecting and disconnecting HP-HIL devices while some language/operating systems or application programs are running may lead to unpredictable results. When possible, connect all needed HP-HIL devices to your computer before booting a language/operating system or running an application program.

1. Find the HP-HIL cable that came with the digitizer.
2. Find the end of the cable that is marked with one black dot.
3. Find the HP-HIL connector on the digitizer that is marked with one dot.
4. Plug the “one-dot” end of the cable into the “one-dot” connector on the digitizer.
5. Connect the other, “two-dot” end of the cable into the HP-HIL connector on your computer (marked “KYBD” or “KEYBOARD”), or to the “two-dot” connector of the last HP-HIL device you installed (for example, keyboard).
6. Plug the stylus or HP 46089A Cursor into the round connector on the digitizer.
7. Keep these constraints in mind:
 - You cannot have more than seven HP-HIL addressable devices connected to your computer at one time. The HP 46080A, 46081A, 46082A and 46082B Extension modules and the HP 46089A Four-Button Cursor do not count as addressable devices, and the HP 46085A Control Dials Module counts as *three* addressable devices. All other devices count as one addressable device.
 - The current requirements of all of your devices must not exceed 750 milliamps (mA). To make sure you do not exceed this requirement, total up the typical power required by each of your HP-HIL devices as given in the following “Worksheet Entries” sections. If the total exceeds 750 mA, you must remove one or more devices.

HP 46087/88A Digitizers and HP 46089A Cursor

HP-UX Set Up Information

Note HP-HIL devices can be added to or removed from the HP-HIL interface without affecting the HP-UX operating system. However, if your application requires the use of a particular device and you remove the device from the link, open the link to the device, or open the link to add a new device, your application might not recognize the change and may not work as expected.

4

Table 4-15.
HP 46087/88A Digitizers and
HP 46089A Cursor
Worksheet Entries

Device Name	Path Name	File Type	Major Number	Minor* Number	Power Req.
HP 46087/88/89A	/dev/r8042	c	23	0x000000	133 mA
HP 46087/88/89A	/dev/digitizer	c	24	0x000020	133 mA
* The second minor number in the table assumes the digitizer is the second device on the HP-HIL interface (address=2). If this is not the case, substitute the correct position (address) of the digitizer in place of the 2 in the minor number (e.g., if the digitizer is the third device on the interface, the minor number would be 0x000030).					

HP 98627A Color Output Interface

The HP 98627A Color Output Interface allows you to connect an external color monitor to your computer.

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

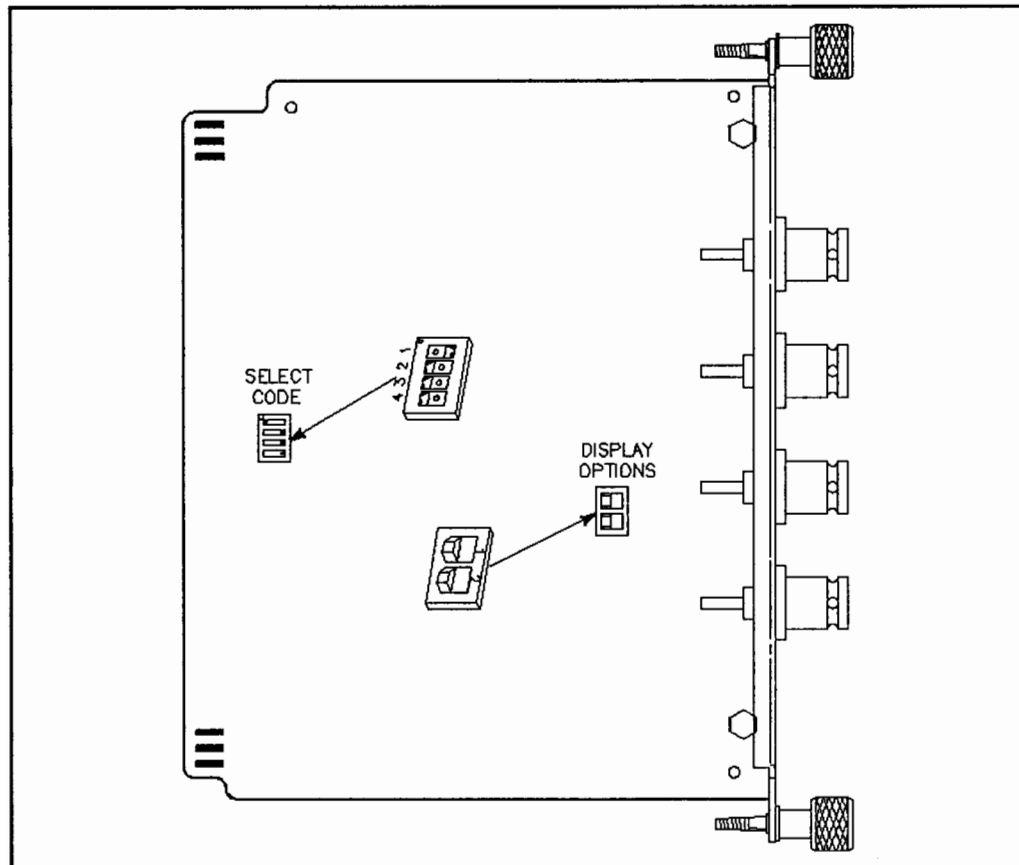


Figure 4-58.
HP 98627A Color Video Output Interface Switches

HP 98627A Color Output Interface

Installing the HP 98627A Color Output Interface

1. *Play it safe.*

- a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
- b. TURN OFF the computer and unplug the power cord.
- c. Remove the Color Output Interface from its envelope, being careful to handle the card only by its edges and metal end plate. The card may be easily damaged by electrostatic discharge (static zap).
- d. Place the card on the envelope.

2. *Set the select code.*

Note

The Color Output Interface is preset to use select codes 28 and 29.

The Multiprogrammer Interface is also preset to select code 29 and will conflict with the default select code setting of the Color Output Interface. If you have both of these interfaces, change the select code of the Multiprogrammer Interface to an unused select code.

- a. Find the set of four select code switches illustrated in Figure 4-58.
- b. The select code switches must be set to an even select code and the next odd select code must not be used by another interface. Refer to the foldout worksheet to find an even select code that meets this requirement.
- c. Set these switches to the switch settings associated with your select code. See the foldout worksheet for switch settings. Refer to the installation notes that came with the interface if you need additional switch setting information.

3. Set Display Option Switch 1.

Note If you intend to connect an HP 13279B Color Monitor to this interface, you can skip to step 4. Display option switch 1 is preset for a combined green and sync signal and need not be changed.

- If connecting an HP 13279B Color Monitor to this interface, set display option switch 1 for combined green and sync signal as shown in Figure 4-58.
- If connecting some other monitor, set display option switch 1 *opposite* of that shown in Figure 4-58 if the monitor provides for a separate sync signal; otherwise set the interface to a combined green and sync signal by setting display option switch 1 as shown in Figure 4-58.

4. Set Display Option Switch 2.

Note If you intend to connect an HP 13279B Color Monitor to this interface, you can skip to step 5. Display option switch 2 is preset to a 24.8 kHz horizontal scan and need not be changed.

- If connecting an HP 13279B Color Monitor to this interface, set option switch 2 to 24.8 kHz horizontal scan as shown in Figure 4-58.
- If connecting some other monitor, set option switch 2 *opposite* of that shown in Figure 4-58 if the monitor has a 15.75 kHz horizontal scan; set option switch 2 as shown in Figure 4-58 if the monitor has a 24.8 kHz scan.

HP 98627A Color Output Interface

5. *Insert the interface.*

- a. Remove the *painted* cover plates from the back of your computer until you find an empty *even-numbered* slot. (Slots are numbered from the top down, so the top-most slot is number 1, the next slot down is number 2, etc.) *Do not* remove the silver cover plates from the bottom of the computer.
- b. Insert the Color Output Interface, component side up, into the empty even-numbered slot. Tighten the thumb screws on the metal end plate until the end plate is flush with the back of the computer.
- c. If you changed the select code of the Color Output Interface in step 2, find this number in the set of select code labels supplied with the interface. Affix this label to the metal end plate.
- d. If you have other interface or accessory cards to install, leave the cover plates off; otherwise, replace them.

6. *Record the select code.*

Make a note that select codes 28 and 29 (or the alternate selects codes you chose in step 2) have been used and are no longer available. Use the foldout worksheet at the end of the book for this purpose.

7. *Verify installation.*

- a. Plug in the power cord, turn on your computer, and hold down the space bar for a few seconds.
- b. Check the list of components displayed on the left-hand side of the screen. If the message:

HP 98627 at 28

appears you have correctly installed the Color Output Interface.

If this message does not appear, make sure there are no select code conflicts and that the board is seated in an even numbered slot. If you still have problems, call your HP Service Representative for assistance.

Hardware Installation Complete!

HP-UX Set Up Information

The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

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Table 4-16.
HP 98627 Color Output Interface HP-UX Set Up Values

Device Name	File Type	Major Number	Select Code	Minor* Number
HP 98627	c	12	28	0x1c0200

HP 13279B Color Monitor

The HP 13279B Color Monitor connects to the HP 98627A Interface.

Note	This monitor is to be installed by an HP Customer Engineer. Installation and adjustment is included in the price of the monitor.
-------------	--

Installing the HP 13279B Color Monitor

1. *Play It Safe.*

- a. Contact your HP Sales and Service Office to arrange for installation of your monitor. Installation and adjustment are included in the price of the unit.
- b. Turn your computer off and remove the power cord.

2. *Connect the Cables.*

- a. Connect one cable from the RED video output on the HP 98627A Interface to the CHANNEL A RED IN connector (J1) at the rear of the monitor (see Figure 4-59).
- b. Connect one cable from the GREEN video output on the HP 98627A Interface to the CHANNEL A GREEN IN connector (J3) at the rear of the monitor (see Figure 4-59).
- c. Connect one cable from the BLUE video output on the HP 98627A Interface to the CHANNEL A BLUE IN connector (J5) at the rear of the monitor (see Figure 4-59).

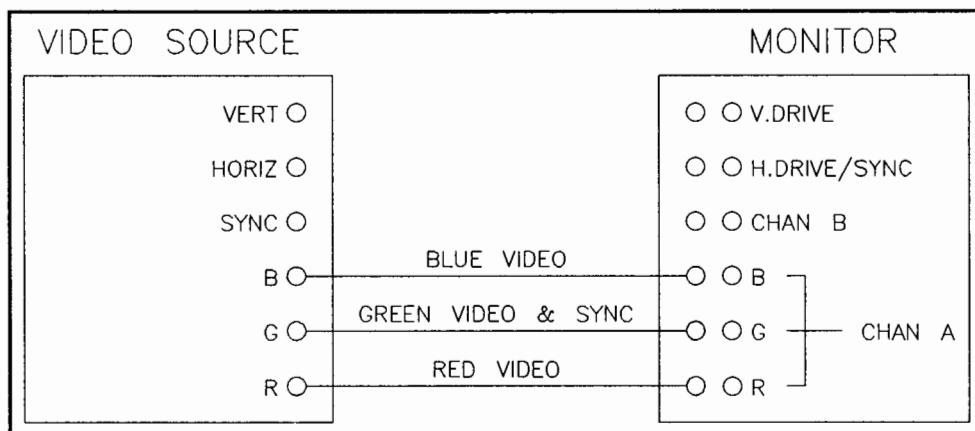


Figure 4-59. HP 13279B Cable Connections

HP 13279B Color Monitor

3. *Connect the Power Cord.*

Connect the female end of the power cord to the power socket on the back of the monitor, and connect the other end to your power outlet.

4. *Adjust the Scan Rate.*

Have your HP Customer Engineer adjust the scan rate.

HP-UX Set Up Information

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The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Table 4-17. HP 13279B Color Monitor

Device Name	File Type	Major Number	Minor* Number
HP 13279B, select code 28	c	12	0x1c0200
* If you changed the select code of the HP 98627A Color Output Interface, write in the new select code (in hexadecimal) instead of 1c in the minor number.			

HP 98556A 2D Integer Based Graphics Accelerator Accessory Card

The HP 98556A 2D Graphics Accelerator is an add-on option for the HP 98549A and HP 98550A Color Graphic Interfaces. The Graphics Accelerator Accessory Card connects directly to the Color Graphic Interface Card "piggy-back" style. The board pair fits into one slot in the computer or Direct-Connect I/O Expander.

Note	If you have an HP 98264A/B ECC RAM card or an HP 98248A Floating-Point Accelerator card mounted in your computer, the HP 98556A 2D Graphics Accelerator card <i>must</i> be mounted in the Direct-Connect I/O Expander.
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Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

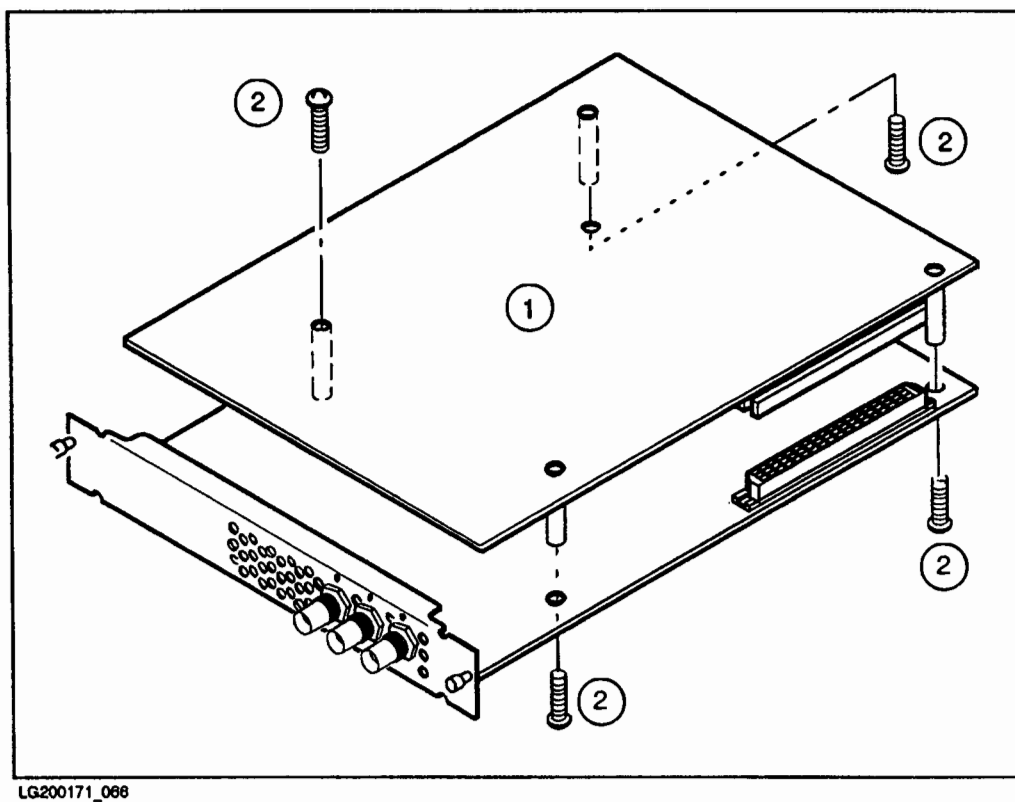


Figure 4-60. Graphics Interface and HP 98556A Accelerator

- ① Circuit side of HP 98556A Accelerator.
- ② four mounting screws.

Installing the HP 98556A 2D Graphics Accelerator

1. *Play it safe.*
 - a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
 - c. Remove the Graphics Accelerator from its envelope, being careful to handle the card only by its non-connector edges. The card may be easily damaged by electrostatic discharge (static zap).
 - d. Place the card on its envelope, or use a static-free workstation, HP part number 9300-0933.
2. *Disconnect the RGB (Red Green Blue) video cable from the video board.*
3. *Remove the video board from the computer and place it on a static-free surface.*
4. *Insert the Graphics Accelerator into the connector on the video board.*
 - a. Make sure it is firmly seated.
 - b. Turn the board pair so that the video board is facing up and the Graphics Accelerator is facing down.
 - c. Insert and tighten the three screws that correspond with stand-offs on the Graphics Accelerator.
 - d. Turn the assembly over and insert and tighten the fourth screw in the hole corresponding with the stand-off on the video board.
5. *Install the board pair into the I/O expander or computer.*

Make sure it is firmly seated into the connector.
6. *Reconnect the RGB video cable to the video board.*
7. *Ensure all power switches are in the OFF position.*
8. *Connect the power cord to the computer.*
9. *Turn on the monitor.*
10. *Turn on the computer.*

Hardware Installation Complete!

HP 98548/49/50A High Resolution Graphics Interface

The HP 98548/49/50A High Resolution Graphics Interface outputs video from the host computer to the following set of HP High Resolution Monitors:

- HP 98548A board for High Resolution (1024×768 pixel) Monochrome Monitors. It has a single frame buffer, 1-image, plane and there are no overlay planes.
- HP 98549A board for High Resolution (1024×768 pixel) Color Monitors. It has 6-color planes that can be soft-configured as four image planes and two overlay planes.
- HP 98550A board for High Resolution (1280×1024 pixel) Color Monitors. It has 8-color planes for 256 colors, plus two full-time overlay planes.

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

Installing the HP 98548/49/50A High Resolution Graphic Interface

1. *Play it safe*
 - a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
 - c. If you have a monitor connected to your computer, turn it off, unplug the monitor's power cord, and disconnect the video cables from the computer and monitor.
 - d. Remove the High Resolution Graphic Interface from its envelope, being careful to handle the card only by its edges. The card may be easily damaged by electrostatic discharge (static zap).
 - e. Place the card on the envelope.
2. *Move the processor board.*

Note	If you are upgrading a computer which has video furnished by a combination processor/video board, continue with this step. Otherwise, skip to step 3.
-------------	---

- a. Turn the monitor power OFF and disconnect the existing monitor and video cable.
- b. Remove the top wide slot cover plate from the back of the computer (see Figure 4-61).

HP 98548A/49A/50A High Resolution Graphic Interface

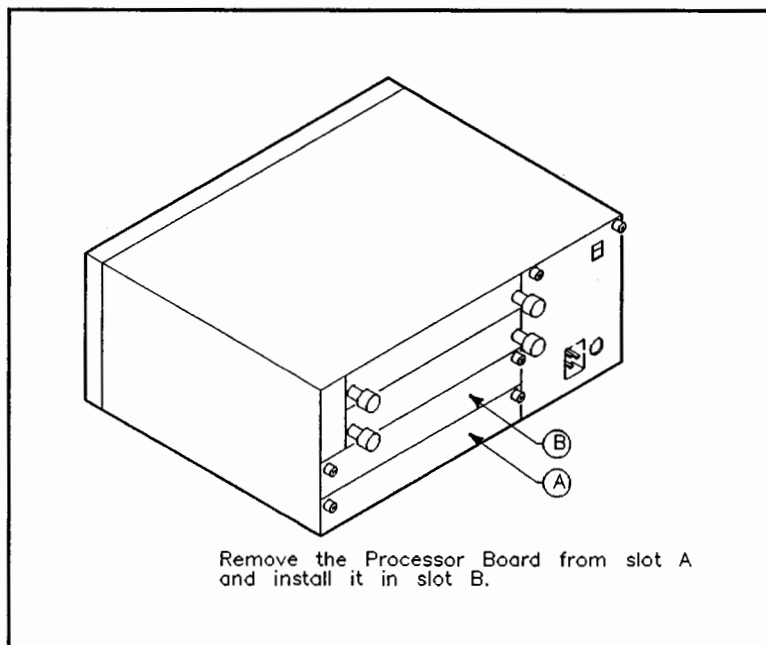


Figure 4-61. Processor Board Placement

- c. Loosen the two captive screws securing the processor board. You may need a Pozidriv screwdriver to loosen them.
- d. Slide the processor board out of the backplane and place it on a static-free surface. The bag which the new video board is packaged in is a good place.

HP 98548A/49A/50A High Resolution Graphic Interface

- e. Locate the Display Disable switch on the processor board (see Figure 4-62).

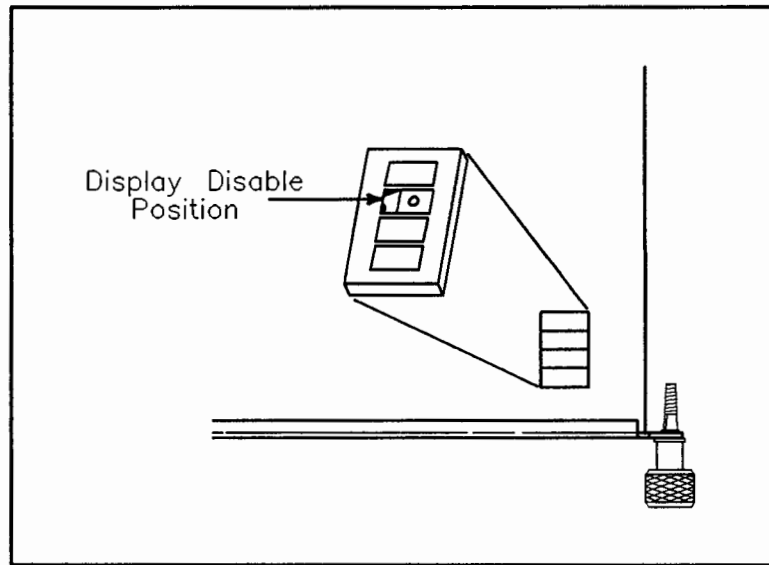


Figure 4-62. Display Disable Switch

- f. Set the switch to the Display Disable position.
- g. If there is a grounding clip on the top edge of the processor board back plate, remove it.
- h. Re-install the processor board in the *upper wide* backplane slot and tighten the captive fasteners.

HP 98548A/49A/50A High Resolution Graphic Interface

3. *Remove existing video board (if you have one).*

Remove the existing video board or empty slot cover plate from the bottom wide slot on the back of the computer (see Figure 4-63). You may need a Pozidriv screwdriver to loosen it.

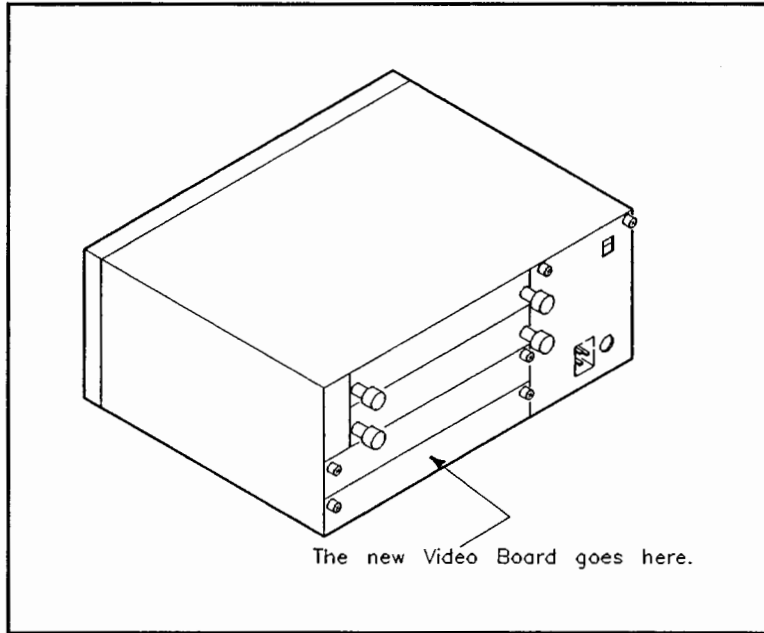


Figure 4-63. Graphics Interface Placement

HP 98548A/49A/50A High Resolution Graphic Interface

4. *Set the High Resolution Graphic Board configuration switches.*

Set the video board's eight configuration switches shown in Figure 4-64 for the HP 98548A and Figure 4-65 for the HP 98549A and HP 98550A. These are the default settings.

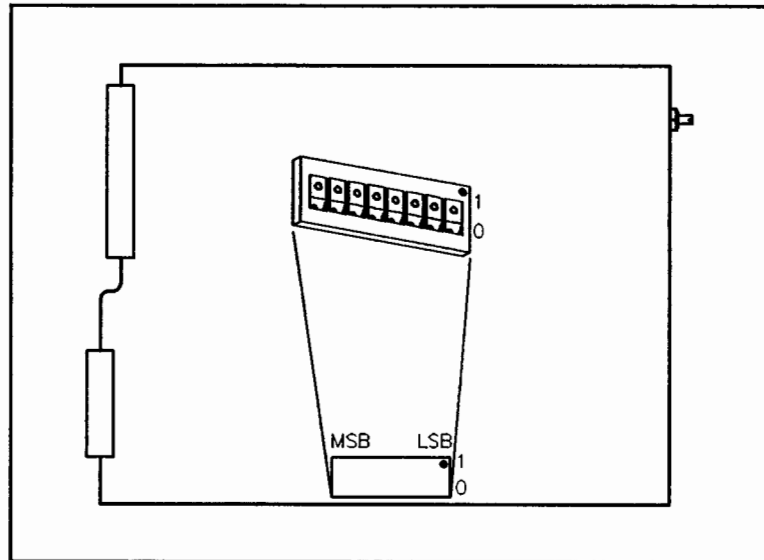


Figure 4-64.
HP 98548A Graphic Interface Configuration Switches

HP 98548A/49A/50A High Resolution Graphic Interface

For the HP 98549A and HP 98550A set the LSB switch to 1 and set all others to 0 configures the display as the internal (console) display. Switch settings are listed in Table 4-18.

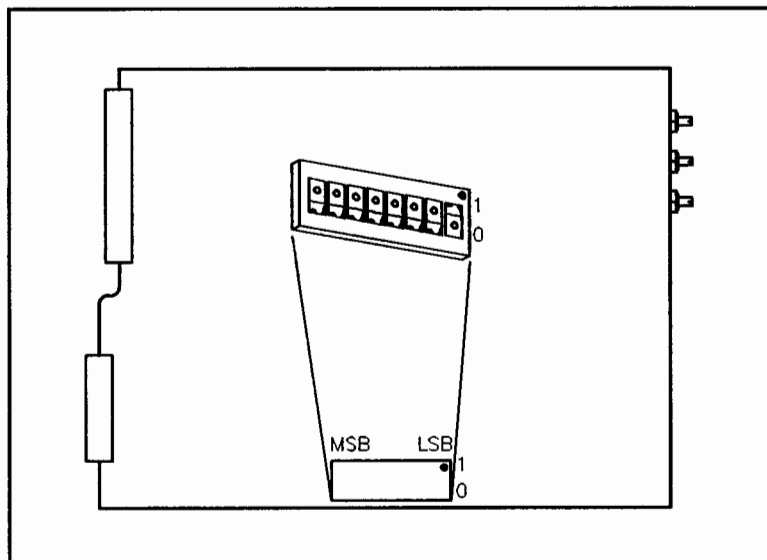


Figure 4-65.
HP 98549A and HP 98550A Graphic Interface Configuration
Switches

Note Switch settings 2 through 131 are not supported.

HP 98548A/49A/50A High Resolution Graphic Interface

Table 4-18.
HP 98548/49/50A High Resolution Graphic Interface
Select Code Switch Values

DIO-II Select Code	Switch MSB- LSB	DIO-II Select Code	Switch MSB- LSB	DIO-II Select Code	Switch MSB- LSB
internal	0000 0001	152	1001 1000	172	1010 1100
132	1000 0100	153	1001 1001	173	1010 1101
133	1000 0101	154	1001 1010	174	1010 1110
134	1000 0110	155	1001 1011	175	1010 1111
135	1000 0111	156	1001 1100	176	1011 0000
136	1000 1000	157	1001 1101	177	1011 0001
137	1000 1001	158	1001 1110	178	1011 0010
138	1000 1010	159	1001 1111	179	1011 0011
139	1000 1011	160	1010 0000	180	1011 0100
140	1000 1100	161	1010 0001	181	1011 0101
141	1000 1101	162	1010 0010	182	1011 0110
142	1000 1110	163	1010 0011	183	1011 0111
143	1000 1111	163	1010 0011	184	1011 1000
144	1001 0000	164	1010 0100	185	1011 1001
145	1001 0001	165	1010 0101	186	1011 1010
146	1001 0010	166	1010 0110	187	1011 1011
147	1001 0011	167	1010 0111	188	1011 1100
148	1001 0100	168	1010 1000	189	1011 1101
149	1001 0101	169	1010 1001	190	1011 1110
150	1001 0110	170	1010 1010	191	1011 1111
151	1001 0111	171	1010 1011	192	1100 0000

HP 98548A/49A/50A High Resolution Graphic Interface

Table 4-19.
HP 98548/49/50A High Resolution Graphic Interface
Select Code Switch Values (con't)

DIO-II Select Code	Switch MSB- LSB	DIO-II Select Code	Switch MSB- LSB	DIO-II Select Code	Switch MSB- LSB
193	1100 0001	214	1101 0011	235	1110 1011
194	1100 0010	215	1101 0111	236	1110 1100
195	1100 0011	216	1101 1000	237	1110 1101
196	1100 0100	217	1101 1001	238	1110 1110
197	1100 0101	218	1101 1010	239	1110 1111
198	1100 0110	219	1101 1011	240	1111 0000
199	1100 0111	220	1101 1100	241	1111 0001
200	1100 1000	221	1101 1101	242	1111 0010
201	1100 1001	222	1101 1110	243	1111 0011
202	1100 1010	223	1101 1111	244	1111 0100
203	1100 1011	224	1110 0000	245	1111 0101
204	1100 1100	225	1110 0001	246	1111 0110
205	1100 1101	226	1110 0010	247	1111 0111
206	1100 1110	227	1110 0011	248	1111 1000
207	1100 1111	228	1110 0100	249	1111 1001
208	1101 0000	229	1110 0101	250	1111 1010
209	1101 0001	230	1110 0110	251	1111 1011
210	1101 0010	231	1110 0111	252	1111 1100
211	1101 0011	232	1110 1000	253	1111 1101
212	1101 0100	233	1110 1001	254	1111 1110
213	1101 0101	234	1110 1010	255	1111 1111

HP 98548A/49A/50A High Resolution Graphic Interface

5. *Insert the High Resolution Graphics board.*

Press the video board into the connector and tighten the captive fasteners. You may need a Pozidriv screwdriver.

6. *Connect the video cable or cable set to the new video board and to the new monitor.*

7. *Plug in the monitor power cord.*

8. *Ensure all power switches are in the OFF position.*

9. *Turn on the monitor.*

10. *Turn on the computer.*

Hardware Installation Complete!

HP-UX Set Up Information

The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

HP 98548A/49A/50A High Resolution Graphic Interface

Table 4-20.
HP 98548/49/50A High Resolution Graphic Interface HP-UX
Set-up Values

DIO-II Select Code	Switch MSB- LSB	mknod Minor Number	DIO-II Select Code	Switch MSB- LSB	mknod Minor Number	DIO-II Select Code	Switch MSB- LSB	mknod Minor Number
internal	0000 0001	0x000000	152	1001 1000	0x980200	172	1010 1100	0xAC0200
132	1000 0100	0x840200	153	1001 1001	0x990200	173	1010 1101	0xAD0200
133	1000 0101	0x850200	154	1001 1010	0x9A0200	174	1010 1110	0xAE0200
134	1000 0110	0x860200	155	1001 1011	0x9B0200	175	1010 1111	0xAF0200
135	1000 0111	0x870200	156	1001 1100	0x9C0200	176	1011 0000	0xB00200
136	1000 1000	0x880200	157	1001 1101	0x9D0200	177	1011 0001	0xB10200
137	1000 1001	0x890200	158	1001 1110	0x9E0200	178	1011 0010	0xB20200
138	1000 1010	0x8A0200	159	1001 1111	0x9F0200	179	1011 0011	0xB30200
139	1000 1011	0x8B0200	160	1010 0000	0xA00200	180	1011 0100	0xB40200
140	1000 1100	0x8C0200	161	1010 0001	0xA10200	181	1011 0101	0xB50200
141	1000 1101	0x8D0200	162	1010 0010	0xA20200	182	1011 0110	0xB60200
142	1000 1110	0x8E0200	163	1010 0011	0xA30200	183	1011 0111	0xB70200
143	1000 1111	0x8F0200	163	1010 0011	0xA30200	184	1011 1000	0xB80200
144	1001 0000	0x900200	164	1010 0100	0xA40200	185	1011 1001	0xB90200
145	1001 0001	0x910200	165	1010 0101	0xA50200	186	1011 1010	0xBA0200
146	1001 0010	0x920200	166	1010 0110	0xA60200	187	1011 1011	0xBB0200
147	1001 0011	0x930200	167	1010 0111	0xA70200	188	1011 1100	0xBC0200
148	1001 0100	0x940200	168	1010 1000	0xA80200	189	1011 1101	0xBD0200
149	1001 0101	0x950200	169	1010 1001	0xA90200	190	1011 1110	0xBE0200
150	1001 0110	0x960200	170	1010 1010	0xAA0200	191	1011 1111	0xBF0200
151	1001 0111	0x970200	171	1010 1011	0xAB0200	192	1100 0000	0xC00200

HP 98548A/49A/50A High Resolution Graphic Interface

Table 4-21.

HP 98548/49/50A High Resolution Graphic Interface HP-UX Set-up Values (con't)

DIO-II Select Code	Switch MSB- LSB	mknod Minor Number	DIO-II Select Code	Switch MSB- LSB	mknod Minor Number	DIO-II Select Code	Switch MSB- LSB	mknod Minor Number
193	1100 0001	0xC10200	214	1101 0011	0xD60200	235	1110 1011	0xEB0200
194	1100 0010	0xC20200	215	1101 0111	0xD70200	236	1110 1100	0xEC0200
195	1100 0011	0xC30200	216	1101 1000	0xD80200	237	1110 1101	0xED0200
196	1100 0100	0xC40200	217	1101 1001	0xD90200	238	1110 1110	0xEE0200
197	1100 0101	0xC50200	218	1101 1010	0xDA0200	239	1110 1111	0xEF0200
198	1100 0110	0xC60200	219	1101 1011	0xDB0200	240	1111 0000	0xF00200
199	1100 0111	0xC70200	220	1101 1100	0xDC0200	241	1111 0001	0xF10200
200	1100 1000	0xC80200	221	1101 1101	0xDD0200	242	1111 0010	0xF20200
201	1100 1001	0xC90200	222	1101 1110	0xDE0200	243	1111 0011	0xF30200
202	1100 1010	0xCA0200	223	1101 1111	0xDF0200	244	1111 0100	0xF40200
203	1100 1011	0xCB0200	224	1110 0000	0xE00200	245	1111 0101	0xF50200
204	1100 1100	0xCC0200	225	1110 0001	0xE10200	246	1111 0110	0xF60200
205	1100 1101	0xCD0200	226	1110 0010	0xE20200	247	1111 0111	0xF70200
206	1100 1110	0xCE0200	227	1110 0011	0xE30200	248	1111 1000	0xF80200
207	1100 1111	0xCF0200	228	1110 0100	0xE40200	249	1111 1001	0xF90200
208	1101 0000	0xD00200	229	1110 0101	0xE50200	250	1111 1010	0xFA0200
209	1101 0001	0xD10200	230	1110 0110	0xE60200	251	1111 1011	0xFB0200
210	1101 0010	0xD20200	231	1110 0111	0xE70200	252	1111 1100	0xFC0200
211	1101 0011	0xD30200	232	1110 1000	0xE80200	253	1111 1101	0xFD0200
212	1101 0100	0xD40200	233	1110 1001	0xE90200	254	1111 1110	0xFE0200
213	1101 0101	0xD50200	234	1110 1010	0xEA0200	255	1111 1111	0xFF0200

HP 98548A/49A/50A High Resolution Graphic Interface

Table 4-22.

HP 98548/49/50A High Resolution Graphic Interface HP-UX Set Up Values

Device Name	Device File ¹	File Type	Major Number	Select Code	Minor Number
HP 98548A	/dev/crt	c	12	internal	0x000000
HP 98548A	/dev/crt	c	12	255	0xFF0200
HP 98549A/50A	/dev/crt	c	12	internal	0x000000
HP 98548A/50A	/dev/ocrt	c	12	internal	0x000001
HP 98548A/50A	/dev/icrt	c	12	internal	0x000002
HP 98548A/50A	/dev/crt	c	12	249	0xF90200
HP 98548A/50A	/dev/ocrt	c	12	249	0xF90201
HP 98548A/50A	/dev/icrt	c	12	249	0xF90202

¹ Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

The HP 98549A color display is supported by the hp98550 and hp98556 device drivers.

HP A1416A High Resolution Color Graphics Interface

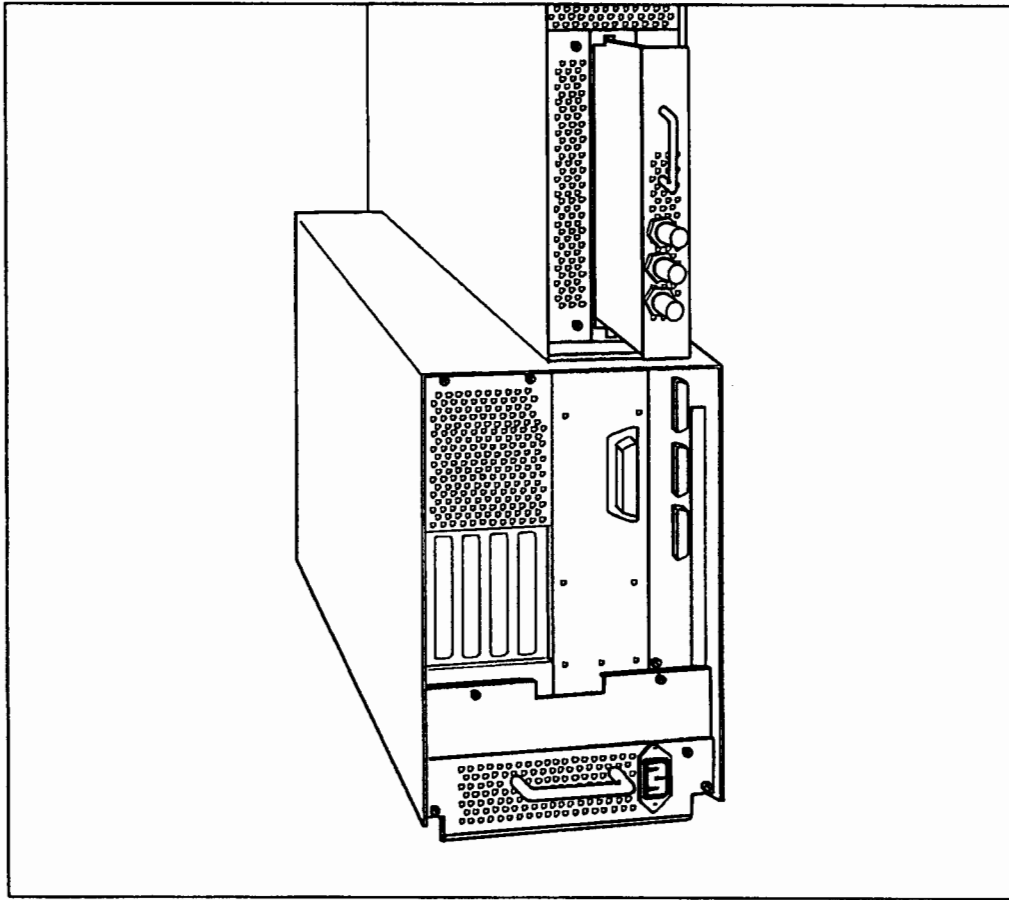
The HP A1416A Graphics Interface board is a graphics processor that connects to the computer's DIO-II bus and outputs color video to a high resolution (1280 by 1024 pixel) color monitor.

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

**HP A1416A High Resolution
Color Graphics Interface**

Installing the HP A1416A High Resolution Color Graphics Interface

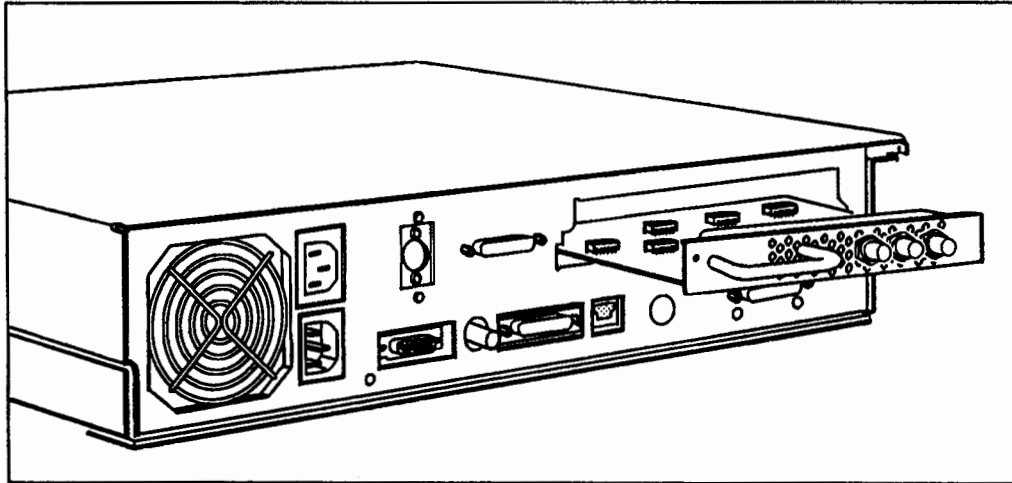
4



LG200171_063

Figure 4-66. Interface Installation into a Model 400s or 433s.

**HP A1416A High Resolution
Color Graphics Interface**



LG200171_084

Figure 4-67. Interface Installation into a Model 400dl, 400t, or 425t.

Caution

The A1416A Graphics Interface contains circuits that are easily damaged by electrostatic discharge. Use a static-free workstation (HP part number 9300-0933) or lay the Graphics Interface on the protective bag it was shipped in.

HP A1416A High Resolution Color Graphics Interface

4

1. *Play it Safe.*
 - a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
 - c. Keep the Graphics Interface board in its protective plastic bag until you are ready to install it.
 - d. Do not touch the connector. Handle the board by its non-connector edges only.
2. *Remove an empty DIO-II slot cover plate.*

You may need a Pozidriv or a slotted screwdriver to loosen the fasteners.
3. *Unpackage the interface card.*

Place the interface card on a static-free surface such as the plastic shipping bag it arrived in.
4. *Set the select code configuration switches.*

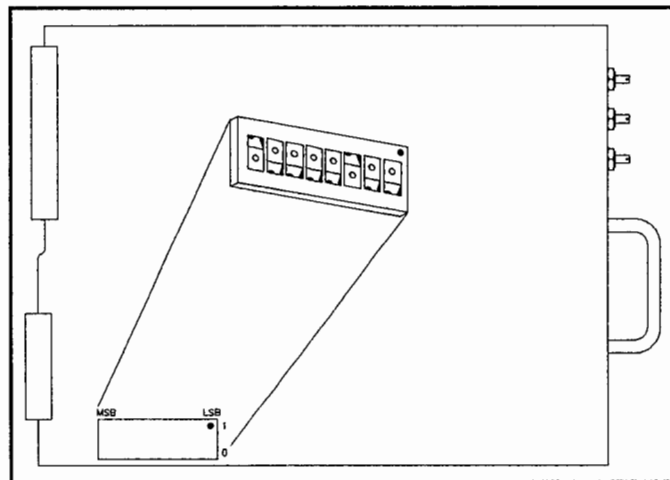


Figure 4-68. Select Code Address Switch

HP A1416A High Resolution Color Graphics Interface

Figure 4-68 shows the default switch setting on the board when it was shipped. This setting configures an A1416A Graphics Interface to a select code of 132. If your system has a conflict with this select code address, you can change the switches to a non-conflicting address. Table 4-23 contains the alternate select code values for the HP A1416A Graphics Interface.

5. *Record the select code.*

Make a note that the select code you assigned this interface has been used and is no longer available. Use the foldout worksheet at the end of this book for this purpose.

6. *Insert the HP A1416A Graphics Interface.*

- a. Insert the interface card into the DIO-II slot.
- b. Press the interface into the connector and install the fasteners (these are not captive and are shipped in a separate plastic envelope). You may need to use a Pozidriv or a slotted screwdriver when tightening the fasteners.

7. *Connect the RGB video cable.*

- a. Connect the included RGB (Red Green Blue) video cable to the monitor: red to red, green to green, and blue to blue connectors.
- b. Connect the other end of the RGB cable to the A1416A Graphics Interface in the same manner.

8. *Ensure all power switches are in the OFF position.*

9. *Connect the power cord to the monitor.*

10. *Turn on the monitor.*

11. *Connect the power cord to the computer.*

12. *Turn on the computer.*

Hardware Installation Complete!

HP A1416A High Resolution Color Graphics Interface

HP-UX Set Up Information

The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Refer to Chapter 7: "Setting Up Devices Using HP-UX Commands" for software configuration information. Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Table 4-23.
HP 1416A High Resolution Color Graphics Interface HP-UX
Set-up Values

DIO-II Select Code	Switch MSB- LSB	mknod Minor Number	DIO-II Select Code	Switch MSB- LSB	mknod Minor Number	DIO-II Select Code	Switch MSB- LSB	mknod Minor Number
132	1000 0100	0x840000	153	1001 1001	0x990000	174	1010 1110	0xAE0000
133	1000 0101	0x850000	154	1001 1010	0x9A0000	175	1010 1111	0xAF0000
134	1000 0110	0x860000	155	1001 1011	0x9B0000	176	1011 0000	0xB00000
135	1000 0111	0x870000	156	1001 1100	0x9C0000	177	1011 0001	0xB10000
136	1000 1000	0x880000	157	1001 1101	0x9D0000	178	1011 0010	0xB20000
137	1000 1001	0x890000	158	1001 1110	0x9E0000	179	1011 0011	0xB30000
138	1000 1010	0x8A0000	159	1001 1111	0x9F0000	180	1011 0100	0xB40000
139	1000 1011	0x8B0000	160	1010 0000	0xA00000	181	1011 0101	0xB50000
140	1000 1100	0x8C0000	161	1010 0001	0xA10000	182	1011 0110	0xB60000
141	1000 1101	0x8D0000	162	1010 0010	0xA20000	183	1011 0111	0xB70000
142	1000 1110	0x8E0000	163	1010 0011	0xA30000	184	1011 1000	0xB80000
143	1000 1111	0x8F0000	164	1010 0100	0xA40000	185	1011 1001	0xB90000
144	1001 0000	0x900000	165	1010 0101	0xA50000	186	1011 1010	0xBA0000
145	1001 0001	0x910000	166	1010 0110	0xA60000	187	1011 1011	0xBB0000
146	1001 0010	0x920000	167	1010 0111	0xA70000	188	1011 1100	0xBC0000
147	1001 0011	0x930000	168	1010 1000	0xA80000	189	1011 1101	0xBD0000
148	1001 0100	0x940000	169	1010 1001	0xA90000	190	1011 1110	0xBE0000
149	1001 0101	0x950000	170	1010 1010	0xAA0000	191	1011 1111	0xBF0000
150	1001 0110	0x960000	171	1010 1011	0xAB0000	192	1100 0000	0xC00000
151	1001 0111	0x970000	172	1010 1100	0xAC0000			
152	1001 1000	0x980000	173	1010 1101	0xAD0000			

**HP A1416A High Resolution
Color Graphics Interface**

**Table 4-24.
HP 1416A High Resolution Color Graphics Interface HP-UX
Set-up Values (cont)**

DIO-II Select Code	Switch MSB- LSB	mknod Minor Number	DIO-II Select Code	Switch MSB- LSB	mknod Minor Number	DIO-II Select Code	Switch MSB- LSB	mknod Minor Number
193	1100 0001	0xC10000	214	1101 0011	0xD60000	235	1110 1011	0xEB0000
194	1100 0010	0xC20000	215	1101 0111	0xD70000	236	1110 1100	0xEC0000
195	1100 0011	0xC30000	216	1101 1000	0xD80000	237	1110 1101	0xED0000
196	1100 0100	0xC40000	217	1101 1001	0xD90000	238	1110 1110	0xEE0000
197	1100 0101	0xC50000	218	1101 1010	0xDA0000	239	1110 1111	0xEF0000
198	1100 0110	0xC60000	219	1101 1011	0xDB0000	240	1111 0000	0xF00000
199	1100 0111	0xC70000	220	1101 1100	0xDC0000	241	1111 0001	0xF10000
200	1100 1000	0xC80000	221	1101 1101	0xDD0000	242	1111 0010	0xF20000
201	1100 1001	0xC90000	222	1101 1110	0xDE0000	243	1111 0011	0xF30000
202	1100 1010	0xCA0000	223	1101 1111	0xDF0000	244	1111 0100	0xF40000
203	1100 1011	0xCB0000	224	1110 0000	0xE00000	245	1111 0101	0xF50000
204	1100 1100	0xCC0000	225	1110 0001	0xE10000	246	1111 0110	0xF60000
205	1100 1101	0xCD0000	226	1110 0010	0xE20000	247	1111 0111	0xF70000
206	1100 1110	0xCE0000	227	1110 0011	0xE30000	248	1111 1000	0xF80000
207	1100 1111	0xCF0000	228	1110 0100	0xE40000	249	1111 1001	0xF90000
208	1101 0000	0xD00000	229	1110 0101	0xE50000	250	1111 1010	0xFA0000
209	1101 0001	0xD10000	230	1110 0110	0xE60000	251	1111 1011	0xFB0000
210	1101 0010	0xD20000	231	1110 0111	0xE70000	252	1111 1100	0xFC0000
211	1101 0011	0xD30000	232	1110 1000	0xE80000	253	1111 1101	0xFD0000
212	1101 0100	0xD40000	233	1110 1001	0xE90000	254	1111 1110	0xFE0000
213	1101 0101	0xD50000	234	1110 1010	0xEA0000	255	1111 1111	0xFF0000

HP 98287A Graphics Display Controller Interface

The HP 98287A Graphics Display Controller Interface provides a connection between the computer and the HP 98700 Graphics Display Controller.

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

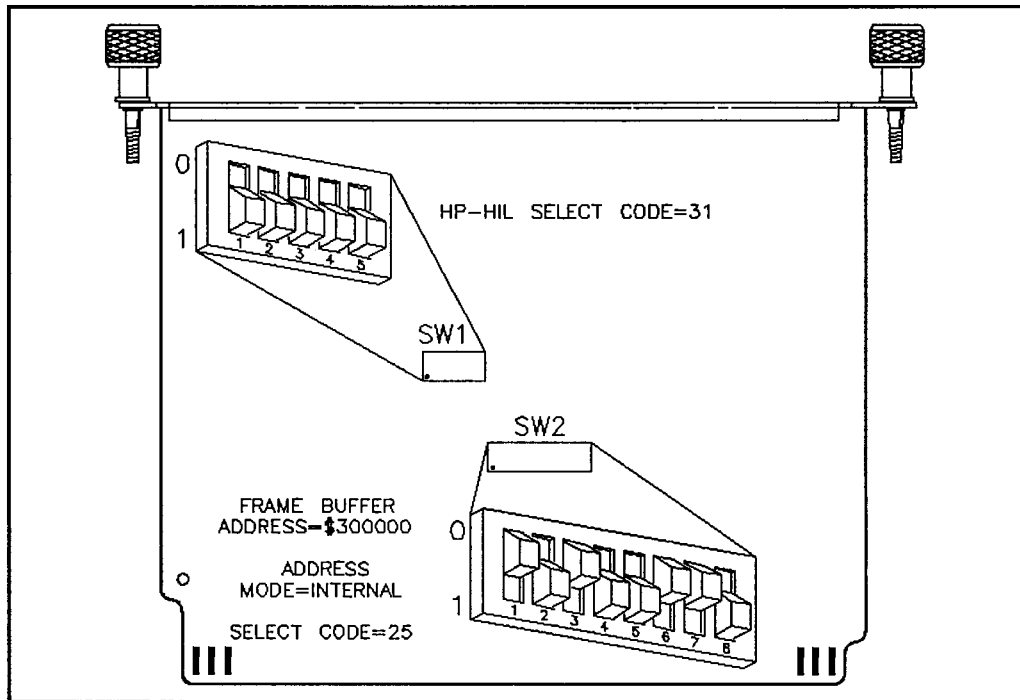


Figure 4-69.
Graphics Display Controller Interface switches

HP 98287A Graphics Display Controller Interface

Installing the HP 98287A Graphics Display Controller Interface

1. *Play it safe.*
 - a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
 - c. Remove the Graphics Display Controller Interface from its envelope, being careful to handle the card only by its edges and metal end plate. The card may be easily damaged by electrostatic discharge (static zap).
 - d. Place the card on the envelope.
2. *Check the HP-HIL select code.*

The HP-HIL select code switches (SW1), should be set to 31, as shown in Figure 4-69.

3. Set the Frame Buffer Address.

Note If this is the first (or only) Graphics Display Controller Interface you are installing, you can skip to step 4. Your frame buffer address is preset to \$300000 (in hexadecimal), as shown in Figure 4-69, and need not be changed.

- a. Find the set of eight switches labeled SW2 on the Graphics Display Controller Interface (see Figure 4-69). Switches 1 and 2 in this group determine the frame buffer address.

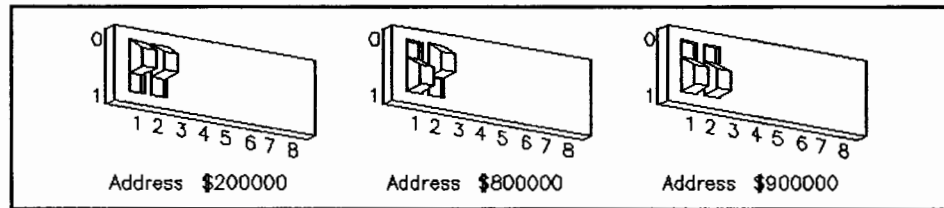


Figure 4-70. Frame Buffer Switch Examples

Table 4-25. Frame Buffer Switch Settings

Switch 1	Switch 2	Frame Buffer Address Value
0	0	\$200000
0	1	\$300000
1	0	\$800000
1	1	\$900000

HP 98287A Graphics Display Controller Interface

- b. Set these switches to one of the values in Table 4-25, keeping the following restrictions in mind:
 - If you have both a Graphics Display Controller *and* a Series 300 bit-mapped display, *do not* use frame buffer address \$200000.
 - If you have a Model 320 computer, *do not* use frame buffer address \$800000 or \$900000.

4. Set the Addressing Mode

- a. Find the set of eight switches labeled SW2 on the Graphics Display Controller Interface (see Figure 4-69). Switch 3 in this group determines the addressing mode, internal (0) and external (1).
- b. If you want to use the Graphics Display Controller as the system console, or if it is your *only* bit-mapped system display, set switch 3 to 0, as shown in Figure 4-69. This places the Graphics Display Controller at **internal address** \$560000 (in hexadecimal). If you have two Graphics Display Controllers, only one of them may be set to internal addressing mode.

Note

If you use internal addressing mode (switch 3 = 0), you cannot also use a Series 300 bit-mapped display connected to an HP 98542/43/44/45A video card. (You *can* use a monitor connected to an HP 98546A Display Compatibility Interface, however.)

You *must* remove your HP 98542/43/44/45A video card. See your *Installation Reference* manual for details.

To use both a Graphics Display Controller and a Series 300 bit-mapped display, you must use external addressing mode (switch 3 = 1) as indicated below.

- c. To use the Graphics Display Controller as a graphics output device *only*, set switch 3 to 1, which is opposite the setting shown in Figure 4-69. This places the Graphics Display Controller at the **external address** (that is, select code) specified in the next step.

4-152 Installing Plotters and Graphic Devices

HP 98287A Graphics Display Controller Interface

5. Set the Graphics Display Controller select code.

Note The select code is preset to 25.

If you have already assigned select code 25 to another device, refer to the foldout worksheet at the end of this book to choose an unused select code.

- a. Find the set of eight switches labeled SW2 on the Graphics Display Controller Interface. Switches 4 through 8 in this group determine the interface's select code.
- b. Set these switches to one of the four select codes given in Figure 4-71, unless you have used them elsewhere. Refer to the installation note that came with the interface if you need additional switch settings.

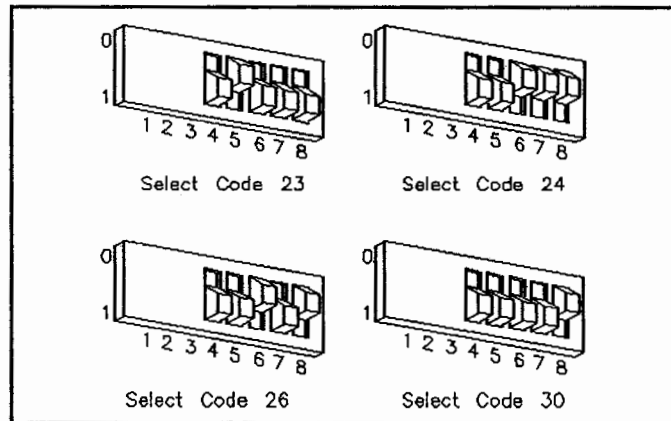


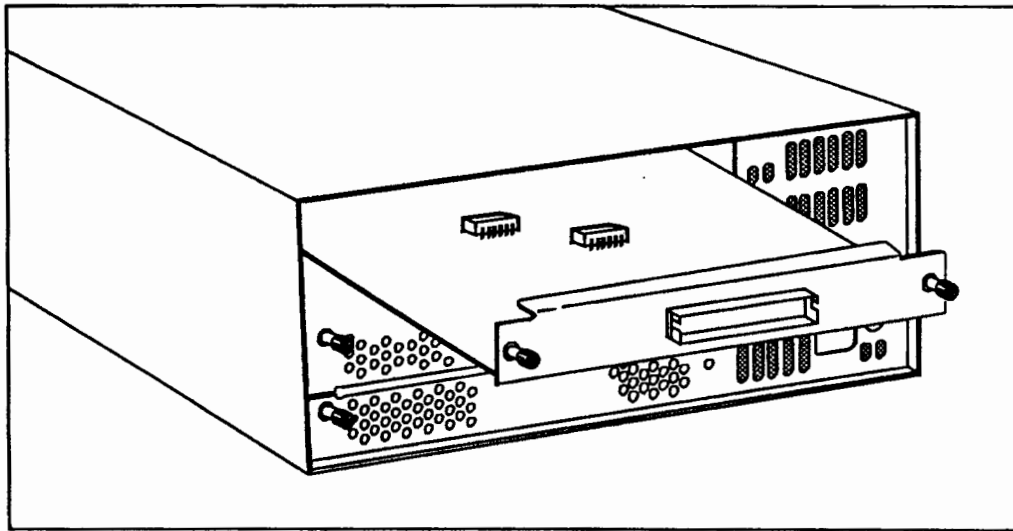
Figure 4-71. Select Code values 23,24,26, and 30

HP 98287A Graphics Display Controller Interface

6. Insert the Interface.

- a. Remove the *painted* cover plates from the back of your computer until you find an empty *even-numbered* slot. (Slots are numbered from the top down, so the top-most slot is number 1, the next slot down is number 2, etc.) *Do not* remove the silver cover plates from the bottom of the computer.
- b. Insert the Graphics Display Controller Interface, component side up, into the empty slot as in Figure 4-72. Tighten the thumb screws on the metal end plate until the end plate is flush with the back of the computer.

4



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Figure 4-72. Inserting the HP 98287 Graphics Display Controller Interface

- c. If you changed the select code of the Graphics Display Controller Interface in step 5, find this number in the set of select code labels supplied with the interface. Affix this label to the metal end plate.
- d. If you have other interface or accessory cards to install, leave the cover plates off; otherwise, replace them.

HP 98287A Graphics Display Controller Interface

7. *Record the select code.*

Make a note that the select code you chose has been used and is no longer available. Use the foldout worksheet at the end of this book for this purpose.

Hardware Installation Complete

Refer to the “HP 98700 CX Graphics Display Controller” section of this chapter for instructions for connecting the HP 98700 CX Graphics Display Controller to the HP 98287A Graphics Display Controller Interface.

HP 98700 CX Graphics Display Controller

The HP 98700 Graphics Display Controller connects to the HP 98287A Graphics Display Controller Interface. The following procedure describes how to install the HP 98700 Display Controller, the optional HP 98710A Graphics Accelerator upgrade system, and the HP 98782A Color Monitor. Installation of the HP 46081A Speaker Module is described in Chapter 6: "Installing Computer Accessories" .

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

Additional installation information can be found in the "HP 98700 Installation Guide", HP part number 98700-90002.

Installing the HP 98700 Graphics Display Controller

1. *Play it Safe.*
 - a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.

Note	If you have the HP 98710A Graphics Accelerator, complete step 2, otherwise skip to step 3.
-------------	--

2. *Install the 98710A Graphics Accelerator (optional).*
 - a. Ensure that the HP 98700 is disconnected from its power source.
 - b. Remove the cover plate on the front bottom of the HP 98700 and place it in the storage position provided (see Figure 4-73). The cover plate must be installed over the connector if the HP 98700 is operated by itself.

HP 98700 Graphics Display Controller

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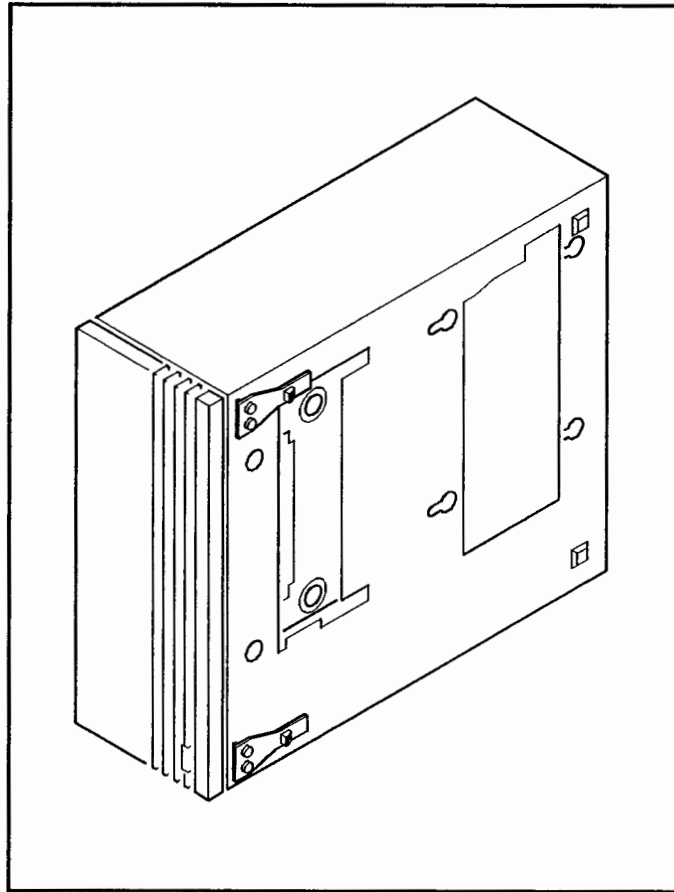


Figure 4-73. Removing the Cover Plate

- c. Move the locking mechanism on top of the HP 98710A to the rear.

HP 98700 Graphics Display Controller

- d. Set the HP 98700 on top of the HP 98710A, making sure the guide pins enter the guide pin sockets.
- e. Gently but firmly press the HP 98700 down until the connector engages and seats (see Figure 4-74).

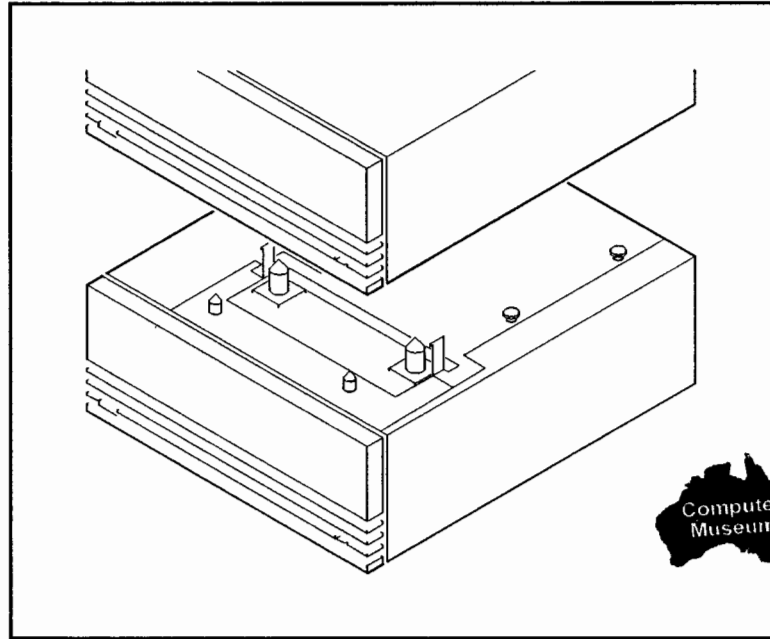


Figure 4-74. Connecting the HP 98700 to the HP 98710A

- f. Slide the locking mechanism forward to lock the two together.

HP 98700 Graphics Display Controller

3. Place the HP 98700/98710 between the computer and the HP 98782A Color Monitor.

No special installation procedures are needed other than to assure adequate circulation for cooling. Do not place the monitor on any surface (rugs, blankets, etc.) that will restrict air flow, or near curtains or draperies that could block the ventilation holes. Do not install near heat sources (radiators, or hot air ducts), or in direct sunlight. Avoid areas with excessive dust, mechanical vibration, or shock.

4

4. Connect the HP 98700 Controller to the HP 98782 Color Monitor.
 - a. Connect the RGB (Red Green Blue) cables to the monitor, observing the color coding of the cables: red to red, blue to blue and green to green.
 - b. Connect the other end of the cables to the HP 98700 in the same manner.

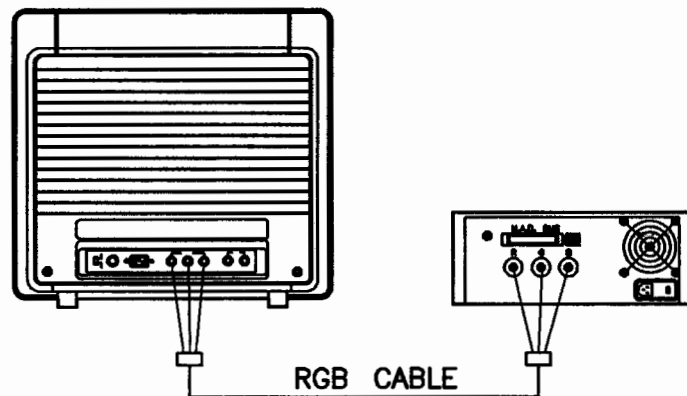
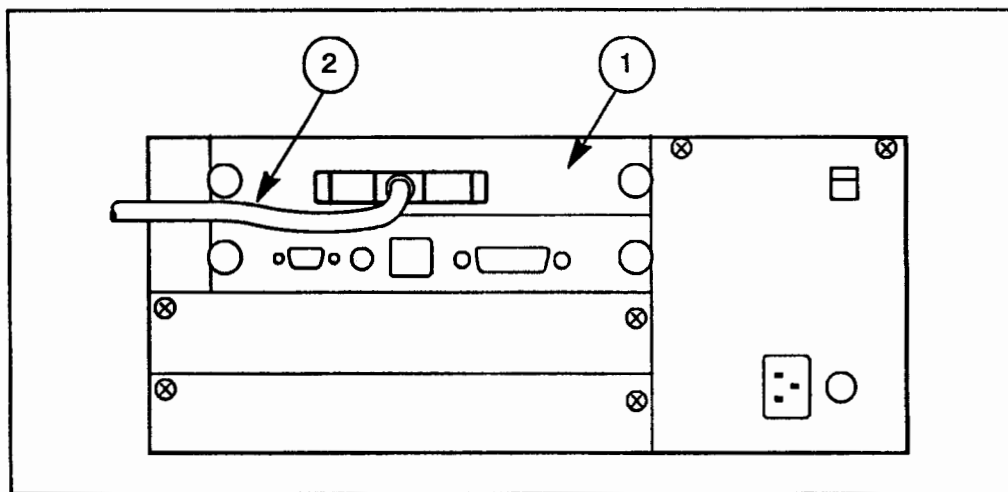


Figure 4-75. Connecting the RGB Cable

HP 98700 Graphics Display Controller

5. *Connect the interconnect cable.*
 - a. Connect the interconnect cable (HP part number 98700-61601) to the HP 98287A Graphics Display Controller Interface as in Figure 4-76.



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Figure 4-76.

Connecting the HP 98700 Graphics Display Controller Interconnect Cable

- ① Interconnect cable to the HP 98700 Display Controller
- ② The HP 98287A Graphics Interface Card

The cable connector key projects outward near the top from each end of the connector shell. Ensure that this is UP when connecting to the interface or the HP 98700.

- b. Connect the other end of the interconnect cable to the HP 98700.

HP 98700 Graphics Display Controller

6. *Ensure all power switches are in the OFF position.*
7. *Connect all power cords.*
8. *Turn on the monitor.* Figure 4-77 illustrates the operator controls for the HP 98782A Color Monitor.

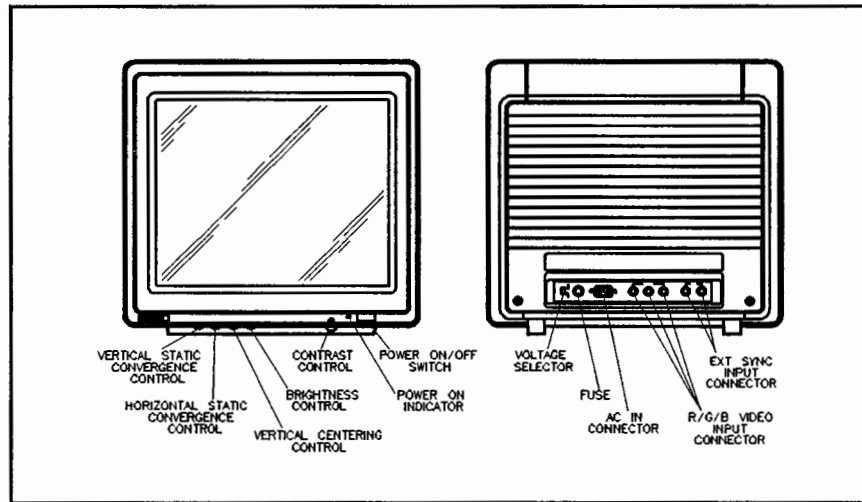


Figure 4-77. Operator Controls

9. *Turn on the HP 98700.*
10. *Turn on the computer.*

Hardware Installation Complete!

HP-UX Set Up Information

The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands". Refer to Chapter 7: "Setting Up Devices Using HP-UX Commands" for software configuration information.

4

Table 4-26.
98700 Graphics Display Controller
Set to External Addressing Mode

Device Name	File Type	Major Number	Select Code	Minor Number
HP 98700	c	12	23	0x170200
HP 98700	c	12	24	0x180200
HP 98700	c	12	25	0x190200
HP 98700	c	12	26	0x1a0200
HP 98700	c	12	30	0x1e0200

HP 98700 Graphics Display Controller

Table 4-27.
98700 Graphics Display Controller
Set to Internal Addressing Mode*

Device Name	File Type	Major Number	Minor Number
HP 98700, no S300 video	c	12	0x000000
HP 98700, with S300 video	c	12	0x000100
* Separate entries are provided for systems with an enabled Series 300 built-in video interface ("with S300 video") and for systems without one ("no S300 video"). Choose the entry appropriate for your system.			

HP 98724A/25A Local Graphics Bus Interface

The HP 98724A/25A Local Graphics Bus (LGB) interface cards provide a connection between the HP 98720 SRX Graphics Display Controller and the computer. The HP 98724A is a DIO-I interface card and the HP 98725A is a DIO-System interface card.

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

HP 98724A/98725A Local Graphics Bus Interface

Installing the HP 98724A/98725A Local Graphics Bus Interface

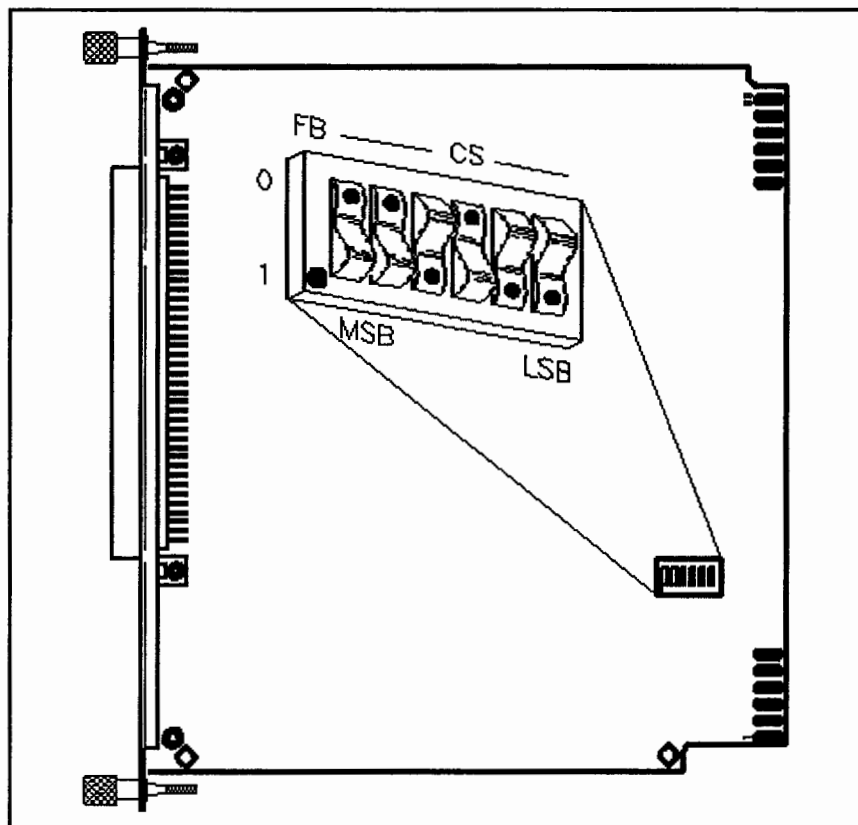


Figure 4-78.
HP 98724A LGB Interface Switches

HP 98724A/98725A Local Graphics Bus Interface

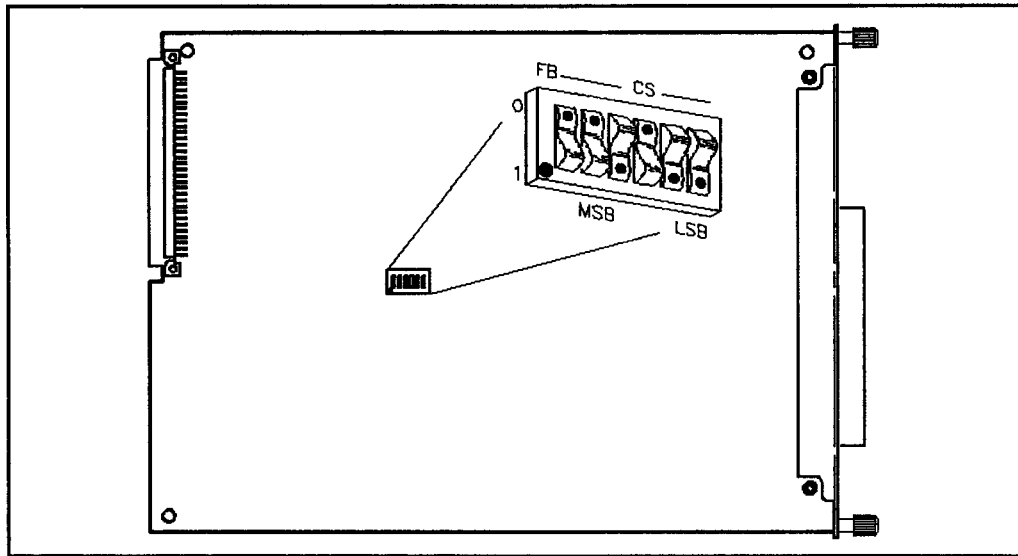


Figure 4-79.
HP 98725A LGB Interface Switches

1. *Play it safe.*
 - a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
 - c. Remove the HP 98724A/25A from its envelope, being careful to handle the card by its edges and metal end plate. The card may be easily damaged by electrostatic discharge (static zap).
 - d. Place the card on the envelope.

HP 98724A/98725A Local Graphics Bus Interface

2. Set the Frame Buffer Address and select code.

Note

If this is the first (or only) LGB card you are installing and you want to use the Graphics Display Controller as the system console, you can skip to step 3. Your LGB interface card has been preset to an internal addressing mode (as shown in Figure 4-78 and Figure 4-79).

If you have two Graphics Display Controllers, only one of them may be set to internal addressing mode, so you should follow the directions in step 2 when installing the second LGB card.

- a. Find the set of six switches labeled "SW1" on the HP 98724A/25A interface card (see Figure 4-78 and Figure 4-79). The switch labeled "FB" determines the Frame Buffer address, and the other five switches labeled "CS" (for Control Space) determine the interface's select code. This interface requires two sequential select code values.
- b. Set the switches to an external addressing mode. Set these switches to one of the three select codes given in Figure 4-80. If you have already assigned the select codes in Figure 4-80, refer to the installation note that came with the interface if you need additional select code switch settings.

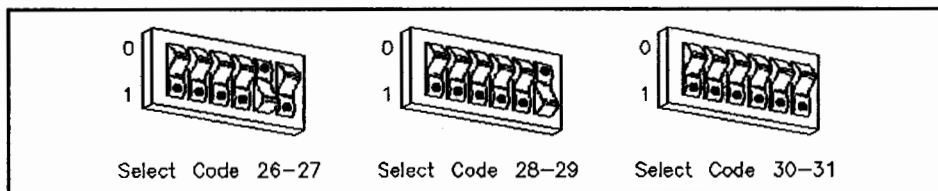


Figure 4-80. Select Code Switches for Values 26-27, 28-29, and 30-31

HP 98724A/98725A Local Graphics Bus Interface

3. *Insert the LGB Interface Card.*

- a. Insert the HP 98724A/25A, component side up, into an empty I/O slot in your computer. Tighten the thumb screws on the metal end plate until the end plate is flush with the back of the computer.
- b. If you have other interface or accessory cards to install, leave the cover plates off; otherwise replace them.

4. *Record the select code.*

Make a note that the select code you chose has been used and is no longer available. Use the foldout worksheet at the end of this book for this purpose.

Hardware Installation Complete!

Refer to the “HP 98720A SRX Graphics Display Controller” section of this chapter for instructions to connect the HP 98720A SRX Graphics Display Controller to the HP 98724A/25A Local Graphics Bus Interface.

HP 98720A SRX Graphics Display Controller

The HP 98720A SRX Graphics Display Controller connects to the HP 98724A, 98725A Local Graphics Bus Interface, or built in Model 319 interface, depending on which Series 300 model computer you are using. The following procedure describes how to install the HP 98720A Display Controller and the HP 98784A Color Monitor.

Caution	Electronic assemblies in the HP 98720A such as the HP 98721A, 98722A, and the 98723A are very susceptible to handling damage. They are installed by HP qualified personnel. Damage caused by users may not be covered under warranty.
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Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

Installing the HP 98720A SRX Graphics Display Controller

Make sure that the correct interface is installed in your computer. Installation of the HP 98724A and 98725A interface cards are covered in separate sections of this chapter.

- If you have a Model 320 computer, you should have an HP 98724A Local Graphics Bus (LGB) interface card.
- If you have a Model 330 or 350 computer, you need an HP 98725A Local Graphics Bus (LGB) interface card.

1. *Play it safe.*
 - a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
 - c. Unpack the display station and check the voltage setting according to the documentation.
2. *Locate the Graphics Display Controller near the computer and the monitor.*
3. *Connect the RGB cable.*
 - a. Connect the RGB (Red Green Blue) cable to the monitor: red to red, green to green, and blue to blue connectors.
 - b. Connect the other end of the RGB cable to the HP 98720A in the same manner.
4. *Connect the LGB cable.*
 - a. Connect the LGB cable to the HP 98724A/25A LGB interface connector.

The cable connector key projects outward near the top from each end of the connector shell. Ensure that this is UP when connecting it to the interface or the HP 98720A.
 - b. Connect the other end of the LGB cable to the HP 98720A.

HP 98720A SRX Graphics Display Controller

5. *Ensure all power switches are in the OFF position.*
6. *Connect all power cords.*

If your HP 98720A contains two power supplies, connect both power cords.

7. *Turn on the monitor.*
8. *Turn on the HP 98720A.*
9. *Turn on the computer.*

4

Hardware Installation Complete!

Refer to Chapter 7: "Setting Up Devices Using HP-UX Commands" for software configuration information.

HP-UX Set Up Information

The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Table 4-28.
HP 98720A
Set to Internal Addressing Mode

Device Name	Path Name ¹	File Type	Major Number	Minor Number
HP 98720A, image planes	/dev/crt	c	12	0x000000
HP 98720A, overlay planes	/dev/ocrt	c	12	0x000001

¹ Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

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HP 98720A SRX Graphics Display Controller

Table 4-29.
HP 98720A
Set to External Addressing Mode (Select Code 26-27, 28-29,
30-31)

Device Name	Path Name ¹	File Type	Major Number	Minor Number
HP 98720A, select code 26-27, image planes	/dev/crt	c	12	0x1a0200
HP 98720A, select code 26-27, overlay planes	/dev/ocrt	c	12	0x1a0201
HP 98720A, select code 28-29, image planes	/dev/crt	c	12	0x1c0200
HP 98720A, select code 28-29, overlay planes	/dev/ocrt	c	12	0x1c0201
HP 98720A, select code 30-31, image planes	/dev/crt	c	12	0x1e0200
HP 98720A, select code 30-31, overlay planes	/dev/ocrt	c	12	0x1e0201

¹ Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

HP 98726A Local Graphics Bus Interface

The HP 98726A interface card provides a connection between a Series 300 SPU-backplane DIO-II bus and the 32-bit multiplexed address/data Local Graphics Bus (LGB). The interface acts as a slave on the DIO bus and as a master controller on the LGB for the HP 98730A *TurboSRX* Display Controller.

The interface supports byte and word transfers in accordance with DIO-I specifications as well as longword and unaligned transfers specified in DIO-II.

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

Installing the HP 98726A Local Graphics Bus Interface

1. *Play it safe.*

- a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
- b. TURN OFF the computer and unplug the power cord.
- c. Remove the HP 98726A from its envelope, being careful to handle the card by its edges and metal end plate. The card may be easily damaged by electrostatic discharge (static zap).
- d. Place the card on the envelope.

2. *Set address mode and select code.*

The switches in Figure 4-81 perform three functions:

- Switch 1 determines whether the interface will respond to a DIO-I (switch = 0) or DIO-II (switch = 1) select code.
- Switch 2 determines whether the interface will work in DIO-I Internal (switch = 0) or External (switch = 1) memory space.
- The remaining five switches set the interface's select code for DIO-I.
- The entire set of eight switches are the select code for DIO-II.

The default settings (DIO-I, internal addressing) for the address switches are shown in Figure 4-81.



HP 98726A Local Graphics Bus Interface

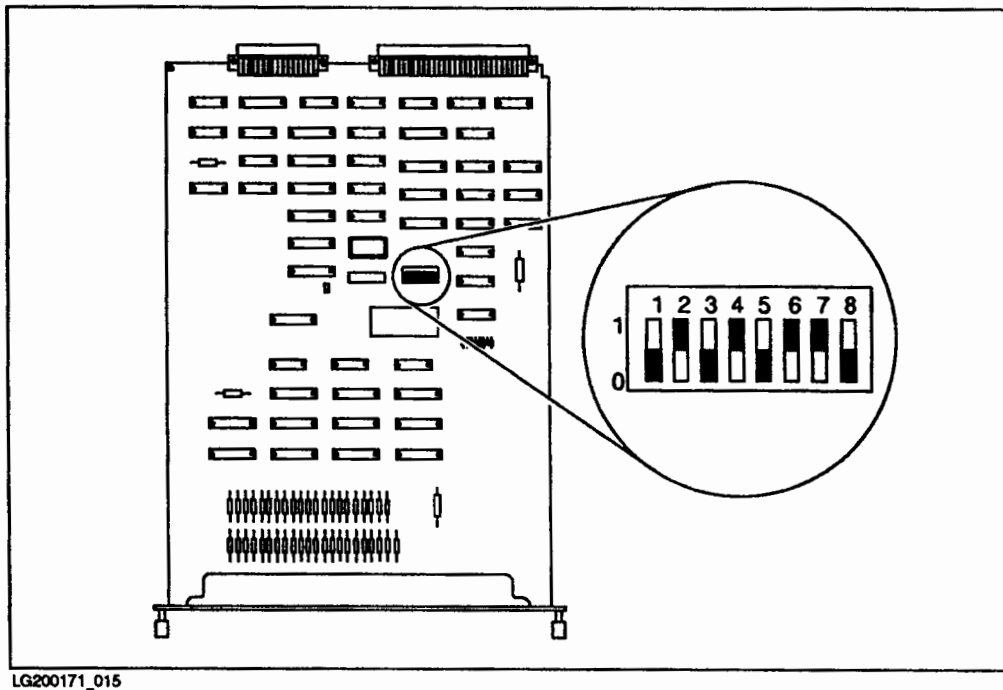


Figure 4-81.
HP 98726A Interface Switches

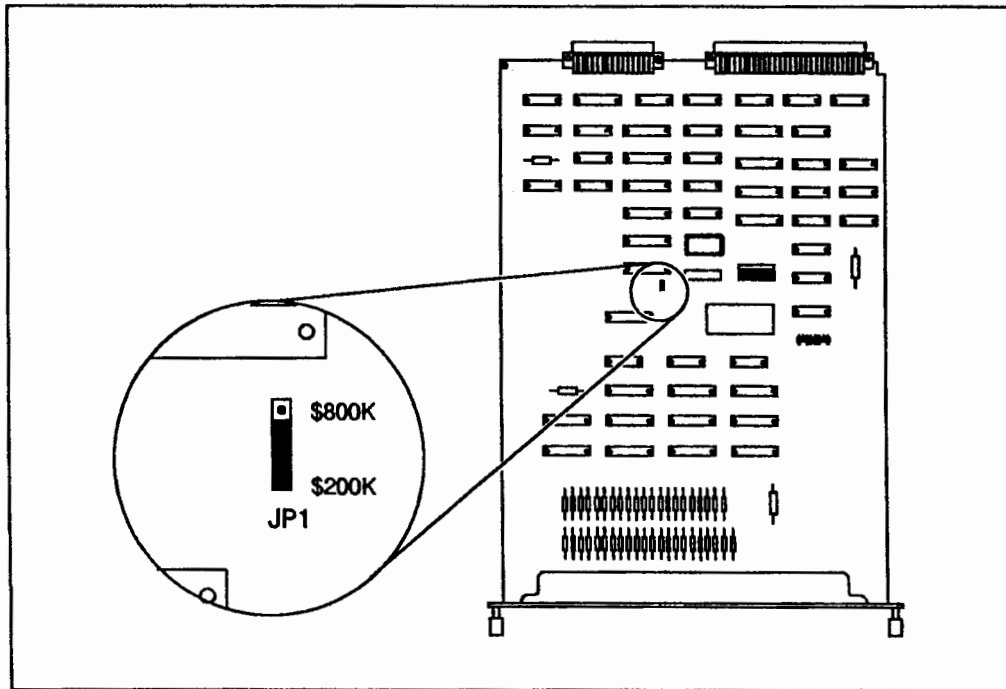
3. *Set the interface control space.*

The jumper JP1 determines the memory location for the card's control space in DIO-I.

Note The jumper JP1 setting is ignored in DIO-II address space.

HP 98726A Local Graphics Bus Interface

The default position of JP1 is shown in Figure 4-82.



LG200171_018

Figure 4-82.
HP 98726A Jumper #1 Default Position

The card's control space can be at \$200000 (default and recommended) or at \$800000.

Caution

When using memory location \$800000 ensure that there is no other use of this area of memory. Unpredictable results will occur if other software/hardware attempt to use memory location \$800000.

HP 98726A Local Graphics Bus Interface

4. *Configure the interface for system console or peripheral device.*

The graphics subsystem attached to this interface card can either be the system console or a peripheral device. The following summary presents your configuration options. The HP-UX operating system identifies the system console using the following choices:

CONSOLE CONFIGURATION

- a. A **System Console Terminal** is an RS-232 terminal that has the **remote bit** set on the RS-232 interface card by altering the hardware switch or altering the switch value at boot-up with boot ROM rev. D or rev. 400. The RS-232 interface card may also configure the remote bit set by a resistor being removed. Any Console Terminal connected to your system is the system console, no matter what other terminals or displays are connected to the system.
- b. As a second choice, any bit-mapped display attached to an interface addressed to \$560000 is the system console. This is the default DIO-I internal addressing configuration shipped. *This is the recommended choice for the HP 98726A / HP 98730A subsystem used as a system console.*
- c. For a third choice, the first bit-mapped display found in DIO-I space is recognized as the console. The search is from lowest to highest memory location (select code) in DIO-I space.
- d. For a fourth choice, the first bit-mapped display found in DIO-II space is recognized as the console. The search is from lowest to highest memory location (select code) in DIO-II space.

PERIPHERAL CONFIGURATION

- a. When a Console Terminal is the system console, the HP 98726A can be placed at any legal location and is treated as a peripheral.
- b. When a bit-mapped display is the system console at \$560000, then the HP 98726A must be placed at any legal address that is not \$560000 and jumper JP1 must be placed in the \$800000 position. *See previous CAUTION note.*
- c. If a bit-mapped display is the system console and located in DIO-II space, the HP 98726A must be addressed at a higher memory location in DIO-II space. The jumper JP1 setting is ignored in DIO-II space.

HP 98726A Local Graphics Bus Interface

5. *Install the interface card in your computer or expander.*
 - a. Insert the card, component side up, into an empty I/O slot in your computer. Tighten the thumb screws on the metal end plate until the end plate is flush with the back of the computer.
 - b. If you have other interface or accessory cards to install, leave the cover plates off; otherwise replace them.
6. *Record the select code.*

Make a note that the select code you chose has been used and is no longer available. Use the foldout worksheet at the end of this book for this purpose.

Hardware Installation Complete!

Refer to the “HP 98730A *TurboSRX* Graphics Display Controller” section of this chapter for instructions to connect the HP 98730A *TurboSRX* Graphics Display Controller to the HP 98726A Local Graphics Bus Interface.

HP 98730A *Turbo*SRX Graphics Display Controller

The HP 98730A *Turbo*SRX Graphics Display Controller connects to your system via the HP 98726A Local Graphics Bus Interface.

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

Installing the HP 98730A TurboSRX Graphics Display Controller

Refer to the documentation that came with the 98730A to:

- Unpack the HP 98730A.
- Check the voltage setting.

Make sure that the HP 98726A interface is installed in your computer. Installation of this interface card is covered in a separate section of this chapter.

1. *Play it safe.*
 - a. Follow the computer “shut down” procedure. See *System Administration Tasks Manual* Chapter 3: “Starting and Stopping HP-UX” for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
 - c. Remove system power cords from the power outlets.
2. *Locate the Graphics Display Controller near the computer and the monitor.*
3. *Connect the LGB cable.*
 - a. Connect the LGB cable to the HP 98726A LGB interface connector.

The cable connector key projects outward near the top from each end of the connector shell. Ensure that this is UP when connecting it to the interface or the HP 98730A.
 - b. Connect the other end of the LGB cable to the HP 98730A.

HP 98730A TurboSRX Graphics Display Controller

4. Connect the RGB cable.

- a. Connect the RGB (Red Green Blue) cable to the monitor: red to red, green to green, and blue to blue connectors.
- b. Connect the other end of the RGB cable to the HP 98730A in the same manner.

5. Ensure the power switches are in the OFF position.

6. Connect all power cords.

If your HP 98730A contains two power supplies, connect both power cords.

7. Turn on the monitor.

8. Turn on the HP 98730A.

9. Turn on the computer.

Hardware Installation Complete!

HP-UX Set Up Information

The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands". Refer to Chapter 7: "Setting Up Devices Using HP-UX Commands" for software configuration information.

The settings in Table 4-30 are DIO-I settings on the 98726A interface card. This setting requires the jumper JP1 to be in the \$200000 position on the interface card. This is the recommended choice for the HP 98726A / HP 98730A subsystem used as a system console. The DIO-I external address

HP 98730A TurboSRX Graphics Display Controller

settings in Table 4-30 require the jumper JP1 to be in the \$800000 position on the interface card.

Table 4-30.
HP 98730A
DIO-I Settings

Switch Setting MSB ... LSB	CTL_BASE (hex)	Select Code	File Type	Major No.	Minor No.
0101 0110 ¹	\$560000	internal	c	12	0x000000
0110 1010	\$6A0000	10-11	c	12	0x0A0200
0110 1100	\$6C0000	12-13	c	12	0x0C0200
0110 1110	\$6E0000	14-15	c	12	0x0E0200
0111 0000	\$700000	16-17	c	12	0x100200
0111 0010	\$720000	18-19	c	12	0x120200
0111 0100	\$7400000	20-21	c	12	0x140200
0111 0110	\$760000	22-23	c	12	0x160200
0111 1000	\$780000	24-25	c	12	0x180200
0111 1010	\$7A0000	26-27	c	12	0x1A0200
0111 1100	\$7C0000	28-29	c	12	0x1C0200
0111 1110	\$7E0000	30-31	c	12	0x1E0200
* Additional settings can be found by referring to the tables listed in the Installation Note for this interface card.					

¹ default setting

The settings in Table 4-31 reflect DIO-II settings for all possible select codes. The jumper JP1 is ignored for DIO-II.

HP 98730A TurboSRX Graphics Display Controller

Table 4-31. HP 98730A DIO-II Settings*

Switch Setting MSB ... LSB	CTL_BASE (hex)	Select Code	File Type	Major No.	Minor No.
1000 0101	\$01400000	133	c	12	0X850200
1000 1001	\$02400000	137	c	12	0X890200
1000 1101	\$03400000	141	c	12	0X8D0200
1001 0001	\$04400000	145	c	12	0X910200
1001 0101	\$05400000	149	c	12	0X950200
1001 1001	\$06400000	153	c	12	0X990200
1001 1101	\$07400000	157	c	12	0X9D0200
1010 0001	\$08400000	161	c	12	0XA10200
1010 0101	\$09400000	165	c	12	0XA50200
1010 1001	\$0A400000	169	c	12	0XA90200
1010 1101	\$0B400000	173	c	12	0XAD0200
1011 0001	\$0C400000	177	c	12	0XB10200
1011 0101	\$0D400000	181	c	12	0XB50200
1011 1001	\$0E400000	185	c	12	0XB90200
1011 1101	\$0F400000	189	c	12	0XBD0200
1100 0001	\$10400000	193	c	12	0XC10200
1100 0101	\$11400000	197	c	12	0XC50200
1100 1001	\$12400000	201	c	12	0XC90200
1100 1101	\$13400000	205	c	12	0XCD0200
1101 0001	\$14400000	209	c	12	0XD10200
1101 0101	\$15400000	213	c	12	0XD50200
1101 1001	\$16400000	217	c	12	0XD90200
1101 1101	\$17400000	221	c	12	0XDD0200
1110 0001	\$18400000	225	c	12	0XE10200
1110 0101	\$19400000	229	c	12	0XE50200
1110 1001	\$A4000000	233	c	12	0XE90200
1110 1101	\$B4000000	237	c	12	0XED0200
1111 0001	\$1C400000	241	c	12	0XF50200
1111 0101	\$1D400000	245	c	12	0XF50200
1111 1001	\$1E400000	249	c	12	0XFD0200
1111 1101	\$1F400000	253	c	12	0XFD0200
* Additional settings can be found by referring to the tables listed in the Installation Note for this interface card.					

HP 98702A Graphics Address and Data Bus Interface

The 98702A Graphics Address and Data Bus Interface provides the connection between your computer and an HP 98705A, B, or C Graphics Display Controller.

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

HP 98702A Graphics Address and Data Bus Interface

Installing the HP 98702A Graphics Address and Data Bus Interface

1. *Play it safe.*
 - a. Follow the computer “shut down” procedure. See *System Administration Tasks Manual* Chapter 3: “Starting and Stopping HP-UX” for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
 - c. Remove the HP 98702A from its envelope, being careful to handle the card by its edges and metal end plate. The card may be easily damaged by electrostatic discharge (static zap).
 - d. Place the card on its envelope.
2. *Set the select code*

Note The select code is preset to 133-135.

If your system has a conflict with the interface’s select code address, you can change the address. If a second interface is installed with the same select code, one of them will have to be given a new select code switch setting.

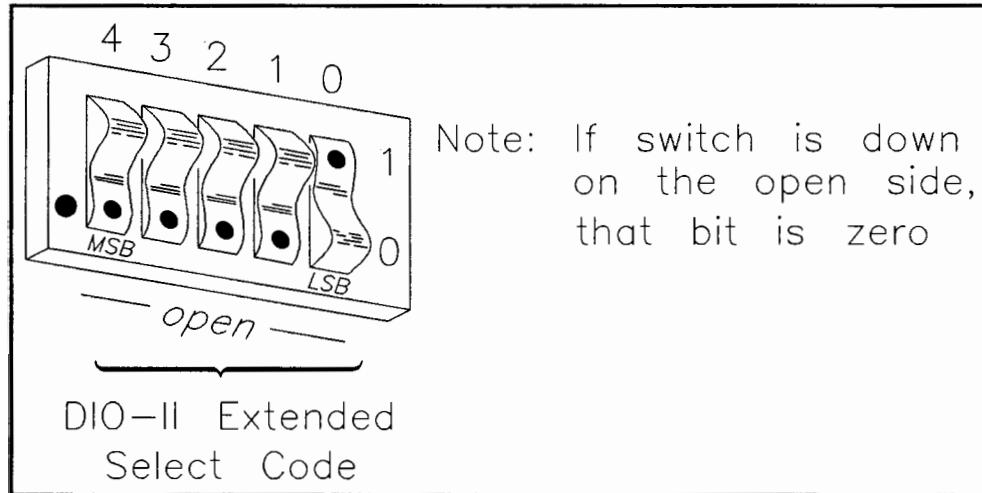


Figure 4-83. HP 98702A Interface Default Address Switch Setting

The switch configuration shown in Figure 4-83 is the Default configuration on the card when it was shipped. It is configured for DIO-II select code 133-135.

The interface occupies three consecutive select codes in uncached address space. The first select code provides 4 Mbytes of address space for control. The second two select codes allocate 8 Mbytes of address space for full pixel addressing to the frame buffer.

Each switch position corresponds to four DIO-II select codes. The first select code is not used and is available for use with other than the Graphics Processor. The second select code is used for the Graphics Processor's control space, and the last two are used for the Graphics Processor's frame buffer space. Table 4-32 shows the translation between the interface's address switch settings, the DIO-II select code, and the mknod minor number.

HP 98702A Graphics Address and Data Bus Interface

Table 4-32. HP 98702 Graphics Interface HP-UX Set-up Values

DIO-II Select Code	Switch MSB- LSB	DIO-II Select Code	Switch MSB- LSB
133-135	00001	205-207	10011
137-139	00010	209-211	10100
141-143	00011	213-215	10101
145-147	00100	217-219	10110
149-151	00101	221-223	10111
153-155	00110	225-227	11000
157-159	00111	229-231	11001
161-163	01000	233-235	11010
185-187	01110	237-239	11011
189-191	01111	241-243	11100
193-195	10000	245-247	11101
197-199	10001	249-251	11110
201-203	10010	253-255	11111

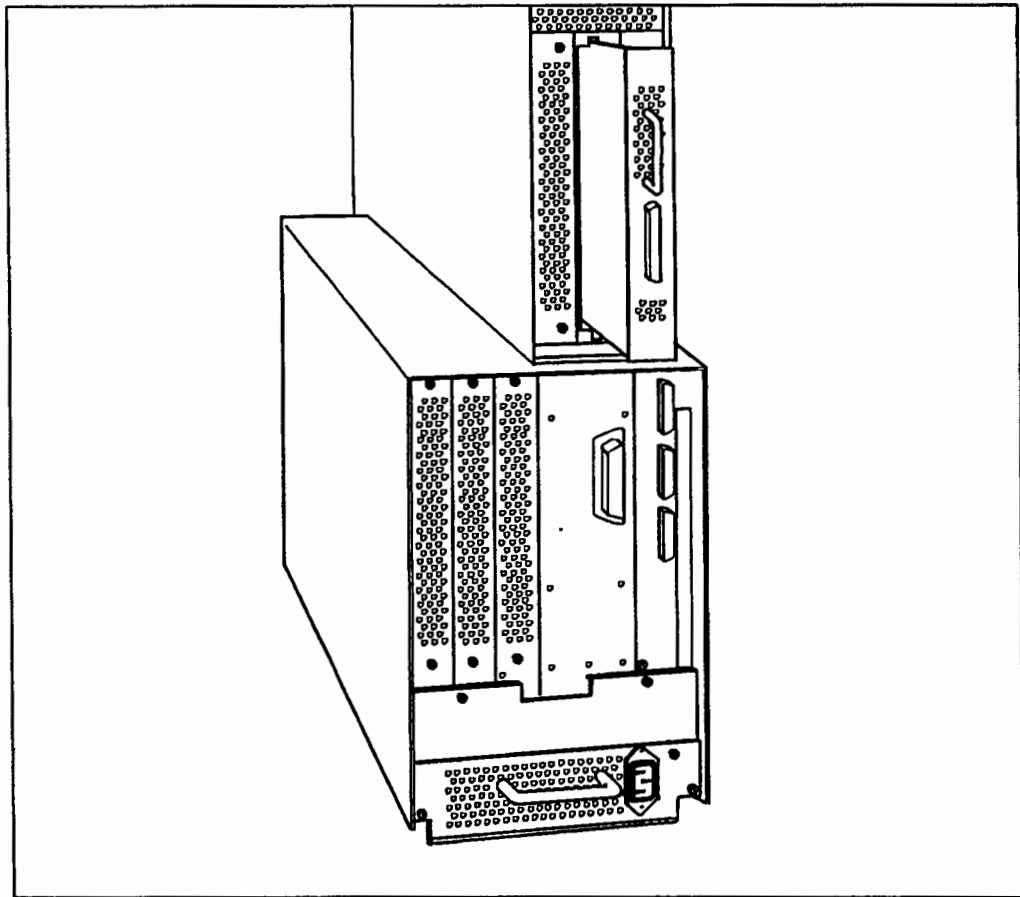
Note

- a. A switch setting of 00000 is not a valid address code. The result will be a failure of the IODC test code to load and run at power-up (all LEDs on the interface will stay ON).
 - b. The Frame Buffer addresses are always 4 Mbytes (0x400000) above the CTL_BASE address.
-

3. *Insert the interface card in your computer or expander.*

- a. Insert the card, component side up, into an empty I/O slot. Tighten the thumb screws on the metal end plate until the end plate is flush with the back of the computer or expander.

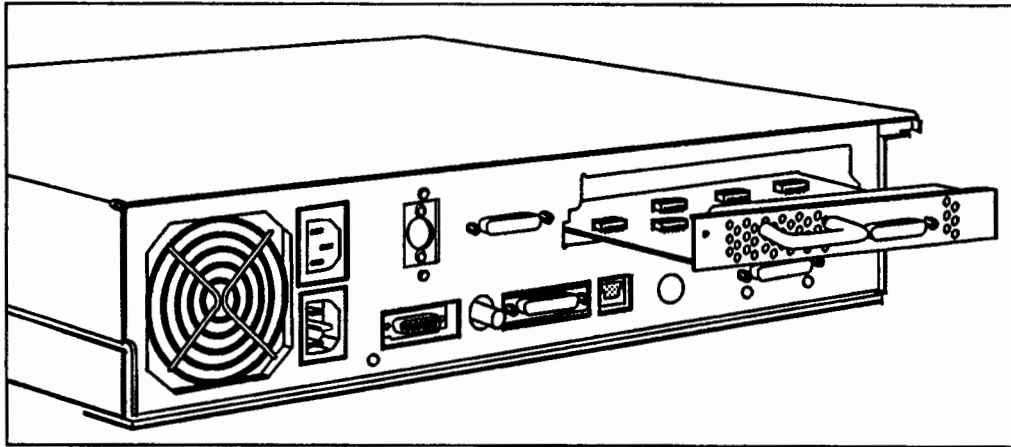
**HP 98702A Graphics Address
and Data Bus Interface**



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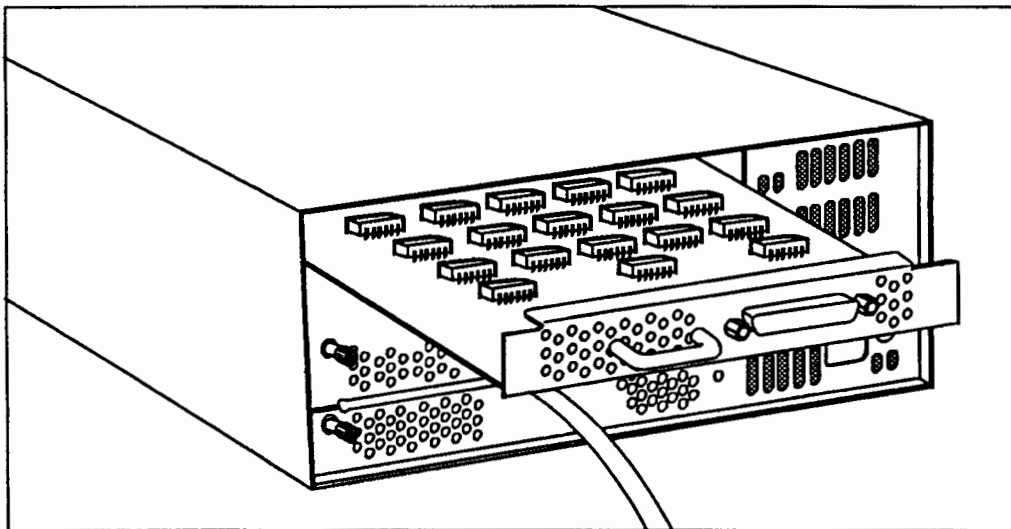
Figure 4-84. Inserting the HP 98702A into a Model 400s or 433s

HP 98702A Graphics Address and Data Bus Interface



LG200171_058

Figure 4-85. Inserting the HP 98702A into a Model 400dl, 400t, or 425t



LG200171_059

Figure 4-86. Inserting the HP98702A into a Series 300 Computer

- b. If you have other interface or accessory cards to install, leave the cover plates off; otherwise replace them.

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4. *Record the select code*

Make a note that the select code you have assigned to the interface has been used and is no longer available. Use the foldout worksheet at the end of this book for this purpose.

Hardware Installation Complete

Refer to the “HP 98705A/B/C Graphics Display Controllers” section of this chapter for instructions to connect the HP 98705A/B/C Graphics Display Controller to the HP 98702A Graphics Address and Data Bus Interface.

HP 98705A/B/C Graphics Display Controllers

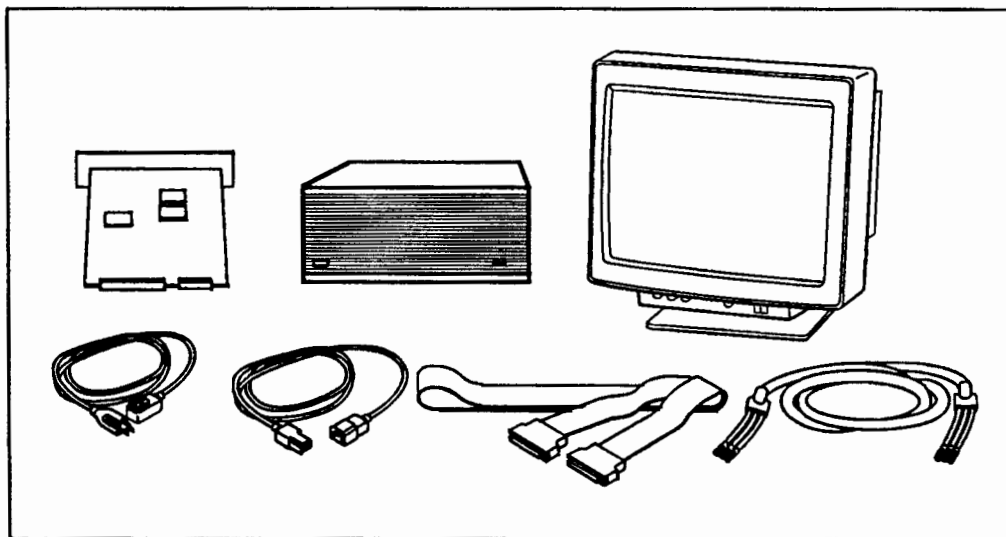
The HP 98705A/B/C Graphics Display Controller connects to your system via the HP 98702A Graphics Address and Data Bus Interface.

The HP 98705A Graphic Display Controller consists of eight image planes and four overlays.

The HP98705B Graphic Display Controller consists of 16 image planes, four overlays, and a 16-bit Z buffer.

The 98705C Graphic Display Controller mirrors the HP 98705A configuration with slower performance.

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.



LG200171_054

Figure 4-87. HP 98705A/B/C Inventory

Installing the HP 98705A/B/C Graphics Display Controllers

Refer to the documentation that came with the 98705A/B/C to:

- Unpack the HP 98705A/B/C.
- Check the voltage setting.

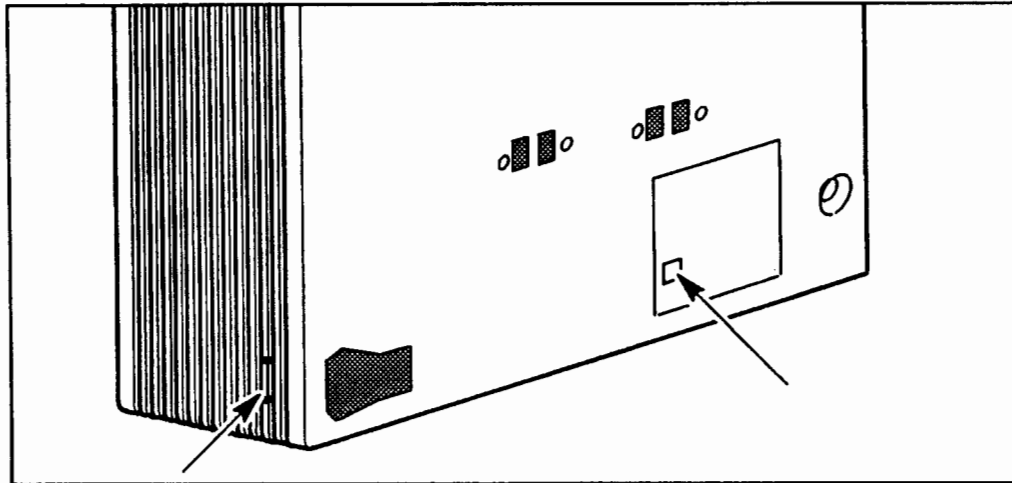


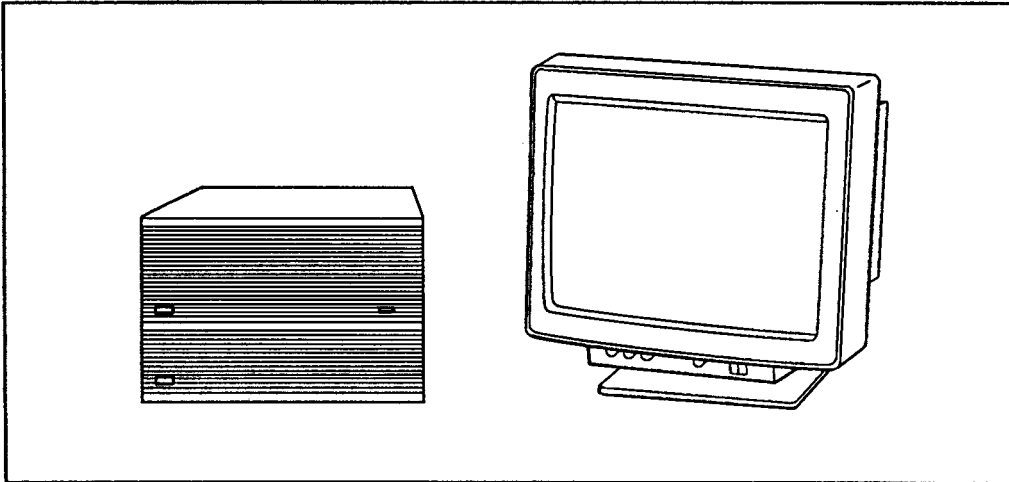
Figure 4-88. Voltage Switches

Make sure that the HP 98702A interface is installed in your computer. Installation of this interface card is covered in a separate section of this chapter.

HP 98705A/B/C Graphics Display Controllers

1. *Play it safe.*
 - a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
2. *Locate the Graphics Display Controller near the computer and the monitor.*

4



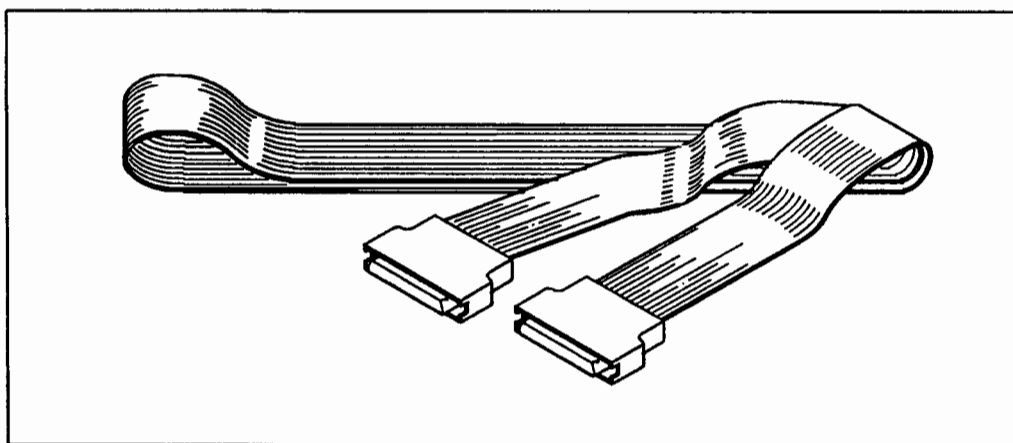
LG200171_058

Figure 4-89. HP 98705A/B/C Graphics Display Controller Placement

Ensure air flow is not restricted at the front or rear of the Graphics Processor.

HP 98705A/B/C Graphics Display Controllers

3. *Connect the Graphics Address and Data (GAD) bus cable.*

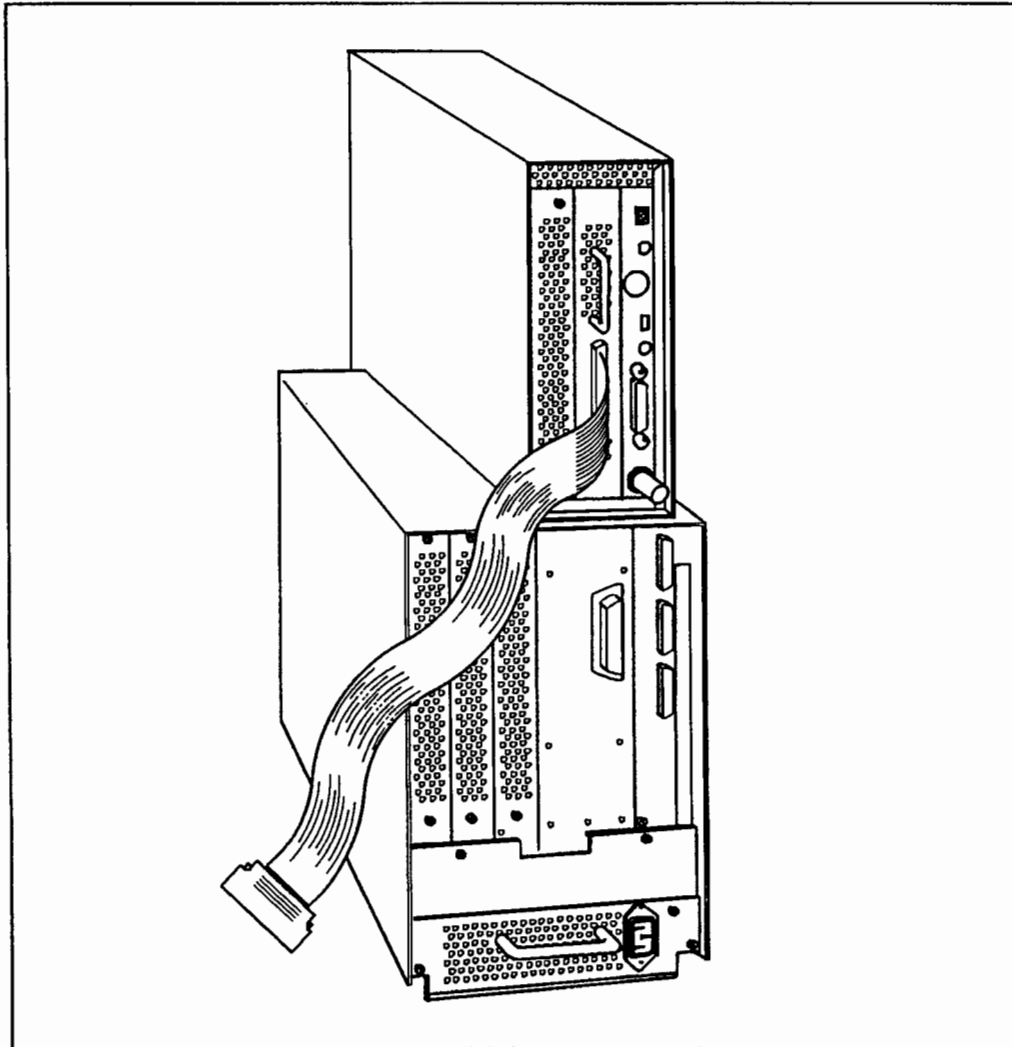


LG200171_048

Figure 4-90. Graphics Address and Data (GAD) Bus Cable

HP 98705A/B/C Graphics Display Controllers

- a. Connect the GAD bus cable to the HP 98702A GAD bus interface connector.

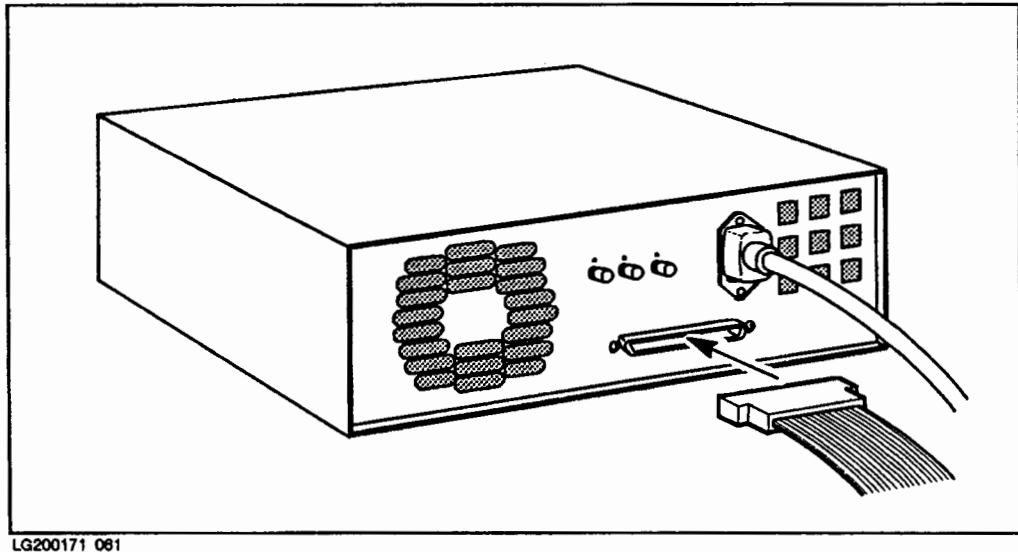


LG200171_055

Figure 4-91. Connecting the GAD Bus Cable to the Interface

HP 98705A/B/C Graphics Display Controllers

- b. Connect the other end of the GAD bus cable to the HP 98705A/B/C.



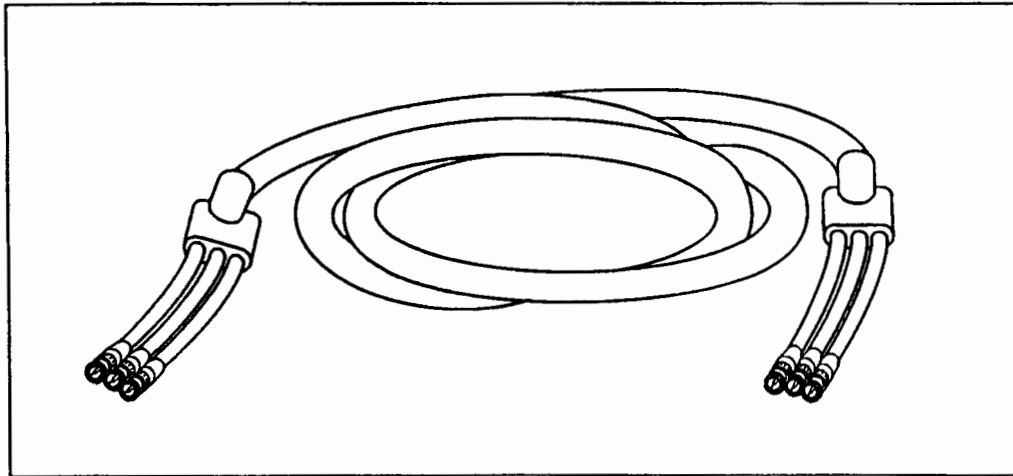
LG200171_081

Figure 4-92. Connecting GAD Bus Cable to the Graphics Controller

Ensure that the connector locks into position.

HP 98705A/B/C Graphics Display Controllers

4. *Connect the RGB cable.*

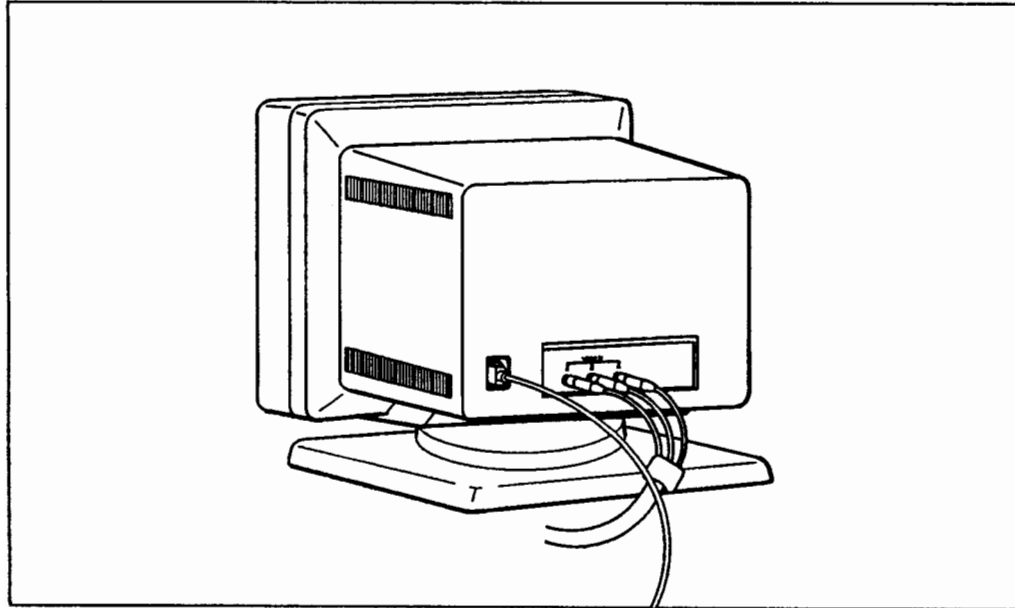


LG200171_044

Figure 4-93. Red Green Blue (RGB) Cable

HP 98705A/B/C Graphics Display Controllers

- a. Connect the RGB (Red Green Blue) cable to the monitor: red to red, green to green, and blue to blue connectors.



LG200171 041

Figure 4-94. Connecting the RGB Cable to the Monitor



HP 98705A/B/C Graphics Display Controllers

- b. Connect the other end of the RGB cable to the HP 98705A/B/C in the same manner.

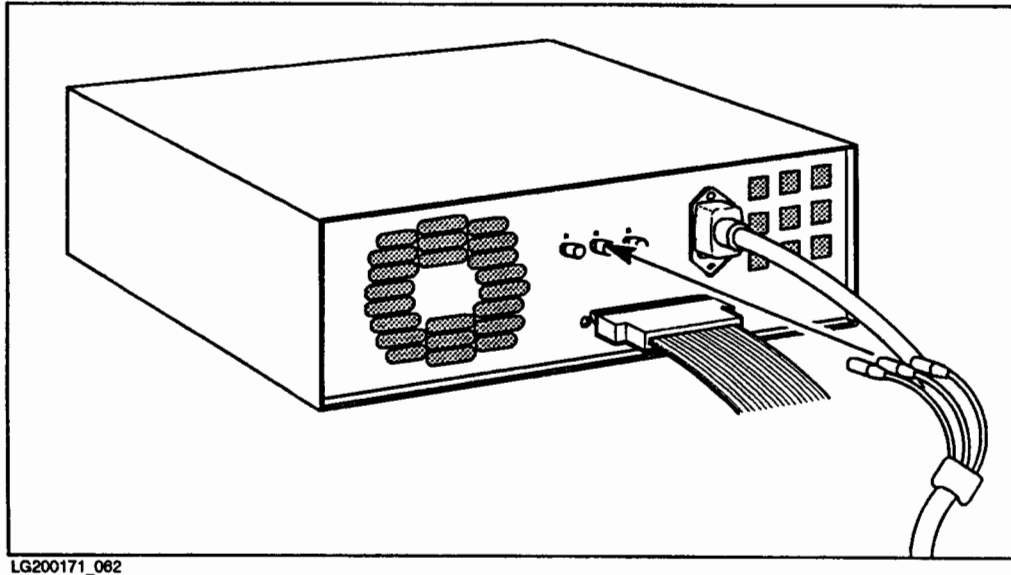
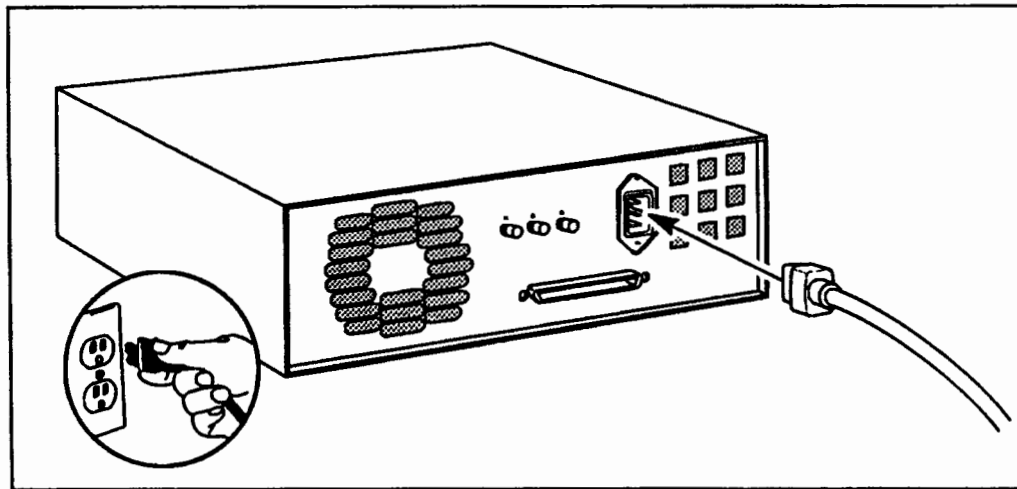


Figure 4-95.
Connecting the RGB Cable to the HP98705A/B/C Graphics Controller

5. *Ensure that the power switches are in the OFF position.*

HP 98705A/B/C Graphics Display Controllers

6. *Connect all power cords.*



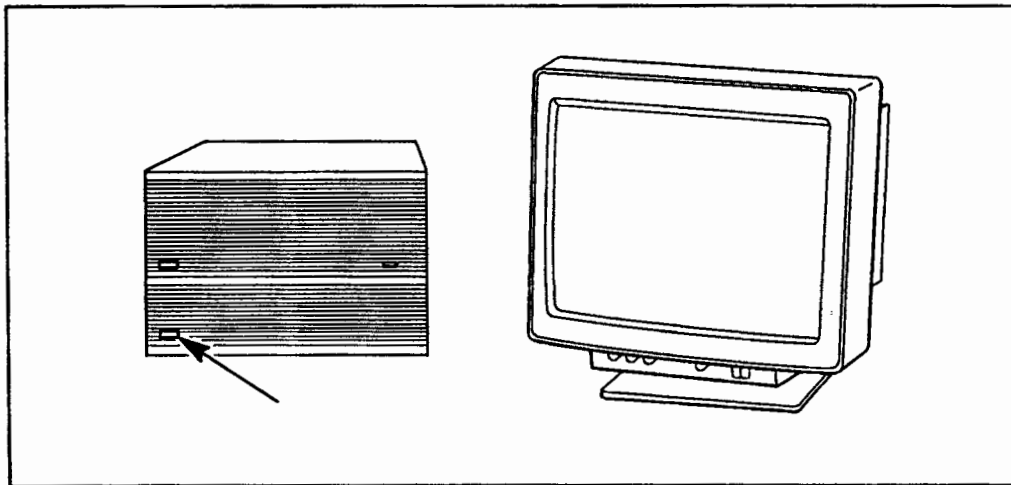
LG200171_000

Figure 4-96. Connecting the power Cord to the HP 98705A/B/C Controller.

7. *Turn on the monitor.*

HP 98705A/B/C Graphics Display Controllers

8. *Turn on the HP 98705A/B/C.*



LG200171_057

Figure 4-97. HP 98705A/B/C Power Switch

9. *Turn on the computer.*
10. *Verify installation.*

Hardware Installation Complete!

HP 98705A/B/C Graphics Display Controllers

HP-UX Set Up Information

The following table contains detailed HP-UX software set up information. SAM does not support adding graphics displays to your system, therefore you must use the the HP-UX commands method to set up HP-UX to communicate with your newly connected device.

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

HP 98735-66580 Physical DMA Interface

The HP 98735-66580 is a DIO-II physical DMA interface for the HP 98735A Graphics Display Controller.

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

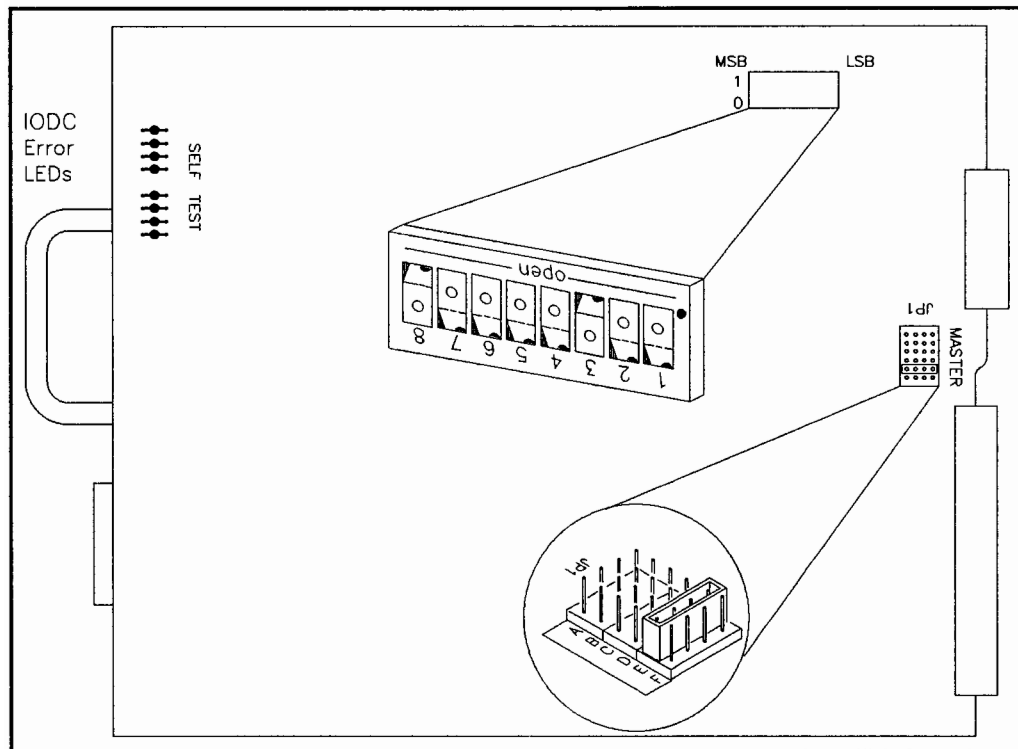


Figure 4-98. Physical DMA Interface

HP 98735-66580 Physical DMA Interface

Installing the HP 98735-66580 Physical DMA Interface

1. *Play it safe.*
 - a. Follow the computer “shut down” procedure. See *System Administration Tasks Manual* Chapter 3: “Starting and Stopping HP-UX” for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
2. *Set the select code.*

The select code is preset to 132.

An eight segment DIP switch is used to set the select codes. These eight switches indicate the binary coding in Table 4-33. the most significant bit (MSB) switch is always a one (open position) and the two least significant bit (LSB) switch are always zero (closed position).

Caution

- If you have “Instant Ignition” (or if you depend on /dev/crt to automatically select the console) do not use a select code above 140.
 - A switch setting of switches 2 through 6 all set to zeros (closed position) must never be used. The interface card will interfere with proper system operation and may prevent the system from booting.
-

The interface occupies 16 Mbytes of address space corresponding to four consecutive select codes. You should never install another DIO-II card with a select code equal to the four select codes taken up by the interface board (for example, if the interface has a select code of 144, no other cards may have select codes of 144, 145, 146, or 147). Failure to observe this limitation will result in bus contention, with neither card operating properly.

Table 4-33.

HP 98735-66580 Physical DMA Interface HP-UX Set-up Values

DIO-II Select Code	Switch MSB-LSB	DIO-II Select Code	Switch MSB-LSB	DIO-II Select Code	Switch MSB-LSB
132-135	1000 0100	176-179	1011 0000	220-223	1101 1100
136-139	1000 1000	180-183	1011 0100	224-227	1110 0000
140-143	1000 1100	184-187	1011 1000	228-231	1110 0100
144-147	1001 0000	188-191	1011 1100	232-235	1110 1000
148-151	1001 0100	192-195	1100 0000	236-239	1110 1100
152-155	1001 1000	196-199	1100 0100	240-243	1111 0000
156-159	1001 1100	200-203	1100 1000	244-247	1111 0100
160-163	1010 0000	204-207	1100 1100	248-251	1111 1000
164-167	1010 0100	208-211	1101 0000	252-255	1111 1100
168-171	1010 1000	212-215	1101 0100		
172-175	1010 1100	216-219	1101 1000		

4

3. Set the Bus Master Daisy Chain Jumpers.

In order for the system to perform DMA transfers correctly, the Bus Master Daisy Chain must be set to the appropriate configuration. The card location in the chassis is independent of the card's position in the daisy chain.

Jumpers on the interface card determine the location in the daisy chain.

The Physical DMA Interface (PDMA), Virtual DMA Interface (VDMA), and CPU cards each have to be configured to daisy chain operation (as well as any other interface cards).

Caution

Incorrect setting of the Bus Master Daisy Chain configuration could cause the following situations:

- The System will “hang” in boot ROM.
- The HP-UX system will boot correctly, but “hangs” when DMA is attempted.

The only remedy to “hanging” your system is to power off the CPU and change the jumpers. This could cause an fsck and loss of data.

HP 98735-66580 Physical DMA Interface

Available daisy chain positions are: MC, and A through F. MC is the highest position and F is the lowest position. (There is also a G position for the special case of BOTH F and G being DIO-I cards.)

MC can only be used by the CPU. Therefore, it may not be shown on other cards.

Normally, the default jumper position on the cards can be used without causing interference. However, if you have a DOS coprocessor, a VME expander, or more than one HP 98735A/36A/36B Graphics Display Controller interface, the daisy chain jumpers must be checked.

The CPU Bus Master Daisy Chain default is position C.

The DMA controller chip on the HP 9000 Model 375 and Model 400S are hard wired at a fixed location (D) in the daisy chain. The rest of the CPU is dependent on the jumper for Bus Master position.

Figure 4-98 shows the location of the jumpers on the PDMA Interface card and the default jumper position E.

The VME expander has a default position E.

The DOS coprocessor may be either E or F and is set through a software configuration file.

HP 98735-66580 Physical DMA Interface

Rules for determining the jumper position:

- a. The daisy chain **MUST** start with the CPU and continue in order to the last board in the chain. There can be no open (unoccupied) positions.
- b. The CPU board can start the chain in any of four locations: MC, A, B, C. All supported DIO-II CPU boards have an eight-pin jumper array.

On Series 300, the jumper array is located between the DIO-II connectors. The position nearest the small connector is position MC. The position nearest the large connector is C.

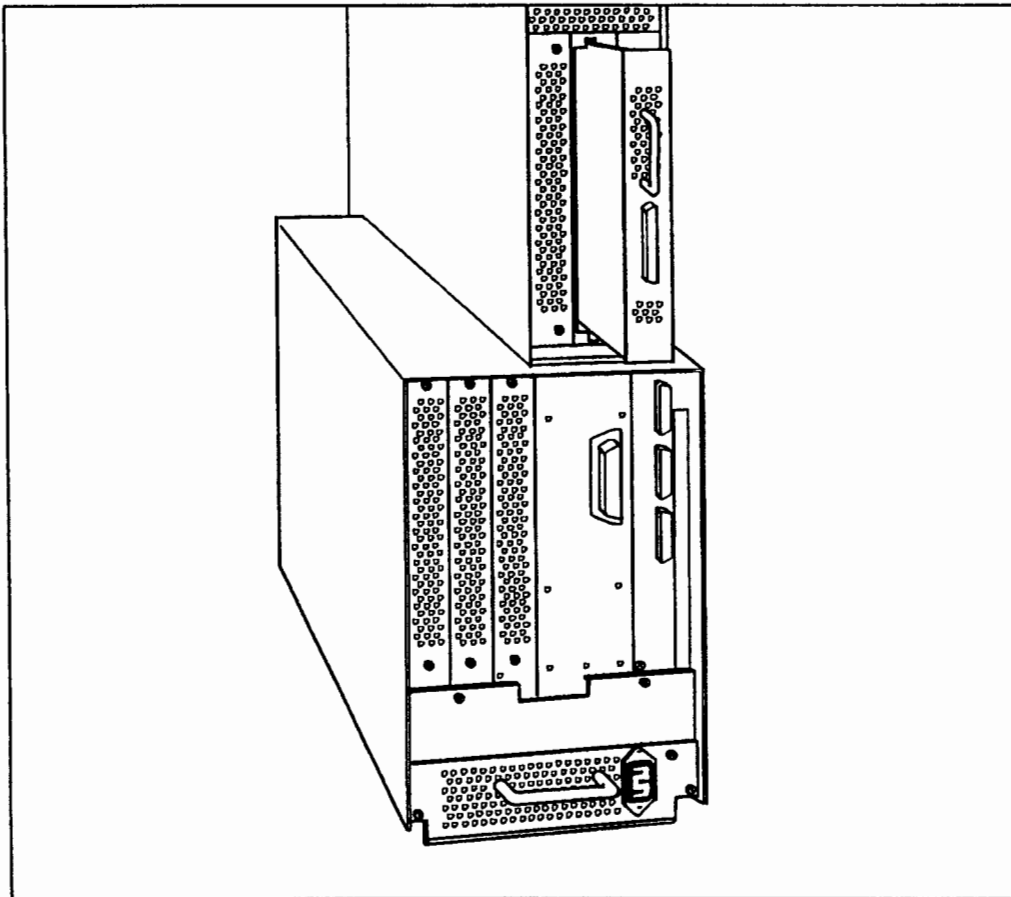
On the Model 400S the jumper is labelled "XBG3" at the MC position and "BG0" at the C position.

- c. The DMA on an HP 9000 Series 375, and Model 400S are hard wired to D. Therefore, the CPU may have to start at a position other than MC in order to keep from leaving open positions in the chain.
- d. The HP 98735A/36A/36B Graphics Display Controller interfaces can be set to position A through F.

Once the position of each board in the chain has been determined, all configurable boards need to have their jumpers checked or set to conform with the rules for determining the jumper position. See Figure 4-98 for location of the jumper on the interface card.

HP 98735-66580 Physical DMA Interface

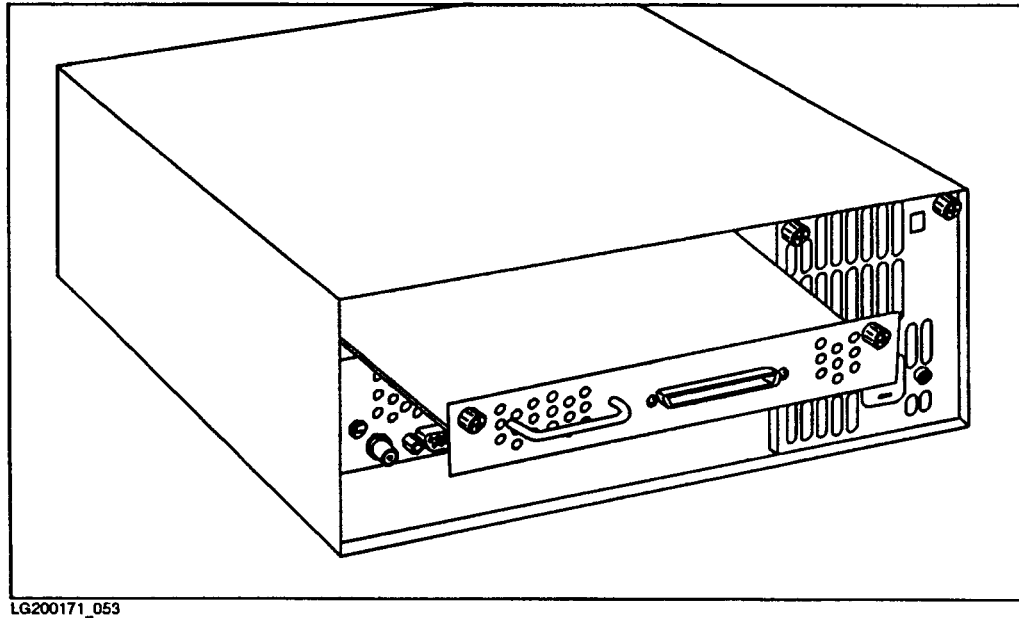
4. *Insert the PDMA Interface into a DIO-II slot.*



LG200171_051

Figure 4-99. Inserting the PDMA Interface into a Model 400s or 433s

HP 98735-66580 Physical DMA Interface



4

Figure 4-100. Inserting the PDMA Interface into a Series 300

5. *Record the select code.*

Make a note that the select code you have assigned to the interface has been used and is no longer available. Use the foldout worksheet at the end of this book for this purpose.

Hardware Installation Complete!

Refer to the “HP 98735A/36A/36B Graphics Display Controllers” section of this chapter for instructions to connect the HP 98735A Graphics Display Controller to the HP 98735-66580 Physical DMA Interface.

HP 98735-66581 Virtual DMA Interface

The HP 98735-66581 is a DIO-II virtual DMA interface for the HP 98736A and HP 98736B Graphics Display Controllers.

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

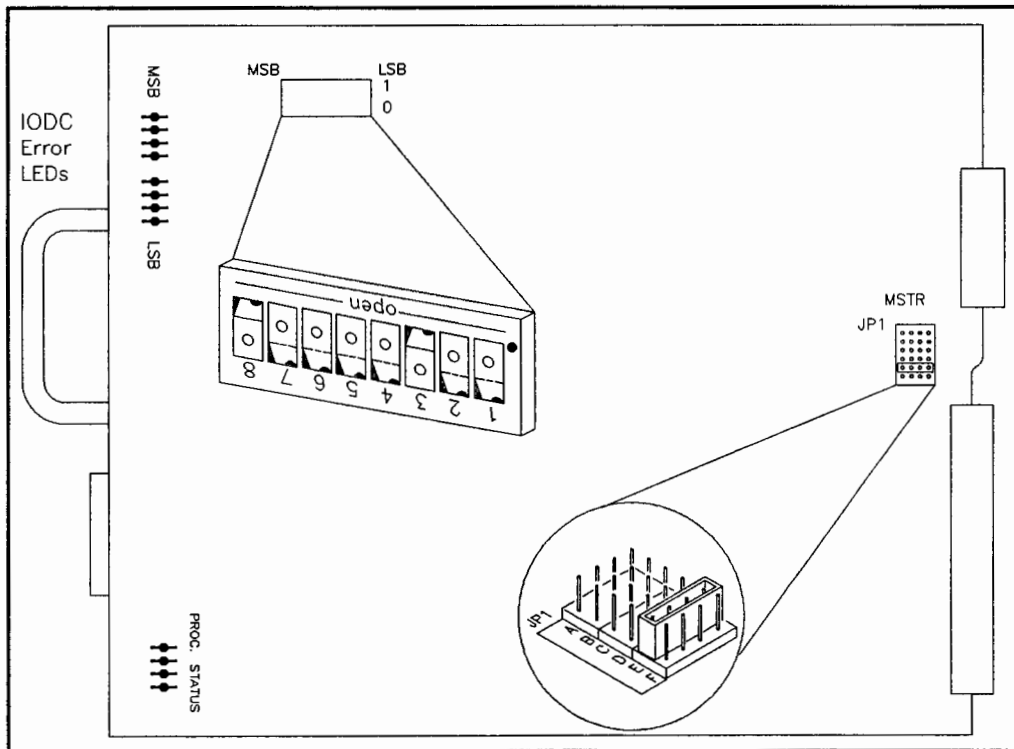


Figure 4-101. Virtual DMA Interface

Installing the HP 98735-66581 Virtual DMA Interface

1. *Play it safe.*

- a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
- b. TURN OFF the computer and unplug the power cord.

2. *Set the select code.*

The select code is preset to 132.

An eight segment DIP switch is used to set the select codes. These eight switches indicate the binary coding in Table 4-34. the most significant bit (MSB) switch is always a one (open position) and the two least significant bit (LSB) switch are always zero (closed position).

Caution

- If you have "Instant Ignition" (or if you depend on /dev/crt to automatically select the console) do not use a select code above 140.
- A switch setting of switches 2 through 6 all set to zeros (closed position) must never be used. The interface card will interfere with proper system operation and may prevent the system from booting.

The interface occupies 16 Mbytes of address space corresponding to four consecutive select codes. You should never install another DIO-II card with a select code equal to the four select codes taken up by the interface board (for example: if the interface has a select code of 144, no other cards may have select codes of 144, 145, 146, or 147). Failure to observe this limitation will result in bus contention, with neither card operating properly.

HP 98735-66581 Virtual DMA Interface

Table 4-34.
HP 98735-66581 Virtual DMA Interface HP-UX Set-up Values

DIO-II Select Code	Switch MSB-LSB	DIO-II Select Code	Switch MSB-LSB	DIO-II Select Code	Switch MSB-LSB
132-135	1000 0100	176-179	1011 0000	220-223	1101 1100
136-139	1000 1000	180-183	1011 0100	224-227	1110 0000
140-143	1000 1100	184-187	1011 1000	228-231	1110 0100
144-147	1001 0000	188-191	1011 1100	232-235	1110 1000
148-151	1001 0100	192-195	1100 0000	236-239	1110 1100
152-155	1001 1000	196-199	1100 0100	240-243	1111 0000
156-159	1001 1100	200-203	1100 1000	244-247	1111 0100
160-163	1010 0000	204-207	1100 1100	248-251	1111 1000
164-167	1010 0100	208-211	1101 0000	252-255	1111 1100
168-171	1010 1000	212-215	1101 0100		
172-175	1010 1100	216-219	1101 1000		

3. *Set the Bus Master Daisy Chain Jumpers.*

In order for the system to perform DMA transfers correctly, the Bus Master Daisy Chain must be set to the appropriate configuration. The card location in the chassis is independent of the card's position in the daisy chain.

Jumpers on the interface card determine the location in the daisy chain. The Physical DMA Interface (PDMA), Virtual DMA Interface (VDMA), and CPU cards each have to be configured to daisy chain operation (as well as any other interface cards).

Caution

Incorrect setting of the Bus Master Daisy Chain configuration could cause:

- System to "hang" in boot ROM.
- HP-UX system to boot correctly, but "hangs" when DMA is attempted.

The only remedy to "hanging" your system is to power off the CPU and change the jumpers. This could cause an fsck and loss of data.

HP 98735-66581 Virtual DMA Interface

Available daisy chain positions are: MC, and A through F. MC is the highest position and F is the lowest position. (There is also a G position for the special case of BOTH F and G being DIO-I cards.)

MC can only be used by the CPU. Therefore, it may not be shown on other cards.

Normally, the default jumper position on the cards can be used without causing interference. However, if you have a DOS coprocessor, a VME expander, or more than one HP 98735A/36A/36B Graphics Display Controller interface, the daisy chain jumpers must be checked.

The CPU Bus Master Daisy Chain default is position C.

The DMA controller chip on the HP 9000 Model 375 and Model 400S are hard wired at a fixed location (D) in the daisy chain. The rest of the CPU is dependent on the jumper for Bus Master position.

Figure 4-101 shows the location of the jumpers on the PDMA Interface card and the default jumper position E.

The VME expander has a default position E.

The DOS coprocessor may be either E or F and is set through a software configuration file.

HP 98735-66581 Virtual DMA Interface

Rules for determining the jumper position:

- a. The daisy chain **MUST** start with the CPU and continue in order to the last board in the chain. There can be no open (unoccupied) positions.
- b. The CPU board can start the chain in any of four locations: MC, A, B, C. All supported DIO-II CPU boards have an eight-pin jumper array.

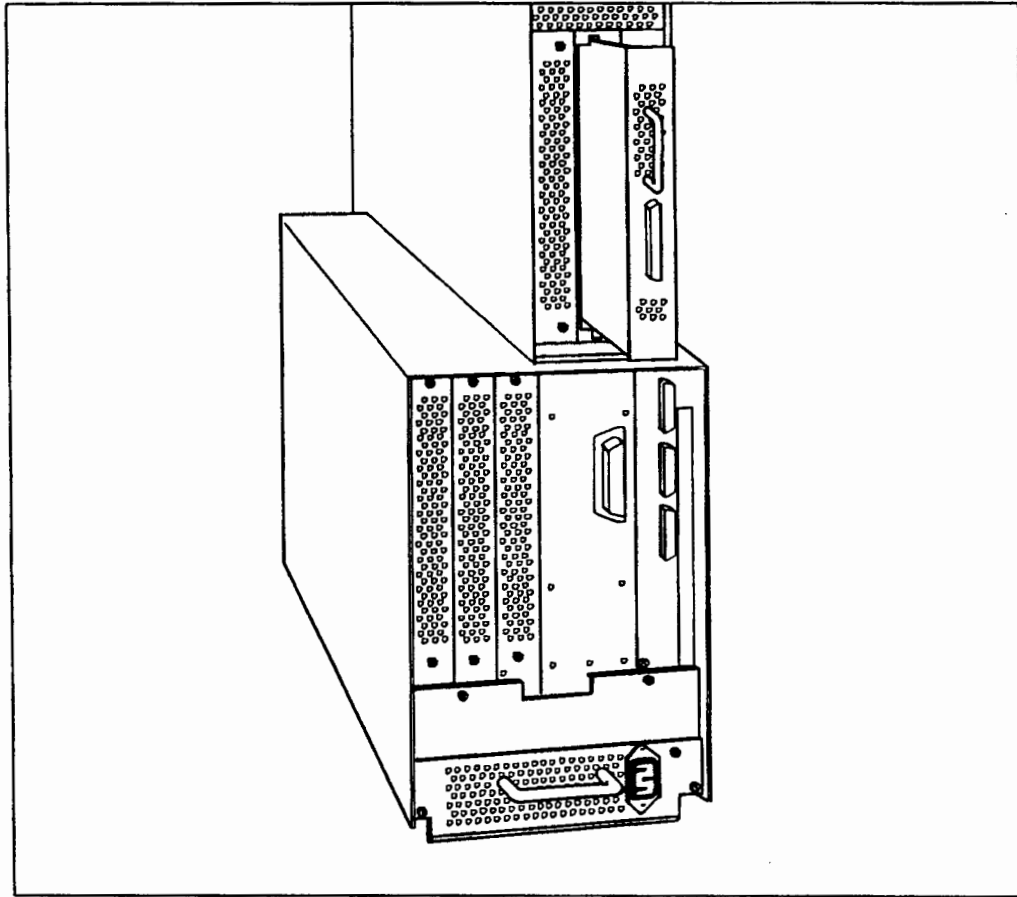
On Series 300, the jumper array is located between the DIO-II connectors. The position nearest the small connector is position MC. The position nearest the large connector is C.

On the Model 400S the jumper is labelled "XBG3" at the MC position and "BG0" at the C position.

- c. The DMA on an HP 9000 Series 375, and Model 400S are hard wired to D. Therefore, the CPU may have to start at a position other than MC in order to keep from leaving open positions in the chain.
- d. The HP 98735A/36A/36B Graphics Display Controller interfaces can be set to position A through F.

Once the position of each board in the chain has been determined, all configurable boards need to have their jumpers checked or set to conform with the rules for determining the jumper position. See Figure 4-101 for location of the jumper on the interface card.

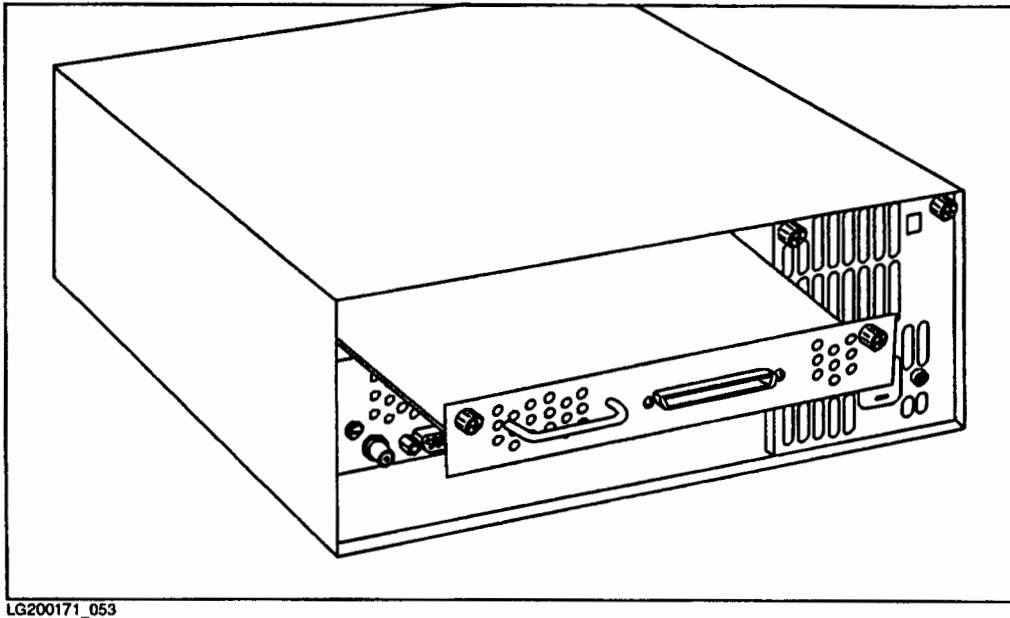
4. *Insert the VDMA Interface into a DIO-II slot.*



LG200171_051

Figure 4-102. Inserting the VDMA Interface into a Model 400s or 433s

HP 98735-66581 Virtual DMA Interface



LG200171_053

Figure 4-103. Inserting the VDMA Interface into a Series 300

5. *Record the select code.*

Make a note that the select code you have assigned to the interface has been used and is no longer available. Use the foldout worksheet at the end of this book for this purpose.

Hardware Installation Complete!

Refer to the “HP 98735A/36A/36B Graphics Display Controllers” section of this chapter for instructions to connect the HP 98736A/36B Graphics Display Controller to the HP 98735-66581 Virtual DMA Interface.

HP 98735A/36A/36B Graphics Display Controllers

The HP 98735A is a low cost 3D graphics peripheral that connects to your system via the 98735-66580 Physical DMA Interface and consists of the following:

- A Physical DMA (PDMA) Interface.
- A G-Bus Cable.
- A Transform Control board.
- A Single Transform Engine board.
- Two Frame Buffer Control boards
- A Frame Buffer board.
- A Z-Buffer board.
- A Display board.
- A Power Supply.
- Cooling Fans.

The HP 98736A is a mid-range controller that connects to your system via the 98735-66581 Virtual DMA Interface and has the same boards as the HP 98735A with the following exceptions:

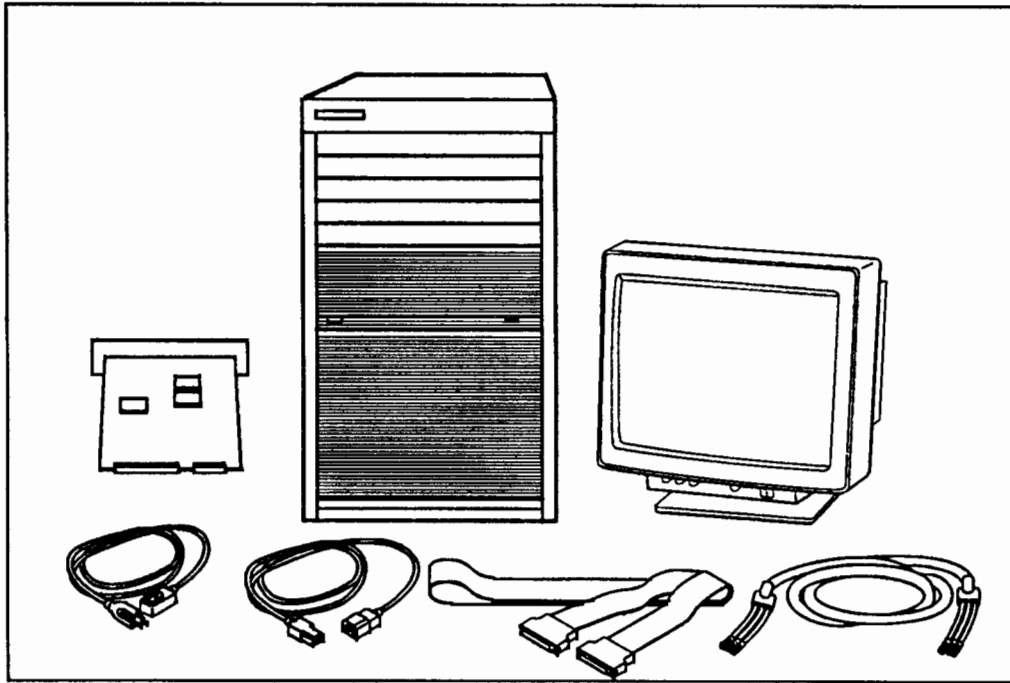
- A Virtual DMA (VDMA) Interface.
- The transform engine board is a Dual-Transform Engine board which gives the controller added throughput speed for graphics processing.

The HP 98736B is a high-range controller that connects to your system via the 98735-66581 Virtual DMA Interface and has the same boards as the HP 98735A with the following exceptions:

- A Virtual DMA (VDMA) Interface.
- The use of three transform engines (both a Single-Transform Engine board and a Dual-Transform Engine board).

Refer to Appendix C: "Series 400 Support Matrix" for Series 400 hardware and software support information.

HP 98735A/36A/36B Graphics Display Controllers



LG200171_050

Figure 4-104. HP 98735A/36A/36B Inventory

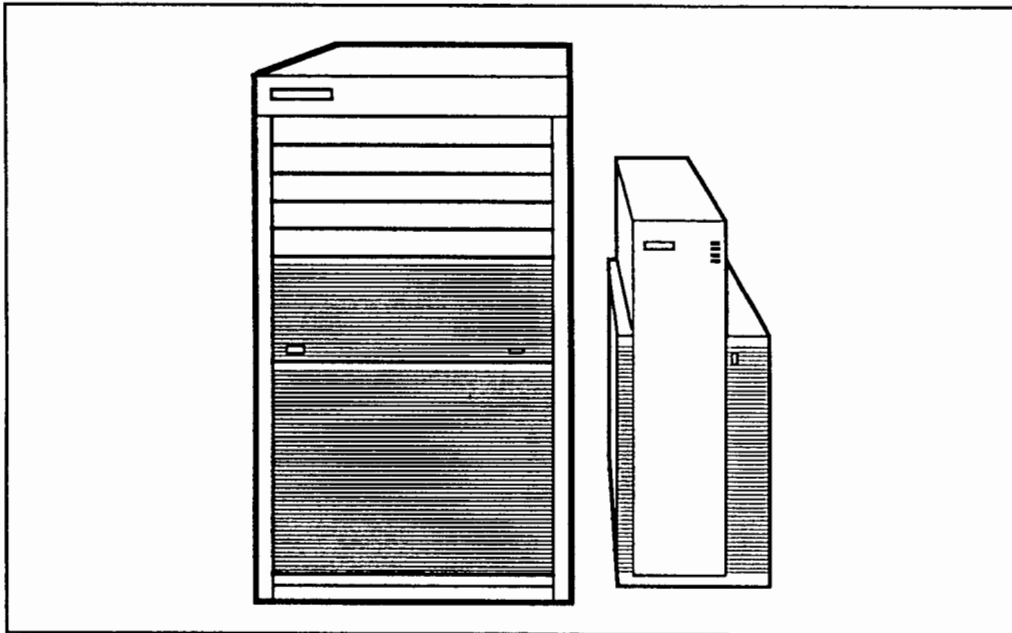
Installing the HP 98735A/36A/36B Graphics Display Controllers

Refer to the documentation that came with the 98735A/36A/37A to unpack the Graphics Display Controller.

Make sure that the 98735-66580 Physical DMA Interface or the 98735-66581 Virtual DMA Interface is installed in your computer. Installation of these interface cards is covered in separate sections of this chapter.

1. *Play it safe.*
 - a. Follow the computer "shut down" procedure. See *System Administration Tasks Manual* Chapter 3: "Starting and Stopping HP-UX" for specific instructions.
 - b. TURN OFF the computer and unplug the power cord.
2. *Locate the Graphics Display Controller near the computer and the monitor.*

4



LG200171_038

Figure 4-105. HP 98735A/36A/36B Graphics Display Controller Placement

HP 98735A/36A/36B Graphics Display Controllers

3. *Remove the top panel of the Graphics Display Controller.*
 - a. Lift rear of panel.
 - b. Slide panel forward.
 - c. Lift panel clear.

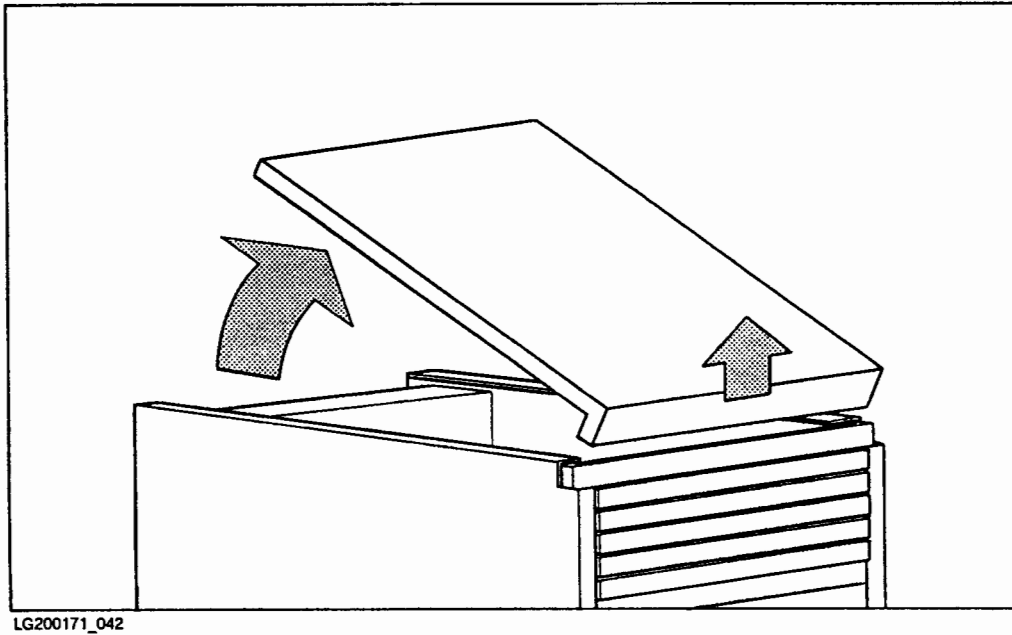
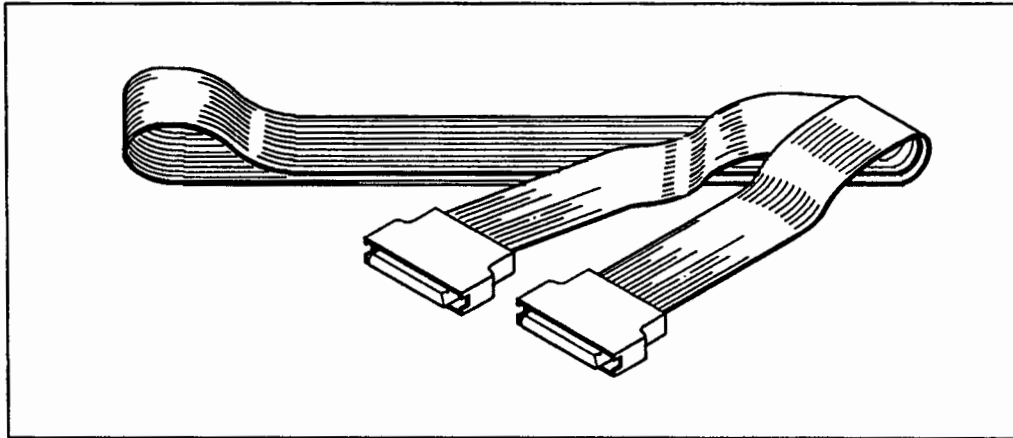


Figure 4-106. Removing the HP 98735A/36A/36B Top Panel

4. *Connect the GBUS cable.*

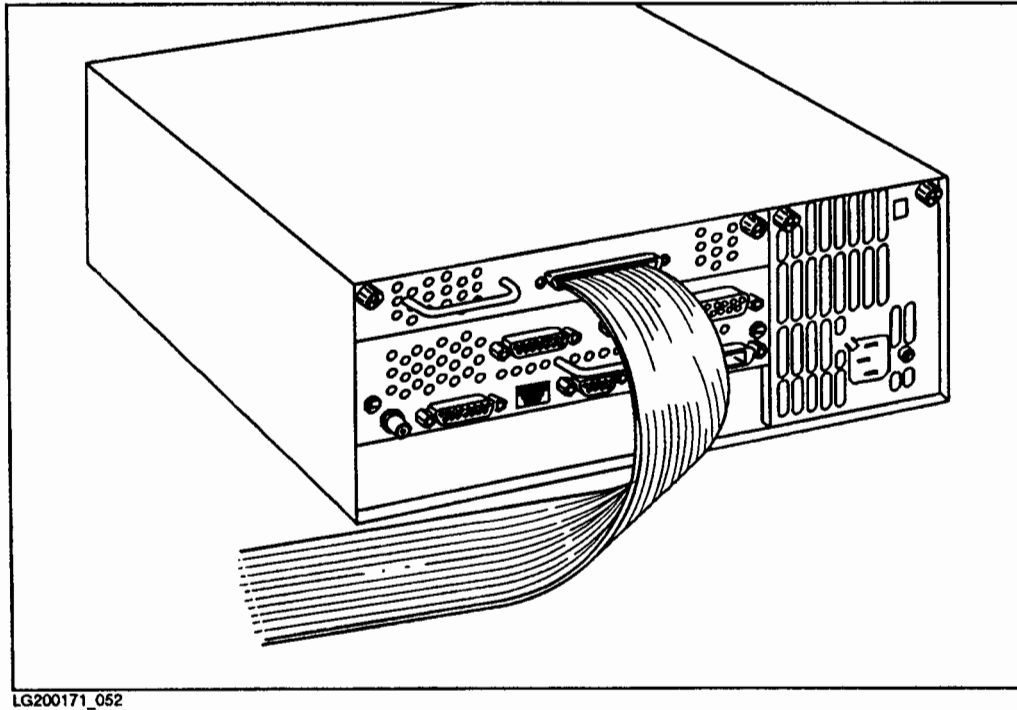


LG200171_048

Figure 4-107. The GBUS Cable

HP 98735A/36A/36B Graphics Display Controllers

- a. Connect one end of the GBUS cable to the interface card in the computer. Figure 4-108 illustrates the interface card in a Series 300 computer.

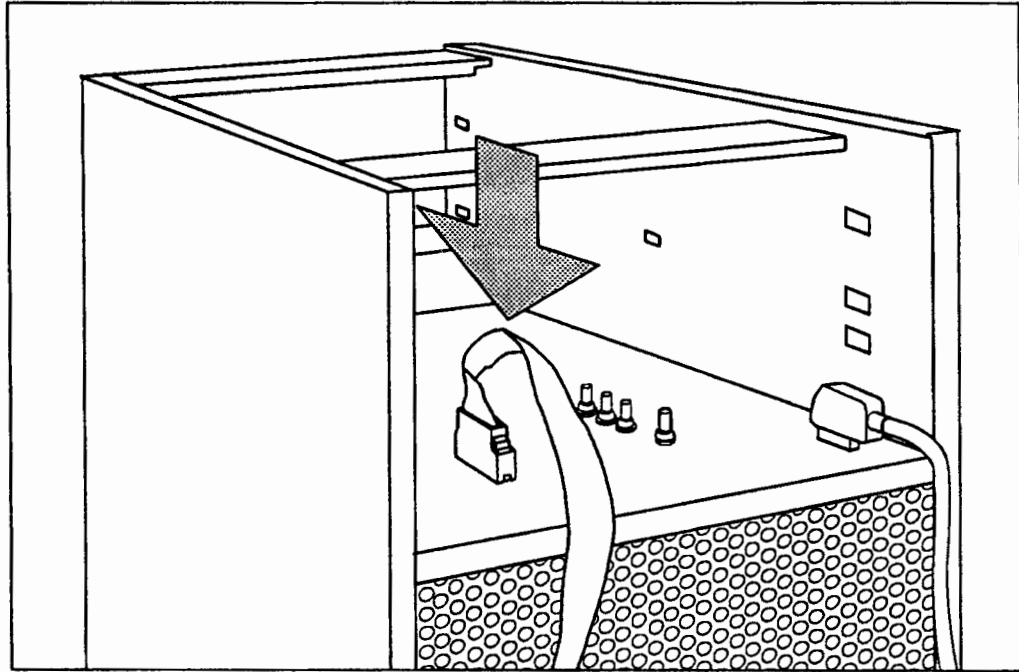


LG200171_052

Figure 4-108. Connecting the GBUS to the Interface Card

HP 98735A/36A/36B Graphics Display Controllers

- b. Connect the other end of the GBUS cable to the Graphics Display Controller.



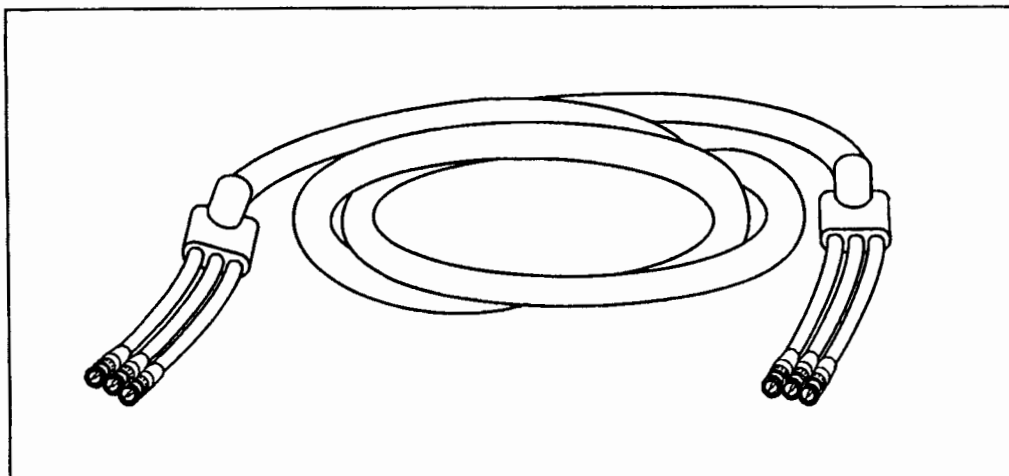
LG200171_045

Figure 4-109. Connecting the GBUS to the HP 98735A/36A/36B

- c. Ensure that the connector locks into position.

HP 98735A/36A/36B Graphics Display Controllers

5. *Connect the RGB cable.*

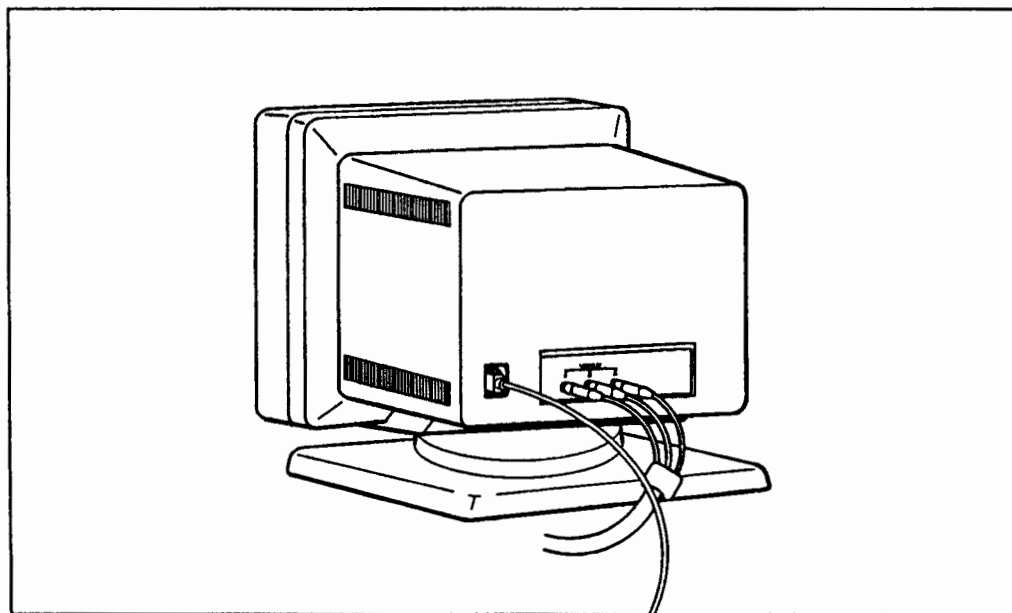


LG200171_044

Figure 4-110. Red Green Blue (RGB) Cable

HP 98735A/36A/36B Graphics Display Controllers

- a. Connect the RGB (Red Green Blue) cable to the monitor: red to red, green to green, and blue to blue connectors.

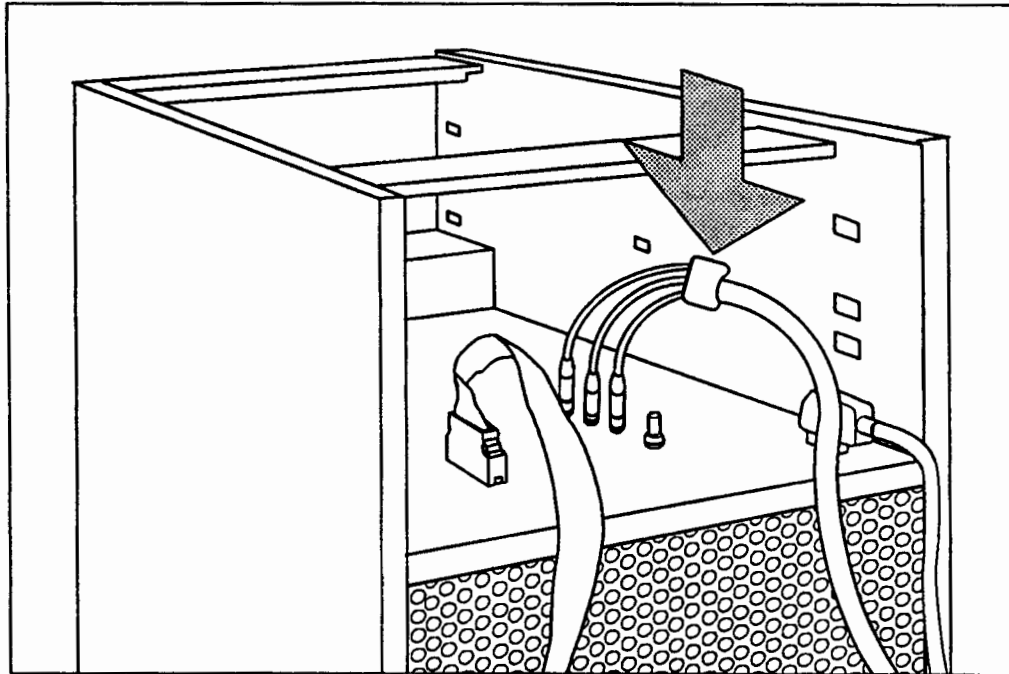


LG200171 041

Figure 4-111. Connecting the RGB Cable to the Monitor

HP 98735A/36A/36B Graphics Display Controllers

- b. Connect the other end of the RGB cable to the HP 98735A/36A/36B in the same manner.



LG200171_049

Figure 4-112. Connecting the RGB Cable to the HP 98735A/36A/36B

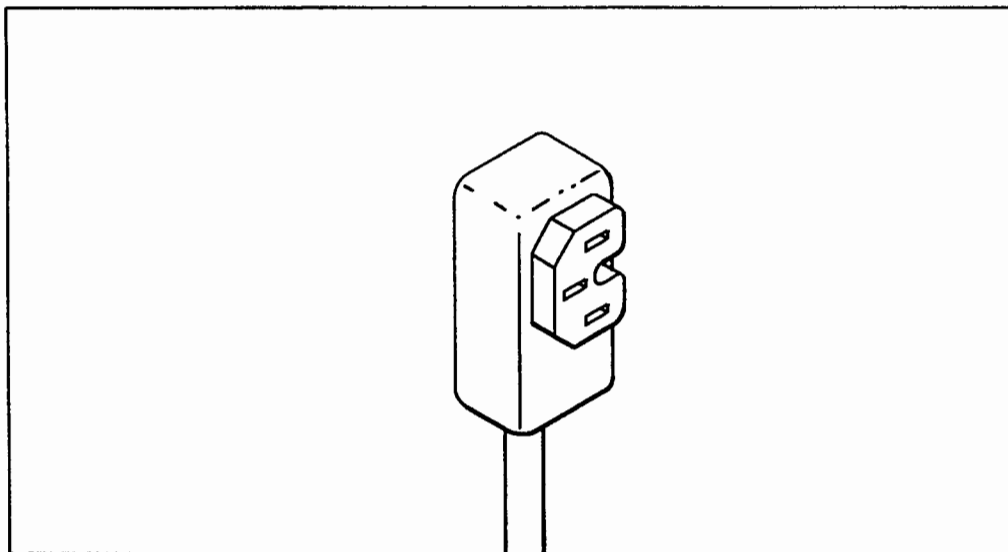
HP 98735A/36A/36B Graphics Display Controllers

6. *Ensure that the power switches are in the OFF position.*

7. *Connect all power cords.*

Ensure that the proper power cord is used for the Graphic Display Controller. This cord has heavier wiring and a distinct slot in the controller connector end.

a. Connect the power cord to your Graphic Display Controller.

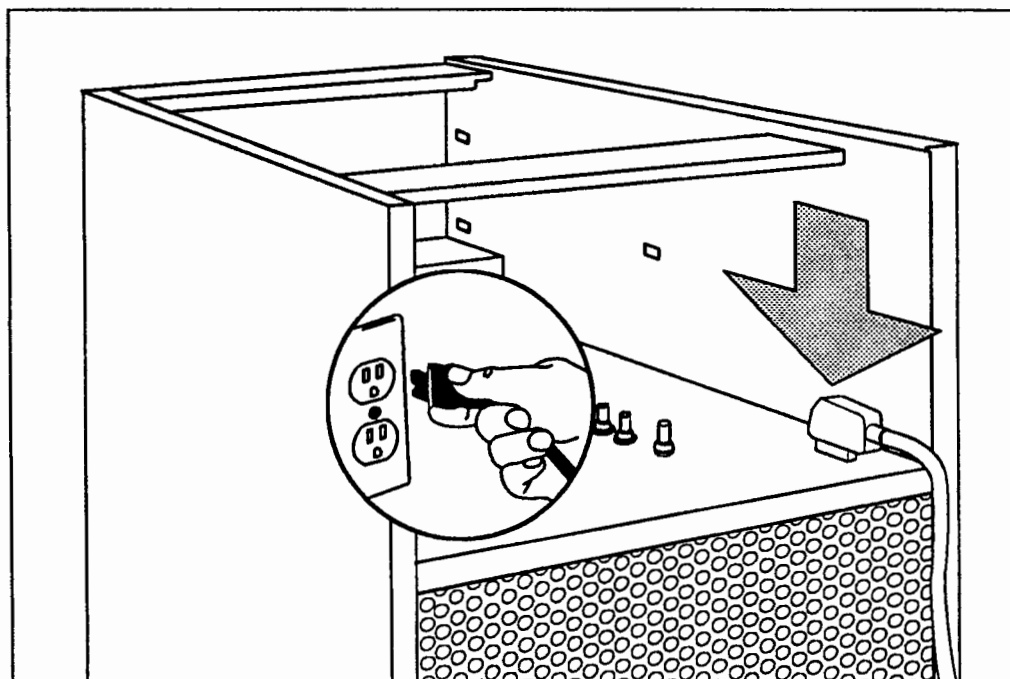


LG200171_047

Figure 4-113. Connecting the Power Cord to the HP 98735A/36A/35B

HP 98735A/36A/36B Graphics Display Controllers

- b. Connect the other end of the power cord to the power outlet.



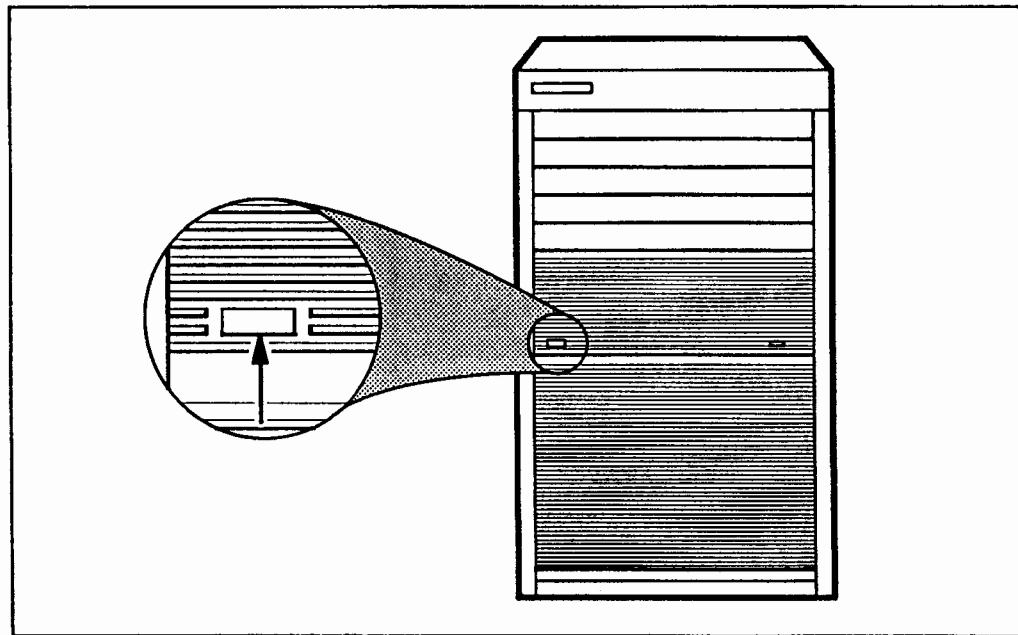
LG200171_048

Figure 4-114. Connecting the Power Cord to the Power Outlet

- c. *Turn on the monitor.*

HP 98735A/36A/36B Graphics Display Controllers

d. *Turn on the HP 98735A/36A/36B.*

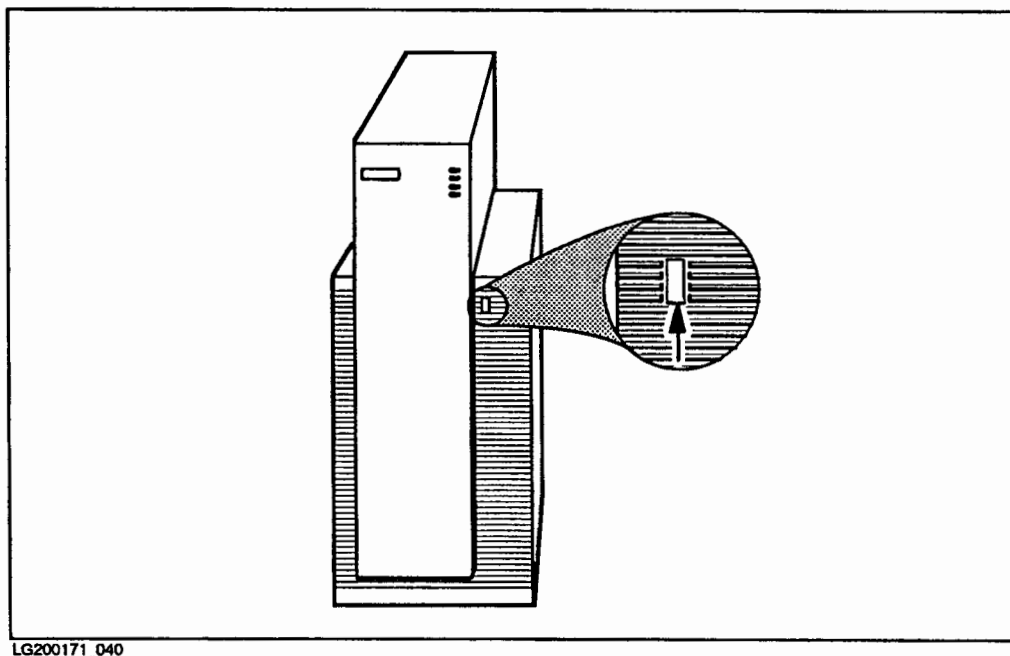


LG200171_039

Figure 4-115. HP 98735A/36A/36B Power Switch

HP 98735A/36A/36B Graphics Display Controllers

e. *Turn on the computer.*



LG200171_040

Figure 4-116. Model 400s and 433s Power Switch

HP 98735A/36A/36B Graphics Display Controllers

8. *Verify installation.*

Compare the console screen to Figure 4-117.

Note This screen is represents a Model 375 and an HP 98735B installed as the console. Other configurations may have different screen messages.

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BOOTROM Rev. D
MC68030 Processor
MC68882 Coprocessor
HIL Keyboard
HP-IB
DMA-C0
RAM 16776992 Bytes
HP98644 (RS-232) at 9
HP98625 (HS HP-IB at 15
HP98643 (LAN) at 21, 080009AAAAAA
Centronics at 23
Bit Mapped Video at 132 (console)



SEARCHING FOR A SYSTEM (Press RETURN to Pause)
RESET To Power-Up

Figure 4-117. Display Showing Boot Up Sequence with HP 98735B as Console

Hardware Installation Complete!

HP-UX Set Up Information

The following table(s) contain detailed HP-UX software set up information. If you are using SAM to set up HP-UX to communicate with your newly-connected device, you will not need to refer to the following table(s). If you are using the HP-UX commands method to set up HP-UX to communicate with your newly-connected device, you may need to refer to the following table(s).

The device file naming conventions, file type specifications, major numbers, minor number format, and device file creation examples are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Device file naming conventions are described in Chapter 7: "Setting Up Devices Using HP-UX Commands". Refer to Chapter 7: "Setting Up Devices Using HP-UX Commands" for software configuraiton information.

Table 4-35.
HP 98735-66580 Physical and Virtual DMA Interface HP-UX
Set-up Values

DIO-II Select Code	Switch MSB-LSB	mknod Minor Number	DIO-II Select Code	Switch MSB-LSB	mknod Minor Number
132-135	1000 0100	0x840200	196-199	1100 0100	0xC40200
136-139	1000 1000	0x880200	200-203	1100 1000	0xC80200
140-143	1000 1100	0x8C0200	204-207	1100 1100	0xCC0200
144-147	1001 0000	0x900200	208-211	1101 0000	0xD00200
148-151	1001 0100	0x940200	212-215	1101 0100	0xD40200
152-155	1001 1000	0x980200	216-219	1101 1000	0xD80200
156-159	1001 1100	0x9C0200	220-223	1101 1100	0xDC0200
160-163	1010 0000	0xA00200	224-227	1110 0000	0xE00200
164-167	1010 0100	0xA40200	228-231	1110 0100	0xE40200
168-171	1010 1000	0xA80200	232-235	1110 1000	0xE80200
172-175	1010 1100	0xAC0200	236-239	1110 1100	0xEC0200
176-179	1011 0000	0xB00200	240-243	1111 0000	0xF00200
180-183	1011 0100	0xB40200	244-247	1111 0100	0xF40200
184-187	1011 1000	0xB80200	248-251	1111 1000	0xF80200
188-191	1011 1100	0xBC0200	252-255	1111 1100	0xFC0200
192-195	1100 0000	0xC00200			

4-234 Installing Plotters and Graphic Devices

Setting Up HP-UX for Plotters and Graphic Devices

This chapter describes how to setup HP-UX to communicate with your plotter or graphics device. SAM supports adding a plotter but does not support following graphics products:

- HP-HIL devices
- Graphics interface cards and associated displays
 - HP 98627A Color Output Interface
 - HP 13279B Color Monitor
 - HP 98556A 2D Graphics Accelerator Accessory Card
 - HP 98548A/49A/50A High Resolution Graphics Interfaces
 - HP A1416A High Resolution Color Graphics Interface
- Graphics interface cards, controllers, and associated displays
 - HP 98287A Graphics Display Controller Interface
 - HP 98700 CX Graphics Display Controller
 - HP 98724A/98725A Local Graphics Bus Interface
 - HP 98720A SRX Graphics Display Controller
 - HP 98726A Local Graphics Bus Interface
 - HP 98730A *Turbo*SRX Graphics Display Controller
 - HP 98702A Graphics Address and Data Bus Interface
 - HP 98705A/B/C Graphics Display Controllers
 - HP 98735-66580 Physical DMA Interface
 - HP 98735-66581 Virtual DMA Interface
 - HP 98735A/36A/36B Graphics Display Controllers

For the above listed graphics products, refer to Chapter 9: "Setting Up Devices Using HP-UX Commands" for setting up HP-UX to communicate with these devices.

The following sequence of SAM menus from the main menu **System Administration Manager** will display the screen on which you will enter information specific to your plotter.

```
Peripheral Devices ->
↓
Printer and Plotters ->
↓
Add a Local Printer ...
```

If you are adding a remote plotter select **Add a Remote Printer ...**.

Enter the following information about your printer:

- plotter name
- plotter model/interface
- plotter device file name
- plotter priority (optional)
- system default option (optional)
- plotter class (optional)
- plotter connected to terminal running tsm(1) option (optional)

Use the **Tab** key to move from field to field as you fill in information on this screen. If you need additional information about a particular field, position the cursor on the field and press **Help F1**.

When you have filled in all of the information, press **Perform Task F4**.

SAM will create the device file needed to communicate with the plotter. SAM uses the device file naming convention `lp_xxxx`, where `xxxx` is the name of your plotter.

Refer to the “HP-UX Set Up information” for your particular plotter to retrieve the driver name for your plotter. Check the kernel configuration to ensure that the driver is part of the current kernel configuration. To find out how to reconfigure your kernel, refer to the *System Administration Tasks Manual* Chapter 11: “Reconfiguring the HP-UX Kernel”.

5-2 Setting Up HP-UX for Plotters and Graphic Devices

Installing Computer Accessories

This chapter contains the hardware installation instructions for the following peripherals:

- HP 35723A HP Touch Bezel
- HP 37212A 300/1200 Baud Modem
- HP 45911A Graphics Tablet
- HP 46020/21 Keyboards
- HP 46060A/B Mouse
- HP 46080A Extension Module
- HP 46081A Speaker Module
- HP 46082A/B Remote Extension Modules
- HP 46083A Rotary Control Knob
- HP 46084A ID Module
- HP 46085A Control Dials Module
- HP 46086A Button Box
- HP 46087/88A Digitizers and\HP 46089A Cursor
- HP 46094A Quadrature Port
- HP 92205A/C Hayes Smartmodem 1200
- HP 92916A Bar Code Reader

HP 35723A HP-HIL HP Touch Bezel

The HP 35723A is a user-installable bezel which adds touchscreen capability to the HP 35731 and 35741 12-inch video monitors. It connects to your computer via the HP-HIL interface.

Refer to Appendix C: "Series 400 Support Matrix" for hardware and software support information.

Connecting the HP 35723A HP Touch Bezel

Note	Connecting and disconnecting HP-HIL devices while some language/operating systems or application programs are running may lead to unpredictable results. When possible, connect all needed HP-HIL devices to your computer before booting a language/operating system or running an application program.
-------------	--

1. Turn your computer and monitor off.
2. Tilt your monitor screen up as far as it goes. Grasp the inner plastic frame by the lower corners, then pull it up and toward you in one even motion (Figure 6-1).

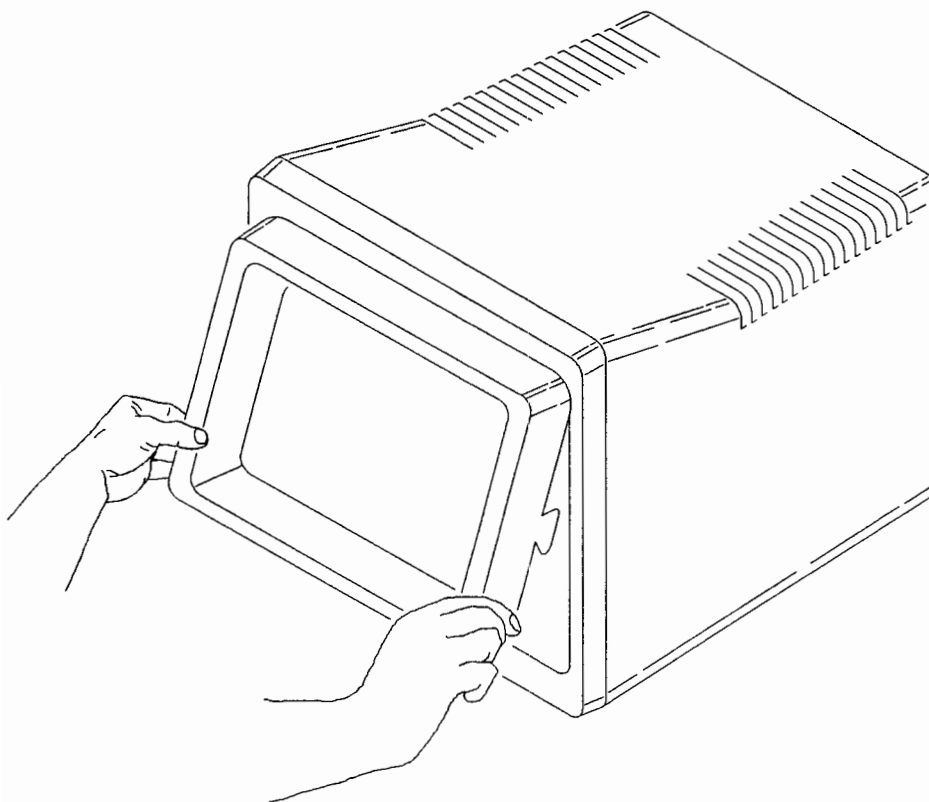


Figure 6-1.
Removing CRT bezel

HP 35723A HP Touch Bezel

3. Locate the connector socket on your monitor (on the right at the bottom of the display tube). If there is a plug in the socket, remove it (Figure 6-2).

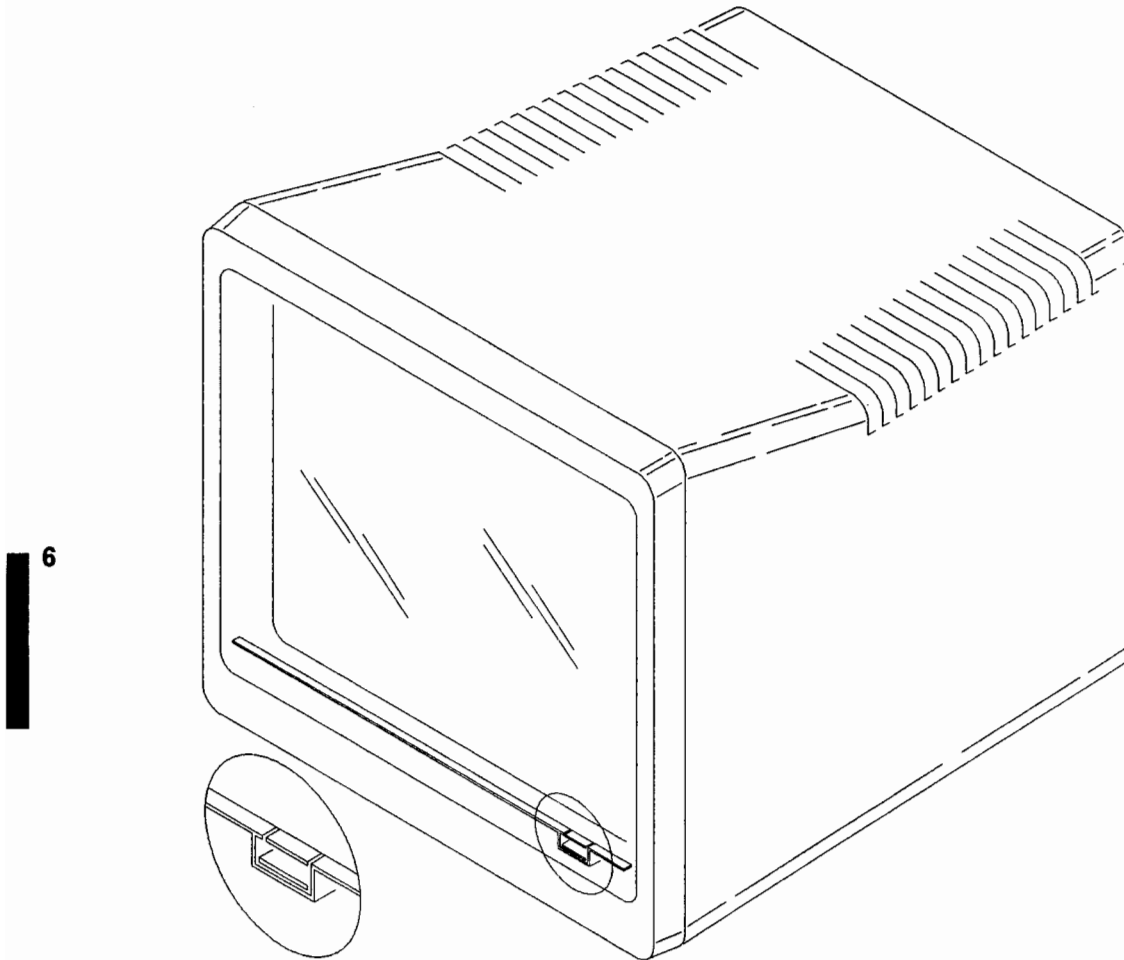


Figure 6-2.
Locating socket on monitor

6-4 Installing Computer Accessories

HP 35723A HP Touch Bezel

4. Place HP Touch flat on the table in front of the monitor so that the plug on the end of the HP Touch ribbon cable lines up with the socket on your monitor (Figure 6-3).

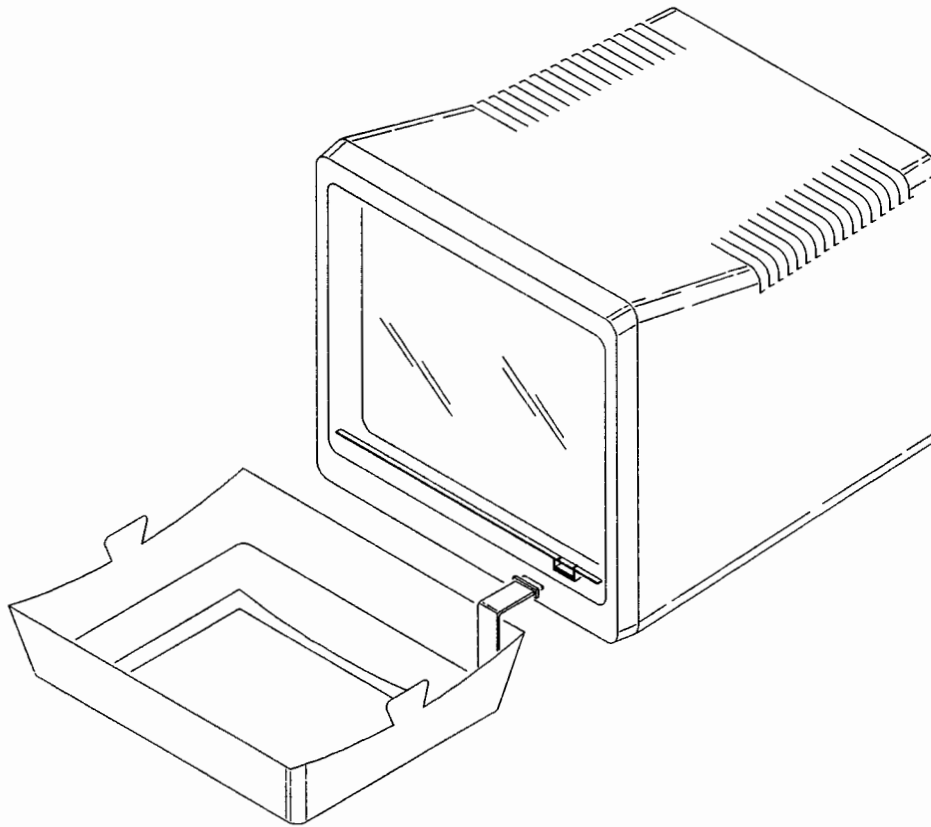


Figure 6-3.
Aligning HP Touch plug with monitor socket

HP 35723A HP Touch Bezel

5. Connect the HP Touch cable plug to the socket on the monitor. Make sure the cable is not twisted. The plug clicks into the socket when the connection is properly made (Figure 6-4).

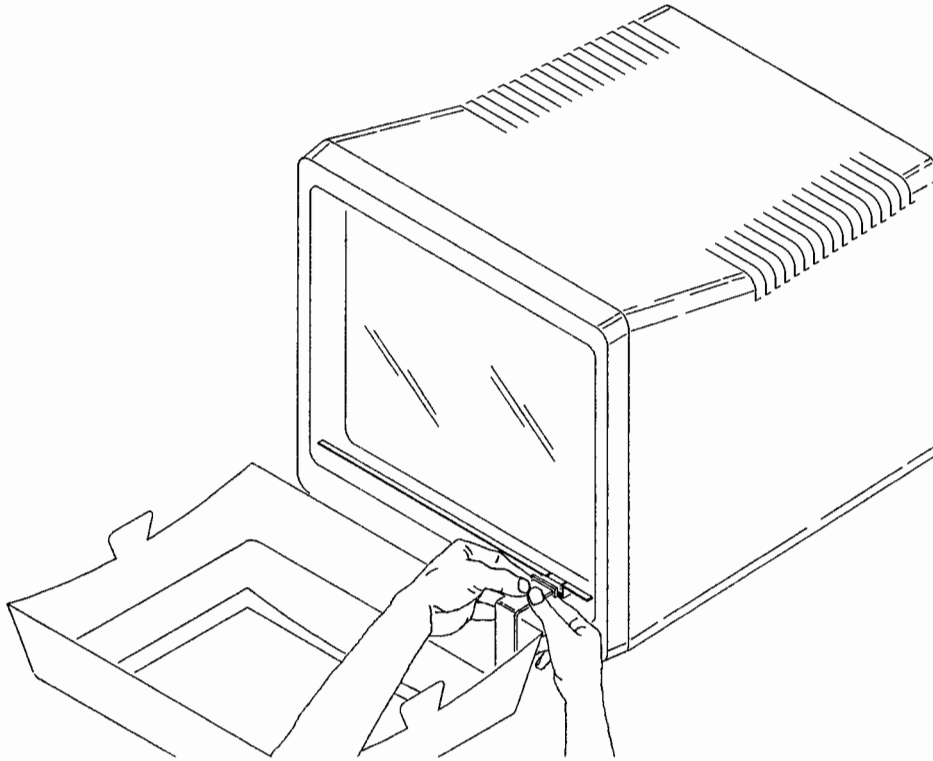


Figure 6-4.
Connecting plug to socket

HP 35723A HP Touch Bezel

6. Hold HP Touch in front of the monitor. Tilt the top of HP Touch toward the monitor. Line up the upper edge of HP Touch's side mounting tabs so that they slip under the retainer clips on the monitor (Figure 6-5).

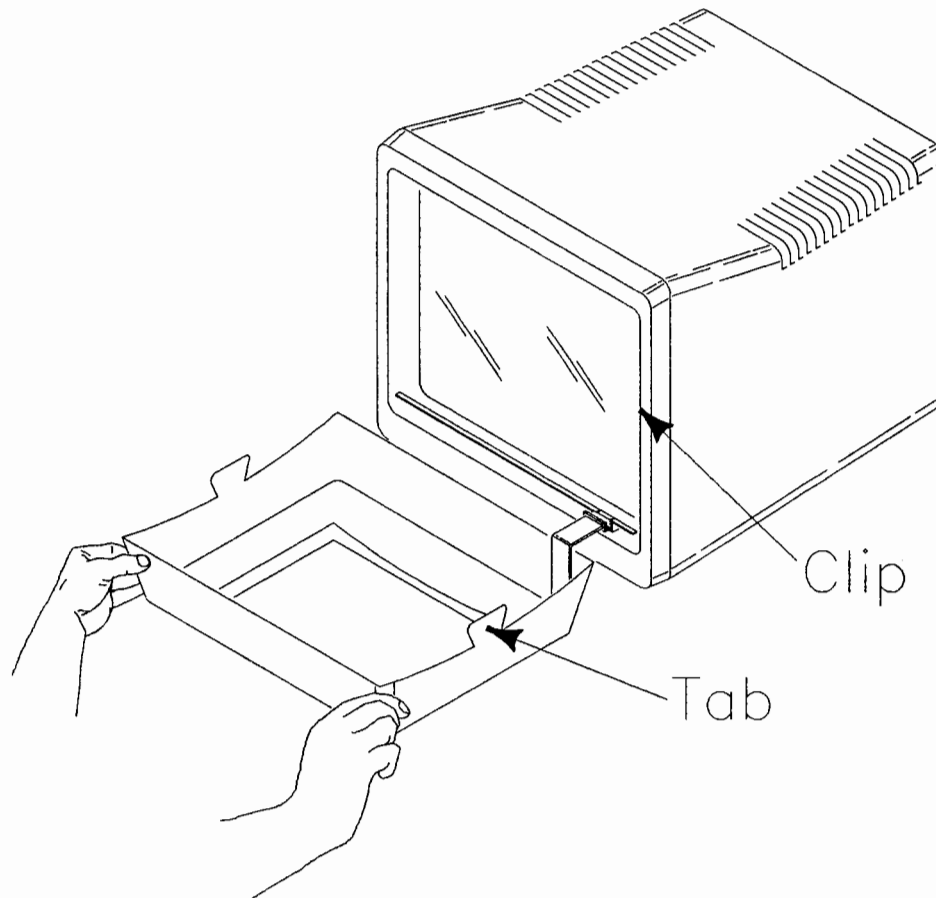


Figure 6-5.
Aligning HP Touch with monitor

HP 35723A HP Touch Bezel

7. Placing your thumbs under the lower corners of HP Touch, push up and toward the monitor until HP Touch snaps firmly into place. Make sure that the cable does not protrude from HP Touch. If it does protrude, pull out the bottom edge of HP Touch, push the cable under and snap HP Touch back into place (Figure 6-6).

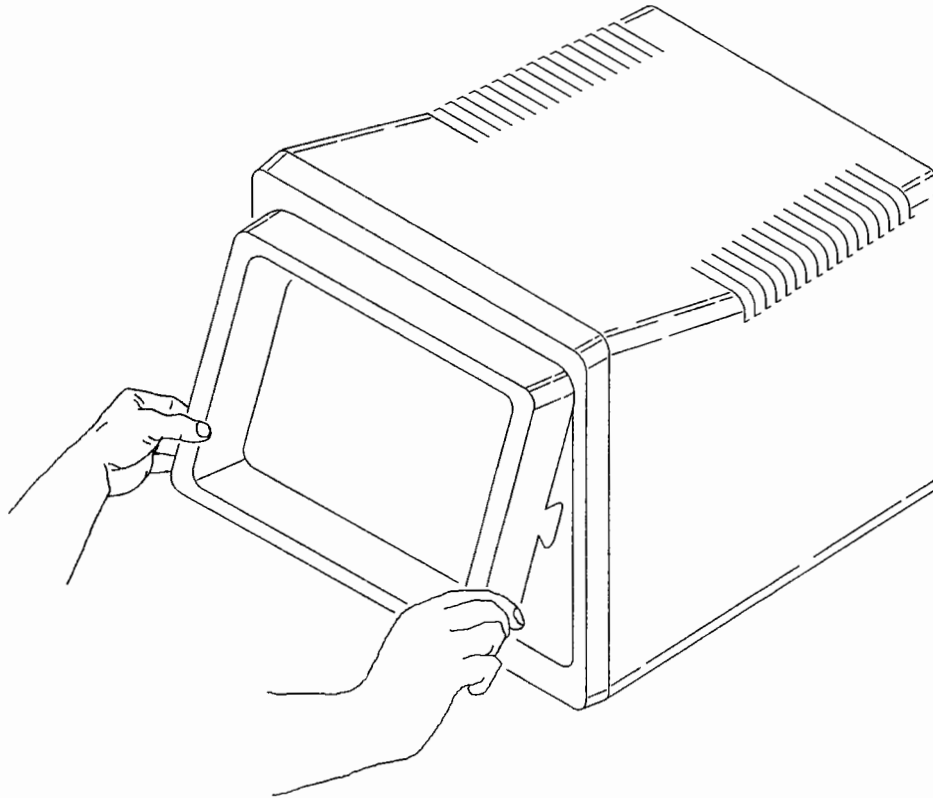


Figure 6-6.
Attaching HP Touch

8. Find the HP-HIL cable that you purchased for the monitor. A separate HP-HIL cable is required to connect the monitor to your HP-HIL interface.

6-8 Installing Computer Accessories

9. Find the end of the cable that is marked with one black dot.
10. Find the HP-HIL connector on the back of the monitor that is marked with one dot (the inner-most HP-HIL connector).
11. Plug the “one-dot” end of the cable into the “one-dot” connector on the monitor.
12. Connect the other, “two-dot” end of the cable into the HP-HIL connector on your computer (marked “KYBD” or “KEYBOARD”), or to the “two-dot” connector of the last HP-HIL device you installed (e.g. keyboard).
13. Keep these constraints in mind:
 - You cannot have more than seven HP-HIL addressable devices connected to your computer at one time. The HP 46080A, 46081A, 46082A and 46082B Extension modules and the HP 46089A Four-Button Cursor do not count as addressable devices, and the HP 46085A Control Dials Module counts as *three* addressable devices. All other devices count as one addressable device.
 - The current requirements of all of your devices must not exceed 750 milliamps (mA). To make sure you do not exceed this requirement, total up the typical power required by each of your HP-HIL devices as given in the following “HP-UX Setup Information” sections. If the total exceeds 750 mA, you must remove one or more devices.

Hardware Installation Complete!

HP 35723A HP Touch Bezel

HP-UX Setup Information

This section contains information needed to configure the newly added device into the HP-UX operating system. Copy this information to the foldout worksheet end of this book.

Refer to Chapter 7: "Setting Up Devices Using HP-UX Commands" for additional software configuration information of HP-HIL devices.

Note HP-HIL devices can be added to or removed from the HP-HIL interface without affecting the HP-UX operating system. However, if you are running an application which requires the use of a particular device and you remove the device from the link, open the link to the device, or open the link to add a new device, your application might not recognize the change and may not work as expected.

Table 6-1. HP 35723A HP Touch Bezel

Device Name	Path Name	File Type	Major Number	Minor Number ¹	Power Req.
HP 35723A	/dev/r8042	c	23	0x000000	133 mA
HP 35723A	/dev/touch	c	24	0x000020	133 mA

¹ The second minor number in the table assumes the digitizer is the second device on the HP-HIL interface (address=2). If this is not the case, substitute the correct position (address) of the digitizer in place of the 2 in the minor number (e.g., if the digitizer is the third device on the interface, the minor number would be 0x000030). Minor number formats are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

HP 46020/21 HP-HIL Keyboards

The HP 46020/21 Keyboards are offered in 17 languages and connects to your computer via the HP-HIL interface.

Refer to Appendix C: "Series 400 Support Matrix" for hardware and software support information.

HP 46020/21 HP-HIL Keyboards

Connecting the HP 46020/21 HP-HIL Keyboards

Note Connecting and disconnecting HP-HIL devices while some language/operating systems or application programs are running may lead to unpredictable results. When possible, connect all needed HP-HIL devices to your computer before booting a language/operating system or running an application program.

1. Find the HP-HIL cable that came with your computer.
2. Find the end of the cable that is marked with one black dot.
3. Find the connector on the back of the keyboard that is marked with one dot.
4. Plug the “one-dot” end of the cable into the “one-dot” connector on the keyboard.
5. Connect the other, “two-dot” end of the cable into the HP-HIL connector on your computer (marked “KYBD” or “KEYBOARD”), or to the “two-dot” connector of the last HP-HIL device you installed.
6. Keep these constraints in mind:
 - You cannot have more than seven HP-HIL addressable devices connected to your computer at one time. The HP 46080A, 46081A, 46082A and 46082B Extension modules and the HP 46089A Four-Button Cursor do not count as addressable devices, and the HP 46085A Control Dials Module counts as *three* addressable devices. All other devices count as one addressable device.
 - The current requirements of all of your devices must not exceed 750 milliamps (mA). To make sure you do not exceed this requirement, total up the typical power required by each of your HP-HIL devices as given in the following “HP-UX Setup Information” sections. If the total exceeds 750 mA, you must remove one or more devices.

Hardware Installation Complete!

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HP-UX Set Up Information

This section contains information needed to configure the newly added device into the HP-UX operating system. Copy this information to the foldout worksheet end of this book.

Refer to Chapter 7: "Setting Up Devices Using HP-UX Commands" for additional software configuration information of HP-HIL devices.

Note HP-HIL devices can be added to or removed from the HP-HIL interface without affecting the HP-UX operating system. However, if your application requires the use of a particular device and you remove the device from the link, open the link to the device, or open the link to add a new device, your application might not recognize the change and may not work as expected.

Table 6-2. HP 46020/21 Keyboard HP-UX Set Up Information

Device Name	Path Name	File Type	Major Number	Minor Number ¹	Power Req.
HP 46020/21	/dev/r8042	c	23	0x000000	67 mA
HP 46020/21	/dev/rkbd	c	24	0x000010	67 mA

¹ The second minor number in the table assumes the keyboard is in the first device on the HP-HIL interface (address=1). If this is not the case, substitute the correct position (address) of the keyboard in place of the 1 in the minor number (e.g., if the keyboard is the third device on the interface, the minor number would be 0x000030). Minor number formats are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

HP 46060A/B HP-HIL Mouse

The HP 46060A is a two-button mouse; the HP 46060B is a three-button mouse. The mouse connects to your computer via the HP-HIL interface and must be the last device in the chain of HP-HIL devices connected to the interface.

Refer to Appendix C: "Series 400 Support Matrix" for hardware and software support information.

Connecting the HP 46060A/B HP-HIL Mouse

Note	Connecting and disconnecting HP-HIL devices while some language/operating systems or application programs are running may lead to unpredictable results. When possible, connect all needed HP-HIL devices to your computer before booting a language/operating system or running an application program.
-------------	--

1. Install all other HP-HIL devices first. The HP 46060A/B Mouse must be the last device you connect to the interface.
2. Turn the mouse upside down and locate the ball housing cover. Remove the ball housing cover by turning it counterclockwise.
3. Insert the ball into its housing. Replace the cover and secure it by turning it clockwise.
4. Connect the end of the mouse cable into the “two-dot” HP-HIL connector of the last HP-HIL device you installed. If you’ve just installed your computer, the last HP-HIL device you installed is your keyboard.
5. Keep these constraints in mind:
 - You cannot have more than seven HP-HIL addressable devices connected to your computer at one time. The HP 46080A, 46081A, 46082A and 46082B Extension modules and the HP 46089A Four-Button Cursor do not count as addressable devices, and the HP 46085A Control Dials Module counts as *three* addressable devices. All other devices count as one addressable device.
 - The current requirements of all of your devices must not exceed 750 milliamps (mA). To make sure you do not exceed this requirement, total up the typical power required by each of your HP-HIL devices as given in the following “HP-UX Setup Information” sections. If the total exceeds 750 mA, you must remove one or more devices.

Hardware Installation Complete!

HP 46060A/B HP-HIL Mouse

HP-UX Set Up Information

This section contains information needed to configure the newly added device into the HP-UX operating system. Copy this information to the foldout worksheet end of this book.

Refer to Chapter 7: "Setting Up Devices Using HP-UX Commands" for additional software configuration information of HP-HIL devices.

Note HP-HIL devices can be added to or removed from the HP-HIL interface without affecting the HP-UX operating system. However, if your application requires the use of a particular device and you remove the device from the link, open the link to the device, or open the link to add a new device, your application might not recognize the change and may not work as expected.

Table 6-3.
HP 46060A/B HP-HIL Mouse HP-UX Set Up Information

Device Name	Path Name	File Type	Major Number	Minor Number ¹	Power Req.
HP 46060A/B	/dev/r8042	c	23	0x000000	133 mA
HP 46060A/B	/dev/mouse	c	24	0x000020	133 mA

¹ The second minor number in the table assumes the mouse is the second device on the HP-HIL interface (address=2). If this is not the case, substitute the correct position (address) of the mouse in place of the 2 in the minor number (e.g., if the mouse is the third device on the interface, the minor number would be 0x000030). Minor number formats are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

HP 46080A HP-HIL Extension Module

The HP 46080A is used to extend the distance between HP-HIL devices. It connects to your computer via the HP-HIL interface, and occupies no HP-HIL address.

Refer to Appendix C: "Series 400 Support Matrix" for hardware and software support information.

Connecting the HP 46080A HP-HIL Extension Module

Note	Connecting and disconnecting HP-HIL devices while some language/operating systems or application programs are running may lead to unpredictable results. When possible, connect all needed HP-HIL devices to your computer before booting a language/operating system or running an application program.
-------------	--

1. Select a suitable mounting location for the connector box. Remove the paper backing from the back of the fastener pad. Place the pad at the location and press down firmly for a few seconds. Attach the connector box to the fastener pad.
2. Turn the computer off.
3. Find the end of the HP-HIL cable that is marked with one black dot.
4. Find the HP-HIL connector on the connector box that is marked with one dot.
5. Plug the “one-dot” end of the cable into the “one-dot” connector on the connector box.
6. Connect the other, “two-dot” end of the cable into the HP-HIL connector on your computer (marked “KYBD” or “KEYBOARD”), or to the “two-dot” connector of the last HP-HIL device you installed (e.g. keyboard).

7. Keep these constraints in mind:

- You cannot have more than seven HP-HIL addressable devices connected to your computer at one time. The HP 46080A, 46081A, 46082A and 46082B Extension modules and the HP 46089A Four-Button Cursor do not count as addressable devices, and the HP 46085A Control Dials Module counts as *three* addressable devices. All other devices count as one addressable device.
- The current requirements of all of your devices must not exceed 750 milliamps (mA). To make sure you do not exceed this requirement, total up the typical power required by each of your HP-HIL devices as given in the following “HP-UX Setup Information” sections. If the total exceeds 750 mA, you must remove one or more devices.

Hardware Installation Complete!

HP 46080A HP-HIL Extension Module

HP-UX Set Up Information

This section contains information needed to configure the newly added device into the HP-UX operating system. Copy this information to the foldout worksheet end of this book.

Refer to Chapter 7: "Setting Up Devices Using HP-UX Commands" for additional software configuration information of HP-HIL devices.

Note

HP-HIL devices can be added to or removed from the HP-HIL interface without affecting the HP-UX operating system. However, if your application requires the use of a particular device and you remove the device from the link, open the link to the device, or open the link to add a new device, your application might not recognize the change and may not work as expected.

Table 6-4. HP 46080A HP-HIL Extension Module

Device Name	Path Name	File Type	Major Number	Minor Number	Power Req.
HP 46080A	—	—	—	—	17 mA

HP 46081A HP-HIL Extension/Speaker Module

The HP 46081A HIL Extension/Speaker Module is used to extend the distance between HP-HIL devices and includes an audio speaker on a separate circuit, with a 2.4m audio cable. It connects to your computer via the HP-HIL interface, and occupies no HP-HIL address.

Refer to Appendix C: "Series 400 Support Matrix" for hardware and software support information.

HP 46081A HP-HIL Extension/Speaker Module

Connecting the HP 46081A HP-HIL Extension/Speaker Module

Note	Connecting and disconnecting HP-HIL devices while some language/ operating systems or application programs are running may lead to unpredictable results. When possible, connect all needed HP-HIL devices to your computer before booting a language/operating system or running an application program.
-------------	---

1. Select a suitable mounting location for the Speaker Module. Remove the paper backing from the back of the fastener pad. Place the pad at the location and press down firmly for a few seconds. Attach the Speaker Module to the fastener pad.
2. Turn the computer off and check whether there is an existing HP-HIL cable connected to the “KYBD” (or “KEYBOARD”) connector on the back of the computer. If so, disconnect it.
3. Find the end of the HP-HIL cable that is marked with one black dot.
4. Find the connector on the back of the Speaker Module that is marked with one dot.
5. Plug the “one-dot” end of the cable into the “one-dot” connector on the Speaker Module.
6. Connect the other, “two-dot” end of the cable into the HP-HIL connector on your computer (marked “KYBD” or “KEYBOARD”).
7. Plug either end of the furnished audio cable into the audio jack on the Speaker Module. Plug the other end of the audio cable into the audio jack near the HP-HIL connector on your computer.
8. If you disconnected an HP-HIL device from the computer in step 2, reconnect it to the “two-dot” jack on the speaker module.
9. Keep these constraints in mind:
 - You cannot have more than seven HP-HIL addressable devices connected to your computer at one time. The HP 46080A, 46081A, 46082A and 46082B Extension modules and the HP 46089A Four-Button Cursor do not count as addressable devices, and the HP 46085A Control Dials

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HP 46081A HP-HIL Extension/Speaker Module

Module counts as *three* addressable devices. All other devices count as one addressable device.

- The current requirements of all of your devices must not exceed 750 milliamps (mA). To make sure you do not exceed this requirement, total up the typical power required by each of your HP-HIL devices as given in the following “HP-UX Setup Information” sections. If the total exceeds 750 mA, you must remove one or more devices.

Hardware Installtion Complete!

HP 46081A HP-HIL Extension/Speaker Module

HP-UX Setup Information

This section contains information needed to configure the newly added device into the HP-UX operating system. Copy this information to the foldout worksheet end of this book.

Refer to Chapter 7: "Setting Up Devices Using HP-UX Commands" for additional software configuration information of HP-HIL devices.

Note HP-HIL devices can be added to or removed from the HP-HIL interface without affecting the HP-UX operating system. However, if your application requires the use of a particular device and you remove the device from the link, open the link to the device, or open the link to add a new device, your application might not recognize the change and may not work as expected.

Table 6-5. HP 46081A HIL Extension/Speaker Module

Device Name	Path Name	File Type	Major Number	Minor Number	Power Req.
HP 46081A	—	—	—	—	17 mA

HP 46082A/B HP-HIL Remote Extension Modules

The HP 46082A/B are used to extend the distance between HP-HIL devices and between monitors and their video interfaces. Both connect to your computer via the HP-HIL interface, and occupy no HP-HIL addresses.

Refer to Appendix C: "Series 400 Support Matrix" for hardware and software support information.



Connecting the HP 46082A/B HP-HIL Remote Extension Modules

Note	Connecting and disconnecting HP-HIL devices while some language/operating systems or application programs are running may lead to unpredictable results. When possible, connect all needed HP-HIL devices to your computer before booting a language/operating system or running an application program.
-------------	--

1. *Install the Control Boxes.*

- a. Select mounting locations for the control boxes. The control box near the computer must be within 500mm (1.64 feet) of the back of the computer.
- b. Remove the paper covering from the back of the fastener pads.
- c. Place the fastener pads at the selected locations and press down firmly for a few seconds.
- d. Slide the control boxes onto the fastener pads from the side.
- e. Twist the control boxes a few degrees to lock them onto the fastener pads.

2. *Connect the Extension Module.*

- a. Turn the computer off and check whether there is an existing HP-HIL cable connected to the "KYBD" (or "KEYBOARD") connector on the back of the computer. If so, disconnect it.
- b. Get the short HP-HIL cable. Find the end of this cable that is marked with one black dot.
- c. Look at the control module nearest the computer. Find the connector on the back of this control module that is marked with one dot.
- d. Plug the "one-dot" end of the short HP-HIL cable into the "one-dot" connector on the nearest control module.
- e. Connect the other, "two-dot" end of the short HP-HIL cable into the HP-HIL connector on your computer (marked "KYBD" or "KEYBOARD").

HP 46082A/B HP-HIL Remote Extension Modules

- f. Plug either end of the furnished audio cable into the audio jack on the same control module. Plug the other end of the audio cable into the audio jack near the HP-HIL connector on your computer.
- g. Plug either end of the extension cable into the control box nearest the computer.
- h. Plug the other end of the extension cable into the other (distant) control box.
- i. If you disconnected an HP-HIL device from the computer in step 2-a, reconnect it to the “two-dot” jack on the distant control box.
- j. Plug one end of each video cable into the corresponding video connector in the computer. The ends are interchangeable. Refer to the red, green and blue labels attached to the cables.
- k. Plug the other end of each video cable into the video input connectors on the monitor. Again refer to the color-coded labels attached to the cables.

3. *Keep These Constraints In Mind:*

- You cannot have more than seven HP-HIL addressable devices connected to your computer at one time. The HP 46080A, 46081A, 46082A and 46082B Extension modules and the HP 46089A Four-Button Cursor do not count as addressable devices, and the HP 46085A Control Dials Module counts as *three* addressable devices. All other devices count as one addressable device.
- The current requirements of all of your devices must not exceed 750 milliamps (mA). To make sure you do not exceed this requirement, total up the typical power required by each of your HP-HIL devices as given in the following “HP-UX Setup Information” sections. If the total exceeds 750 mA, you must remove one or more devices.

Hardware Installation Complete!

HP 46082A/B HP-HIL Remote Extension Modules

HP-UX Setup Information

This section contains information needed to configure the newly added device into the HP-UX operating system. Copy this information to the foldout worksheet end of this book.

Refer to Chapter 7: "Setting Up Devices Using HP-UX Commands" for additional software configuration information of HP-HIL devices.

Note HP-HIL devices can be added to or removed from the HP-HIL interface without affecting the HP-UX operating system. However, if your application requires the use of a particular device and you remove the device from the link, open the link to the device, or open the link to add a new device, your application might not recognize the change and may not work as expected.

Table 6-6. HP 46082A/B HP-HIL Remote Extension Modules

Device Name	Path Name	File Type	Major Number	Minor Number	Power Req.
HP 46082A/B	—	—	—	—	33 mA

HP 46083A HP-HIL Rotary Control Knob

The HP 46083A provides 2-axis relative cursor positioning via a rotary knob and 2-axis toggle button. It is best suited for text editing and spreadsheet applications. The HP 46083A connects to your computer via the HP-HIL interface.

Refer to Appendix C: "Series 400 Support Matrix" for hardware and software support information.

HP 46083A HP-HIL Rotary Control Knob

Connecting the HP 46083A HP-HIL Rotary Control Knob

Note	Connecting and disconnecting HP-HIL devices while some language/operating systems or application programs are running may lead to unpredictable results. When possible, connect all needed HP-HIL devices to your computer before booting a language/operating system or running an application program.
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1. Find the HP-HIL cable that came with the rotary control knob.
2. Find the end of the cable that is marked with one black dot.
3. Find the HP-HIL connector on the rotary control knob that is marked with one dot.
4. Plug the “one-dot” end of the cable into the “one-dot” connector on the rotary control knob.
5. Connect the other, “two-dot” end of the cable into the HP-HIL connector on your computer (marked “KYBD” or “KEYBOARD”), or to the “two-dot” connector of the last HP-HIL device you installed (e.g. keyboard).
6. Keep these constraints in mind:
 - You cannot have more than seven HP-HIL addressable devices connected to your computer at one time. The HP 46080A, 46081A, 46082A and 46082B Extension modules and the HP 46089A Four-Button Cursor do not count as addressable devices, and the HP 46085A Control Dials Module counts as *three* addressable devices. All other devices count as one addressable device.
 - The current requirements of all of your devices must not exceed 750 milliamps (mA). To make sure you do not exceed this requirement, total up the typical power required by each of your HP-HIL devices as given in the following “HP-UX Setup Information” sections. If the total exceeds 750 mA, you must remove one or more devices.

Hardware Installation Complete!

HP-UX Setup Information

This section contains information needed to configure the newly added device into the HP-UX operating system. Copy this information to the foldout worksheet end of this book.

Refer to Chapter 7: "Setting Up Devices Using HP-UX Commands" for additional software configuration information of HP-HIL devices.

Note HP-HIL devices can be added to or removed from the HP-HIL interface without affecting the HP-UX operating system. However, if your application requires the use of a particular device and you remove the device from the link, open the link to the device, or open the link to add a new device, your application might not recognize the change and may not work as expected.

Table 6-7. HP 46083A HP-HIL Rotary Control Knob

Device Name	Path Name	File Type	Major Number	Minor Number ¹	Power Req.
HP 46083A	/dev/r8042	c	23	0x000000	73 mA
HP 46083A	/dev/knob	c	24	0x000020	73 mA

¹ The second minor number in the table assumes the rotary control knob is the second device on the HP-HIL interface (address=2). If this is not the case, substitute the correct position (address) of the rotary control knob in place of the 2 in the minor number (e.g., if the rotary control knob is the third device on the interface, the minor number would be 0x000030). Minor number formats are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

HP 46084A HP-HIL ID Module

The HP 46084A HP-HIL ID Module contains a unique, machine-readable serial number required by software which uses HP's "Codeword Delivery" security scheme (e.g., HP 98305A HP EGS), or software which is customized to an HP 46084A. It connects to your computer via the HP-HIL interface.

Refer to Appendix C: "Series 400 Support Matrix" for hardware and software support information.

Connecting the HP 46084A HP-HIL ID Module

Note	Connecting and disconnecting HP-HIL devices while some language/operating systems or application programs are running may lead to unpredictable results. When possible, connect all needed HP-HIL devices to your computer before booting a language/operating system or running an application program.
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1. Find the HP-HIL cable that came with the ID Module.
2. Find the end of the cable that is marked with one black dot.
3. Find the HP-HIL connector on the ID Module that is marked with one dot.
4. Plug the “one-dot” end of the cable into the “one-dot” connector on the ID Module.
5. Connect the other, “two-dot” end of the cable into the HP-HIL connector on your computer (marked “KYBD” or “KEYBOARD”), or to the “two-dot” connector of the last HP-HIL device you installed (e.g. keyboard).
6. Keep these constraints in mind:
 - You cannot have more than seven HP-HIL addressable devices connected to your computer at one time. The HP 46080A, 46081A, 46082A and 46082B Extension modules and the HP 46089A Four-Button Cursor do not count as addressable devices, and the HP 46085A Control Dials Module counts as *three* addressable devices. All other devices count as one addressable device.
 - The current requirements of all of your devices must not exceed 750 milliamps (mA). To make sure you do not exceed this requirement, total up the typical power required by each of your HP-HIL devices as given in the following “HP-UX Setup Information” sections. If the total exceeds 750 mA, you must remove one or more devices.

Hardware Installation Complete!

HP 46084A HP-HIL ID Module

HP-UX Set Up Information

This section contains information needed to configure the newly added device into the HP-UX operating system. Copy this information to the foldout worksheet end of this book.

Refer to Chapter 7: "Setting Up Devices Using HP-UX Commands" for additional software configuration information of HP-HIL devices.

Note HP-HIL devices can be added to or removed from the HP-HIL interface without affecting the HP-UX operating system. However, if your application requires the use of a particular device and you remove the device from the link, open the link to the device, or open the link to add a new device, your application might not recognize the change and may not work as expected.

Table 6-8. HP 46084A HP-HIL ID Module

Device Name	Path Name	File Type	Major Number	Minor Number ¹	Power Req.
HP 46084A	/dev/r8042	c	23	0x000000	40 mA
HP 46084A	/dev/security	c	24	0x000020	40 mA

¹ The second minor number in the table assumes the ID Module is the second device on the HP-HIL interface (address=2). If this is not the case, substitute the correct position (address) of the ID Module in place of the 2 in the minor number (e.g., if the ID Module is the third device on the interface, the minor number would be 0x000030). Minor number formats are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

HP 46085A HP-HIL Control Dials Module

The HP 46085A HP-HIL Control Dials Module provides nine graphics positioning devices, implemented as three 3-axis devices. The control dials module is commonly used in graphics display applications to provide 3-axis attitude, 3-axis translation, scaling and other attribute functions. It connects to your computer via the HP-HIL interface and occupies three addresses.

Refer to Appendix C: "Series 400 Support Matrix" for hardware and software support information.

Connecting the HP 46085A HP-HIL Control Dials Module

Note Connecting and disconnecting HP-HIL devices while some language/operating systems or application programs are running may lead to unpredictable results. When possible, connect all needed HP-HIL devices to your computer before booting a language/operating system or running an application program.

1. Find the HP-HIL cable that came with the control dials module.
2. Find the end of the cable that is marked with one black dot.
3. Find the HP-HIL connector on the control dials module that is marked with one dot.
4. Plug the “one-dot” end of the cable into the “one-dot” connector on the control dials module.
5. Connect the other, “two-dot” end of the cable into the HP-HIL connector on your computer (marked “KYBD” or “KEYBOARD”), or to the “two-dot” connector of the last HP-HIL device you installed (e.g. keyboard).
6. Keep these constraints in mind:
 - You cannot have more than seven HP-HIL addressable devices connected to your computer at one time. The HP 46080A, 46081A, 46082A and 46082B Extension modules and the HP 46089A Four-Button Cursor do not count as addressable devices, and the HP 46085A Control Dials Module counts as *three* addressable devices. All other devices count as one addressable device.
 - The current requirements of all of your devices must not exceed 750 milliamps (mA). To make sure you do not exceed this requirement, total up the typical power required by each of your HP-HIL devices as given in the following “HP-UX Setup Information” sections. If the total exceeds 750 mA, you must remove one or more devices.

Hardware Installation Complete!

HP-UX Set Up Information

This section contains information needed to configure the newly added device into the HP-UX operating system. Copy this information to the foldout worksheet end of this book.

Refer to Chapter 7: "Setting Up Devices Using HP-UX Commands" for additional software configuration information of HP-HIL devices.

Note HP-HIL devices can be added to or removed from the HP-HIL interface without affecting the HP-UX operating system. However, if your application requires the use of a particular device and you remove the device from the link, open the link to the device, or open the link to add a new device, your application might not recognize the change and may not work as expected.

Table 6-9. HP 46085A HP-HIL Control Dials Module

Device Name	Path Name	File Type	Major Number	Minor Number ¹	Power Req.
HP 46085A	/dev/r8042	c	23	0x000000	213mA
HP 46085A	/dev/dial.top	c	24	0x000020	213mA
HP 46085A	/dev/dial.mid	c	24	0x000030	213mA
HP 46085A	/dev/dial.bot	c	24	0x000040	213mA

¹ The second, third and fourth minor numbers in the table assume the control dials module is the second device on the HP-HIL interface, thus occupying addresses 2, 3 and 4. If this is not the case, substitute the correct position (address) of the control dials module in place of the 2 in the second minor number, and change the third and fourth minor numbers accordingly (e.g., if the device is the fourth device on the interface, the last three minor numbers would be 0x000040, 0x000050 and 0x000060, respectively). Minor number formats are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

HP 46086A HP-HIL Button Box

The HP 46086A HP-HIL Button Box provides 32 user-definable buttons for menu selection, and one user-programmable LED. Buttons can be labeled with defined functions, freeing the display for other uses. It includes one pre-printed and two blank overlays, and connects to your computer via the HP-HIL interface.

Refer to Appendix C: "Series 400 Support Matrix" for hardware and software support information.

Connecting the HP 46086A HP-HIL Button Box

Note	Connecting and disconnecting HP-HIL devices while some language/operating systems or application programs are running may lead to unpredictable results. When possible, connect all needed HP-HIL devices to your computer before booting a language/operating system or running an application program.
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1. Find the HP-HIL cable that came with the button box.
2. Find the end of the cable that is marked with one black dot.
3. Find the HP-HIL connector on the button box that is marked with one dot.
4. Plug the “one-dot” end of the cable into the “one-dot” connector on the button box.
5. Connect the other, “two-dot” end of the cable into the HP-HIL connector on your computer (marked “KYBD” or “KEYBOARD”), or to the “two-dot” connector of the last HP-HIL device you installed (e.g. keyboard).
6. Keep these constraints in mind:
 - You cannot have more than seven HP-HIL addressable devices connected to your computer at one time. The HP 46080A, 46081A, 46082A and 46082B Extension modules and the HP 46089A Four-Button Cursor do not count as addressable devices, and the HP 46085A Control Dials Module counts as *three* addressable devices. All other devices count as one addressable device.
 - The current requirements of all of your devices must not exceed 750 milliamps (mA). To make sure you do not exceed this requirement, total up the typical power required by each of your HP-HIL devices as given in the following “HP-UX Setup Information” sections. If the total exceeds 750 mA, you must remove one or more devices.

Hardware Installation Complete!

HP 46086A HP-HIL Button Box

HP-UX Set Up Information

This section contains information needed to configure the newly added device into the HP-UX operating system. Copy this information to the foldout worksheet end of this book.

Refer to Chapter 7: "Setting Up Devices Using HP-UX Commands" for additional software configuration information of HP-HIL devices.

Note HP-HIL devices can be added to or removed from the HP-HIL interface without affecting the HP-UX operating system. However, if your application requires the use of a particular device and you remove the device from the link, open the link to the device, or open the link to add a new device, your application might not recognize the change and may not work as expected.

Table 6-10. HP 46086A HP-HIL Button Box

Device Name	Path Name	File Type	Major Number	Minor Number ¹	Power Req.
HP 46086A	/dev/r8042	c	23	0x000000	53 mA
HP 46086A	/dev/buttons	c	24	0x000020	53 mA

¹ The second minor number in the table assumes the button box is the second device on the HP-HIL interface (address=2). If this is not the case, substitute the correct position (address) of the button box in place of the 2 in the minor number (e.g., if the button box is the third device on the interface, the minor number would be 0x000030). Minor number formats are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

HP 46094A HP-HIL Quadrature Port

The HP 46094A HP-HIL Quadrature Port is used to connect an off-the-shelf three-button mouse or other compatible device to the HP-HIL interface.

Refer to Appendix C: "Series 400 Support Matrix" for hardware and software support information.

Connecting the HP 46094A HP-HIL Quadrature Port

Note Connecting and disconnecting HP-HIL devices while some language/operating systems or application programs are running may lead to unpredictable results. When possible, connect all needed HP-HIL devices to your computer before booting a language/operating system or running an application program.

1. Select a suitable mounting location for the quadrature port. Remove the paper backing from the back of the fastener pad. Place the pad at the location and press down firmly for a few seconds. Slide the module unit onto the fastener pad from the side and twist the module unit a few degrees to lock it onto the fastener pad.
2. Find the end of the HP-HIL cable that is marked with one black dot.
3. Find the connector on the back of the quadrature port that is marked with one dot.
4. Plug the “one-dot” end of the cable into the “one-dot” connector on the quadrature port.
5. Connect the other, “two-dot” end of the cable into the HP-HIL connector on your computer (marked “KYBD” or “KEYBOARD”), or to the “two-dot” connector of the last HP-HIL device you installed (e.g., keyboard).
6. Connect the 3-button mouse (or other compatible device) to the 9-pin D-subminiature connector on the quadrature port and fasten the two screws with a screwdriver.
7. Keep these constraints in mind:
 - You cannot have more than seven HP-HIL addressable devices connected to your computer at one time. The HP 46080A, 46081A, 46082A and 46082B Extension modules and the HP 46089A Four-Button Cursor do not count as addressable devices, and the HP 46085A Control Dials Module counts as *three* addressable devices. All other devices count as one addressable device.

- The current requirements of all of your devices must not exceed 750 milliamps (mA). To make sure you do not exceed this requirement, total up the typical power required by each of your HP-HIL devices as given in the following "HP-UX Setup Information" sections. If the total exceeds 750 mA, you must remove one or more devices.

Hardware Installation Complete

HP-UX Setup Information

This section contains information needed to configure the newly added device into the HP-UX operating system. Copy this information to the foldout worksheet end of this book.

Refer to Chapter 7: "Setting Up Devices Using HP-UX Commands" for additional software configuration information of HP-HIL devices.

Note	HP-HIL devices can be added to or removed from the HP-HIL interface without affecting the HP-UX operating system. However, if your application requires the use of a particular device and you remove the device from the link, open the link to the device, or open the link to add a new device, your application might not recognize the change and may not work as expected.
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HP 46094A HP-HIL Quadrature Port

Table 6-11.
HP 46087/88A Digitizers and
HP 46089A Cursor
Worksheet Entries

Device Name	Path Name	File Type	Major Number	Minor Number ¹	Power Req.
HP 46087/88/89A	/dev/r8042	c	23	0x000000	133 mA
HP 46087/88/89A	/dev/digitizer	c	24	0x000020	133 mA

¹ The second minor number in the table assumes the digitizer is the second device on the HP-HIL interface (address=2). If this is not the case, substitute the correct position (address) of the digitizer in place of the 2 in the minor number (e.g., if the digitizer is the third device on the interface, the minor number would be 0x000030). Minor number formats are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Table 6-12. HP 46094A HP-HIL Quadrature Port

Device Name	Path Name	File Type	Major Number	Minor Number ¹	Power Req.
HP 46094A	/dev/r8042	c	23	0x000000	125 mA
HP 46094A	/dev/quad	c	24	0x000020	125 mA

¹ The second minor number in the table assumes the quadrature port is the second device on the HP-HIL interface (address=2). If this is not the case, substitute the correct position (address) of the quadrature port in place of the 2 in the minor number (e.g., if the quadrature port is the third device on the interface, the minor number would be 0x000030). Minor number formats are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

HP 92916A HP-HIL Bar Code Reader

The HP 92916A is a general-purpose bar code reader. It connects to your computer via the HP-HIL interface.

Refer to Appendix C: "Series 400 Support Matrix" for hardware and software support information.

Connecting the HP 92916A HP-HIL Bar Code Reader

Note Connecting and disconnecting HP-HIL devices while some language/operating systems or application programs are running may lead to unpredictable results. When possible, connect all needed HP-HIL devices to your computer before booting a language/operating system or running an application program.

1. Find the HP-HIL cable that came with the bar code reader.
2. Find the end of the cable that is marked with one black dot.
3. Find the HP-HIL connector on the bar code reader that is marked with one dot.
4. Plug the “one-dot” end of the cable into the “one-dot” connector on the bar code reader.
5. Connect the other, “two-dot” end of the cable into the HP-HIL connector on your computer (marked “KYBD” or “KEYBOARD”), or to the “two-dot” connector of the last HP-HIL device you installed (e.g. keyboard).

NOTE! Connect your HP 46020/21 keyboard to the HP-HIL interface before connecting the bar code reader. The keyboard must be “upstream” from the bar code reader in the chain of HP-HIL devices.

6. Connect the wand to the bar code reader.
7. Set the Configuration Switches:
 - a. Set the code selection switches, 1 through 3, according to your application:

Table 6-13.
HP 92916A HP-HIL Bar Code Reader
Configuration Switches

Definition	Switch 1	Switch 2	Switch 3
Interleaved 2/5	0	0	1
Codebar ABC	0	1	0
Codabar USD-4	0	1	1
UPC/EAN/JAN	1	0	0
Code 39	1	0	1

- b. Set the transmission type switch, 4, to "Keycode" by setting it to 1.
- c. Set the keyboard selection switches, 5 through 8, according to which keyboard you have. Set all switches to 0 for a US ASCII keyboard. Refer to your bar code reader manual for additional settings.
- d. Set the appended control switches, 9 and 10, to select Return by setting switch 9 to 0 and switch 10 to 1.
- e. Set the check digit switch, 11, to off (0) or on (1) depending on your application. This switch has no meaning in UPC/EAN applications.
- f. Set the field length check switches, 12 through 16, to off (all 0) unless your application requires a different setting.

HP 92916A HP-HIL Bar Code Reader

8. Keep these constraints in mind:

- You cannot have more than seven HP-HIL addressable devices connected to your computer at one time. The HP 46080A, 46081A, 46082A and 46082B Extension modules and the HP 46089A Four-Button Cursor do not count as addressable devices, and the HP 46085A Control Dials Module counts as *three* addressable devices. All other addressable devices count as one.
- The current requirements of all of your devices must not exceed 750 milliamps (mA). To make sure you do not exceed this requirement, total up the typical power required by each of your HP-HIL devices as given in the following “HP-UX Setup Information” sections. If the total exceeds 750 mA, you must remove one or more devices.

Hardware Installation Complete

HP-UX Setup Information

This section contains information needed to configure the newly added device into the HP-UX operating system. Copy this information to the foldout worksheet end of this book.

Refer to Chapter 7: "Setting Up Devices Using HP-UX Commands" for additional software configuration information of HP-HIL devices.

Note HP-HIL devices can be added to or removed from the HP-HIL interface without affecting the HP-UX operating system. However, if your application requires the use of a particular device and you remove the device from the link, open the link to the device, or open the link to add a new device, your application might not recognize the change and may not work as expected.

Table 6-14. HP 92916A HP-HIL Bar Code Reader

Device Name	Path Name	File Type	Major Number	Minor Number ¹	Power Req.
HP 92916A	/dev/r8042	c	23	0x000000	133 mA
HP 92916A	/dev/wand	c	24	0x000020	133 mA

¹ The second minor number in the table assumes the bar code reader is the second device on the HP-HIL interface (address=2). If this is not the case, substitute the correct position (address) of the bar code reader in place of the 2 in the minor number (e.g., if the bar code reader is the third device on the interface, the minor number would be 0x000030). Minor number formats are described in Chapter 7: "Setting Up Devices Using HP-UX Commands".

Setting Up Devices Using HP-UX Commands

Introduction

After you have connected your device, you must set up HP-UX to communicate with your newly connected device. Setting up HP-UX to communicate with devices consists of two steps:

- Creating the device file or verifying that the correct device file already exists for communication with the device.
- Ensuring that the appropriate HP-UX device driver is part of the current kernel configuration.

These tasks can be performed in any order. This chapter focuses on these two tasks.

Creating Device Files

Device files (special files) must be created for every device connected to your system. Interface cards are an exception. The interface card itself does not require a device file associated with it, but the device that is connected to the interface card does need a device file. For interface cards you only need to ensure that the device driver for the interface card is part of the kernel configuration. (See the section entitled “Ensuring the Device Driver is Part of the Kernel” later in this chapter for more information.) Adding a device driver to the current kernel configuration is discussed later in this chapter.

This section contains the following information:

- The `mknod(1M)` command syntax and examples.
- Viewing device file characteristics.
- Disk drive information and examples.
- Tape drive information and examples.
- Terminal and modem information and examples.
- Psuedo terminal information and examples.
- Plotter information and examples.
- Printer information and examples.
- Graphics device information and examples.
- HP-HIL device information and examples.
- GPIO device information and examples.

Using the `mknod` Command

The `mknod(1M)` command is used to create device files. The `mknod(1M)` command has the following syntax:

```
/etc/mknod path_name file_type major minor
```

where:

<i>path_name</i>	The pathname of the device file to be created. Select a name for the device file that easily identifies the associated peripheral. In the following sections, a paragraph for each type of peripheral describes the naming conventions for device files. Use this naming convention to make your system easier to support and maintain. Put all device files into the <code>/dev</code> directory; many commands expect to find device files in <code>/dev</code> and will fail if the required device file is not there.
<i>file_type</i>	File type is represented by a single character: <code>b</code> (block), <code>c</code> (character), <code>n</code> (network) or <code>p</code> (pipe). Refer to the <i>HP-UX Reference Manual mknod(1M)</i> man page for networking and pipe file type information. Disks should have both block and character device file entries. Any cartridge tape or flexible disk drives that will have mounted file systems should have entries for both block and character device files. All other devices should have character device file entries only. Character mode of device access is also referred to as raw mode, thus the naming of the device file directories <code>/dev/dsk</code> and <code>/dev/rdsk</code> .
<i>major</i>	The major number is a pointer to the kernel device driver used to communicate with the peripheral. For devices needing both a character and a block device file, there are different device drivers and therefore different major numbers for block and character device files for the same peripheral.
<i>minor</i>	The minor number specifies the hardware address (location on the I/O bus). It is made up of the select code, bus address or port number, and other driver specific information. It is a 24-bit value represented in hexadecimal on the command line.

Setting Up Devices Using HP-UX Commands

The following examples illustrate several occurrences of the `mknod` command.

```
% mknod /dev/rmt/Omn c 54 0x0e0103 <-- SCSI DDS-format drive
% mknod /dev/ac/1a   b 10 0x0e3001 <-- SCSI optical autochanger
% mknod /dev/crt     c 12 0x000001 <-- Graphics System Console
```

If you make a mistake while creating a device file, delete the device file you want to change and re-create it with `mknod`.

Viewing the Device File Characteristics

To view the device file characteristics execute an `ll` command from the directory containing your device file. For example,

```
crw--w--w-   1 root    other    0 0x000000 May 20 09:30 console
```

where the first character in the entry tells you whether the device file is a character (c) or block (b) device and the next series of characters represent the file's access permissions. The major and minor numbers are located in the fifth and sixth fields, respectively (where the size is displayed for a regular file). In this case, the major number is 0 and the minor number is 0x000000.

Disk Drives

There are three kinds of disk drives:

- Hard Disks
- Flexible Disks
- Optical Disks

You can use your hard disk as part of your swap space, part of the HP-UX file system, or both.

You can use your flexible disk as part of the file system or as miscellaneous storage space (for example, for backups). Flexible (floppy) disks come in two sizes: 5.25 inch and 3.5 inch. The 3.5 inch flexible disks are more common with an HP-UX system than the 5.25, but they are treated in the same manner.

You can use your optical disk setup, standalone or autochanger, as part of the file system or as secondary storage (for example, backups, archives). Additionally, the standalone optical disk drive can be used as part of your swap space.

This section contains the following information:

- Device file location and naming conventions.
- Block and character device file requirements and recommendations.
- Major number.
- Minor number format.
- Other information.
- Examples of creating device file for the following devices:
 - CS80-type Hard Disk Drive
 - Amigo-type Hard Disk Drive
 - 650/A Optical Disk Drive
 - Optical Library System

Setting Up Devices Using HP-UX Commands

Device files for disk drives should reside in the `/dev` directory. Disk drives require both character and block device files. Disks use the `/dev/rdisk` directory for the character device files and the `/dev/dsk` directory for the block device files.

Disk device file names are in the following format:

`/dev/[r]dsk/[r]c#d#s#`

where:

- | | |
|------------|---|
| r | indicates a raw interface to the disk; the second r should not be used and is reserved for future use |
| c#d | indicates the controller number (which is optionally specified by the system administrator) |
| #s# | indicates the drive and section numbers, respectively. The assignment of controller, drive, and section numbers is described in the <i>System Administration Tasks Manual</i> . |

Additional information about disks can be found in `disk(7)` in the *HP-UX Reference Manual*.

Setting Up Devices Using HP-UX Commands

Table 7-1 lists the supported disk drives, their kernel device driver name, block major number, and character major number.

Table 7-1. Kernel Driver & Major Numbers for Disk Drives

Product Number or Name	Kernel Driver	Block Major Number	Character Major Number
HP 1707, HP 7907, HP 7908, HP 7911, HP 7912, HP 7914, HP 7933, HP 7935, HP 7936, HP 7937, HP 7941, HP 7942, HP 7945, HP 7946, HP 7957A/B, HP 7958A/B, HP 7959B, HP 9122, HP 9125, HP 9127, HP 9133D/H/L, HP 9134D/H/L, HP 9144, HP 9145, HP 9153, HP 9154	cs80	0	4
HP 7906, HP 7920, HP 7925, HP 82901, HP 82902, HP 9121, HP 9133A/B/V/XV, HP 9134A/B/XV, HP 9135, HP 9138A, HP 9895	amigo	2	11
HP 7957S, HP 7958S, HP 7959S, HP C2212A/13A, HP 1701	scsi	7	47
HP 1700 Model 20GB/A	autoch, autox	10	55

Setting Up Devices Using HP-UX Commands

The minor number format for disk drives is as follows:

`0xScBaUV`

where:

- `0x` specifies format is in hexadecimal.
- `Sc` specifies the select code of the interface (8 bit value).
- `Ba` specifies the HP-IB or SCSI bus address (4 bit value).
- `U` specifies the unit number.
- `V` specifies the volume number (0 for single file systems).

Permissions for File Systems

You must have restricted access permission on all device files that are associated with mountable file systems, giving read/write permission to the owner (root) only. This prevents someone from mounting unauthorized media on your system, and prevents everyone on the system from accidentally overwriting a file system residing on the device associated with this device file.

For example:

```
chown root /dev/dsk/1s0 /dev/rdisk/1s0
chmod 600 /dev/dsk/1s0
chmod 600 /dev/rdisk/1s0
```

CS80-type Hard Disk Drive

If you have a CS80-type hard disk drive at select code 14 using bus address 2, use the following `mknod` command lines:

```
mknod /dev/dsk/1s0 b 0 0x0e0200
mknod /dev/rdisk/1s0 c 4 0x0e0200
```

If this is an integrated device (hard disk drive with either a flexible disk drive or a cartridge tape drive), you would also create device files for the other drive. For example, if you were adding an integrated hard disk and flexible disk drive, you would type, in addition to the above, the following two lines (notice the last two digits are 01 instead of 00 because it is unit 1):

```
mknod /dev/dsk/2s0 b 0 0x0e0101
mknod /dev/rdisk/2s0 c 4 0x0e0101
```

Note To help your users (and yourself) remember the names of the disk drive, you should label the disk drive with the device file path name.

Amigo-type Hard Disk Drive

If you have an Amigo -type hard disk drive at select code 14 using bus address 2, use the following `mknod` command lines:

```
mknod /dev/dsk/      b 2 0x0e0200
mknod /dev/rdisk/    c 11 0x0e0200
```

Note To help your users (and yourself) remember the names of the disk drive, you should label the disk drive with the device file path name.

650/A Optical Drive

If you have an optical disk drive, at select code 14, using bus address 1, use the following `mknod` command lines:

```
mknod /dev/dsk/mo b 7 0x0e0100
mknod /dev/rdisk/mo c 47 0x0e0100
```


Setting Up Devices Using HP-UX Commands

Optical Library System

For the Optical Library System, the minor number format changes to address the many surfaces available for data storage. The minor number for the Optical Library System has the following format:

`0xScBISur`

where:

Ox specifies format is in hexadecimal.
Sc specifies the select code of the interface (8 bit value).
B specifies the SCSI bus address (4 bit value).
Sur specifies the surface (16 bit value).

If you have a SCSI optical autochanger at select code 14 and address 3, use the following `mknod` command lines for one disk, both sides:

```
mknod /dev/ac/1a b 10 0x0e3001 <-- Side 1a/disk surface 1 - block
mknod /dev/rac/1a c 55 0x0e3001 <-- Side 1a/disk surface 1 - character
mknod /dev/ac/1b b 10 0x0e3002 <-- Side 1b/disk surface 2 - block
mknod /dev/rac/1b c 55 0x0e3002 <-- Side 1b/disk surface 2 - character
```

Continue with `mknod` commands until you end with the thirty-second disk, both sides, as in:

```
mknod /dev/ac/32a b 10 0x0e303f <-- Side 32a/disk 32 surface 63 - block
mknod /dev/rac/32a c 55 0x0e303f <-- Side 32a/disk 32 surface 63 - character
mknod /dev/ac/32b b 10 0x0e3040 <-- Side 32b/disk 32 surface 64 - block
mknod /dev/rac/32b c 55 0x0e3040 <-- Side 32b/disk 32 surface 64 - character
```

7

Since there are 129 `mknod` commands to execute (32 disks, 64 surfaces, 2 device files per surface, and 1 `ioctl` setup) you should create a script file to reduce the amount of typing.

Note The default SCSI select code is 14 and the default interface set on the optical autochanger controller is 3. If you have other SCSI peripherals set at interface 3, 4, or 5, you should check the optical autochanger installation manual for information on how to change these defaults.

To ensure timely product performance, you should mount only two surfaces at a time as readable or writable. All of the other surfaces should be read-only.

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None of the surfaces should be permanently mounted; therefore, do not include the optical surface file systems in the `/etc/checklist` file.

Tape Drives

There are three kinds of tape drives:

- 9-track Magnetic Tape
- Cartridge Tape
- DDS-Format Tape (DAT)

This section contains the following information:

- Device file location and naming conventions.
- Block and character device file requirements and recommendations.
- Major number.
- Minor number format.
- Other information.
- Examples of creating device file for the following devices:
 - 9-track Magnetic Tape
 - Cartridge Tape
 - DDS-Format Tape (DAT)

Setting Up Devices Using HP-UX Commands

DDS-format drives and 9-track magnetic tape drives are logically very similar. Both belong to the family of streaming tape drives. Most HP-UX commands that are typically associated with 9-track tapes, such as backups, can be used without modification with DDS drives.

9-track magnetic tapes are 1/2 -inch tapes on reels. You can use your magnetic tape for miscellaneous storage space (for example, backups).

Cartridge tapes, such as HP 9144 and HP 9145, are the 1/4 -inch tapes in plastic cartridges. Do not confuse this family of devices with DDS drives; they are quite different. HP-IB cartridge tape drives use the CS80 kernel disk driver. You can use your cartridge tape for miscellaneous storage space (for example, for backups).

DDS-Format tapes are based on Digital Audio Tape (DAT) technology. DAT uses an advanced form of helical scan recording to store 1.3 Gbytes of data on a DDS cassette, approximately the size of a credit card. The tape drive provides for high-capacity, unattended backups.

Note	Use only HP-labeled DDS media in HP DDS-format tape drives.
-------------	---

A box of five (60m) HP labeled DDS-format tapes is available, HP part number 92283A.

Device files for tape drives should reside in the `/dev` directory. 9-track Magnetic and the DDS-Format tape drives use the `/dev/rmt` directory for the device file, and cartridge tape drives use the `/dev/rct` directory for the device file.

The following dedicated sections (magnetic tape, cartridge tape, and DDS-format tape), contain the device file naming conventions for each type of tape drive.

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Setting Up Devices Using HP-UX Commands

All tape drives require only character device files.

Table 7-2 lists the supported tape drives, their kernel device driver name, and character major number.

Table 7-2. Tape Drive Kernel Drivers and Major Device Numbers

Product Number or Name	Kernel Driver	Character Major Number
HP 7970	tape	5
HP 7971	tape	5
HP 7974	stape	9
HP 7978	stape	9
HP 7979	stape	9
HP 7980	stape	9
Cartridge Tape	cs80	4
HP C1511	stape	9
HP C1512A	scsitape	54

Setting Up Devices Using HP-UX Commands

9-Track Magnetic Tape Drive

The following naming convention is recommended for magnetic tape devices because it connects most of the mode flags with the device name:

`/dev/[r]mt/c#d#[hml][c][n]`

where:

<code>r</code>	indicates a raw (character) device
<code>c#d</code>	indicates the controller number (optionally specified by the system administrator)
<code>#</code>	is the device number
<code>hml</code>	indicates the density: ■ <code>h</code> (high) for 6250 bpi ■ <code>m</code> (medium) for 1600 bpi ■ <code>l</code> (low) for 800 bpi
<code>c</code>	indicates data compression
<code>n</code>	indicates no rewind on close

For example, `/dev/rmt/2mn` is raw device 2 at 1600 bpi with no rewind and no compression.

Additional information about 9-track magnetic tape is available in *mt(7)* of the *HP-UX Reference Manual*.

Setting Up Devices Using HP-UX Commands

For the 9-track magnetic tape drives, the minor number format changes to address the different recording densities: 800 bpi, 1600 bpi, 6250 bpi, and compressed 6250 bpi. The minor number format for the 9-track magnetic tape is as follows:

0xScBaUV

0x	This prefix indicates the number is hexadecimal.
Sc	This field is a two-digit hexadecimal representation of the select code. The select code is determined from the switch settings on the tape drive's interface card.
Ba	This field is a two-digit hexadecimal representation of the bus address. It is determined from the switch settings on the tape drive.
U	The single hexadecimal unit number (U) represents a four-bit binary value. Setting and clearing the bits of this binary value affect the manner in which the tape drive operates, as indicated in Table 7-3.
V	The volume number (V) field of the minor number also has special meaning when creating device files for magnetic tape drives. The single hexadecimal volume number represents a four-bit binary value. Setting and clearing the bits of this binary value affect the manner in which the tape drive operates, as indicated in Table 7-4 .

Setting Up Devices Using HP-UX Commands

Table 7-3 indicates the special meanings of each bit in the unit number portion of the magnetic tape minor number. Bits 6 and 7 select the tape density, while bits 4 and 5 represent the unit number, and “x”s represent “don’t care”:

Table 7-3. Tape Density and Unit Number Bit Settings

Hex Value	7	6	5	4	Selects
c	1	1	x	x	Density = 6250 bpi compressed (HP 7980XC and HP 7980SX)
8	1	0	x	x	Density = 6250 bpi (HP 7978, HP 7980A and HP 7980S)
4	0	1	x	x	Density = 1600 bpi (All mag tapes)
0	0	0	x	x	Density = 800 bpi (HP 7974, opt 800 only)
0	x	x	0	0	Select Unit 0
1	x	x	0	1	Select Unit 1, etc.

Table 7-4 indicates the special meaning each bit has in the volume number of the magnetic tape minor number:

Table 7-4. Magnetic Tape Operation Bit Settings

Bit Order	When Clear (0)	When Set (1)
3	Industry Standard mode	HP-UX 2.0 compatibility mode
2	Immediate report on (ignored by HP 7970/7971)	Immediate report off
1	AT&T-style compatibility mode	Berkeley-style compatibility mode
0	Rewind on close	No rewind on close

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Setting Up Devices Using HP-UX Commands

If you connected an HP 7978 tape drive to select code 14, HP-IB bus address to 3, use the following `mknod` commands:

```
mknod /dev/rmt/0mn c 9 0x0e0343
mknod /dev/rmt/0h c 9 0x0e0382
```

You could access the same drive as a 6250 bpi device using the “0h” device and as a 1600 bpi device using the “0mn” name. You could also use the “mt” command to do various positioning operations on the tape without having to provide a device name because `mt` uses the default device `/dev/rmt/0mn`. Since `tar` defaults to `/dev/rmt/0m`, you may also want to create this file.



Setting Up Devices Using HP-UX Commands

Cartridge Tape Drive

Cartridge tape device file names have the following format:

`/dev/(r)ct/(r)c#(d#)(s#)`

where:

- | | |
|-----------|---|
| r | indicates a raw interface to the cartridge tape; the second r is reserved to indicate that this cartridge tape is on a remote system. |
| c# | indicates the controller number |
| d# | optionally indicates the drive |
| s# | optionally indicates a section number |

The assignment of controller, drive, and section numbers is described in the *System Administration Tasks Manual*.

Additional information about cartridge tapes is in *ct(7)* of the *HP-UX Reference Manual*.

The minor number format for cartridge tape drives is as follows:

`0xScBaUV`

where:

- | | |
|-----------|---|
| 0x | specifies format is in hexadecimal. |
| Sc | specifies the select code of the interface (8 bit value). |
| Ba | specifies the HP-IB bus address (4 bit value). |
| U | specifies the unit number. |
| V | specifies the volume number (0 for single file systems). |

Setting Up Devices Using HP-UX Commands

If you have a CS80 cartridge tape drive at select code 14, HP-IB bus address 1, your **mknod** command line would be:

```
mknod /dev/rct/0s0 c 4 0x0e0100
```

If this is an integrated device (both hard disk and cartridge tape drive in the same unit), the hard disk drive is unit 0 and the cartridge tape drive is unit 1. You would create three device files: one block device file for the hard disk, and one character device file for each unit. For example, if you have a CS80 drive at select code 14, bus address 1, your **mknod** command lines would be:

```
mknod /dev/dsk/1s0 b 0 0x0e0100
mknod /dev/rdisk/1s0 c 4 0x0e0100
mknod /dev/rct/0s0 c 4 0x0e0110
```

Note	To help your users (and yourself) remember the names of the drive, you should label the drive with the device file path name.
-------------	---

Setting Up Devices Using HP-UX Commands

DDS-Format Tape Drive (DAT)

The following naming convention is recommended for DDS-format tape drives:

`/dev/[r]mt/c#d#m[n]`

where:

<code>r</code>	indicates a raw (character) device
<code>c#d</code>	indicates the controller number (optionally specified by the system administrator)
<code>#</code>	is the device number
<code>m</code>	indicates the density <code>m</code> (medium) for 1600 bpi
<code>n</code>	indicates no rewind on close

Additional information about magnetic tape can be found in *mt(7)* of the *HP-UX Reference Manual*.

Setting Up Devices Using HP-UX Commands

Encoded in the minor number of the DDS-Format Tape Drive (DAT) are its various modes of operation. The minor number for the DDS-Format Drive has the following format:

0xScBaUV

where:

0x specifies format is in hexadecimal.
Sc specifies the select code of the interface (8 bit value).
Ba specifies the SCSI bus address (4 bit value).
U specifies the unit number. (0 for SCSI Drive, 4 for HP-IB Drive, 4 bit value)
V specifies the volume number (4 bit value). Most significant bit (bit 3) is always zero (0). The other three bits have the following meaning:

Table 7-5.

Bit	Clear(0)	Set(1)
2	Immediate Report on	Immediate Report off
1	AT&T-style close	Berkeley-style close
0(lsb)	Rewind on close	No rewind on close

An HP-IB DDS-format drive is connected to the high-speed disk interface at select code 14. The tape drive's bus address is set to 3. Your **mknod** command lines are the following:

```
% mknod /dev/rmt/0mn c 9 0x0e0343 <--IR on, Berkeley-close, no rewind
% mknod /dev/rmt/0m c 9 0x0e0342 <--IR on, Berkeley-close, rewind
```

Setting Up Devices Using HP-UX Commands

A SCSI DDS-format drive is connected to the SCSI interface at select code 14. The tape drive's bus address is set to 1. Your `mknod` command lines are as follows:

```
% mknod /dev/rmt/0mn c 54 0x0e0103 <--IR on, Berkeley-close, no rewind  
% mknod /dev/rmt/0m c 54 0x0e0102 <--IR on, Berkeley-close, rewind
```

Note	To help your users (and yourself) remember the names of the drive, you should label the drive with the device file path name.
-------------	---

Terminals and Modems

This section contains the following terminal and modem information:

- Process overview for setting up HP-UX to communicate with terminals and modems.
- Device file location and naming conventions.
- Block and character device file requirements and recommendations.
- Major number
- Minor number format.
- Examples of creating device files.
- Other information.

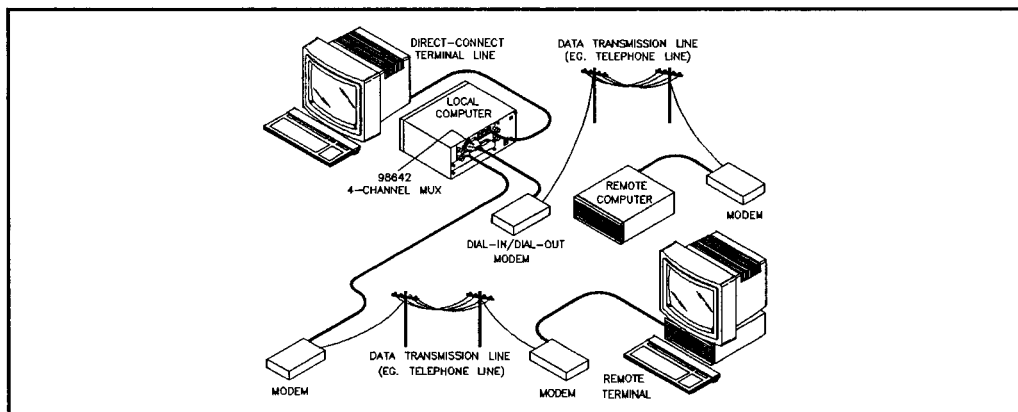


Figure 7-1. Terminal and Modem Connections

You should already have the terminal and modem physically connected to your system as in Figure 7-1. If you do not have the terminal and/or modem connected to your system, refer to *Installing Peripherals, Volume 1*, Chapter 5: "Installing Terminals and Modems".

Communication ports (user terminals as well as modems) need to be identified by one or more device file, depending on the intended use of the port. Device file naming conventions vary, depending on the device's use. Terminal (tty) files are required for terminals (hard-wired ports). Ports that receive incoming

Setting Up Devices Using HP-UX Commands

signals (“dial in” modems) require a special naming convention, `ttyd`, for device files. Ports that transmit signals (“dial out”) require both `cua` and `cul` device files.

Use the following procedure to set up a terminal or a modem.

1. Create the device files required. If the terminal uses both dial-in and dial-out access, you will need three files.
2. Add the necessary `getty` entries to the `/etc/inittab` file.
3. Add the necessary entries to the `/etc/ttytype` file.
4. When using the terminal, set the `TERM` environment variable and execute the `tset` command.

Note	If you are on an HP-UX cluster, <code>/dev</code> is a context-dependent file. This means you must create the device file from the cnode where the terminal is located.
-------------	---

Setting Up Devices Using HP-UX Commands

The following list contains RS-232-C driver names associated with several types of serial connections. The drivers listed must be included in the `dfile` for the specified serial connection type.

Device Driver	Connection Type
98626	Series 300 Built-in RS-232-C port and HP 98626A RS-232-C Interface
98628	HP 98628A Datacomm Interface
98644	HP 98644A Asynchronous Serial Interface
<code>apci</code>	Series 400 Built-in RS-232-C port
98642	HP 98642A 4-Channel Multiplexer Interface or HP 98638A 8-Channel Multiplexer Interface

All serial drivers require a major number of 1.

Setting Up Devices Using HP-UX Commands

The minor number format for terminals and modems is as follows:

0xScPa0X

where:

- 0x* This indicates the number is hexadecimal.
- Sc* The select code, which is a two-digit hexadecimal number determined by switches set on the terminal or modem's interface card.
- Pa* The port address for each port.
This two-digit hexadecimal number is set by switches on the device. Port address is always 00 if your terminal was connected to an HP 98626 or HP 98644 interface card, and can be 00, 01, 02, or 03 if the terminal was connected to an HP 98642 interface card.
- 0* Four bits of 0.
- X* The hexadecimal representation of a 4-bit binary number as defined below:

Bit	Value
3	Always 0
2	1=direct connect, 0=modem
1	1=CCITT protocol (Europe), 0=Simple protocol (U.S.)
0	1=dialout modem, 0=dial-in modem

Table 7-6 shows a general `mknod` template for ports where `xx` is a two-digit line identifier in the device file name:

Table 7-6. General Template for Ports

Device	Notes
<code>ttyxx</code>	hardwired ports (terminals)
<code>ttydxx</code>	dial-in modems
<code>cuaxx</code>	autodial-out ports
<code>culxx</code>	dial-out ports

Modems require two device files and possibly three. The “dial-in modems” device file `ttydxx` and the “dial-out ports” device file `culxx` are required. If you are using a non-HoneyDanBear uucp, the system dials its connection using `/usr/lib/dialit.c`, which requires you to create a third modem device file `cuaxx` with the same minor number as the `culxx` device file.

Assume that you want to create device files for a modem at select code 20 (decimal 20 = hexadecimal 14), using an HP 98626 card, and associate it with line 20 (that is, `/dev/ttyd20`). Because the modem will be used as a dial-in and dial-out port, the X term of the minor number on the `cul` file must be 1, and on the `ttyd` file must be 0. The following `mknod` command lines are needed:

```
mknod /dev/cul20 c 1 0x140001
mknod /dev/cua20 c 1 0x140001
mknod /dev/ttyd20 c 1 0x140000
```

There are now three device files associated with the dial-in and dial-out modem at select code 20. Similarly, the `mknod` command lines for an HP 98642 four port mux with port 0 attached to a modem and terminals attached to ports 1 to 3 are:

```
mknod /dev/tty01 c 1 0x0d0004
mknod /dev/cul01 c 1 0x0d0001
mknod /dev/cua01 c 1 0x0d0001
mknod /dev/tty02 c 1 0x0d0100
mknod /dev/tty03 c 1 0x0d0200
mknod /dev/tty04 c 1 0x0d0300
```

Setting Up Devices Using HP-UX Commands

The following example will set up a direct-connect port for an HP 98642 on line 13 at select code 13 (13 decimal = hexadecimal d). The minor number ends with a four since this is a direct-connect port:

```
mknod /dev/tty13 c 1 0x0d0004
```

When a terminal is added to the system, you must add entries to the `/etc/ttytype` and `/etc/inittab` files. This allows a user to login from the terminal.

Adding an Entry to the `/etc/ttytype` File

The `/etc/ttytype` file is a data base that contains the terminal type of the terminal associated with each port on the system. It is used by the `tset` and `login` commands. Based on the information in this file, `tset` will perform terminal-dependent processing, such as setting erase and kill characters, setting or resetting delays, and sending sequences needed to properly initialize the terminal. `login` uses this file to set the `TERM` variable.

The `/etc/ttytype` entries have the form:

model_number location

where:

model_number is the product number of the terminal or computer (as defined in `/usr/lib/terminfo`). For more information on the model number to use here, refer to the *terminfo(4)* entry in the *HP-UX Reference Manual*

location is the device file associated with the terminal/computer and contained in the `/dev` directory (not the full path name, just the file name).

Here is a sample `/etc/ttytype` file:

```
300h    console    # Frodo's (administrator) system console
2622    tty00      # Bilbo's terminal
2622    tty01      # Gandalf's terminal
2623    tty02      # Strider's terminal
dialup   ttyd03    # Greybeard's dialup modem
```

If the entry is for a dialup port, the *model_number* should be `dialup`. This causes `tset` to request the proper terminal type during the login sequence.

Note If you are on an HP-UX cluster, this file is a context-dependent file. There must be one subfile for each cluster node.

Setting Up Devices Using HP-UX Commands

Adding an Entry to the `/etc/inittab` File

The `/etc/inittab` file is described in Chapter 3, section “System Startup Functions”. For terminals, `/etc/inittab` entries contain the `/etc/getty` command. This section discusses entries specific to terminals.

Most `/etc/inittab` entries for terminals have the form:

```
id:rstate:respawn:/etc/getty -t xxx device_file_name N # comment field
```

where:

id	is a unique two-character string. The value of the two-character string is arbitrary but must be unique for each entry. It is used to refer to the same entry/process in other states.
rstate	indicates the <code>getty</code> run-levels. This field typically equals two, meaning the terminal can be used in run-level two only.
respawn	Specifies that the command in the command field (such as <code>getty</code>) is re-invoked once the process terminates (typically, when a user logs off the system).
/etc/getty	This is the command to execute. The fields of the <code>/etc/getty</code> command are described below.

The fourth field, the `process` field, must contain the `/etc/getty` command; it is immediately followed by three parameters for a `getty` command, as follows:

-t xxx	is the optional time-out option for use with modems.
device_file_name	is the file name (<code>tty04</code>)—not the complete path name (<code>/dev/tty04</code>)—of the terminal’s or modem’s character device file. The named file must reside in the <code>/dev</code> directory.
N	specifies a speed indicator for <code>getty</code> . A value of H is common for “hardwired” (9600 baud terminal) lines; a value of three is common for dial-up (300/1200 baud modem) lines.

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Setting Up Devices Using HP-UX Commands

For more information, refer to the `getty(1M)` and `gettydef(4)` entries in the *HP-UX Reference Manual*.

On a multi-user system, each terminal connected to the system must have an entry in `/etc/inittab`. For example, to add a terminal on `/dev/tty04` for run-level 2 the `/etc/inittab` is the following:

```
04:2:respawn:/etc/getty tty04 H #terminal at rob's desk
```

Note that the `id` field `04` corresponds to the last two digits of the terminal's device file (`tty04`). This convention is often used with "continuous" (`respawn`) `getty` processes that get killed in the single-user run-level but is *not* required syntax: any two-character string will suffice. After a user logs out, `getty` is "respawned", and the "login:" prompt is redisplayed. Refer to Chapter 3 in this manual, and to the `getty(1M)`, `gettydef(4)`, and `inittab(4)` entries in the *HP-UX Reference Manual* for further details.

If you are on an HP-UX cluster, this file is a context-dependent file. There must be one subfile for each cluster node.

You must configure your kernel to support the terminal or modem's interface card. The interface card kernel drivers to choose from are: 98628, 98642, or 98626. The HP 98644 interface card requires the 98626 kernel device driver. For example, if your terminal is connected to an HP 98642 Mux Card, you need kernel driver 98642.

If you haven't reconfigured your kernel to include the new interface card, you will receive a message on your console similar to:

```
Unable to access ttyxx
```

If you don't know what interface your terminal or modem is connected to, or can't decide which interface to connect it to, read the information for your peripheral in *Installing Peripherals, Volume 1* Chapter 5: "Installing Terminals and Modems".

Setting Up Devices Using HP-UX Commands

Removing A Terminal

If you remove a remote terminal from your system, you must clean up your system by performing the following steps:

1. Find the system's name for the terminal. If you have been receiving messages on your console that are similar to:

`Unable to access ttyxx`

the system's name for the terminal is the `ttyxx` name.

If you do not receive the message, determine the name of the remote terminal by the following method:

- a. type `cd /dev`
- b. type `ls -l tty*`

You will see lines similar to:

`crw--w--w- 1 ryk axe 1 0x000000 1986 /dev/ttyxx`

If you have only one `tty` file, that is the terminal you are removing.

If you have several, determine which one to remove by using the information you used to set up the terminal. Refer to the section "Minor Number for Ports".

2. Edit the file `/etc/inittab`.

Delete the line that has a field with the words:

`id:rstate:respawn:/etc/getty ttyxx`

where `ttyxx` is the port you identified in Step 1.

3. Notify the `init` process that `/etc/inittab` has changed by typing:

`telinit q`

4. Remove the device file associated with the terminal you removed.

Pseudo Terminals

This section contains the following information:

- Process overview for setting up HP-UX to communicate with pseudo terminals.
- Device file location and naming conventions.
- Block and character device file requirements and recommendations.
- Major number.
- Minor number format.
- Other information.
- Examples of creating device files.

Some applications need a form of software support that enables them to act as though they are connected to a terminal. This implementation is called a **pseudo terminal**. A pseudo terminal is a pair of character devices: a **master** device and a **slave** device.

The pseudo terminal is structured so that output from either process acts as input to the other. The slave device interacts with the application process. It provides processes (in this case, user applications) and an interface identical to that described in *termio(4)* of the *HP-UX Reference Manual*. The master device interacts with the server process controlling the application process. It interacts through the device as though it were a hardware terminal interface.

The difference between an HP-UX pseudo terminal and the interface described in *termio* is that the latter always has a hardware device behind it—like an HP 2623 terminal. A slave device has another process manipulating it through the master half of the pseudo terminal. Anything written on the master device is given to the slave device as input, and anything written on the slave device is presented as input on the master device.

According to HP-UX naming conventions, all pseudo terminal devices are located in the directories `/dev/pty` (slaves), and `/dev/ptym` (masters). The master device file should be called `/dev/ptym/ptyXX`, and the slave side `/dev/pty/ttyXX`, where *XX* is an identifying letter from p to w, and a hexadecimal digit. *Do not change these naming conventions because some programs depend on them.*

Setting Up Devices Using HP-UX Commands

For example, `/dev/ptym/ptyp0` (master) and `/dev/pty/ttyp0` (slave) would be the lowest numbered pseudo terminal pair; `/dev/ptym/ptywf` and `/dev/pty/ttywf` would be the highest ordered pair.

All pseudo terminals must be character device files.

The master pseudo terminal device driver must have a major number of 16.

The slave pseudo terminal device driver must have a major number of 17.

The minor number for both master and slave pseudo terminal device files is:

`0x00YYYY`

where `YYYY` is a unique hexadecimal value, in the range of 0 to `npty-1`, where `npty` is a configurable system parameter. (Refer to “Configuring Operating System Parameters” in Chapter 6 and to Appendix D in Volume 2 of this manual if you want to read about this parameter.) This value is used to identify the relationship between master and slave.

Using the lowest numbered pair, a sample `mknod` command would be:

```
mknod /dev/ptym/ptyp0 c 16 0x000000
mknod /dev/pty/ttyp0 c 17 0x000000
```

These commands would create a master and slave pair called `ptyp0` and `ttyp0`. The minor numbers, shown above as zeros, must be in the range of 0 to `npty-1` where `npty` is a configurable system parameter.

7

Your application’s documentation will tell you how many pseudo terminals you need. For example, HP Windows/9000 needs three master/slave pairs per window.

For more information on pseudo terminals, refer to both the *termio(5)* and *pty(5)* sections of the *HP-UX Reference Manual*.

Plotters and Digitizers

This section contains the following plotter and digitizer information:

- Device file location and naming convention.
- Block and character device file requirements and recommendations.
- Major number.
- Minor number format.
- Other information.
- Examples of creating device files.

Plotter and digitizer device files should be located in the `/dev` directory. Device file naming conventions use `plt` followed by the product number for plotters and `dig` followed by the product number for digitizers. If more than one device with the same product number is present, be certain not to duplicate their special file names. For example, to differentiate between two HP 7580 plotters, name the first one `plt7580.1` and the second `plt7580.2`. You can also use the `“.#”` prefix to distinguish plotters and digitizers based on their HP-IB bus address.

The file type for plotters and digitizers is always character.

Note	For HP-HIL plotter and digitizers, refer to the “HP-HIL Devices” section of this chapter for configuration information.
-------------	---

The device driver required for HP-IB and parallel plotters and digitizers is `hpib` (major number 21). For parallel plotters the `parallel` driver is also required.

Note	The <code>parallel</code> requires the <code>hpib</code> driver. Both of these drivers must be part of the kernel configuration for the parallel driver to operate.
-------------	---

Setting Up Devices Using HP-UX Commands

The following list contains RS-232-C driver names associated with several types of serial connections. The drivers listed must be included in the `dfile` for the specified serial connection type.

Device Driver	Connection Type
98626	Series 300 Built-in RS-232-C port and HP 98626A RS-232-C Interface
98628	HP 98628A Datacomm Interface
98644	HP 98644A Asynchronous Serial Interface
apci	Series 400 Built-in RS-232-C port
98642	HP 98642A 4-Channel Multiplexer Interface or HP 98638A 8-Channel Multiplexer Interface

All serial drivers require a major number of 1.

Refer to the `/etc/master` file to determine which driver you need for your plotter. There is a section in this file with the heading:

```
* field 1: product #      field 2: driver name.
```

Look for your plotter model in the first column; the associated driver is listed in the second column.

Setting Up Devices Using HP-UX Commands

The minor number for HP-IB plotters and digitizers has the following format:

`0xScBa00`

where:

<code>0x</code>	specifies format is in hexadecimal.
<code>Sc</code>	specifies the select code of the interface (8 bit value).
<code>Ba</code>	specifies the HP-IB bus address (4 bit value).
<code>00</code>	indicates last two hexadecimal digits are both zero (0).

For example, several HP 7580 plotters attached at HP-IB bus addresses 3, 4, and 5 to the same interface at select code 7 would require the following command lines to create the device files:

```
mknod /dev/plt7580.1 c 21 0x070300
mknod /dev/plt7580.2 c 21 0x070400
mknod /dev/plt7580.3 c 21 0x070500
```

Setting Up Devices Using HP-UX Commands

The minor number for RS-232-C plotters has the following format:

0xScPo0A

where:

Ox specifies format is in hexadecimal.
Sc specifies the select code of the interface (8 bit value).
Po specifies the RS-232-C port number, values 0 - 3 (8 bit value).
0 indicates value of zero (4 bit value).
A indicates access type. The hexadecimal representation of a 4-bit binary number as defined below:

Bit	Value
3	Always 0
2	1=direct connect, 0=modem
1	1=CCITT protocol (Europe), 0=Simple protocol (U.S.)
0	1=dialout modem, 0=dial-in modem

For example, consider an HP 7550A plotter attached at the built-in RS-232-C port and an another HP 7550A plotter connected an HP 98628A Datacomm Interface at select code 20. Use the following command lines to create the device files for the two plotters:

```
mknod /dev/plt7580.1 c 1 0x090004  
mknod /dev/plt7580.2 c 1 0x140004
```

Printers

This section contains the following printer information:

- Device file location and naming convention.
- Block and character device file requirements and recommendations.
- Major number.
- Minor number format.
- Other information.
- Examples of creating device files.

Printer device files should be located in the `/dev` directory. Device file naming conventions use `ptr` followed by the product number. If more than one device with the same product number is present, be certain not to duplicate their special file names. For example, to differentiate between two HP 2567C printers, name the first one `ptr2567C.1` and the second `ptr2567C.2`. You can also use the `“.#”` prefix to distinguish printers based on their HP-IB bus address.

The file type for printers is always character.

There are three HP-IB device drivers, one parallel, and five RS-232-C drivers for printers. The following list contains the device driver name and the associated major number:

Major Number	Driver Name
21	hpib (HP-IB)
26	ciper (HP-IB)
7	printer (HP-IB)
21	parallel

Note The `parallel` requires the `hpib` driver. Both of these drivers must be part of the kernel configuration for the parallel driver to operate.

Setting Up Devices Using HP-UX Commands

The following list contains RS-232-C driver names associated with several types of serial connections. The drivers listed must be included in the `dfile` for the specified serial connection type.

Device Driver	Connection Type
98626	Series 300 Built-in RS-232-C port and HP 98626A RS-232-C Interface
98628	HP 98628A Datacomm Interface
98644	HP 98644A Asynchronous Serial Interface
apci	Series 400 Built-in RS-232-C port
98642	HP 98642A 4-Channel Multiplexer Interface or HP 98638A 8-Channel Multiplexer Interface

All serial drivers require a major number of 1.

Refer to the `/etc/master` file to determine which driver you need for your printer. There is a section in this file with the heading:

```
* field 1: product #      field 2: driver name.
```

Look for your printer model in the first column; the associated driver is listed in the second column.

Setting Up Devices Using HP-UX Commands

The HP-IB minor number for HP-IB printers has the following format:

0xScBa0M

where:

0x specifies format is in hexadecimal.
Sc specifies the select code of the interface (8 bit value).
Ba specifies the HP-IB bus address (4 bit value).
0 indicates 1 hexadecimal digit with value zero (4 bit value).
M indicates mode of operation with the following settings:

Printer Driver Bits

Bit	Value
3 Auto FF	1=NO-EJECT
2 Case Fold	1=Upper
1 Overprint	1=NOCR
0 Cooked/Raw	1=non-protocol (raw), 0= Amigo (cooked) protocol



Setting Up Devices Using HP-UX Commands

Ciper Driver Bits

Bit	Value
3 Auto FF	1=NO-EJECT
2 Case Fold	0=Upper
1 Overprint	0=NOCR
0 Cooked/Raw	1=non-protocol (raw),

For example, several HP 2563B printers attached at HP-IB bus addresses 3, 4, and 5 to the same interface at select code 7 would require the following command lines to create the device files:

```
mknod /dev/ptr2563B.1 c 7 0x070300
mknod /dev/ptr2563B.2 c 7 0x070400
mknod /dev/ptr2563b.3 c 7 0x070500
```

Setting Up Devices Using HP-UX Commands

The RS-232-C minor number for RS-232-C printers has the following format:

`0xScPo0A`

where:

`0x` specifies format is in hexadecimal.
`Sc` specifies the select code of the interface (8 bit value).
`Po` specifies the RS-232-C port number, values 0 - 3 (8 bit value).
`0` indicates value of zero (4 bit value).
`A` indicates access type. The hexadecimal representation of a 4-bit binary number as defined below:

Bit	Value
3	Always 0
2	1=direct connect, 0=modem
1	1=CCITT protocol (Europe), 0=Simple protocol (U.S.)
0	1=dialout modem, 0=dial-in modem

For example, consider an HP 2567C printer attached at the built-in RS-232-C port and another HP 2567C printer connected an HP 98628A Datacomm Interface at select code 20. Use the following command lines to create the device files for the two plotters:

```
mknod /dev/ptr2567C.1 c 1 0x090004  
mknod /dev/ptr2567C.2 c 1 0x140004
```

Setting Up Devices Using HP-UX Commands

The parallel minor number for parallel printers has the following format:

`0xScPo0A`

where:

<code>0x</code>	specifies format is in hexadecimal.
<code>Sc</code>	specifies the select code of the interface (8 bit value).
<code>Po</code>	specifies the RS-232-C port number, values 0 - 3 (8 bit value).
<code>000</code>	indicates value of zero (12 bit value).

An HP 2567C printer, parallel interface, is connected to your system at select code 23. The `mknod` command line to create the device file would be:

```
mknod /dev/ptr2567C c 21 0x170000
```

Graphics Display Devices

This section contains the following graphic display device information:

- Device file location and naming convention.
- Block and character device file requirements and recommendations.
- Major Number.
- Minor number format.
- Other information.
- Examples of creating device files.

The device files for graphics displays should be located in the `/dev` directory. Device file naming conventions use `/dev/graphics` or `/dev/crt` for graphic displays. To address graphic display overlay planes, use the naming convention of prepending the device file name with the letter “o”, for example, `/dev/graphics` and `/dev/ographics` and `/dev/crt` and `/dev/ocrt`. If your graphic display is to be your system console, the naming convention is `/dev/console`.

The file type for graphic display devices is always character.

The major number is 12 for graphic display devices.

Setting Up Devices Using HP-UX Commands

The minor number for graphic devices has the following format:

0xSTXXXX

where:

- | | |
|------|--|
| 0x | specifies hexadecimal format. |
| S | specifies select code (4 bit value). |
| T | specifies the following values (4 bit value) : |
| 0 | Configures automatically to one of the following: <ul style="list-style-type: none">■ Low-resolution graphics device at physical address 0x520000 (if present).■ High-resolution graphics device at physical address 0x560000 if low resolution device at 0x520000 not present. |
| 1 | High-resolution graphics device at physical address 0x560000 (unless there is no low resolution device at 0x520000, in which case type 1 is invalid). |
| 2 | High- or low-resolution graphics device at the select code specified by the select code field in the minor number. |
| XXXX | is zero or contains device-specific information as defined in the appropriate Starbase Device Drivers Library. |

Additional information about graphics can be found in *graphics(7)* of the *HP-UX Reference Manual*.

HP-HIL Devices

HP-HIL devices include the HP Touch Bezel, keyboards, mouse, digitizers, and control knobs.

To set up HP-HIL devices, there must be one device file with a major number 23 and for each HP-HIL device a device file with major number 24.

The minor number format is as follows:

0x0000B0

where:

0x	specifies hexadecimal format.
0000	specifies 16 bit value of 0.
B	specifies position on the HP-HIL bus (4 bit value).
0	specifies 4 bit value of 0.

The following `mknod` commands create the necessary device file with major number 23 and 24 HP-HIL device files for devices.

```
mknod /dev/raw_8042 c 23 0x000000
mknod /dev/hil1 c 24 0x000010
mknod /dev/hil2 c 24 0x000020
```

The HP-HIL kernel driver is not an optional kernel driver so you never need to configure it into your kernel.

Additional information about the HP-HIL interface can be found in *hil(7)* of the *HP-UX Reference Manual*.

Setting Up Devices Using HP-UX Commands

GPIO Devices

GPIO devices include HP 98622. This is a protocol used mostly for instruments.

The gpio driver only operates in character mode.

The major number for gpio is 22.

The minor number format is as follows:

`0xSc0000`

where:

`0x` specifies hexadecimal format.

`Sc` specifies the select code (8 bit value).

`0000` specifies a 16 bit value of zero.

Assuming you have an HP 98622A GPIO interface card at select code 12, default select code for interface card, the `mknod` command to access a device connected to the device is as follows:

```
mknod /dev/gpio c 22 0x0C0000
```

You also must verify that your kernel contains the `gpio` kernel driver, and configure it if it does not.

Ensuring the Device Driver is Part of the Kernel

The `/etc/conf/dfile` is used as input to generate a kernel. Look in `/etc/conf/dfile` to see if your kernel includes the appropriate kernel driver for the peripheral you want to add to your system.

Caution	Your <code>/etc/conf/dfile</code> reflects the current kernel configuration if it was used to generate your current kernel. It is possible that the currently executing kernel was generated from a template other than <code>/etc/conf/dfile</code> . In this case, <code>/etc/conf/dfile</code> may not reflect the configuration found in the currently executing kernel.
----------------	--

If the `dfile` does not contain the driver you need to operate your peripheral, you must add the driver to `/etc/conf/dfile` and remake the kernel (this involves a reboot of the system). Regenerating the kernel is discussed in the *System Administration Tasks Manual* Chapter 11: "Reconfiguring the HP-UX Kernel".

The following table lists the drivers that must be present for specific peripheral types and additional information.

Setting Up Devices Using HP-UX Commands

Table 7-7. Device Drivers

Driver Name	Used For:
cs80	most mass storage devices (included in all sample configuration files)
scsi	SCSI direct access storage devices
amigo	Amigo mass storage devices
ciper	Ciper printers
printer	Non-ciper printers
hpib	Plotters; also needed for Device I/O Library (DIL)
tape	9-Track magnetic tape drives
stape	9-Track streaming tape drives
scsitape	SCSI tape drives
autoch autox	Optical autochanger drivers (require scsi driver)
apci	Advanced Serial driver for Series 400
dos	HP 98686 DOS Coprocessor driver
vme	HP 98646 VME card
vme2	HP 98577A VME expander
98624	Internal Standard-speed HP-IB disk controller (always included—other drivers depend on it)
parallel	Parallel interface for plotters and printers.
98625	High-speed HP-IB disk controller
98626	HP 98626, HP 98644 RS-232 serial interface, or Series S300 RS-232-C built-in interface.
98628	HP 98628A RS-232 datacomm card
98642	HP 98624 RS-232 4-channel and HP 98638A 8-channel MUX card
98265	HP 98265 SCSI interface card
gpio	GPIO card; also include for Device I/O Library (DIL)
srm	Shared Resource Manager (SRM)
rje	Remote Job Execution (RJE)
ptymas ptyslv	pseudo terminal drivers (required for HP Windows/9000, Xwindows, and other software). Included in all sample configuration files.

7-50 Setting Up Devices Using HP-UX Commands

CS/80 and AMIGO Drives

The `cs80` and/or `amigo` device drivers must be in the `dfile`.

In addition to the `cs80` or `amigo` device driver (as shown in Table 7-1), you must also include the appropriate interface driver. If your drive is connected to the internal HP-IB, you need the kernel driver `98624`. If your drive is connected to the high-speed HP-IB, you need the kernel driver `98625`. Some of the Amigo drives can only be used with the `98624` kernel driver.

If you don't know to what interface your peripheral device is connected, or can't decide to which interface to connect it, read the information for your peripheral in previous chapters of this book.

SCSI Drives

Any SCSI drive should be connected to a SCSI interface card. The SCSI disk drives require the `scsi` kernel driver. The kernel code for the SCSI interface card is automatically included when you include the `scsi` driver. To use SCSI tape drives, include the `scsitape` kernel driver (in addition to the `scsi` driver).

Optical Drives

The `autoch`, `autox`, and the `scsi` drivers must be present in the `dfile`. The kernel code for the SCSI interface card is automatically included when you include the `scsi` driver.

Tape Drives

The tape driver `stape` or `scsitape` for your tape drive listed in Table 7-2 must be present in the `dfile`.

Setting Up Devices Using HP-UX Commands

Plotters and Digitizers

There are three interface for plotters. The following list contains the interface type and the associated driver:

HP-IB requires the `hpib` driver

Parallel requires the `parallel` and `hpib` driver.

The following list contains RS-232-C driver names associated with several types of serial connections. The drivers listed must be included in the `dfile` for the specified serial connection type.

Device Driver	Connection Type
98626	Series 300 Built-in RS-232-C port and HP 98626A RS-232-C Interface
98628	HP 98628A Datacomm Interface
98644	HP 98644A Asynchronous Serial Interface
<code>apci</code>	Series 400 Built-in RS-232-C port
98642	HP 98642A 4-Channel Multiplexer Interface or HP 98638A 8-Channel Multiplexer Interface

All serial drivers require a major number of 1.

Printers

There are three interface for printers. The following list contains the interface type and the associated driver:

HP-IB requires the **printer**, **ciper**, or **hpib** driver depending on the printer HP-IB protocol. The **ciper** driver supports ciper protocol, the **printer** driver supports amigo and non-protocol, and **hpib** driver is strictly non-protocol.

Parallel requires the **parallel** and **hpib** driver.

The following list contains RS-232-C driver names associated with several types of serial connections. The drivers listed must be included in the **dfile** for the specified serial connection type.

Device Driver	Connection Type
98626	Series 300 Built-in RS-232-C port and HP 98626A RS-232-C Interface
98628	HP 98628A Datacomm Interface
98644	HP 98644A Asynchronous Serial Interface
apci	Series 400 Built-in RS-232-C port
98642	HP 98642A 4-Channel Multiplexer Interface or HP 98638A 8-Channel Multiplexer Interface

All serial drivers require a major number of 1.

Graphic Devices

All graphics interfaces require the `graphics` driver present in the `dfile`. This includes the interfaces that directly connect to the graphic displays and those interfaces that connect to a graphic display controller.

HP-HIL Devices

HP-HIL devices require the `hil` driver present in the `dfile`.

GPIO Devices

GPIO devices require the `gpio` driver present in the `dfile`.

Using Boot ROM Revision D Configuration Mode

Introduction

Configuration Mode allows you to set your SPU's built-in interface's select codes, addresses and interrupt levels. These built-in interfaces are on the system board. As they do not have physical configuration switches like other interface cards, their configurations are set by keyboard entry while in the Boot ROM's Configuration Mode before booting the operating system. SPU's that have a configuration mode available are identified by the message:

Configuration EEPROM

appearing in the power-up display right after the MC68882 Co-processor message and just before the HP-HIL.Keyboard message.

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BOOTROM Rev. D
Bit-Mapped Video
MC68030 Processor
MC68882 Coprocessor
Configuration EEPROM
HP-HIL.Keyboard
HP-IB
DMA-CO
RAM 4194080 Bytes
HP98644 (RS-232) at 9
HP98265 (SCSI S 32) at 14
HP98625 (HS HP-IB) at 15
HP98643 (LAN) at 21 080009AAAAAA
HP PARALLEL at 23

System Search Mode
RESET to Power-up

Figure A-1. Power-Up and Self-Test Display

A

A-2 Using Boot ROM Revision D Configuration Mode

If the configuration information in the EEPROM could not be accessed or correctly applied to the built-in interfaces, the message would read:

Configuration EEPROM Failed

which means something failed and one of three situations may exist:

- All the built-in interfaces have been set to default values.
- Some default and some changed settings have been set.
- All the built-in interfaces have been set to their changed values. Some minor error occurred that shouldn't affect the configuration.

When that message appears, you should check your computer built-in interfaces' configurations and verify they are correct for your application.

Configurable Interfaces

You should enter configuration mode and find out what each built-in interface configuration values are set. Interfaces that have their configurations controlled by configuration mode are:

- HP-IB.
- RS-232.
- Small Computer Systems Interface.
- High-Speed HP-IB.
- Local Area Network.
- HP Parallel.

After you have set your built-in interface select codes and addresses, these values are stored in Electrically Erasable Programmable Read-Only Memory, or EEPROMS. If you turn your SPU off, then back on, your configuration values are still set. You may change them to suit your applications whenever you want by resetting your SPU and entering the Configuration Mode.

In the following sections, using the menus and user responses are shown in order. This is done to show you what the menus look like. Menu items may be selected in any order.

Note that menu changes will not be shown in the self-test results on the left side of the screen until the changes effected by the menus are saved and the self-test re-run.

A

Entering Configuration Mode

When you see this display show the memory size in RAM (RAM 4194080 Bytes):

```
Copyright 1989,  
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All Rights Reserved.  
  
BOOTROM Rev. D  
Bit-Mapped Video  
MC68030 Processor  
MC68882 Coprocessor  
Configuration EEPROM  
HP-HIL.Keyboard  
HP-IB  
DMA-CO  
RAM 4194080 Bytes  
HP98644 (RS-232) at 9  
HP98265 (SCSI S 32) at 14  
HP98625 (HS HP-IB) at 15  
HP98643 (LAN) at 21 080009AAAAAA  
HP PARALLEL at 23  
  
System Search Mode  
RESET to Power-up
```

Figure A-2.

type **C** **Return**.

Your display changes to indicate your SPU has entered Configuration Mode as shown in Figure A-3.

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All Rights Reserved.

BOOTROM Rev. D
Bit-Mapped Video
MC68030 Processor
MC68882 Coprocessor
Configuration EEPROM
HP-HIL.Keyboard
HP-IB
DMA-CO
RAM 4194080 Bytes
HP98644 (RS-232) at 9
HP98265 (SCSI S 32) at 14
HP98625 (HS HP-IB) at 15
HP98643 (LAN) at 21 080009AAAAAA
HP PARALLEL at 23

Configurable Interfaces
Keys Interface Select Code

1	HP-IB	
2	RS-232	9
3	SCSI	14
4	HS HP-IB	15
5	LAN	21
6	HP PARALLEL	23

N store New values
D store Default values
(then cycle SPU power)
A Abort without changes

Type [key] RETURN ?

System Search Mode

RESET to Power-UP, SPACE to clear input

? C

Figure A-3.

Note the Configuration Menu in the upper-right corner. Depending on how your specific computer lists the interfaces, they may be in different order. Interface key numbers may also be different. Be sure you use the correct key number for the interface you want to configure.

A

A-6 Using Boot ROM Revision D Configuration Mode

If an error message appears in the mode line at the bottom, for example:

```
Configure Mode Failed
RESET to Power-UP, SPACE to clear input          ? C
```

or the Configuration EEPROM Failed error message appears at power up, a hardware problem with the Boot ROM or its memory probably exists. Refer to the following table for possible error messages you may see when entering Configuration Mode.

Table A-1. Configuration Mode Entry Error Messages

Error Message	Meaning and What To Do
(no message)	Configure Mode could not start. Error messages can not be displayed. Hardware failure.
Configure Mode Failed	Configure Mode started but something failed.
EEPROM has bad information	Configuration Mode started, menu may have appeared, but something failed.
Too much data to save	Re-configure computer with fewer interfaces.
EEPROM Load section missing	Could not load new configuration data. Hardware failure.
EEPROM Defaults section missing	Default settings could not be found. Hardware failure.

A

Configuration Menu

The Configuration Menu's user actions are explained below:

- **Keys** - the keyboard's number keys representing the built-in interface you want to configure. Letter keys N, D, and A are control keys. You may select one or more keyboard configurable interfaces in any order.
- **Interface** - built-in interfaces listed in the display's left column that do not have configuration switches are listed by their name.
- **Select Code** - lists select code for interfaces that can have one. The built-in standard-speed HP-IB interface has a select code, but it cannot be changed. When you turn ON the SPU, each interface's default select code is listed.

Below the menu, the prompt line:

Type [key] RETURN ?

means:

- ? - waiting for keyboard input.
- Type [key] RETURN - type the key for the interface you want to configure, then type Return.

A

Example Interface Menu

You may select one or more keyboard configurable interfaces in any order. For each interface, you're able to go to its Interface Menu. An example Interface Menu for the RS-232 Interface is:

```
      RS-232
Key Feature      Value
-----
 1 Select Code      9
 2 Interrupt Level  5
 3 Remote/Local     L
 4 Fast/Normal      N
 5 Modem Enable     Y

X to eXit menu
-----
Type [key] RETURN ?
```

Three columns have this information for you to use:

- **Key** - the keyboard number keys represent the interface function you want to configure. Type **X** **Return** to exit and return to the Configuration Menu.
- **Feature** - Lists the interface's function. The menu control features are at the bottom.
- **Value** - Lists state or value of that interface function.

Note that all Interface Menus are not the same. Each has its own functions available for configuration.

Below the menu, the prompt line:

```
Type [key] RETURN ?
```

means:

- **?** - waiting for keyboard input.
- **Type [key] RETURN** - type the key for the interface you want to configure, then type **Return**.
- You may just type **Return** exit the Interface Menu and return to the Configuration Menu.

A

When you select an interface's function, the prompt line changes. An example is the RS-232's Select Code. After you have selected the RS-232 interface to configure, and you want to change its select code you would type **1** **Return**. The RS-232 Menu's prompt would change to:

```
1   Select Code           9
used select codes are :
14 15 21 23
Type 0.. 31 except used RETURN ?
```

Note the select code function line appears like it does in the main part of the RS-232 Menu. The current select code appears at the right. Select codes already used in your SPU are listed in the line:

```
used select codes are :
14 15 21 23
```

The bottom prompt line:

```
Type 0.. 31 except used RETURN ?
```

tells you to type in a select code number between 0 and 31 except for those codes already used. In this case, codes 14, 15, 21, and 23 are already used by other interfaces.

A

Recommended Procedures

A good way for you to use the Configuration Mode is explained below:

1. Find out and write down what interface configurations your application and peripherals need for:
 - Select Codes.
 - Interrupt Levels.
 - Addresses.
 - Fast or Normal Speed.
 - DMA bus width.
 - System Controller.
 - Remote or Local.
 - Modem Enable.
2. Turn ON your SPU and get it into Configuration Mode.
3. Determine what interface you will configure first.
4. Go to that section in this chapter for instructions.
5. Read the instructions and change that interface's configuration.
6. Return to the main Configuration Menu.
7. Go to the following section titled 'Using the Control Functions.'
8. Do those steps and exit Configuration Mode.

A

Using the Control Functions

The last three lines of the Configuration Menu are control functions.

```
Configurable Interfaces
Keys Interface Select Code
```

```
-----
1  HP-IB
2  RS-232          9
3  SCSI           14
4  HS HP-IB       15
5  LAN            21
6  HP PARALLEL    23
```

```

N  store New values
D  store Default values
   (then cycle SPU power)
A  Abort without changes
-----
```

```
Type [key] RETURN ?
```

Here's how they work:

Typing **(N)** **(Return)** saves all listed interfaces reconfigured values in non-volatile memory. You can turn OFF your SPU, then turn it back ON and the values you configured the interfaces to will be used. Then the self-test will run.

Typing **(D)** **(Return)** exits the Configuration Mode and resets the default configurations. You must cycle SPU power to then reconfigure the interfaces to these default values.

Typing **(A)** **(Return)** causes the Boot ROM to reset and run the self-test without saving any of the changes.

A

If the Boot ROM has problems as you exit configuration mode, the mode lines provide you with one or more of these error messages:

Table A-2. Configuration Mode Exit Error Messages

Keys Typed	Error Message	Meaning and What To Do
(M) (Return), or (D) (Return)	Too many configuration saves	More than 64000 saves.
	Can not save new configuration	Something prevented saving new configuration. Hardware failure.
	EEPROM can not save information	EEPROM may not save all of the new configuration information. Hardware failure.
(A) (Return)	(no message)	No messages should be seen when you abort the configure mode and reset your SPU.

Configuring Interfaces

HP-IB

When you type (1) (Return), the Configuration Menu changes to the HP-IB Menu:

```

      HP-IB
Key Feature      Value
-----
 1 Sys. Controller  Y

X to eXit menu
-----
Type [key] RETURN ?
```

The (1) key now changes definition to mean when typed, you want to change the built-in HP-IB interface's system controller function. System controller



is the only function this interface has. A Y in the value column means 'yes', built-in HP-IB is the system controller.

If you want to change your built-in HP-IB interface's system controller function to 'no':

1. Type **1** **Return** and the HP-IB Menu prompt changes to:

```
1 Sys. Controller      Y
Type Y or N RETURN ?
```

2. Type **N** **Return** and the HP-IB Menu prompt changes to:

```
HP-IB
Key Feature           Value
-----
1 Sys. Controller      N

X to eXit menu
-----
Type [key] RETURN ?
```

To go back to the Configuration Menu, type **X** **Return**:

```
Configurable Interfaces
Keys Interface  Select Code
-----
1 HP-IB
2 RS-232          9
3 SCSI           14
4 HS HP-IB        15
5 LAN            21
6 HP PARALLEL     23

N store New values
D store Default values
  (then cycle SPU power)
A Abort without changes
-----
Type [key] RETURN ?
```

RS-232

Enter the RS-232 Menu by typing **(2)** **(Return)**. The Configuration Menu changes to the RS-232 Menu:

```
      RS-232
Key Feature      Value
-----
1  Select Code      9
2  Interrupt Level   3
3  Remote/Local     L
4  Fast/Normal       N
5  Modem Enable      Y

X  to eXit menu
-----
Type [key] RETURN ?
```

Five RS-232 functions are explained in the next five sections.

Select Codes

Typing **(1)** **(Return)** changes the prompt line to:

```
1  Select Code      9
used select codes are :
14 15 21 23
Type 0.. 31 except used RETURN ?
```

The RS-232's current select code (9) appears to the right. Select codes set for other interfaces are identified. In the above example, select codes 14, 15, 21, and 23 are currently used. The bottom prompt tells you to enter a select code between 0 and 31 except those already used. If you enter a select code that's already used, the prompt line won't change.

For example, to set the RS-232 select code to 10, type **(1)** **(0)** and the bottom prompt line will show:

```
Type 0.. 31 except used RETURN ? 10
```

A

Then type **Return** and the RS-232 Menu changes to:

```
      RS-232
Key Feature      Value
-----
 1 Select Code   10
 3 Interrupt Level 3
 2 Remote/Local  L
 4 Fast/Normal   N
 5 Modem Enable  Y

X to eXit menu
-----
Type [key] RETURN ?
```

Interrupt Level

To enter the Interrupt Level Menu, type **2** **Return**. You'll see these lines appear:

```
 2 Interrupt Level 3
Type 3, 4, 5 or 6 RETURN ?
```

Your two options are to type:

Return if the listed interrupt level will be used.

One key, **3** through **6**, then **Return**, to set the interrupt level to 3 through 6.

The RS-232 Menu appears and the interrupt level's value shows what you set it to.

A

Remote/Local

Typing **3** **Return** changes the prompt line to:

```
3 Remote/Local      L
Type L or R RETURN ? L
```

The local (L) mode is the default setting. To change the remote/local function, type:

R **Return** to change to remote.

L **Return** to change to local.

Then your RS-232 Menu reappears and the value for the remote/local function shows up in the Value column.

Fast/Normal

If you are in the RS-232 Menu and type **4** **Return**, the prompt lines change to:

```
4 Fast/Normal      N
Type N or F RETURN ? F
```

Type the indicated to set the RS-232 speed:

F **Return** to change to Fast speed from Normal.

N **Return** to change to Normal speed from Fast.

When the main RS-232 menu appears, its speed line indicates what it's set to.

Modem Enable

While in the RS-232's main menu, go to the Modem Enable Menu by typing **5** **Return**, then the prompt lines display:

```
5 Modem Enable      Y
Type Y or N RETURN ?
```

If the Modem Enable function shows Y, you can disable it by typing **N** **Return**.

Typing **Return** gets you back to the RS-232 Menu without changing the Modem Enable's value.

After you have set your built-in RS-232 interface functions, return to the Configuration Menu from the RS-232 menu by typing **X** **Return**.



Small Computer Systems Interface

Enter the SCSI Menu by typing (3) (Return). The Configuration Menu changes to the SCSI Menu:

```
      SCSI
Key Feature      Value
-----
1  Select Code      14
2  Interrupt Level   3
3  Parity            Y
4  Bus Address       7

X  to eXit menu
-----
Type [key] RETURN ?
```

Select Code

Like the other interface menus, to choose the select code function to change, type (1) (Return). The prompt changes to:

```
1  Select Code      14
used select codes are :
9 15 21 23
Type 0.. 31 except used RETURN ?
```

As before, used select codes are listed. Your options are to type:

(Return) if the current select code will be used; no changes.

(0) through (3) (1) then (Return), except for used codes, to change select code.

A

In either case, the SCSI menu returns.

```
      SCSI
Key Feature      Value
-----
1  Select Code   14
2  Interrupt Level 3
3  Parity        Y
4  Bus Address   7

X  to eXit menu
-----
Type [key] RETURN ?
```

Interrupt Level

Your SCSI Interrupt Level control is entered by typing **(2)** **(Return)**. Prompt lines then appear as:

```
      2  Interrupt Level    3
Type 3, 4, 5, or 6 RETURN ?
```

As before, your options are to type:

(Return) if the current interrupt level will be used; no changes.

(3) through **(6)** then **(Return)** to change interrupt level.

In either case, the SCSI menu returns.

A

Parity

Your SCSI parity control is entered by typing **3** **Return**. Prompt lines then appear as:

```
4 Parity Y
Type Y or N RETURN ?
```

Your options are to type:

Return if the current parity state will be used; no changes.

N **Return** to change from 'yes' to 'no.' Parity checking will not be done by your SCSI interface. Each peripheral may have its own control.

Y **Return** to change from 'no' to 'yes.' Parity checking will be done by your SCSI interface.

In either case, the SCSI menu returns.

```
SCSI
Key Feature      Value
-----
1 Select Code    14
2 Interrupt Level 3
3 Parity         Y
4 Bus Address    7

X to eXit menu
-----
Type [key] RETURN ?
```

A

Bus Address

Your SCSI bus address is entered by typing **(4)** **(Return)**. Prompt lines then appear as:

```
      3  Bus Address          7
Type 0.. 7 RETURN ?
```

Your options are to type:

(Return) if the current bus address will be used; no changes.

(0) through **(7)** then **(Return)** to change bus address.

In either case, the SCSI menu returns.

After all SCSI functions have been configured to your application, you may type **(X)** **(Return)** to go back to the main Configuration Menu.



A

High-Speed HP-IB

Type **4** **Return** to enter high-speed HP-IB Mode and see this Menu:

```
      HP-IB
Key Feature      Value
-----
 1 Select Code      15
 2 Interrupt Level   4
 3 Sys. Controller   Y
 4 Fast/Normal       N
 5 98625B mode      16

X to eXit menu
-----
Type [key] RETURN ?
```

Select Code

By typing **1** **Return**, the HS HP-IB menu's prompt changes to:

```
 1 Select Code      15
used select codes are :
10 14 21 23
Type 0.. 31 except used RETURN ?
```

Remember you cannot use a select code already used. Choices available are:

Return if the current select code will be used; no changes.

0 through **3** **1** then **Return**, except for used codes, to change select code.

After making your choice, the HS HP-IB menu returns.

A

Interrupt Level

Your HS HP-IB Interrupt Level control is entered by typing **2** **Return**. Prompt lines then appear as:

```
      2   Interrupt Level      4
      Type 3, 4, 5 or 6 RETURN ?
```

As before, your options are to type:

Return if the current interrupt level will be used; no changes.

3 through **6** then **Return** to change interrupt level.

In either case, the HS HP-IB menu returns.

System Controller

If you want to change your HS HP-IB interface's system controller function, type **3** **Return** and the HS HP-IB Menu prompt changes to:

```
      3   Sys. controller      Y
      Type N or Y RETURN ?
```

Your options are to type one of these:

Return if the current system controller state will be used; no changes.

Y **Return** to change from 'no' to 'yes.' Your SPU's HS HP-IB interface will be the system controller.

N **Return** to change from 'yes' to 'no.' Your SPU's HS HP-IB interface will not be the system controller.

Then your HS HP-IB menu returns.

A

Fast/Normal

If you are in the HS HP-IB Menu and type **4** **Return**, the prompt lines change to:

```
4    Fast/Normal      F
Type N or F RETURN ? F
```

Type one of these to set the HS HP-IB speed:

F **Return** to change to Fast speed from Normal.

N **Return** to change to Normal speed from Fast.

When the HS HP-IB menu appears, its speed line indicates what it's set to.

A

98625B Mode

Your HS HP-IB interface's direct memory addressing (DMA) emulates the HP 98265B Interface Card. Its bus width can be set to either 16- or 32-bit mode.

If your SPU's HS HP-IB interface has 32-bit DMA width set, the self-test will identify it as HP-IB (HS 32) in the power-up display.

Note	Operating systems cannot boot on the high-speed HP-IB interface when in 32-bit mode. Nor will the interface be tested in test mode. If software requires the 32-bit DMA mode, it will change the interface from 16-bit to 32-bit mode as needed. Then the software will reset it to the 16-bit mode.
-------------	--

From the HS HP-IB Menu, type to change the prompt to:

```
      5  98625B mode          Y
Type Y or N RETURN ?
```

Set the DMA width by:

to change from 32-bit wide to 16-bit wide.

to change from 16-bit wide to 32-bit wide.

You may type to go back to the HS HP-IB Menu.

Then the HS HP-IB Menu appears with the 98625B mode indicated in the value column.

After your HS HP-IB Menu shows the configuration you need, type to get back to the main Configuration Menu.

A



Local Area Network

To enter the LAN Menu, get the main Configuration Menu, then type **5** **Return**. The LAN Menu appears:

```
      LAN
Key Feature      Value
-----
 1 Select Code      21
 2 Interrupt Level   5

X to eXit menu
-----
Type [key] RETURN ?
```

Select Code

Typing **1** **Return** makes the prompt change to:

```
 1 Select Code      21
used select codes are :
10 14 15 23
Type 0.. 31 except used RETURN ?
```

Remember you cannot use a select code already used. Choices available are:

Return if the current select code will be used; no changes.

0 through **3** **1** then **Return**, except for used codes, to change select code.

After making your choice, the LAN menu returns.

A

Interrupt Level

Enter your LAN Interrupt Level control by typing **(2)** **(Return)**. Prompt lines then appear as:

```
2   Interrupt Level   5
Type 3, 4, 5 or 6 RETURN ?
```

As before, your options are to type:

(Return) if the current interrupt level will be used; no changes.

(3) through **(6)**, then **(Return)** to change interrupt level.

In either case, the LAN Menu returns.

When your LAN Menu shows the configuration you need, type **(X)** **(Return)** to get back to the main Configuration Menu.

A

HP Parallel Interface

Enter the HP Parallel Menu by typing **6** **Return**. Its menu looks like:

```
      HP PARALLEL
Key Feature          Value
-----
 1 Select Code      23
 2 Interrupt Level   3

X to eXit menu
-----
Type [key] RETURN ?
```

Select Code

Typing **1** **Return** makes the prompt change to:

```
 1 Select Code      23
used select codes are :
10 14 15 21
Type 0.. 31 except used RETURN ?
```

Remember you cannot use a select code already used. Choices available are:

Return if the current select code will be used; no changes.

0 through **3** **1** then **Return**, except for used codes, to change select code.

After making your choice, the HP Parallel Menu returns.

A

Interrupt Level

Your HP Parallel Interrupt Level control is entered by typing **(2)** **(Return)**. Prompt lines then appear as:

```
      2  Interrupt Level      3
      Type 3, 4, 5 or 6 RETURN ?
```

As before, your options are to type:

(Return) if the current interrupt level will be used; no changes.

(3) through **(6)** then **(Return)** to change interrupt level.

In either case, the HP Parallel Menu returns.

When your HP Parallel Menu shows the configuration you need, type **(X)** **(Return)** to get back to the main Configuration Menu.

A

Using Boot ROM Revision 400 Configuration Mode

Workstation Configurations

Your workstation may be configured with one of several combinations of system console, type of operating systems and internal interface settings. If these configurations are matched the correct displays will appear and the desired operating system can be booted. If there is a mismatch, you have to enter Configuration Control Mode and change the EEPROM configuration. lists typical matched configurations. lists typical mismatched configurations and what you need to do to enable the system console and boot the desired operating system.

Table B-1.
System Unit, System Console, and Operating System Mismatch
Situations at Power-Up

System Console	RS-232 Mode	Boot Mode	Display	Seen	What to Do
Monitor & Kbd.	Local	HP-UX	HP-UX	Power Up	Configure internal I/O if needed
Monitor & Kbd.	Local	Domain	Domain	Blank Screen	Configure internal I/O if needed
Monitor & Kbd.	Remote	HP-UX	HP-UX	Power Up	Configure internal I/O if needed
Monitor & Kbd.	Local	Undetermined	Don't Care	Config Menu	Configure internal I/O if needed Change Boot Mode to Op. Sys. installed.
Monitor & Kbd.	Local	HP-UX	Domain	Power Up	Configure internal I/O if needed Change Boot Mode to Domain.
Monitor & Kbd.	Local	Domain	HP-UX	Blank Screen	Configure internal I/O if needed Change Boot Mode to HP-UX.
Monitor & Kbd.	Remote	Undetermined	Don't Care	Remote at 9	Change RS-232 to Local Configure internal I/O if needed Change Boot Mode to Op. Sys. installed.
Monitor & Kbd.	Remote	HP-UX	Domain	Remote at 9	Change RS-232 to Local Configure internal I/O if needed Change Boot Mode to Domain.
Monitor & Kbd.	Remote	Domain	HP-UX	Blank Screen	Change RS-232 to Local Configure internal I/O if needed Change Boot Mode to HP-UX Select operating system,if needed.
Terminal	Local	Undetermined	Don't Care	Blank Screen	Change RS-232 to Local Configure internal I/O if needed Change Boot Mode to Op. Sys. installed.
Terminal	Local	HP-UX	Domain	Blank Screen	Set SERVICE Mode and push Reset Configure internal I/O if needed Change Boot Mode to Domain.
Terminal	Local	Domain	HP-UX	Blank Screen	Set RS-232 to Remote Configure internal I/O if needed Change Boot Mode to HP-UX Select operating system, if needed.

B

B-2 Using Boot ROM Revision 400 Configuration Mode

System Console and System Unit Configurations

Either a keyboard with a monitor or a terminal may be used as your workstation's system console. When a keyboard is connected to the system unit's HP-HIL connector, it may always be used for inputting keyboard commands. Depending on the system console used, one or several types of information will be displayed at the first power-up.

Keyboard and Monitor as System Console

When your workstation uses a keyboard and monitor as the system console and there are no pre-installed operating systems, at the first power-up after installation of a new system unit, one of these situations should happen:

- This Configuration Control Main Menu will appear in the upper right-hand corner. If it does, you may continue configuring your system unit by referring to the section titled Using Configure Mode.

```
Configuration Control
  Keys Control Class
-----
1  I/O Configuration
2  Boot Mode Selection

A  Abort without changes
-----
Type [key] RETURN ?
```

- This message will appear:

```
Remote Console at 9
After beeps, type L RETURN to use the local monitor as console.
```

If the above message appears, that means the system unit's internal RS-232 interface or another accessory DIO-II RS-232 interface has been set to Remote.

If the indicated select code is 9, it's the internal RS-232 interface. To temporarily use the HP-HIL/Video interfaces so the keyboard and monitor may be used as the system console, listen for two beeps (about 5 seconds after the message appears) then type L Return within 10 seconds of hearing the two beeps.

B

To permanently change the internal RS-232 to local, you must enter I/O Configuration Mode and change the interface configuration to Local.

If the select code is any other number, it's an accessory DIO-II RS-232 interface and you must remove the RS-232 accessory card and change its configuration switches to make a permanent change to the accessory card. Refer to the interface card's documentation. Then power up the system unit.

The system unit will reset and the Configure Mode Main Menu should appear in the display's upper right-hand corner. Go on to the section titled Using Configuration Control Mode to continue configuring your system unit.

Terminal as System Console

When your workstation uses a terminal as the system console and has no pre-installed operating systems, at the first power-up one of these situations should happen:

- This Configuration Mode Main Menu will appear on the right-hand side. If it does, you may continue configuring your system unit by referring to the section titled Using Configuration Control Mode.

```
Configuration Control
  Keys Control Class
-----
1  I/O Configuratioin
2  Boot Mode Selection

A  Abort without changes
-----
Type [key] RETURN ?
```

- If nothing appears on the display, the system unit's internal RS-232 interface has been set to Local mode. You must reconfigure your system unit's RS-232 interface to Remote mode. The next section explains how to do this.

B

B-4 Using Boot ROM Revision 400 Configuration Mode

Reconfiguring the RS-232 Interface to Remote Mode

Follow these steps to temporarily reconfigure your system unit's RS-232 interface to Remote mode when you power-up the system unit and no display appears on your terminal:

1. Refer to Figure B-1. On the system unit, find the Service/Normal switch and set it to Service.

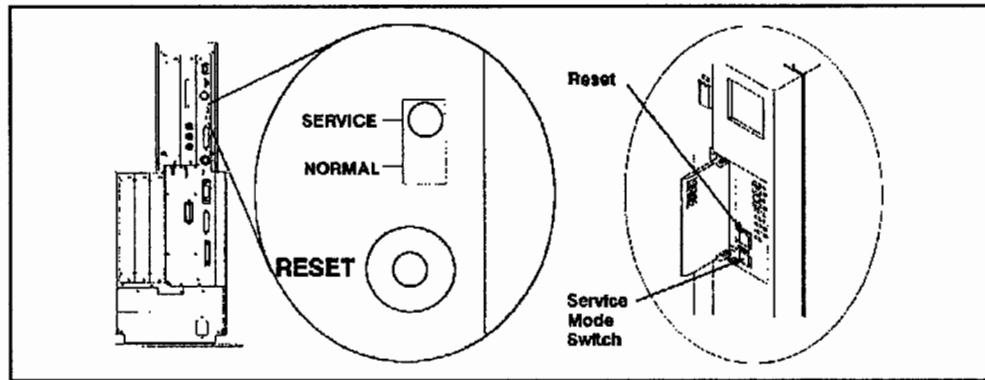


Figure B-1. System Unit Service/Normal Switch and Reset Button

2. Refer to Figure B-1. On the system unit, press the RESET button to reset the system unit.
3. To temporarily change the internal RS-232 interface to Remote so the terminal may be used as the system console, listen for two beeps (about 5 seconds after the message appears) then type this command on the terminal's keyboard:

R **Return**

The system unit will reset and the Configuration Control Main Menu should appear in the terminal display's right-hand side. Go on to the section titled Using Configuration Control Mode to continue configuring your system unit.

Terminal as System Console With Monitor

If your workstation uses a terminal as the system console and also has a monitor connected to the video board but no keyboard connected to the HP-HIL connector, one of these situations should happen:

- This Configuration Control Main Menu will appear on the right-hand side. If it does, you may continue configuring your system unit by referring to the section titled Using Configuration Control Mode.

```
Configuration Control
  Keys Control Class
-----
1  I/O Configuratioin
2  Boot Mode Selection

A  Abort without changes
-----
Type [key] RETURN ?
```

- This power-up display will appear on the monitor. If it does, type the command:

R Return

on the terminal and the system unit will reset. The Configuration Control Mode Main Menu should appear. You may continue configuring your system unit by referring to the section titled Using Configuration Control Mode.

B

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Series 400 Rev. 1, 5 Jun 90
md 12 rev 0.20, 1990/03/12.16:31:17
Bit-Mapped Video
MC68030 Processor
MC68882 Coprocessor

Configuration Control
Keys Control Class

- 1 I/O Configuration
2 Boot Mode Selection
A Abort without changes

Type [key] RETURN ?

Configuration EEPROM

HP-HIL.Keyboard

Type R RETURN for internal RS-232 console

HP-IB

DMA-C0

RAM 4194080 Bytes

HP98644 (RS-232) at 9

HP98265 (SCSI S 32) at 14

HP98643 (LAN) at 21, THIN, 080009AAAAAA

HP PARALLEL at 12

Configuration Mode

RESET to Power-up SPACE clears input

?

Note the line about in the middle that reads:

Type R RETURN for internal RS-232 console

That line means to type the command:

R Return

on the terminal's keyboard to change the internal RS-232 interface to Remote
so you can use the terminal as the system console. Depending on when you type
the command, some of the display may not appear.

B

Using Configuration Control Mode

Before you use Configuration Control Mode, ensure your system console interface has been properly configured. Refer to the earlier section titled 'System Console and System Unit Configurations' for that procedure.

New System Unit First Turn-On

Your system unit's Boot Mode determines whether it runs Domain compatible or HP-UX compatible operating systems. New system units display their Boot Mode selection in two ways:

- A special LED pattern will appear a few seconds after the system unit gets powered up. The pattern will appear after the power up display has completed on the left side of the screen and before the Configuration Control Menu appears.
- The power-up display has a Configuration Control Menu that may be accessed to find out what the Boot Mode selection is and you can change it if required.

Boot Mode LED Patterns

When you first power-up your system unit, the middle eight front panel LEDs will all turn on, then ripple off. After the left side of the power-up display appears, the fourth yellow LED down, or to the right if the LED display is horizontal, will blink at a high rate for about three seconds. During the time the fourth LED blinks, the top, or left, two yellow LEDs will indicate the current Boot Mode selection. Table lists these LED patterns

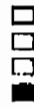
Undetermined	HP-UX	Domain
		

Figure B-2.
Boot Mode Selection Top/Left Four Amber LED Patterns

Power-Up Display

This Configuration Control Mode screen appears when you first turn a new system unit on:

Copyright 1990,
Hewlett-Packard Company,
All Rights Reserved.

Series 400 Rev. 1, 5 Jun 90
md 12 rev 0.20, 1990/03/12.16:31:17
Bit-Mapped Video
MC68030 Processor

Configuration EEPROM
HP-HIL.Keyboard
RAM 4194080 Bytes

Configuration Control
Keys Control Class

1 I/O Configuration
2 Boot Mode Selection
A Abort without changes

Type [key] RETURN ?

Configuration Mode
RESET to Power-up

In the upper right-hand corner you'll see the Configuration Control Menu. The next to the last line at the bottom identifies the system unit as being in the Configuration Mode.

Note the line on the left side that reads Configuration EEPROM. If the configuration information in the EEPROM could not be accessed or correctly applied, the line would read:

Configuration EEPROM Failed

That means something wasn't quite right and one or more of the Configuration Control Classes has not worked correctly. You may have to replace the CPU board.

B

Boot Mode Selection

With the Configuration Control Mode menu displayed, type the number key command:

2 **Return**

and this Boot Mode Selection menu should appear:

```
      Boot Mode Selection
Keys Mode                Status
-----
  1  Domain Compatible
  2  HP-UX Compatible
  3  Undefined           P

  C  Clear temporary
  E  Execute
  A  Abort without changes
-----
Type [key] RETURN ?
```

The number keys are used to select one of the compatibility modes. Letter keys are the control keys for the menu. A C is used to clear any mode's temporary status that's indicated by a T in the status column. The E key is used to execute the menu and store the status information in the EEPROM. If the status is correct, you may type the A key to abort the Boot Mode Selection without changing it.

Below the menu, you'll see a prompt line:

```
Type [key] RETURN ?
```

The question mark means the system unit is waiting for a keyboard input.

"Type [key] RETURN" means type the key, either letter or number key, then press **Return** to complete the command.

Type the number key command to select the Boot Mode you want to use:

- 1 **Return** to select Domain compatible mode
- 2 **Return** to select HP-UX compatible mode

B-10 Using Boot ROM Revision 400 Configuration Mode

This menu appears below the Boot Mode Selection menu. If you selected HP-UX compatible, the menu would look like this:

```
      Boot Mode Selection
Keys Mode                      Status
-----
  1  Domain Compatible
  2  HP-UX Compatible
  3  Undefined                      P

  C  Clear temporary
  E  Execute
  A  Abort without changes
-----
Type [key] RETURN ?

  2  HP-UX Compatible
Temporary or Permanent
Type T or P RETURN ?
```

Type the letter key command to select either permanent or temporary use of the selected boot mode:

- T **Return** to temporarily select the boot mode. If you execute this selection, then cycle power or reset the system unit, the permanently select boot mode will be used.
- P **Return** to permanently select the boot mode selection If you execute this selection, then cycle power or reset the system unit, the permanently select boot mode will be used.

The menu would look like this if you typed the command P:

```
      Boot Mode Selection
Keys Mode                Status
-----
  1  Domain Compatible
  2  HP-UX Compatible      P
  3  Undefined

  C  Clear temporary
  E  Execute
  A  Abort without changes
-----
Type [key] RETURN ?
```

Type one of these letter key commands for your selection:

E to execute the menu selections.

C to clear any temporary selection.

If you set the Boot Mode Selection to Domain compatible, the system unit would reset with no apparent change on the screen. You would then boot the Domain operating system if the system unit was in normal mode.

After executing the Boot Mode Selection menu with HP-UX compatible mode selected, the system unit would reset and this power-up display would appear:

B

Copyright 1990,
Hewlett-Packard Company,
All Rights Reserved.

Series 400, Rev. 1, 5 Jun 90
md 12 rev 0.20, 1990/03/12.16:31:17
Bit-Mapped Video
MC68030 Processor
MC68882 Coprocessor
Configuration EEPROM
HP-HIL.Keyboard
HP-IB
DMA-C0
RAM 4194080 Bytes
HP98644 (RS-232) at 9
HP98265 (SCSI S 32) at 14
HP98643 (LAN) at 21, THIN, 080009AAAAAA
HP PARALLEL at 12

System Search Mode
RESET to Power-up SPACE clears input

?

B

As soon as you see this display for HP-UX compatible mode, you have three options:

- Do nothing and the Boot ROM will search for an HP-UX compatible operating system. If one is found, it will be booted. For system units that have pre-installed operating systems, this should be the correct procedure.
- Type any key to stop the Boot ROM functions and place the system unit in an attended mode.

While in attended mode, you may do one of the following as soon as the keyboard line appears in the power-up display

- Type any key to stop the Boot ROM process and put the system unit in attended mode. From attended mode, you may also do the next two options.
- Type C **Return** to enter Configuration Control Mode to change the Boot Mode Selection, Auto System Select, or I/O Configuration.
- Type T **Return** to enter Test Mode and run the Boot ROM diagnostics.

If you are turning on a new system unit for the first time and need to change the internal interface configurations or change the Auto System Select Mode, you should type the command C **Return** to enter Configuration Control Mode. Then you may select either the I/O Configuration or Auto System Select Mode. These modes are explained in the following sections.

I/O Configuration Mode

These procedures are used for interfaces that are configured under Boot ROM control using keyboard inputs. If your system unit has interfaces with switches or jumpers to configure it, refer to their documentation for instructions.

Entering I/O Configuration Mode

After you have selected the HP-UX compatibility mode from the Boot Mode Selection Menu, executed that menu, then type C **Return** from the power-up display, you should see this menu in the power-up display:

```
Configuration Control
Keys Control Class
-----
1  I/O Configuratioin
2  Auto System Selection
3  Boot Mode Selection

A  Abort without changes
-----
Type [key] RETURN ?
```

B

From the Configuration Control Menu, type 1 **Return** and this menu appears:

```
Configurable Interfaces
Keys Interface  Select Code
-----
 1 LAN                21
 2 SCSI               14
 3 HP Parallel        12
 4 RS-232              9
 5 HP-IB

N store New values
D store Default values
  (then cycle SPU power)
A Abort without changes
-----
Type [key] RETURN ?
```

The order that interfaces appear and their respective number keys may be different than the above example. Only interfaces that are configurable from Boot ROM control will be listed. Interfaces in the system unit that have switches to set their configuration will not be listed.

If the one of the following error messages appear in the display:

Configure Mode Failed

Configuration EEPROM Failed

one or more of these situations exists with the I/O Configuration Mode:

- All of the configurations have been set to default values.
- Some default and some changed values have been set.
- All the configurations have been set to their changed values. Some minor error occurred that shouldn't affect the system unit's configuration.

When that message appears, you should check your system unit's Boot Mode Selection and I/O Configuration Mode selections and verify they are correct for your application.

B

B-16 Using Boot ROM Revision 400 Configuration Mode

If an error message appears in the mode line at the bottom, for example:

```
Configure Mode Failed
RESET to Power-UP, SPACE to clear input          C?
```

or the Configuration EEPROM Failed message appears at power-up, a hardware problem with the Boot ROM or its associated circuits probably exists. Refer to Figure B-3 for possible error messages you may see when entering Configuration Mode.

Error Message	Meaning and What To Do
(No error message)	If Configuration Mode does not start and no error message appears, a hardware failure probably occurred. Replace CPU board.
EEPROM Has Bad Information	Configuration Mode started, main menu may appear, but something failed. Try again. Replace CPU board.
EEPROM Load Section Missing	Could not load new configuration data. Hardware failure. Replace CPU board.
EEPROM Defaults Section Missing	Default configurations could not be found. Hardware failure. Replace CPU board.
Too much data to save	Too many interfaces for EEPROM to manage. Reconfigure system unit with fewer interfaces.

Figure B-3. Configuration Mode Entry Error Messages

Only the interfaces select codes are listed in the main Configurable Interfaces menu. HP-IB is fixed at select code 7 and cannot be changed. Most built-in interfaces have several configurable features. Interface default values are listed in Figure B-4.

B

Interface	Configuration Function	Default	Options
Optional HP-IB	Select Code (cannot be changed)	7	None
	System Controller	Yes	No
RS-232	Select Code	9	0 to 31
	Remote/Local		
	sys. unit shipped with keyboard	Local	Remote
	sys. unit shipped without keyboard	Remote	Local
	Interrupt Level	3	3 to 6
SCSI	Modem Enable	Yes	No
	Select Code	14	0 to 31
	Interrupt Level	3	3 to 6
	Bus Address	7	0 to 7
	Parity	Yes	No
Thin/AUI LAN	Select Code	21	0 to 31
	Interrupt Level	5	3 to 6
HP Parallel	Select Code	12	0 to 31
	Interrupt Level	3	3 to 6

Figure B-4. Built-In Interface Default Configurations

If your system unit is using Domain operating systems, the internal RS-232 interface will not be used. Instead, a different internal SIO interface will be used with the RS-232 connector.

If the default configurations will be used, you should exit the menu by typing the **A** command. If you want to change any of the configuration functions, go to the section titled Configuring the Built-In Interfaces.

There are three columns of information:

Keys	the keyboard number keys represent the interface you want to select to configure. Letter keys are for control functions. You may select any key in any order.
Interface	the built-in configurable interfaces. If an interfaces listed in your screen's left-hand side does not appear in the Main Configuration Menu, that interface cannot be configured from I/O Configure Mode.
Select Code	shows the listed interfaces select code. Note the standard-speed HP-IB interface is fixed at select code 7. When you get the power-up display in HP-UX compatible mode or enter I/O Configuration Mode, default select codes are listed. If you change an interface select code, then save the new configuration, the next time you turn on your system unit, the new select code will be listed. You may also revert back to the default settings.

Example Interface Menu

You may select one or more keyboard configurable interfaces in any order. For each interface, you're able to go to its Interface Menu. In this example, the RS-232 Interface Menu will be used. To select the RS-232 Interface, type the command key for the RS-232 interface:

[key] **Return**

The Configurable Interfaces Menu gets replaced with this RS-232 Menu:

RS-232		
Key	Feature	Value

1	Select Code	9
2	Interrupt Level	5
3	Remote/Local	L
4	Modem Enable	Y
X	to eXit menu	

Type [key] RETURN ?		

B

Three columns are similar to the Configurable Interfaces Menu:

Feature	lists each configurable function for the selected interface.
Value	shows the current value, or mode for each function.
Key	indicates the feature you want to select. To exit the interface menu, type X Return .

Note that all Interface Menus are not the same. Each has its own features available for configurations.

When you select an interface's function, the prompt line changes. An example is the RS-232's Select Code. After you have selected the RS-232 interface to configure, and you want to change its select code you would type the command:

1 **Return**

Then the command line would change to:

```
1  Select Code      9
   used select codes are :
12 14 15 21
Type 0.. 31 except used RETURN ?
```

Note the select code function line appears like it does in the main part of the RS-232 Menu. The current select code appears at the right. Select codes already used in your system unit are not available and are listed in the third line.

At the bottom, you'll see the prompt line. This example means you would enter a select code between 0 and 31, except for select codes 12, 14, 15 and 21. If you want to use select code 23, you would enter the command:

23 **Return**

Other features would be selected and changed the same way. After you have made all the changes to the RS-232 Interface your system unit needs, exit the RS-232 Menu by entering the command:

X **Return**

B

Using the Control Functions

Your Configurable Interfaces Menu has three control functions:

- N store New values
- D store Default values
(then cycle SPU power)
- A Abort without changes

Each of the three commands are explained below:

- N saves all listed interfaces reconfigured values in the EEPROM. You can turn OFF your system unit, then turn it back ON and the values you configured the interfaces to will be used. Then the self-test will run.
- D exits the Configuration Mode and resets the factory default configurations. You must cycle system unit power to then reconfigure the interfaces to these default values.
- A causes the Boot ROM to reset and run the self-test without saving any new interface configurations you may have made. The interfaces' existing configurations will be used.

If the Boot ROM or EEPROM has problems after you enter one of these commands, the mode lines display one of the error messages shown in the following table.

Command	Error Message	Meaning and What To Do
N or D	Too many configuration saves	More than 64,000 saves was tried. Unlikely to occur.
N or D	Can not save new configuration	Something prevented saving the new configuration. Hardware failure. Replace CPU board.
N or D	EEPROM can not save information	EEPROM may not save any or all of the new configuration information. Hardware failure. Replace CPU board.
A	(no message should appear)	No error messages should appear when you abort configuration mode and reset you system unit.

Figure B-5. Configuration Mode Exit Error Messages

HP-IB Configuration

When your display has the Configurable Interfaces Menu and you enter the command for the HP-IB interface:

[key] **Return**

this HP-IB Menu takes its place:

```
      HP-IB
Key Feature          Value
-----
 1  Sys. Controller    Y

X   to eXit menu
-----
Type [key] RETURN ?
```

The '1' key now changes definition to mean when typed, you want to change the built-in HP-IB interface's system controller function. System controller is the only function this interface has. A Y in the value column means 'yes', built-in HP-IB is the system controller.

If you want to change your built-in HP-IB interface's system controller function to 'no:'

1. Type the command 1 and the HP-IB Menu prompt changes to:

```
 1  Sys. Controller    Y
Type Y or N RETURN ?
```

2. Type the command N and the HP-IB Menu changes to:

```
      HP-IB
Key Feature          Value
-----
 1  Sys. Controller    N

X   to eXit menu
-----
Type [key] RETURN ?
```

3. Return to the Configurable Interfaces Menu by typing the command:

X **Return**

RS-232 Configuration

From the Configurable Interfaces Menu, type the command key for the RS-232 interface meny and this RS-232 Menu appears:

```
      RS-232
Key Feature      Value
-----
1  Select Code      9
2  Interrupt Level   3
3  Remote/Local     L
4  Modem Enable     Y

X  to eXit menu
-----
Type [key] RETURN ?
```

Each feature is explained in the following sub-sections.

RS-232 Select Code

From the RS-232 Menu, type the command 1 and the prompt line changes to:

```
1  Select Code      9
   used select codes are :
12 14 15 21
Type 0.. 31 except used RETURN ?
```

Note the select code function line appears like it does in the main part of the RS-232 Menu. The current select code appears at the right. Select codes already used in your system unit are not available and are listed in the third line.

B

At the bottom, you'll see the prompt line. Enter a select code between 0 and 31, except for select codes already used for other interfaces. If you want to use select code 20, you would enter the command 20. Then the RS-232 Menu would change to:

```

      RS-232
Key Feature      Value
-----
1  Select Code      20
3  Interrupt Level   3
2  Remote/Local     L
4  Modem Enable      Y

X  to eXit menu
-----
Type [key] RETURN ?
```

RS-232 Interrupt Level

Typing the command 2 from the RS-232 Menu changes the prompt line to:

```

      2  Interrupt Level   3
Type 3, 4, 5 or 6 RETURN ?
```

You can change the interrupt level to one of three other levels. If you want to use level 4, you would type the command 4. The RS-232 Menu reappears with the new interrupt level shown. If you do not want to change the interrupt level, type Return.

RS-232 Remote/Local Mode

Typing the command 3 from the RS-232 Menu changes the prompt line to:

```

      3  Remote/Local     L
Type L or R RETURN ?
```

Change the mode by typing the command L (local) if a keyboard and monitor will be used as the system console, or R (remote) if a terminal will be used as the system console. The RS-232 Menu changes and the new mode is identified in the Value column.

B

RS-232 Modem Enable Mode

Typing the command 4 from the RS-232 Menu changes the prompt line to:

```
4   Modem Enable      Y
Type Y or N RETURN ?
```

Change the mode by typing the command N (no, you do not) or Y (yes, you do) want modem enable. The RS-232 Menu changes and the new mode is identified in the Value column.

After you have reviewed the RS-232 Menu and made the required changes, return to the Interface Menu by typing the command X.

Small Computer Systems Interface Configuration

Enter the SCSI Menu by typing the command key for the SCSI interface. The Configurable Interfaces Menu changes to the SCSI Menu:

```
SCSI
Key Feature      Value
-----
1  Select Code   14
2  Interrupt Level 3
3  Parity        Y
4  Bus Address   7

X  to eXit menu
-----
Type [key] RETURN ?
```

SCSI Select Code

From the SCSI Menu, type the command 1 and the prompt line changes to:

```
1  Select Code          14
used select codes are :
9 12 15 21
Type 0.. 31 except used RETURN ?
```

Note the select codes already used Type the command for the select code you want to use. After you have entered the select code, the SCSI Menu changes to show your change.

SCSI Interrupt Level

From the SCSI Menu, type the command 2 and the prompt line changes to:

```
2  Interrupt Level      3
Type 3, 4, 5, or 6 RETURN ?
```

Type the command for the interrupt level you want to use. After you have entered the new interrupt level, your SCSI Menu changes to show your change.

SCSI Parity Mode

From the SCSI Menu, type the command 3 and the prompt line changes to:

```
3  Parity              Y
Type Y or N RETURN ?
```

Type the command Y if you do want parity checking done by the system unit's SCSI interface. Type the command N if you do not want parity checking done. After you have made your choice, your SCSI Menu changes to show your change.

SCSI Bus Address

From the SCSI Menu, type the command 4 and the prompt line changes to:

```
      3  Bus Address          7
Type 0.. 7 RETURN ?
```

Type the command for your new SCSI bus address. After you have made your choice, your SCSI Menu changes to show you choice.

After all SCSI features have been changed as you need them, from the SCSI Meny type the command X to return to the Interface Menu.

Local Area Network Configuration

Enter the LAN Menu by typing the command key for the LAN and this menu appears:

```
LAN
Key Feature      Value
-----
1  Select Code   21
2  Interrupt Level 5

X to eXit menu
-----
Type [key] RETURN ?
```



LAN Select Code

From the LAN Menu, type the command 1 to change the prompt to:

```
1  Select Code   21
   used select codes are :
10 14 15 23
Type 0.. 31 except used RETURN ?
```

You may change the LAN select code to any number except those already used. Just type the number for the select code you want, then type **Return**. The LAN Menu will change to show the new select code. Then exit the menu.

LAN Interrupt Level

Enter the LAN Menu's interrupt level by typing the command 2. Then the prompt line changes to

```
2  Interrupt Level 5
Type 3, 4, 5 or 6 RETURN ?
```

Type the command to change the LAN interrupt level, then exit the LAN Menu.

B

HP Parallel Interface Configuration

Enter the HP Parallel Interface Menu from the Interface Menu by typing the command key for the HP Parallel Interface. This menu will appear:

```
      HP PARALLEL
Key Feature          Value
-----
 1  Select Code      23
 2  Interrupt Level   3

X  to eXit menu
-----
Type [key] RETURN ?
```

HP Parallel Select Code

Type the command 1 to get this select code prompt:

```
 1  Select Code      23
    used select codes are :
    10 14 15 21
Type 0.. 31 except used RETURN ?
```

You can type the command for any unused select code. The menu changes to reflect the new select code.

HP Parallel Interrupt Level

Your HP Parallel interrupt level is accessed by typing the command 2. Then the prompt changes to:

```
2  Interrupt Level  3
Type 3, 4, 5 or 6 RETURN
```

Type the command for the new select code. Then exit the menu.

Note	After you have made the required changes to your system unit's built-in interface configurations, you must use the Interface Menu and make the changes permanent. Otherwise, if you turn the system unit off, then back on again, the original interface configurations will be in effect.
-------------	--

Configuring Internal Interfaces

1. If you have already booted an operating system, log out and stop any user processes. Otherwise, go on to step 2.
2. Reset the system unit and get the power-up display, then when the keyboard is identified, type the command

C

3. From the Configuration Control Menu, type this command to get the I/O Configuration Menu:

1

4. From the I/O Configuration Menu, type the number command for the interface you want to configure:

key

5. Type the number command for the feature you want to change:

key

6. Type the number or letter key(s) command to change the feature:

key(s)

7. Exit the selected interface menu by typing:

X

8. Type the letter key command to store the new values, store the default values or abort and not make any changes:

key

9. When the Configuration Control Menu appears and the system unit was turned on for the first time, you should type the following command to enter the Auto System Select Mode:

2

10. If you have already selected an operating system, you should abort the menu without changing it by typing this command:

A

B

Auto System Select Mode

After configuring the system unit's Boot Mode Selection for HP-UX and I/O Configuration, you should use the Auto System Select Mode to determine what operating system will be automatically booted when you turn on your workstation. If you have selected Domain Compatible for the Boot Mode Selection, this section does not apply.

From this Configuration Control menu:

```
Configuration Control
Keys Mode Class
-----
1  I/O Configuration
2  Auto System Selection
3  Boot Mode Selection

A  Abort without changes
-----
Type [key] RETURN ?
```

typing 2 Return causes this Auto System Select menu to appear:

```
Auto System Select
Keys Option          Status
-----
1  Scan for System    Y
2  Selected System    N
3  Store Selected Sys. N

E  Execute menu
A  Abort without changes
-----
Type [key] RETURN ?
```

The status column has letters indicating yes (Y) or no (N). When you type a number key command, you change the status for that option.

Each option is explained in the next three subsections.



Scan for System

Mass storage devices are searched for operating systems determined by the priority shown below:

1. SCSI interface, select codes 0 - 31, bus address 7 - 5, unit 0.
2. HP-IB interface, select codes 0 - 31, bus address 0, unit 0.
3. SRM interface at select code 21.
4. LAN at select code 21.
5. SCSI interface, select codes 0 - 31, bus address 4 - 0, all units.
6. HP-IB interface, select code 0 - 31, bus address 1 - 7, all units.
7. SRM interface at select code other than 21.
8. LAN at select code other than 21.

The boot priority list was designed to make it easy to change and control which operating system will be booted in the 'Search for System' mode. The guidelines used to establish the boot list are:

- High priority addresses before low priority addresses.
- Local systems before remote systems (Local refers to dedicated devices and remote refers to shared devices, i.e. a server).

Selected System

If you want to boot a specific operating system and more than one exists on your mass storage devices, set the Selected System status to yes (Y), then type the E (execute) command. The system unit resets and the power-up display changes to list mass storage devices with operating systems mounted on them and should look something like this:

```
Copyright 1990,                      :HP7958S, 1405, 0
Hewlett-Packard Company,             1H  SYSTEM_HPUX
All Rights Reserved.
```

```
Series 400, Rev. 1, 5 Jun 90          :RODIME, 1404, 0
md 12 rev 0.20, 1990/03/12.16:31:17  2H  SYSTEM_HPUX
Bit-Mapped Video
MC68030 Processor
MC68882 Coprocessor
Configuration EEPROM
HP-HIL.Keyboard
HP-IB
DMA-C0
RAM 4194080 Bytes
HP98644 (RS-232) at 9
HP98265 (SCSI S 32) at 14
HP98643 (LAN) at 21, THIN, 080009AAAAAA
HP PARALLEL at 12
```

```
System Search Mode, will store selected system
RESET to Power-up SPACE clears input Select system, Type RETURN ?
```

For example, if you wanted to select the HP-UX operating system on the Rodime Disk Drive, you would type the command:

2H Return

and the HP-UX operating system would start booting. That operating system would be stored and automatically booted the next time you turned on the system unit.

B

Store Selected Sys.

If you have set the Store Selected Sys. option to Y by typing the command:

3 **Return**

the Auto System Select menu changes to:

Auto System Select		
Keys	Option	Status

1	Scan for System	N
2	Selected System	Y
3	Store Selected Sys.	Y
E	Execute	
A	Abort without changes	

Type [key] RETURN ?		

You may store either a selected operating system, or the operating system found when the Boot ROM searches for an operating system.

When you execute this menu, the system unit resets and the following power-up display appears:

```
Copyright 1990,                      :HP7958,123, 4
Hewlett-Packard Company,             1H  SYSTEM_HPUX
All Rights Reserved.
```

```
Series 400, Rev. 1, 5 Jun 90         :HP7959, 567, 8
md 12 rev 0.20, 1990/03/12.16:31:17  2H  SYSTEM_HPUX
Bit-Mapped Video
MC68030 Processor
MC68882 Coprocessor
Configuration EEPROM
HP-HIL.Keyboard
HP-IB
DMA-C0
RAM 4194080 Bytes
HP98644 (RS-232) at 9
HP98265 (SCSI S 32) at 14
HP98643 (LAN) at 21 080009AAAAAA (T)
HP PARALLEL at 12
```

System Search Mode, will store selection
RESET to Power-up SPACE clears input Select System Type RETURN ?

The path to the selected operating system will be stored in the EEPROM when you execute the Auto System Select menu. If your workstation or system environment changes and the operating system you previously selected as the default one has moved to another mass storage device, you must reconfigure the EEPROM. To reconfigure for the new path to the operating system you want, enter Configuration Control Mode, select Auto System Select and reselect the operating system.

From this point on, the selected and stored operating system will automatically boot each time the system unit is turned on. You may prevent that by entering Attended Mode when you turn the system unit on. At this time, you may temporarily select another operating system to boot.



HP Apollo 9000 Series 400 Support Matrix*

Series

400

Wed Jan 23 14:15:18 MST 1991

This document summarizes the compatibility of the optional products available for the Series 400. For detailed support information, consult the **HP Apollo 9000 Workstation Configuration Guide** (HP pub. no. <T.B.A.>) and **Installing Peripherals** (HP part no. 97005-90002).

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SPUs Covered by this Document

The phrase "all SPUs" denotes Models 400dl, 400s, 400t, 425s, 425t and 433s. A separate matrix exists for the compatible Series 300 family.

Host SPU Slots

The following table lists the slot types available on specific SPU Models. Not all slots listed as "Yes" are standard on all Models. Some slot capabilities may be optional at extra cost. On SPUs with DIO-II slots, two of those slots are individually convertible to a single DIO-I I/O slot via the A1401A adaptor. DIO-System cards may be used in DIO-II slots.

Processor Model	Slot Types Supported		
	ISA	EISA	DIO-II
400dl	None	None	None§
400t	1	None	None§
425t	1	None	None§
400s	4 Opt.	4 Opt.	2 std. 3 Opt.
425s	4 Opt.	4 Opt.	2 std. 3 Opt.
433s	4 Opt.	4 Opt.	2 std. 3 Opt.

Operating System Support

SPU Model	Operating System	Stand-alone	Diskless	
			Server	Client
400dl	HP-UX	7.03	7.03	7.03
400dl	DOMAIN	SR10.2+	SR10.2+	SR10.2+
400t	HP-UX	7.0	7.0	7.0
400t	DOMAIN	SR10.2+	SR10.2+	SR10.2+
400s	HP-UX	7.0	7.0	7.0
400s	DOMAIN	SR10.2+	SR10.2+	SR10.2+
425s	HP-UX	T.B.A.	T.B.A.	T.B.A.
425s	DOMAIN	T.B.A.	T.B.A.	T.B.A.
425t	HP-UX	T.B.A.	T.B.A.	T.B.A.
425t	DOMAIN	T.B.A.	T.B.A.	T.B.A.
433s	HP-UX	T.B.A.	T.B.A.	T.B.A.
433s	DOMAIN	T.B.A.	T.B.A.	T.B.A.

* Information subject to change without notice.

§ Graphics video board uses one internal DIO-II slot.

Support Status

To be supported, a device must be **qualified** on the computer model being considered **and** have **software support** on the operating system being considered. This means the device must appear in the appropriate column under "Hardware Support" and "Earliest Operating System Version". For software support, the tables show the earliest system version available for the Series 400. Earlier systems may support the device on an Apollo DN-Series or HP 9000 Series 300 system. All later versions of the system also support the device.

The status of configurations "planned" and "under investigation" may change within 30 days. Contact your HP Sales Representative for current peripheral support information. Users may send comments and corrections to:

HPDESK: MATRIX (HPFCRJN) /HP4000/UX,
Internet: matrix@hpfcrrjn.FC.HP.COM,
UUCP: hpfcse!matrix.

This document is available to HP internal users as a PCL data object; directory ~ftp/misc/Matrix on system hpfcse. System hpfcse is not an open subnet host. Customer access via anonymous ftp is under investigation.

Support Status Glossary

"10.2+, 7.03" -

Denotes the earliest version of Series 400 software which might support the device. Note: many devices show software support, but **no** hardware support. This implies that this same software supports the device on a DN-Series or Series 300 system. The software revision is listed as a convenience to those customers who already own the device, and wish to use it at their own risk on the Series 400.

Revision "2.0c" under *SoftPC* implies the 2.0 version

as supplied in media&manuals product 98870C. The earlier 98870A and 98870B versions are not supported on Series 400.

"ID"

(In the boot ROM column) the device (typically an interface or accessory card) is merely identified by the boot ROM and is not used as a system load device. A **number** (such as 7.0) in a software support column indicates the earliest version of the operating system for which device-supporting software exists and in which the peripheral has been tested. "NOP" in the boot ROM column indicates that the device is ignored by the boot ROM.

"Inves." or "Under Investigation"

Planned, contingent on resolution of outstanding technical issues.

"NA"

"not applicable". "_" (underscores) indicate that information was not available at time of publication.

"No." or "Does not function"

Indicates that the device is not supported by the mainframe or operating system shown in that column **and does not work**. "Does not function" in a hardware column indicates that the device has no interface or cable. "Does not function" in a software column indicates that the device either has no supporting software or cannot perform all functions required for support.

"Planned"

Testing was in progress at time of publication and that HP plans to support the configuration indicated by that entry. Contact your HP Sales Representative for current information. "Under Investigation" and "Inv." represent a configuration that HP would like to support, but outstanding qualification or technical issues must first be resolved.

"Qualified"

(under "Hardware Support") the peripheral is not formally supported by Hewlett-Packard, but that a representative sample was tested for EMI/RFI and functionality. An entry of "Vendor Qualified" under "Hardware Support" means that the peripheral is supported on the Series 400 by the peripheral vendor. Qualified peripherals may be distributed by Hewlett-Packard.

"Supported"

(under "Hardware Support") the peripheral complies with at least FCC Class A and at least VDE/FTZ Level A in a system configuration. These classifications refer to the electromagnetic interference (EMI/RFI) properties of the system. It also means that a diagnostic or exerciser program exists for that mainframe and HP offers on-site service of the system.

"T.B.A."

To Be Announced

"Unsupported" and "Uns."

the device is untested and no testing is planned. They are, however, "not known to not work". These devices should not be purchased for use with the

mainframe/operating system under which the "Unsupported" appears. Many of these devices are Apollo DN-Series and HP9000 Series 300 accessories and peripherals. Although Series 400 software is essentially identical to earlier MC68xxx-series DOMAIN and HP-UX, not all peripherals supported by the earlier systems have been qualified on the Series 400. This means it is possible for a device to be supported by the **software** but not by the **hardware**.

"Vendor Supported"

Although distributed by HP/Apollo, this product is supported by the original equipment vendor, and not by HP/Apollo.

"Via O.S." (Via Operating System) -

The DOS emulation software has no specific code for support of this device. Ordinary operations from DOS may use the device subject to normal DOS/DOMAIN and/or DOS/HP-UX I/O and filesystem mapping.

A vertical bar in the margin indicates changes and additions since the edition of 08 Oct 90.

Series 400 System Processor Compatibility

Unlisted Options are either transparent to software (e.g. localization) or are supported by all software (e.g. RAM).

Product Number	Description	Type	Min. Boot ROM	Operating Environment Support		
				DOMAIN O.S.	HP-UX	SoftPC
A1421A	Model 400s, base SPU	68030	1.0	SR10.2+	7.03	2.0c
A1421B	Model 425s, base SPU	68040	2.0	SR10.3+	7.05	T.B.A.
A1630E	Model 425r, base SPU	68040	2.0	SR10.3+	7.05	T.B.A.
T.B.A.	Model 433s, base SPU	68040	T.B.A.	T.B.A.	T.B.A.	T.B.A.
A1630A	Model 400r, base SPU	68030	1.0	SR10.2+	7.03	2.0c
A1630B	Model 400dl, Mono VRX	68030	1.0	SR10.2+	7.03	2.0c
A2000A	Model 400r	HP-UX	1.0	Unsup.	7.03	2.0c
A2001A	Mono VRX		1.0	Unsup.	7.0	2.0c
A2002A	Color VRX		1.0	Unsup.	7.03	2.0c ^x
A2002A	Personal VRX P2	HP-UX	1.0	Unsup.	7.03	2.0c ^x
A2010A	Model 400r	Domain	1.0	SR10.2+	Unsup.	Unsup.
A2011A	Mono VRX		1.0	SR10.2+	Unsup.	Unsup.
A2012A	Color VRX		1.0	SR10.2+	Unsup.	Unsup.
A2012A	Personal VRX P2	Domain	1.0	SR10.2+	Unsup.	Unsup.
A2040A	Model 425r Upgrade from Model 400r	68040	T.B.A.	Unsup.	T.B.A.	T.B.A.
A2041A	from Model 400r	68040	T.B.A.	T.B.A.	Unsup.	Unsup.
A2020A	Model 400s, Mono VRX	HP-UX	1.0	Unsup.	7.03	2.0c
A2021A	Model 400s, Color VRX	HP-UX	1.0	Unsup.	7.0	2.0c
A2022A	Model 400s, Personal VRX P3	HP-UX	1.0	Unsup.	7.03	2.0c ^x
A2023A	Model 400s, Turbo VRX T2	HP-UX	1.0	Unsup.	7.03	2.0c ^x
A2024A	Model 400s, Server	HP-UX	1.0	Unsup.	7.03	2.0c
A2030A	Model 400s, Mono VRX	Domain	1.0	SR10.2+	Unsup.	Unsup.
A2031A	Model 400s, Color VRX	Domain	1.0	SR10.2+	Unsup.	Unsup.
A2032A	Model 400s, Personal VRX P3	Domain	1.0	SR10.2+	Unsup.	Unsup.
A2033A	Model 400s, Server	Domain	1.0	SR10.2+	Unsup.	Unsup.
A2042A	Model 433s Upgrade from Model 400s	68040	T.B.A.	Unsup.	T.B.A.	T.B.A.
A2043A	from Model 400s	68040	T.B.A.	Unsup.	T.B.A.	T.B.A.
A2043A	from Model 400s	68040	T.B.A.	T.B.A.	Unsup.	Unsup.
A2044A	Model 425s Upgrade from Model 400s	68040	T.B.A.	Unsup.	T.B.A.	T.B.A.
A2045A	from Model 400s	68040	2.0	Unsup.	7.05	T.B.A.
A2045A	from Model 400s	68040	2.0	SR10.3+	Unsup.	T.B.A.
A2046A	Model 433s Upgrade from Model 425s	68040	T.B.A.	Unsup.	T.B.A.	T.B.A.
A2047A	from Model 425s	68040	T.B.A.	Unsup.	T.B.A.	T.B.A.
A2047A	from Model 425s	68040	T.B.A.	T.B.A.	Unsup.	Unsup.
A2100A	Model 425r	HP-UX	2.0	Unsup.	7.05	T.B.A.
A2101A	Mono VRX, diskless		2.0	Unsup.	7.05	T.B.A.
A2101A	Mono VRX, 200 Mb	HP-UX	2.0	Unsup.	7.05	T.B.A.

C-4 Series 400 Support Matrix

Series 400 SPU Compatibility, continued...

Product Number	Description	Type	Min. Boot ROM	Operating Environment Support		
				DOMAIN O.S.	HP-UX	SoftPC
A2102A	Model 425r, continued...	HP-UX	2.0	Unsup.	7.05	T.B.A.
A2103A	Color VRX, 16", diskless	HP-UX	2.0	Unsup.	7.05	T.B.A.
A2104A	Color VRX, 16", 200 Mb	HP-UX	2.0	Unsup.	7.05	T.B.A.
A2105A	Color VRX, 19", 200 Mb	HP-UX	2.0	Unsup.	7.05	T.B.A.
A2106A	Personal VRX P3	HP-UX	2.0	Unsup.	7.05	T.B.A.
A2108A	Model 425r	Domain	2.0	SR10.3+	Unsup.	Unsup.
A2109A	Mono VRX, diskless	Domain	2.0	SR10.3+	Unsup.	Unsup.
A2110A	Mono VRX, 200 Mb	Domain	2.0	SR10.3+	Unsup.	Unsup.
A2111A	Color VRX, 16", diskless	Domain	2.0	SR10.3+	Unsup.	Unsup.
A2111A	Color VRX, 19", diskless	Domain	2.0	SR10.3+	Unsup.	Unsup.
A2112A	Color VRX, 16", 200 Mb	Domain	2.0	SR10.3+	Unsup.	Unsup.
A2113A	Color VRX, 19", 200 Mb	Domain	2.0	SR10.3+	Unsup.	Unsup.
A2114A	Personal VRX P3	Domain	2.0	SR10.3+	Unsup.	Unsup.
A2116A	Model 425s	HP-UX	2.0	Unsup.	7.05	T.B.A.
A2117A	Mono VRX	HP-UX	2.0	Unsup.	7.05	T.B.A.
A2118A	Color VRX, 19"	HP-UX	2.0	Unsup.	7.05	T.B.A.
A2119A	Color VRX, 19", DIO-II	HP-UX	2.0	Unsup.	7.05	T.B.A.
A2120A	Personal VRX P3	HP-UX	2.0	Unsup.	7.05	T.B.A.
A2120A	Turbo VRX T2	HP-UX	2.0	Unsup.	7.05	T.B.A.
A2121A	Server	HP-UX	2.0	Unsup.	7.05	T.B.A.
A2123A	Model 425s	Domain	2.0	SR10.3+	Unsup.	Unsup.
A2124A	Mono VRX	Domain	2.0	SR10.3+	Unsup.	Unsup.
A2125A	Color VRX, 19"	Domain	2.0	SR10.3+	Unsup.	Unsup.
A2126A	Personal VRX P3	Domain	2.0	SR10.3+	Unsup.	Unsup.
A2126A	Server	Domain	2.0	SR10.3+	Unsup.	Unsup.
T.B.A.	Model 433s, Mono VRX	HP-UX	T.B.A.	Unsup.	T.B.A.	T.B.A.
T.B.A.	Model 433s, Color VRX	HP-UX	T.B.A.	Unsup.	T.B.A.	T.B.A.
T.B.A.	Model 433s, Personal VRX P3	HP-UX	T.B.A.	Unsup.	T.B.A.	T.B.A.
T.B.A.	Model 433s, Turbo VRX T2	HP-UX	T.B.A.	Unsup.	T.B.A.	T.B.A.
T.B.A.	Model 433s, Mono VRX	Domain	T.B.A.	T.B.A.	Unsup.	Unsup.
T.B.A.	Model 433s, Color VRX	Domain	T.B.A.	T.B.A.	Unsup.	Unsup.
T.B.A.	Model 433s, Personal VRX P3	Domain	T.B.A.	T.B.A.	Unsup.	Unsup.
#ADA†	Series 400 Options					
#ADB†	Personal VRX P1 (98705C\$)	DIO-II	1.0	SR10.2+	7.03	2.0c ^x
#ADC†	Personal VRX P2 (98705A)	DIO-II	1.0	SR10.2+	7.03	2.0c ^x
#ADD†	Personal VRX P3 (98705B)	DIO-II	1.0	Unsup.	7.03	2.0c ^x
#ADE†	Turbo VRX T1 (98735A)	DIO-II	1.0	Unsup.	7.03	2.0c ^x
#ADE†	Turbo VRX T2 (98736A)	DIO-II	1.0	Unsup.	7.03	2.0c ^x
#ADF†	Turbo VRX T3 (98736B)	DIO-II	1.0	Unsup.	7.03	2.0c ^x
#ADG	Monitor, 19-inch mono. (98774A)	1280	1.0	SR10.2+	7.03	2.0c
#ADH†	Monitor, 16-inch color (98789A)	1280	1.0	SR10.2+	7.03	2.0c
#ADJ†	Monitor, 19-inch color (98754A)	1280	1.0	SR10.2+	7.03	2.0c

Series 400 SPU Compatibility, continued...

Product Number	Description	Type	Min. Boot ROM	Operating Environment Support		
				DOMAIN O.S.	HP-UX	SoftPC
#ADK	Mono VRX for Server	DIO-II	1.0	SR10.2+	7.03	Via O.S.
#ADL	Color VRX for Server	DIO-II	1.0	SR10.2+	7.0	Via O.S.
#ADM	Personal VRX P3	DIO-II	1.0	SR10.2+	Unsup.	Unsup.
#AD7	Monochrome VRX (A1096A)	DIO-II	1.0	SR10.2+	7.03	2.0c
#AD8†	Color VRX (A1416A)	DIO-II	1.0	SR10.2+	7.0	2.0c
#AL0	Add 3 DIO-II slots	DIO-II	1.0	No	7.03	Via O.S.
#AL1	Add 4 ISA slots	ISA	1.0	SR10.2+	Planned	Via O.S.
#AL3†	Apollo Token Ring i/f (A-NET-ATR)	ISA	1.0	SR10.2+	No	No
#AL4†	IBM Token Ring i/f (A-NET-ITR)	ISA	1.0	SR10.2+	No	No
#AL5†	IEEE-488 i/f, std. speed	HP-IB	1.0	No	7.03	2.0c
#AL6	1→3 serial i/f cable (K2292)	RS-232C	1.0	SR10.2+	7.05 ¹	No
#AL7	ID Module (46084A)	HP-HIL	NOP	No	7.03	Via O.S.
#AL8†	Parallel i/f driver	-	NOP	No	7.03	Via O.S.
#AL9	Disable ThinLAN, enable AUI	802.3	1.0	SR10.2+	7.03	Via O.S.
#AMA	Add 2nd A1444A 660 Mb disk	SCSI	1.0	SR10.2+	No	No
#AM0	Add A1440A 200 Mbyte int. disk	SCSI	1.0	No	7.03	Via O.S.
#AM1	Add A1440A 200 Mbyte int. disk	SCSI	1.0	SR10.2+	No	No
#AM2	Add 2nd A1440A 200 Mbyte disk	SCSI	1.0	SR10.2+	7.03	Via O.S.
#AM2	Add A1442A 330 Mbyte int. disk	SCSI	1.0	Unsup.‡	7.0	Via O.S.
#AM3	Add A1442A 330 Mbyte int. disk	SCSI	1.0	SR10.2+	No	No
#AM4	Add A1443A 660 Mbyte int. disk	SCSI	1.0	Unsup.‡	7.0	Via O.S.
#AM5	Add A1444A 660 Mbyte int. disk	SCSI	1.0	SR10.2+	No	No
#AM6	Add 2nd A1443A 660 Mb disk	SCSI	1.0	Unsup.‡	7.0	Via O.S.
#AM7§	Add A1447A DDS (4mm DAT) drive	SCSI	1.0*	Inves.	T.B.A.	Via O.S.
#AM8	Add A1448A CD-ROM drive	SCSI	1.0*	Unsup.	7.03	Via O.S.
#AM9	Add A1449A QIC-24 ctg. tape	SCSI	1.0*	SR10.2+	Inves.	Unsup.
#ANB	Subs. 16 Mbytes RAM	SIMM	1.0	SR10.2+	7.0	2.0c
#ANC	Subs. 32 Mbytes RAM	SIMM	1.0	SR10.2+	7.0	2.0c
#AN1	Subs. 32 Mbytes RAM	SIMM	1.0	SR10.2+	7.0	2.0c
#AN2	Add 4 Mbytes ECC RAM	SIMM	1.0	SR10.2+	7.03	2.0c
#AN4	Add 8 Mbytes ECC RAM	SIMM	1.0	SR10.2+	7.03	2.0c
#AN4	Add 8 Mbytes RAM	SIMM	1.0	SR10.2+	7.0	2.0c
#AN6	Add 32 Mbytes RAM	SIMM	1.0	SR10.2+	7.0	2.0c
#AN8	Add 16 Mbytes RAM	SIMM	1.0	SR10.2+	7.0	2.0c
#AN9	Add 128 Kbytes cache	PGA	1.0	SR10.2+	7.0	2.0c

* Boot ROM support does not imply support by install/update processes or availability of software in this media format.

§ This Option or product listed for reference, and not currently orderable as shown.

† Not available on Model 400dl.

‡ The current combination of drive firmware and DOMAIN operating system software does not provide optimum performance. These configurations will be fully supported in a future release.

X SoftPC supported only within an X-window at this time.

C-6 Series 400 Support Matrix

Series 400 Disk Compatibility

This table includes disk and disk/tape drives. The "Min. Boot ROM" column shows the earliest ROM capable of loading an operating system from the device.

"CS/80" and "SS/80" disks all use the HP-IB interface. All AMIGO disks are unsupported. See **Series 300 Support Matrix** for information on AMIGO disks and HP-UX. Disks known to not work on contemporary HP MC 68000-based HP-UX systems also do not work on the Series 400.

Product Number	Description	Type	Min. Boot ROM	Hardware Qualification and Support	Operating Environment Support		
					DOMAIN O.S.	HP-UX	SoftPC
A-200EF	200 Mb hard disk & 5¼-inch floppy, external	SCSI	1.0	Models 400r & 425r only	Unsup.	Unsup.	Unsup.
A-660E	660 Mb external	SCSI	1.0	All except 400dl	10.2+	Unsup.	Unsup.
A-697	External disk cluster	SCSI	Unsup.	Unsupported	Unsup.	Unsup.	Unsup.
AADDSFLP	1.2Mb 5¼-inch flex.	SCSI	Inves.	All except 400dl	SR10.2+	Unsup.	Unsup.
A1440A	200 Mbyte internal	SCSI	1.0	Models 400r/425r only	SR10.2+	7.0	Via O.S.
A1442A	330 Mbyte internal	SCSI	1.0	400s/425s/433s only	SR10.2+	7.0	Via O.S.
A1443A	660 Mbyte internal	SCSI	1.0	400s/425s/433s only	Unsup.‡	7.0	Via O.S.
A1444A	660 Mbyte internal	SCSI	1.0	400s/425s/433s only	SR10.2+	Unsup.	Via O.S.
A1448A	CD-ROM drive, internal	SCSI	1.0*	400s/425s/433s only	Planned	7.0	Via O.S.
C1700A	Series 6300 Magneto-Optic Model 20GB/A MO autochanger	SCSI	Unsup.	All except 400dl (400s/425s/433s only on DOMAIN)	SR11	7.0	Via O.S.
C1701A	Model 650/A MO ctg drive	SCSI	1.0	All except 400dl	SR10.2+	7.0	Via O.S.
C1707A	Series 6100 Model 600/A CD-ROM, stand-alone	HP-IB CS/80	1.0	All except 400dl	No	7.0	Via O.S.
C2200A	Series 6000 Model 335H 335 Mbyte hard disk	HP-IB CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
C2201A	Model 670FL 670 Mbyte hard disk	HP-FL	NA	No HP-FL i/f on 400	NA	NA	NA
C2202A	Model 670XP 670 Mbyte hard disk	HP-IB CS/80	Unsup.	Unsupported	No	Unsup.	Unsup.
C2203A	Model 670H with cache 670 Mbyte hard disk	HP-IB CS/80	Unsup.	Unsupported	No	7.0	Unsup.
C2204A	Model 1.34FL 1.34 Gbyte hard disk	HP-FL	NA	No HP-FL i/f on 400	NA	NA	NA

° This symbol is used throughout this document to denote discontinued products listed for reference. Discontinued° devices may still be available as used, refurbished or remanufactured products from HP's Finance and Remarketing Division. Add an "R" to the product number, e.g. 7935HR.

‡ The current combination of drive firmware and operating system software does not provide optimum performance.

Series 400 Disk Compatibility, continued...

Product Number	Description	Type	Min. Boot ROM	Hardware Qualification and Support	Operating Environment Support		
					DOMAIN O.S.	HP-UX	SoftPC
C2212A	Series 6000 for HP-UX Model 330/S 330 Mbyte hard disk	SCSI	1.0	All except 400dI	Unsup.‡	7.0	Via O.S.
C2213A	Model 660/S 660 Mbyte hard disk	SCSI	1.0	All except 400dI	Unsup.‡	7.0	Via O.S.
#001	<see C2290A>						
#002,022	<see C2291A>						
#003	<see C2292A in Tapes>						
#004,024	<see C2293A>						
#005	<see C2294A>						
C2212D	Series 6000 for DOMAIN Model 330/D 330 Mbyte hard disk	SCSI	1.0	All except 400dI	SR10.2+	Unsup.‡	Unsup.
C2213D	Model 660/D 660 Mbyte hard disk	SCSI	1.0	All except 400dI	SR10.2+	Unsup.‡	Unsup.
#A01	<see C2290D>						
#A02,A22	<see C2291D>						
#005	<see C2294A>						
C2269A	Network Mass Storage System	SCSI	→	Under investigation	←	←	←
C2290A	C2212/13A/D Upgrades 332 Mbyte upgrade	SCSI	1.0	All except 400dI	Unsup.‡	7.0	Via O.S.
C2290D	332 Mbyte upgrade	SCSI	1.0	All except 400dI	SR10.2+	Unsup.‡	Unsup.
C2291A	664 Mbyte upgrade	SCSI	1.0	All except 400dI	Unsup.‡	7.0	Via O.S.
C2291D	664 Mbyte upgrade	SCSI	1.0	All except 400dI	SR10.2+	Unsup.‡	Unsup.
C2293A	CD-ROM upgrade	SCSI	1.0*	All except 400dI	Unsup.	7.0	Via O.S.
C2294A	Magneto-Optic upgrade	SCSI	1.0	All except 400dI	SR10.2+	7.0	Via O.S.
°7907A	20/20 Mb Fxd/Rem ctg	CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
°7908P	16 Mb Fxd w/ctg tape	CS/80	Unsup.	Unsupported	No	Unsup.	Unsup.
°7911P/R	28 Mb Fxd w/ctg tape	CS/80	Unsup.	Unsupported	No	Unsup.	Unsup.
°7912P/R	65 Mb Fxd w/ctg tape	CS/80	Unsup.	Unsupported	No	Unsup.	Unsup.
°7914CT	132 Mb Fxd w/ctg tape	CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
°7914P/R	132 Mb Fxd w/ctg tape	CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
°7914TD	<see 7914R & 7971A>						
°7914ST	<see 7914R & 7974A>						
°7933H	404 Mbyte fixed disk	CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
°7933XP	404 Mbyte fixed disk	CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
°7935H	404 Mbyte remv pack	CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
°7935XP	404 Mbyte remv pack	CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
7936FL	308 Mbyte fixed disk	HP-FL	NA	No interface	No	No	No
7936H	308 Mbyte fixed disk	CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
7936XP	308 Mbyte fixed disk	CS/80	Unsup.	Unsupported	No	Unsup.	Unsup.

C-8 Series 400 Support Matrix

Series 400 Disk Compatibility, continued...

Product Number	Description	Type	Min. Boot ROM	Hardware Qualification and Support	Operating Environment Support		
					DOMAIN O.S.	HP-UX	SoftPC
7937FL	571 Mbyte fixed disk	HP-FL	NA	No interface	No	No	No
7937H	571 Mbyte fixed disk	CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
7937XP	571 Mbyte fixed disk	CS/80	Unsup.	Unsupported	No	Unsup.	Unsup.
*7941/45A	24/55 Mbyte disk	CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
*7942A	7941A+9144A pkg.	CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
*7946A	7945A+9144A pkg.	CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
*7957A	80 Mbyte disk	CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
7957B	80 Mbyte disk	CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
7957S	107 Mbyte disk	SCSI	Unsup.	Unsupported	Unsup.	7.0	Via O.S.
*7958A	131 Mbyte disk	CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
7958B	152 Mbyte disk	CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
7958S	161 Mbyte disk	SCSI	Unsup.	Unsupported	Unsup.	7.0	Via O.S.
7959B	304 Mbyte disk	CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
7959S	323 Mbyte disk	SCSI	Unsup.	Unsupported	Unsup.	7.0	Via O.S.
*7962B	152 Mbyte disk	CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
*7963B	304 Mbyte disk	CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
*97962B	152 Mbyte add-on	CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
97963B	304 Mbyte add-on	CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
9122C	1.6Mb 3½-in. flex.	SS/80	Unsup.	All except 400dl	No	7.0	2.0c
*9122D/S	788Kb 3½-in. flex.	SS/80	Unsup.	Unsupported	No	7.0	Unsup.
*9125S	360Kb 5¼-in. flex.	SS/80	Unsup.	Unsupported	No	Unsup.	Unsup.
9127A	360Kb 5¼-in. flex.	SS/80	Unsup.	All except 400dl	No	7.0	2.0c
*9133D	9134D+9122S pkg.	SS/80	Unsup.	Unsupported	No	Unsup.	Unsup.
*9133H	9134H+9122S pkg.	SS/80	Unsup.	Unsupported	No	Unsup.	Unsup.
*9133L	9134L+9122S pkg.	SS/80	Unsup.	Unsupported	No	Unsup.	Unsup.
*9134D	14.8 Mbyte disk	SS/80	Unsup.	Unsupported	No	Unsup.	Unsup.
*9134H	19.9 Mbyte disk	SS/80	Unsup.	Unsupported	No	Unsup.	Unsup.
*9134L	39.9 Mbyte disk	SS/80	Unsup.	Unsupported	No	Unsup.	Unsup.
*9153A	9154A+9122S pkg.	SS/80	Unsup.	Unsupported	No	Unsup.	Unsup.
*9153B	9154B+9122S pkg.	SS/80	Unsup.	Unsupported	No	Unsup.	Unsup.
*9154A/B	10/20 Mbyte disk	SS/80	Unsup.	Unsupported	No	Unsup.	Unsup.
9153C/M	10-40 Mb Modular	SS/80	Unsup.	Unsupported	No	7.0	2.0c
*9262B	Secure 7962B	CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
*9263B	Secure 7963B	CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
97902B	152 Mbyte add-on	CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
97903B	304 Mbyte add-on	CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
98433D	Model 345 200 Mb internal	SCSI	→	Supported only as A1440A	→	→	→

Series 400 Tape Compatibility

The "Min. Boot ROM" column shows the earliest ROM capable of loading an operating system from the device.

"797X" and "AMIGO" tape drives listed here are all HP-IB interfaced. All AMIGO tapes are unsupported. See **Series 300 Support Matrix** for information on AMIGO tapes known to not work on contemporary HP MC68000-based HP-UX systems.

Product Number	Description	Type	Min. Boot ROM	Hardware Qualification and Support	Operating Environment Support		
					DOMAIN O.S.	HP-UX	SoftPC
A-6250	½" 9-trk (LMS) 1600/6250 bpi	SCSI	Unsup.	Unsupported	SR10.2+	No	No
AADDESTC	¼" 9-trk 60Mb QIC-24 ctg., external	SCSI	1.0	All except 400dI	SR10.2+	Unsup.	Unsup.
A-EX- A-XT-	8mm 2.3Gb External	SCSI	Unsup.	All except 400dI	10.2+ [‡]	Unsup.	Unsup.
	8mm 2.3Gb Internal	SCSI	Unsup.	Unsupported	Unsup.	Unsup.	Unsup.
A1447A	4mm 1.3Gb DDS (DAT), internal	SCSI	1.0*	Model 400s/433s only	Planned	7.0	Via O.S.
A1449A	¼" 9-trk 60Mb QIC-24 ctg., internal	SCSI	1.0	Model 400s/433s only	SR10.2+	Unsup.	Unsup.
C1511A	1.3Gb DDS (DAT)	HP-IB	NOP	All except 400dI	No	7.0	Via O.S.
C1512A	1.3Gb DDS (DAT)	SCSI, ext.	1.0*	All except 400dI	Planned	7.0	Via O.S.
C2212/13A #003	Series 6000 <see C2292A>						
C2292A	1.3Gb DDS (DAT)	SCSI	1.0*	All except 400dI	Planned	7.0	Via O.S.
*35401A	¼" 16-trk 536Mbyte ctg. autochanger	HP-IB CS/80	Unsup.	Unsupported	No	7.0	Via O.S.
*7970E	½-inch 9-track 800/1600 bpi	AMIGO	NOP	Unsupported	No	Unsup.	Unsup.
*7971A	1600 bpi	AMIGO	NOP	Unsupported	No	Unsup.	Unsup.
*7974A	1600/800 bpi	HP-IB,797x	NOP	Unsupported	No	Unsup.	Unsup.
*7978A/B	1600/6250 bpi	HP-IB,797x	NOP	Unsupported	No	Unsup.	Unsup.
7979A	½-inch 9-track 1600/800 bpi	HP-IB,797x	NOP	All except 400dI	No	7.0	Via O.S.
7980A	1600/6250 [§] bpi	HP-IB,797x	NOP	400s/425s/433s only	No	7.0	Via O.S.
#800	800 bpi NRZI	HP-IB,797x	NOP	400s/425s/433s only	No	7.0	Via O.S.
7980XC	7980A w/L-Z data compression [§]	HP-IB,797x	NOP	400s/425s/433s only	No	7.0	Via O.S.
9144A	¼-inch cartridge 16-track, 67Mb	CS/80	1.0	All except 400dI	No	7.0	Via O.S.
9145A	16/32-track, 134Mb	CS/80	1.0	All except 400dI	No	7.0	Via O.S.

* Boot ROM functionality does not imply install/update process support, nor availability of software on this media type.

§ Requires A1401A and 98625B high-speed HP-IB for 6250 GCR or compressed operation.

‡ Requires *OmniBack*.

C-10 Series 400 Support Matrix

Series 400 Terminal and Console Compatibility

The "Min. Boot ROM" column shows the earliest ROM capable of using the device as system console.

Product Number	Description	Type	Min. Boot ROM	Hardware Qualification and Support	Operating Environment Support		
					DOMAIN O.S.	HP-UX	SoftPC
A1096A	Monochrome VRX	DIO-II	1.0	All Models	SR10.2+	7.03	2.0c
A1416A	Color VRX	DIO-II	1.0	All except 400dl	SR10.2+	7.0	2.0c
C1001	700 Family Alpha-Numeric Terminals						
	Model 700/92	term0	1.0	All Models	Unsup.	7.0	2.0c
C1002	Model 700/94	term0	1.0	All Models	Unsup.	7.0	2.0c
C1003	Model 700/41	ASCII	1.0	Unsupported	Unsup.	7.0*	Unsup.
C1004	Model 700/22	ANSI	1.0	Unsupported	Unsup.	7.0*	Unsup.
C1006	Model 700/43	ASCII	1.0*	Unsupported	Unsup.	7.0*	Unsup.
C1007	Model 700/44	ANSI/PC	1.0*	All Models	Unsup.	7.0*	2.0c
C1010C	Localized 700/92 Simplified Chinese	term0	1.0	All Models	Unsup.	7.0	Unsup.
C1010J	Japanese	term0	1.0	All Models	Unsup.	7.0	Unsup.
C1010K	Korean	term0	1.0	All Models	Unsup.	7.0	Unsup.
C1010T	Traditional Chinese	term0	1.0	All Models	Unsup.	7.0	Unsup.
C1017	Model 700/32	ANSI	1.0*	All Models	Unsup.	7.0*	Unsup.
C2301A°/B	X-terminals Base unit	X-11	No	All Models	SR10.2+	7.0	Unsup.
*C2302A	Monochrome, 17"	X-11	No	All Models	SR10.2+	7.0	Unsup.
C2303A°/B	VGA color, 14"	X-11	No	All Models	SR10.2+	7.0	Unsup.
C2304A°/B	Hi-res color, 16"	X-11	No	All Models	SR10.2+	7.0	Unsup.
C2305A°/B	Grey Scale, 19"	X-11	No	All Models	SR10.2+	7.0	Unsup.
C2307B	Color, Japan, 19"	X-11	No	All Models	SR10.2+	7.0	Unsup.
D1187A	Monitors: multi-sync 19-inch	Color	-	Unsupported	Unsup.	Unsup.	-
D1188A	15-inch	Color	-	Unsupported	Unsup.	Unsup.	-
Vectra	w/Advancelink-2392	term0	1.0	All Models	Unsup.	7.0	Unsup.
<various>	Monitors: all bearing older Apollo part numbers	-	-	No supporting i/f	-	-	-
*2392A	Alphanumeric terminal	term0	1.0	Unsupported	Unsup.	7.0	2.0c
2393A	Graphics terminal	term0	1.0	Unsupported	Unsup.	7.0	2.0c
*2394A	Data entry terminal	term0	1.0	Unsupported	Unsup.	7.0	2.0c
2397A	Color terminal	term0	1.0	Unsupported	Unsup.	7.0	2.0c
*3082B	Industrial terminal	term0	1.0	Unsupported	Unsup.	7.0	Unsup.

- * Although the Boot ROM supports non-HP terminal commands, key system tools such as *install*, *update* and *sam* presently require an HP *term0* console.

Series 400 Terminal and Console Compatibility, continued...

Product Number	Description	Type	Min. Boot ROM	Hardware Qualification and Support	Operating Environment Support		
					DOMAIN O.S.	HP-UX	SoftPC
35731A/B	Monitor: 12" 512×400(390) 50/60 Hz for 2393A, 98204B, 98542A and 98546A	Mono.	-	No supported i/f	Unsup.	Unsup.	←
35741A/B	Monitor: 12" 512×400(390) 50/60 Hz for 2397A, 98543A	Color	-	No supported i/f	Unsup.	Unsup.	←
45711A	<i>Portable Plus</i> (as 2622A)	term0	1.0	Unsupported	Unsup.	7.0	Unsup.
*45850	HP 150-II (as 2623A)	term0	1.0	Unsupported	Unsup.	7.0	Unsup.
*9666A	Ruggedized 2397A	term0	1.0	Unsupported	Unsup.	7.0	2.0c
*98287A	"CX" 1024×768×8 98700 MADbus	DIO-I/O	Unsup.	Unsupported	No	7.0	No
98542A	Video interfaces 512×400×1	DIO-Sys.	1.0	Unsupported	No	7.0	No
98543A	512×400×4	DIO-Sys.	1.0	Unsupported	No	7.0	No
*98544A	1024×768×1	DIO-Sys.	1.0	Unsupported	No	7.0	2.0c
98544B	1024×768×1	DIO-Sys.	1.0	Unsupported	No	7.0	2.0c
*98545A	1024×768×4	DIO-Sys.	1.0	Unsupported	No	7.0	2.0c
98546A	512×390×2	DIO-I/O	1.0	Unsupported	No.	7.0	No
98547A	1024×768×6	DIO-Sys.	1.0	Unsupported	No	7.0	2.0c
98548A	Video interfaces "MH" 1280×1024×1	DIO-II	1.0	Unsupported	No	7.0	2.0c
98549A	"C+" 1024×768×6	DIO-II	1.0	Unsupported	No	7.0	2.0c
98550A	"CH" 1280×1024×8	DIO-II	1.0	400s/425s/433s only	No	7.0	2.0c
98556A	"CHX" Accelerator	DIO-II	1.0	400s/425s/433s only	No	7.0	2.0c
*98700	"CX" Controller	M.A.D.	Unsup.	<see *98287A>			
98702A\$	Personal VRX LGB i/f	DIO-II	1.0	Supported on Models w/avail. DIO-II slot.	SR10.2+	7.03	2.0c ^x
98705A	Personal VRX P2	LGB	1.0	<see 98702A>	←	←	←
98705B	Personal VRX P3	LGB	1.0	<see 98702A>	←	←	←
98705C\$	Personal VRX P1	LGB	1.0	<see 98702A>	←	←	←
98720A	SRX Processor	LGB	1.0	<see 98724/25A>			
*98724A	LGB Interfaces for 98720A SRX	DIO-I/O	1.0	Unsupported	No	7.0	2.0c
98725A	for 98720A SRX	DIO-Sys.	1.0	Unsupported	No	7.0	2.0c
98726A	for 98730A <i>Turbo</i> SRX	DIO-II	1.0	Unsupported	No	7.0	2.0c ^x
98730A	<i>Turbo</i> SRX Processor	LGB	1.0	<see 98726A>			

C-12 Series 400 Support Matrix

Series 400 Terminal and Console Compatibility, continued...

Product Number	Description	Type	Min. Boot ROM	Hardware Qualification and Support	Operating Environment Support		
					DOMAIN O.S.	HP-UX	SoftPC
98735A 98727A§	Turbo VRX products T1 Processor PDMA interface	G-Bus DIO-II	1.0 1.0	<see 98727/28A> Supported on Models w/avail. DIO-II slot.	Inves.	7.03	2.0c ^x
98728A§	VDMA interface	DIO-II	1.0	Supported on Models w/avail. DIO-II slot.	Inves.	7.03	2.0c ^x
98736A 98736B	T2 Processor T3 Processor	G-Bus G-Bus	1.0 1.0	<see 98727/28A> <see 98727/28A>			
°98751A °98752A	Monitors 19" 1024×768 60 Hz 19" 1280×1024 60 Hz for 98550/720/30	Color Color	- -	No supported i/f Unsupported	Unsup. Unsup.	Unsup. Unsup.	← ←
98753A 98754A	19" 1024×768 60 Hz 19" 1280×1024 60 Hz for A1416A, 98550, 98705/06, 98720/30, 98735/36	Color Color	- -	No supported i/f All except 400dl	Unsup. <see i/f>	Unsup. <see i/f>	← ←
98774A	19" 1280×1024 72 Hz for A1096A	Mono.	-	All Models	<see i/f>	<see i/f>	←
98785A 98786A 98788A	Monitors 16" 1024×768 60 Hz 17" 1024×768 60 Hz 19" 1280×1024 60 Hz for 98548	Color Mono. Mono.	- - -	No supported i/f No supported i/f Unsupported	Unsup. Unsup. Unsup.	Unsup. Unsup. Unsup.	← ← ←
98789A	16" 1280×1024 60 Hz for A1416A, 98550, 98705/06, 98720/30, 98735/36	Color	-	All except 400dl	<see i/f>	<see i/f>	←

§ This component product number is listed for reference and is not separately orderable at present.

x SoftPC supported only within an X-window at this time.

Series 400 Human Interface

The "Min. Boot ROM" column shows the earliest ROM capable of using the device as system console.

Product Number	Description	Type	Min. Boot ROM	Hardware Qualification and Support	Operating Environment Support		
					DOMAIN O.S.	HP-UX	SoftPC
A-LPFK-	32-button pad	Serial	No	All Models	SR10.2+	Unsup.	Unsup.
A1098A	Keyboard/local kits	Serial	1.0	All Models	SR10.2+	No	No
A1099A	HP-UX (ITF)	HP-HIL	1.0	All Models	No	7.0	2.0c
C1027A#ABA	Keyboard, 700/44 AT/2-style (aka C1408A, see 98016A)	MITF-5	1.0	All Models	No	7.0	Unsup.
K1388	8 knob Dial Set	Serial	No	Under investigation	SR10.2+	Unsup.	Unsup.
K1410	Mouse, 3-button (see also 46094A)	Quad.	NOP	All Models	SR10.2+	7.0*	2.0*
K1422	Spaceball XYZ, 8-button	Serial	No	Vendor supported	SR10.2+	Unsup.	Unsup.
K1424	Summagraphics tablets	Serial	No	Vendor supported	SR10.2+	Unsup.	Unsup.
K1432	Bit Pad Two	Serial	No	Vendor supported	SR10.2+	Unsup.	Unsup.
K1434	Trackballs	Quad.	NOP	Under investigation	SR10.2+	Unsup.*	Unsup.*
K1435	3-button Marconi RB2	Quad.	NOP	Vendor supported	SR10.2+	Unsup.*	Unsup.*
M1309A	3-button Itac	HP-HIL	NOP	All Models	Unsup.	7.0	2.0c
35723A	12-inch touch bezel	HP-HIL	No	Unsupported	No	7.0	—
45911A°/C	11 × 11" tablet	HP-HIL	NOP	All Models	No	7.0	—
46021A	Keyboard, "ITF"	HP-HIL	1.0	All Models	No	7.0	2.0c
46060A	Mouse, 2 button	HP-HIL	NOP	All Models	No	7.0	2.0c
46060B	Mouse, 3 button	HP-HIL	NOP	All Models	No	7.0	2.0c
46080A	HP-HIL Extensions	HP-HIL	NOP	All Models	No	7.0	2.0c
46081A	2.4m	HP-HIL	NOP	All Models	SR10.2+ ^a	7.0	2.0c
46082A	2.4m with audio	HP-HIL	NOP	All Models	No	7.0	2.0c
46082B	15m w/RGB & audio	HP-HIL	NOP	All Models	No	7.0	2.0c
46083A	30m w/RGB & audio	HP-HIL	NOP	All Models	No	7.0	2.0c
46083A	1-Knob dial set	HP-HIL	NOP	Unsupported	No	7.0	—
46084A	ID Module	HP-HIL	NOP	All Models	No	7.0	2.0c
46085A	9-Knob dials set	HP-HIL	NOP	All Models	No	7.0	2.0c
46086A	32-button pad	HP-HIL	NOP	All Models	No	7.0	2.0c
46087	Digitizer, A-size	HP-HIL	NOP	All Models	No	7.0	—
46090C	Digitizer, A-size	HP-HIL	NOP	All Models	No	7.0	—
46088	Digitizer, B-size	HP-HIL	NOP	All Models	No	7.0	—
46091C	Digitizer, B-size	HP-HIL	NOP	All Models	No	7.0	—

C-14 Series 400 Support Matrix

Series 400 Human Interface, continued...

Product Number	Description	Type	Min. Boot ROM	Hardware Qualification and Support	Operating Environment Support		
					DOMAIN O.S.	HP-UX	SoftPC
46094A	Adaptor, quadrature	HP-HIL	NOP	All Models	No	7.0	2.0c
*46095A	Mouse, 3-button (Replaced by K1410)	Quad.	NOP	All Models	Unsup.	7.0	2.0c
*92915A	Barcode Readers For HP 2390-series terminals and HP 150 PCs	MITF-12	→	<support via terminal>			
*92916A	For HP 9000 workstations and HP 150-II PCs	HP-HIL	NOP	All Models	No	7.0	2.0c
92917A	For HP 700 family terminals	MITF-5	→	<support via terminal>			
98016A§	MITF-5 keyboard adaptor	HP-HIL	1.0	All Models	No	7.0	Unsup.
98203C	Large Keyboard	HP-HIL	Unsup.	Unsupported	No	Unsup.	No

* Connection requires 46094A HP-HIL quadrature adaptor.

* Supported limited to audio port only.

§ "Special"; consult factory for availability.

Series 400 Text Printer Compatibility

This table refers only to simple text printing capability of the printer. Refer to the **Graphics Device Compatibility** table (next) for information on support of vector/raster printing. DOS applications are usually device-dependent. Also, unless they support HP-PCL, they may require that the printer be switch-configured for IBM/Epson emulation.

Legend: cps - characters per second, lpm - lines per minute, ppm - pages per minute

Product Number	Description	Type	Hardware Qualification and Support	Operating Environment Support		
				DOMAIN O.S.	HP-UX	SoftPC
C1200A	Asian System Printer Serial interface	APCL RS232	All Models All Models	Unsup. Unsup.	7.0 7.0	via O.S. via O.S.
C1202A #1AA #1A8 #1A9	Asian Serial Printer Parallel interface IEEE-488 interface Serial interface	APCL Par. HP-IB RS232	All Models Unsupported All except 400dl All Models	Unsup. Unsup. Unsup. Unsup.	7.0 Unsup. 7.0 7.0	via O.S. Unsup. via O.S. via O.S.
C1602A Opt.1AX Opt.1AX Opt.1A8 C1608A	<i>PaintJet</i> XL, B-size color inkjet Serial/parallel interface Serial/parallel interface IEEE-488/serial interface HP-GL/2 cartridge	PCL Par. RS232 HP-IB HP-GL/2	- All except 400dl All except 400dl All except 400dl All Models	w/C1608A SR10.2+ SR10.2+ No SR10.2+	7.0 Inves. 7.0 7.0 7.0	Via O.S. Via O.S. Via O.S. Via O.S. Via O.S.
C2106A	<i>DeskJet</i> 500, 300 dpi, A-size	Serial Par.	All Models All except 400dl	— —	Planned Planned	Via O.S. Via O.S.
HCD-MMP	(Genicom) impact	RS232	Unsupported	SR10.2+	Unsup.	Unsup.
K1626 K1627	"PTR-2106" PostScript, 6ppm "PTR-2115" PostScript, 15ppm	RS232 RS232	Vendor Supported Vendor Supported	SR10.2+ SR10.2+	Unsup. Unsup.	Unsup. Unsup.
K2132	<i>Tek Phaser Ps</i>	RS232	Vendor supported	SR10.2+	Unsup.	Unsup.
LP26-SPE LP26-S	LP/26 PostScript LP/26 PostScript	ISA RS232 Par.	Unsupported Unsupported Unsupported	SR10.2+ SR10.2+ SR10.2+	Unsup. Unsup. Unsup.	Unsup. Unsup. Unsup.
LP80010	LP 800 PostScript	Par.	Unsupported	SR10.2+	Unsup.	Unsup.
2225A 2225C/P 2225D	<i>ThinkJet</i> , 150 cps, 6.5" <i>ThinkJet</i> <i>ThinkJet</i>	HP-IB Par. Serial	Unsupported Unsupported Unsupported	No Unsup. Unsup.	7.0 Unsup. Unsup.	2.0c Unsup. Unsup.
2227A 2227B 2228A	<i>QuietJet Plus</i> , 192 cps, 14" <i>QuietJet Plus</i> , 14" <i>QuietJet</i> , 8"	Serial Par. HP-IB Serial Par.	Unsupported Unsupported Unsupported Unsupported Unsupported	No Unsup. No No Unsup.	7.0 Unsup. 7.0 7.0 Unsup.	2.0c Unsup. 2.0c 2.0c Unsup.
2235A/C 2235B/D	<i>RuggedWriter</i> , 480 cps, 14" <i>RuggedWriter</i>	Serial Par. HP-IB Serial	Unsupported Unsupported Unsupported Unsupported	No Unsup. No No	7.0 Unsup. 7.0 7.0	2.0c Unsup. 2.0c 2.0c

C-16 Series 400 Support Matrix

Series 400 Text Printer Compatibility, continued...

Product Number	Description	Type	Hardware Qualification and Support	Operating Environment Support		
				DOMAIN O.S.	HP-UX	SoftPC
*2276A	<i>DeskJet</i> , 300 dpi, A-size	Serial	All Models	Unsup.	7.0	2.0c
		Par.	All except 400dl	Unsup.	7.0*	2.0c
*2277A	<i>DeskJet Plus</i> , 300 dpi, A-size	Serial	All Models	Unsup.	7.0	2.0c
		Par.	All except 400dl	Unsup.	7.0*	2.0c
2562C	300 lpm impact, 16"	PCL	Unsupported	Unsup.	7.0	Via O.S.
2563	300 lpm impact, 16"	PCL	Unsupported	Unsup.	7.0	Via O.S.
2564	600 lpm impact, 16"	PCL	Unsupported	Unsup.	7.0	Via O.S.
*2565A	600 lpm impact, 18"	PCL	All Models	Unsup.	7.0	Via O.S.
2566	900 lpm impact, 18"	PCL	All Models	Unsup.	7.0	Via O.S.
2567	1200 lpm impact, 18"	PCL	All Models	Unsup.	7.0	Via O.S.
#046	CIPER (aka #290,850)	HP-IB	Unsupported	No	7.0	Via O.S.
#046	Simple (aka #200)	HP-IB	Unsupported	No	7.0	Via O.S.
#049	RS-232C interface	RS232	All Models	Unsup.	7.0	Via O.S.
#050	RS-422 Interface	422	Unsupported	Unsup.	Unsup.	Unsup.
#053	Parallel Interface	Par.	Unsupported	Unsup.	Unsup.	Unsup.
*2603A	45 cps daisywheel	RS232	Unsupported	Unsup.	Unsup.	Unsup.
2684	<i>LaserJet/2000</i> printer	PCL	Unsupported	Unsup.	7.0	2.0c
26843A	Serial interface	RS232	Unsupported	Unsup.	7.0	2.0c
26843B	Parallel interface	Par.	Unsupported	Unsup.	Unsup.	Unsup.
*2686A	<i>LaserJet</i> , 8 ppm	RS232	Unsupported	Unsup.	7.0	2.0c
		Par.	Unsupported	Unsup.	Unsup.	Unsup.
*2686D	<i>LaserJet 500</i>	RS232	Unsupported	Unsup.	7.0	2.0c
		Par.	Unsupported	Unsup.	Unsup.	Unsup.
*2932A	200 cps impact	RS232	Unsupported	Unsup.	7.0	2.0c
*2933A	200 cps "Factory Printer"	RS232	Unsupported	Unsup.	7.0	2.0c
*2934A	200 cps "Office Printer"	RS232	Unsupported	Unsup.	7.0	2.0c
#046	HP-IB interface	HP-IB	Unsupported	No	7.0	2.0c
33439P	PostScript cartridge for <i>LaserJet-IIID</i> , -IIP and -III	Font slot	All Models	SR10.2+	Planned	—
*33440A	<i>LaserJet-II</i> , 8 ppm single	PCL	All Models	SR10.2+	7.0	2.0c
	Parallel interface	Par.	All except 400dl	SR10.2+	7.0*	2.0c
	Serial interface	RS232	All Models	SR10.2+	7.0	2.0c
33447A	<i>LaserJet-IIID</i> , 8 ppm double	PCL	All Models	SR10.2+	7.0	2.0c
	Parallel interface	Par.	All except 400dl	SR10.2+	7.0*	2.0c
	Serial interface	RS232	All Models	SR10.2+	7.0	2.0c
33449A	<i>LaserJet-III</i> , 8 ppm single	PCL	All Models	SR10.2+	7.0	2.0c
	Parallel interface	Par.	All except 400dl	SR10.2+	7.0*	2.0c
	Serial interface	RS232	All Models	SR10.2+	7.0	2.0c
33459A	<i>LaserJet-IIID</i> , 8 ppm double	PCL	All Models	SR10.2+	Planned	Via O.S.
	Parallel interface	Par.	All except 400dl	SR10.2+	Planned	Via O.S.
	Serial interface	RS232	All Models	SR10.2+	Planned	Via O.S.



Series 400 Text Printer Compatibility, continued...

Product Number	Description	Type	Hardware Qualification and Support	Operating Environment Support		
				DOMAIN O.S.	HP-UX	SoftPC
33471A	<i>LaserJet-IIIP</i> , 4 ppm single Parallel interface Serial interface	PCL	All Models	SR102.+	7.0	2.0c
		Par.	All except 400 <i>dI</i>	SR102.+	7.0*	2.0c
		RS232	All Models	SR102.+	7.0	2.0c
3630A #001 #002 #002	<i>PaintJet</i> color graphics Serial interface IEEE-488 interface Parallel interface	PCL	All Models	Unsup.	7.0	2.0c
		RS232	All Models	No	7.0	2.0c
		HP-IB Par.	All except 400 <i>dI</i> All except 400 <i>dI</i>	—	7.0*	2.0c
41063A #040	Asian Workstation, PCL Serial interface	HP-IB	All except 400 <i>dI</i>	No	7.0	Via O.S.
		RS232	All Models	No	7.0	Via O.S.
°82906A	160 cps impact	HP-IB	Unsupported	No	7.0	Via O.S.
°9876A	480 lpm thermal	HP-IB	Unsupported	No	7.0	Via O.S.

-
- * Use in systems prior to 8.0 is not transparently configurable with *sam*. Use *sam* to create the lp spooler and printer device file (as either HP-IB or serial). Then replace the */dev/lp..* and */dev/rtp..* device files with identically named device files with major number 21 and minor number 0xsc0000. The kernel must also contain the *gpio* and *dil* drivers ('sam' can install these and re-build the kernel).

C-18 Series 400 Support Matrix

Series 400 Graphics Compatibility

For printers, this table refers only to the graphics capability. Refer to the **Printer Compatibility** table (previous) for information on support of text printing. DOS applications are usually device-dependent. Also, unless they support HP-PCL, they may require that the printer be switch-configured for IBM/Epson emulation.

Legend: cps - characters per second, lpm - lines per minute, ppm - pages per minute

Product Number	Description	Type	Hardware Qualification and Support	Operating Environment Support	
				DOMAIN O.S.	HP-UX
A-LPFK	32-button pad	Serial	All Models	SR10.2+, GPR	Unsup.
A1096A	Monochrome VRX board	DIO-II	All Models	SR10.2+	7.03, X, Starbase
A1416A	Color VRX board	DIO-II	All except 400dl	SR10.2+	7.0, X, Starbase
CGP	CP300 (Tek 4693DX)	Par.*	All except 400dl	SR10.2+, <i>cpscr</i>	No
CGP10AT	CP300 (Tek 4693DX)	ISA	All except 400dl	SR10.2+, <i>cpscr</i>	No
CGP9-AT	CP300 (Tek 4693DX)	ISA	All except 400dl	SR10.2+, <i>cpscr</i>	No
C1200A	Asian System Printer Serial interface	APCL RS232	All Models All Models	Unsup. Unsup.	7.0, <i>pcltrans</i> 7.0, <i>pcltrans</i>
C1202A	Asian Serial Printer	APCL	All Models	Unsup.	7.0, <i>pcltrans</i>
#1AA	Parallel interface	Par.	Unsupported	Unsup.	Unsup.
#1A8	IEEE-488 interface	HP-IB	All except 400dl	Unsup.	7.0, <i>pcltrans</i>
#1A9	Serial interface	RS232	All Models	Unsup.	7.0, <i>pcltrans</i>
°C1600A	7600 Model 240D plotter	HP-GL/2	All except 400dl Unsupported Unsupported Unsupported	Unsup.	7.0, Starbase
°C1601A	7600 Model 240E plotter	HP-GL/2		Unsup.	7.0, Starbase
	IEEE-488 interface	HP-IB		-	-
	Serial interface	RS232		-	-
	Parallel interface	par.		-	-
C1602A	<i>PaintJet</i> XL, B-size color inkjet	PCL	-	w/C1608A	7.0, <i>pcltrans</i>
Opt.1AX	Serial/parallel interface	Par.	All except 400dl	SR10.2+	Inves.
Opt.1AX	Serial/parallel interface	RS232	All except 400dl	SR10.2+	7.0, <i>pcltrans</i>
Opt.1A8	IEEE-488/serial interface	HP-IB	All except 400dl	No	7.0, <i>pcltrans</i>
C1608A	HP-GL/2 cartridge	HP-GL/2	All Models	SR10.2+	7.0, Starbase
C1620A	Series 7600 Model 355, E-size color electrostatic plotter/printer	HP-GL/2 PCL	-	SR10.2+	7.0, Starbase, <i>pcltrans</i>
	IEEE-488 Interface	HP-IB	All except 400dl	No	-
	Serial Interface	RS232	Unsupported	-	-
	Parallel Interface	Par.	All except 400dl	SR10.2+	-

- * The CP-300 (Tektronix 4693DX) is incompatible with the built-in parallel interface. A "KIT-CENT-CP" ISA card is required.

Series 400 Graphics Compatibility, continued...

Product Number	Description	Type	Hardware Qualification and Support	Operating Environment Support	
				DOMAIN O.S.	HP-UX
C1625A C1629A	Series 7600 Model 250, D-size monochrome electrostatic plotter/printer IEEE-488 Interface Serial Interface Parallel Interface	HP-GL/2 PCL HP-IB RS232 Par.	- All except 400d// Unsupported Unsupported	SR10.2+ No - SR10.2+	7.0, Starbase, <i>pcltrans</i> - - -
C1627A C1631A	Series 7600 Model 255, E-size monochrome electrostatic plotter/printer IEEE-488 Interface Serial Interface Parallel Interface	HP-GL/2 PCL HP-IB RS232 Par.	- All except 400d// Unsupported Unsupported	SR10.2+ No - SR10.2+	7.0, Starbase, <i>pcltrans</i> - - -
C2106A	Deskjet 500, 300 dpi A-size	RS232 Par.	All Models All except 400d//	Unsup. Unsup.	Planned Planned
C2301A°/B °C2302A C2303A°/B C2304A°/B C2305A°/B C2307B	X-terminal base unit Monochrome X-terminal, 17" VGA color X-terminal, 14" Hi-res color X-terminal, 16" Grap Scale X-terminal, 19" Color X-terminal, Japan, 19"	X-11 X-11 X-11 X-11 X-11 X-11	All Models All Models All Models All Models All Models All Models	Planned Planned Planned Planned Planned Planned	7.0 7.0 7.0 7.0 7.0 7.0
HCD-MMP	(Genicom) impact	RS232	Unsupported	SR10.2+, <i>cpser</i>	Unsup.
K1388	8 knob Dial Set	Serial	All Models	SR10.2+, GPR	Unsup.
K1410	Mouse, 3-button	Quad.	All Models	SR10.2+, GPR	7.0, X, Starbase
K1422	Spaceball XYZ, 8-button	Serial	Vendor supported	Vendor sup.	Unsup.
K1424 K1432	Summagraphics <i>Bit Pad Two</i> Summagraphics B-tablet	Serial Serial	Vendor supported Vendor supported	SR10.2+, GPR SR10.2+, GPR	Unsup. Unsup.
K1434 K1435	3B Trackball, Marconi RB2 3B Trackball, Itac	Quad. Quad.	All Models Vendor supported	SR10.2+, GPR SR10.2+, GPR	Unsup. Unsup.
K1603 K1604 K1605 K1606	Shinko CHC-335, 200 dpi color Shinko CHC-336, 200 dpi color, HP-GL, CGI/CGM Parallel interface Serial interface Shinko CHC-345, 300 dpi color Shinko CHC-645B, 300 dpi color	Par. ↓ Par. RS232 Par. Par.	Vendor supported Vendor supported Vendor supported Vendor supported Vendor supported	Vendor sup. Vendor sup. Vendor sup. Vendor sup. Vendor sup.	Unsup. Unsup. Unsup. Unsup. Unsup.
LP26-SPE LP26-S	LP/26 PostScript LP/26 PostScript	Par. RS232	Unsupported Unsupported	SR10.2+, GPR SR10.2+, GPR	Unsup. Unsup.
LP80010	LP 800 PostScript Serial interface Parallel i/f	↓ RS232 Par.	Unsupported Unsupported Unsupported	SR10.2+, GPR - -	Unsup. - -

C-20 Series 400 Support Matrix

Series 400 Graphics Compatibility, continued...

Product Number	Description	Type	Hardware Qualification and Support	Operating Environment Support	
				DOMAIN O.S.	HP-UX
M1309A	3-button trackball	HP-HIL	All Models	Unsup.	7.0, X, Starbase
2225A	<i>ThinkJet</i> , 150 cps, 6.5"	HP-IB	Unsupported	Unsup.	7.0, <i>pcltrans</i>
2225C/P	<i>ThinkJet</i>	Par.	Unsupported	Unsup.	Unsup.
2225D	<i>ThinkJet</i>	Serial	Unsupported	Unsup.	7.0, <i>pcltrans</i>
2227A	<i>QuietJet Plus</i> , 192 cps, 14"	Serial	Unsupported	Unsup.	7.0, <i>pcltrans</i>
2227B	<i>QuietJet Plus</i> , 14"	Par.	Unsupported	Unsup.	Unsup.
2228A	<i>QuietJet</i> , 8"	HP-IB	Unsupported	Unsup.	7.0, <i>pcltrans</i>
		Serial	Unsupported	Unsup.	7.0, <i>pcltrans</i>
		Par.	Unsupported	Unsup.	Unsup.
2235A/C	<i>RuggedWriter</i> , 480 cps, 14"	Serial	Unsupported	Unsup.	7.0, <i>pcltrans</i>
		Par.	Unsupported	Unsup.	Unsup.
2235B/D	<i>RuggedWriter</i>	HP-IB	Unsupported	Unsup.	7.0, <i>pcltrans</i>
		Serial	Unsupported	Unsup.	7.0, <i>pcltrans</i>
2276A	<i>DeskJet</i> , 300 dpi, A-size	Serial	All Models	Unsup.	7.0, <i>pcltrans</i>
		Par.	All except 400dl	Unsup.	Planned
2277A	<i>DeskJet Plus</i> , 300 dpi, A-size	Serial	All Models	Unsup.	7.0, <i>pcltrans</i>
		Par.	All except 400dl	Unsup.	Planned
2393A	Graphics terminal, term0	RS232	Unsupported	Unsup.	7.0, Starbase
2397A	Color terminal, term0	RS232	Unsupported	Unsup.	7.0, Starbase
2562C	300 lpm impact, 16"	PCL	Unsupported	Unsup.	7.0, <i>pcltrans</i>
2563	300 lpm impact, 16"	PCL	Unsupported	Unsup.	7.0, <i>pcltrans</i>
2564	600 lpm impact, 16"	PCL	Unsupported	Unsup.	7.0, <i>pcltrans</i>
°2565A	600 lpm impact, 18"	PCL	Unsupported	Unsup.	7.0, <i>pcltrans</i>
2566	900 lpm impact, 18"	PCL	Unsupported	Unsup.	7.0, <i>pcltrans</i>
2567	1200 lpm impact, 18"	PCL	Unsupported	Unsup.	7.0, <i>pcltrans</i>
#046	CIPER i/f (aka #290,850)	HP-IB	Unsupported	Unsup.	7.0, <i>pcltrans</i>
#046	Simple protocol (aka #200)	HP-IB	Unsupported	Unsup.	7.0, <i>pcltrans</i>
#049	RS232 interface	RS232	Unsupported	Unsup.	7.0, <i>pcltrans</i>
#050	RS-422 Interface	422	Unsupported	Unsup.	Unsup.
#053	Parallel Interface	Par.	Unsupported	Unsup.	Unsup.
2684	<i>LaserJet</i> /2000 printer	PCL	Unsupported	Unsup.	7.0, <i>pcltrans</i>
26843A	Serial interface	RS232	Unsupported	Unsup.	7.0, <i>pcltrans</i>
26843B	Parallel interface	Par.	Unsupported		
°2686A	<i>LaserJet</i> , 8 ppm	RS232	Unsupported	Unsup.	7.0, <i>pcltrans</i>
		Par.	Unsupported		
°2686D	<i>LaserJet 500</i>	RS232	Unsupported	Unsup.	7.0, <i>pcltrans</i>
		Par.	Unsupported		
°2932A	200 cps impact	RS232	Unsupported	Unsup.	7.0, <i>pcltrans</i>
°2933A	200 cps "Factory Printer"	RS232	Unsupported	Unsup.	7.0, <i>pcltrans</i>
°2934A	200 cps "Office Printer"	RS232	Unsupported	Unsup.	7.0, <i>pcltrans</i>
#046	HP-IB interface	HP-IB	Unsupported	Unsup.	7.0, <i>pcltrans</i>
33439P	PostScript cartridge for <i>LaserJet</i> -IID, -IIP and -III	Font slot	All Models	SR10.2+, GPR	Unsup.

Series 400 Graphics Compatibility, continued...

Product Number	Description	Type	Hardware Qualification and Support	Operating Environment Support	
				DOMAIN O.S.	HP-UX
*33440A	<i>LaserJet-II</i> , 8 ppm single Parallel interface Serial interface	PCL Par. RS232	Unsupported All except 400dl All Models	Unsup. SR10.2+ SR10.2+	7.0, <i>pcltrans</i> Planned 7.0, <i>pcltrans</i>
*33447A	<i>LaserJet-IIID</i> , 8 ppm double Parallel interface Serial interface	PCL Par. RS232	All Models All except 400dl All Models	Inves. SR10.2+ SR10.2+	7.0, <i>pcltrans</i> Planned 7.0, <i>pcltrans</i>
33449A	<i>LaserJet-III</i> , 8 ppm single Parallel interface Serial interface	PCL Par. RS232	All Models All except 400dl All Models	Inves. SR10.2+ SR10.2+	7.0, <i>pcltrans</i> Planned 7.0, <i>pcltrans</i>
33459A	<i>LaserJet-IIID</i> , 8 ppm double Parallel interface Serial interface	PCL Par. RS232	All Models All except 400dl All Models	— — —	Planned Planned Planned
33471A	<i>LaserJet-IIP</i> , 4 ppm single Parallel interface Serial interface	PCL Par. RS232	All Models All except 400dl All Models	w/33439P SR10.2+ SR10.2+	7.0, <i>pcltrans</i> Planned 7.0, <i>pcltrans</i>
35723A	12-inch touch bezel	HP-HIL	Unsupported		
3630A #001 #002 #002	<i>PaintJet</i> color graphics Serial interface IEEE-488 interface Parallel interface	PCL RS232 HP-IB Par.	All Models All Models All except 400dl All except 400dl	Unsup. Unsup. Unsup. Unsup.	7.0, <i>pcltrans</i> 7.0, <i>pcltrans</i> 7.0, <i>pcltrans</i> Unsup.
41063A #040	Asian Workstation, PCL Serial interface	HP-IB RS232	All except 400dl All Models	Unsup. Unsup.	7.0, <i>pcltrans</i> 7.0, <i>pcltrans</i>
*45850	HP 150-II term0 terminal	RS232	Unsupported	Unsup.	7.0, Starbase
45911A°/C	11×11" tablet	HP-HIL	All Models	Unsup.	7.0, Starbase
46060A	Mouse, 2 button	HP-HIL	All Models	Unsup.	7.0, X, Starbase
46060B	Mouse, 3 button	HP-HIL	All Models	Unsup.	7.0, X, Starbase
46083A	1-Knob dial set	HP-HIL	Unsupported		
46085A	9-Knob dials set	HP-HIL	All Models	Unsup.	7.0, Starbase
46086A	32-button pad	HP-HIL	All Models	Unsup.	7.0, Starbase
46087	Digitizer, A-size	HP-HIL	All Models	Unsup.	7.0, Starbase
46090C	Digitizer, A-size	HP-HIL	All Models	Unsup.	7.0, Starbase
46088	Digitizer, B-size	HP-HIL	All Models	Unsup.	7.0, Starbase
46091C	Digitizer, B-size	HP-HIL	All Models	Unsup.	7.0, Starbase
46094A	Quadrature adaptor	HP-HIL	All Models	Unsup.	7.0, X, Starbase
*46095A	3-button mouse	HP-HIL	<see K1410>		
7440A #001 #002	<i>ColorPro</i> 8-pen A-size plotter Serial interface IEEE-488 interface	HP-GL RS232 HP-IB	- Unsupported Unsupported	Unsup. Unsup. No	7.0, Starbase 7.0, Starbase 7.0, Starbase
7440Bx	<i>ColorPro</i> (HP-IB only)	HP-GL	-	Unsup.	7.0, Starbase

C-22 Series 400 Support Matrix

Series 400 Graphics Compatibility, continued...

Product Number	Description	Type	Hardware Qualification and Support	Operating Environment Support	
				DOMAIN O.S.	HP-UX
7475A #001 #002 7475Bx	B-size, 6-pen plotter Serial interface IEEE-488 interface (HP-IB only)	HP-GL RS232 HP-IB HP-GL	- Unsupported Unsupported -	Unsup. Unsup. No Unsup.	7.0, Starbase 7.0, Starbase 7.0, Starbase 7.0, Starbase
°7550A	B-size, 8-pen plotter Serial interface IEEE-488 interface	HP-GL RS232 HP-IB	- All Models Unsupported	Unsup. - No	7.0, Starbase 7.0, Starbase 7.0, Starbase
7550B #005 #005 #006	B-size, 8-pen plotter Serial interface IEEE-488 interface Parallel interface	HP-GL RS232 HP-IB Par.	- All Models All except 400dl Under investigation	Unsup. Unsup. No No	Planned Planned Planned Inves.
7570A 17570A	<i>DraftPro</i> C/D-size, 8-pen pltr Serial interface IEEE-488 Interface	HP-GL RS232 HP-IB	All Models All Models All except 400dl	Unsup. Unsup. No	7.0, Starbase 7.0, Starbase 7.0, Starbase
7575A	<i>DraftPro</i> DXL A..D-size, 8-pen plotter	HP-GL	-	Unsup.	7.0, Starbase
7576A	<i>DraftPro</i> EXL A..E-size, 8-pen plotter	HP-GL	-	Unsup.	7.0, Starbase
17570A	Serial interface IEEE-488 interface	RS232 HP-IB	All Models All except 400dl	Unsup. No	7.0, Starbase 7.0, Starbase
7580B 7585B 7586B	D-size, 8-pen plotter E-size, 8-pen plotter E-size, 8-pen, roll-feed Serial interface IEEE-488 interface	HP-GL HP-GL HP-GL RS232 HP-IB	- - - Unsupported Unsupported	Unsup. Unsup. Unsup. Unsup. No	7.0, Starbase 7.0, Starbase 7.0, Starbase 7.0, Starbase 7.0, Starbase
°7595A	<i>DraftMaster</i> E-size, 8-pen plotter	HP-GL	-	Unsup.	7.0, Starbase
°7596A	<i>DraftMaster</i> E-size, 8-pen, roll-feed Serial interface IEEE-488 interface	HP-GL RS232 HP-IB	- All Models All except 400dl	Unsup. — No	7.0, Starbase 7.0, Starbase 7.0, Starbase
7595B	<i>Draftmaster</i> SX E-size, 8-pen plotter	HP-GL/2	-	SR10.2+	7.0, Starbase
7596B	<i>Draftmaster</i> RX E-size, 8-pen, roll-feed Serial interface IEEE-488 interface	HP-GL/2 RS232 HP-IB	- All Models All except 400dl	SR10.2+ SR10.2+ No	7.0, Starbase 7.0, Starbase 7.0, Starbase
7599A	<i>DraftMaster</i> MX E-size, 8-pen, roll-feed, spooled Serial interface IEEE-488 interface	HP-GL/2 RS232 HP-IB	- All Models All except 400dl	SR10.2+ SR10.2+ No	7.0, Starbase 7.0, Starbase 7.0, Starbase

Series 400 Graphics Compatibility, continued...

Product Number	Description	Type	Hardware Qualification and Support	Operating Environment Support	
				DOMAIN O.S.	HP-UX
*82906A	160 cps impact	HP-IB	Unsupported	Unsup.	Unsup.
*9190A	<i>ScanJet</i> monochrome scanner, SCL	Par.	Unsupported	No	Unsup.
9195A	<i>ScanJet Plus</i> monochrome scanner, SCL	Par.	All except 400 <i>dl</i>	Inves.	Inves.
*9666A	Ruggedized 2397A	RS232	Unsupported	Unsup.	7.0, Starbase
*98287A	1024×768×8 M.A.D.bus	DIO-I/O	Unsupported	No	Unsup.
98542A	512×400×1 video i/f	DIO-Sys.	Unsupported	No	7.0, X, Starbase
98543A	512×400×4 video i/f	DIO-Sys.	Unsupported	No	7.0, X, Starbase
*98544A	1024×768×1 video i/f	DIO-Sys.	Unsupported	No	7.0, X, Starbase
98544B	1024×768×1 video i/f	DIO-Sys.	Unsupported	No	7.0, X, Starbase
*98545A	1024×768×4 video i/f	DIO-Sys.	Unsupported	No	7.0, X, Starbase
98546A	512×390×2 compat. i/f	DIO-I/O	Unsupported	No	Unsup.
98547A	1024×768×6 video i/f	DIO-Sys.	Unsupported	No	7.0, X, Starbase
98548A	"MH" 1280×1024×1 video i/f	DIO-II	Unsupported	No	7.0, X, Starbase
98549A	"C+" 1024×768×6 video i/f	DIO-II	Unsupported	No	7.0, X, Starbase
98550A	"CH" 1280×1024×8 video i/f	DIO-II	400s/425s/433s only	No	7.0, X, Starbase
98556A	"CHX" Accelerator	DIO-II	400s/425s/433s only	No	7.0, Starbase
*98700	"CX" Controller	M.A.D.	Unsupported	No	Unsup.
98702A§	Personal VRX LGB i/f	DIO-II	All except 400 <i>dl</i>	Inves.	7.03, X, PHIGS, Starbase
98705A	Personal VRX P2 processor	LGB	All except 400 <i>dl</i>	Inves.	7.03, X, PHIGS, Starbase
98705B	Personal VRX P3 processor	LGB	All except 400 <i>dl</i>	Inves.	7.03, X, PHIGS, Starbase
98705C§	Personal VRX P1 processor	LGB	All except 400 <i>dl</i>	Inves.	7.03, X, PHIGS, Starbase
98720A	SRX Processor	LGB	Unsupported	No	7.0, X, Starbase
*98724A	98720A SRX LGB interface	DIO-I/O	Unsupported	No	7.0, X, Starbase
98725A	98720A SRX LGB interface	DIO-Sys.	Unsupported	No	7.0, X, Starbase
98726A	98730A <i>TurboSRX</i> LGB i/f	DIO-II	Unsupported	No	7.0, X, Starbase
98727A§	Turbo VRX PDMA i/f	DIO-II	400s/425s/433s only	Inves.	7.03, X, PHIGS, Starbase
98728A§	Turbo VRX VDMA i/f	DIO-II	400s/425s/433s only	Inves.	7.03, X, PHIGS, Starbase
98730A	<i>TurboSRX</i> Processor	LGB	Unsupported	No	7.0, X, Starbase
98735A	Turbo VRX T1 Processor	G-Bus	400s/425s/433s only	Inves.	7.03, X, PHIGS, Starbase
98736A	Turbo VRX T2 Processor	G-Bus	400s/425s/433s only	Inves.	7.03, X, PHIGS, Starbase
98736B	Turbo VRX T3 Processor	G-Bus	400s/425s/433s only	Inves.	7.03, X, PHIGS, Starbase
*9876A	480 lpm thermal	HP-IB	Unsupported	Unsup.	Unsup.

§ Product number listed for reference, orderable only as part of supporting graphics processor.

C-24 Series 400 Support Matrix

Series 400 Datacomm Compatibility

The "Min. Boot ROM" column refers to the computer's ability to load a remote system via the datacomm device. "Transp." means the device is transparent to software.

Product Number	Description	Type	Min. Boot ROM	Hardware Qualification and Support	Operating Environment Support		
					DOMAIN O.S.	HP-UX	SoftPC
K1095	"ETH-RPTR-FIBER" AFR-1 Fiber Optic Repeater; 2 SMA, 1 AUI/f	LAN	Transp.	Vendor supported	SR10.2+	Unsup.	Via O.S.
K1096	"ETH-RPTR-MR2" MR-2000C Multiport Thinnnet repeater; 2 BNC	LAN	Transp.	Vendor supported	SR10.2+	Unsup.	Via O.S.
K1097	"ETH-RPTR-2C" AMR-9C Multiport repeater; 2 AUI/f	LAN	Transp.	Vendor supported	SR10.2+	Unsup.	Via O.S.
K1098	"ETH-RPTR-9C" AMR-9C Multiport repeater; 8 BNC, 1 AUI/f	LAN	Transp.	Vendor supported	SR10.2+	Unsup.	Via O.S.
K1112	"ETH-XCVR-MP8" AMT-8 Multiport MAU; 8 AUI/m, 1 AUI/m?	LAN	Transp.	Vendor supported	SR10.2+	Unsup.	Via O.S.
K1115	"ETH-XCVR-TMS3" MAU, 10Base2; 1 AUI/m, 1 BNC	AUI/m	Transp.	Vendor supported	SR10.2+	Unsup.	Via O.S.
K1116	"ETH-XCVR-03DIAG" MAU, 10Base2; 1 AUI/m, 1 BNC	AUI/m	Transp.	Vendor supported	SR10.2+	Unsup.	Via O.S.
K1117	"ETH-XCVR-02DIAG" MAU, 10Base5; 1 AUI/m, 1 N-type	AUI/m	Transp.	Vendor supported	SR10.2+	Unsup.	Via O.S.
K1118	"ETH-XCVR-3C" MAU, 10Base5; 1 AUI/m, 1 N-type	AUI/m	Transp.	Vendor supported	SR10.2+	Unsup.	Via O.S.
K1489	MultiTech modems MT212AH3 1200 bps	RS232,AT	NOP	Vendor supported	SR10.2+	Unsup.	Via.Appl.
K1492	MT224AH 2400 bps	RS232,AT	NOP	Vendor supported	SR10.2+	Unsup.	Via.Appl.
K1494	MT224EH (MNP5)	RS232,AT	NOP	Vendor supported	SR10.2+	Unsup.	Via.Appl.
K1498	MT932EA V.32	RS232,AT	NOP	Vendor supported	SR10.2+	Unsup.	Via.Appl.
K1769	"RNS-ATR" Rem. Net. Switch	ATR	Transp.	All except 400dl	SR10.2+	Unsup.	Unsup.

Series 400 Datacomm Compatibility, continued...

Product Number	Description	Type	Min. Boot ROM	Hardware Qualification and Support	Operating Environment Support		
					DOMAIN O.S.	HP-UX	SoftPC
*2334A	X.25 Cluster controller	RS232	NOP	All Models	Unsup.	7.0	Via O.S.
2335A	X.25 Cluster controller	RS232	NOP	All Models	Unsup.	7.0	Via O.S.
2342A	TS-8 terminal controller	LAN	NOP	All Models	SR10.2+	7.0	Via O.S.
2345A	DTC LAN Terminal Server	LAN, __	NOP	All Models	Unsup.	__	Via O.S.
28641A	10Base2 ThinLAN MAU	AUI/m	Transp.	All Models	SR10.2+	7.0	Via O.S.
28645A	Multiport repeater, 1 AUI/f, 3 10Base2/m	LAN	Transp.	All Models	SR10.2+	7.0	Via O.S.
28648B	LAN Bridge, 2 AUI/f	LAN	Unsup.	All Models	SR10.2+	7.0	Via O.S.
28649A	IEEE 802.3 LAN to 802.5 Token Ring bridge; 1 AUI/f, 1 __	LAN	Unsup.	_____	?__?	?__?	Via O.S.
28663A	StarLAN-10 Hub; 1 AUI/f, 12 RJ-45	LAN	Transp.	_____	Unsup.	7.0	Via O.S.
28664A	StarLAN-10 MAU, RJ-45	AUI/m	Transp.	_____	Unsup.	7.0	Via O.S.
28684A	EtherTwist Hub; 1 __, 12 RJ-45	LAN	Transp.	All Models	SR10.2+	7.0	Via O.S.
28685A	10BaseT EtherTwist MAU	AUI/m	Transp.	All Models	SR10.2+	7.0	Via O.S.
30241A	10Base5 ThickLAN MAU	AUI/m	Transp.	All Models	SR10.2+	7.0	Via O.S.
*37212A	1200 baud HP modem	RS232	NOP	Unsupported	Unsup.	7.0	Via O.S.
37212B	2400 baud HP modem	RS232	NOP	Unsupported	Unsup.	7.0	Via O.S.
*39301A	Optical 8/16-channel repeater	RS232	Transp.	Unsupported	Unsup.	7.0	Via O.S.
50759A	Remote Support modem	RS232,AT	NOP	Under investigation	Unsup.	7.0	Via.Appl.
92178S	ABC switch	RS232	Transp.	Unsupported	Unsup.	Unsup.	Transp.
92203A	Codex 2264 V.32 modem	RS232	NOP	Under investigation	__	Inves.	Via.Appl.
92205A/C 92205B	Hayes modems	RS232,AT	NOP	Unsupported	__	7.0	Via.Appl.
	Smartmodem 1200						
92205B	Smartmodem 2400	RS232,AT	NOP	Unsupported	__	Unsup.	Via.Appl.
	Smartmodem 2400						
*98028A	SRM Multiplexer	50-pin	Unsup.	Unsupported	No	7.0	Unsup.
<none>	3rd-party modems						
<none>	Telebit T2500 PEP/V.32	RS232,AT	NOP	Unsupported	__	7.0	Via.Appl.
<none>	Telebit <i>TrailBlazer</i>	RS232,AT	NOP	Unsupported	__	7.0	Via.Appl.
<none>	USR HST/V.32 dual std.	RS232,AT	NOP	Unsupported	__	7.0	Via.Appl.
<none>	USR <i>Courier</i> 2400	RS232,AT	NOP	Unsupported	__	7.0	Via.Appl.
<none>	USR <i>Courier</i> HST	RS232,AT	NOP	Unsupported	__	7.0	Via.Appl.

C-26 Series 400 Support Matrix

Series 400 Miscellaneous Device Compatibility

Product Number	Description	Type	Hardware Qualification and Support	Operating Environment Support		
				DOMAIN O.S.	HP-UX	SoftPC
A1401A	DIO-II to DIO-I/O adaptor	DIO-II	400s/425s/433s only. Maximum of two per SPU.	Inves.	7.0	2.0c
26075A	ABC Switch	HP-IB	All Models except 400dl	No	7.0	Transp.
37201A	HP-IB Extenders	HP-IB	Unsupported	No	7.0	Unsup.
37204A	Serial/twisted-pair Coax/Fibre Optic	HP-IB	Unsupported	No	7.0	Transp.
82169A	HP-IL Converter	HP-IB	Unsupported	No	Unsup.	Unsup.
92203J/K	HP-IB → Centronics converter	HP-IB	All Models except 400dl	N.A.	7.0	Via HP-UX
98242A	Add-on DIO-I kits Two slot pairs	DIO-Sys/II	Incompatible with Series 400	N.A.	N.A.	N.A.
98242B	Single slot pair	DIO-Sys/II	Incompatible with Series 400	N.A.	N.A.	N.A.
98568A	Series 300 DIO-I Expander	DIO-I	Incompatible with Series 400	N.A.	N.A.	N.A.
#132	DIO-II version	DIO-II	Incompatible with Series 400	N.A.	N.A.	N.A.
98570A	Series 300 DIO-II Expander	DIO-II	Incompatible with Series 400	N.A.	N.A.	N.A.
98577A	Series 300 VME Expander	DIO-II	Incompatible with Series 400	N.A.	N.A.	N.A.
9888A	Series 200 Bus Expander	DIO-I/O	Unsupported	Unsup.	Unsup.	Unsup.

Series 400 Interface & Plug-in Accessory Compatibility

The "Min. Boot ROM" column refers to the computer's ability to identify (ID), test, use the device as console port and/or load a system via the device. "Transp." means the device is transparent to software.

Product Number	Description	Type	Min. Boot ROM	Hardware Qualification and Support	Operating Environment Support		
					DOMAIN O.S.	HP-UX	SoftPC
A-ADD-PCC	DOS co-processor	ISA	NOP	400s/425s/433s only	SR10.2+	No	Via O.S.
A-ADD-SPE	Apollo serial/par i/f	ISA	NOP	400s/425s/433s only	SR10.2+	Unsup.	No
A-ADD-SWFC	SCSI controller	ISA	Unsup.	Unsupported	Unsup.	No	No
A-ADD-WFC	ESDI controller	ISA	Unsup.	Unsupported	Unsup.	No	No
APLR-386	386 Co-processor	ISA	NOP	400s/425s/433s only	SR10.2+	7.05	No
A-NET-ATR	Apollo token ring i/f	ISA	1.0	All except 400dI	SR10.2+	No	No
A-NET-ETH	IEEE-802.3 i/f	ISA	Unsup.	Under investigation	Inves.	No	No
A-NET-ITR	IBM token ring i/f	ISA	1.0	All except 400dI	SR10.2+	No	No
A1096A	Monochrome VRX	DIO-II	1.0	All Models	SR10.2+	7.03	2.0c
A1401A	DIO-II to DIO-I/O adaptor	DIO-II	1.0	400s/425s/433s only	Inves.	7.0	2.0c
A1416A	Color VRX	DIO-II	1.0	All except 400dI	SR10.2+	7.0	2.0c
A1450A	Add std.spd HP-IB	400	1.0	Models 400r/425r only	No	7.0	2.0c
A1451A	Add std.spd HP-IB	400	1.0	400s/425s/433s only	No	7.0	2.0c
A1460A	Add 4 EISA slots	400	1.0	400s/425s/433s only	T.B.A.	T.B.A.	T.B.A.
D1180A	VGA card w/256 Kb	ISA	NOP	Unsupported	No	No	No
D1677A	ESDI controller	ISA	NOP	Unsupported	No	No	No
K1015°	Convert 1→3 port	RS232	1.0	All Models	SR10.2+	Unsup.	T.B.A.
K2292	Convert 1→3 port	RS232	1.0	All Models	SR10.2+	7.05 ¹	T.B.A.
K1094	"ETH-LINK-II" 3COM i/f	ISA	NOP	Unsupported	Unsup.	No	No
*K1493	MultiTech Modems	ISA	Unsup.	Unsupported	Unsup.	Unsup.	Unsup.
*K1496	224PC + MNP5 compr. 2400/1200/300 bps	ISA	Unsup.	Unsupported	Unsup.	Unsup.	Unsup.
K1623	"PTR-PAR-BOARD"	ISA	NOP	Unsupported	Unsup.	Unsup.	Unsup.
KIT-CENTx	Parallel interface	ISA	NOP	400s/425s/433s only	SR10.2+	Unsup.	Unsup.
SCAT10N/R-	X.25 interface	ISA	NOP	400s/425s/433s only	SR10.2+	No	Via O.S.
24540B	Serial/parallel i/f	ISA	NOP	Unsupported	Unsup.	No	No
24541B	Dual Serial interface	ISA	NOP	Unsupported	Unsup.	No	No
24550A	1200 bps modem	ISA	NOP	Unsupported	Unsup.	No	No
24551B	2400 bps modem	ISA	NOP	Unsupported	Unsup.	No	No
*27209A	HP-IB (aka 88990A)	ISA	NOP	Unsupported	Unsup.	No	No
27210B	ThinLAN interface	ISA	NOP	Unsupported	No	No	No
27236A	StarLAN 10 interface	ISA	NOP	Unsupported	No	No	No
27245A	EtherTwist interface	ISA	NOP	Unsupported	No	No	No
27250A	ThinLAN interface	ISA	NOP	Unsupported	No	No	No
28672A	8-channel MUX daughter card	SBX	NOP	400s/425s/433s only	No	7.0	Via O.S.
36592/93A	SNALink (includes 98649A card)	DIO-I/O	ID	400s/425s/433s only	No	7.0	Via O.S.
36941A	X.25/300 Link	DIO-I/O	ID	400s/425s/433s only	No	7.0	Via O.S.

C-28 Series 400 Support Matrix

Series 400 Interface & Plug-in Accessory Compatibility, continued...

Product Number	Description	Type	Min. Boot ROM	Hardware Qualification and Support	Operating Environment Support		
					DOMAIN O.S.	HP-UX	SoftPC
50955A	IBM 3278 Coax i/f	DIO-I/O	Unsup.	Unsupported	No	No	No
°50961A	SRM Coax interface	DIO-I/O	Unsup.	Unsupported	No	Unsup.	No
50962A	SRM Coax interface	DIO-I/O	Unsup.	Unsupported	No	Unsup.	No
82300B	BASIC Lang. proc.	ISA	Unsup.	Unsupported	No	No	No
82328A	Intelli. Graphics card	ISA	NOP	Unsupported	Unsup.	No	No
82329A	EGA Emulation card	ISA	NOP	Unsupported	Unsup.	No	No
82335A	HP-IB-II interface	ISA	NOP	Unsupported	Unsup.	No	No
#002							
°88141A	JetScript i/f for LaserJet-II	ISA	NOP	Unsupported	Unsup.	No	No
88295A	ScanJet interface	ISA	NOP	Unsupported	Unsup.	No	No
88500A	CS/80 HP-IB interface	ISA	NOP	Unsupported	Unsup.	No	No
98171A	LAN interface	DIO-I/O	1.0	400s/425s/433s only	No.	7.0	Via O.S.
°98201A	Custom Keypad i/f	DIO-I/O	NOP	Unsupported	No	No	No
°98204A/B	Video Output i/f	DIO-I/O	Unsup.	Unsupported	No	Unsup.	No
98229A	ECC RAM pairs 4 Mbytes, 1 Mbit	Short	-	Phys. incompatible	-	-	-
98229B	8 Mbytes, 1 Mbit	Tall	1.0	All Models	SR10.2+	7.0	2.0c
98229C	4 Mbytes, 1 Mbit	Tall	1.0	Models 400r/425r only	SR10.2+	7.0	2.0c
98229D	16 Mbytes, 4 Mbit	Tall	1.0	Models 425s/425r only	SR10.3+	7.05	2.0c
98229E	32 Mbytes, 4 Mbit	Tall	1.0	400s/425s/433s only	SR10.2+	7.0	2.0c
98229S	16 Mbytes, 1 Mbit	Short	-	Phys. incompatible	-	-	-
98235A	AUI daughter board	340	Unsup.	Incompatible w/S400	No	No	No
98237A	ThinMAU daughter bd.	340	Unsup.	Incompatible w/S400	No	No	No
98248A°/B	Fltg. pt. accel.	DIO-II	Unsup.	Unsupported	No	Unsup.	No
98253A	EPROM Progr. i/f	DIO-Acc.	Unsup.	Unsupported	No	Unsup.	No
°98254A	64 Kbyte RAM card	DIO-Acc.	No	Incompatible w/S400	No	No	No
98255A	EPROM memory card	DIO-Acc.	Unsup.	Unsupported	No	Unsup.	No
98256A	256 Kbyte RAM card	DIO-Acc.	Unsup.	Incompatible w/S400	No	No	No
98257A	1.0 Mbyte RAM card	DIO-Acc.	Unsup.	Incompatible w/S400	No	No	No
98258A	4 Mbyte DIO-II RAM	DIO-II	Unsup.	Incompatible w/S400	No	No	No
98258B,C	4,12 Mbyte RAM	s300	Unsup.	Incompatible w/S400	No	No	No
98259A	128K Bubble memory	DIO-Acc.	Unsup.	Unsupported	No	No	No

Series 400 Interface & Plug-in Accessory Compatibility, continued...

Product Number	Description	Type	Min. Boot ROM	Hardware Qualification and Support	Operating Environment Support		
					DOMAIN O.S.	HP-UX	SoftPC
98262A	HP-IB daughter i/f	s300	Unsup.	Incompatible w/S400	No	No	No
98264A	8 Mbyte ECC RAM	DIO-II	Unsup.	Incompatible w/S400	No	No	No
98264B	16 Mbyte ECC RAM	DIO-II	Unsup.	Incompatible w/S400	No	No	No
98265A	SCSI daughter i/f	s300	Unsup.	Incompatible w/S400	No	No	No
98266	4,8 Mbyte RAM	s300	Unsup.	Incompatible w/S400	No	No	No
98267	4,8,12 Mbyte RAM	s300	Unsup.	Incompatible w/S400	No	No	No
98268A	4 Mbyte RAM	s300	Unsup.	Incompatible w/S400	No	No	No
98269A,B	1,4 Mbyte RAM	s300	Unsup.	Incompatible w/S400	No	No	No
98286	DOS Coprocessor	DIO-Acc.	ID	Unsupported	No	Unsup.	N.A.
*98287A	CX 1024×768×8 M.A.D.bus	DIO-I/O	Unsup.	Malfunction likely	No	Unsup.	No
98297A	RTI/SBX interface	2×DIO-Sys	NOP	400s/425s/433s only	Unsup.	7.0	Via O.S.
98542A	Video interfaces 512×400×1	DIO-Sys.	1.0	Unsupported	No	7.0	No
98543A	512×400×4	DIO-Sys.	1.0	Unsupported	No	7.0	No
*98544A	1024×768×1	DIO-Sys.	1.0	Unsupported	No	7.0	2.0c
98544B	1024×768×1	DIO-Sys.	1.0	Unsupported	No	7.0	2.0c
*98545A	1024×768×4	DIO-Sys.	1.0	Unsupported	No	7.0	2.0c
98546A	512×390×2	DIO-I/O	1.0	Unsupported	No.	7.0	No
98547A	1024×768×6	DIO-Sys.	1.0	Unsupported	No	7.0	2.0c
98548A	Video interfaces MH 1280×1024×1	DIO-II	1.0	Unsupported	No	7.0	2.0c
98549A	C+ 1024×768×6	DIO-II	1.0	Unsupported	No	7.0	2.0c
98550A	CH 1280×1024×8	DIO-II	1.0	400s/425s/433s only	No	7.0	2.0c
98556A	CHX Accelerator	DIO-II	1.0	400s/425s/433s only	No	7.0	NOP
98561-6653x	320 Human i/f	DIO-I/O	No	Select code conflicts	No	No	No
98562-6653x	DIO-II System i/f	DIO-II	No	Select code conflicts	No	No	No
98603	BASIC 5.1 ROM	DIO-Acc.	Unsup.	Unsupported	No	Unsup.	Unsup.
98620A°/B	DMA controller	DIO-Acc.	Unsup.	Incompatible w/S400	No	No	No
98622A	GPIO interface	DIO-I/O	Unsup.	400s/425s/433s only	No	7.0	Via O.S.
98623A	BCD interface	DIO-I/O	Unsup.	Unsupported	No	Unsup.	No
98624A	HP-IB interface	DIO-I/O	1.0	400s/425s/433s only	No	7.0	Via O.S.
*98625A	Hi-speed HP-IB i/f	DIO-I/O	Unsup.	Unsupported	No	Unsup.	Unsup.
98625B	Hi-speed HP-IB i/f	DIO-I/O	1.0	400s/425s/433s only	No	7.0	Via O.S.
98626A	RS-232C Serial i/f	DIO-I/O	1.0	Unsupported	No	7.0	Via O.S.
98627A	512×474×3 RGB	DIO-I/O	Unsup.	Malfunction likely	No	Unsup.	Unsup.
98628A	Datacomm i/f	DIO-I/O	1.0	400s/425s/433s only	No	7.0	Via O.S.
*98629A	SRM interface	DIO-I/O	1.0	Unsupported	No	Unsup.	No
98630A	Breadboard i/f	DIO-I/O	Unsup.	User supported	No	Unsup.	No
98633A	HP 6944A i/f	DIO-I/O	ID	Unsupported	No	Unsup.	No
98635A	Model 310 FPA	DIO-Acc.	ID	Unsupported	No	Unsup.	No
98638A	8-ch. MUX	DIO-Sys.	1.0	400s/425s/433s only	No	7.0	2.0c

C-30 Series 400 Support Matrix

Series 400 Interface & Plug-in Accessory Compatibility, continued...

Product Number	Description	Type	Min. Boot ROM	Hardware Qualification and Support	Operating Environment Support		
					DOMAIN O.S.	HP-UX	<i>SofiPC</i>
98640A	ADC input i/f	DIO-I/O	ID	Unsupported	No	7.0	Via O.S.
98641A	RJE 2780/3780 i/f	DIO-I/O	ID	400s/425s/433s only	No	7.0	No
98642A	4-port RS-232C Mux	DIO-I/O	1.0	Under investigation	No	7.0	2.0c
*98643A	LAN interface	DIO-I/O	→	<see 98171A>	←	←	←
98644A	RS-232C Serial i/f	DIO-I/O	Unsup.	Unsupported	No	7.0	Via O.S.
98646A	VMEbus interface	DIO-I/O	NOP	Qualified	No	7.0	No
*98647A	PC-IB interface	DIO-I/O	Unsup.	Unsupported	No	Unsup.	No
98658A	SCSI interface	DIO-I/O	1.0	400s/425s/433s only	Unsup.	7.0	Via O.S.
98659A	High speed Serial i/f	DIO-I/O	ID	? ____ ?	No	Via Appl.	No
98691A	PDI interface	DIO-I/O	ID	User supported	No	Unsup.	No
*98695A	IBM 3270 Coax i/f	DIO-I/O	ID	Unsupported	No	No	No
98702A§	Personal VRX LGB i/f	DIO-II	1.0	All except 400dl	SR10.2 +	7.03	2.0c ^x
*98724A	LGB Interface						
98725A	98720A SRX	DIO-I/O	1.0	Unsupported	No	7.0	2.0c
98726A	98720A SRX	DIO-Sys.	1.0	Unsupported	No	7.0	2.0c
98726A	98730A <i>Turbo</i> SRX	DIO-II	1.0	Unsupported	No	7.0	2.0c
98727A§	Turbo VRX PDMA i/f	DIO-II	1.0	400s/425s/433s only	Planned	7.03	2.0c ^x
98728A§	Turbo VRX VDMA i/f	DIO-II	1.0	400s/425s/433s only	Planned	7.03	2.0c ^x
<none>	DigiChannel C/X 16-ch MUX	EISA	NOP	Qualified on 400s/425s/433s	Unsup.	Contrib.	Via O.S.

1 Only Port 1 supported on 7.0 and 7.03. Ports 2 & 3 require 7.05 or later. An unsupported patch is available for 7.0 and 7.03.

^x *SofiPC* supported only within an X-window at this time.

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