

X Station User's Guide for the HP 700/RX



**HEWLETT
PACKARD**

**HP Part No. C2700-90023
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Edition 1

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Printing History

This is the first edition of the *X Station User's Guide for the HP 700/RX*. The firmware release printed after the date indicates the version level of the product at the time the manual was issued. Many product updates do not require manual changes and, conversely, manual changes may be made without product changes. Therefore, do not expect a one-to-one correspondence between product releases and manual editions.

Edition 1, December 1991

Firmware Release B.03

Safety Symbols

Note



Calls attention to a procedure, practice, or condition that requires special attention by the reader.

Caution



Calls attention to a procedure, practice, or condition that could possibly cause damage to equipment or permanent loss of data.

Warning



Calls attention to a procedure, practice, or condition that could possibly cause bodily injury or death.

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Radio Interference Warnings

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

Funkentstörung Deutschland

Herstellerbescheinigung

Hiermit wird bescheinigt, dass das Gerät (HP 700/RX) in Übereinstimmung mit den Bestimmungen von Postverfügung 1046/84 funkenstört ist. Der Deutschen Bundespost wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

Lärmangabe nach der Maschinenlärmverordnung - 3 GSGV (Deutschland)

Bei Umgebungstemperatur von 35 Cel LpA 35 dB

Bei Umgebungstemperatur von 35 Cel und höher LpA 45 dB am Arbeitsplatz
normaler Betrieb nach DIN 45635 T. 19 (per ISO 7779)

Dieses Gerät erfüllt in Verbindung mit den hierfür geprüften weiteren Geräten die Anforderungen für Bildschirmarbeitsplätze im Buerobereich:

- CA-93-6MD mouse
- HP C1405A keyboard
- HP A1097A color monitor
- HP 98774A black-and-white monitor.

For Operation in Canada

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux Appareils Numériques de Classe A prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

Documentation Map

To install and operate your HP 700/RX X station you will need this manual and one of the following:

HP System Administrator's Guide for the HP 700/RX (HP C2700-90019)
Sun System Administrator's Guide for the HP 700/RX (HP C2700-90020)
ROM Server User's Guide for the HP 700/RX (HP C2700-90022)

For Use in Japan:

HP System Administrator's Guide for the HP 700/RX (Japanese)
(HP C2700-90119)

Software Licenses

License to Use (unlimited users): B.03 HP 700/RX Software

This certificate evidences Hewlett-Packard Company's grant of a license to use HP 700/RX software on the HP 700/RX with which this manual was shipped.

Rights and restrictions on the use, transfer, and copying of the software are set forth in the Hewlett-Packard Company's Software License Terms Agreement applicable to the License to Use.

License to Use (one user): HP Visual User Environment 2.01

This certificate evidences Hewlett-Packard Company's grant of a license to use HP Visual User Environment 2.01 on the HP 700/RX with which this manual was shipped.

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HP Support Services for the HP 700/RX

Customers who purchase HP 700/RX X-server software for HP systems are automatically covered under the existing HP-UX ResponseLine support contract for HP SupportLine calls. However, to receive software and manual updates for the HP 700/RX, you must purchase HP Software Update Materials separately.

To add HP Software Update Materials to your current contract, order the following:

H2014A+S00	HP Software Materials Update
#AA0	1/4-inch Cartridge Tape

Pricing can be quoted by your local HP office.

Sun Support Services for the HP 700/RX

Sun users can order on-line and on-site support and, optionally, automatic software updates for the HP 700/RX.

To get

- telephone access to the HP Response Center
- access to HP SupportLine
- critical on-site assistance
- the right *to use* software updates

you must purchase HP Application Software Support for Non-HP Systems (H2084A+H00). To get software updates for the HP 700/RX, you must also purchase HP Software Update Materials for Non-HP Systems (H2085A+S00) separately.

To order support services for the HP 700/RX, purchase the following:

- H2084A+H00 HP Application Software Support for Non-HP Systems
- Opt 100 (required to cover the HP 700/RX server software)

You must order H2084A+H00 once, then order H2084A+H00-100 for each non-HP system that is running the HP 700/RX server software.

- Optionally, choose
 - H2085A+S00 HP Software Update Materials for Non-HP Systems
 - Opt 100 (required to cover the HP 700/RX server software)

□ Opt AA0 (specifies 1/4 inch tape).

You would order H2085A+S00, H2085A+S00-100, and H2085A+S00-AA0 once each.

(There would be other support services to be ordered to cover your host computer. Your HP sales representative has details.)

Limited Warranty

One-Year Limited Hardware Warranty

Hewlett-Packard warrants your HP 700/RX X Station against defects in materials and workmanship for a period of one year from receipt by the end user (proof of purchase required). If HP receives notice of such defects during the warranty period, HP will either, at its option, repair or replace products which prove to be defective.

Exclusions

The above warranty shall not apply to defects resulting from: improper or inadequate maintenance by the customer; customer-supplied software or interfacing; unauthorized modification or misuse; operation outside of the environmental specifications for the product; or improper site preparation and maintenance.

Obtaining Warranty Service

To obtain warranty service call the HP Customer Service Center nearest to you. For more information contact your local HP sales representative.

Preface

This guide describes how to assemble the HP 700/RX X station, connect it to your network, turn the terminal on, and, if the HP 700/RX X server code is available for loading into the X station's RAM, start clients.

The HP 700/RX X server code is supplied either on the HP 700/RX server tape, which your system administrator will install on your host computer, or in the HP 700/RX ROM-based server, which you must install in the X station yourself.

Chapter 1 introduces this manual and the components of the HP 700/RX X station.

Chapter 2 describes the HP 700/RX hardware installation.

Chapter 3 describes turning on the HP 700/RX and the configuration changes you may need to make to your X station.

Chapter 4 describes how to set up an X session using SLIP.

Chapter 5 describes how to start and control your client programs on an HP host.

Chapter 6 describes how to start and control clients on a Sun host.

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Welcome to the HP 700/RX

This chapter will summarize the components of your HP 700/RX X station and the prerequisites that must be met in your computing environment to allow your HP 700/RX X station to run.

The full functionality of the X station, including the ability to display X windows, requires that X server code be loaded into the X station's RAM. The X server code must be installed on your host computer or a ROM-based server must be installed in the X station. The installation of the X server code is documented in the manual that is supplied with the server tape or ROM server.

Hardware Components

The contents of your HP 700/RX shipment will vary, depending on which bundled unit you ordered. If any components are damaged or missing, contact your Hewlett-Packard Sales and Support Office.

For All Units

All units should contain

- the X-processor unit and its power cord
- a BNC "T" connector and a Velcro cover
- a monitor cable
- AT/2 keyboard cable (AT/2 is PS/2™ compatible)
- an AT/2 keyboard (HP part number HP C1405A) (may have been deleted by delete option 1A2)
- an AT/2 3-button mouse (HP part number HP 1150-1835)
- pedestal feet that can be used to hold the base unit vertically.

For C2702A, C2705A, C2706A, C2710A, and C2711A Units ...

These bundled units should contain all of the components above plus one of the following monitors:

Bundle	Monitor Part #	Description
C2702A	HP 98774A	1280×1024, 19-inch monochrome
C2705A	HP D1195A	1024×768/800×600, 14-inch color
C2706A	HP A1497A	1024×768, 16-inch color
C2710A	HP A1497A	1024×768, 16-inch color
C2711A	HP A1097A	1280×1024, 19-inch color

For C2701A, C2704A, C2709A, C2712A, C2713A, and C2714A ...

These units contain the X-processor only. We recommend that you use one of the following monitors:

Part Number	Type	Resolution	Hz	C2700A	C2703A	C2707A	C2708A
HP 98774A	19-in b/w	1280×1024	72 Hz	✓			✓
HP 98778A	19-in b/w	1024×768	60 Hz	✓	✓	✓	✓
HP D1195A	14-in color	640×480	72 Hz		✓		
HP D1195A	14-in color	800×600	72 Hz		✓		
HP D1195A	14-in color	1024×768	60 Hz		✓	✓	✓
HP 98753A	19-in color	1024×768	60 Hz		✓	✓	✓
HP D1188A	16-in color	multi-sync	60 Hz		✓	✓	✓
HP 98785A	16-in color	1024×768	60 Hz		✓	✓	✓
HP A1497A	16-in color	1024×768	75 Hz		✓	✓	✓
HP 98754A	19-in color	1280×1024	60 Hz				✓
HP A1097A	19-in color	1280×1024	72 Hz				✓
HP 98789A	16-in color	1280×1024	60 Hz				✓
HP D1187A	20-in color	multi-sync	60 Hz				✓

Supported Input Devices

The following input devices are supported:

- HP C1405A AT/2 keyboard
- HP 1150-1835 AT/2 3-button mouse
- HP C1429A PC101-layout HP-HIL keyboard
- HP 46021A HP-HIL keyboard
- HP 46060B HP-HIL 3-button mouse
- HP 45911C digitizer
- HP 46085A 9-knob control dial module
- HP 46086A 32-key button box
- HP 46087C ANSI A/ISO A4-size digitizer
- HP 46088C ANSI B/ISO A3-size digitizer
- HP M1309A 3-button trackball
- AT/2 bar code scanner
- AT/2 bar code wedge
- AT/2 mag stripe reader.

Other input devices may work, but are not supported.

The Cherry G80-1307 LK201-layout USASCII keyboard has been tested and found to work, but is not supported.

See Chapter 1 of the *System Administrator's Guide for the HP 700/RX* for any updated information.

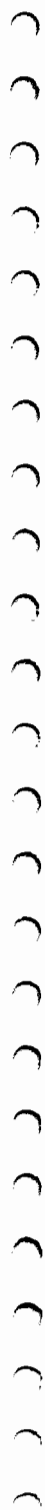
Supported Output Devices

The following output devices are supported:

- any HP serial printer
- any HP plotter
- any Centronics-style parallel printer.

Recommended Modems

We have tested SLIP using V.32bis and V.42bis modems under compression at the 38.4 kbps interface data rate. For best performance, choose a modem that supports CCITT V.42.



Installing the HP 700/RX

Quick Hardware Installation

If you have experience installing HP 700/RX X stations, you can try the following quick installation instructions. Full details on each instruction are given in the remaining sections of this chapter.

1. Install the DRAM.

Caution

The HP 700/RX components can be damaged by static electricity. When you open the HP 700/RX X station, you must be wearing a grounding strap that is attached to a metal surface on the back panel of X station's chassis.

2. Install the optional ROM-based server kit.
3. Optionally, insert the pedestals into the base.
4. Connect the mouse (or other pointing devices) and the keyboard.
5. Connect your LAN cable to *either* the BNC connector or the AUI connector, but not both.
6. Connect the monitor cable.
7. Optionally, connect a serial printer, other RS-232 device, modem, or direct serial-line connection to the serial port.
8. Optionally, connect a parallel printer to the parallel port.
9. Connect the power cords for the monitor and HP 700/RX X station.

Installing DRAM

Your HP 700/RX has two memory expansion slots. You can install one memory module or two, but if you install two modules, these modules must be the same size. To order DRAM modules for your HP 700/RX X station, contact your local Hewlett-Packard sales office and ask for the following product numbers:

Component	Product Number
1-MByte DRAM Expansion Kit	C2320A
2-MByte DRAM Expansion Kit	C2321A
4-MByte DRAM Expansion Kit	C2322A
8-MByte DRAM Expansion Kit	C2323A

Tools Required

To install the DRAM expansion kits you will require

- a #1 Phillips® screwdriver
- a grounding strap.

Caution



The HP 700/RX components can be damaged by static electricity. When you open the HP 700/RX X station, you must be wearing a grounding strap that is attached to a metal surface on the back panel of X station's chassis.

Warning



Do not open the HP 700/RX while the power cord is plugged in. Contact with energized components can cause personal injury.

Step 1: Remove the Top of the HP 700/RX Case

1. Ground your antistatic wrist strap to a metal part of X station's chassis.
2. Remove the two Phillips screws from the HP 700/RX's connector panel.
3. Lift the rear of the top, then slide out its tabs from the slots in the front of the chassis.

Step 2: Insert the DRAM Module

The DRAM module must be installed in the socket in the correct orientation. The module has a notch on one end of the contact strip. The socket has a tab at the bottom of the clip on the left end. The notched end of the module must be aligned with the tab in the socket. See Figure 2-1.

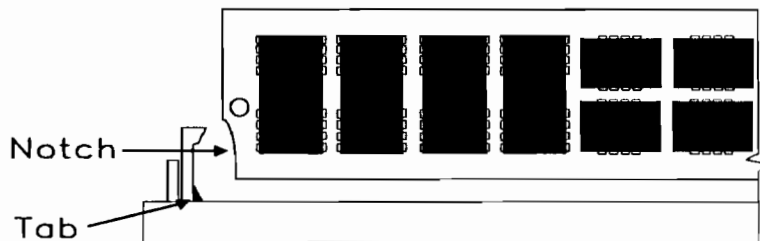


Figure 2-1. Orientation of the DRAM Module

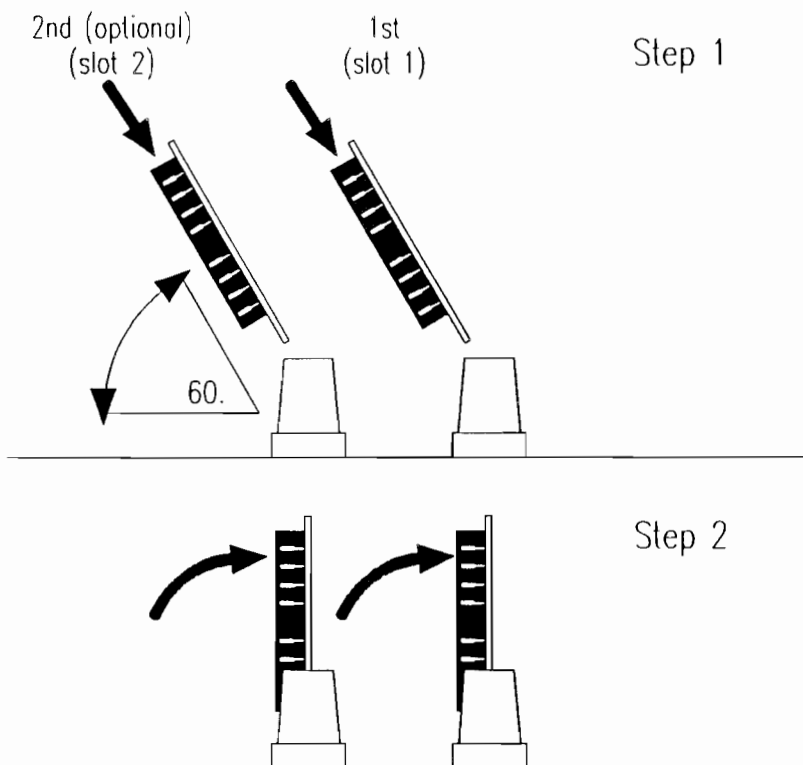


Figure 2-2. Insert the DRAM module.

Insert each DRAM module as follows (refer to Figure 2-2):

1. Orient the DRAM module at approximately 60° to the CPU board and with the notch on the contact strip aligned with the tab on the socket.

Sockets are labeled *1* and *2*. These sockets must be filled in the correct order if the X station is to recognize the DRAM. If the X station has only one DRAM module, it must be in the *1* socket.

2. Insert the DRAM module into the open side of the socket.

Note

The DRAM module must be inserted completely into its socket while at an angle. Only then can it be flipped into the upright position and locked into place.

3. Rotate the module upward until it snaps into place when it is at 90° to the CPU board.
-

Note

When you power on the X station, verify that it indicates the proper amount of DRAM when powered-on (that is, 2 MBytes plus the amount of memory you installed).

Step 3: Replace the Top of the HP 700/RX Case

Install and tighten the rear panel screws. To avoid stripping the screws and/or the case, do not overtighten the screws.

Note

If you are installing a ROM-based server product, do not replace the top of the HP 700/RX case at this time. Instead, refer to the instructions on the following page.

Installing the ROM-Based Server Kit

You can install a ROM-based server kit in your HP 700/RX. This kit, which contains an adaptor board and a ROM card, will allow your HP 700/RX X station to boot up no matter what type of UNIX computer you want to access clients from (since the X station will not need to download X server code and essential fonts). To order a ROM-based server kit for your HP 700/RX X station, contact your local Hewlett-Packard sales office and ask for one of the following product numbers:

Component	Product Number
English ROM-Based Server Kit (Color)	C2725A
English ROM-Based Server Kit (Mono)	C2727A
Japanese ROM-Based Server and Fonts Kit (Color)	C2726A
Japanese ROM-Based Server and Fonts Kit (Mono)	C2728A

Tools Required

To install the ROM adaptor board you will require

- a #1 Phillips® screwdriver
- a grounding strap.

Caution



The HP 700/RX components can be damaged by static electricity. When you open the HP 700/RX X station, you must be wearing a grounding strap that is attached to a metal surface on the back panel of X station's chassis.

Warning



Do not open the HP 700/RX while the power cord is plugged in. Contact with energized components can cause personal injury.

Step 1: Remove the Top of the HP 700/RX Case

1. Ground your antistatic wrist strap to a metal surface on the back panel of the X station's chassis.
2. Remove the two Phillips screws from the HP 700/RX's connector panel.
3. Lift the rear of the top, then slide out its tabs from the slots in the front of the chassis.

Step 2: Insert the ROM Adaptor Board

Insert the ROM adaptor board.

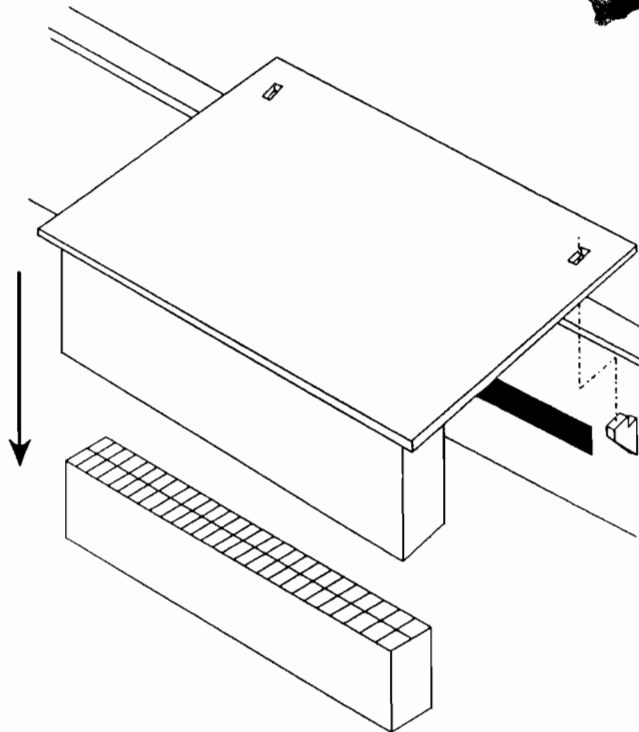


Figure 2-3. Insert the ROM adaptor board.

Step 3: Replace the Top of the HP 700/RX Case

Install and tighten the rear panel screws. To avoid stripping the screws and/or the case, do not overtighten the screws.

Step 4: Insert the ROM Card

Insert the ROM card as shown in Figure 2-4.

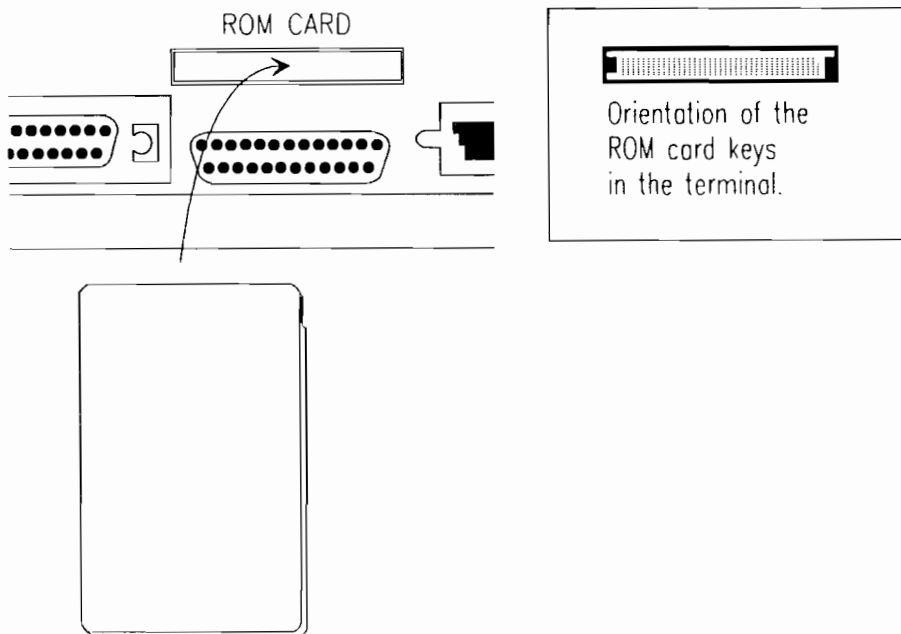


Figure 2-4. Insert the ROM Card.

Inserting the Pedestals into the HP 700/RX (Optional)

The HP 700/RX X station comes with two pedestal feet which can be used to enable the base unit stand vertically. Clips attach the pedestals to the side of the X station.

To install the pedestals:

1. Insert a clip into the bottom of each pedestal.
2. Insert the pedestal's clips into the slots on the power-supply side of the HP 700/RX.
3. Slide the pedestal until it locks into place.

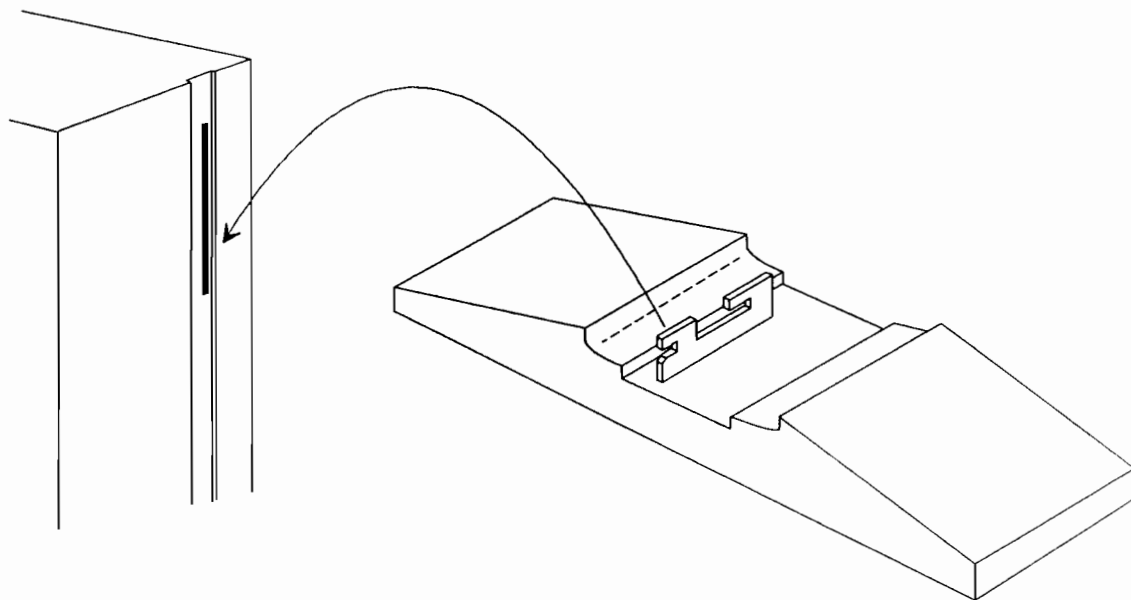


Figure 2-5. Insert the Pedestal Clips into the X Station's Side

Connecting the Mouse and Keyboard

Note



- If any devices are connected to the AT/2 KEYBOARD port, the X station will not recognize a keyboard on the HP-HIL loop (unless your system administrator has created files called *terminal.Xdevices* and *terminal.Xpointerkeys* in the *tftp_home_dir/usr/lib/X11/700X/config* directory; the *System Administrator's Manual for the HP 700/RX* has details.)
 - An HP-HIL keyboard cable is not provided with the unit; it must be ordered separately.
-

Connecting AT/2 Devices

DIN connectors are provided on the back of the base unit for connection of an AT/2 keyboard and mouse. An AT/2 keyboard cable, which can be identified by the DIN connector on one end, is provided with the unit.

Plug the AT/2 keyboard (and, optionally, a barcode wedge) into the connector marked KEYBOARD; plug the AT/2 mouse into the connector marked MOUSE.

Connecting HP-HIL Devices

A keyboard and a pointing device (such as a mouse) may be connected in the HP-HIL loop:

The end of an HP-HIL cable is marked with either one or two dots and each HP-HIL socket is similarly marked. To complete an HP-HIL loop, cable ends with two dots must be inserted in sockets with two dots, and cable ends with one dot, in sockets with one dot.

Connecting to the Network

The HP 700/RX has a LAN AUI connector and a BNC connector. If you are using a LAN, as opposed to using only SLIP, connect the LAN to *one* of the HP 700/RX's connectors according to the LAN cable type (refer to Figure 2-6):

- If you are connecting the cable for
 - a ThickLAN MAU (HP part number HP 30241A)
 - an EtherTwist MAU (HP part number HP 28685A)
 - a ThinLAN MAU (HP part number HP 28641A)use the AUI connector.
- If you are connecting a ThinLAN cable, use the BNC connector.

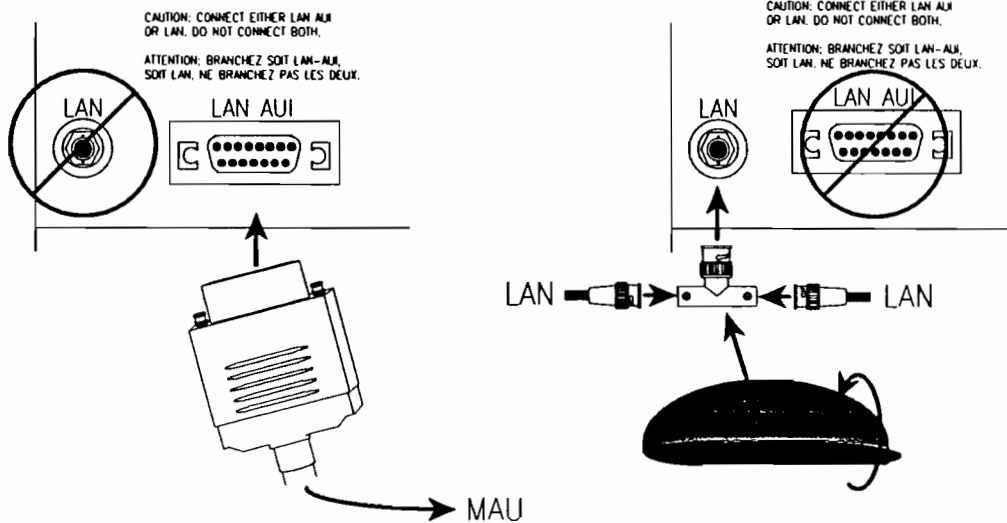


Figure 2-6. Connecting the LAN to the HP 700/RX

Caution

- If you use the BNC connector, add the insulating Velcro cover so that the LAN cannot come in contact with something that may ground or induce noise into the network.
 - Do not attach LAN cables to both the AUI and BNC connectors at the same time. If you do, the HP 700/RX will not be able to use the LAN and the network may fail.
-

About Networks ...

When you install HP 700/RX X stations on a network, read your LAN hardware installation manuals (for example, *LAN Cable and Accessories Installation Manual* HP part number HP 5955-7680) to ensure that your network will work properly.

If your network does not work well with the HP 700/RX X stations, confirm that

- each segment of the network ends with a 50 ohm terminator (do not connect the LAN directly to an X station—use a T connector)
- no section of a ThinLAN cable has a length that is a multiple of 5 meters. (Precut cable from HP is supplied in lengths of 1 m, 2 m, and 2ⁿ m.)
- the LAN cable does not have severe bends or kinks
- you have signal repeaters if your ThinLAN cable is long enough to require them (the maximum ThinLAN cable length is 184 m (615 feet)).

Connecting the Monitor

Connect the monitor cable to the monitor and to the HP 700/RX X station. If you use a cable other than the C2300-60005 supplied with the X station, it must have a 15-pin VGA D-connector on the end that connects to the X station.

If your monitor has a video select switch, choose 0.7V.

For a VGA Monitor

If you have a VGA monitor that has an attached monitor cable, the cable end connecting to the HP 700/RX X station must have a 15-pin VGA D-connector.

For a Monochrome/Grayscale Monitor

When you connect the monitor cable, attach only the green (G) connector to the monitor.

Connecting the Parallel Port

Connect your printer, plotter, or other parallel device to the parallel port. To connect to a printer, use an HP 24542D cable.

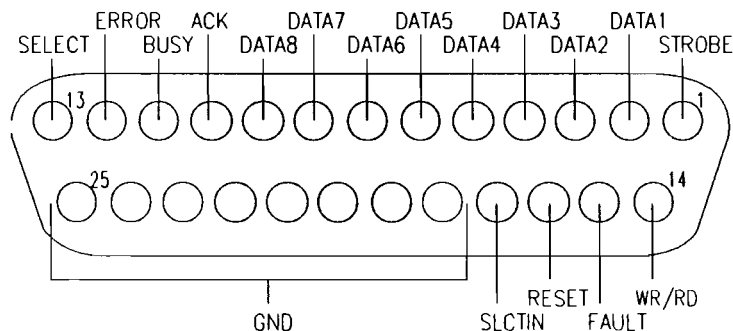


Figure 2-7. Pinout for the Parallel Port

Connecting the Serial Port

Connect your modem, printer, plotter, other serial device, or direct serial line to the RS-232 port.

Connecting a Printer

To connect to a printer, use an HP 24542G cable. If you need to make your own cable, use the pinout diagram below. The DSR line and RI line are not used.

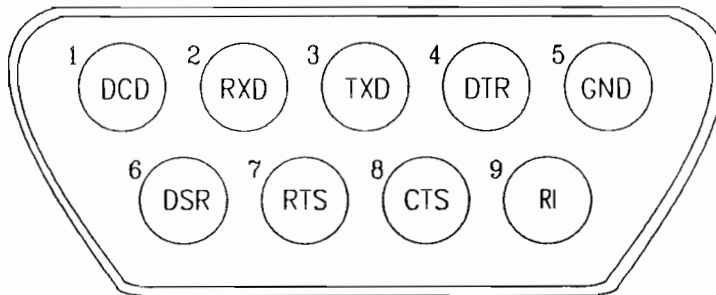


Figure 2-8. Pinout for the RS-232 Port

Connecting a Modem

To connect to a modem, use an HP 24542M cable. Set the modem so that DTR is in normal mode. Do not set DTR to ON. The hang up modem command will not work if DTR is always on.

A modem that supports CCITT V.42 is recommended.

Wiring a Direct Connection to a Host

If you make a cable that connects directly to a remote host, refer to the pinout for the serial port connector on the HP 700/RX shown in Figure 2-8. The DSR line and RI line are not used. If you are wiring the serial connector for a direct connection to the host, you may wish to consider including modem signals for signal assurance. Wiring pin 1 (DCD) will provide signal assurance from the host (or modem) and wiring pin 4 (DTR) will provide signal assurance from

the X station. Including modem controls will assure correct disconnect and cleanup of X server windows and clients over SLIP.

Connecting the Power Cords

Connect the power cords to the HP 700/RX and the monitor.



Turning On Your X Station

Note



If you do not have a ROM-based server installed, confirm that the HP 700/RX X server code has been installed on the file server before proceeding.

Turning On Your X Station: Default Operation

After the X station is assembled, connected to the LAN, and powered on, many X stations will be able to automatically begin an X session without any operator intervention. (If your X station or computer network is not set up to use the X station's default configuration, you will have to reconfigure your terminal. See "Problems You May Have at the First Power On" for help with this process.)

When the HP 700/RX X station is powered on, its default operation is to do the following:

1. Display the boot screen using video output that will work with the default monitor for your HP 700/RX model.

If your screen is unreadable, see "If your monitor is unreadable ...".

When your X station begins to boot you should see a screen similar to the following:

HP 700/RX - X Window Graphics X Station

Copyright (c) 1989, 1990 Hewlett-Packard Company Ltd. All rights reserved.

Copyright (c) 1988, The Regents of the University of California.

Copyright (c) 1988, Carnegie Mellon University.

Copyright (c) 1987, 1988 Sun Microsystems, Inc. ...

Figure 3-1. Startup Messages on the Boot Screen

2. Send out a “boot request” on the LAN. The boot request contains the X station’s hardware address (sometimes referred to as the link level address). The X station uses the boot request to ask any computer to send the X station’s network configuration parameters.

If a computer on your network runs `bootp` and if the file `/etc/bootptab` has been configured with your X station’s network configuration parameters, the `bootp` program will respond by downloading those network parameters to the X station. Otherwise, you will have to reconfigure your X station to use a ROM server (if installed) or to boot from a computer that has the X station’s server and fonts:

- If your X station has a ROM-based server, see “To boot from a ROM card ... ”.
 - If you do not have a ROM-based server and you have a “Boot failed” error message, see “To boot from a computer ... ”.
3. Send out an “xdmcp request”. The `xdmcp` request asks a computer (by default, the file server) to send the X station a login screen. It can take a minute for the login screen to appear.

If you do not see an `xdm` login screen, see “If you have no login screen ... ”.
 4. Display a login screen. If you have an account on the computer that has sent the login screen, you can login. An X session will begin automatically. See “Logging In Using `xdm`”.

Before You Turn Off the X Station

Before turning off the X station, it is a good practice to terminate all the clients to prevent stray processes from remaining on the UNIX computer. You can terminate clients (and reset your X server) by pressing

- on AT/2 and C1429A HP-HIL keyboards: **Ctrl** **Alt** **Delete**
- on 46021A HP-HIL keyboards: **Ctrl** **Shift** **Reset**
- on the LK201-layout keyboard: **Ctrl** **Shift** **F4**

Note



- If you use **x**dm, pressing the reset key-sequence will terminate only those clients on the computer that **x**dm is running on. You must manually terminate clients running on other computers.
 - If you have both a serial session and LAN session, pressing the reset key-sequence will terminate the clients of both X sessions.
-

Problems You May Have at the First Power On

If your monitor is unreadable ...

If you have a monitor other than the default, your screen may be blank or unreadable at bootup.

You can set up your monitor type immediately after the X station beeps. If you are using a ROM-based server, you have two seconds to make your selection; if a downloaded server, you have a few seconds more.

1. Refer to Table 3-1 to determine which numeric keypad key corresponds to your monitor type.
2. Turn the X station off and on again and wait for the beep.
3. To set up your monitor type, press and release the appropriate numeric keypad key.

Not all monitors work with all base units. If the X station beeps when you press a keypad key, you are trying to make a selection that is not valid for your unit.

Table 3-1. Keypad Keys for Setting Monitor Type

Keypad Key	Monitor Characteristics ¹			
	Display	Resolution	Frequency	Part Number
0	color	1280×1024	72 Hz	HP A1097A
1	color	1280×1024	60 Hz	HP 98754A, HP 98789A, HP D1187A
2	color	1024×768	75 Hz	HP A1497A
3	color	1024×768	60 Hz	HP 98785A, HP D1188A, HP 98753A
4	color	1024×768	60 Hz	HP D1195A (SVGA)
5	color	800×600	72 Hz	HP D1195A (VGA+)
6	color	640×480	60 Hz	HP D1195A (VGA)
7	monochrome ²	1280×1024	72 Hz	HP 98774A
8	monochrome ²	1024×768	60 Hz	HP 98778A

¹ Not all supported monitors work with all base units. If the X station beeps when you press a keypad key, you are trying to make a selection that is not valid for your base unit.

² If you are using a grayscale monitor on a color base unit, select monochrome. The X station will be configured as a grayscale server.

When configured as a grayscale server, the X station maps color values to 256 levels of luminosity and outputs to the green video connector. Also when a client tries to open a window, the X station will signal that it is a grayscale server, so that the client can send it a special color mapping if necessary (a simple map of color values to levels of luminosity does not always produce optimal results).

If you have a LK201-layout keyboard ...

The Cherry G80-1307 LK201-layout USASCII keyboard has been tested and found to work, but is not supported.

If you are using this keyboard, your system administrator will need to configure your terminal to operate with its keyboard by using remote configuration. Confirm with your system administrator that this was done.

If you have a non-USASCII AT/2 keyboard ...

The default keyboard language is USASCII. If you have a HP-HIL keyboard, the X station will read the language of the keyboard automatically at bootup. If you have a non-USASCII HP C1405A AT/2 keyboard, you will have to set up the keyboard or the keyboard language.

To Access the Configuration Screens ...

- if the terminal has not yet booted, just press **(F12)**
- if an `xm` login prompt is displayed on your screen, turn the terminal off and on and wait for the beep before pressing **(F12)**
- if the terminal has already booted but an `xm` login prompt is *not* being displayed, hold **(F12)** down for two seconds.

Note



(F12) indicates the key you press to access the configuration screens.

- On AT/2 keyboards (the standard keyboard) and on C1429A PC101-layout HP-HIL keyboards, this key is labelled **(F12)**.
- On 46021A HP-HIL keyboards, this refers to the fourth unlabeled key above the numeric keypad as shown in Figure 3-2.
- On the LK201-layout keyboard, this refers to the key labelled **(F3)**.

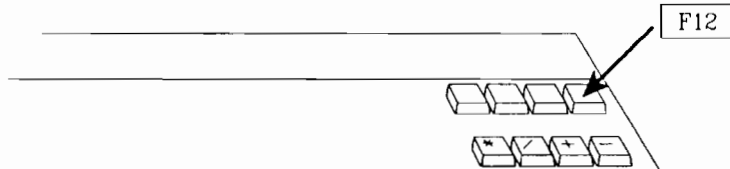


Figure 3-2. The F12 Key on the 46021A HP-HIL Keyboard

To Choose Your Keyboard Language . . .

1. On the Terminal screen, click on the AT/2 keyboard language button.
2. Select your language from the table that appears.
3. Click on **OK**
4. Click on **Save**
5. Click on **To Boot Screen**
6. Click on **Download Code**.



If you see a “Boot Failed” message ...

A “Boot failed” message indicates you will need to configure your X station before it will boot. To access the configuration screens, press **F12**.

To boot from a ROM card ...

Note



- Before you can boot from a ROM-based server, you must install the ROM-based server kit (HP part number C2725A and C2727A (English) or C2726A and C2728A (Japanese). Refer to “Installing the ROM-Based Server Kit” in Chapter 2 for installation instructions.
- To configure your X station to use SLIP, see Chapter 5.

To configure the HP 700/RX to use an optional ROM server, do the following:

1. Turn on the HP 700/RX and, when the terminal beeps, press **F12** to access the configuration screens.
2. On the Startup configuration screen, select:

Fonts ROM on, X Server from **ROM**, RGB File from **ROM**

3. Configure other parameters according to the requirements of your network.

For example:

Network Params from **Enter Below**

IP Address for your X station: _____

XDMCP **Enabled** **Broadcast** or **Direct** Host IP address: _____

(Consult your System Administrator for other settings you need.)

4. Click on **Save**.
5. Turn the terminal off and on again.

To boot from a computer ...

To configure your X station so it can boot from a computer, your system administrator will tell you which of the following parameters you need to enter:

Settings required for all networks not using bootp

Network Params from

IP Address for your X station: _____

File Server (or) IP address: _____

Fonts from , X Server from , RGB File from

XDMCP (or) Host IP address: _____

Settings that may be required for your network

Gateway IP address: _____ Route to: _____

Gateway IP address: _____ Route to: _____

Subnet Mask field: _____

Alt. File Server (or) IP address: _____

File Timeout: _____

Name Server IP address: _____

Alt. Name Server IP address: _____

Domain Name (if Name Server used): _____

Terminal Name (if NFS used): _____

Click on when you are done, then turn your X station off and on again.

Settings required to use bootp and NFS

The recommended way to give the X station its network configuration parameters is to use bootp. On Sun systems, NFS is the recommended file transfer mechanism to download the X server and fonts. However, because the X station defaults to downloading files using tftp, Sun users are likely to need to manually configure the terminal to use NFS.

If your terminal has downloaded its network parameters using bootp and you want to boot using NFS, you need only to configure the X station to use NFS:

- press **F12** to get the configuration screens
- click on **Network**
- to the right of "File Server" is a button that reads **TFTP**. Click on this button until it reads **NFS**
- click on **Save**
- click on **To Boot Screen** and then on **Download Code**.

Logging In Using xdm

If, after a minute, you see a login window, this indicates that `xdm` is being used. If you have an account on the computer running `xdm`, you can login normally. `xdm` will take care of the login process. It checks the password file, selects a system shell, sets up your environment, and starts clients automatically.

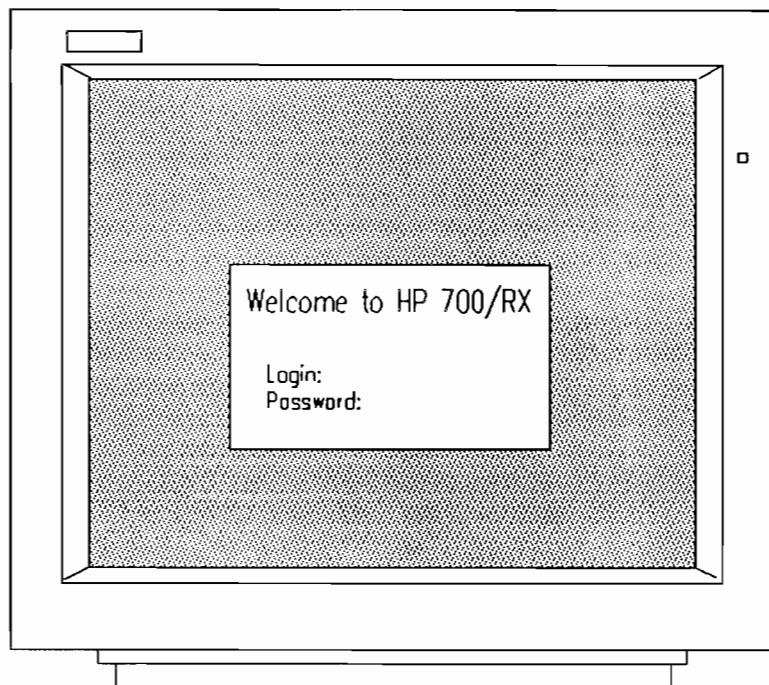


Figure 3-3. HP 700/RX xdm Login Prompt

If you have a Select Session Manager screen . . .

If you see a Select Session Manager screen, this indicates that your X station is configured to send an `xmcp` broadcast at power up. The computers that are willing to provide an X session to your X station are listed in the window along with their load levels from the past one, five, and fifteen minutes. Highlight the host you want to run your clients on, then click on **OK**. If you have an account on the computer, you can log into a normal `xdm` session.

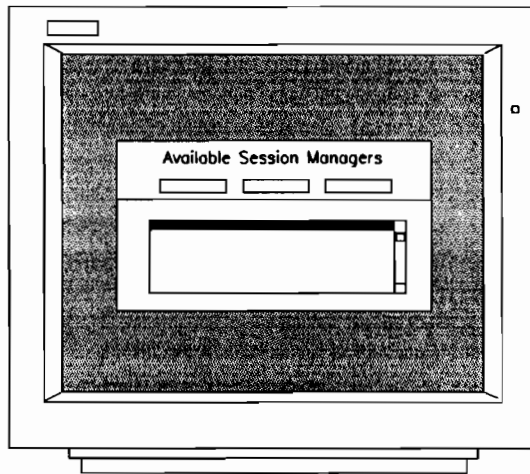


Figure 3-4. Select Session Manager Screen

How xdm Controls Clients

`xdm` automatically runs the `.xsession` script in the your home directory to start the window manager and clients. If `.xsession` is not found, `xdm` defaults to `/usr/lib/X11/xdm/sys.xsession`. The default `.xsession` starts a window manager, a client such as `xload`, and a terminal emulator (for example, `hpterm`). Error messages from clients, if any, will be put in the `.xsessionlog` file in your home directory.

You should copy `/usr/lib/X11/xdm/sys.xsession` to your home directory as `.xsession` so you will be able to edit it to control the clients that start automatically when you login.

`xdm` also downloads a resource file to the X server. This will be `.Xdefaults.700x`, if present in your home directory. Otherwise it will download `.Xdefaults`, or, if that is not found, `/usr/lib/X11/sys.Xdefaults`. The resource file sets up the fonts and colors used by clients and, once downloaded, remains in effect until the X station is restarted or the server resets.

`xdm` logs you out when `.xsession` runs to completion. The foreground task (that is, the client startup command that does not end with an `&`) is assumed to be the end of the startup script. Therefore when you close the foreground task, a terminal emulator (for example, `hpterm`) in the default `.xsession` script, `xdm` logs you out.

Logging Out from xdm

To log out from `xdm`, close the foreground task. If the foreground task is a terminal emulator (which is the default), you can simply type `exit`.

If you have no login screen ...

If, after a minute, an **x** on a gray background continues to be displayed on your screen, this indicates that **xm** is *not* being used.

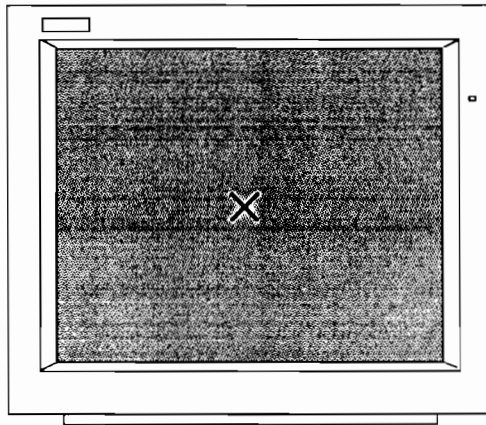


Figure 3-5. The x on a Gray Background

To open a connection to the UNIX computer you will have to use TELNET. Perform the following steps.

1. Go to the configuration screens by holding **(F12)** down for 2 seconds.
 - a. go to the Startup configuration screen
 - b. disable XDMCP
 - c. enable TELNET Autostart
 - d. enter the TELNET host's IP address
 - e. click on the **(Save)** button
 - f. click on **(To X Server)** to return to the server screen.
2. click on the **(Save and Reset)** button on the popup window. A TELNET window will appear.
3. Login normally. If prompted for a terminal type, enter vt100.

So that clients will be able to output to your screen, you should enter one of the following UNIX commands:

If you are running the Bourne shell or the Korn shell (which give a \$ command-line prompt), then enter a command similar to the following:

```
DISPLAY=75.4.11.128:0.0 ; export DISPLAY
```

If you are running the C shell (which gives a % command-line prompt), then enter a command similar to the following:

```
setenv DISPLAY 75.4.11.128:0.0
```

In both cases replace *75.4.11.128* with the IP address of your X station.

4. Your system administrator will explain how you are to start your clients. Typically you would copy the startup script `/usr/lib/X11/700X/examples/x11start.700x` to your home directory so you will be able to edit this script to control the clients it starts. If you have done this, type

```
x11start.700x
```

5. Click on **To X Server** to enter X server mode and display your clients.

Note



Clients won't be able to start until you enter X server mode and they may time out if you wait too long.

Logging Out from a TELNET-Initiated Session

To log out from TELNET, close all connections by pressing

- on AT/2 and C1429A HP-HIL keyboards: **Ctrl** **Alt** **Delete**
- on 46021A HP-HIL keyboards: **Ctrl** **Shift** **Reset**
- on the LK201-layout keyboard: **Ctrl** **Shift** **F4**

This will return you to the TELNET screen where you can type **exit** or use the **Disconnect** button.

Setting up Your X Station to Work with Your Clients

If you have a printer ...

If you are connecting a printer, plotter, or other serial device to your RS-232 port, you will have to know what values to set the port's communications parameters to. You will be able to determine these from the manual that comes with your serial device. Check that your system administrator has configured the UNIX computer to let you use the X station's serial port (details are given in the *System Administrator's Guide for the HP 700/RX*).

Using the C1405A AT/2 Keyboard with HP Clients

If you are primarily running HP clients, we recommend that you use a 46021A HP-HIL keyboard. However, by uncommenting the line

```
#xmodmap /usr/lib/X11/700X/hpemulation
```

in the startup script (`.xsession` or `x11start.700x`) you can set up your C1405A AT/2 keyboard so that keys are re-mapped to provide the missing functions required by HP clients. Refer to Table 3-2.

Table 3-2. HP 46021A HP-HIL Keyboard Emulation on AT/2

HP-HIL Keys	Emulation on AT/2	HP-HIL Keys	Emulation on AT/2
Stop	Scroll Lock	System	(Alt)+Numkpd (/)
Reset/Break	Pause/Break	Enter	(Shift)+Numkpd (-)
Delete Char	Delete	Select	(Alt)+Numkpd (-)
(Shift)+Delete line	(Shift)+Delete	Clear line	(Alt)+Numkpd (+)
Delete line	(Alt)+End	(Shift)+Clear line	(Shift)+Numkpd (*)
Insert Char	Insert	Clear display	(Alt)+Numkpd (*)
(Shift)+Insert line	(Shift)+Insert	f1 ... f8	F1 ... F8
Insert line	(Alt)+Home	Blank 1 ... Blank 4	F9 ... F12
Menu	(Alt)+Num Lock	Numkpd Enter	Numkpd Enter
(Shift)+Menu	(Shift)+Num Lock	Numkpd Tab	
User	(Shift)+Numkpd (/)	right Extend Char	right (Alt)



Starting Clients on an HP Host

By following the instructions in Chapter 3 you started an X windows session and are now running a few clients. By default these clients will be `xclock`, `xload`, a terminal emulator and a window manager.

This chapter describes

- how to start new clients using command lines entered from a terminal emulator window.

You will learn

- how to specify your clients' colors and fonts
- how to size and position the window in which the client appears.

- how to use a window manager.

The commands you use to start clients from a command line can be put into your window manager, which enables you to start a client by clicking a mouse button.

- how to modify your startup script to start the clients you want.

If you are using `xdm`, the clients you are running now were started with a startup script. This section will show you how to modify this script so the clients you want start automatically when you power on your X station.

- how to solve client startup problems.

Controlling a Client's Appearance

Specifying a Client's Font

To specify the 8x13 font for an `hpterm` window, type the following line from an existing `hpterm` window:

```
hpterm -fn 8x13 &
```

Specifying a Client's Color

`xclock` is a client in `/usr/bin/X11` that displays a clock. Its foreground and background colors can be specified in its command line. Enter the following line from the `hpterm` window:

```
xclock -fg White -bg LightSteelBlue &
```

(If you would prefer other colors, the color names you can use are contained in `/usr/tftpd/usr/lib/X11/700X/rgb.txt`)

If you have typed in the last two examples as given, the `xclock` and `hpterm` have overlapped. After invoking a window manager, for example, by typing `mwm &`

you can move the clients so they no longer overlap and you can resize windows.

Alternatively, you can use the information in the next section to locate and size windows when the client is started. This is especially important if a client does not work well after being resized—which occurs with terminal emulators such as `hpterm`.

Positioning and Sizing Windows

The `-geometry Width×Height±column±row` option specifies the size and location of a new window. The size, `Width×Height`, is in characters by lines for terminal windows, and in pixels for others. The location, `±column±row`, is in pixels and depends on the resolution of the screen. Plus values (+) start at the upper left corner and proceed to the right and down. Minus values (−) start at the lower right corner and proceed to the left and up.

Positioning an 80×24 Window.

To position a window here ...

Use ...

The upper left corner of the root window. `-geometry +1+1`

The lower left corner of the root window. `-geometry +1-1`

The upper right corner of the root window. `-geometry -1+1`

The lower right corner of the root window. `-geometry -1-1`

Using the Window Manager to Position Windows

Window managers that have title bars (such as `mwm` and `hpwm`) enable you to move windows. Put the mouse cursor on the title bar, press and hold the left mouse button, then drag the window to the desired location. When you use a window manager to move a window in this way, a small pop-up window in the middle of your screen will report the position of the upper-left corner of the window being moved. You can use this position information when you start clients, particularly when you start clients from a startup script. Refer to “Example: Customizing `mwm`”.

Summary of Command-Line Options for Clients

The following table lists some of the options that affect the appearance and behavior of four popular X11 clients.

Options for Popular X11 Clients

Option Descriptions		X11 Clients			
To change this ...	Use this option ...	hp ^{term}	x ^{term}	x ^{clock}	x ^{load}
Cursor color	<code>-cr color</code>	✓	✓		
Client in window	<code>-e command</code>	✓	✓		
Run login shell	<code>-ls</code>	✓	✓		
Location	<code>-geometry W×H±col±row</code>	✓	✓	✓	✓
Name of an icon and window*	<code>-n name</code>	✓	✓	✓	✓
Name of a window*	<code>-title name</code>	✓	✓	✓	✓
Hostname as window name*	<code>-title 'hostname'</code>	✓	✓	✓	✓
Destination of display	<code>-display hostname:0</code>	✓	✓	✓	✓
Foreground color	<code>-fg color</code>	✓	✓	✓	✓
Background color	<code>-bg color</code>	✓	✓	✓	✓
Pointer color	<code>-ms color</code>	✓	✓	✓	✓
Font selection	<code>-fn font</code>	✓	✓	✓	✓
Update interval	<code>-update number</code>			✓	✓
Clock hands color	<code>-hd color</code>			✓	
Hand edge color	<code>-hl color</code>			✓	
Type of clock	<code>-analog or digital</code>			✓	
*Works only with window managers that provide title bars, such as <code>mwm</code> .					

Using a Window Manager

A window manager is a client that enables you to change the size and placement of windows on the root window. The window manager usually includes a menu for the root window.

The window manager defaults are found in the *system.*wmrc* file (for example *system.mwmrc*) in */usr/lib/X11* on the computer, unless there is a *.*wmrc* file in your home directory.

Example: Customizing mwm

To customize *mwm*, copy the */usr/lib/X11/system.mwmrc* file to *.mwmrc* in your home directory, then edit it to customize the window manager.

For example, you may want to be able to start a client easily, but not automatically when the server is started. The solution is to edit the *.mwmrc* file in your home directory to add a selection to the root menu.

Note



When you copy *system.mwmrc* to your home directory, open the newly created *.mwmrc* file and add a *-ls* option to the line that opens a new window, as follows:

```
"New Window"      f.exec "hpterm -ls &"
```

The *-ls* option indicates that the new *hpterm* will come up in a login shell, so that environment variables, such as the *PATH* variable, will be re-established.

Adding a Selection to Your Root Menu

When the mouse pointer is in the root window, you can call up the root menu by pressing *and holding* the left mouse button.

Follow these steps to add an electronic mail selection to your root menu.

1. Add the following line to the file *.mwmrc*:

```
"Read/Send Mail" f.exec "hpterm -geometry 80x24+1+1 -e mailx &"
```

2. Save the changed file.

3. Restart **mwm** by pressing *and holding* the left mouse button while the pointer is over the root window, then dragging the pointer down the menu until the “Restart” selection is highlighted. Release the left mouse button.

When **mwm** is completely restarted, you will see the changes when the root menu is displayed again. If you select the new item, you will create a window and start the **mailx** electronic mail program in it. The window will be 80 characters wide, 24 lines long, and in the upper-left corner of the root window.

Setting Default Colors and Fonts. To begin, copy
`/usr/lib/X11/sys.Xdefaults` to your home directory as `.Xdefaults`

- To give **xclock** the default colors of a white foreground and a light steel blue background, scroll down to the “Client Colors and Operational Defaults” portion of `.Xdefaults` and make the following changes:

```
XClock*foreground: White
XClock*background: LightSteelBlue
```

To view the results of your edit, type

```
xrdb .Xdefaults
xclock &
```

`xrdb` downloads the edited `.Xdefaults` file without restarting the X station.

- **hpterm** is a terminal emulator. To make **6x10r2** the default font for **hpterm** windows, put the following line in the `.Xdefaults` file:

```
XTERM*Font: 6x10r2
```

To download the `.Xdefaults` file to the X server, type

```
xrdb .Xdefaults
```

Customizing the Startup Script

The default xdm startup script is `/usr/lib/X11/xdm/sys.xsession`. However, you can copy `sys.xsession` into your home directory as `.xsession` and edit it according to the instructions that follow. (If you login using TELNET, these instructions also apply if you copy `/usr/lib/X11/hpvt/examples/x11start.700x` to your home directory as `x11start.700x`)

To learn about the command line options available for clients, see “Summary of Command-Line Options for Clients”.



Adding a Client

Follow these steps to add a digital clock to the startup script:

1. Open `.xsession`
2. Scroll down or search for two lines similar to the following:

```
# Add client commands below, one command per line.  
# End each command line with an ampersand (&).
```
3. Beginning on the line below these, insert the following line:

```
xclock -digital -update 1 -geometry 160x35+1-1 &
```

Note



The ampersand (&) at the end of the line runs the client as a background process and allows other clients to be started from this login session.

4. Save the file and exit from your text editor.

Now when you start the startup script, a digital clock will be displayed, 160×35 pixels in size, located in the bottom-left corner of the screen.

Solving Client Startup Problems

Common problems encountered with X clients are

- **DISPLAY variable not set.** If you log into a computer using TELNET, you must set the **DISPLAY** variable to the X station's *ip_address*:0.0 (use **DISPLAY=*ip_address*:0.0 ; export DISPLAY** for Korn or Bourne shell or **setenv DISPLAY *ip_address*:0.0** for C shell.)
- **bad file path.** If clients don't start, check your path on the computer. Your path must include **/usr/bin/X11** and other directories where you have X clients. Also, **/usr/bin/X11** must precede **/usr/bin** in your path so that the computer will search for X11 files before it searches for X10 files.

A client may also hang or quit if it requests fonts that are not in the font search path of the X server. Use **xset** to change the X server's font path.

To list the current font path, type **xset q** The font path can be changed with the commands **xset fp+** (which adds a directory to the path) and **xset fp-** (which deletes a directory from the path). The command syntax is **xset fp[+|-] *path1,path2*, ...**

where *path* is the path to a font directory. Commas separate the paths.

You can make changes to the font path by typing the **xset** command line. However, because the changes made by typing in a command line will stay in effect only until the X server is reset, the font path will typically be set in the your startup script (typically **.xsession**) in lines similar to the following:

```
FONT=/usr/lib/X11/700X/fonts
xset fp+ $FONT/iso_8859.1/75dpi,$FONT/r2
```

If you specify an incorrect font path, the X server will produce an "out-of-range" error.

- **insufficient memory.** You can tell if you need more memory if low-memory warnings pop up on your screen.

If backing store is on, you should be able to free up some memory by going to the Preferences screen (press **F12** for two seconds) and clicking on the **Backing Store** button until it reads **By Application** or **Disabled**. Click on **Save** and then power your X station on and off.

You can also add more DRAM to your IIP 700/RX by following the procedure given in Chapter 2.

Starting Clients on a Sun Host

By following the instructions in Chapter 3 you started an X windows session and are now running a few clients. By default these clients will be a non-console version `cmdtool` window, an `xterm` window, a File Manager window and a Performance Meter window. The window manager is `olwm`.

This chapter describes

- how to start new clients using commands entered from a terminal emulator window.

You will learn

- ☐ how to specify your clients' colors and fonts
- ☐ how to size and position the window in which the client appears.
- how to use a window manager.

The commands you use to start clients from a command line can be put into your window manager, which enables you to start a client by clicking a mouse button.

- how to modify your startup script to start the clients you want.

If you are using `xdm`, the clients you are running now were started with a startup script. This section will show you how to modify this script so the clients you want start automatically when you power on your X station.

- how to map the `Lx` keys to the HP 700/RX's keyboard
- how to compose national language characters
- how to solve client startup problems.

Controlling a Client's Appearance

Specifying a Client's Font

You can start a client with a specific font from the command line of an existing `cmdtool` window by using the `-fn` option. For example, to specify the **8x13** font for a `cmdtool` window, type the following line from an existing `cmdtool` window:

```
cmdtool -fn 8x13 &
```

To view the fonts that are available to you, type

```
xlsfonts | more
```

in the `cmdtool` window.

Note



The ampersand (&) at the end of the line runs the client as a background process and allows other clients to be started from the command line.

Specifying a Client's Color

A client's foreground and background colors can be specified in the command line. Entering the following line will open a `cmdtool` window with white text on a light-steel-blue background.

```
cmdtool -fg White -bg LightSteelBlue &
```

(If you would prefer other colors, the color names you can use are contained in `/usr/lib/X11/700X/rgb.txt`)

Positioning and Sizing Windows

The `-geometry Width×Height±column±row` option specifies the size and location of a new window. The size, `Width×Height`, is in characters by lines for terminal windows, and in pixels for others. The location, `±column±row`, is in pixels and depends on the resolution of the screen. Plus values (+) start at the upper left corner and proceed to the right and down. Minus values (-) start at the lower right corner and proceed to the left and up.

Positioning a Window.

To position a window here ...

Use ...

The upper left corner of the root window. `-geometry +1+1`

The lower left corner of the root window. `-geometry +1-1`

The upper right corner of the root window. `-geometry -1+1`

The lower right corner of the root window. `-geometry -1-1`

Summary of Command-Line Options for Clients

The following table lists some of the options that affect the appearance and behavior of `cmdtool` and `xterm` windows.

Options for X11 Clients

Option Descriptions	
To change this ...	Use this option ...
Location	<code>-geometry <i>W</i> × <i>H</i> ± <i>col</i> ± <i>row</i></code>
Name of a window	<code>-title <i>name</i></code>
Hostname as window name	<code>-title '<i>hostname</i>'</code>
Foreground color	<code>-fg <i>color</i></code>
Background color	<code>-bg <i>color</i></code>
Font selection	<code>-fn <i>font</i></code>

Using a Window Manager

`olwm` (OPEN LOOK window manager for OpenWindows) is a client that enables you to

- manipulate windows (change the size and placement) on the root window
- invoke applications from the Workspace (root) Menu
- view and customize the OpenWindows environment settings.

Manipulating Windows

`olwm` uses a three-button mouse to manipulate windows. The left mouse button, referred to as SELECT, selects and drags objects. If the pointer is on the window title bar or border, clicking the left mouse button and dragging the mouse will move the window. Clicking and dragging on the window corners will resize the window.

The middle button, referred to as ADJUST, toggles the selected state of objects (windows and icons). It allows you to select more than one object to move or resize.

The right button, referred to as MENU, brings up a pop-up menu appropriate for the object under the pointer.

`olwm` and the Workspace (Root) Menu

`olwm` has a Workspace (root) Menu that allows you to start a client more easily than from the command line, but not automatically when the server is started. Pressing the right mouse button over the workspace brings up the Workspace Menu. This menu is customizable, but typically contains four entries:

- Programs
- Utilities
- Properties
- Exit

The default Programs sub-menu contains all of the OpenWindows Deskset programs. To view programs in the sub-menu click and hold the right (MENU) button on “Programs ...”, and move the pointer to the right. The sub-menu

will appear. Move the pointer to the appropriate program and release the button.

To add your own applications to the Programs sub-menu, copy the system default file (`$OPENWINHOME/lib/openwin-menu`) to a file named `.openwin-menu` in your home directory and edit it accordingly.

Example: Customizing the cmdtool program

Follow these steps to customize the cmdtool program in your root menu.

1. Edit the cmdtool line in the `.openwin-menu` file.

```
"New Window ... " DEFAULT exec $OPENWINHOME/bin/xview/cmdtool -bg  
Magenta -title New_Window
```

2. Save the changed file.

3. Restart olwm.

When `olwm` is completely restarted, you will see the changes when the root menu is displayed again. "Command Tool ..." will be replaced with "New Window ...". If you select the new item, you will create a `cmdtool` window with the title "New_Window" and a pink background.



Customizing the OpenWindows Environment Settings

To customize the OpenWindows Environment settings, click with the right button on the root window, move the pointer to "Properties", and release the button. The workspace properties window will appear. Click with the right mouse button on the arrow beside "Category" to view the sub-menu.

You can change

- the color of your workspace and window borders
- the positions of the icons
- the function of the middle (SELECT) mouse button with menus
- how a window is activated (by either moving or clicking the mouse)
- various mouse settings.

Changes that you make to workspace properties are stored in the `.Xdefaults` file in your home directory.

Some of the OpenWindows Deskset programs also have “Properties” sub-menus. For example, if you click the right mouse button in the clock window, you can choose the clock face type and certain display options. Properties for OpenWindows Deskset programs are stored in `.namerc` files in your home directory. For example,

<code>.clockrc</code>	is the clock properties file
<code>.filemgrrc</code>	is the file manager properties file

Using xdm to Control Clients

`xdm` automatically runs the `.xsession` script in the user’s home directory to start the window manager and clients. If `.xsession` is not found, `xdm` defaults to `/top/usr/lib/X11/xdm/sys.xsession`. The default `.xsession` will start `olwm`, a non-console version of `cmdtool`, `filemgr`, `xterm` and `perfometer`. Error messages from clients, if any, will be put in the `.xsessionlog` file in the user’s home directory.

`xdm` also downloads a resource file to the X server. This will be `.Xdefaults.700x`, if present in the user’s home directory. Otherwise it will download `.Xdefaults`, or, if that is not found, `/top/usr/lib/X11/sys.Xdefaults`. The resource file sets up the fonts and colors used by clients and, once downloaded, remains in effect until the X station is rebooted or the server resets. Sample `Xdefaults` files for various types of monitors can be found in `/top/usr/lib/X11/700X/examples`. To download a new resource file without restarting the X station, use `xrdb .Xdefaults`.

`xdm` logs out the user when `.xsession` runs to completion. The foreground task, that is, the first client that does not have an ampersand at the end of its command line, is the last client started by the startup script. Therefore when the user closes the foreground task, `cmdtool` in the default `.xsession` script, `xdm` logs the user out.

Customizing the xdm Startup Script

The default xdm startup script is `/top/usr/lib/X11/xdm/sys.xsession`. However, you can copy `sys.xsession` into your home directory as `.xsession` and edit it according to the instructions that follow. (If you login using TELNET, these instructions also apply if you copy `/top/usr/lib/X11/700X/examples/x11start.700x` to your home directory as `x11start.700x`)

Adding a Client

Follow these steps to add a digital clock to the startup script:

1. Open `.xsession` with an editor.
2. Scroll down or search for two lines similar to the following:

```
# Add client commands below, one command per line.  
# End each command line with an ampersand (&).
```

3. Beginning on the line below these, insert the following line:

```
clock -digital -update 1 -geometry 160x35+1-1 &
```

Note



The ampersand (&) at the end of the line runs the client as a background process and allows other clients to be started from this login session.

4. Save the file and exit from your text editor.

Now when you start the startup script, a digital clock will be displayed, 160×35 pixels in size, located in the bottom-left corner of the screen.

Mapping Lx Keys to the HP 700/RX's Keyboard

To map the “L” keys’ functionality to the HP 700/RX keyboard, copy `/top/usr/lib/X11/xdm/sys.Xsession` to `.xsession` in your user’s home directory, then uncomment the following lines:

```
# xmodmap -e 'keysym F1 = L1'
# xmodmap -e 'keysym F2 = L2'
# xmodmap -e 'keysym F3 = L3'
# xmodmap -e 'keysym F4 = L4'
# xmodmap -e 'keysym F6 = L6'
# xmodmap -e 'keysym F8 = L8'
# xmodmap -e 'keysym F9 = L9'
# xmodmap -e 'keysym F10 = L10'
# xmodmap -e 'keysym F11 = Help'
```

Using olwm with the HP 700/RX's Keyboard

If you do not want to map all of the L-key functionality to the AT/2 keyboard’s F-keys, you may still want to map the four Sun keyboard “L-keys” `olwm` uses to control window functions. These are:

- **Ctrl****L2** locks the colormap focus
- **Ctrl****L4** unlocks the colormap focus
- **L5** raises a window to the top of the window stack
- **L7** is a toggle that iconifies or opens a window.

To map this functionality to the HP 700/RX keyboard, copy `/top/usr/lib/X11/700X/examples/Xdefaults.sun` to `.Xdefaults` in your user’s home directory. `Xdefaults.sun` maps these operations to the HP 700/RX keyboard’s function keys with the following lines:

```
!***** map olwm keys to HP 700/RX keyboard *****
OpenWindows.ColorLockKey:      Control F2
OpenWindows.ColorUnlockKey:    Control F4
OpenWindows.FrontKey:         F5
OpenWindows.OpenKey:          F7
!*****          end of olwm key mapping          *****
```

Note

Refer to the `olwm` man pages for other modifications you may want to make to the `.Xdefaults` file.

To Compose National Language Characters

National language characters are 8-bit characters. If you are using an AT/2 keyboard and you want to activate national language characters that are on your keyboard, then you will have to set the character type.

If you want to use the compose characters, then you will have to set your character type and assign the compose function to a particular key. After you reset the HP 700/RX, the combination of the COMPOSE-key and the correct keying sequences will generate 8-bit characters for your Xclients. The keying sequences are documented in the SunOS documentation “System Services Overview”, Appendix C.

Note

Backtab (**(Shift+Tab)**) and certain accents (acute, grave, asciicircum, diaeresis, and asciitilde) will not work. If you intend to use these character symbols, see “If 8-bit Characters Will Not Work....”.

To Set the Character Type

For applications to access the 8-bit Latin-1 character set (ISO 8859.1) on the host machine, add the following two lines to the `.cshrc` file in the user's home directory:

```
setenv LC_CTYPE iso_8859_1
stty pass8
```

To Assign the COMPOSE-key

Edit the `.xsession` file in the user's home directory to assign the compose function (called Multi-key) to a particular key. For example, to assign the COMPOSE-key to **F11**, use

```
xmodmap -e "keysym F11 = Multi_key"
```

If 8-bit Characters Will Not Work....

If you intend to use backtab (**Shift**+**Tab**) or any of these accents: acute, grave, asciicircum, diaeresis, or asciitilde, then you must substitute HP-specific keysyms with standard keysyms that your clients will recognize, by re-mapping certain keys on your keyboard.

The recommended procedure is to re-map on the command line and record the re-map commands. After you are sure that everything works, make the re-map commands permanent by adding them to the `.xsession` file in the user's home directory.

1. Identify the HP-specific keysym value (a hexadecimal number) that corresponds with the standard keysym name that you intend to use.

Keysym Name	Keysym Value
tab	0x1000FF74
acute	0x100000a8
grave	0x100000a9
asciicircum	0x100000aa
diaeresis	0x100000ab
asciitilde	0x100000ac

2. Look at the current mapping. Type
`$OPENWINHOME xmodmap -pk | fgrep Keysym_Value`
(You can view the full keyboard mapping by typing `xmodmap -pk | more`)

3. Re-map the symbol. Type
`xmodmap -e "keycode keycode = keysym1 keysym2 keysym3 keysym4"`

For example, if the current mapping is

```

53 0x0074 (t) 0x0054 (T) 0x100000a9 (no name) 0x100000a9 (no name)
54 0x0072 (r) 0x0052 (R) 0x100000a8 (no name) 0x100000a8 (no name)

```

where the keycode (53 or 54) is followed by the four keysyms,

- the 1st keysym is the value produced by pressing the key
- the 2nd keysym is the value produced with **Shift**+**key**
- the 3rd keysym is the value produced with **Alt**+**key**
- the 4th keysym is the value produced with **Shift**+**Alt**+**key**

and each keysym column contains the keysym value and the keysym name.

If you intend to use accent grave, the re-map command in this example is

```
xmodmap -e "keycode 53 = t T grave"
```

If you intend to use accent acute, the re-map command in this example is

```
xmodmap -e "keycode 53 = r R acute"
```

4. Add the re-map command(s) to the `.xsession` file in the user's home directory. Reset the HP 700/RX to use the new mappings.

Solving Client Startup Problems

Common problems encountered with X clients are

- **DISPLAY** variable not set. If you log into a computer using TELNET, you must set the **DISPLAY** variable to the X station's `ip_address:0.0` (use `DISPLAY=ip_address:0.0 ; export DISPLAY` for Korn or Bourne shell or `setenv DISPLAY ip_address:0.0` for C shell.)
- **bad file path.** If clients don't start, check your path on the computer. Your path should include `/usr/openwin/bin`, `/usr/openwin/bin/xview`, `/usr/bin/X11`, and other directories where you have X clients. If `/usr/bin` is in your path, the previous directories should precede it.

A client may also hang or quit if it requests fonts that are not in the font search path of the X server. To see the current font path, look on the Startup configuration screen.

The font path can be changed with the commands **xset fp+** (which adds a directory to the path) and **xset fp-** (which deletes a directory from the path). The command syntax is

```
xset fp[+|-] path1,path2, ...
```

where *path* is the path to a font directory. Commas separate the paths.

You can make changes to the font path by typing the **xset** command line. However, because the changes made by typing in a command line will stay in effect only until the X server is reset, the font path will typically be set in the your startup script (typically **.xsession**) in lines similar to the following:

```
FONT=/usr/lib/X11/700X/fonts
```

```
xset fp+ $FONT/iso_8859.1/75dpi,$FONT/r2
```

If you specify an incorrect font path, the X server will produce an “out-of-range” error.

- insufficient memory. You can tell if you need more memory if low-memory warnings pop up on your screen.

If backing store is on, you should be able to free up some memory by going to the Preferences screen (press **F12** for two seconds) and clicking on the **Backing Store** button until it reads **By Application** or **Disabled**. Click on **Save** and then power your X station on and off.

You can also add more DRAM to your HP 700/RX by following the procedure given in Chapter 2.



Using the Serial Session Screen and SLIP

Note



Before you can use SLIP, you need to be connected to a host computer (directly or through a modem) as described in Chapter 2 and your system administrator needs to configure files on the host computer. These files are:

- on HP-UX systems, `usr/lib/ppl/ppl.users` and `usr/lib/ppl/ppl.remotes`
- on Sun systems, `/etc/hosts.slip` (this is not required for CSLIP).

The Serial Line Interface Protocol (SLIP) and the Compressed Serial Line Interface Protocol (CSLIP) make it possible for you to use the HP 700/RX's serial port to communicate with a host computer. You can use SLIP either as your sole connection to the host (if you have a ROM-based server installed) or as a remote connection for a single window.

To configure the X station for a serial session, do the following:

- Configure the HP 700/RX with SLIP network parameters.
- Load the X server from the ROM card (or use SLIP only after the X station has loaded its X server from the LAN).
- Use the Serial Session screen to log into the host computer and begin the SLIP session.
- Run clients by logging into the host computer through TELNET or XDM.
- End the session by terminating the clients and disconnecting from the host.

Configuring an HP 700/RX for a Serial Session and SLIP

To configure the X station for a Serial Session and SLIP, do the following:

1. Press and hold **F12** to access the configuration screens.
2. Click on **Network** to go to the Network configuration screen.
3. Click on **Configure SLIP**, then enter the serial line network information:
 - **SLIP Local IP** the HP 700/RX serial-line IP address: _____
 - **SLIP Remote IP** the host serial-line IP address: _____
 - **SLIP Subnet Mask** the serial-line subnet mask: _____
 - If desired, enable **Compression (CSLIP)**.
 - Click on **OK**.
4. Click on **Terminal** to go to the Terminal configuration screen.
5. Set the serial port so that it works with the modem or with the serial-line direct connection.

Note



Not all serial port parameters are configurable with SLIP:

- the data bits setting is always **8**
- the parity setting is always **None**
- the flow control used will be **None** if **XON/XOFF** is set, otherwise the configured setting will be used.

-
6. Set **Serial Port Use For** to **Serial Session** so you can type to the serial port; for example, to dial out.
 7. Click on **OK**.
 8. Click on **Serial**.
 9. Click on **Options**.
 10. Configure the serial line operations to work with the host computer:
 - **New Line** (enabled ☐ or disabled ☐)
 - **Auto Wrap** (enabled ☐ or disabled ☐)
 - **Local Echo** (enabled ☐ or disabled ☐)
 - **Character Set** (**USASCII** ☐, **HP Roman-8** ☐, or **ISO Latin-1** ☐)
 - **Numeric Keypad** (**Numeric** ☐ or **Application** ☐)
 - **Cursor Keys** (**Normal** ☐ or **Application** ☐)
 - **Backspace Key** (**Backspace** ☐ or **Delete** ☐)
 11. Click on **OK**.

Running a SLIP Session

Load the X Server and Fonts Before Using SLIP

The HP 700/RX's X server code and fonts cannot be downloaded over the serial line. Consequently you will want to load the X server from a ROM card or from the LAN before you use SLIP.

"Installing the ROM-Based Server Kit" in Chapter 2 describes how to install the optional ROM-based server kit and "To boot from a ROM card ..." in Chapter 3 describes configuring the HP 700/RX to use a ROM card.

Connecting to the SLIP Host Computer

You can use SLIP on a direct line to the host computer or through a modem. From a configuration screen, click on **Serial** to go to the Serial Session screen. If **Serial Session** is not enabled, click on it now.

Using the Serial Session Screen

When the Serial Session screen is displayed and **Serial Session** is enabled, the characters you type are sent to the serial port. Typically this would be used to dial a modem and start a SLIP session.

To Establish a Connection Through a Modem ...

If you have a modem, type a dial-out command as described in the documentation that came with your modem. Typically, this will be similar to

```
ATDT 555-1234
```

When You Have a Connection ...

1. Login normally. If prompted for your terminal type, respond **vt100**
2. Once you have logged in, start SLIP on the host:

- On HP-UX systems, type **ppl** to start SLIP.

If you have not been set up in **ppl.users** on the host computer, type **ppl** and the HP 700/RX serial-line IP address. For example:

```
ppl 192.81.1.3
```

- On Sun systems, you start SLIP sessions and CSLIP sessions differently:

- ☐ If you are using SLIP, type **sliplogin**

- ☐ If you are using CSLIP and your connection is on **dev/ttya**, type
slattach ttya host_ip_address X_station_address

(You must have enabled CSLIP on the Network configuration screen's **Configure SLIP** menu.)

3. Click on **SLIP**.

Starting Your X Session

You can use either `xdm` or TELNET to start your serial-line X session, just as you can for an ethernet-based X session.

Typically you would use `xdm` for ethernet-based X session because it is so easy to use—you log into the host and the `.xsession` startup script runs automatically. However, as an ethernet user you can have a startup script that uses many resources (multiple terminal emulators, `mwm`, and numerous X clients). Rather than attempt to start such a time-consuming X session over a serial line, you may prefer to use TELNET for a serial-line X session. By using TELNET, you can either start clients individually or create a startup script that runs a limited number of clients.

To Use TELNET with SLIP

In order to use TELNET to begin an X session over the serial line, do the following:

1. Access your configuration screens by clicking on **To Config** or by pressing **F12**, as appropriate.
2. Click on **TELNET**.
3. Type in the IP address of the TELNET host.
4. Click on **Execute TELNET**.
5. Login normally; if asked for your terminal type, respond
`vt100`
6. Before you can access clients, you must use one of the following command lines to set the DISPLAY environment for your X station (substitute the *serial line* IP address of your X station in place of `192.81.1.3`)
 - If you use Korn or Bourne shell:
`DISPLAY=192.81.1.3:0.0 ; export DISPLAY`
 - If you use C shell:
`setenv DISPLAY 192.81.1.3:0.0`
7. Start your clients.
8. Click on **To X Server**.

Ending the SLIP Session

To end the SLIP session, do the following:

1. Terminate your serial port's clients.

Note



If you choose to reset the HP 700/RX, you will terminate both the clients on the serial connection and those on the LAN (if any).

2. Terminate the serial session on the host.
3. Hang up the modem by going to the Serial Session screen and clicking on **Disconnect** and **OK**.

Note



Disconnect and **Hangup Modem** (on the Terminal screen) attempt to hang up the modem by dropping DTR for three seconds. This requires a modem that uses pin 20. If these buttons do not work with your modem, turn the modem off and on.

A

Using the Configuration Screens

How you access the configuration screens depends on whether the X server has been downloaded and what type of keyboard you have:

- if the terminal has not yet booted, just press **F12**
- if an `xm` login prompt is displayed on your screen, turn the terminal off and on and wait for the beep before pressing **F12**
- if the terminal has already booted but an `xm` login prompt is *not* being displayed, hold **F12** down for two seconds.

Note



F12 Indicates the key you press to access the configuration screens.

- On AT/2 keyboards (the standard keyboard) and on C1429A PC101-layout HP-HIL keyboards, this key is labelled **F12**.
- On 46021A HP-HIL keyboards, this refers to the fourth unlabeled key above the numeric keypad as shown in Figure A-1.
- On the LK201-layout keyboard, this refers to the key labelled **F3**.

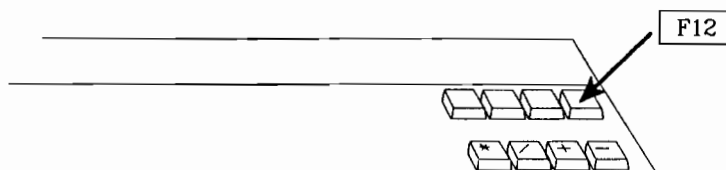


Figure A-1. The F12 Key on the 46021A HP-HIL Keyboard

Selecting Screen Buttons and Fields

To select a screen button or field, move the mouse cursor to it and click the left mouse button:

- Buttons that can have a number of discrete values display a new value with each click.
- Buttons that can be clicked on and off display an indicator light.
- Fields that permit text entry are white. To enter text in a field, move the mouse cursor to the field and click the left mouse button. A text cursor will appear, allowing you to type in your selection. Backspace deletes characters.

Using Online Help

If you need information on a configuration parameter, move the cursor to that field and click the right mouse button to make a pop-up help window appear. Click any mouse button to make the window disappear.

Saving and Recalling Configuration Values

- The **Save** button saves the choices displayed on the configuration screens for future recall.
- The **Recall** button restores the most recently “Saved” values.
- The **To X Server** button exits the configuration screens. However, changes made to the screen parameters will be implemented, with the exception of changes made to the network parameters or to the monitor parameters.
- The **Factory Defaults** button sets the parameters on all of the configuration screens to their factory defaults.
- The **Reset** button sets the parameters on the Preferences screen to their factory defaults.

Putting Parameters into Effect

If you make changes to the configuration screens, some parameters become active even if you do not use **Save**, (however changes that are not saved are lost when the X station is reset). Other configuration parameter changes do not come into effect until you **Save** your changes and reset the X station or, in some cases, until you turn the X station off and on. A pop-up window will warn you if you have made such changes.

Using the Self Tests

If the X station appears to be configured correctly, but still does not boot or fails to print, run the self tests to verify that the X station is in working order. You access the Self Test screen by clicking on the **Self Test** button before the X server is downloaded.

Note



1. To run the external loopback test for the LAN port or the RS-232 port, you will require external loopback connectors (see the following section to learn how to make the loopback connectors).
2. Testing the serial port with an external loopback connector provides a reasonable test for the circuitry of both the serial port and the parallel port.
3. **Continuous** specifies whether or not the self tests repeat continuously. To stop a continuous test, click the left mouse button 3 times, or press any key on the keyboard. The current test will run to completion before the tests stop.

Keystrokes and button clicks may be lost during the Keyboard/Mouse selftest. Repeated attempts may be necessary to stop continuous execution of this test.

To completely test the HP 700/RX

1. Turn your X station off.
2. Disconnect your X station from the LAN.
3. Attach a BNC loopback connector to the LAN port.
4. Attach an RS-232 loopback connector to the RS-232 port.
5. Turn your X station on.
6. Press **(F12)** immediately after the X station beeps.
7. Click on **(Self Test)**, then click on **(ROM Test)**, **(RAM Test)**, **(VRAM Test)**, **(HP-HIL)** (if you are using HP-HIL input devices), **(Keyboard/Mouse)** (if you are using AT/2 input devices), **(Display/Bell)**, **(RS-232)**, **(Parallel)**, and **(LAN Test)**.
8. Click on **(Internal)** once to select the External RS-232 loopback test.
9. Click on **(Stage 1 Internal)** twice to set up the External LAN loopback test.
10. Click on **(Start Test)** to execute the tests.

If a failure occurs, contact Hewlett-Packard for servicing.

Making a LAN Loopback Connector

LAN loopback tests require that a BNC loopback connector be attached to the LAN port. You can use the LAN port for your LAN loopback tests whether or not you normally connect to the LAN through the LAN port (as long as the AUI port remains unconnected).

To make a BNC loopback connector, put 50 ohm LAN terminators on the ends of a LAN T-connector.

Making an RS-232 Loopback Connector

To make a loopback connector for the RS-232 port, connect the following:

- pin 1 to pin 7
- pin 2 to pin 3
- pin 4 to pin 6
- pin 7 to pin 8
- pin 8 to pin 9.

B

Troubleshooting and Solving Startup Problems

This appendix may help you solve problems that may occur when you are attempting to install and start clients on your HP 700/RX X station. Additional troubleshooting information for special features is provided in the relevant chapters in the main body of the manual.

Cannot download server code.

The B00T failed error message appears.

Step 1: Review all error messages.

Accompanying the above bootup error message, there will probably be other error messages. Look them up in "Warning and Error Messages Generated by the X Station" and take the action indicated there.

Step 2: Check HP 700/RX Hardware

If the X station will not boot when it is in its simplest configuration, run the built-in selftests:

1. Press the **F12** key.
2. When the configuration screen appears, click on **Selftest**.

The selftest screen is self-explanatory; however, for more details, refer to "Using the Self Tests" in Appendix A.

Printer will not print

If the printer is configured to match the configuration of the X station but does not print data, there are two possible areas where the problem may lie:

- the printer may have a bad connection
- there may be a problem with the print spooler or the `pty` driver.

The procedures below will allow you to test the printer connection and configuration without using the print spooler or the `pty` driver. For information on print spooler or `pty` driver software, refer to the *System Administrator's Guide for the HP 700/RX*.

Test the X Station-to-Printer Connection

To test the X station-to-printer connection on non-PostScript printers, use the **Print Test** function.

1. Press **F12** to access the configuration screens.
2. Go to the Terminal configuration screen.
3. Click on the **Print Test** button for the serial or parallel port. Your X station's configuration data should be printed by your printer.
4. If your printer does not print, check the cable, the flow control settings, and the printer for problems.

Test the Computer-to-Printer Connection

The HP 700/RX software includes `lpctest700x`, a utility that tests the printer connection and configuration without using the print spooler or the `pty` driver.

To compile `lpctest700x` for your system, change to the directory `/usr/lib/X11/700X/lptest/src` and type

make

Test the printer by using one of the following commands from a terminal emulator window on the HP 700/RX X station that is connected to the printer:

- For non-PostScript printers, use

```
ls | ./lpctest700x -h Xstation_nodename [-p port]
```

where *port* can be 9100 or 9101. Choose 9100 to send data to the primary port (the serial port in the default configuration) or 9101 to send data to the auxiliary port (the parallel port in the default configuration). See Note, list item 1.

- For PostScript printers, use

```
cat postscript_testfile | ./lptest700x -h Xstation_nodename [-p port]
```

Note



1. The serial and primary ports can be configured as primary or auxiliary from the Terminal configuration screen. There is no particular advantage to configuring a port as primary or as auxiliary. The only effect of changing the configuration will be to redirect the data stream.
2. The `lptest700x` program will not work if the `xtptyd` daemon is running. If you have completed all eight steps in the printer installation and are now debugging, kill the `xtptyd` daemon before running this test.



If the printer fails with an XOFF pending . . .

If your printer uses XON/XOFF handshaking, it is possible to have the printer fail while the X station's serial port is locked with an XOFF. When the printer is ready to print again, it should send an XON signal. If it does not, you can cause the X station to cancel the XOFF it has stored by doing the following:

1. Press **F12** to go to the configuration screens. (On HP-HIL keyboards, **F12** is the fourth unlabeled key over the numeric keypad.)
2. On the Terminal configuration screen, change the Serial Port pacing from **XON/XOFF** to **None**.
3. Change Serial Port Use For to **Disabled**.
4. Click on **OK**.
5. Change the Serial Port pacing from **None** back to **XON/XOFF**.
6. Change Serial Port Use For to its original setting.
7. Click on **OK**.
8. Click on **To X Server** to return to the X server.

Solving Client Startup Problems

Common problems encountered with X clients are

- Some clients, such as `xterm`, rely on R3 bugs for some features. For example, `xterm` internal popup menus rely on an R3 bug. If you find that a client will run with an X11 R3 server, but does not run with the HP 700/RX server, then try turning on **R3 Compatible** on the Preferences configuration screen.
- `DISPLAY` variable not set. If you log into a computer using TELNET, you must set the `DISPLAY` variable to the X station's `ip_address:0.0` (use `DISPLAY=ip_address:0.0 ; export DISPLAY` for Korn or Bourne shell or `setenv DISPLAY ip_address:0.0` for C shell.)
- bad file path. If clients don't start check your path on the computer. Your path must include `/usr/bin/X11` and other directories where you have X clients. Also, `/usr/bin/X11` must precede `/usr/bin` in your path so that the computer will search for X11 files before it searches for X10 files.
- missing fonts. A client may also hang or quit if it requests fonts that are not in the font search path of the X server.

To list the current font path, in a terminal emulator window type `xset q`

The font path can be changed with the `xset fp` commands which add directories to and delete directories from the path. These commands are typed in a terminal emulator window. The command syntax is

```
xset{[+|-]fp|fp[+|-]} path1/,path2/, ...
```

where *path* is the path to a font directory. Each path ends with a forward slash ("/"). Commas separate the paths. `-fp` and `fp-` remove directories; `+fp` prepends a directory and `fp+` appends a directory.

If you specify an incorrect font path, the X server will produce an "out-of-range" error.

Note



If `tftp` is used to download fonts, the font path is relative to the `tftp` home directory. Therefore, even though the path to the `tftp` home directory is part of the font path, this part of the font path is left out of the `xset` command line. Thus, to add `/usr/tftpdire/usr/lib/X11/700X/fonts/r2` to the font path, you would type

```
xset fp+ /usr/lib/X11/700X/fonts/r2/
```

Symbolic links have been set up to allow NFS to access fonts using the same font path as `tftp`.

If you make changes to the font path by using `xset`, you can make those changes permanent by going to the Startup configuration screen, clicking on **Assign to Default Path**, then clicking on **Save**.

Note



Some clients do not rely on the user to set the font path and will attempt an `X_SetFontPath` to find the fonts they need. With X11 R4 but not with X11 R3, if this attempt fails, the server will return an error and the client will hang even if the required font is already in the font path, which has been previously set with `xset`. However, the client may begin to work if you go to the Preferences screen and turn on **R3 Compatible**. Another fix is to move the required fonts to the directory where the application expects to find them.

- insufficient memory. You can tell if you need more memory if low-memory warnings pop up on your screen.

If backing store is on, you should be able to free up some memory by going to the Preferences screen and turning it off. Press **F12** for two seconds. If the **Backing Store** button reads **Auto. When Mapped** or **By Application**, click on it until it reads **Disabled**. Click on **To X Server** and then reset your X station.

You can also add more RAM to your HP 700/RX by following the procedure given in “Installing DRAM” in Chapter 2.

- too many clients. The HP 700/RX will support in excess of 100 clients at the same time.
- too many connection requests. The HP 700/RX X station will queue up to 20 requests from the computer to open connections to the X server at the same time. If you attempt to open more than 20 clients too quickly, some may fail to open.

Font Problems

The most common font problems are

- the client cannot find a font
- the client cannot generate non-USASCII characters
- the server cannot use a font because of the font's format
- the font is truncated when displayed.

Finding Fonts

For a client to be able to find a font, the font path must be correctly set.

To determine which fonts exist, list the `fonts.dir` files in each font directory. To list fonts the X server has *available*, use `xlsfonts | more`. If the font you want appears in the `fonts.dir` files, but not in the output from `xlsfonts`, you should be able to get the font you want simply by changing the font path.

To determine the font path, look on your Startup configuration screen. To change the font path, use `xset fp+ path` or `xset fp- path`, then go to the Startup configuration screen and click on **Assign to Default Path** and **Save**.

Generating non-USASCII Characters

The keyboard will be able to generate non-USASCII characters only if the X server can access a font that contains non-USASCII characters. For HP clients these fonts can be found in the `/usr/tftpd/usr/lib/X11/700X/fonts/hp_roman8 /75dpi` directory. For example, to specify the 8x13 font for an `hpterm` window, type

```
hpterm -fn courR14 &
```

For non-hp clients, these fonts can be found in subdirectories under the `usr/tftpd/usr/lib/X11/700X/fonts/iso_8859.1` directory.

Truncated Letters

Some R2 clients will display letters that have pieces missing, typically the lower parts of the letters g, j, p, q, and y. This is caused by the use of an R3 font in place of the intended R2 font. In the fonts issued by MIT, eight font names that were used in R2 were repeated in R3. The HP 700/RX server uses these names to specify R3 fonts. R2 clients that use these font names must use the HP 700/RX font names in the following table.

MIT Name	HP 700/RX Name	MIT Name	HP 700/RX Name
6x10	6x10r2	6x12	6x12r2
6x13	6x13r2	8x13	8x13r2
8x13bold	8x13boldr2	9x15	9x15r2
cursor	cursorr2	fixed	fixedr2

Warning and Error Messages Generated by the X Station

This section lists Warning and error messages generated by the HP 700/RX X station. Warning messages appear in a popup window in the center of the video display. Error messages appear on the boot screen and the Log screen. Some error messages also appear on the TELNET screen.

Note



X Window System and operating system error messages also appear on the boot screen and the Log screen. These messages are documented elsewhere.

If you see ...	It means ...
Can't open ... : directory mount failed.	The directory mount attempted by NFS failed. This may be because the directory is not there or your X station has not been given permission in <code>/etc/exports</code> .
Can't open ... : file server not responding.	Communication with the file server has failed. If an alternative file server has been specified, the X station will switch to the alternative.
Can't open ... : file server not valid.	Check the Network screen. The file server IP address is 0.0.0.0 or the host name of the file server could not be resolved by the name server.
Can't open ... : not found.	The file cannot be found.
Can't open ... : permission denied.	The file has the wrong permissions.

If you see ...	It means ...
Downloading ... : bad file CRC.	The CRC stored in the X server file does not match the calculated CRC. The file is probably corrupt.
Downloading ... : bad file format.	The X server file is corrupt or has been corrupted by the network. Try to download the file again.
Downloading ... : file server not responding.	Communication with the file server has failed. If an alternative file server has been specified, the X station will switch to the alternative.
Downloading ... : hardware type mismatch.	Check the Startup screen. The X server file you are attempting to download will not work with the HP 700/RX model you are using. Delete the file name from the X Server File field and the X station will default to a suitable name.
Downloading ... : insufficient memory.	While attempting to download an X server file, the X station ran out of memory. Try powering off and on without invoking TELNET. If this still fails, you may need to add more memory.
Downloading ... : not an image file.	This is not an X server file or it is a corrupt X server file.
EEPROM error: Bad CRC	The EEPROM is defective.
EEPROM error: Bad data	The EEPROM is defective.
Fatal error: no memory. Rebooting	When this message appears the X server attempts to close all clients. Consider adding more memory or running fewer applications.
Font ... not in fonts.dir(s).	Check to see if the named font is in the directory. If it is, run the <code>xtmkfontdir</code> program as described in the system administrator's manual.
Error loading font.	The font may not be in the proper format for the HP 700/RX X station. Contact your system administrator.
HIL Device detected: Unknown device	You have an unsupported keyboard or mouse plugged into the HP-HIL port.

If you see ...	It means ...
EEPROM error: Incompatible with installed boot ROM	Upgrade your boot ROM. The data stored in EEPROM by the boot ROM is incompatible with the format required by the downloaded X server software.
EEPROM error: Incompatible with download file	Upgrade your X server software. The data stored in EEPROM by the upgraded boot ROM is incompatible with the format required by the old X server software.
Invalid Gateway IP addresses specified. Cannot access File Server(s).	Check the Network screen. The gateway routing table contains invalid entries. If a gateway's IP address is valid, the result of ANDing the gateway's IP address with the subnet mask will be the same as the result of ANDing the X station's IP address with the subnet mask. Contact your system administrator.
Less than 128 KB of free memory	This message will not be displayed again until free memory goes above 256 KB, and then back under 128 KB.
MEMORY FAULT: Two memory modules of differing sizes are installed.	If you are using two memory modules, they must be the same size.
MEMORY FAULT: Memory module in slot 2 must be placed in slot 1.	If you are using only one memory module, it must be in slot 1. If you choose to upgrade to two memory modules, you can install a matching memory module in the empty slot.
Mouse reset FAILED!	You have something other than a mouse plugged into the MOUSE port.
Name servers not responding.	Check the Network screen. The Name Servers specified are not responding.

If you see ...	It means ...
Network cable fault detected.	If the X station continues to boot, this is not a serious problem. Confirm that ■ all X stations are connected to the LAN through a T-connector ■ each segment of the LAN ends with a 50-ohm terminator ■ no section of a ThinLAN cable has a length that is a multiple of 5 meters ■ the LAN cable does not have severe bends or kinks ■ no segment of ThinLAN is longer than 185 m (600 ft.).
Network hardware fault: run selftests.	To run self tests, press (F12) and click on (Self Tests).
Network cable not connected.	This message may also appear if the cable is unterminated.
No connection.	TELNET could not open a connection to the TELNET host. The TELNET host name/IP address is correct, but the computer does not respond.
No Domain Name specified. Cannot resolve domain.	Check the Network screen. You have entered an IP address in the Name Server field without specifying a Domain Name.
No fonts found in system ROM.	No fonts were found in the base ROM. Run the ROM self test.
No File Server Names specified. Cannot connect.	Check the Network screen. You must enter a file server name in the File Server field.



If you see ...	It means ...
No valid File Server IP address specified.	Check the Network screen. You have entered a host name into the File Server and/or Alt. File Server field without specifying the IP address of the Name Server that is to resolve the name. You will get the same error message if the attempt to contact the file server fails and a name appears in the Alt. File Server field when there is no IP address in the Name Server field. When you specify the name server, you must also specify the Domain Name of the X station.
Not enough memory for all tasks	This message appears at the first non-fatal out-of-memory condition when backing store is enabled. The X server will turn backing store off for the requesting window.
Resolving address of file server ... Cannot resolve.	Check the Network screen. The host name of the file server could not be correlated with an IP address. This may be because the file server does not appear in the nameserver database, the wrong IP address appears in the Name Server field, or the wrong Domain Name appears in the Domain Name field.
Resolving host address ... unknown host.	Check the Startup and Network screens. This message appears briefly if the TELNET host name cannot be resolved. Likely causes are that the TELNET host does not appear in the nameserver database, that the wrong IP address appears in the Name Server field, or that the wrong Domain Name appears in the Domain Name field.
Server ROM not installed.	Check the Startup screen. The X station is configured to get its X server from ROM, but there is no ROM server installed.

If you see ...	It means ...
Switching to file server: ...	The first file server has failed to respond and the X station is switching to the alternative.
The terminal's IP address is not in valid dotted decimal format.	Check the Network screen. In fact, the address is in valid format, but has not been changed from its factory default value of 0.0.0.0.
Trying BOOTP.... failed.	No computer responded to the X station's boot request. The terminal will send bootp requests every minute until successful or until you press a key. If you have edited the <code>/etc/bootptab</code> file and are unable to use bootp to download data to several X stations, your system administrator should check that there are no syntax errors. To verify that there is no network or hardware problem, refer to "Cannot download server code."
Under 32KB memory: close a task	This message appears when there is less than 32 KB of memory and backing store is not enabled. This provides you with an opportunity to close an application without losing data.
Unexpected characters during vi sessions.	You have probably set your terminal type to a value other than <code>vt100</code> . This may have been set with a startup script. Set your terminal type to <code>vt100</code> by typing <code>TERM=vt100 ; export TERM</code> (for Bourne shell or Korn shell) or <code>setenv TERM vt100</code> (for C shell).
Using memory from backing store	The server has disabled backing store for some windows to free enough memory to satisfy current demands.
Warning: Resorting to ROM font default path	The X station is using its default font path and taking its misc fonts from the boot rom.



Glossary

access control

When turned on, access control restricts the computers that can communicate with your X station to the file server, the TELNET host, the `xdm` host, and those listed in the file `tftp_Home_Dir/usr/lib/X11/700X/etc/Xstation.hosts` where *Xstation* is the IP address or hostname of your X station.

agent

The SNMP software that runs on the equipment being controlled, such as the HP 700/RX. The agent is polled by the **network manager**, which runs on a host computer.

auxiliary device

Auxiliary device is a designation that can be given to the X station's serial or parallel port. This port will be the destination of data that is sent to port 9101 of that X station, as set in `/etc/xtptydtab`. This daemon is only available from the HP 700/RX server tape.

background process

A process that does not control the terminal window from which it was started. Background processing enables an operating system to execute more than one program or command at a time from the same terminal window.

backing store

Backing store automatically saves parts of windows obscured by other windows. The software uses "active" backing store, which does update obscured portions of windows, but also can quickly consume the X station's memory.

bootp (boot protocol)

bootp can be used to download network configuration data to an X station. The network configuration data is the information that enables the X station to communicate directly with devices on the LAN and includes the IP addresses of the X station and of the computers it accesses. This data must be entered manually if **bootp** is not used.

boot server

The computer that responds to the X station's **bootp** request. By default, the boot server will also be the file server. This can be changed by using the **T145** tag in the **bootptab** file.

client

A program written specifically for the X Window System.

cluster server

The cluster server is the computer controls the file-system disk drives in a network cluster. The computers that link into the network need not have disk drives and are sometimes known as "diskless nodes."

domain

The part of the host name that follows the first period. For example, in the host name **xnet4.tw.pjl**, **xnet4** is the node name and **tw.pjl** is the domain. You do not need to specify a domain if you do not use a domain name server.

drag

To press *and hold down* a mouse button while moving the mouse on the desktop (and the pointer on the screen). Typically, dragging is used with menu selecting, and window moving and resizing.

file server

The computer that sends the X station files it requires (that is, the fonts and the X server file). The file server is not to be confused with a cluster server, which controls the file-system disk drives in a network cluster.

font

A collection of characters that have a characteristic shape. For example, the body of this manual is printed in Modern Roman font, while the headlines are printed in Helvetica.

foreground task

The foreground task is the the last task started in the `.xsession` startup script, which is used by `xdm`. The foreground task is the first client that does not have an ampersand at the end of its command line.

When the user closes the foreground task, a terminal emulator in the default `.xsession` script, `xdm` logs the user out.

gateway

A gateway is loosely defined to be any device that allows interconnection between computer networks. Interconnection devices, such as routers, are included in this use of the term “gateway.”

home directory

The directory on the computer in which you are placed after you log on. Typically, this is `/users/username`, where *username* is your logon name. You keep all “your” files in or under your home directory.

host name

A string that identifies a computer on the network. It has two parts, a *node name* and a *domain*. For example, in the host name `pc.tw.pjl`, `pc` is the node name and `tw.pjl` is the domain. You do not need to specify a domain if you do not use a domain name server.

host table

A file where all the host names are correlated with IP addresses; typically, `/etc/hosts`.

hpterm

An X11 client program supplied with HP-UX. It displays a terminal window that emulates HP 2622-compatible terminals.

icon

A small, graphic representation of an object on the root window. Objects can be “iconified” (turned into icons) to clear a cluttered workspace and “normalized” (returned to their original appearance) as needed. Processes executing in an object continue to execute when the object is iconified.

IP address

An Internet Protocol address consists of four decimal integers separated by periods. Each integer represents eight bits (an octet) of an IP address. The IP address consists a network portion and a host portion. The two parts of the the IP address can be separated by using the netmask and subnetmask.

magic cookie

The client authorization mechanism used in the HP 700/RX. The magic cookie is a number generated by **x_{dm}** and sent to the X server at login time. Each display has one, unique, number.

If the HP 700/RX is configured to Client Authorization enabled and XDMCP enabled, during a client's attempt to connect to the X server, the X server compares the client's magic cookie to its own magic cookie. If these numbers do not match, the connection is rejected.

MIB (Management Information Base)

A list of variables (SNMP objects) that an SNMP agent can access. The standard lists are called MIB I and MIB II.

multi-scanning

Also known as multi-sync. Refers to the ability of a monitor to synchronize to a range of video frequencies, so it can display at various resolutions.

name server

The computer that resolves host names and their corresponding IP addresses. If you use a name server, you can enter the host name (rather than the IP address) in the TELNET Host and XDMCP Host fields on the Startup screen as well as in the File Server and Alt. File Server fields on the Network screen.

netmask

The netmask specifies how much of the IP address is reserved for subdividing addresses into networks. The mask contains 1's for the bit positions to be used as network part and 0's for the host part. The netmasks for the various classes of internet addresses are

Class A: 255.0.0.0

Class B: 255.255.0.0

Class C: 255.255.255.0

network manager

The SNMP software that runs on a host computer. Hewlett-Packard's version of this software is called Network Node Manager (NNM); the X windows extension to this software is X Node Manager (xnm). NNM is part of Open View/UX (OV/UX), Hewlett-Packard's network management package.

NFS (Network File System)

A file-transfer mechanism for downloading X server code and font files from the file server to the X station. NFS is a faster alternative to `tftp`, but NFS is more complicated to set up.

node name

The part of the host name that precedes the first period. For example, in the host name `xnet4.tw.pjl`, `xnet4` is the node name and `tw.pjl` is the domain.

non-X-client

A program that is written to run on a terminal and so must be "fooled" by a terminal emulation window into running in the window environment.

object

A variable in an SNMP MIB.

**ping**

`ping` is a program that sends an echo packet, usually once a second. Each packet is echoed back and displayed on the screen of the sender. When `ping` terminates, a screen of communications statistics is displayed. The X station can echo a `ping` but cannot initiate it.

pointer

Sometimes called the "mouse cursor," the pointer shows the location of the mouse. The pointer's shape depends on its location. In the root window, the pointer is an `x`.

primary device

Primary device is a designation that can be given to the X station's serial or parallel port. This port will be the destination of data that is sent to port 9100 of that X station, as set in `/etc/xtptydtab`. This daemon is only available from the HP 700/RX server tape.

primary manager

The `xdmcp` manager that relays an X station's indirect request for `xdm` services to a list of secondary managers. The first of these managers to send the X station a willing response will be allowed to provide the X station with `xdm` services.

pseudo-terminal driver

A pseudo-terminal driver is a program that allows the host computer to talk to a device on the LAN as if that driver were connected directly to one of the computer's output ports. Each pseudo-terminal driver has two sides, a master side that talks to the hardware device and a slave side that talks to the application software within the computer.

rebooting

Rebooting means reloading the X server code. The easiest way to accomplish this is by turning the X station off and on. To ensure that no stray X clients are left on the UNIX computer, it is generally advisable to reset the X station before rebooting.

resetting

Resetting means restarting the X server code that is already loaded into the X station. Resetting closes all connections to X clients and activates certain configuration parameters, such as TELNET Autostart, and reloads the fonts. To reset the X station, press

- on AT/2 and C1429A HP-HIL keyboards: **Ctrl** **Alt** **Delete**
- on 46021A HP-HIL keyboards: **Ctrl** **Shift** **Reset**
- on the LK201-layout keyboard: **Ctrl** **Shift** **F4**

root menu

The menu associated with the root window. The root menu enables you to control the behavior of your environment.

root window

The backdrop of your X environment when you start X. Although you can hide the root window under windows or other graphic objects, you can never position anything behind the root window. All windows and graphic objects appear "stacked" on the root window.

save under

Save under saves parts of windows obscured by pop-up screens.

Simple Network Management Protocol (SNMP)

Literally, the definition of a protocol used in network monitoring and management. SNMP is usually taken to mean the protocol, daemons, and MIBs used in network management.

socket

An addressable entity at either end of a communication connection. A program can write data to and read data from a socket, just as it writes and reads data to and from files. A socket is identified by a socket port number. In the HP 700/RX, the primary port is connected to the socket with the port number 9100 and the auxiliary port is connected to the socket with the port number 9101.

subnet

A LAN segment that is reached through a gateway.

subnet mask

Four decimal integers that subset the host address space into multiple subnetworks.

sync

To display a data image, a monitor must synchronize (sync) its screen refresh rate with the output of the X station. To make this synchronization possible, the X station sends out a sync signal that tells the monitor when the next bit of data is coming. There are two common ways of providing this sync signal:

- External sync (also known as digital sync). Horizontal and vertical synchronization signals are sent on two separate lines. Digital sync is part of the VGA standard.
- Internal sync (also known as sync on green in the case of color monitors and composite sync in the case of monochrome monitors). Synchronization signals are sent on the line that carries green or monochrome information to the monitor. Internal sync is typically used with high resolution monitors.

terminal emulator

A window that emulates a complete display terminal. Terminal emulators are typically used to “fool” non-X-client programs into believing they are running in their favorite terminal—not a difficult task in most cases. When not running programs or executing operating system commands, terminal emulators display the command-line prompt. Two common terminal emulators are **hpterm**, which is supplied with HP-UX X11 and emulates HP terminals, and **xterm**, which emulates DEC VT102 and Tektronix 4014 terminals.

TELNET

TELNET is the Internet standard protocol that allows a user at a terminal to interact with a remote computer over a network.

tftp (trivial file transfer protocol)

A file-transfer program provided on the HP 700/RX server tape for downloading X server code and font files from the file server to the X station. NFS is an alternative to **tftp**, but it must be set up on your system.

trap

An SNMP message sent by an agent to the network manager that indicates a particular event has occurred (for example, a cold start).

window manager

A client that controls the size, placement, and operation of windows on the root window. The window manager menu is called from the root window.

xclock

An X11 client program that displays the time, either analog (hands and dial) or digital (text readout).

xdm (x display manager)

A program used to take care of the login process and control X server displays. It can be used to legally log many users onto different accounts on computers that have restricted user licenses. It checks the password file, selects a system shell, and sets up the user’s environment. It starts clients automatically when X servers turn on and closes sessions automatically when users log out.

xdm server

The computer that responds to the X stations **xdmcp** request. This computer may be any one of a number of computers, depending on how the X station is configured. If the X station is configured to send out a directed request, the **xdm** server will be the computer in the **XDMCP Host** field (or the file server, by default). If the X station is configured to broadcast a request, the **xdm** servers that are willing to provide **xdm** services will be displayed on the **Select Session Manager** screen.

xdmcp (X display manager control protocol)

Terminals that support **xdmcp**, such as the HP 700/RX X station, are able to broadcast to a computer a request for **xdm** services.

In contrast, X stations that do not support **xdmcp** require the computer to poll the X station continuously to ask if the X station requires **xdm** services yet. Once the computer is able to provide **xdm** services to an X station, the computer must poll continuously to determine if the X station still requires those services.

xload

An X11 client program that displays the work load of the system as a histogram.

X server

The combination of graphics display, hardware, and X-server software that provides display services for clients.

xterm

An X11 client program that displays a terminal window that emulates DEC VT102 and Tektronix 4014 terminals. **xterm** requires use of the bug compatibility mode.



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