
# PC-Xware User's Guide

NCD PC-Xware
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## Document History

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# About This Guide

This guide explains how to operate PC-Xware.

**Chapter 1: Introduction**
Highlights PC-Xware features, X applications, compatibility, and related documentation.

**Chapter 2: Getting Started**
Shows how to start and stop PC-Xware, get online help, introduces the PC-Xware user interface, and shows how to build and establish various types of connections between your PC and host machines.

**Chapter 3: Configuration and Setup**
Explains how to customize various features of PC-Xware, and how to control choices PC-Xware offers for building or establishing connections.

**Chapter 4: PC-Xware Features**
Describes how to examine current PC memory and resource statistics, view history of PC-Xware events and messages, and control copy and paste operations between your PC and host machines and PC printer.

**Chapter 5: Terminal Emulation**
Explains how to control features of the PC-Xware terminal emulator. Also explains how to make use of PC-Xware's ability to use login scripts.

**Chapter 6: Local Window Managers**
Provides information on window management, including how to change window sizes, establish focus, and properties.

**Chapter 7: Fonts**
Describes fonts and font server functions supported by PC-Xware, including interactions with PCF, BDF, and native Microsoft Windows fonts.

**Chapter 8: Utilities**
Explains how to customize key actions, monitor connection activity, and get information on your PC environment.

**Appendix A: Error and Status Messages**
Explains the on-screen and server messages PC-Xware can generate.

**Appendix B: PC-Xservices**
Describes PC-Xservices, an NCD interface similar to X terminals.

**Appendix C: Product Support**
Explains how to get product support for PC-Xware.

**Glossary**
Defines terms used in this guide.

## Text Conventions

This guide uses the following text conventions:

| | |
|---|---|
| → | Indicates the movement through menu options. For example, the sequence for requesting extended font diagnostics is:<br>**Configure → X Server → Fonts** |
| **bold** | Indicates a directory or a file. For example:<br>**/usr/lib/X11/config** |
| ***bold italic*** | Indicates a program or utility. For example:<br>***ncdwm*** is the NCD Window Manager. |
| `courier` | Indicates information that displays on the screen. For example, the date command displays:<br>`Friday September 15 03:05:12 PTD 1995` |
| *`courier italic`* | Indicates a variable for which you can substitute one or more parameter values, group names, or file names. |
| **`courier bold`** | Indicates information you type. For example, to display characters in a 6 x 13 font, type:<br>**`% xfd -fn 6x13`** |
| `[ ]` | Square brackets indicate command options |
| \| | A vertical bar separates each option within square brackets. If you specify an option, choose only one value within the square brackets. |

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## Chapter 6: Local Window Managers



## Chapter 7: Fonts

## Chapter 8: Utilities



## Appendix A: Error and Status Messages



## Appendix B: PC-Xservices

# Chapter 1

# Introduction

Welcome to PC-Xware and the world of interactive computing. PC-Xware crosses many of the largest network hurdles, allowing you to view and work on UNIX, VMS, Microsoft Windows, and in almost every connected environment with links to local networks, including Workstations and Supercomputers.

With PC-Xware, you can cut and paste text and graphics, use a VT320 terminal emulator, run X applications, and select a preferred window manager.

PC-Xware, based on the powerful X11R6 server software used in NCD terminals, moves your PC beyond the realm of purely windowing to a fully interactive environment. The following items are just a few of the many additional capabilities you can learn to access and use with PC-Xware:

- Choose between network or serial connections.
- Choose a window manager from your remote host, or the Microsoft Windows or NCD window manager built into PC-Xware.
- Access applications with the click of a mouse button.
- Use multiple machines on your network for the applications you require.

The following pages describe other features.

## Network Audio System

The Network Audio System incorporated into PC-Xware provides applications that can send and receive audio data such as voice, sound effects, and music within the network environment. X applications that use the NCD Audio X function calls PC-Xware supports.

**Note** Network audio is available only for network connections.

## Simple Imaging Extension (SIE)

PC-Xware supports high-end imaging from X applications that call SIE functions. With SIE, PC-Xware handles compression and decompression, easily sending bitmap images across the network. Related operations include image transfer, scaling, panning, zoom, and 90-degree rotations.

## X Imaging Extension (XIE)

XIE does the following:

- Facilitates efficient and robust image display on X Window System servers.
- Provides tools that rapidly transfer an image from client to server, and converts the image format to match the server's hardware characteristics.
- Provides simple image enhancement and filtering operations such as contrast enhancement and convolution, as well as dithering, geometric transformations, and histogram generation.

XIE does not provide tools for general-purpose image processing.

## Connection Methods

PC-Xware provides host connectivity via ***rsh***, ***rlogin***, ***rexec***, Cterm, LAT, ***telnet***, and ***xdm***. For more information, see Chapter 2, "Getting Started."

## Telnet/Terminal Emulation

PC-Xware provides a VT320 terminal emulator for network use or across serial lines to your host. For more information, see Chapter 5, “Terminal Emulation.”

## Window Managers

PC-Xware supplies two local X window managers:

- MSwm, the default manager. (Functions similarly to Microsoft Windows.)
- NCDwm, a Motif window manager.

For more information, see Chapter 6, “Local Window Managers.”

## Desktop Modes

With PC-Xware, your X applications can reside on the Microsoft Windows desktop or in a separate, single window.

## XRemote

PC-Xware can run X applications over serial lines using NCD’s XRemote capability.

## Login Scripting

This feature simplifies the login, password, and application startup process. For more information, see Chapter 5, “Terminal Emulation.”

## Keyboard Mapping

This keyboard mapping tool allows you to re-map your PC keyboard for X applications that need host-style keyboard function. For more information, see Chapter 8, “Utilities.”

## System Management Services

PC-Xware supplies advanced configuration services for system administrators. You can use several configuration methods to configure PC-Xware along with various access control methods. Also, an extensive configuration language is supplied to assign

and display parameter values, read values from NVRAM, write values to NVRAM, lock out other clients from the database, and protect parameters from modification or display.

# About PC-Xware

To get started with PC-Xware, see these manuals and chapters:

| For Information About... | See... |
|---|---|
| Installation | *PC-Xware Installation and Configuration Guide.* |
| Location of Serial Number and Authorization Code | *PC-Xware Installation and Configuration Guide.* |
| General Information—starting and running PC-Xware | Chapter 2, “Getting Started” |
| Network Operations—network connection details | Appendix A, “Troubleshooting Network Connections,” in the *PC-Xware Installation and Configuration Guide* |
| Features—using PC-Xware’s online operations | Chapter 3, “Configuration and Setup” |
| System Administration | *PC-Xware System Administrator’s Guide.* Network Computing Devices, Inc. |
| Remote Configuration | *PC-Xware Configuration Reference Guide*. Network Computing Devices, Inc. |
| XRemote Host Software | *PC-Xware XRemote Host Utilities User’s Guide.* Network Computing Devices, Inc. |

# About the X Window System

For more information about X windows, see these resources:

| For Information About... | See... |
|---|---|
| X Window System / User Level | *Volume 3: X Window System User's Guide*—Valerie Quercia and Tim O'Reilly. O'Reilly & Associates, Inc. |
| X Window System / Administration Level | *Volume 8: X Window System Administrator's Guide*—Linda Mui and Eric Pearce. O'Reilly & Associates, Inc. |
| X Protocol References | *Volume 0: X Protocol Reference Manual*—Robert W. Scheifler. O'Reilly & Associates, Inc. |
| C Library and X Protocols | *X Window System, C Library and Protocol Reference*—Robert W. Scheifler, James Gettys, Ron Newman. Digital Press. |
| X Reference | *X User Reference Guide*—Ira Chayut, Camille Cook, Anatole Olczak. A System Publications, Inc. |

# Chapter 2

# Getting Started

This chapter's topics include:

- A Quick Tour of PC-Xware—how to start, navigate, and exit PC-Xware. Also explains how to access online help.
- Connecting to a Host—how to define a connection, and how to connect to machines on your network or across your phone lines.
- Modifying and Deleting Existing Connections.

## A Quick Tour of PC-Xware

### Starting PC-Xware

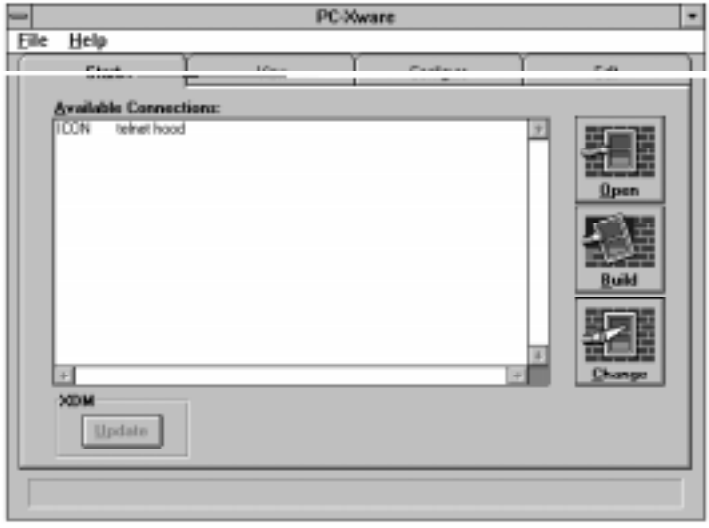
**Note** Be sure that your system meets all pre-installation requirements as described in Chapter 1 of your *PC-Xware Installation and Configuration Guide*. If you run PC-Xware on a network, your network software must be installed and running before you start PC-Xware.

To start PC-Xware:

1. Start Windows.
2. Start PC-Xware using one of these methods:
   - Double-click the ***telnet*** icon in your PC-Xware program group.

     **Note** This method is available only if you have a network and PC-Xware validated the connection to your host machine during installation.

     The PC-Xware copyright screen displays, followed by a VT320 terminal emulation window, showing the host machine's login prompt.
   - Double-click the PC-Xware icon in the PC-Xware program group. The copyright screen displays, followed by the main PC-Xware window:



3. Connect to a host. The PC-Xware **Start** tab lists connections from your PC to other hosts on the network or hosts reached via serial lines. Once you *build* (that is, define) one or more connections, you can connect to a host:
   a. Select the method you want in the **Available Connections** window.
   b. Select **Open**.

   For information on building new connections, read "Connecting to a Host" beginning on page 2-7.

## Quitting PC-Xware

To terminate your PC-Xware session, select **File → Quit** in PC-Xware's main window.

## Navigating PC-Xware

The main PC-Xware window contains two menus and four tabs, through which you access various PC-Xware options.

To access PC-Xware options:

| To Select: | Do: |
|---|---|
| A menu item or tab | Move the cursor over it and press (click) the left mouse button. |
| A different tab | Press the arrow keys on the keyboard or click the mouse. |
| An option from the menu bar | Press Alt and the menu item's underlined character or click the mouse. |
| An option on a pull-down menu or tab | Press the menu item's underlined character or click the mouse. |
| A different editable region | Press Alt and the option's underlined character or click the mouse. |

Selecting a tab makes it *active*, meaning you can choose options on that tab and input requested information. You do not need to save the information you specify on a tab; PC-Xware does this automatically.

## PC-Xware Menus

The PC-Xware window offers two menus:

| Menu | Menu Item | Description |
|---|---|---|
| File | Save Log File | Records all PC-Xware activities during the current session to **pcxware.xlg**, the default log file located in the local PC-Xware installation directory. |
| | Save Log File As... | Prompts for a filename in which to record PC-Xware's activities during the current session. |
| | Abort XRemote | Terminates the Xremote session and breaks the serial connection with a remote host. This option available only if an active Xremote session exists. |
| | Reset X Server | Resets the X server, terminating current connections and remotely running applications. |
| | Start Local Window Manager ***** | Starts the local window manager. Displays only when a local window manager is selected but not running. |
| | Stop Local Window Manager ***** | Stops the local window manager. Displays only when a local window manager is selected and running. |
| | Quit PC-Xware | Ends the PC-Xware session. |
| Help | Contents | Lists PC-Xware topics for which help pages exist. |
| | Search for Help on... | Offers a keyword search of PC-Xware topics. |
| | Current Screen (F1) | Displays help text about the currently selected tab. |
| | Technical Support | Records information about PC-Xware and the PC in **support.xsu**, a log file located in the PC-Xware installation directory. |
| | About PC-Xware | Displays version and copyright information. |

***** If no Window Manager is selected (**Configure → Startup → Desktop → Initial Window Manager**), then this menu option isn't available; it is grayed out. Choose a local window manager to make the option available.

## PC-Xware Tabs

PC-Xware's main menu displays four tabs.

| Notebook Tab | Description |
|---|---|
| Start | Lists available hosts and connects to a selected host. |
| View | Displays information on the installation and current running state of this PC-Xware session. |
| Configure | Customizes PC-Xware features and functions. |
| Edit | Edits user-specified data. For example: hosts, applications. |

When selected, some tabs reveal additional tabs that offer subordinate choices.

## Common Option Mechanisms

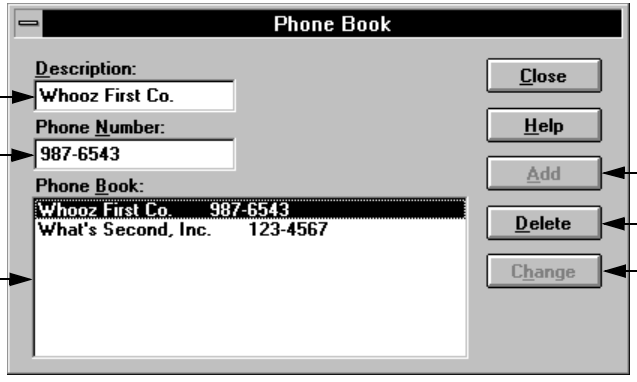
Many PC-Xware tabs and dialog boxes offer similar choices. This section describes the most common of these.

### Modifying a Choice List

Many PC-Xware options display a choice list that you can modify, such as the list of available hosts and phone numbers available for modem connections. Typically, a window displays the current list of items, and one or more text entry boxes for entering new items or modifying existing items:

**Text entry box**
To enter new items or modify existing items, do one of these:

- Type a new item directly into a *text entry box*
- Select an item from the *window*. The item displays in the text entry box for




**Add**
Adds the item in the text entry box to the list.

**Delete**
Removes the item in the text entry box from the list.

**Change**
Replaces the currently selected item in the list with the item specified in the text entry box.

## Getting Online Help

PC-Xware provides two kinds of online help:

- **Help pages**
  Online pages that describe PC-Xware features. You access these help pages by selecting one of these:
  - The **Help** item in the menu bar at the upper right of the PC-Xware window. Lists help items that you can select. **Help** menu options are described in the table on page 2-4
  - The **F1** key. Displays a help page for the currently selected tab.
  - A **Help** button. Displays a help page for the current dialog box.
- **Quick Help**

# Connecting to a Host

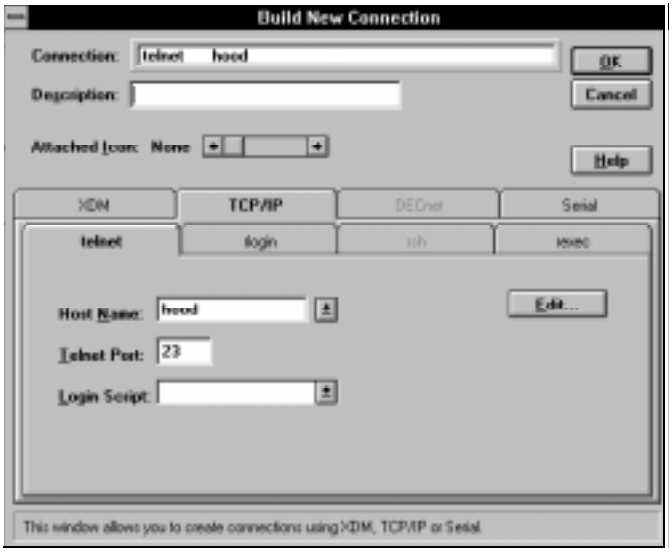
This section describes how to build host connections, which you can then choose from the **Available Connections** list to connect to a host or start an application.

To build a new connection:

1. Select the **Start** tab.
2. Select **Build**. The **Build New Connection** dialog box displays:

**Top region**
Information in these prompts are common to all tabs below.

**Tabs**
Each tab specifies a different connection type.



3. Supply the connection information requested by the prompts in the top region of this dialog:

| Option | Description |
|---|---|
| Connection | Displays characteristics about the connection you are creating. It reflects either the parameters you choose for the connection, such as communications protocol, host name and user name, or descriptive text you enter in the **Description** box.<br>You cannot enter or modify values in the **Connection** box. It automatically updates to reflect choices you make elsewhere.<br>The connection description displays in the **Start** tab's **Available Connections** list. |
| Description | Provides a connection description other than that constructed automatically from your other choices in this dialog box. |
| Attached Icon | Displays icons you can attach to a connection.<br>When you select an icon, the text in the **Connection** box is replaced with:<br>`ICON [no description]`<br>Text you enter in the **Description** box replaces `[no description]`, and displays under the selected icon in the PC-Xware program group. |
| OK | Confirms your choices, builds an entry in the **Start** tab's **Available Connections** list, and builds the icon in your PC-Xware program group.<br>You can now establish this connection by;<br>• Clicking the icon, if any, in the PC-Xware program group.<br>• Selecting the entry from the **Start** tab's **Available Connections** list. |
| Cancel | Cancels all choices and displays the **Start** tab. |

4. Supply connection-specific information. The bottom half of the **Build New Connection** dialog contains sets of tabs that specify the various types of connections (communication methods) you can choose to reach your host machine. The

following sections describe how to complete each of these tabs to build different connection types.

5. When satisfied with the connection you defined in **Build New Connection**, select **OK**. The connection you defined displays in **Start → Available Connections**.

**Note** For certain connection types, PC-Xware invokes a *terminal emulator*, a program that emulates the behavior of a terminal connected to the specified host machine. The terminal emulator prompts you to log in, just as you would on a terminal.

PC-Xware invokes a terminal emulator for these connection types: ***serial***, ***telnet***, ***rlogin***, ***Lat*** and ***Cterm***. For more information about terminal emulators used by PC-Xware, see Chapter 5, "Terminal Emulation".

## Network Connections

Network connections are those that use network communication protocols. PC-Xware supports TCP/IP (***xdm***, ***telnet***, ***rlogin***, ***rsh***, ***rexec***) and DECnet (***Session***, ***Lat***, ***Cterm***, ***Launch***) network connections. If you are not sure whether a host supports a particular connection type, use PC-Xware's Configuration Survey to find out. (For more information, read "Configuration Survey" beginning on page 8-1).

**Note** Network connections are not available in the PC-Xware Remote (serial only) product.

### Building an XDM Connection

***xdm*** is a common X Window System display manager. Most UNIX hosts with X support ***xdm*** connections. Some UNIX hosts have vendor-specific names for ***xdm***, such as ***vuelogin*** on HP UX machines.

To build an ***xdm*** connection, choose the **Start → Build → XDM** tab and supply the information requested by the prompt:

| Option | Description |
|---|---|
| Host Name: | Lists the IP addresses or names of hosts available on the network for establishing a connection. To select a host, do one of these:<br>• Scroll through the list and select the host you want to use.<br>• Enter or modify the host name in this box. |

When you initiate an ***xdm*** connection on most systems, X Display Manager software displays the ***xdm*** login banner:


Login banners usually contain the host name and entry areas for your user name and password.

By logging in, you identify yourself to the X Display Manager software so the primary host can verify you as an authorized user. The login process enables ***xdm*** to read a startup file in your home directory.

The startup file, which your system administrator creates, lists X applications that ***xdm*** starts automatically each time you begin an X session. The name of your startup file (or files) depends on the software you are using. If your primary host is running the

UNIX operating system, the file is called **.xsession** and resides in your home directory. If you do not have a **.xsession** file, a system-wide startup file is used. That system-wide file is typically one of the following:

- **/usr/lib/X11/xdm/Xsession**
- **$OPENWINHOME/lib/xdm/Xsession**

If your primary host machine is running the VMS operating system, the startup file(s) might be one or both of the following:

- **LOGIN.COM**
- **DECW$XDEFAULTS.DAT**.

Login procedures vary, depending on how your system administrator customized the software. Most login procedures prompt you to enter a user name (also called a login name) and a password in a banner similar to that in the previous figure. A typical procedure follows these steps:

1. At the **Login** prompt, type your user name and press **Return**. The **Password** prompt displays.
2. Type your password and press **Return**.

   **Note** When you type your password, it does not display on the screen.

   After you press Return, ***xdm*** starts the applications listed in your startup file(s). These might include an ***xterm*** terminal emulator and a window manager.

For more information on customizing ***xdm*** connections, read "Setting Up XDM Connections" beginning on page 3-15.

## Building a telnet Connection

***Telnet*** is a simple remote terminal protocol supported by UNIX hosts and some TCP/IP-equipped VMS systems. A ***telnet*** connection uses PC-Xware's terminal emulator to display the login prompt from your host.

To build a telnet connection, choose the **Start → Build → TCP/IP → telnet** tab. Options on this tab include:

| Option | Description |
|---|---|
| Host Name: | Lists the IP addresses or names of hosts available on the network for establishing a connection. To select a host, do one of these:<br>• Scroll through the list and select the host you want to use.<br>• Enter or modify the host name in this box.<br>You can create a list of default hosts through the **Edit → Hosts** tab. |
| Telnet port | Specifies the ***telnet*** port number to use in establishing the ***telnet*** connection. Do not change the default setting, port 23, without confirmation from your system administrator. |
| Login Script | Specifies the login script you want to run when the connection reaches the host.<br>A login script specifies events you want to occur automatically whenever you log in to a host through PC-Xware. For details on creating login scripts, see “Login Scripting” beginning on page 5-7. |
| Edit... | Customizes font and background color, and edits login scripts. For more information, see “Configuring Color for Your Terminal” on page 5-7 and “Creating and Editing Scripts” beginning on page 5-7. |

## Building an rlogin Connection

An ***rlogin*** connection establishes a remote login session on a host from your PC. The ***rlogin*** connection uses PC-Xware’s terminal emulator to display the login prompt from your host. To build an ***rlogin*** connection, choose the **Start → Build → TCP/IP → rlogin** tab.

Options on this tab include:

| Option | Description |
|---|---|
| Host Name: | Lists the IP addresses or names of hosts available on the network for establishing a connection. To select a host, do one of these:<br>• Scroll through the list and select the host you want to use.<br>• Enter or modify the host name in this box.<br>You can create a list of default hosts through the **Edit → Hosts** tab. |
| User Name | Your user login name for the host specified in the **Host Name** box. |
| Login Script | Specifies the login script you want to run when the ***rlogin*** connection reaches the host.<br>A login script specifies events you want to occur automatically whenever you log in to a host through PC-Xware. For details on creating login scripts, see “Login Scripting” beginning on page 5-7. |
| Edit... | Customizes font and background color, and edits login scripts. For more information, see “Configuring Color for Your Terminal” on page 5-7 and “Creating and Editing Scripts” beginning on page 5-7. |

## Building an rsh Connection

**Note** If you need ***rsh*** disabled, contact NCD technical support (see Appendix C, “Product Support” for the telephone number).

An ***rsh*** connection is a *remote shell* connection between your PC and a host machine. This connection type lets PC-Xware start a host-based application, displaying the application’s interface on the PC screen.

To build an ***rsh*** connection, choose the **Start → Build → TCP/IP → rsh** tab. Options on this tab include:

| Option | Description |
|---|---|
| Host Name: | Lists the IP addresses or names of hosts available on the network for establishing a connection. To select a host, do one of these:<br>• Scroll through the list and select the host you want to use.<br>• Enter or modify the host name in this box.<br>You can create a list of default hosts through the **Edit → Hosts** tab. |
| User Name | Your user login name for the host specified in the **Host Name** box. |
| Default Path | Indicates the path prefixed to the X application.<br>If you do not enter a path name in the **Start → Build → Application** dialog box, this default path is prefixed to the X application you enter. For example, if you enter `xterm -ls`, PC-Xware interprets it as:<br>`/usr/bin/X11/xterm -ls`<br>If the application you want to use is not in the **/usr/bin/X11** directory, enter the entire path and application name. Your entered path overrides the **Default Path.**<br>The default path is set by **Edit → Default → Append Display Name to Applications**. |
| Application | Specifies the host-based X application you want running after establishing the remote connection. To create a list of default applications, do one of these;<br>• Enter application names in this box, specifying the complete path and appropriate command-line options. To ensure that the application displays on your PC, include the `-display` command-line option. For example, if the name of your PC is "pc_west," this line starts an Xterm application on your PC:<br>`/usr/bin/X11/xterm -ls -display pc_west:0`<br>If you don't know your PC's name, see your system administrator.<br>• Enter application names through the **Edit → Application** tab. |

| Option | Description |
|---|---|
| Default Display | Inserted after the X application command.<br>If you do not enter `-display` as an option to your ***rsh*** or ***rexec*** application, PC-Xware inserts the default display name.<br>To use a display other than the default, enter this at the ***rsh*** or ***rexec*** text box:<br>`-display Other_PC_Name:0`<br>Where `Other_PC_Name` is the IP name or address of a different PC. For example:<br>`xterm -ls -display Other_PC_Name:0`<br>The default display is set by **Edit → Default → Append Display Name to Applications**. |

## Building an rexec Connection

After establishing a connection, an ***rexec*** connection automatically executes an X application on a remote host—similar to an ***rsh*** connection. Unlike an ***rsh*** connection, the remote host prompts you for a password before invoking the X application.

**Note** PC-Xware does not save ***rexec*** passwords.

To build an ***rexec*** connection, choose the **Start → Build → TCP/IP → rexec** tab. Options on this tab include:

| Option | Description |
|---|---|
| Host Name: | Lists the IP addresses or names of hosts available on the network for establishing a connection. To select a host, do one of these:<br>• Scroll through the list and select the host you want to use.<br>• Enter or modify the host name in this box.<br>You can create a list of default hosts through the **Edit → Hosts** tab. |
| User Name | Your user login name for the host specified in the **Host Name** box. |

| Option | Description |
|---|---|
| Default Path | Indicates the path prefixed to the X application.<br>If you do not enter a path name in the **Start ➔ Build ➔ Application** dialog box, this default path is prefixed to the X application you enter. For example, if you enter `xterm -ls`, PC-Xware interprets it as:<br>`/usr/bin/X11/xterm -ls`<br>If the application you want to use is not in the **/usr/bin/X11** directory, enter the entire path and application name. Your entered path overrides the **Default Path.**<br>The default path is set by **Edit ➔ Default ➔ Append Display Name to Applications**. |
| Application | Specifies the host-based X application you want to run after establishing the remote connection. To create a list of default applications, do one of these:<br>• Enter application names in this box, specifying the complete path and appropriate command-line options. To ensure the application displays on your PC, include the `-display` command-line option. For example, if the name of your PC is "pc_west," this line starts an Xterm application on your PC:<br>`/usr/bin/X11/xterm -ls -display pc_west:0`<br>If you don't know your PC's name, see your system administrator.<br>• Enter application names through the **Edit ➔ Application** tab.<br>These fields are associated with the **Application** box: |
| Default Display | Inserted after the X application command unless you enter the `-display` command line option.<br>To use a display other than the default, enter this at the ***rsh*** or ***rexec*** text box:<br>`-display Other_PC_Name:0`<br>Where `Other_PC_Name` is the IP name or address of a different PC. For example:<br>`xterm -ls -display Other_PC_Name:0`<br>The default display is set by **Edit ➔ Default ➔ Append Display Name to Applications**. |

## Building a Session Connection

A ***Session*** connection establishes a remote login session on a DECnet host and starts the DECwindows Session Manager on your PC. Although a ***Session*** connection is a type of Launch connection, PC-Xware provides a separate ***Session*** tab for your convenience because it is used so frequently.

When a Session connection is established, a log file listing communication events is created in the VMS host's home directory.

To build a Session connection, choose the **Start → Build → DECnet → Session** tab. Options on this tab include:

| Option | Description |
|---|---|
| Host Name: | Lists the DECnet node number or names of hosts available on the network for establishing a connection. To select a host, do one of these:<br>• Scroll through the list and select the host you want to use.<br>• Enter or modify the host name in this box. |
| User Name | Your user login name for the host specified in the **Host Name** box. |

**Note** Before using your ***Session*** connection, read "Preparing for DECnet Session and Launch Connections" beginning on page 2-22.

## Building a Lat Connection

A ***Lat*** connection is a connection to a ***Lat*** (Local Area Transport) server through DECnet. ***Lat*** uses PC-Xware's terminal emulator to display the login prompt from your host. ***Lat*** connections are available only if you loaded DECnet's **LAT.EXE** program prior to starting Microsoft Windows.

To build a Lat connection, choose the **Start → Build → DECnet → Lat** tab. Options on this tab include:

| Option | Description |
|---|---|
| Host Name: | Lists the DECnet node number or names of hosts available on the network for establishing a connection. To select a host, do one of these:<br>• Scroll through the list and select the host you want to use.<br>• Enter or modify the host name in this box.<br>You can create a list of default hosts through the **Edit → Hosts** tab. |
| Login Script | Specifies the login script you want to run when the ***Lat*** connection reaches the host.<br>A login script specifies events you want to occur automatically whenever you log in to a host through PC-Xware. For details on creating login scripts, see "Login Scripting" beginning on page 5-7. |
| Edit... | Customizes font and background color, and edits login scripts. For more information, see "Configuring Color for Your Terminal" on page 5-7 and "Creating and Editing Scripts" beginning on page 5-7. |

To start DECwindows applications, log in using your LAT connection, then enter these commands:

1. Set your PC as the display by entering one of these commands:
   - For DEC Pathworks, DEC Pathworks with TCP/IP, or DEC Pathworks and Winsock users:

     ```
     $ set display/create/node=XXXX/tran=DECNET
     ```

   - For DEC Pathworks with TCP/IP or DEC Pathwork and Winsock users:

     ```
     $ set display/create/node=YYYY/tran=ZZZZ
     ```

   where XXXX is the node name of your PC, YYYY is the Internet name of your PC, and ZZZZ is the name of the TCP/IP transport layer (FUSION, WINTCP, etc.).

2. Start a DECterm by entering one of these commands.
   - For DEC Pathworks, DEC Pathworks with TCP/IP, or DEC Pathworks and Winsock users:

     ```
     $ create/terminal/detach
     ```

   - For DEC Pathworks with TCP/IP or DEC Pathwork and Winsock users:

     ```
     $ create/terminal=decterm/detach
     ```

3. Start the DECwindows Session Manager by entering:

   ```
   $ @sys$manager:decw$startsm
   ```

## Building a Cterm Connection

A ***Cterm*** connection is a Command Terminal Protocol connection to a host using DECnet. ***Cterm*** uses PC-Xware's terminal emulator to display the login prompt from your host. ***Cterm*** connections are available only if you loaded DECnet's **CTERM.EXE** program prior to starting Microsoft Windows.

To build a ***Cterm*** connection, choose the **Start → Build → DECnet → Cterm** tab. Options on this tab include:

| Option | Description |
|---|---|
| Host Name: | Lists the DECnet node number or names of hosts available on the network for establishing a connection. To select a host, do one of these:<br>• Scroll through the list and select the host you want to use.<br>• Enter or modify the host name in this box.<br>You can create a list of default hosts through the **Edit → Hosts** tab. |
| Login Script | Specifies the login script you want to run when the ***Cterm*** connection reaches the host.<br>A login script specifies events you want to occur automatically whenever you log in to a host through PC-Xware. For details on creating login scripts, see "Login Scripting" beginning on page 5-7. |

| Option | Description |
|---|---|
| Edit... | Customizes font and background color, and edits login scripts. For more information, see “Configuring Color for Your Terminal” on page 5-7 and “Creating and Editing Scripts” beginning on page 5-7. |

To start DECwindows applications, log in using your Cterm connection, then enter these commands:

1. Set your PC as the display by entering one of these commands:
   - For DEC Pathworks, DEC Pathworks with TCP/IP, or DEC Pathworks and Winsock users:

     **$ set display/create/node=XXXX/tran=DECNET**

   - For DEC Pathworks with TCP/IP or DEC Pathwork and Winsock users:

     **$ set display/create/node=YYYY/tran=ZZZZ**

     where XXXX is the node name of your PC, YYYY is the Internet name of your PC, and ZZZZ is the name of the TCP/IP transport layer (FUSION, WINTCP, etc.).
2. Start a DECterm by entering one of these commands:
   - For DEC Pathworks, DEC Pathworks with TCP/IP, or DEC Pathworks and Winsock users:

     **$ create/terminal/detach**

   - For DEC Pathworks with TCP/IP or DEC Pathwork and Winsock users:

     **$ create/terminal=decterm/detach**
3. Start the DECwindows Session Manager by entering:

   **$ @sys$manager:decw$startsm**

## Building a Launch Connection

A ***Launch*** connection sends a command to a VMS host over a DECnet connection. When a Launch connection is established, a log file listing communication events is created in the home directory of the VMS host machine.

To build a ***Launch*** connection, choose the **Start → Build → DECnet → Launch** tab. Options on this tab include:

| Option | Description |
|---|---|
| Host Name: | Lists the DECnet node or names of hosts available on the network for establishing a connection. To select a host, do one of these:<br>• Scroll through the list and select the host you want to use.<br>• Enter or modify the host name in this box.<br>You can create a list of default hosts through the **Edit → Hosts** tab. |
| User Name | Your user login name for the host specified in the **Host Name** box. |
| Application | Specifies the host-based X application you want running after establishing the remote connection. Do one of these to create a list of default applications:<br>• Enter application names in this box, specifying the complete path and appropriate command-line options. For example, to start the DECwindows Session Manager, use this application line:<br>`sys$manager:decw$startsm.com`<br>If you don't know your PC's name, see your system administrator.<br>• Enter application names through the **Edit → Application** tab. |

**Note** Before using your Launch connection, read "Preparing for DECnet Session and Launch Connections" beginning on page 2-22.

### Preparing for DECnet Session and Launch Connections

To use the Session or Launch protocols, you must first complete these preparatory steps on the VMS host(s) with which you want to establish PC connections.

1. Install the file **ncd_serv.com** (found in the PC-Xware installation directory) on the VMS systems you plan to use. You can do this by entering the Pathworks NFT command:

```
$NFT COPY ncd_serv.com VMSHOST"user password":: ncd_serv.com
```

2. Install the **ncd_serv.com** file as an NCP (Network Control Program) object. (You must have system account privileges to do so.)
   a. Copy **ncd_serv.com** to the system executables directory by entering:

      ```
      $copy ncd_serv.com sys$common:[sysexe]
      ```

   b. Set the protections to allow use of **ncd_serv.com** by entering:

```
$set protection=(S:RWED, O:RWED, G:RWED, W:RE) sys$system:ncd_serv.com
```

   c. Run the NCP program by entering:

      ```
      $NCP
      ```

   d. Define the object for the permanent data base by entering:

```
NCP>define object pcx$server file sys$system:ncd_serv.com number 0
```

   e. Define the object for the current data base by entering.

```
NCP>set object pcx$server file sys$system:ncd_serv.com number 0
```

   f. Exit the NCP program.

## Serial Connections

To communicate with a host machine over a modem or through a serial communications cable, you must create a serial connection. Serial connections use PC-Xware's terminal emulator to display modem commands, machine prompts, and your login session to the host machine.

Because you are in a terminal emulator, you can run character-based applications from your host. With the help of NCD's XRemote code on your host, you can also run X applications during your serial session. For more information about XRemote, see Appendix B, "Troubleshooting Serial Connections" in your *PC-Xware Installation and Configuration Guide.*

To build a serial connection, choose the **Start → Build → Serial** tab. Options on this tab include:

| Option | Description |
|---|---|
| Phone Number | Specifies the phone number you want PC-Xware to dial. You can enter a number or select a number from the Phone Book list displayed on this tab. |
| Phone Book | Lists default phone numbers created through the **Edit → Phone Book** tab. See "Editing the Phone Book" on page 3-13. |
| Edit... | Displays serial connection features you can edit. These features are listed below. For details on how to edit |

| Option | Description | | |
|---|---|---|---|
| Modem | Displays the names of modems available for establishing serial connections. Default modems include Hayes, Multitech and US Robotics.<br>Select the desired modem, or “direct” for a serial line attached directly to a host. | | |
| Serial Port | Specifies the serial port and communication parameters to use over it: | | |
| | Com Port | Displays the names of available serial communication ports on your PC. Select the port you want to use. | |
| | Setup... | Displays or modifies the serial communications settings for the specified port. The options request settings for typical serial communication parameters: | |
| | | Baud Rate | Specifies the modem speed (baud rates) for sending data across a serial line. Pick the optimal rate for your modem and purpose. |
| | | Parity | Specifies the parity-checking method (an error-checking mechanism). |
| | | Handshake | Specifies the method for coordinating sending and receiving signals between the PC and host machine.<br>If you plan to use NCD’s XRemote facility to run X applications across serial lines, do *not* select XON/XOFF; noise on the communication line can introduce spurious XOFF characters, one of which might halt the transmitter, thereby freezing the line. |
| | | Data bits | Specifies the number of data bits per word (7 or 8). |

| Option | Description | |
|---|---|---|
| | Stop bits | Specifies the number of stop bits (1 or 2), an error-checking mechanism. |

# Modifying and Deleting Existing Connections

You can modify and delete already-built PC-Xware connections. For example, you might want to change the icon used for a connection, but leave other details unchanged.

To modify or delete an existing connection definition:

1. In the main PC-Xware window, select the **Start** tab. The **Available Connections** list displays.
2. Select the connection you want to modify or delete.
3. Select **Change**. The **Change Connection** dialog box displays, offering the same choices as the **Build New Connection** dialog box. Differences include:
   - The **Connection** text box lists the connection you selected in step 1.
   - The box includes a **Delete** button.
4. Do one of these:
   - Select **Delete** to delete this connection from the list of available connections. PC-Xware deletes the connection and any associated icon, and returns to the main PC-Xware window.
   - Modify the connection by choosing the options and/or filling in the edit and list boxes as desired. Select **OK** to save your changes.

     For details on connection options, see "Connecting to a Host" beginning on page 2-7.

Chapter 3

# Configuration and Setup

This chapter provides information about:

- X Server Configuration
- Defining Connection Choices
- Setting Up XDM Connections
- Changing Your PC-Xware Serial Number

## X Server Configuration

You can use PC-Xware to customize features that govern the way the X server operates. The following subsections describe the configuration options PC-Xware offers in the **Configure → X Server** and the **Configure → Startup** tabs.

### Configuring Fonts

For information about these features, see Chapter 7, ”Fonts”.

### Configuring the Keyboard

For information about these features, see “Customizing Your Keyboard” beginning on page 8-3.

## Configuring X Server Performance

You can increase the speed at which PC-Xware displays X applications by adjusting the way it processes graphical data. This section describes the features you can control.

To optimize X server performance, choose **Configure → X Server → Performance**. Checking the boxes on this tab has the following performance-enhancing effects:

| Option | Description |
|---|---|
| Fast Width 1 lines | Specifies how PC-Xware displays a graphical line of width "1" sent by an X application. Choose one of these:<br>**Enabled**: (default) Displays a width "0" line. This value increases speed and performance.<br>**Disabled**: Displays a width "1" line. This value improves accuracy. |
| Arc Cache | Specifies whether PC-Xware stores arc coordinates send by X applications in a *cache*, a special location in the PC's memory allocated for this purpose. Choose one of these:<br>**Enabled**: (default) Stores arc coordinates in a cache. If the application sends another instruction to display the same arc, PC-Xware retrieves the arc definition from the cache and sends it to the display, rather than reprocessing the data from the application.<br>**Disabled**: No arc cache exists. |
| Benchmark Pattern Recognition | Specifies how to encode constantly repeated patterns sent from X applications to PC-Xware. Choose one of these:<br>**Enabled**: (default) Optimizes the way patterns are encoded to increase communication speed and performance.<br>**Disabled**: Does not optimize pattern encoding. |
| Fast Dashed Lines | Specifies how PC-Xware displays dashed lines or arcs of width "0" sent by an X application. Choose one of these:<br>**Enabled**: (default) Displays a width "0" line using the Microsoft Windows dash pattern that most closely approximates the actual dash pattern. This value is more efficient.<br>**Disabled**: Use the dash pattern specified by X applications to draw 0 width lines or arcs. |

| Option | Description |
|---|---|
| Fast Image Transfer | Specifies whether PC-Xware optimizes image processing by copying image data directly to the screen. Choose one of these:<br>**Enabled**: (default) Allows the PC's graphics card to process image data.<br>**Disabled**: Causes PC-Xware to perform pre-processing required by the PC's graphics card. Choose this value when your X application graphics are of poor quality—an indication that your PC's graphic facilities cannot adequately process the image data. |

## Configuring X Server Settings

X Settings control the way PC-Xware and the X applications it runs are invoked, displayed, and terminated. To configure your X server settings, choose the **Configure → X Server → Settings** tab. Options on this tab include:

| Option | Description | |
|---|---|---|
| Backing Store | Specifies how to save the pattern of windows hidden by other elements on the display. When the window is no longer hidden, PC-Xware re-creates the window from the pattern stored in the backing store.<br>Backing store improves X application performance as the application doesn't have to redraw windows each time they're brought to the foreground. However, backing store also uses PC memory, making that memory unavailable for other operations.<br>Choose one of these: | |
| | Disabled | (Default) Does not activate backing store. |
| | By Request | Activates backing store only if requested by that X application. |
| | When Mapped | Activates backing store for all X applications on the screen, whether requested by the application or not. |

<table>
<tr><th>Option</th><th>Description</th></tr>
<tr><td>Default Visual:</td><td>Specifies a color mapping scheme. Adjust the value in this option if the colors displayed by an X application do not seem correct.<br>Note: Unless instructed by your system administrator, do not change the Default Visual setting.<br>The HP VUE application, when run on a 16-color graphics card, generally requires an alternate color-mapping scheme. For example:<br>1. Set Configure → X Server → Settings → Default Visual to Pseudo Color.<br>2. Enable PC-Xservices' Setup → Change Setup Parameters → X and Graphics → Allocate Minimum System Colors. For more information about PC-Xservices, see “Appendix B: PC-Xservices.”<br>3. Restart PC-Xware, to display the correct colors.<br>Choose one of these options:
<table>
<tr><td>Automatic</td><td>(Default): PC-Xware automatically selects a visual that reflects the capabilities of the Microsoft Windows video driver.<br>If the video driver supports a color palette, then PC-Xware runs with a Pseudo Color visual. Otherwise, it runs with Static Color, Static Gray, or Gray Scale, depending on whether your display is color or gray scale.</td></tr>
<tr><td>Static Gray</td><td>Use static gray as the default visual.</td></tr>
<tr><td>Gray Scale</td><td>Use gray scale as the default visual.</td></tr>
<tr><td>Static Color</td><td>Use static color as the default visual.</td></tr>
<tr><td>Pseudo Color</td><td>Use pseudo color as the default visual.</td></tr>
<tr><td>True Color</td><td>Use true color as the default visual.</td></tr>
<tr><td>Direct Color</td><td>Use direct color as the default visual.</td></tr>
</table>
</td></tr>
</table>

| Option | Description |
|---|---|
| Terminate on Reset | Specifies when to terminate PC-Xware. Choose one of these:<br>**Disabled**: (default) Do not terminate PC-Xware when the last X application terminates.<br>**Enabled**: Terminate PC-Xware when the last X application terminates. |
| Middle Button Emulation | Specifies whether PC-Xware emulates the middle mouse button when the PC mouse has only two buttons. Many applications need three buttons, while many PCs provide only a two-button mouse.<br>Choose one of these:<br>**Enabled**: (default) Emulate the middle mouse button. Pressing both mouse buttons at the same time sends the same signal as pressing the middle button on a three-button mouse.<br>**Disabled**: Does not emulate the middle mouse button. X applications detect only the left and middle buttons on a two-button mouse. |
| Allow Old X Server Bugs | Specifies whether to bypass error checks on requests accepted under previous X releases.<br>Some X applications are based on versions of the X Window System that contained bugs which have since been fixed. Fixing some of these bugs makes some functions in these applications inoperative.<br>Choose one of these:<br>**Enabled**: (default) Bypass error checks. Ensures backward compatibility with X applications based on earlier versions of the X Window System by allowing those bugs to persist in the PC-Xware code. This is the recommended value.<br>**Disabled**: Do not bypass error checks. Choose this value if you are developing X applications and want to verify that they work strictly with the latest version of X Window System code. |

| Option | Description |
|---|---|
| MWM Focus Support | Specifies what window-stacking conventions to use when a Motif window manager runs. Choose one of these:<br>**Disabled**: (default) Treat Microsoft Windows and Motif windows as separate groups when raising and lowering overlapping windows. Raising a window brings it to the foreground over other windows in that group, but not over overlapping windows from the other group.<br>**Enabled**: Put Microsoft and Motif windows in the same window stack. Raising a window brings it to the foreground over all windows on the screen. |

## Configuring PC-Xware Startup Options

To customize the settings used by PC-Xware when it starts, choose the **Configure → Startup → Options** tab. Options on this tab include:

| Option | Description |
|---|---|
| Network Audio | Disables (default) or enables audio data transmissions across the network connection. When enabled, PC-Xware uses TCP socket 8000 for transmissions.<br>**Note:** The Network Audio System incorporated into PC-Xware requires a Microsoft Windows Wave sound device and driver. Network audio is available only for network connections. It is not available in the PC-Xware Remote (serial only) product. |
| Remote Configuration | Disables (default) or enables remote configuration of PC-Xware through the PC-Xware Configuration daemons that use TCP/IP (***telnet*** and TCP) and DECnet ports.<br>For more information, see the *PC-Xware System Administrator's Guide* and the *PC-Xware Configuration Reference Guide.* |
| Host rsh Access | Enables (default) or disables the TCP/IP port that allows ***rsh*** startup of local X applications or Microsoft Windows programs. |

| Option | Description |
|---|---|
| Report Messages | Disables (default) or enables application error messages reporting to PC-Xware. When enabled, a message displays when an application error occurs.<br>**Note:** This option applies only to X applications started through ***rsh*** or ***rexec*** connections. |
| Display Startup Banner | Enables (default) or disables displaying the PC-Xware banner each time PC-Xware starts. |
| XRemote over TCP/IP | Allows PC-Xware to initiate an X connection over a serial network (for example, a serial line using PPP). When enabled, you can connect to your host using a PC-Xware TCP/IP connection method (**telnet**, **rlogin**, **rsh**, or **rexec**) and on the host, run the **xinitremote** command with the following options:<br>`xinitremote -- -inet` |
| Use IP Address Instead of Name | Turn this field on if your PC uses an automatic method (DHCP or PPP Dialup Router) to obtain an IP address. |
| Local X Defaults | Determines if PC-Xware reads the local X resources file, that specifies X resources.<br>X resources are configuration options for an X application or a set of X applications. For example, PC-Xware's terminal emulator, NCDterm, has a status line that you configure through the X resource:<br>`NCDterm.StatusLine: false`<br>**Note:** Use your host ***xrdb*** application to load X resources when using ***xdm*** or session managers such as the DECwindows session manager. These session managers remove all resources in the X server when they start.<br>Options include: |
| Enable Local X Defaults | Choose one of these:<br>**Disabled**: (default) The local X resources file, **xdefault**, is not read.<br>**Enabled**: Instructs PC-Xware to read local X resource information from the **xdefault** file.<br>The next time you start PC-Xware, **xdefault** provides X resource information. |

| Option | Description | |
|---|---|---|
| | Edit X Defaults | Opens **xdefault** in an editor so you can change the file's contents.<br>The default **xdefault** file contains sample resources for PC-Xware's terminal emulator (NCDterm) and NCD window manager (NCDwm). Comments begin with an exclamation mark (!). To activate a resource, remove the exclamation mark. |
| Edit X Startup Commands | Specifies or changes X server commands (that invoke local X applications) you want to execute each time you start PC-Xware.<br>Examples include the local Microsoft window manager (***mswm***), the local NCD window manager (***wm***), and the selection client (***select***), which allows copy and paste operations. Options include: | |
| | Startup Commands: | Adds X server commands you want to execute each time PC-Xware starts to the **Current Startup Commands:** list. |
| | Current Startup Commands: | Lists X server commands that execute each time you start PC-Xware. |

# Configuring PC-Xware Startup Desktop

To control the way X applications display on the PC, choose the **Configure → Startup → Desktop** tab. Options on this tab include:

## On the Desktop

Selecting this option means X applications and Windows applications display together on the Microsoft Windows desktop.

| Option | Description | |
|---|---|---|
| Initial Window Manager | Identifies the window manager you want PC-Xware to use. A window manager controls the look and behavior of borders around X applications, as well as mechanisms for changing size and location of windows.<br>Choose one of these: | |
| | Microsoft | (Default) Gives borders the look and feel of the Microsoft Windows user interface. |
| | NCDwm | Gives borders a Motif interface look and feel. |
| | None | Provides no borders. Windows cannot be moved or resized. Choose this option if you plan to use a remote window manager, such as ***mwm*** (Motif Window Manager), ***twm***, or ***olwm*** (Open Look Window Manager) from your host machine. |

## In a Single Window

When you select this option, all X applications display in a single, fixed-size window. This window, called the X screen, may be larger than the physical screen. To see portions of an off-screen X application, move the mouse the direction of the hidden X application.

| Option | Description | |
|---|---|---|
| Initial Window Manager | Identifies the window manager you want PC-Xware to use. A window manager controls the look and behavior of borders around X applications, as well as mechanisms for changing size and location of windows.<br>Choose one of these: | |
| | Microsoft | This window manager is not available when X applications run in a single window. |
| | NCDwm | (Default) Gives borders a Motif interface look and feel. |
| | None | Provides no borders. Windows cannot be moved or resized. Choose this option if you plan to use a remote window manager, such as ***mwm*** (Motif Window Manager), ***twm***, or ***olwm (***Open Look Window Manager) from your host machine. |
| Window size (pixels) | Specifies the height and width, in pixels, of the X screen. The default is the physical size of your screen | |
| Provide Scroll Bars | Specifies the size of the X screen. Choose one of these:<br>**Enabled**: (default) Displays the X screen in a window with scroll bars. To see portions of the X screen currently hidden from view, click the scroll bars at the bottom and right side of the X screen's window.<br>**Disabled**: Displays the X screen without scroll bars. Move the mouse in the direction of hidden items to pan them onto the screen. | |

# Defining Connection Choices

PC-Xware lets you create databases of frequently used host names, X applications, phone numbers, modem types, and login scripts. These database entries are then available when you build (**Start → Build**) or modify (**Start → Change**) connections.

PC-Xware lets you create and modify these databases through the **Edit** tab and the subtabs beneath it. This section describes the settings you can change through these tabs.

**Note** Many of these tabs use the same input and feedback mechanisms, such as list boxes, text entry boxes and choice (**Add**, **Delete**, and **Change**) buttons.

**Note** The following assumes you are familiar with these mechanisms and does not explain features identical on all tabs. For more information about these mechanisms, read .

## Editing the Host List

To edit the list of available hosts, choose the **Edit → Hosts** tab. Options on this tab include:

| Option | Description |
|---|---|
| Host: | Specifies the host name you want to retain. |
| Host List: | Displays hosts currently in the database. |

## Editing the Application List

To edit the applications list, choose the **Edit → Applications** tab. Options on this tab include:

| Option | Description |
|---|---|
| Application: | Specifies the application name you want to retain. |
| Application List: | Displays application names currently in the database. |

## Editing PC-Xware Defaults

You can specify defaults to use automatically each time you start PC-Xware or build connections. To set or modify these defaults, choose the **Edit → Defaults** tab. Options on this tab include:

| Option | Description |
|---|---|
| Default Host: | Lists host machines from which to choose a default. This name displays in the **Host Name** box when you build a new connection. |
| Default User Name: | Specifies the default user login name. This name displays in **rlogin**, **rsh**, **rexec**, **Session** and **Launch** tabs when you build a new connection. |
| Default Application Path: | Specifies the default application path. This path is automatically prefixed to path specified in the ***rsh*** and ***rexec*** **Start → Build → Application** text box. The default is:<br>`/usr/bin/X11` |
| Append Display Name to Applications | Determines whether a display name is automatically inserted in the ***rsh*** and ***rexec*** **Start → Build → Application** text box. The default is:<br>`-display PC_Name:0`<br>Where `PC_Name` is the IP name or address of your PC. |
| Default Font Server Port: | Specifies the default font server port number. The initial default port number is 7100. |

## Editing the Phone Book

You can maintain a list of phone numbers to initiate serial connections over a modem. One way to edit this phone list is by choosing the **Edit → Phone Book** tab. Options on this tab include:

| Option | Description |
|---|---|
| Description: | Describes a specified phone number. Often used to record the location the phone number reaches. |
| Phone Number: | Specifies the phone number you want to modify. You can select a number from the **Phone Book:** list or key it in. |
| Phone Book: | Lists currently known phone numbers. |

You can also edit the phone book while building a serial connection:

1. Select **Build New Connections → Serial**. (Chapter 2 discusses how to build various connections types.)
2. Select the **Edit...** option. The Edit menu displays.
3. Choose **Phone Boo**k. The **Phone Book** dialog displays, which contains the same elements as the **Edit → Phone Book** tab described above.

## Editing the Modem Setup

You can create and modify a list of modem types and associated modem commands available to establish serial connections. One way to do this is by choosing the **Edit → Modem** tab. Options on this tab include:

| Option | Description | |
|---|---|---|
| Modem Type: | Specifies the modem type you want to modify. | |
| Available Modem Types: | Displays modem types currently defined for establishing serial connections over a modem. (The "direct" modem type has no associated commands.)<br>It assumes a direct serial line from the PC to the host. | |
| Modem Strings | Sets up modem commands that PC-Xware automatically sends as part of the serial connection process: | |
| | Initialization | Specifies commands that control modem functions. PC-Xware provides default initialization strings that establish these recommended settings:<br>• Compression: off. Important if you run X applications through Xremote on the serial line.<br>• Error correction: on. Important if your modem's baud rate is 9600 baud or greater.<br>• Data rate: fixed.<br>• Hardware flow control: on.<br>• Software flow control: off. |

| Option | Description | |
|---|---|---|
| | Dial Prefix | Specifies whether to use touch tone or pulse dialing when initiating a serial connection through a modem. The dial prefix is sent with the phone number specified in the serial connection attempt. |
| | Hangup: | Specifies the standard hangup command. The hangup string is sent to the modem when the serial connection window terminates. |

You can also edit the modem list while building a serial connection, as follows:

1. Select **Build New Connections → Serial**. (Chapter 2 discusses how to build connections of various types.)
2. Select the **Edit...** option. The Edit menu displays.
3. Choose **Modem**. The the **Modem** dialog displays, which contains the same elements as the **Edit → Modem** tab described above.

## Editing Login Scripts

For information about login scripts, see "Creating and Editing Scripts" beginning on page 5-7.

# Setting Up XDM Connections

**Note** ***xdm*** connections are not available in the PC-Xware Remote (serial only) product.

***xdm*** connections have a number of customizable features that PC-Xware supports. To customize these features, choose the **Configure → XDM** tab.

Options on this tab include:

| Option | Description | |
|---|---|---|
| Type of Query at Startup: | Determines whether, and how extensively, you want PC-Xware to search your network for available hosts upon invocation. (See “Broadcasting for XDM Hosts” beginning on page 3-18.)<br>Choose one of these options: | |
| | None | Does not perform a host search. If you select this value, the **XDM Update** button on the **Start** tab is disabled. |
| | Direct | Sends a query for ***xdm*** availability to the host you specify in the **Direct or Indirect Host** (described below.) |
| | Indirect | Instructs a specified host to broadcast a query across the network for all available hosts. (See **Direct or Indirect Host** below.) |
| | Broadcast | (Default) Broadcasts a query across the network for all available hosts. Choose this value to connect to different hosts on different occasions, or see all machines on your network that can support ***xdm*** connections. |
| Direct or Indirect Host: | Specifies a host if you choose the **Direct** or **Indirect** option for **Type of Query at Startup.** | |
| Response to Query at Startup: | Controls how PC-Xware queries the network for hosts when it starts. Choose one of these options: | |
| | Prompt | (Default) Tells PC-Xware to put appropriate ***xdm*** entry(s) in the **Start** tab’s **Available Connection** list for you to select. |

| Option | Description | |
|---|---|---|
| | Use First | The effect of this option depends on the type of query you chose:<br>• If you chose **Indirect query** or **Broadcast query**, when you start PC-Xware or select **XDM Update** on the **Start** tab, PC-Xware connects to the first host found.<br>• If you chose **Direct query**, when you start PC-Xware or select **XDM Update** on the **Start** tab, PC-Xware initiates an ***xdm*** connection to the host displayed in the **Direct Host** or **Indirect Host** list box (described above). |
| Response to Session Ending: | Specifies PC-Xware's behavior when an ***xdm*** session terminates. Choose one of these options:<br>**Note:** The *controlling xdm application* refers to the last application started in your **.xsession** file or in the system-wide **Xsession** file. For more information see "Building an XDM Connection" beginning on page 2-9.) | |
| | Logout | Logs you out of the current ***xdm*** session and out of the host machine. |
| | Prompt | (Default) Asks whether you want to terminate any remaining X applications and the XDM session. |
| | Ignore | Maintains the ***xdm*** session without displaying any feedback to your terminal. |
| | Shutdown | Terminates PC-Xware. |
| XDM Authentication Key | Specifies the ***xdm*** authentication key. Unless instructed by your system administrator, leave this value unchanged.<br>**Note:** This option effective only if a host with which PC-Xware establishes an ***xdm*** connection uses ***xdm*** authentication. | |
| XDM Display Class: | Groups classes of ***xdm*** nodes. Unless instructed by your system administrator, leave this value unchanged. | |

| Option | Description |
|---|---|
| Restart local window manager after XDM login | Determines whether PC-Xware automatically restarts either local window manager after an ***xdm*** session begins.<br>When an ***xdm*** session starts, ***xdm*** terminates all X applications—including PC-Xware local window managers. With this option enabled, PC-Xware runs the window manager specified in **Configure → Startup → Desktop → Initial Window Manager** after an ***xdm*** session begins.<br>**Note:** Do not enable this option if you use HPVue. HPVue will not start if a window manager is running. |

You can also use one of these methods to restart the local window manager:

- Select PC-Xware's **File → Start Local Window Manager**.
- Start the window manager as part of the **.xsession** file used by ***xdm***. The **.xsession** file should contain a command similar to this:

```
PCNAME='echo $DISPLAY | cut -d: -f1'

rsh $PCNAME mswm # starts local MS Window Manager

- or -

rsh $PCNAME wm # starts local NCD Window Manager
```

On HP hosts, replace `rsh` with `remsh`. On SCO hosts, replace `rsh` with `rcmd`.

## Broadcasting for XDM Hosts

To initiate an ***xdm*** connection, hosts that support this connection type must be listed on the **Start** tab in the **Available Connections** list. Once listed, use the **Open** button to start the ***xdm*** session.

To find hosts available for ***xdm*** connections and put them in the **Available Connections** list, you must broadcast a query across the network:

1. Choose the **Configure → XDM** tab.
2. At the **Type of Query at Startup** prompt, choose the **Broadcast** option. This will make the **XDM Update** button on the **Start** tab active.
3. In the **Response to Query at Startup** box, choose the **Prompt** option.
4. Terminate and start PC-Xware.
5. Select **XDM Update** at the bottom of the **Start** tab. This lists any hosts available for an ***xdm*** connection in the **Available Connections** list.

# Changing Your PC-Xware Serial Number

PC-Xware provides a serial number for each copy of PC-Xware. When you start PC-Xware, it checks for a valid serial number.

PC-Xware also checks an internal authorization code to determine which PC-Xware features you can invoke, such as network connections and XRemote. These features are listed on the **View → Installation** tab.

To find the correct serial number and to use on your PC, check the following:

- The bottom of your PC-Xware box.
- Your PC-Xware Warranty card.
- The contents of the **xware.ini** file in your Microsoft Windows directory.
- Check with your system administrator.

To view or change a serial number or authorization code, choose the **Configure → Authorization** tab. Type the desired serial number into the edit box.

Serial number changes take effect the next time PC-Xware starts.

# Chapter 4

# PC-Xware Features

This chapter provides information about:

- Viewing Status and History
- Copy and Paste operations between Microsoft Windows and X applications.

## Viewing Status and History

PC-Xware lets you view the status and history of events that occurred during the current session, as described below.

### Viewing Installation Details

To view details about the version of PC-Xware you are running, select **View → Installation**. This information displays:

| Option | Description |
|---|---|
| Version: | PC-Xware's release number. |
| Installed in: | Pathname to the *installation directory* (the directory into which your PC-Xware software was installed). |
| Environment: | The versions of DOS and Microsoft Windows running on your PC. |

| Option | Description |
|---|---|
| Screen: | The color format (8-bit color, 16-bit color, and so on), and dimensions of your display (for example, 1024 x 768). |
| Serial Number: | PC-Xware's serial number. |
| Authorized Features: | Optional extensions for your copy of PC-Xware. |
| Name | Name of the user. |
| Company | Name of the company. |
| Network Software: | The network software PC-Xware uses for inter-machine communications. |
| TCP/IP Address: | Your PC's internet protocol address. |
| DECnet | Your PC's DECnet protocol address. |

## Viewing Environment Status

To see how your PC allocates memory and information about currently established connections, select **View → Status**. This information displays:

| Option | Description |
|---|---|
| Started: | The time and date the current PC-Xware session started. |
| Memory: | Total and free memory statistics for your PC. |
| Resources: | Percentages of Microsoft Windows resources available for graphic display services and for application demands. |
| X Connections: | Number of current local and remote applications |
| Network Sockets Used: | Number and types of network sockets used by PC-Xware. |
| Current Font Path: | Pathnames of locations where PC-Xware looks for fonts requested by X applications. |

## Viewing PC-Xware History

To see all PC-Xware actions performed during the current session, select **View → Log**.

The log records codes and descriptions that identify status messages, errors and other events that occurred during a session. You can use this information to diagnose problems.

To record the **View → Log** information in a file, choose PC-Xware's **File → Save Log File**. For information on error messages, see Appendix A, "Error and Status Messages".

# Copy and Paste

The X Window System provides several ways to transfer text and graphics between applications. Microsoft Windows provides the Windows clipboard for transfer operations. PC-Xware can make the two methods work together so you can exchange text and graphics between X and Windows applications.

Ideally, you can select text and graphics in an X application, and a Windows application's paste facility knows where to access it, and vice-versa. However, if a paste in either direction fails, you can use PC-Xware's **Copy and Paste** facility to ensure the target application finds and pastes the copied material.

To access PC-Xware's copy and paste options:

1. Display PC-Xware's **Control** menu using one of these methods:
   - Click the **Control** menu button at the left end of the PC-Xware title bar.
   - If PC-Xware is running and is iconified, click the PC-Xware icon.
2. Click the **Copy and Paste** item at the bottom of the **Control** menu. The **Copy and Paste** menu displays.

The **Copy and Paste** menu includes these options:

| Option | Description |
|---|---|
| Copy from X Selection to Clipboard | Copies text or graphics from an X selection to the Microsoft Windows clipboard so you can paste it into a Windows application.<br>An X selection is an area of memory that holds data for transfers between applications. |
| Paste from Clipboard to X Selection | Pastes text or graphics from the Windows clipboard into an X selection so it can be pasted into an X application. |
| Copy Rectangle to Clipboard | Copies a rectangular region of the display to the Windows clipboard. After choosing this option, move the cursor to a corner of the area you want to copy. Press and hold the left mouse button. Drag the mouse to outline the region you want, then release the mouse button.<br>The outlined area is copied to the Windows clipboard and can be pasted into any Windows application or into an X selection. |
| Copy Window to Clipboard | Copies the specified window to the Windows clipboard. After choosing this option, move the cursor to the window you want to copy. Click the left mouse button.<br>The window is copied to the Windows clipboard and can be pasted into any Windows application or into an X selection. |
| Copy Rectangle to Printer | Copies a rectangular region from the display to the default printer. After selecting this option, move the cursor to anywhere within the window you want to copy, then click the left mouse button. The window's contents are copied to the default printer.<br>**Note**: Requires a default printer be set up in Windows.<br>After copying, PC-Xware prompts you to size the image. |
| Copy Window to Printer | Copies the specified window to the default printer. After selecting this option, move the cursor to anywhere within the window you want to copy, then click the left mouse button. The window's contents are copied to the default printer.<br>**Note**: Requires a default printer be set up in Windows.<br>After copying, PC-Xware prompts you to size the image. |

| Option | Description | |
|---|---|---|
| | To size images obtained from **Copy Rectangle to Printer** or **Copy Window to Printer**, select one of these options: | |
| | Best Fit: | Sizes the image to fit the page horizontally, retaining the image's proportions. |
| | Fit to Page: | Sizes the image to fit the page. |
| | WYSIWYG: | Prints the document at its current size.<br>If the selected rectangle or window is larger than the printer's maximum, the image is clipped to the printer's vertical or horizontal maximum size. |
| | Custom Dimensions: | Sizes the image to the size you specify in the **Full Page**: box. The default is the largest size that will fit on the page.<br>If you do not enter numbers in the **Full Page**: box, the image prints at the maximum size the printer allows.<br>If you enter dimensions that are larger than the printer's maximum, the printed image is clipped at the printer's maximum size. |
| X Selections | Displays a submenu of options designating alternate X selections in which to store text or graphics for transfer between applications. These are as follows: | |
| | None | No X selection holds text and graphics for transfer operations.<br>Choosing this option means you cannot copy and paste between X and Windows applications. |
| | Primary Selection | (Default) Used by many X applications, including terminal emulators. |
| | Secondary Selection | A standard alternate to the primary selection. |

| Option | Description | |
|---|---|---|
| | Clipboard | The X System clipboard (used by many Open Look applications). |
| | Cut Buffer 0 (through) Cut Buffer 7 | Eight alternate buffers in which to store text and graphics. |
| | Custom... | Specifies the custom X selection to use for text and graphics transfers. Select this option only for applications that have a special transfer method defined within it. |

# Chapter 5

# Terminal Emulation

This section describes the PC-Xware terminal emulator features that you can control.

## Terminal Emulation

PC-Xware starts a terminal emulator when it connects to a host using ***serial***, ***telnet***, ***rlogin***, ***Lat***, or ***Cterm***.

The terminal emulator emulates a standard ASCII terminal in one of these modes:

- VT320
- VT220
- VT100
- XTERMS

You can open as many as eight local terminal emulator windows at a time on your screen, depending on available PC memory and the number of network connections configured in the PC network software.

## Configuring Your Terminal

Certain connection types (serial, ***telnet***, ***rlogin***, ***Lat*** and ***Cterm***) invoke a terminal emulation program that makes the host windows on the PC behave like windows on an actual terminal. The **Configure → Terminal** tab lets you control the following characteristics of the terminal emulator:

| Option | Description | |
|---|---|---|
| Terminal Reported: | Specifies the terminal type PC-Xware reports to the host when the terminal emulator starts. It modifies the terminal emulation environment on the host to respond to the terminal type you select at this prompt: | |
| | VT320 | (Default) VT320 terminal emulation. |
| | VT220 | VT220 terminal emulation. |
| | VT100 | VT100 terminal emulation. |
| | XTERMS | XTERMS terminal emulation. |
| | Use X resource | The NCD X resource set in the **Configure → Startup → Options → Local X Defaults** tab defines terminal reported. |
| Terminal Cursor Type: | Specifies the terminal cursor type used by the terminal emulator (for example, Hatched.) | |
| | Use X resource | The NCD X resource set in the **Configure → Startup → Options → Local X Defaults** tab defines the terminal cursor type.<br>The default cursor type is solid block. |
| Backspace Key: | Determines how the terminal emulator responds when you press the backspace key: | |
| | Del | Pressing the Backspace key sends the DEL character to the host machine. The result is host-dependent. |
| | BS | (Default) Pressing the Backspace key sends the BS character to the host machine. The result is host-dependent. |

| Option | Description | |
|---|---|---|
| | Use X resource | The NCD X resource set in **Configure → Startup → Options → Local X Defaults** defines the backspace key. |
| Font Size: | Specifies the size of text displayed in the terminal emulation window on the PC: | |
| | Small | Displays 10.5 point type. |
| | Large | (Default) Displays14 point type. |
| | Jumbo | Displays18 point type. |
| | Use X resource | The NCD X resource set in **Configure → Startup → Options → Local X Defaults** defines the point size. |
| Scroll Bar: | Left | Displays scroll bar on the left. |
| | Right | (Default) Displays scroll bar on the right. |
| | None | Does not display a scroll bar. |
| | Use X resource | The NCD X resource set in **Configure → Startup → Options → Local X Defaults** defines the scroll bar. |
| Scroll Buffer Size: | Specifies the number of text lines the scroll buffer can accommodate. The maximum size is 9999; the default is 500. | |
| DEC Prefix | Determines how to format the terminal type sent to the host. Choose one of these:<br>**Enabled**: Adds a dec- prefix to either the VT320, VT220, or VT100 terminal type sent to the host. Some systems require this prefix.<br>**Disabled**: (Default) Does not add a prefix. | |
| 132 Column Mode | Determines how many characters display in a column. Choose one of these:<br>**Enabled**: Displays text in a 132-column wide mode.<br>**Disabled**: (Default) Displays text in an 80-column wide mode. | |

| | |
|---|---|
| Auto Line Wrap: | Determines what text does when it reaches the right edge of the window. Choose one of these:<br>**Enabled**: (Default) Text wraps to the next line down.<br>**Disabled**: Text continues on the same line. |

## Terminal Emulator Menus

When a terminal emulator is running, you can control its appearance and other actions by using options on the menu bar at the top of the window. The menu options are described below.

Using the scroll bar on the side of the terminal emulator window, you can review the transcript of input and output that occurred during the terminal emulator session.

### File Menu

The **File** menu includes these options:

| Menu Item | Action |
|---|---|
| Redraw | Redraws the contents of the Terminal Emulator's display window. |
| Soft Reset | Resets the Terminal Emulator to the default state. |
| Hard Reset | Resets the Terminal Emulator to the default state, deletes all content, and clears all selections. |
| Close Connection | Closes the current Terminal Emulator session. |
| Open Logfile/Close Logfile | Opens a log file named **ncdterm.*n***, and records interactions with the terminal emulator.<br>Once a logfile is opened, the menu item becomes |

| Menu Item | Action (Continued) |
|---|---|
| Send Break | Sends the “break” character to the host. Often used to alert the host that new data is coming. |
| Exit | Exits the Terminal Emulator session. |

## Edit Menu

Controls copying and pasting to and from the Windows clipboard. See “Copy and Paste” on page 4-3 for information on copying and pasting. The following table summarizes the action of the items in the **File** menu.

| Menu Item | Action |
|---|---|
| Copy | Copies the currently selected text to the Windows Clipboard. |
| Paste | Pastes the contents of the Windows Clipboard into the terminal emulator beginning at the cursor location. |

## Options Menu

Changes terminal mode settings while the Terminal Emulator is running. The options are all toggles: checkmarks enable the options. The following table summarizes the **Options** menu modes.

| Menu Item | Action When Set |
|---|---|
| Jump Scroll | Enables the Terminal Emulator to add lines to the screen quickly. |
| Reverse Video | Reverses the Terminal Emulator’s foreground and background characteristics (for example, if your Terminal Emulator displays dark characters on a light background, reverse video displays light characters on a dark background). |
| Visual Bell | Uses flashing instead of an audible bell. |
| Auto Wraparound | Displays on the next line characters typed after the cursor reaches the right border of the page.<br>When disabled, characters typed after the end of the line do not display on the screen. |

| Menu Item | Action When Set (Continued) |
|---|---|
| Reverse Wraparound | Allows the cursor to wrap from the leftmost column on the line to the rightmost column of the previous line, thereby allowing you to backspace to the previous line. |
| Auto Linefeed | Generates a linefeed automatically. For use with programs that generate carriage returns without dropping down a line on the screen. |
| Application Cursor Mode | Generates ANSI escape sequences rather than standard cursor movements when you use arrow keys. |
| Application Keypad Mode | Generates control functions rather than numeric characters when you use the keypad. |
| Local Flow Control | Software control of data flow (to avoid the loss of data) over a serial connection (xon/xoff). |
| Strip Parity | Tells the Terminal Emulator to strip out one parity bit, so that it is operating in 7-bit parity mode. |
| Blink Cursor | Specifies that the cursor should blink. |
| Visible Status Line | Displays a 25th line at the bottom of the Terminal Emulator window. Applications running in the Terminal Emulator window use this line to display status information. |

## Fonts Menu

Changes the Terminal Emulator's display font dynamically. The choices available through the **Fonts** menu include:

- Default
- Small (10.5 point)
- Large (14 point) (default)
- Jumbo (18 point)

When you change the font size by toggling an option in the **Fonts** menu, the window size changes automatically to accommodate the new font.

**Note** Although changing the font size automatically changes the **Terminal Emulator** window size, changing window size does not change the font size.

### Help Menu

The **Help** menu provides help on the contents of the PC-Xware Terminal Emulator.

## Configuring Color for Your Terminal

From the **Start** tab, select **Build**. Select your terminal emulation connection type (***serial, telnet, rlogin, Lat, Cterm***) and select **Edit**. This button allows you to change the foreground and background colors on your terminal.

Once a connection is created and displays in the **Start** tab's **Available Connections** list, color can also be changed from the **Start → Change** terminal emulation tabs.

# Login Scripting

Login scripting automates remote logins when using PC-Xware's terminal emulation program. You can use login scripting with PC-Xware's ***serial, telnet***, ***rlogin***, ***Lat***, and ***Cterm*** connections. This is a useful tool if you always perform such logins the same way.

A login script is a file that consists of a set of login commands, arranged to perform the login tasks you specify each time you log in to a remote host. You can create, delete, or edit a script file using any Windows text editor.

The rest of this section explains how to create login scripts and describes each login scripting command available in PC-Xware. It also provides examples of login scripts using these commands.

## Creating and Editing Scripts

To create a login script:

1. Select the **Edit → Scripts** tab.
2. Type the name of your script file into the **Script Name** list box. PC-Xware appends a **.xsc** extension to script file names.
3. Select **Add...** and a Windows editor opens.

4. Enter your script commands.
5. Save the file via **File → Save**. Files are saved in the **USER** directory below the main PC-Xware directory.

**Note** If you choose the **File → Save As...** option, you must use the **.xsc** extension and you must save the file in the **USER** directory.

The **Edit → Scripts** tab includes these options:

| Option | Description |
|---|---|
| Script Name: | Specifies the name of the login script you want to affect. |
| Available Scripts: | Displays the names of login scripts. |
| First Line of Script: | Displays the first line of the script currently selected in **Available Scripts**. |
| Add... | Creates a new login script and makes it available to PC-Xware.<br>If you specify the name of a new script in **Script Name:** and select this option, a Windows editor opens a text file of that name for you to edit and save. It also adds that script name to **Available Scripts:**. |
| Delete... | Deletes the selected script from **Available Scripts**. |
| Change... | Modifies an existing login script.<br>If you select one of the items in **Available Scripts:**, then select this option, a Windows editor opens that file for you to modify and save. |

You can also create login scripts using any Microsoft Windows compatible editor:

1. Create the file in the user directory below the main PC-Xware directory.
2. Use **Edit → Scripts** to make the Script Name known to PC-Xware. Be sure to use a **.xsc** extension on your script file for PC-Xware to recognize the file.

Login scripts can also be created within the terminal emulation connection window where the script will be used. For example, **Start → Build → TCP/IP → telnet → Edit → Scripts** allows you to create a script and attach it to a ***telnet*** connection.

# Login Script Commands

## Case Sensitivity

Be aware of case-sensitivity when specifying text string arguments to some of these commands. The `waitfor` command is the only command that receives text strings from the host machine. The `waitfor` *`string`* must exactly match the string, including case, sent by the host.

All other commands that have text string arguments send their strings to the host machine. For these commands, case-sensitivity depends on the host machine. Typically, host machines running UNIX operating systems are case sensitive, whereas machines running VMS operating systems are not.

## alarm

Sounds the alert tone on your PC. You might use this command to indicate when connection is established between your PC and the host.

## break

Sends a `break` signal to the host. Some computers use the `break` signal as an attention character on a serial line. (The `break` signal has limited use in scripts for network connections.)

## command *string*

Sends the specified string. Use this command for modem control. Thus, the string specified must be a command recognized by a modem.

Use this command to request pauses between characters in commands sent to modems. For faster communications to devices other than modems, use the `transmit` command.

**Note** Even though the PC communicates with a host *through* a modem, you can use the `transmit` command to send commands directly to the host once the connection is established.

### pause *number*

Makes the PC wait the specified number of seconds before executing the next command. Some actions require a pause. For example, if you send commands that take the host several seconds to execute, you can use the `pause` command to make the PC wait for the host to catch up.

### prompt *string*

Displays a dialog box with the specified string as a prompt, then transmits the input the user enters at the prompt.

### transmit *string*

Sends the specified string as fast as possible, with no pauses between characters. This command does not work well for sending commands to modems. Use `command` instead.

### waitfor *string int*

Makes the PC wait the specified number of seconds for the string to be received from the host. If, after waiting the specified interval, this message is not received, the PC times out (that is, the login script aborts) and the PC-Xware **View → Log** window displays this message:

```
Script Reader: Waitfor timeout
```

## Login Script File Examples

The following script file examples show how to create a script. If you use these examples as a base for your script, be sure to modify all areas that will differ in your environment. For example, login and password prompts, hosts names, and user names.

## Example: Direct Dial-In

This script initializes a Hayes modem and dials into a Host machine. Since the script file initializes and dials the modem, keep the following in mind when creating the serial connection:

- Set the **Build New Connection → Serial → Modem:** entry to **direct**.
- Enter no **Phone Number**.

**Direct Dial-In Script**

```
pause 2
command "ATQ0V1E1S0=0\r" ;; Initialize the modem.
command "ATDT9,555-5555\r"; Dial the host.
waitfor "login: " 60 ; Wait for login banner.
transmit "bob\r"; Login as bob.
waitfor "word:" 60 ; Wait for password prompt.
prompt "Hood Password"; Prompt user for password.
```

**Note** The `\r`, a standard escape character, designates a carriage return. Semicolons precede comments (shown in these examples on the right side of lines).

This script instructs the PC to:

1. Wait 2 seconds, initialize the modem, then dial into the host, “hood”.
2. Wait up to 60 seconds for hood to transmit a login prompt back to the PC.
3. After receiving the login prompt, send the username “bob” to the host, then wait for hood to send a password prompt.
4. After receiving the password prompt, display a dialog box with the prompt “Hood Password”.

The user then enters a password and login completes.

## Example: Terminal Server Login

This script directs the PC to log in to a host over telephone lines through a terminal server. The modem initialization and dialing is defined in the serial connection and performed automatically.

**Terminal Server Login Script**

```
pause 2
waitfor "word: " 60 ; Wait for password prompt.
prompt "Cisco Password"; Send a Cisco password.
pause 1
transmit "hood\r"; Connect to host "hood."
waitfor "login:" 60
transmit "bob\r"; Login as bob.
waitfor "word:" 60
prompt "Hood Password"; Prompt for password.
```

This script instructs the PC to:

1. Wait 2 seconds for modem dialing to complete.
2. Wait up to 60 seconds for the terminal server to provide a password prompt.
3. After receiving the password prompt, display a dialog box with the prompt **Cisco Password**.

The user then enters the terminal server password and login completes.

## Example: Require a Callback

In this example, the login script requires the host to call back and give permission to log in. The modem initialization and dialing is defined in the serial connection and performed automatically.

**Require a Callback Script**

```
pause 1
waitfor "username:" 20
transmit "hood\r"; Send user name response.
waitfor "word:" 20
```

```
prompt "Group Password"; Prompt for group password
pause 2
command "ath\r"; Hangup.
pause 1
waitfor "RING" 60; Host calling back. Modem
   ;  sends tone signal to PC.
command "ata\r"; Answer the phone.
waitfor "name:" 20
transmit "bob\r"; Send user name.
waitfor "word:" 20
prompt "Login Password";Prompt for password.
```

## Example: Telnet

This example is for a ***telnet*** session. It tells the host to open an EMACS window on the PC running PC-Xware.

**Telnet Script**

```
pause 1
transmit "bob\r"; Login as bob.
waitfor "word:" 20
prompt "Hood Password\r"; Prompt for password.
waitfor "hood(1)" 20; Wait for user's host shell prompt.

transmit "xemacs -DISPLAY bobs_pc:0 >& /dev/null\r"
   ; Start emacs on the user's pc.
waitfor "hood(2)" 20; Wait for user's host shell prompt.
transmit "exit\r"; Logout from host.
```

## Login Script Restrictions

Note the following caveats when you build login scripts.

| Feature | Caveat |
|---|---|
| Max. line length | 80 characters. |
| Max. string length | 50 characters.<br>You can surmount this restriction by continuing a single statement on multiple lines with consecutive `transmit` commands. For example:<br><br>`transmit “xemacs -i -display bobs_pc:0”`<br>`transmit “-fg white -bg black”`<br>`transmit “-font 6x13 &\r”` |
| Max. commands per file | 75 |
| “command” statement | Send characters at the rate of one character per 155 ms. |
| Sending non-printable characters to host | Use either:<br>• The numeric decimal code for the character, preceded with a backslash (\).<br>• An escape character (described below). |

To send non-printable characters, use the standard C escape characters listed in the Alpha Code or Numeric Code column in the following table. For other non-printable characters, use a backslash (\) followed by the decimal value of the character.

| Meaning | Alpha Code | Numeric Code |
|---|---|---|
| back space | \b | \8 |
| form feed | \f | \12 |
| line feed | \n | \10 |
| carriage return | \r | \13 |
| tab | \t | \9 |
| vertical tab | \v | \11 |

# Chapter 6

# Local Window Managers

This chapter describes the two local window managers available in PC-Xware: Microsoft Windows Window Manager and NCD Window Manager.

If you use a window manager from your host machine, such as ***mwm*** (Motif Window Manager) or ***olwm*** (Open Look Window Manager), you can still use it with PC-Xware. See the window manager's own documentation for usage instructions. To use these "remote" window managers with PC-Xware, you must start PC-Xware without a local window manager running. See "Disabling the Window Manager" on page 6-3 for instructions.

**Note** When ***mwm*** runs from your host to your PC, ***mwm*** knows only about the X windows on the screen. It has no knowledge of Microsoft Windows. Thus, using a window manager to raise or lower an X window only raises or lowers it within the stack of X windows. PC-Xware attaches a **Lower** option to all system menus. To lower Microsoft Windows beneath X windows, select **Lower** from any Microsoft Windows system menu.

**Note** To inform ***mwm*** about Microsoft Windows and raise or lower X Windows within the entire stack of windows on your screen, set the **Configure → X Server → Settings → MWM Focus Support** flag.

# Microsoft Windows Window Manager

The Microsoft Windows Window Manager (***mswm***) allows you to run each of your X Window System applications in its own Microsoft window.

In general, windows managed by the Microsoft Windows Window Manager behave and are manipulated just like any other Microsoft Windows window; however, the X Window System provides a means for clients to make hints to the window manager. Hints express the X application's preferences about how it wants the window manager to treat its top-level window. The Windows window manager honors hints that make sense in the Microsoft Windows environment.

Windows are sized and placed according to the X application's specifications, as nearly as possible. The Microsoft window title bar is always visible, even if it means overriding the client's position request.

When the user attempts to resize the Microsoft window, ***mswm*** honors the X application's size constraints and does not allow the window to become smaller or larger than the client specifies.

## Enabling the Window Manager

**Note** You can select a new window manager from the **Configure → Startup → Desktop → Initial Window Manager** menu, but NOT for the current PC-Xware session. The new window manager is enabled the NEXT time you start PC-Xware.

The Microsoft Window Manager is on by default. If you turn it off and need to enable it at a later date, select **Configure → Startup → Desktop**. Then select Microsoft in the **Initial Window Manager** menu. The Microsoft Windows Window Manager will be enabled the next time you start PC-Xware.

## Disabling the Window Manager

To disable the PC-Xware local window manager and run a "remote" window manager from your host, select **Configure → Startup → Desktop**. Then select **None** in the **Initial Window Manager** menu. No local window manager will start the next time you start PC-Xware.

## Activating a Window

***mswm*** follows Microsoft Windows' "point and click" focus policy and gives input focus to the client's top-level window when it is activated.

## Icons

Icons in Microsoft Windows are 32x32 pixels. ***mswm*** uses the pixmap requested by the X application for its icon and uses the entire application icon region for icon selection. If the X application icon is smaller than 32x32, then the pixmap is tiled into the allowable 32x32 area.

For more information on basic elements of windows under the Microsoft Windows Window Manager, see the *Microsoft Windows User's Guide*.

# NCD Window Manager (*ncdwm*)

The most common function of a window manager is to move and resize windows. The NCD Window manager provides additional operations through the use of a root menu.

## Enabling the Window Manager

**Note** You can select a new window manager from the **Configure → Startup → Desktop → Initial Window Manager** menu, but NOT for the current PC-Xware session. The new window manager is enabled the NEXT time you start PC-Xware.

To enable the NCD Window Manager from PC-Xware, select **Configure → Startup → Desktop**. Then select **NCDwm** in the **Initial Window Manager** menu. The NCD Window Manager is enabled the next time you start PC-Xware.

## Disabling the Window Manager

To disable the PC-Xware local window manager and to run a "remote" window manager from your host, select **Configure → Startup → Desktop**. Then select **None** in the **Initial Window Manager** menu. No local window manager will start the next time you start PC-Xware.

## Starting Local X Applications

NCDwm allows you to start PC-Xware's local X applications using a root menu.

**Note** By default, the right mouse button displays the ***ncdwm*** root menu.

To display the root menu:

1. Place the mouse pointer anywhere on the root (background) window.
2. Press the middle or the right mouse button; the root menu displays and remains until you either select one of the menu items or press any mouse button.

**Note** All references to mouse buttons in this document assume that the default (right-handed, three-button) mouse mapping is in effect. Left-handed mapping is the reverse of the default: the left button is logical button 3, the middle button is logical button 2, and the right

The default root menu lists local X applications that execute when you select them with your mouse. The menu then disappears and ***ncdwm***'s "Launcher" facilities start the selected application.

To close the root menu without selecting an item, place the pointer outside the root menu and press any mouse button.

Default ***ncdwm*** root menu options include:

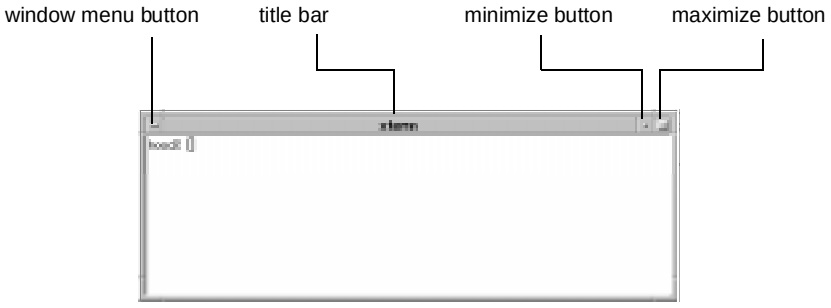
| Menu Option | Description |
|---|---|
| Show Console | Displays the PC-Xservices Console. See Appendix B, "PC-Xservices". |
| Start Terminal | Starts a VT320 terminal emulator session. |
| Show Version | Shows characteristics of PC-Xware. |
| Show Memory | Shows current memory usage. |
| Show X Connections | Shows clients connected to PC-Xware. |
| Show Host Names | Shows hosts known to PC-Xware's TCP/IP Name Service. |
| Lock Screen | Allows you to lock your PC screen. |
| Setup User Preferences | Displays the PC-Xservices Preferences screen. |
| Login | Starts an XDM session. |
| Logout | Ends an XDM session. |
| Exit NCDwm | Stops the NCD local window manager. |

The PC-Xware Remote (serial product only) root menu contains:

- Show Console
- Start Terminal
- Show Version
- Show Memory
- Show X Connections
- Lock Screen
- Setup User-Preferences
- Exit NCDwm

## Using the Window Manager

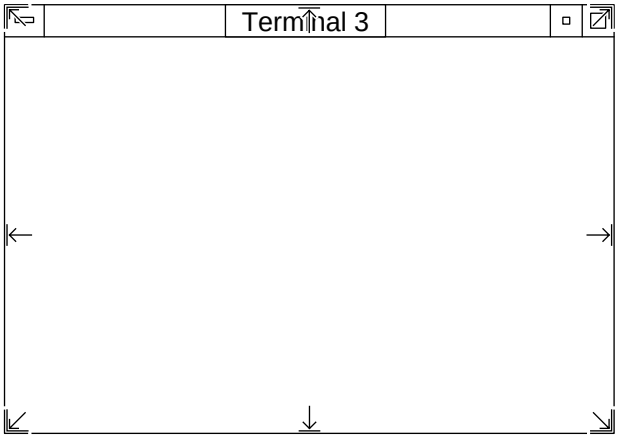
When the NCD Window Manager is running, each X application window is framed with the ***ncdwm*** frame. This figure shows an ***xterm*** window with the characteristic NCD Window Manager frame.




| Tool | Location | Function |
|---|---|---|
| Window menu | Left corner (dash) | Clicking displays a menu of window operations.<br>Double-clicking closes the window; in some cases, it stops the application. |
| Title bar | Top bar of the window frame | Contains the X application or host name. Clicking raises the window above or below other windows.<br>Clicking and dragging moves the window. |
| Minimize button | Right corner (small square) | Clicking iconifies the window. |
| Maximize button | Right corner (large square) | Clicking enlarges the window to a full screen or restores it to its original size if it has been enlarged. |

Many functions summarized above are described in detail later in this chapter.

The ***ncdwm*** frame is divided into eight parts: four sides and four corners. The parts, called resize handles, are defined by fine lines. Each resize handle represents a movable portion of the frame that you can use to change window size:




**Resize Handles**

## Activating a Window

When you have several open windows, you must activate a window to let the window manager know which window you want to work in. The NCD Window Manager has three methods, called focus policies, for activating windows.

| Focus policy | To activate a window... |
|---|---|
| Click-to-focus | Move the mouse pointer anywhere inside the window and press a mouse button. When you create a window, it is automatically activated. Click-to-focus is the default method. |
| Point-to-focus | Move the mouse pointer anywhere inside the window; you don't need to press a mouse button. |
| Explicit focus | Like click-to-focus, click in a window to activate it. Unlike click-to-focus, newly created windows do not automatically activate. |

To change the focus policy:

1. Select the **Configure → Startup → Options** tab.
2. Select **Edit X Defaults** to run a Windows editor in which the sample **xdefault** file is listed.
3. In Notepad, search for:

   `NCDwm.keyboardFocusPolicy:`

   Modify the current **keyboardFocusPolicy** entry by removing the comment character (!) from the front of the entry.

   Valid focus policy is one of these text strings:

   - `click`
   - `pointer`
   - `explicit`
4. In the editor, do a **File → Save**. Then exit the editor.
5. Check the **Enable Local X Defaults** checkbox so that the modified file is read the next time you start PC-Xware.
6. Exit and re-start PC-Xware.

## Pointers

The mouse pointer takes on different appearances, depending on the operation the window manager performs:

| Pointers | Name | Operation |
|---|---|---|
|  | Arrow | Displays when the pointer is on a window. This the most common pointer. |
|  | Root | Displays when the pointer is on the root window. Pressing a mouse button displays the root menu. |
|  | Crossed-arrow | Displays when you move a window. |
|  | Resizing | Displays as a window's size is altered. |
|  | Watch | Displays when the server connects to a host or performs a similar server function. You cannot use the mouse until a different pointer displays. |

## Moving Windows

1. Select the window using one of these methods:
   - Position the arrow pointer on the title bar of the window you want to move, then press and hold the left mouse button.
   - Click the Window menu button of the window you want to move, then select **Move**.
   - Make sure the window you want to move is the active window, then press Alt+F7 at the same time.
2. Move the mouse to re-position the window. An outline of the window moves around the display along with the mouse. The position of the upper left corner of the outline is shown in the center of the screen. The position is in the form *x*, *y* where *x* is the horizontal position and *y* is the vertical position; the upper left corner's position is 0, 0.
3. When the outline is in the desired position, release or press the left mouse button. The outline disappears and the window moves to its new position.

## Changing a Window's Hierarchical Position

This section describes the ways you can change the order of windows that overlap each other on the display.

**Note** You can change the hierarchical position of all windows except the root window (the Windows desktop). It always remains on the bottom; it is the background upon which the other windows display.

**Note** These instructions assume that the click-to-focus policy is in effect for activating a window. See "Activating a Window" on page 6-7 for more information about focus policies.

- Bring a window to the top and activate it.

  Position the pointer anywhere in the window you want to bring to the top. (Do not put the pointer on buttons, menus or resize handles.) Press the left mouse button. The window comes to the top and becomes the active window.

- Move a window to the bottom and activate it using one of these methods:
  - Place the pointer anywhere on the window frame of a window you want to lower. (Do not put the pointer on buttons, menus, or resize handles.) Press the right mouse button. The window goes to the lowest position on the desktop and becomes the active window.
  - Select the window menu of the window you want to lower. Select Lower. The window is placed below all other windows and remains the active window.
  - Make sure the window you want to lower is the active window. Press Alt+F3 at the same time. The window is placed below all other windows and remains the active window.

- Move a window to the bottom, don't activate it.

  Position the pointer anywhere in the window you want to lower. Hold down the Alt key and press the right mouse button. The window goes to the bottom but is not activated.

## Changing Window Size

- Resize a window.
  1. Select the window using one of these methods:
     - Move the mouse pointer to the edge of the window. Where you place the pointer depends on the direction in which you want to resize the window.
     - Select the window menu of the window you want to resize, then select **Size**. Press the left mouse button.
     - Make sure the window you want to move is the active window, then press Alt+F8 keys at the same time.

The pointer changes to one of the resizing arrows shown on page 6-8.

2. Press and hold the left mouse button.
3. Drag the mouse until the window outline is the desired size. An outline of the window moves with the mouse. The position of the edge you are resizing is shown in the center of the screen. The position is in the form *x*, *y* where *x* is the horizontal position and *y* is the vertical position; the upper left corner's position is 0, 0.
4. When the outline is the desired size, release the mouse button.

■ Maximize the window using one of these methods:

- Select **Maximize**. The window manager enlarges the window to fill the screen (unless the client's maximum size is set to less than the size of the display screen).

  Select **Maximize** again to restore the window to its previous size.

- Make sure the window you want to move is the active window, then press Alt+F10 at the same time.

## Iconifying Windows

An icon is a small representation of a window. When you minimize a window, processes that were running in the window continue, but the window uses less space on the desktop. You cannot direct input to a minimized window.

■ To minimize a window, use one of these methods:

- Select **Minimize**.
- Select the window menu, then select **Minimize**.
- Make sure the window you want to move is the active window, then press Alt+F9 at the same time.
- Make sure the window you want to iconify is the active window, then press the Alt key and the middle mouse button at the same time.

## Restoring Windows from Icons

When you "restored" a window, it reassumes the size and position it had when it was iconified.

- To restore a window from an icon, use one of these methods:
  - Place the pointer on the icon you want to restore, then double-click the left mouse button.
  - Place the pointer on the icon you want to restore, then press the middle mouse button.
  - Place the pointer on the icon you want to restore, press the left mouse button once. Select **Restore** from the menu.

## Closing Windows and Icons

When you close a window or an icon, you remove it from the display screen. If an X application runs in only one window, closing the window also closes the X application connection.

- To close a window, use one of these methods:
  - Move the pointer to the window menu button, then double-click the left mouse button.
  - Select the window menu, then select **Close**.
  - If the window is an icon, move the pointer to the icon. Press the left mouse button, then select **Close**.
  - Select the window or icon you want to close, then press Alt+F4 at the same time.

# Chapter 7

# Fonts

Because PC-Xware is based on X version 11, release 6, PC-Xware supports and supplies a series of standard PCF (Portable Complied Format) X server fonts. In addition, PC-Xware can use a number of other font styles including ASCII Bitmap Distribution Format (BDF) and native Microsoft Windows fonts. PC-Xware can also add fonts or substitute fonts automatically when an application requests a missing font.

## Standard and Optional Fonts

After installation, the standard PC-Xware fonts reside in two subdirectories below the PC-Xware Installation directory (**C:\PCXWARE** is the default installation directory).

PC-Xware includes most of the freely distributable fonts known to NCD at the time of product release. When you select the default installation components, the font directories contain:

| Component | Directory | Contents | |
|---|---|---|---|
| Misc fonts | misc | Contains a variety of critical and obscure fonts. The most notable fonts in this directory are: | |
| | | cursor | Fonts used by PC-Xware and many X applications for cursors. |
| | | 6x13 | The default fixed-width font. The file **fonts.ali** in the **misc** directory sets the "fixed" alias to this font when you install PC-Xware. |
| | | 7x14<br>8x16<br>12x24 | Full ISO fixed-width fonts, meaning that these fonts define all 256 character values for international use. Most PC-Xware fonts are full ISO fixed-width fonts. |
| | | fonts.ali | Aliases of non-existent fonts to existing fonts. When PC-Xware is installed, **fonts.ali** contains entries for fixed, variable, and other commonly requested fonts. |
| 75 DPI fonts | 75dpi | Contains fonts for low-resolution displays, such as EGA and VGA. | |
| PC-Xware Server | mswin | Accesses Microsoft Windows fonts. | |

The next table shows optional fonts, installed through ***setup*** by selecting **Change** next to **Installed Components** in the **Existing Installation Summary** dialog box.

| Component | Directory | Contents |
|---|---|---|
| 100 DPI fonts | 100dpi | Fonts for higher resolution displays. If you need the full set of 100 dpi fonts, perform a selective |

## Microsoft Windows Fonts

PC-Xware can recognize and use Microsoft Windows fonts. You can access Microsoft Windows fonts for use in X applications by adding **mswin** to the font path.

To adhere to the X Logical Font Description Conventions (XLFD) for font names, MS Windows font names are converted to contain distinct entries for identifying Windows fonts. An XLFD name for a Windows font contains these fields:

| Field | Description |
|---|---|
| **Foundry** | The developer of the font. `mswin` specifies Microsoft Windows as the foundry. |
| **Font Family** | Fonts from the Microsoft Windows font family such as `arial`, `ms sans serif`, `roman`, or `small font`. |

For more information on XLFD naming conventions, see “Font Names” on page 7-4.

## Korean, Japanese, and Chinese Fonts

The following font files are also available. If you need these fonts, contact the Sales Department at Network Computing Devices Inc.:

# Font Names

In the X Window System, fonts are named using the X Logical Font Description (XLFD) conventions. XLFD names supply information about the developer of the font, the font family, and various characteristics of the font, including size, weight, and dots per inch.

An XLFD name consists of 15 fields separated by hyphens. For example, the bitmap font name:

```
-adobe-courier-medium-r-normal--8-80-75-75-m-50-iso8859-1
```

describes a font with the following properties:

| Variable | Field Description |
|---|---|
| `adobe` | Developer of the font, also called the foundry. |
| `courier` | Font family. |
| `medium` | Weight. |
| `r` | Slant (*r* stands for Roman). |
| `normal` | Width. |
| `8` | Size of the characters in pixels. |
| `80` | Size of the font in tenths of a point. |
| `75` | Horizontal and vertical resolution in DPI (dots per inch). This is the resolution of the device for which the font is designed and controls the size of the font when displayed. |
| `m` | Monospaced font (as opposed to proportionally spaced). Terminal emulators, such as the NCD local client terminal emulators and ***xterm***(1) require monospaced fonts. |
| `50` | Average width in tenths of a pixel. |
| `iso8859-1` | Character set. Most fonts are in the ISO8859-1 character set (Latin-1, a superset of ASCII). |

## Wildcards in Font Names

Any field in a font specification can be replaced by a wild card. A wild card is a special character that allows any font to match the property represented by the wildcard.

- The asterisk (*) wildcard replaces an entire field.
- The question mark wildcard (?) replaces any single character.

For example, the font name:

```
-*-fixed-bold-r-normal--13-120-*-*-*-*-*-*
```

matches these fonts:

```
-misc-fixed-bold-r-normal--13-120-75-75-c-70-iso8859-1
-misc-fixed-bold-r-normal--13-120-75-75-c-80-iso8859-1
```

When searching for a font, the X server uses the first font it finds that meets all the criteria specified in the font name. If you use wild cards instead of specifying all properties, the server uses the first font that matches the properties you specify.

Wildcards provide flexibility because a usable font can be substituted if the intended font is not found. A complete font name specification with no wildcards may cause a client to fail if the X server cannot find the font that exactly matches the specification.

## Bitmap Font Names versus Outline Font Names

Bitmap font names differ from outline font names in the amount of information specified. A bitmap font name has data in all fields. An outline font name has 0s (zeros) in all of the size fields: the size of the characters in pixels, the size in tenths of points, horizontal resolution, vertical resolution, and average width. Outline font names look similar to the following:

```
-*-courier-*-*-*--0-0-0-0-m-0-*-*
```

## Specifying Fonts for X Applications

You can specify fonts for most X applications as X resources or in the command line with the **-fn** option. When specifying a font you must use the XLFD font name, with or without wildcards. For example:

```
xterm*boldfont: -adobe-courier-bold-r-normal--20-140-100-100-m-110-iso8859-1
```

—or—

```
% xterm -fn -adobe-courier-bold-r-normal--20-140-100-100-m-110-iso8859-1
```

If you are using a font name with asterisks in a command line, the font name must be surrounded by single quotes to prevent the shell from interpreting the asterisks. For example:

```
% xterm -fn '-*-courier-bold-r-normal--20-140-*-*-*-*-*-*'
```

For outline fonts, you must provide a *well-formed* font name in the font specification. A well-formed font name contains all 14 hyphens specified in the XLFD convention. Wild cards are permitted for any field. For example, this is not a well-formed name because it does not contain all 14 hyphens:

```
-*-helvetica-bold-o-*-*-*-120-*
```

but this is a well-formed name:

```
-*-courier-*-*-*--0-0-0-0-m-0-*-*
```

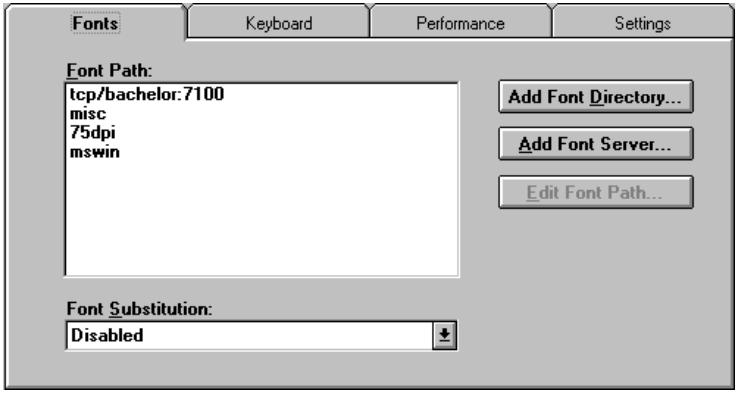
# Adding Fonts

Applications sometimes request fonts that are not available. If this happens, the application may use undesirable default fonts or may even crash. In addition, the default font may be too small or may cause a change in the application's appearance.

When an application is missing a font, you can:

- Use a host-based font server to provide fonts to PC-Xware.
- Move the font to the PC and compile it for use by PC-Xware.

- Have PC-Xware make a substitution for the missing font using the **Configure → X Server → Fonts** tab:




## Font Server

**Note** Font servers are not available over serial lines.

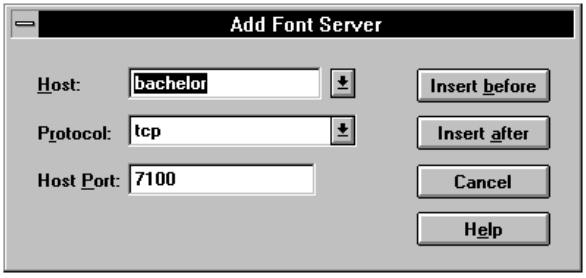
A Font Server is a host-based utility that can scale outline fonts and provide bitmap fonts, located on a networked host machine, to PC-Xware. A Font Server may be included as part of your host machine's X environment.

If you are using Font Servers, add them to PC-Xware's font path via PC-Xware's **Configure → X Server → Fonts → Add Font Server** dialog. The Font Server's entry in the font path consists of the following entries:

| Option | Description |
|---|---|
| Host | Specifies the name of the host machine with which you want PC-Xware to connect.<br>To choose a different host, click the arrow, then select the desired host from the displayed list. |

| Option | Description |
|---|---|
| Protocol | Specifies the communications protocol to use in accessing font directories on the specified host machine.<br>To choose a different protocol, click the arrow, then select the desired protocol from the displayed list. |
| Host Port | Specifies the port number used by the X font server on the specified host machine:<br>• If your host is running the R5 version of the X Window system, the default port number is 7000 (the default displayed in this box).<br>• If your host is running the R6 version of the X Window system, this number is 7100.<br>Ask your system administrator to verify the port used by the font server on the host you have chosen.<br>**Insert before** and **Insert after** buttons put specified font server information either before or after the item currently selected on the **Fonts** screen. |

The order of locations in the font path represents the order by which a requested font is looked up. If you want the font server to resolve most of your fonts, place the font server at the front of the font path. This figure shows an example of adding a font server:



# Using the PC-Xware Font Compiler

## Adding New Fonts - BDF Format

If you have an application using X fonts that are not available in PC-Xware, you can make those fonts available by:

1. Transferring the ASCII Bitmap Distribution Format (**.bdf**) of the font to the PC.
2. Double-click the PC-Xware **Font Tools** icon in the PC-Xware program group.
3. Using the directory browse mechanism, select the directory containing the **.BDF** files.
4. Select the files you want to compile.

**Note** Leave the Font Tool Options (Glyph Padding, Scanline Unit, Bit Order and Byte Order) as they are, unless you have specific knowledge about your BDF files. These default settings create the smallest, most efficient PCF files.

5. Select **Convert**.

You now have two options:

1. Create a new directory for your fonts, move the new PCF files to that directory, and add that directory to the **Font path** line in the **Configure → X Server → Fonts → Add Font Directory** dialog. Be sure to include the fully qualified font path as shown in this figure:

**Insert before** and **Insert after** buttons put the specified font directory name either before or after the directory selected on the **Fonts** screen.

2. Place the new PCF files in either the **MISC** or **75DPI** sub-directory of your PC-Xware installation directory.

Once you complete one of the previous steps, do the following:

1. Using the directory browse mechanism, select the directory containing the PCF files.
2. Select **Make Font Directory**.
3. This scans the fonts in the selected directory and builds a database **fonts.dir** listing for each font and the file storing it. The server then uses the **fonts.dir** database when looking for fonts in a given directory.

## Adding New Fonts - PCF Format

If you have an application that uses PCF fonts not available in PC-Xware, you can make those fonts available to PC-Xware using one of these methods:

- Copy the files to a new directory:
  1. Transfer the PCF files from the host to the PC. Be sure to use a binary transfer method.
  2. Double-click the **Font Tools** icon in the PC-Xware program group.
  3. Create a new directory for your fonts, move the new PCF files to that directory, and add that directory to the **Font path** line in the **Configure → X Server → Fonts → Add Font Directory** dialog. Be sure to include the fully qualified font path.
- Place the new PCF files in either the **MISC** or **75DPI** sub-directory of your PC-Xware installation directory:
  1. Double-click the **Font Tools** icon in the PC-Xware program group.
  2. Using the directory browse mechanism, select the directory containing the PCF files.

3. Select **Make Font Directory**.
4. This scans the fonts in the selected directory and builds a database **fonts.dir** listing for each font and the file storing it. The server then uses the **fonts.dir** database when looking for fonts in a given directory.

## Font Substitution

Font Substitution lets you substitute fonts if an X application requests fonts that are not available.

At the **Configure → X Server → Fonts** tab, you can display the font substitution modes by pressing on the arrow in the **Font Substitution:** list box. There are two modes of font substitution, which are detailed in the following paragraphs.

### Disabled Mode

Font substitution is disabled by default. When an X application requests an unavailable font, the font request fails. The X application is responsible for noting the font error and opening a substitute font.

### Automatic Mode

In **Automatic** mode, if your X application's selected font is not available, a replacement font is automatically chosen. The font chosen is the one whose name most closely matches the missing font. If there is no close match, the default font (named "fixed") is used.

# Getting Font Information

The following host-resident X applications display information about the font path and fonts.

- ***xset***(1)—displays information about the current font path
- ***xlsfonts***(1)—lists the fonts known to the server
- ***xfd***(1)—displays the characters in a font
- ***xfontsel***(1)—displays samples of a font

## Viewing the Font Path

The ***xset*** command displays the font path and other current server settings.

```
# xset q
.
.
.
Font Path:
    misc, 75dpi, 100dpi
```

## Listing the Available Fonts

The ***xlsfonts***(1) command lists the fonts currently available to the X server. It has many options for narrowing the search, but its basic form lists the names of all fonts known to the server.

```
# xlsfonts
```

When running with the argument **-fn *pattern, xlsfonts*** lists only fonts that match ***pattern***. The ***pattern*** may include the wildcard characters "*****" (matches any sequence of characters) and "**?**" (matches any single character). Quote these characters to prevent the shell from expanding them. For example, the following command lists all fonts whose names include the word *helvetica*.

```
# xlsfonts -fn '*helvetica*'
```

## Displaying the Characters in a Font

The ***xfd***(1) command displays all the characters in a font. The command's most basic syntax is:

```
xfd -fn font_name
```

For example, the following command displays all the characters in the 6x13 font.

```
% xfd -fn 6x13
```

The font specification can include wildcard characters as shown in the example above for ***xlsfonts***.

## Displaying Samples of a Font and XLFD Names

The ***xfontsel***(1) client displays the fonts known to the server, allows you to examine samples of a font, and shows the XLFD name for a font. The command's basic syntax is:

```
xfontsel -pattern font_specification
```

The font specification may include wild card characters. For example, the following command displays a window in which you can select samples of various bold fonts.

```
% xfontsel -pattern '*bold'
```

# Font Interactions with Microsoft Windows

## Windows TEMP Environmental Variable

Windows font files (**.FON**) are created and accessed by PC-Xware. If the Windows TEMP environmental variable has been set, PC-Xware will store the font files in the specified directory. Otherwise, the font files will be created in the root directory of your boot disk drive. These font files are temporary and are deleted by PC-Xware at termination.

If for some reason PC-Xware terminates abnormally, the existing font files will be deleted the next time PC-Xware is executed. For further information on the Windows TEMP environmental variable, see your Microsoft Windows User's Guide.

# Chapter 8

# Utilities

PC-Xware includes advanced features that perform a variety of useful tasks, including:

- Diagnosing your PC environment. See “Configuration Survey” below.
- Modifying keyboard definitions and saving them to a file. See “Customizing Your Keyboard” on page 8-3.

## Configuration Survey

The PC-Xware Configuration Survey provides information about your PC environment that affects the performance of PC-Xware. This includes:

- Microsoft Windows version number
- Display resolution
- Color capability
- Type of central processing unit
- Available memory and free resources

**Note** To get an accurate reading of your configuration, the configuration survey will not run if PC-Xware is running.

PC-Xware's **Configuration Survey** also determines the available startup methods and number of TCP/IP sockets available (on TCP networks). This information can be useful in diagnosing problems.

To run the survey:

1. Double-click the **Configuration Survey** icon.

   A dialog box displays, describing what the survey will do.

2. Select **OK** to proceed.

   If you use DEC Pathworks and Winsock or DEC Pathworks with TCP/IP, another dialog box displays requesting the type of network to test.

   If you don't use these network utilities, skip to step 4.

3. Enter the type of network you want to test: DECNET or TCP/IP.

   The survey prompts for the name of a host machine.

4. Enter the host name with which you want the network portion of the survey to establish a testing connection, and then press **Return** or select **Continue**.

   The network portion determines the startup methods available on that host. A dialog box quickly cycles through the available sockets.

   The survey informs you of detected problems.

5. Select **Review** to list test results. A Windows editor displays available network connections, system configuration, and the current state of system memory resources.

   Because this information is useful for diagnosing problems, it is saved in a log file named **survey.xsu**, located in the Microsoft Windows directory.

**Note** To gather this and other PC-Xware information into a single file, select **Help → Technical Support**. For more information about this option, see "Appendix C: Product Support".

# Customizing Your Keyboard

PC-Xware gives you control over the actions initiated by the keys on your keyboard by providing options that govern key definition:

To customize your keyboard, choose the **Configure → X Server → Keyboard** tab. Options on this tab include:

| Option | Description | |
|---|---|---|
| Keyboard Mapping | Redefines operations performed by the keys on your keyboard, and saves these custom definitions for later use. For detail information, see “Keyboard Mapping” on page 8-5. | |
| | Swap Modifier Keys... | Exchanges the definitions of a pair of *modifier keys*, such as the Ctrl and Alt keys. |
| | Assign Single Key... | Assigns a custom definition to a particular key. |
| | Run Keymap Viewer | Displays the valid keycode and corresponding **keysym** (numeric and textual symbols) for specific keys, and the valid text for a modifier key combination, such as Ctrl+L. This is useful when you want to redefine keys. |
| | Edit Keymap with Notepad... | Opens the keymap file being used by PC-Xware in Notepad. You can manually edit the key definitions in this file. The file entries are changes to PC-Xware’s default keymap. |
| | Enable Keymap | Updates the keymap used by PC-Xware with changes you made to key definitions during the current PC-Xware session. Changes take effect the next time PC-Xware starts.<br>**Note** If you do not check this box, changes are not implemented. |

| Option | Description | |
|---|---|---|
| Special Key Handling | Determines whether the action initiated by special key combinations is governed by key definitions in your Microsoft Windows environment, or by the remote X applications you are running through PC-Xware. For detailed information, see “Swapping Modifier Keys” on page 8-6.<br>Options in this region include: | |
| | Action: | Determines where special key combinations (sometimes called *shortcut* keys) are used. This prevents a key combination you want to use in one environment from being pre-empted by another definition for the same combination in the other environment.<br>Choose one of these values:<br>**Send them all to Windows**: (default) Activates key combinations anywhere in the Microsoft Windows desktop.<br>**Send them all to X**: Activates key combinations only in X applications run through PC-Xware. |
| | Exceptions: | Enables or disables special key combinations. |
| Local NumLock Support | Determines whether X applications receive a keycode when a user presses the NumLock key.<br>**Enabled**: (default) PC-Xware intercepts the NumLock keycode and processes input from the numeric keypad keys.<br>**Disabled**: PC-Xware sends the NumLock keycode through to the X application. Choose this value for X applications that directly process the NumLock keycode (for example, most DECwindows applications). | |

## Keyboard Mapping

The key definitions determining the functions of the keys on your keyboard are stored in a server's *keymap*. Keyboard Mapping lets you modify key definitions and save them in a file (called **keymap.xkb**) which is used automatically to modify the

## Swapping Modifier Keys

Suppose you don't like the default location of the Ctrl key on your keyboard; you would prefer that the Ctrl key reside where the Alt key is.

With PC-Xware you can *swap* modifier keys, exchanging the behaviors of two keys, so that Alt key combinations perform the actions Ctrl key combinations used to, and vice-versa. You can swap any pair of modifier keys on your keyboard.

To swap two modifier keys:

1. Select **Configure → X Server → Keyboard**.
2. In the **Keyboard Mapping** box, select **Swap Modifier Keys**. A dialogue box prompts you for two modifiers to swap.
3. In the two list boxes, select the modifier names whose definitions you want to swap. Valid modifier names include:

   **shift mod1 lock control**

   By default, the Ctrl key is assigned the control modifier, and the Alt key is assigned the mod1 modifier.
4. Select **OK**. The new statements are saved to the **keymap.xkb** file.
5. Activate the **Enable Keymap** checkbox.
6. Exit and restart PC-Xware.

   The server's keymap is modified to include the new modifier definitions.

## Assigning Key Definitions

To assign key definitions:

1. Select **Configure → X Server → Keyboard**.
2. In the **Keyboard Mapping** box, select the **Assign Single**

3. At the prompt **Keysym to be assigned:** specify the key you want to reassign using one of these methods:
   - **Specify the keysym for that key.**
     If the **keysym** matches the character on a physical key on the keyboard, press the key whose **keysym** you want to use, for example:

     ```
     b
     ```

     However, if the **keysym** you want to assign is not a character on any of the physical keys, you must type it. For example, to assign the backspace **keysym** to the target key, enter:

     ```
     BackSpace
     ```

     To list current **keysym** assignments, use PC-Xware's Keymap Viewer, described in "Viewing Current Key Definitions" on page 8-8. For a list of valid **keysyms**, see *X Window System* by Scheifler and Gettys.
   - **Specify the keycode for that key.**
     To do this, type the # character, followed by the **keycode** for the key. For example, the keycode for Backspace is 8 as seen in the keymap Viewer:

     ```
     #8
     ```

4. At the prompt **New keysym assignment:**, specify the **keysym** you want to assign to the target key. As explained in step 3, you do this by either pressing a key, or typing in the name of the **keysym**. (You cannot specify a **keycode** for this item.)
5. When satisfied with the assignment, select **OK**. The dialog box disappears and your changes are saved to the **keymap.xkb** file.
6. Activate the **Enable Keymap** checkbox.
7. Exit and restart PC-Xware.

   The server's keymap is modified to include the new **keysym** assignment statements.

## Viewing Current Key Definitions

PC-Xware provides a Keymap Viewer that makes it easy to check the current key definitions and to view valid **keycodes** and modifier names.

To view current key definitions:

1. Choose the **Configure → X Server → Keyboard**.
2. In the **Keyboard Mapping** box, select **Run Keymap Viewer**. The **Keymap Viewer** displays.
3. Press the key or key combination whose definition you want to see. The **keycode, keysym** and / or modifier values display. You can then use these values in making new key assignments.

## Editing the Keymap Directly

You can edit a keymap file directly with the Notepad editor, specifying key assignments in the Key Definition Language (documented later in this section):

1. Choose the **Configure → X Server → Keyboard**.
2. In the **Keyboard Mapping** box, select the **Edit Keymap with Notepad...** option. A Windows editor opens with the keymap file, **keymap.xkb**. Any custom key definitions made previously displays in this file.
3. Type or modify key definitions in the file, following the rules of the Key Definition Language described in “Key Definition Language” on page 8-10.
4. Save the file by choosing the Notepad Editor’s **File → Save** menu item.
5. Activate the **Enable Keymap** checkbox.
6. Exit and restart PC-Xware.

An example of key definitions in a keymap file is shown below.

**Example: Keymap File that Swaps CapsLock and Ctrl Key Actions**

```
remove lock = Caps_Lock
remove control = Control_L
keysym Control_L = Caps_Lock
keysym Caps_Lock = Control_L
add lock = Caps_Lock
add control = Control_L
```

These statements swap the definitions of the Ctrl and Caps Lock keys. If you save this file and check **Enable Keymap**, the functions of the Ctrl and Caps Lock keys will be reversed the next time you start PC-Xware.

## Returning to the Default Keymap

To return to the system default keymap:

1. Ensure that **Enable Keymap** is *not* checked.
2. Restart PC-Xware.

## Keymap File for DEC Keyboards

PC-Xware provides a sample keymap file that redefines a US PC keyboard to a DEC keyboard. It is installed as **lk401.xkb**, located in the directory in which PC-Xware was installed.

If you want to use this sample keymap file as the default keymap, copy it to the default local user directory **C:\PCXWARE\USER**. When you copy **lk401.xkb** to the desired location, rename it to **keymap.xkb**.

If you installed PC-Xware in a *different* directory, for example, **C:\INSTDIR**, copy **lk401.xkb** to the **USER** directory under *that* directory (for example, **C:INSTDIR\USER**) and rename it **keymap.xkb**.

When PC-Xware is installed on a file server, use the directory you specified as the local files directory during the **pcsetup** stage of the install in place of **INSTDIR\USER**.

## Key Definition Language

This section describes the key definition commands used in the **keymap.xkb** file to redefine key functions.

A keymap file is processed by an ***xmodmap*** program internal to PC-Xware. PC-Xware's ***xmodmap*** is identical to ***xmodmap*** programs found on many UNIX machines. In general, the ***xmodmap*** program reads in and processes all statements in a keymap file before attempting to execute them. This makes it possible to assign **keysyms** in an intuitive manner, without having to worry about problems that might be caused by prior redefinitions in the same file. (The exception to this rule is statements using the `remove` command.)

Lines that begin with an exclamation mark (!) are interpreted as comments.

To change a modifier key definition, you must also remove it from the appropriate modifier map (see the `remove` command description below).

### add

Syntax: `add` *`modifier_name = keysym_name`*

*`modifier_name`* Name of the modifier you want to redefine.

*`keysym_name`* Name of the **keysym** you want to assign to the specified modifier.

This statement assigns the specified **keysym** to the specified modifier. For a list of valid modifier names, see "Swapping Modifier Keys" on page 8-6.

### clear

Syntax: `clear` *`modifier_name`*

*`modifier_name`* Name of the modifier key whose definitions you want to clear.

This statement removes *all* definitions in the modifier map for the specified modifier. For example, suppose your modifier map contains definitions for the "control" modifier, using these **keysyms**:

```
Control_L
Control_R
```

Further, suppose you put this statement in your keymap file:

```
clear control
```

Executing this statement removes from the modifier map definitions for both Ctrl key entries specified above.

**Note** Modifier names are case-insensitive.

## keysym

Syntax: `keysym` *`target = replacement`*

*`target`* Specifies the **keysym** you want to redefine. Specified as a character matching the character on a key or as a text string defined as the identifier for a given behavior, such as **BackSpace**.

*`replacement`* Specifies the new **keysym** with which you want to replace the existing one specified by *target*. Specified in the same way as the target.

The result of this statement is that the key currently defined by *`target`* is modified so that it is now defined by *`replacement`*.

You can make multiple assignments of the form shown below:

```
target = replacement_1 replacement_2 ... replacement_4
```

Only these four replacements are allowed:

| Replacement | Definition |
|---|---|
| *`replacement_1`* | Unshifted target key |
| *`replacement_2`* | Shifted target key |
| *`replacement_3`* | Mode switch and target key combination |
| *`replacement_4`* | Shift, mode_switch, target key combination |

The mode switch **keysym** is available when using international keyboard mappings and is assigned to the Alt+GR or right Alt key.

An example of multiple assignments is defining the Backspace key to generate a backspace when unshifted and generating a delete when shifted:

keysym `BackSpace = BackSpace Delete`

**Note** **keysym** names are case-sensitive.

## keycode

Syntax: `keycode` *`target = replacement`*

*`target`* Specifies the keycode you want to redefine. Specified as a decimal number assigned to a physical key on the keyboard or a composed character.

*`replacement`* Specifies the new **keysym** with which you want to replace the existing one specified by *`target`*. Specified as a character matching the character to be sent to the display, or as a text string defined as the identifier for a given behavior, such as **BackSpace**.

The result of this statement is that the key currently defined by *`target`* is modified so that it is now defined by *`replacement`*.

As with the **keysym** statement, you can make multiple assignments of the form shown below:

*`target = replacement_1 replacement_2 ... replacement_4`*

Only in this case, `target` is a **keycode** number.

**Note** Keycodes are not portable and may change per X server implementation.

## remove

| | |
|---|---|
| Syntax: | `remove` *`modifier_name = keysym_name`* |
| *`modifier_name`* | Name of the modifier you want to affect. |
| *`keysym_name`* | Name of the keysym you want to remove from the specified modifier. |

This statement removes the specified **keysym** from the definition of the specified modifier. (This is different from the **`clear`** command in that it affects only the *specified* **keysym** for the modifier, rather than *all* the **keysyms** for that modifier.)

Consider this example:

```
remove control Control_L
```

When executed, the previous statement removes the definition for the Ctrl+L key combination from the modifier map.

In contrast to `add` statements, `remove` statements are evaluated as they are read from the keymap file. This lets you clear a modifier definition without worrying about whether an assignment earlier in the keymap file redefines the modifier when the keymap file is executed.

# Appendix A

# Error and Status Messages

This chapter describes PC-Xware's message facilities:

- **On-screen message facility**: displays messages in pop-up Microsoft Windows.
- **Server message facility**: posts messages to PC-Xware's **View → Log** tab.

## On-screen Message Facility

On-screen messages display in pop-up Microsoft windows and contain either error notifications information. The messages occur in situations that might prevent further use of PC-Xware, and therefore require immediate response.

On-screen messages include:

- Confirmation Messages
- Connection Messages
- Memory Messages
- Network Software Messages
- Software Protection Messages
- Startup Messages

## Confirmation Messages

Prompt you to approve or cancel an action. These messages display after a user action (such as exiting PC-Xware) or after a change in PC-Xware's operating state.

Confirmation prompts include:

`PC-Xware is still active. Quit PC-Xware before quitting Windows.`

`Do you wish to terminate PC-Xware?`

`Do you wish to terminate PC-Xware with your` ***n*** `active connection?`

## Connection Messages

Displays messages regarding the status of your connection. PC-to-host connections selected from PC-Xware's **Start** tab can generate on-screen messages. Some messages are received from your host machine after a failed connection attempt. Since hosts messages vary, every connection message cannot be listed here. Some connection messages include:

`Startup Failed: Can't get client status`

Ensure that the daemon for the connection type (***telnetd***, ***rexecd***, ***rlogind***) is running on the host. Also ensure that the PC's name is in the host's name resolution table.

`Startup Failed: Password incorrect`

User Action: Try the connection again and retype your password.

`Unknown host` *`host name`*

User Action: Your network software cannot resolve the given host name into a network address. Examine your network software configuration to determine if a local hosts file or a name server is being used. Then check the configuration of that hosts file or name server.

## Memory Messages

Displays messages regarding memory needed to run PC-Xware. Once started, PC-Xware uses about 17 Kbytes of low DOS memory.

`Cannot allocate #kb of memory`

User Action: There is not enough memory to start a PC-Xware task. Terminate a Windows application.

`Insufficient memory to run` *`name`*

Explanation: Not enough DOS memory to run *name* task.

User Action: PC-Xware may require 100 kbytes of the low DOS 640 kbytes region at startup time. As much as 80 kbytes of the 100 kbytes might be needed by your network software. Examine your low DOS memory use in **CONFIG.SYS** and **AUTOEXEC.BAT.** Are you using a DOS memory manager and loading devices into high memory? Use our **DOSMEM.EXE** (Microsoft Windows 3.x only) program to examine your low DOS memory usage while MS Windows is running to find the major MS Windows low DOS memory users.

## Network Software Messages

Displays network software errors received by PC-Xware. The following error messages are typical examples. Appendix A, "Troubleshooting Network Connections" in your *PC-Xware Installation and Configuration Guide*, provides more information about messages specific to your network.

`Cannot find` *`name`*`.DLL`

A file of your network software cannot be found. Ensure that the indicated **.DLL** file is in your DOS PATH statement.

`Failed to initialize network type` *`name`*

User Action: PC-Xware is configured to use the indicated network software, but PC-Xware cannot find the network software. Ensure that your network is running and that the

network listed in **windows\xware.ini**, **net-network-software-type=** statement matches your network software.

`Failed to get interface characteristic table`

User Action: Your NetManage Chameleon network software is improperly configured. Examine the network statements in **CONFIG.SYS** and **AUTOEXEC.BAT**. Ensure that all drivers load correctly.

`Network Error 1304`

User Action: Your network software is not loaded. Load your network software and ensure that the network type listed in **windows\xware.ini**, **net-network-software-type=** statement matches your network software.

`Undetermined network error`

User Action: The user does not have UNIX permission to access the mountable file or directory.

## Software Protection Messages

Displays information about PC-Xware license violations.

Each copy of PC-Xware contains a serial number. PC-Xware broadcasts this number and, at the same time, examines the network for other instances of the number. If another instance is found, PC-Xware displays a message informing you of a license violation.

To broadcast the serial number, PC-Xware opens a socket from your network software and places a packet containing the serial number and the PC's IP address on the network.

Extraneous software protection messages can occur if your network software is improperly configured. For example, if the your PC name is not set in your network software, an error stating that your PC-Xware serial number is used twice by the same PC displays. Other software protection messages might occur if the network software socket used for protection is not available.

`Software protection failed: Bind error 10035`

User Action: Contact NCD's technical support. The network software does not provide access to UDP port 128, registered with the Network Information Center (NIC) for NCD's use.

`Software protection failed: send to error 1057`

User Action: If using Novell TCP/IP, decrease the number of tcp-sockets in your **net.cfg** file. If you are not running Novell TCP/IP, contact NCD's technical support.

`Software protection failed: send to error` ***number***

User Action: Contact NCD's technical support.

## Startup Messages

Displays messages that inform you of problems encountered when PC-Xware started.

`Could not load directory`

Explanation: PC-Xware's Font Tool found an invalid **.pcf** file in a font directory.

User Action: Examine the **.pcf** file sizes in the directory and use the Convert Button to recompile the font from a **.bdf** into a **.pcf** file.

`Undefined datalink`

User Action: PC-Xware found an incompatible version of the Microsoft Windows Dynamic Link Library (.DLL). A program called a DLL to perform a certain function and the DLL does not support that function.

This error can occur if a version of PC-Xware is incorrectly mixed with another PC-Xware release or a version of your network software is mixed with another version of the same software.

# Overview—Server Message Facility

Displays messages that inform you about PC-Xware operations, including successful completion of user requests, unsuccessful attempts to perform an action or fatal errors.

While running, PC-Xware modules continually generate messages and send them to the Diagnostic daemon.

The Diagnostic daemon (DIAGD) stores the messages in an internal buffer and forwards them to the ***console*** local X application. ***console*** posts the messages in the **View → Log** folder.

## Message Format

All messages follow the format:

*%MODULE-S-IDENT, message*

where:

| | |
|---|---|
| *MODULE* | is the component of PC-Xware issuing the message, such as the Configuration daemon or the Execution daemon |
| *S* | is the level of severity:<br>• I for Information<br>• W for Warning<br>• E for Error<br>• F for Fatal |
| *IDENT* | is the message identifier, usually an abbreviated form of the message |
| *message* | is the message text |

An example of a message following this format is:

```
%EXECD-I-START, running command:mswm
```

In this example:

- EXECD is the reporting module
- I is the severity level; in this case, Information
- START is the message identifier

- `running command:mswm` is the message text

The following sections describe these fields in more detail.

## Reporting Modules

Displays module-specific messages.

**Note** For the most current listing of these messages, see the **MESSAGES.WRI** file located in the PC-Xware installation directory:

- Messages common to all modules.
- Messages for each module.

This table lists the reporting software modules and describes the information that each reports:

| The module: | Reports messages pertaining to: |
|---|---|
| CONFIGD | The Configuration daemon |
| CONFUI | The Configuration daemon user interface |
| CONSOLE | The ***console*** local X application |
| DIAGD | The diagnostic daemon |
| EXECD | The execution of local X applications |
| FONT | Font service |
| LOGIN | The ***login*** X application providing XDMCP ability |
| MSWM | Microsoft Windows local window manager |
| NETFILE | Network file services |
| NETSRV | The common daemon library |
| PROTECTION | Software protection serial number licensing |
| SELECT | Cut and past selection |
| SIE | The Simple Imaging Extension (SIE) |
| TERM | The ***ncdterm*** local X application |
| UI | The user interface |
| VIEWER | Keyboard map viewer |
| WM | The local NCD window manager and application launcher |

| The module: | Reports messages pertaining to: (Continued) |
|---|---|
| XMODMAP | Keyboard modifier |
| XREMOTE | Serial access for X applications |
| XSERVER | The X server code |

## Severity Levels

The severity level tells you how serious, or severe, a message is:

- I (Information)—The specified module performed its activities. This message provides information about X server activities.
- W (Warning)—The specified module may have completed some, but not all, the requested activity. You should verify the results to make sure they are correct. This severity level indicates recoverable error situations.
- E (Error)—The specified module did not complete the requested activity, but is attempting to continue. This severity level indicates that errors occurred in X server processing.
- F (Fatal)—The specified module did not complete the requested activity and cannot continue. This severity level indicates irrecoverable errors in X server processing.

If PC-Xware repeatedly reports messages with severity level F, contact NCD Technical Support for help. For information about contacting Technical Support, see Appendix C.

## Message Text

While most X server messages contain unique text strings, some messages may contain one of several text strings. The text string included in the message depends on the detected error and aids in identifying the reason for the X server message.

## Server Messages

See the **MESSAGES.WRI** file, in your PC-Xware installation directory for a complete list and explanation of PC-Xware Server error and status messages.

# Appendix B

# PC-Xservices

PC-Xservices is an NCD X terminal-like interface to PC-Xware configuration capabilities. PC-Xware provides this interface for the convenience of advanced users who are familiar with the NCD X terminal and its controlling software NCDware.

You can use the PC-Xservices menu to set up and modify many PC-Xware parameters, including:

- Displaying messages from the X server
- Logging in
- Logging Out
- Starting a local window manager
- Starting a terminal emulator
- Changing user preferences
- Checking statistics
- Restricting Access to utilities

The PC-Xservices Console menus are summarized in this table and detailed later in this section:

| Menu and Selections | Purpose |
|---|---|
| Console | |
| Clear Messages | Deletes all output from the message area in the PC-Xservices Console. |
| Rescan Messages | Recalls messages that were previously cleared. |
| Abort XRemote | Terminates XRemote and returns to serial session. |
| Shutdown... | Closes all connections and terminates PC-Xware. |
| Close | Closes the PC-Xservices Console. |
| Login | Logs in and out of the X server via *XDM*. |
| Terminals | Accesses local terminal emulators for each type of host connection. |
| WindowMgr | Selects and terminates a window manager. |
| Utilities | Provides utilities that redraw the screen, rescan the font path, lock the screen and view the keymap. |
| Setup | |
| Change Setup Parameters | Sets up user options. Used by system administrators. |
| Change User Preferences | Customizes the X environment, including keyboard, bell, mouse and display screen features. |
| Statistics | Displays information about current jobs, hosts and the network. |

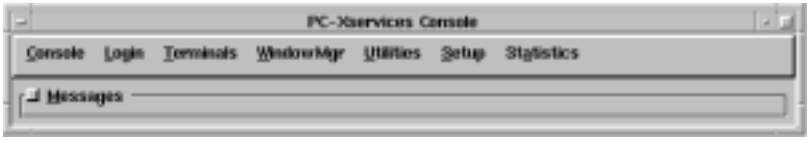
# Enabling Access to PC-Xservices

To install PC-Xservices, add it as a new Program Item to the PC-Xware program group using the Program Manager's **File → New** menu item. PC-Xservices is installed in the PC-Xware directory as **XWCONSOL.EXE**.

# Accessing PC-Xservices

After installing PC-Xservices, you can start it in one of these ways:

- Double-click the icon you created for it in the program group.
- Choose the **File → Run** menu item from the Program Manager menu, specify the name of the executable file, **XWCONSOL.EXE** in the Run dialog box, and select **OK**.




**PC-Xservices Console**

- Press a single key after assigning that key as follows:
  1. Select **Setup → Change User Preferences... → Keyboard**.
  2. At **Setup Key (raise PC-Xservices)**, select a key: F10, F12 or Pause.
  3. Select **Apply** to activate the selection.

  You can now activate PC-Xservices by pressing this key whenever PC-Xware is running.

# Displaying X Server Messages

To display messages, select the button to the left of **Messages** option. The message window displays. If a local window manager is running, you can resize the PC-Xservices Console to display as large a message area as you need.

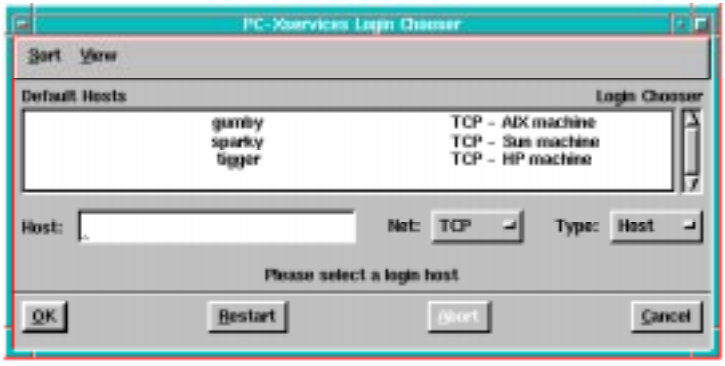
Use the scroll bar to view messages that scrolled off the top of the message area. The message area remains open until you select the hide button again.

The message area displays diagnostic messages, such as codes and descriptions that identify errors. If you have specified that you want to display font diagnostic information, it is also listed here.

# Logging In

The following description assumes you are running the ***XDM*** display manager. There are many X display managers; the one you are using may not be described in this manual. To begin an ***xdm*** session, select **Login → Login New X Session**.

When the X server connection is completed, the Login Chooser displays.




From the Login Chooser, you can select and log into a primary host computer for your X session. The Chooser lists the hosts accessible to you.

1. To select a host, select the host you want.

   The list is scrollable. If the host you want is not visible, click the left mouse button on the arrowhead of the scroll bar to the right of the list to display more hosts.

   You can also request a host by typing its name in the **Host** text entry box below the list.

Notice that when you select a host from the **Default Hosts** list, its name displays in the Host text entry box. The Network and Type are also automatically inserted.

2. Select **OK** button below the **Host** text entry box.

   If the host you selected is not available, a message displays below the **Host** box and in the **Message** text display box.

   - To terminate the request, select **Abort**.
   - To update the list of available hosts, select **Restart**.
   - To cancel the login selection process and get rid of the Login Chooser, select **Cancel**.

# Logging Out

1. Select **Logout** from the Console's Login menu.

   A popup window displays asking you to confirm that you want to end the session.

2. Select **Yes** to log out. (Selecting **No** cancels the logout procedure and resumes the current X session.) If you select **Yes**, the X session ends. You can start another session by choosing a host and logging in again.

   Selecting **Show** displays the **Show Connections** popup window, which lists the current X connections (local and host-based clients).

   The **Show Connections** popup window can be displayed at any time during an X session by selecting **Show X Connections** from the Console's **Statistics** menu.

## Logging Out Automatically

You can configure your PC to logout automatically after a specified period of inactivity.

1. From the PC-Xservices Console, select **Setup**, then select **Change User Preferences**.
2. Select the hide box to the left of **Console and Utilities**. The Console and Utilities option settings display.
3. In the **Automatic Logout After** text entry box, enter the number of minutes of inactivity to be allowed before the automatic logout occurs.
4. In the **Automatic Logout Cancel Delay** text entry box, enter the number of seconds of delay you want to allow cancellation of the automatic logout.
5. When finished, select **Apply**.

When you leave the X server idle for the number of minutes specified in the **Automatic Logout After** field, a cautionary box displays, offering you the opportunity to cancel the logout.

- To stop the logout, select **No**. (This is the default.)
- To confirm the logout, select **Yes**.
- To list current clients, select **Show**.

# Connecting to Hosts and Starting a Terminal Emulator

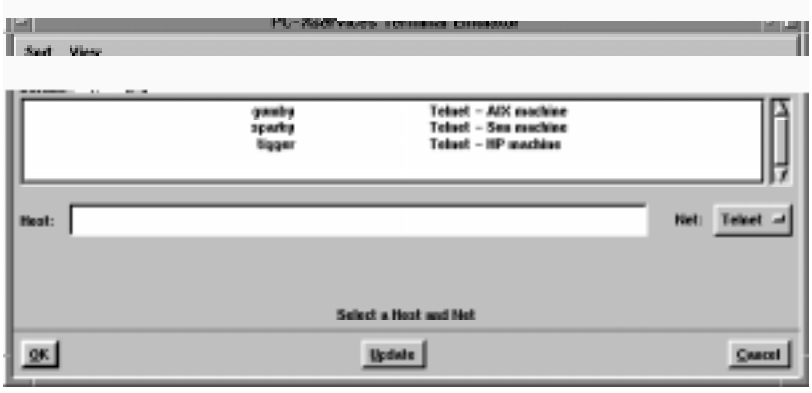
To log into a host by a ***telnet***, ***Lat***, ***Cterm*** or serial connection, use the **Terminals** menu to start a local terminal emulator.

1. From the PC-Xservices Console, select **Terminals**.
2. Select an option from the **Terminals** menu.
   - Choose **New Terminals** to display all connection types on your network: ***telnet***, ***rlogin***, ***Lat***, ***Cterm*** and serial.
   - Choose **New Telnet**, **New Rlogin**, **New Lat**, **New Cterm** or **New Serial** to list only connections of that type. The

listing includes configured hostnames or addresses and the type of connection.

The **Terminal Emulator** window opens. The **Default Hosts** list displays the configured host connections on your network. The sample **Terminal Emulator** window in the following figure does not have any available hosts listed.

The list of available hosts is established in the dialog box that displays when you choose PC-Xservices' **Terminal → New Terminal**.




**Note** The serial connection is usually used for connecting to a host via a modem. For more information about using a modem with PC-Xware, see "Serial Connections" on page 2-22.

3. Select the host name from the list of Default hosts, if available.
   - If the host you want is not in the list, type the hostname or address into the **Host** text entry box below the **Default Hosts** list.
   - If the wrong connection type displays on the **Net** option button, click the button to display your options. Click again on the type you want to use.

- If a password text area displays, click in the text area and type your password.

Select **Update** to update the list of network hosts available to the current state.

To sort the listing by host name or by network, select **Sort**, then select the sort type from the pulldown menu.

You can also customize the appearance of the window by selecting which types of connections you want to display. Use the toggles on the **View** menu (next to the **Sort** menu) to select the types of connections to display.

After logging into your host, if you intend to use X applications and display them on your PC, you may need to set your DISPLAY variable to direct process output to your PC X server display.

- If you are logged into a UNIX host, type one of the following commands at the prompt. C shell users, type:

```
% setenv DISPLAY PC_name:0
```

Bourne and K shell users, type:

```
$ DISPLAY=PC_name:0; export DISPLAY
```

- If your primary host is a VMS system, use the **SET DISPLAY** command to set the display. Enter the following (all on one line).

```
$ SET DISPLAY/CREATE/NODE=node_name/TRANS=t_name/SERVER=0
```

- ***PC name*** is the PC's TCP/IP address or TCP/IP name.
- ***t_name*** is the method used to reach the VMS host (DECNET or the TCPIP transport name).
- ***node_name*** is the DECnet node name, if TRANS is DECNET, or the PC's internet address, if TRANS is TCPIP.

- If you do not know your PC's TCP/IP address or TCP/IP name, ask your system administrator.

# Starting a Local Window Manager

When no window manager is running, the frames around the client windows are thin lines and there is no title bar. Resize handles do not display in the corners of the frame; you cannot move or resize the window.

To allow moving, resizing and minimizing of client windows, perform the following steps:

1. From the PC-Xservices Console, select **WindowMgr**.
2. Select either the NCD or the Microsoft Windows (MSW) window manager.

   In a moment the window manager starts and the characteristic frames display around all the clients.

**Note** See Chapter 6, "Local Window Managers", for more information about window managers.

# Utility Options

The **Utilities** pulldown menu provides tools for redrawing the screen, locking the screen to prevent unauthorized use, and rescanning the font path.

## Refresh Screen

This option redraws the contents of the **Terminal Emulator**'s display window. It is useful when validating whether or not the display contains editing remnants.

## Lock Screen

If you want to ensure that no one can access your display, but

1. Select **Lock Screen** from the **Utilities** menu.

   The screen blanks, and the Console displays a popup window that requests that you type a password.

2. Type a password, then press the **Return** key or select **OK**. Type the password a second time, as prompted by the display.

   After you type the same password twice, the display states Screen Locked. The Console window cannot be used to resume the X session until you re-enter the same password that you typed twice.

3. To unlock the display and resume your X session, type the password into the popup window and press **Return** or select **OK**.

### Rescan Font Path

This facility is useful when you have a new application installed that requires special fonts. Activating **Rescan Font Path** makes PC-Xware reread the font paths in its font data base. It forces PC-Xware to discard cached information about which fonts are available in each element of the font path. This allows the contents of font directories to accept new information. This has the same effect as running **`xset fp rehash`** from your host to your PC.

### Keymap Viewer

PC-Xware provides a Keymap Viewer that makes it easy to check the current key definitions and also see what the valid **keycodes** and modifier names are.

## Changing Setup Parameters

Setup parameters you may need to alter are discussed in the *PC-Xware System Administrator's Guide*.

# Changing User Preferences

For information on changing user preferences, see the *PC-Xware System Administrator's Guide*.

# Checking Statistics

## Show Version

**Show Version** displays information about PC-Xware. The following table describes the entries in this window.

| Name | Information Displayed |
|---|---|
| PC-Xware | Version number of current PC-Xware software |
| Built | Date and time PC-Xware was built |
| Started | Date and time PC-Xware was last started |
| Windows | Version number of Microsoft Windows software |
| DOS | Version number of DOS software |
| Screen | Description of current video display |
| Resolution | Screen resolution in pixels |
| DPMI Memory | Amount of memory installed for data generated by users |
| Serial Number | PC-Xware serial number |
| Authorization Code | PC-Xware authorization code |
| Expiration | Date when PC-Xware authorization code expires |
| Authorized features | List of PC-Xware features included in your copy |
| Installed in | Directory on your PC where PC-Xware files are located |
| Network type | Network software currently installed |
| TCP/IP Name | Name assigned to the PC for use in Internet communications |
| TCP/IP Address | Internet Protocol address, a number assigned to the PC for use in Internet communications |

## Show Memory

The **Show Memory** item displays a histogram representation of the amount of memory PC-Xware has allocated. Below the histogram, the amount of total installed memory, the amount of free memory and the size of the largest free memory block is displayed.

The **Update** button adds to the histogram by showing an updated reading of free memory. The **Restart** button starts the histogram again with an updated reading of free memory.

## Show X Connections

**Show X Connections** displays a window that lists the X connections and resource usage. Specific information for each client includes the client name, its host, the type of authorization used, the X window identification number (XID), the number of fonts in use, the pixmaps (off-screen drawing areas), graphics context information, allocated color cells and color maps.

## Show Host Names

**Show Host Names** displays a popup window that lists names, addresses and the types of connection protocols for all the network hosts known by PC-Xware's TCP/IP Name Service (PC-Xservices' **Setup → Change Setup Parameters → TCP/IP Name Service**).

## Show Statistics

**Show Statistics** displays a wide variety of system and network transmission statistics. Select the hide box buttons to display details for any of the topics.

# Appendix C

# Product Support

**Note** Return your product Warranty card before requesting product support.

If you have a question about PC-Xware, first consult this User's Guide, the Product Release Notes, and online Help.

If you cannot find a satisfactory answer, select the **Help → Technical Support** menu item to gather product and system information, then follow the instructions in this appendix to contact product support.

## Product Support Worldwide

International customers should contact the distributor from whom they purchased the product. If this is not possible, or you need direct technical assistance, use the country code dialing appropriate for your location to access the numbers provided under "Product Support Within the United States".

Because NCD is in the Pacific time zone, fax and electronic mail are usually the best methods for international customers. Send electronic mail to **intl_support@pcx.ncd.com**.

# Product Support Within the United States

If you purchased PC-Xware from an NCD distributor or a value added reseller (VAR), that corporation may provide product support. Contact the distributor or reseller to determine if they provide product support.

If you purchased the product from NCD or need direct technical assistance, contact Network Computing Devices, Inc.'s Technical Support:

- Fax: 1-503-641-2959
- Phone: 1-503-641-2200, ask for Technical Support
- Electronic mail: support@pcx.ncd.com
- FTP site: ftp.ncd.com
- Bulletin board: 1-503-646-1743
- World Wide Web site: www.ncd.com

# Fax Support

A fax is preferred to a phone conversation when the problem is complex or the explanation is lengthy. Faxing questions and problems allows the support engineer to better understand the question and prepare a solution before contacting you. When the support engineer is prepared, it takes less of your time to resolve the problem.

When faxing information, please include a completed "PC-Xware Technical Support" form. This form is included in your PC-Xware package. It is essential that you clearly describe your PC's software and hardware, and the X environment that you use. This data is vital to a timely resolution of technical problems.

If the problem is network-related, also include a printout of your **AUTOEXEC.BAT** and **CONFIG.SYS** files.

# Telephone Support

When you call, please be at your PC, have Microsoft Windows running and have your PC-Xware manual nearby. Often the support engineer requests data from the PC or asks you to perform tasks on the PC.

Please have this information available:

- Product version number
- Product serial number
- A short description of the problem
- Information about the PC environment (DOS version, Microsoft Windows version, other Microsoft Window applications in use)
- Network software configuration (network software product name, version number, NDIS / packet / native network adapter driver)
- Network card configuration (network card model, hardware interrupt, I/O base address, shared memory region)
- Microsoft Windows display driver (Control Panel's **Display** entry)
- Your **AUTOEXEC.BAT** file and **CONFIG.SYS** files if the problem is network related.

After logging the problem with a support team member, you will receive a problem report number. Please give the problem report number to the support engineer for subsequent calls concerning the same issue.

# Electronic Mail Support

Electronic mail is an easy way to reach technical support. Please include this information in your email message:

- Your name
- Company name

- Phone and fax numbers
- Email address
- Product version number
- Product serial number
- A short description of the problem
- Information about the PC environment (DOS version, Microsoft Windows version, other Microsoft Window applications in use)
- Network software configuration (network software product name, version number, NDIS / packet / native network adapter driver)
- Network card configuration (network card model, hardware interrupt, I/O base address, shared memory region)
- Microsoft Windows display driver (Control Panel's **Display** entry)
- Your **AUTOEXEC.BAT** and **CONFIG.SYS** files if the problem is network related.

The reply to your email will contain a problem report number at the top of the message. Please use this number in further email messages to product support that concern the same issue.

# Bulletin Board Support

Network Computing Devices, Inc. provides an electronic bulletin board as a service to customers. The only charge for customers is the price of the phone call. The bulletin board often contains updates for:

- PC-Xware network modules (IF*.DLL, IF*.EXE)
- PC-Xware font files (*.PCF)
- PC-Xware font compiler
- PC-Xware icons
- XRemote host software
- Product technical notes

You can use the bulletin board to post messages or data files as follow up information to previous phone, fax, or email product support requests. Do not leave product support requests on the bulletin board.

**Note** Please notify your support engineer if you post data to the bulletin board.

## Using the Bulletin Board

- Log in to the bulletin board by dialing 503-646-1743 via your PC's communication software. The default bulletin board configuration is 9600 baud, 8 data bits, 1 stop bit, no parity, and XON/XOFF flow control.
- To download a file from the bulletin board, ensure that the data transfer protocol of your PC communication software matches that of the bulletin board. The bulletin board supports the following data transfer protocols:
  - ASCII with DC2/CC4
  - ASCII only
  - XMODEM
  - XMODEM-1k
  - YMODEM (Batch)
  - YMODEM-G
  - SEAlink
  - KERMIT
  - SuperKERMIT
  - ZMODEM-90

  After selecting download and selecting a file, do what your PC communication software requires to begin receiving a transferred file. The bulletin board will indicate when the file transfer is complete.

# FTP Support

The NCD FTP site provides the same updates as the Bulletin Board, plus most of the current NCD Contribution CD, and access to updates for other Network Computing Devices, Inc. products.

You can put message files on the FTP site as follow-up information to previous phone, fax, or email support requests. Do not leave initial product support requests on the FTP site.

**Note** Please notify your support engineer if you post data to the FTP site.

## Using the FTP Site

Log in to the NCD FTP site as anonymous:

```
ftp ftp.ncd.com
Name: anonymous
Password: your_email_address
```

You can find information about the topics below in the corresponding directory:

| | |
|---|---|
| PC-Xware: | **/pub/pcx/Archive** |
| Marathon: | **/pub/pcx/Archive** |

**Note** Since most files are binary, remember to do a binary command before getting a file.

# World Wide Web Support

The NCD Web site provides updates, product information, and technical notes. Using your Internet browser, connect to:

**http://www.ncd.com**

# Glossary

| | |
|---|---|
| **Acceleration Parameter** | The parameter used to control the proportion of display screen represented by the mouse's motion across the mouse pad. |
| **Active Window** | The window to which user input is focused. The active window is distinguished from other windows by different frame color or shading. |
| **ANSI** | American National Standards Institute. |
| **Application** | A program for a specific purpose, such as accounting or word processing. Applications and other programs written especially for X are called clients. |
| **Architecture** | The design and structure of the software and/or hardware components comprising a system. |
| **ARP** | Address Resolution Protocol. A network facility whereby an Ethernet address is given or resolved. Note that ARP datagrams do not use IP headers. |
| **ASCII** | American Standard Code for Information Interchange. A standard for transmission of numerals, letters and control characters. |

| | |
|---|---|
| **Background** | The solid color or tile pattern that usually underlies the characters or graphics in a window or menu. |
| **Backing Store** | When an X server maintains the contents of a window, the pixels saved off screen are called a backing store. |
| **BIS** | An extension to the V.32 CCITT standard for modem communications. |
| **Bitmap** | A sequence of bytes representing a grid of pixels; used to form pointers, icons, and background window patterns. |
| **CCITT** | A French communications standard group whose English equivalent title is: Consultative Committee for International Telegraph and Telephone. |
| **Character Cell** | The imaginary box surrounding a character. The character cell encompasses the character's height, ascenders, descenders, and left or right offset. |
| **Click-to-Focus** | The focus policy under which directing input to a window (making it the active window) is accomplished by clicking in the window. Click-to-focus is the default under most window managers, including ***ncdwm*** (See also "Focus"). |
| **Client** | An X Window System application program. Most clients run on a host computer, but PC-Xware servers includes local clients that run on the PC. |
| **Client Memory** | The memory left after loading PC-Xware. A client uses some of this memory upon starting. |
| **Configuration** | A compatible assembly of computer hardware and software. |
| **Configure** | To select and install compatible hardware and software components for a computer system. Configuring the computer network is a major part of a system administrator's responsibility. |
| **Console window** | The window where PC-Xservices are displayed. |

**CTERM** Command Terminal Protocol; a DECnet communication protocol.

**CTerm Client** A client used to provide VT320 terminal emulation using the CTERM protocol.

**DEC** Digital Equipment Corporation.

**DECnet** DEC networking software that runs over Ethernet in local area networks and wide-area networks.

**DECterm** An X application that is a VT320 (monochrome) terminal emulator or a VT340 (color) terminal emulator.

**DECwindows** DEC's implementation of the X Window System. A software interface for video displays.

**DCE** Data Communications Equipment. An RS-232C connection standard used mostly by modems.

**Default** A function dependent parameter assigned when you do not "specify" a value.

**Deiconify** To change an icon back into the window from which it was iconified. Also referred to as Restore.

**Dialog Box** A temporary window that displays information and/or prompts the user for input.

**Display** The video screen upon which output and input may display.

**Display Manager** A client used to start and manage X sessions (See also "X Display Manager").

**Display Server** The combination of graphics display, hardware, and X server software that provides display services for clients. The display server also handles your keyboard and mouse inputs.

**DLL** Dynamic Link Library. A Windows executable module containing functions that Windows applications may use to perform useful tasks. DLLs are similar to the C programming language run-time libraries, except that the DLL function is bound (linked) to the application at run time instead of the function being linked from a library to the physical application. The functions of a DLL may be shared by other Windows applications.

**DNS** Domain Name Server. An optional network utility serving as a centralized name-to-IP address mapping device.

**Download** The process of transferring data to a remote computer system from a host computer system.

**DTE** Data Terminal Equipment; an RS-232-C connection standard used by most hosts and terminal servers.

**Ethernet** A popular network protocol and physical channel for transmitting data over coaxial cable, twisted-pair cable, or fiber-optic cable.

**Ethernet Address** The address identifying a network adaptor on the Ethernet network.

**Explicit Focus** A focus method supported by ***ncdwm***. Under explicit focus, a window becomes active when you click it. It is different from click-to-focus only in that a newly opened window is not automatically the active window (See also “Focus”).

**Focus** To direct keyboard input to a specific window. The window to which focus is directed is called the active window or the focus window. If the window manager is set to have pointer focus, keyboard input is directed to the window under the pointer. If it is set to have click-to-focus, the input is directed to a window in which you have clicked (See also “Click-to-Focus”, “Pointer Focus”, and “Explicit Focus”).

| | |
|---|---|
| **Font** | A distinct set of character glyphs, such as 10-point Roman bold. |
| **Font Server** | A program that provides X fonts and scalable X fonts to X servers on the network. |
| **Foreground Color** | The displayed color of window or menu text, or graphics output. |
| **FTP** | File Transfer Protocol. An application permitting remote file transfer in either direction. |
| **Geometry** | The width, height, and position of an X window expressed as WxH +/-xoffset +/-yoffset. |
| **GID** | Group Identification (also called Group ID). A unique number associated with each group name on the server applicable when using SNMP. |
| **Graphical User Interface (GUI)** | Software that facilitates the interaction between the computer and the user. |
| **GUI** | See “Graphical User Interface”. |
| **Host** | A computer system which provides a set of services for a remote system. |
| **ICMP** | Internet Control Message Protocol. A network protocol permitting acknowledgment of requests to remote systems. |
| **Icon** | A small symbol that represents a window but uses little space on the display. Converting windows to icons allows you to keep your display uncluttered. |
| **Iconify** | To change a window into a small graphical representation. Processing may occur in an iconified window, but you cannot direct input to it. (See also “Minimize.”) |
| **Input Device** | A device used to direct data and instructions to an X server. The keyboard and a mouse are the standard input devices used with the X server. |

**Internet** The collection of networks and gateways that use the

| | |
|---|---|
| **Local Window Management** | Window manipulation (position and size) and related user interface provided by a PC-Xware window manager program that runs on the PC. |
| **Logging In** | The process of providing a user name and password to a host computer to verify that you are authorized to use the computer. |
| **Logging Off** | Terminating a session on a host computer. |
| **Login** | A user identification word used by a computer system to authenticate users (See also “Password”). |
| **Login Banner** | A banner displayed on the screen to provide a means of entering the user name and password for logging in. |
| **Login Chooser** | A popup window that provides a list of accessible hosts and allows selection of a host. |
| **Magic Cookie** | A secret password used under ***XDM*** to control access to an X server and protect a user’s display from unauthorized access. |
| **Maximize** | Increases the size of a window, filling the screen except for the Title and Menu bars. |
| **Menu** | A list of items that can be selected by pressing a mouse button. |
| **Meta Key** | The Alt key on the keyboard. |
| **MIB** | Management Information Block. A network item (See also “SNMP”). |
| **Minimize** | Changes the window to an icon representing the application. (Also see “Iconify.”) |
| **Modem** | The device used to interface the serial line of the computer with the telephone system. Usually used for both send and receive transmissions (full duplex). |
| **Modifier Keys** | Keyboard keys such as Shift, Control, Alt and CapsLock, which when pressed along with a second key, modify the function of the second key. |

| | |
|---|---|
| **MOP** | Maintenance Operations Protocol. Used on DEC systems for address resolution. |
| **Mouse** | A hand-held input device used with X servers to direct the movement of the screen pointer. |
| **NCDware** | NCD's software for X terminals. |
| ***ncdwm*** | NCD's local window manager program (See also "Local Window Manager"). |
| **NDIS** | Network Device Interface System. A standard used for communication with network adapters. |
| **Network** | A collection of computing devices connected by communication hardware and software. |
| **NFS** | Network File System. A protocol allowing a set of computers to access each other's file systems. |
| **OPEN LOOK** | A graphical user interface specification developed by Sun Microsystems and registered by UNIX Systems Laboratories, Inc. |
| **OpenWindows** | Sun Microsystem's X-based user environment. |
| **OSF/Motif** | Open Software Foundation's graphical user interface; used by the NCD local window manager, ***ncdwm***. |
| **Output Device** | The device used to receive the output from a processor. The display screen is often the output device used by X servers. Another frequently used output device is a printer. |
| **Parameter** | A definable characteristic of an item, device, or system. |
| **Password** | A user-defined word used to authenticate computer system users. |
| **PC-Xservices** | PC-Xware's set of utilities to access hosts and clients, customize the X environment, and examine network and terminal statistics. |
| **PCF** | Portable Complied Format. An X server font format supported by PC-Xware. |

**Pixel** The smallest element of the display grid of a graphics display device. The name comes from an abbreviation of the words picture element.

**Pointer** A device used by the user to communicate with the server. Pointer also refers to the symbol that represents the device's location on the screen (for example, an X or an arrow shape).

**Pointer Focus** A focus method supported by ***ncdwm***. Under pointer focus, a window becomes active when you place the

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|---|---|
| **Root Menu** | In using ***ncdwm*** and other GUIs, root menus are menus that are accessed by placing the pointer on the screen background and pressing a mouse button. |
| **Root Window** | A window that fills the screen background during an X session; all windows opened by clients display on top of the root window. |
| **RS-232-C** | A industry standard for serial communications connections. |
| **Serial Client** | A local client that provides a VT320 terminal emulation window for connecting to a host through the serial port. |
| **Serial Communication** | A type of data transmission in which data and instructions are sent one after the other over the same wire. |
| **Server** | A system which provides a specific set of services (such as input or display) to a client program or system. Also a device on a network providing a service, such as a boot server or a print server (See also “X Server”). |
| **Session** | See “X Session.” |
| **Session Manager** | The DECwindows client used to control DECwindows sessions. |

| | |
|---|---|
| **System Administrator** | An individual responsible for managing the computers and network at a computer site. |
| **TCP/IP** | See “Transmission Control Protocol/Internet Protocol”. |
| **Telnet** | The Internet standard protocol for remote terminal connection services. |
| **Telnet Client** | The local client that provides VT320 terminal emulation for connecting to a host using ***telnet***. |
| **Terminal Emulator** | A client used to emulate the function of a terminal. Xterm, the standard X terminal emulator, emulates a VT102 terminal. NCD’s local client terminal emulators (Telnet, LAT, CTerm, and Serial), emulate a VT320 terminal. |
| **Terminal Server** | A device that connects X terminals to services or hosts in a local area network. |
| **Terminate-and -stay-Resident** | A program that stays loaded in memory, even after control has been given up to another **(**TSR**)** application. |
| **TFTP** | Trivial File Transfer Protocol. A protocol that allows simple file transfer to and from a remote system. |
| **Transmission Control Protocol/Internet Protocol (TCP/IP)** | Two networking protocols commonly used for communication over local area networks. |
| **UNIX** | A portable, multi-user time-sharing operating system developed in the early 1970s. |
| **UID** | User Identification (User ID). A unique number associated with the user’s name on the server system. |
| **VAX** | A type of computer manufactured by Digital Equipment Corporation (DEC). |
| ***vi*** | A UNIX visual text editor. |
| **VMS** | Virtual Memory System; the operating system for a VAX computer. |

| | |
|---|---|
| **VT320** | A widely used terminal emulation standard. A DEC terminal. |
| **Window** | In X, a region on the display created by an X application. Windows can be moved and sized by a window manager. |
| **Window Manager** | A host-based or local client that allows you to manipulate windows on a display. |
| **X** | See "X Window System." |
| **X 11 Release 6 (X11R6)** | The current release of the X Window System, implemented by NCD in PC- Xware. |
| **X Consortium** | The guiding organization for the development of standards for the X Window System. It is made up of more than 90 corporations and universities, including NCD. |
| **X Display Manager** | A protocol that provides automatic X protocol connection to a specified host when an X server starts or restarts. |
| **xhost** | A host X program that controls access to the X server from the host system. |
| **xman** | An X application which provides documentation access similar to the man pages for UNIX. |
| **X Server** | The software that provides display services for clients and handles keyboard and pointer input. This is the part of the X Window System that runs in NCD PC-Xware. |
| **X Session** | All the processing that goes on from the time you log in to use the X Window System until you log out. |
| **X Terminal** | A display monitor, keyboard, base containing processors, and a mouse. The X terminal processors are dedicated to running the X server. |
| **X Window System** | A network-based graphical window system developed at MIT to allow users to use applications running on more than one host. |

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|---|---|
| **XDM** | See “X Display Manager.” |
| **XRemote** | NCD’s software for running X over a serial line. |
| ***xterm*** | The standard X terminal emulator. (Also see “Terminal Emulator and Local Client.”) |

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