NCBridge Software

User Manual

Version 4.0.10

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Typographical Conventions

This manual uses the following typographical conventions:

This symbol indicates additional or background information for the particular section. For example, the symbol is used in Chapter 2 to refer to the specific commands that were set by your system administrator.

This symbol indicates a Launcher Menu selection. Depending on how your account is set up, the Launcher may already be on your screen. If that is the case, simply use the mouse to select an option. If the Launcher is not present, press the Setup key or key sequence for your keyboard, as shown in Table 1.

Table 1 Setup Key and Key Sequences

Keyboard Type	Press
101/102 with Setup	Setup key
101/102 with Pause	SHIFT-Pause
Windows 95	SHIFT-Pause
Sun keyboard	ALT-GRAPH-HELP or ALT-GRAPH-SETUP
3270 keyboard	Right ALT-ExSel (The left ALT key does not work)
LK401	F3 key
UNIX keyboard	Alt-Graph-HELP

Figure 1 on the next page illustrates the typographical conventions used in this manual.

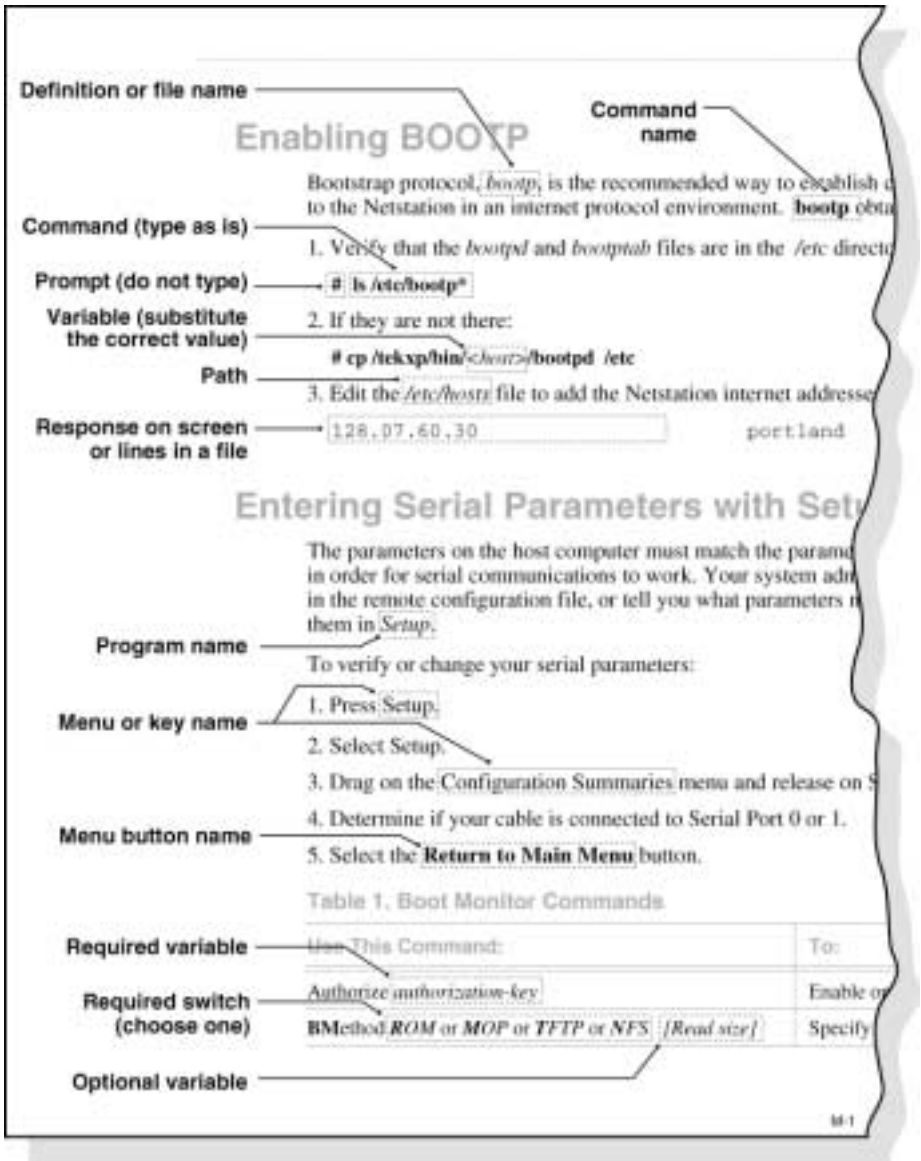


Figure 1 Typographical Conventions

Network Computer Package

This manual assumes you have installed your network computer according to the included pictorial instructions. Your network computer has the following components:

- The *monitor* is the screen where text and graphical information is displayed for viewing. You can position the monitor to a comfortable viewing angle by tilting and turning the monitor on its base. You can adjust the brightness and contrast controls according to your preference. The controls are typically located on the front or side of the monitor.
- The *logic board* is the controller inside your network computer that handles all input and output communications and local processing.
- The *keyboard* is used as the primary method for entering alphanumeric data. You can open the folding legs on the back of the keyboard to adjust the keyboard angle. There are several different keyboards available, in many different languages.
- The *mouse* is a device used to position a pointer appearing on the display in order to access or select information. It is used as the primary method to move about in a window manager or X window application, access menus, and select options. Information on using the mouse and the mouse buttons is in the next section of this chapter. Trackballs, touchscreens, and tablets can also be used as pointing devices. Contact your system administrator for more information on these devices.
- The *communication port* is a connector on the back of the cabinet housing your network computer logic board. You connect your existing network cable to this connector. A network cable must be set up for you by your system administrator. This cable must be attached to your network computer in order to run.
- The *NCBridge software* is the network computer operating system and support files that your system administrator must load and configure on a host computer so your network computer can start up. If your network computer has an optional flash ROM-based unit, the software may not be necessary.

  The software is shipped on one or more CD-ROMs (also on magnetic tape for VMS only). The disks or tapes and the documentation CD-ROM with various manuals are shipped with the software in a separate package from the network computer.

Map to the NCBridge Documentation

Table 2 presents the contents of the manuals in the NCBridge documentation set. These manuals are included on the *Documentation CD-ROM*.

Table 2 Available NCBridge Documentation

Manual Title	Contents
NCBridge User Manual	(This manual) Provides information on using the network computer with NCBridge software.
NCBridge Reference Manual	Provides explanation of all NCBridge, Setup Main Menu, and Boot Monitor commands; plus Diagnostics, SNMP, Tek220 and Tek340 Emulators, Printing, Keyboard, CSLIP, and Scripting Language setup.
3270 User Manual	Provides information on using the OpenConnect 3270 emulator.
3270E/5250 User Manual	Provides information on using the TEEMX 3270E/5250 emulators.
NCBridge for UNIX Installation and Configuration Manual	Provides information for installing NCBridge on a UNIX server and explains how to configure the network computer to download and execute the NCBridge software.
NCBridge for VMS Installation and Configuration Manual	Provides information for installing NCBridge on a VAX VMS server and explains how to configure the network computer to download and execute the NCBridge software.
NCBridge for Windows NT Installation and Configuration Manual	Provides information for installing NCBridge on a Microsoft Windows NT server and explains how to configure the network computer to download and execute the NCBridge software.

The following documentation is available from Prentice-Hall:

- *OSF/Motif User's Guide* ISBN 0-13-640509-6
  This book presents Motif fundamentals.

Discontinued Software Features

As NCD continues to add new features to make your NC hardware more valuable, we are forced to discontinue support for some of the older software features. The following is a list of features that were supported in previous NCBridge software releases, but are not supported in NCBridge 4.0.10.

- Navio browser
- Serial Xpress
- Local OpenLook Window Manager
- X Blink Extension
- Local 3179G Terminal Emulator
- Sun Audio Intercept Driver for Sun OS Environments
- XIE
- SIE
- Display PostScript and Acrobat Reader
- Flash Control Console Client
- Support for XP10 X terminals
- Support for XP330 X terminals

Serial Xpress

Serial Xpress enabled a NC or X terminal to connect to a remote host and transmit X Windows data over an RS-232 cable, or indirectly over a phone line using modems. The NC can now be connected using PPP over an RS-232 connection, or connected to a DSL or ISDN connection using the standard network port to provided remote access to a host replacing the need for Serial Xpress.

Local OpenLook Window Manager

The local OpenLook window manager (OLWM) is a window manager for the X Window System that implements parts of the OPEN LOOK graphical user interface, original developed by Sun Microsystems, Inc. This feature was previously provided to allow the OLWM program to run as a local client on the Network Computer (NC) to help off load server resources. The OLWM window manager is still supported on the NC's under X Windows by simply running OLWM directly from a Sun host. OLWM is one of the standard window managers on Sun's Workstation products running Solaris. NC's still offer Local Motif (MWM) or (XPWM) window managers to use in place of OLWM where a local window manager is necessary.

Local 3179G Terminal Emulator

The local 3179G Terminal Emulation is no longer included. The local IBM 3179G Terminal Emulation included IBM3720 support along with special IBM Graphics functions (GDDM), including support for older IBM host graphics applications. The NC still offers optional support for IBM3270 Emulation.

Chapter **1**

A New Piece of Hardware

A box labeled *network computer* has been delivered to your desk. Maybe it is a replacement for your current personal computer, text-only (ASCII) terminal, or workstation. Or, maybe it is to be used with a new system or application. Either way, what is a network computer, and how is this new piece of hardware going to make your job easier than the piece of hardware you already have?

What is a Network Computer?

The broad definition of a network computer (NC) is an internet-capable device that supports the following features and formats:

- Minimum screen resolution of 640x480
- Pointing device (such as a mouse)
- Text input, audio output
- TCP/IP, FTP, NFS, UDP, Telnet
- SMTP, IMAP4, POP3 (e-mail protocols)
- JPEG, GIF, WAV, AU (multimedia file formats)
- Bootp
- HTML, HTTP (web protocols)
- Java application access

This definition includes everything from internet appliances, such as set-top boxes that provide Internet access to your television, to powerful PC servers that meet these requirements. Obviously, not every device that meets these minimum requirements will be useful in a business environment.

A network computer is a device-independent, network-transparent, multi-tasking device connected to a host computer in a distributed computing environment. If that makes sense, skip to Chapter 2, *Operating the Network Computer*. Otherwise, please read this chapter to better understand what a network computer is and how it works when you consider the components used in the definition.

- *Distributed computing* allows you, from a single network computer, to take advantage of all the resources available on multiple host computers. For example, from your network computer you can access multiple hosts at the same time, perhaps to run a spreadsheet from one computer, create a document on a second, and receive mail from a third. A distributed-computing environment is composed of host computers joined together by a network. Figure 1-1 shows a typical distributed-computing environment.

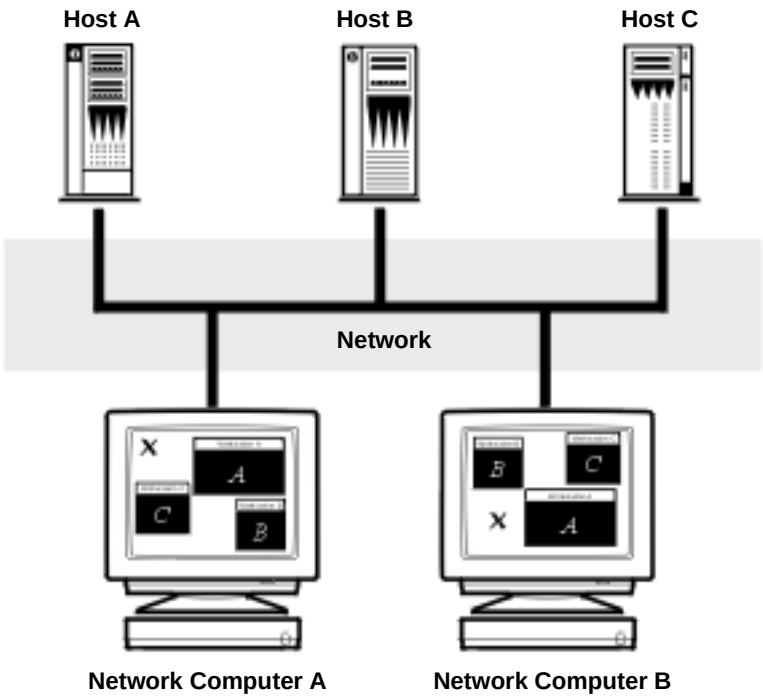


Figure 1-1 Typical Distributed-Computing Environment

- *Device-independent* means that your network computer can open a session on any host computer accessible to you, regardless of the computer's operating system. With your network computer, you can even have simultaneous sessions running on totally different operating systems.
- *Network-transparent* means that your network computer can log in and run applications (called *clients*) on one or more host computers over the network just as if it were running locally on the computer itself. This requires a single network connection cable, not one direct cable for each host you need to access.
- *Multi-tasking* means that a client you start up in one window continues to run (in its window) even while you are using a different window. Also, a window can receive output even if it is completely hidden from view. Each window essentially functions like an individual terminal or personal computer. For you, the advantage is that you can have many different windows all on your network computer display.

Why Use a Network Computer?

To better understand your network computer's capabilities and advantages, consider something possibly more familiar, such as a personal computer (PC).

- The display, keyboard, and mouse serve the same function on your network computer as they do on a PC.
- Both devices require software in order to boot up and run applications. Here are some differences:
  - PC software is loaded onto a (local) disk right in the PC cabinet.
  - Network computer software is loaded onto a (remote) disk on a central computer.

The network computer advantage is that there is probably far more disk space available to the central computer than to a PC. Also, there is typically a support staff to load software and perform back ups on a central system.

  - PC software is typically licensed for a single user on a single PC.
  - X applications run on a network and are licensed for multiple users.

Sharing software across the network is usually more cost effective than buying and maintaining separate copies for each user.

- Both devices require logic boards and storage devices (disks) to handle information.
  - For a PC, the boards and disk drives are within the cabinet. You can only add a limited number of peripheral devices such as extra disks, printers, or modems.
  - For your network computer, some of the boards are inside the logic module, but your network computer takes advantage of the main computing boards, disk drives, and peripherals located on one or more remote computers.

This is one of the key advantages of a distributed-computing environment. Computing power, storage, and access to peripheral devices like printers can be shared to maximize their use, and provide users with more flexibility. It is also far easier to share information with other users.

How Do You Use a Network Computer?

1. Unpack your network computer according to the pictorial instructions on the network computer shipping box.
2. Connect the keyboard, mouse, cords, and cables as shown in the pictorial physical installation guide included in the network computer box.
3. Verify with your system administrator that the software to support your network computer has been installed on a computer. Ask your administrator if you need specific booting information.
4. Power on your network computer and log in. Chapter 2, *Operating the Network Computer* details these topics.
5. Run your applications. Chapter 3, *Using the Network Computer* describes what to do to get started.

Mouse Operations

The following list presents and explains the terms related to mouse operations that are used in this manual.

Button (on the display) A small display box within the borders of a window, or inside a dialog box. Generally, clicking on a button activates a function or performs some action.

Button (on the mouse) The three buttons on the top of the mouse. Table 1-1 shows the factory configuration of the buttons.

Table 1-1 Mouse Button Configuration

Button Name In Manual	3-button Mouse Selection
Select	Left button
Menu	Middle button
Custom	Right button

Clicking Quickly pressing and releasing a mouse button (without moving the pointer) to select an object on the display screen or initiate a command.

Dialog Box A box where you choose options and enter information. Use the mouse to move from field to field, click on buttons and position the text cursor. Use the keyboard to enter information in a dialog box.

Dragging Pressing and holding down the Select mouse button while moving the pointer.

Moving Using a mouse to change the location of the pointer on the display screen.

Pointer An arrow on the display screen indicating the current cursor position for selecting or clicking.

Pointing Using a mouse to position the pointer (such as an "x" or "↑" symbol on the screen) on an object on the display screen.

Releasing Releasing (lifting your finger) from a mouse button to complete a dragging action.

Chapter 1 A New Piece of Hardware

Chapter 2

Operating the Network Computer

Powering On the Network Computer

The first step is to power on your network computer. For network computer models with a separate logic module, power on both the display and the logic module. Figure 2-1 illustrates the location of the power switch for the NC900 series base.

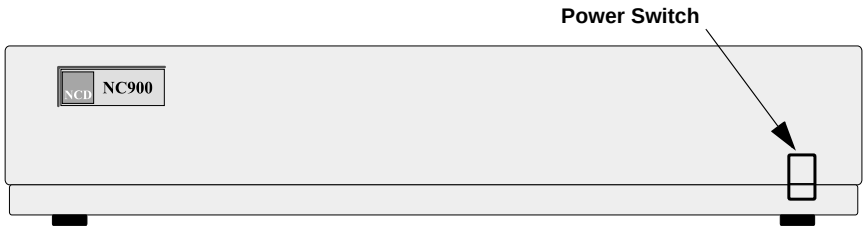


Figure 2-1 Power Switch Location for NC900 Series

If the network computer does not power on, refer to Chapter 6, *Troubleshooting* for troubleshooting information.

The Network Computer Boot Process

When your network computer is powered on, it automatically begins booting. *Booting* means your network computer is locating and reading its start-up files. The boot screen shown in Figure 2-2 appears on your display as the network computer is booting.

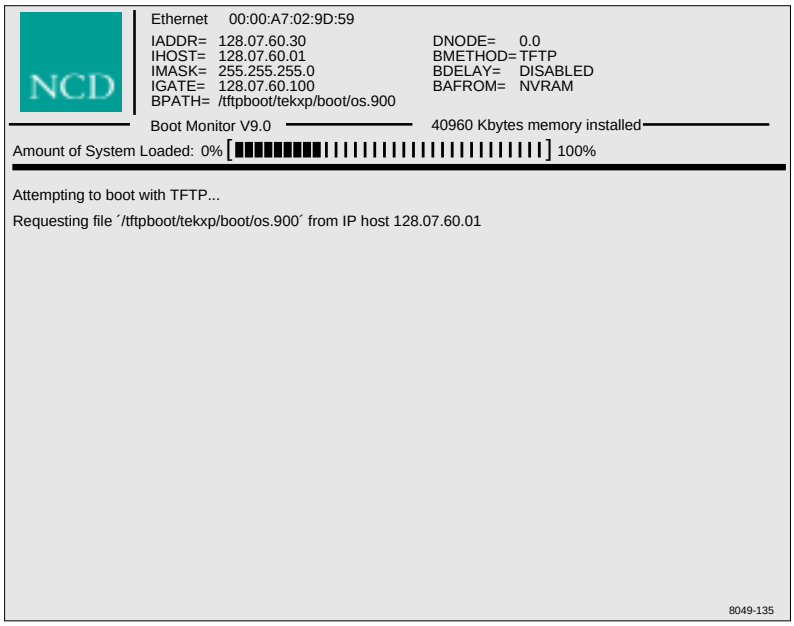


Figure 2-2 Network Computer Boot Screen

During a normal boot, the network computer successfully locates and begins to read the boot files and the Percent of File Loaded slide bar appears on the boot screen. During a boot, pressing any key on the keyboard halts the boot process. Do not halt the boot unless directed by your system administrator.

If the slide bar does not appear, or, if your network computer displays a `BOOT>` prompt, the boot has halted. To try the boot again, type **b** and press **Enter**.

If the boot fails again, call your system administrator or refer to Chapter 6, *Troubleshooting* for more information. To help troubleshoot the boot problem, write down any messages that were displayed.

Your network computer is attempting to boot from the network or from an optional Flash memory or ROM board (read only memory). You can tell how your network computer is trying to boot by looking at the Boot Method (BMETHOD=) status line on the boot screen. Possible values are ROM, TFTP, NFS, or MOP.

Logging In to the Network Computer

The next step depends on the way your system administrator sets up the network computer software on the host computer. Each login method is illustrated and described in the following sections to help you identify your login method.

After your network computer completes the boot process, one of these should appear on your monitor:

- Gray pattern (called the *root weave*) with an **X** cursor (shown on page 2-4)
- Client Launcher (page 2-5)
- HostMenu (page 2-7)
- Login window prompt (page 2-10)
- Telnet window (page 2-12)
- Cterm window (page 2-14)
- WinDD (page 2-16)
- Serial Port Window (page 2-22)
- LAT Window (page 2-24)

If you cannot log in, refer to Chapter 6, *Troubleshooting* for troubleshooting information.

The login method is determined by the **Host Connect Method** command. This command is set by the system administrator in the remote configuration file or through Setup on the network computer.

Logging In from the Root Weave

The root weave is a gray, patterned screen available on all network computers. When the network computer is ready for input, an X-shaped cursor appears on the screen. A network computer with the root weave and cursor is illustrated in Figure 2-3.

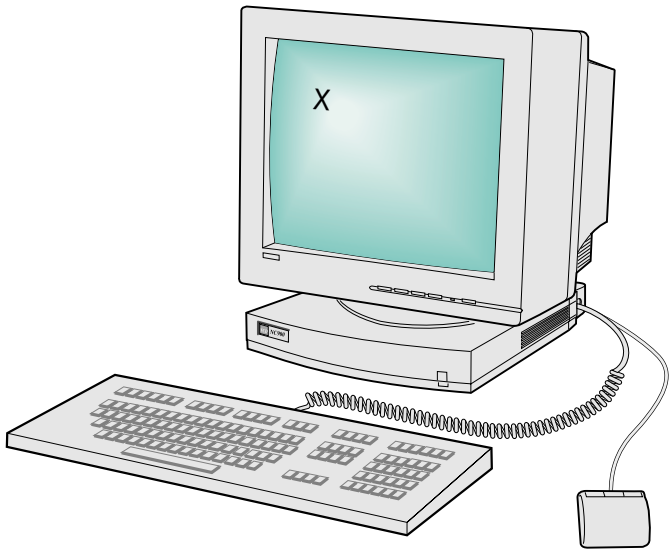


Figure 2-3 Root Weave with X Cursor

To log in from the root weave, you need to manually start the Client Launcher.

Press **Setup** or a key combination, depending on the keyboard type (see Table 1, *Setup Key and Key Sequences*,on page ix), to bring up the Client Launcher. Refer to *Logging In with Client Launcher* on page 2-5.

Logging In with Client Launcher

The Client Launcher starts the local client you select from a menu. An arrow to the right of an entry indicates a submenu. In Figure 2-4, selecting Host Connections displays a submenu listing available host connections, such as Telnet or Cterm.

Your system administrator configures the Client Launcher to include the local clients you use most often. (Refer to your NCD NCBridge Installation and Configuration manual for details on defining the Client Launcher menu.) The Client Launcher on your network computer may list different clients and submenus than those that appear in Figure 2-4.

Figure 2-4 Client Launcher Menu

Use one of these methods to start a client from the Client Launcher:

- Position the pointer on the client name and click the **Select** mouse button.
- Position the pointer on the option to display the submenu. Position the pointer on the client name and click the **Select** mouse button.

If using Client Launcher to open a host connection, see the applicable section:

- *Logging In with HostMenu* on page 2-7
- *Logging In with Telnet* on page 2-12
- *Logging In with Cterm* on page 2-14
- *Logging In with the WinDD ICA Client* on page 2-16
- *Logging In with LAT* on page 2-24

The Client Launcher appears automatically if it is specified in the remote configuration file. The applicable command is **start** (set to LAUNCHER).

Logging In with HostMenu

HostMenu is a window showing a list of host computer names and network addresses. Figure 2-5 shows a sample HostMenu.

Notice the list buttons across the top (for example, XDMCP and VMS TDEnet). These buttons determine which type of log in list is displayed. The button pressed in indicates which list is currently displayed.

If there are more host names than can fit on one screen, use the mouse to scroll through the host names. If your host does not appear on the list, try clicking the **Update** button or click one of the list choice buttons to display a different list. If it still does not appear, contact your system administrator.

Figure 2-5 Example HostMenu

To log in with HostMenu using either the mouse or the keyboard:

- Using the mouse, position the pointer on a host computer where you have a login account. If your host is not displayed, try the **Update** button or look for your host on one of the other lists (change lists by clicking one of the list buttons across the top).
- Click the **Select** button (left mouse button) to connect to the host.
- Using the keyboard, enter the host's name or address in the Host text box and press **Enter**. If connecting to a LAT host, enter the Node's name or address in the Node Name text box, and the Service name in the Service Name text box. Use the keys listed in Table 2-1 to edit and move around the HostMenu.

Table 2-1 Keyboard Interface for HostMenu

To:	Press:
Clear the contents of a text box	Control–u keys
Move among the text boxes	Tab key
Move to the first host in the list of hosts	Home key
Move to the last host in the list of hosts	End key
Move to a specific host in the list of hosts	The first few letters of the hostname, or if using LAT, the first few letters of the service name
Page up and down through the list of hosts	PgUp and PgDn keys

After selecting a log in host, some type of screen with a `Login:` prompt is displayed. If you selected the wrong host, press Ctrl–c to close the login box without logging in to the specified host. Depending on your log-in method, another action may be required. For example, if Telnet was the log-in method, type **`exit`** to log out.

- At the `Login:` prompt, type your user name and press **Enter**.
- At the `Password:` prompt, type your user password and press **Enter**.

For more information, see the applicable section:

- *Logging In at a Login Prompt* on page 2-10
- *Logging In with Telnet* on page 2-12
- *Logging In with Cterm* on page 2-14
- *Logging In with the WinDD ICA Client* on page 2-16
- *Logging In with Serial Port 0 or 1* on page 2-22
- *Logging In with LAT* on page 2-24

Continue with Chapter 3, *Using the Network Computer*.

HostMenu appears automatically if it is set up as the connection method through the remote configuration file or through Setup. The applicable commands are **Host Connect Method** (set to HostMenu) and **Default Host List** which determines the list that is initially displayed.

Logging In at a Login Prompt

If your system administrator has set up your network computer to directly log in to a specific host, some type of welcome screen with a login prompt is displayed. A welcome screen is also displayed for programs like HostMenu after a connection is made. Sample login screens for the UNIX host **oregon** and the VMS host **IDAHO** are illustrated in Figure 2-6 and Figure 2-7.

Figure 2-6 Example UNIX Login Screen

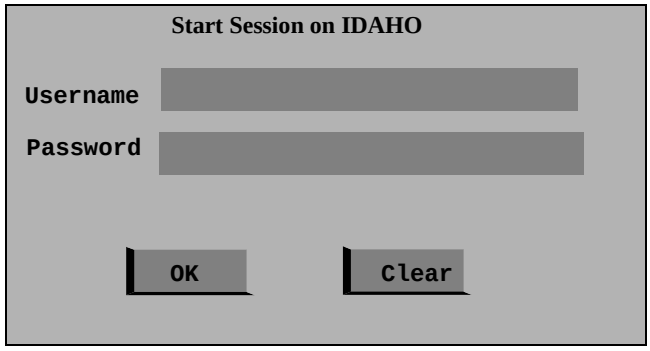


Figure 2-7 Example VMS Login Screen

To log in:

1. At the `Login:` or `Username:` prompt, type your user name and press **Enter**.
2. At the `Password:` prompt, type your user password and press **Enter**.

Continue with Chapter 3, *Using the Network Computer*.

Direct connections are specified by your system administrator through the remote configuration file or through Setup. The applicable commands for UNIX systems are **Host Connect Method** (XDMCP Direct) and **XDMCP Server** (set to your host). The applicable commands for VMS systems are **Host Connect Method** (set to VMS), **VMS Autologin Transport** (set to TDEnet), and **VMS Autologin TDEnet Host** (set to your host).

For additional information, refer to *XDMCP_keepalive* on page 5-95 of this manual.

Logging In with Telnet

There are two ways to log in through Telnet, depending on whether your system administrator specified a default Telnet host for your network computer. If your network computer displays a `Telnet>` prompt like Figure 2-8, a default host has not been specified. In this case, you must open a connection before you can log in to the host.

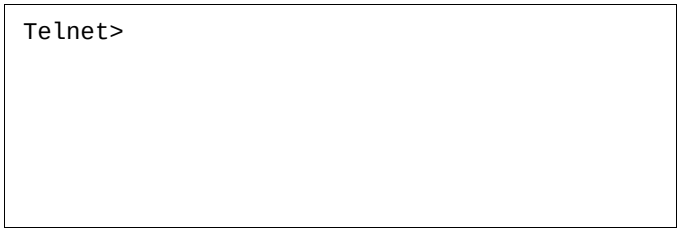


Figure 2-8 Telnet Window Waiting for an Open Command

To open a connection to your host computer:

1. Use the mouse to position the pointer in the Telnet window. You can type **h** and press **Enter** to see a list of Telnet commands.
2. Type:

   `Telnet>` **`open`** ***`hostname`***

   where ***`hostname`*** is the name or network address of the host.

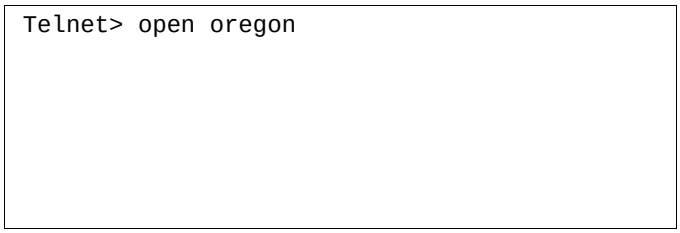


Figure 2-9 Telnet Open Command

Once a connection is made (Figure 2-10), either automatically or with the **open** command, you can log in:

1. Type your user name at the `login:` prompt and press **Enter**.
2. Type your password at the `password:` prompt and press **Enter**.

```
Trying...
Connected to 128.07.60.01.
Escape character is '^]'


login:
```

Figure 2-10 Telnet Window With a Host Connection

Continue with Chapter 3, *Using the Network Computer*.

Telnet connection and default Telnet host are specified by the system administrator through the remote configuration file or through Setup. The applicable commands are **Host Connect Method** (set to Telnet) and **Default Telnet Host** (set to your host name or address).

Closing a Telnet Window

Press Ctrl–d at the `login:` prompt to return to the `Telnet>` prompt without logging in to the computer.

To close the Telnet window from the `Telnet>` prompt, type **`quit`** and press **Enter**.

Logging In with Cterm

There are two ways to log in through Cterm, depending on whether your system administrator specified a default Cterm host for your network computer. If your network computer displays an NSH> or CTERM> prompt like Figure 2-11, a default host has not been specified. In this case, you must specify a connection before you can log in to the host.

```
CTERM>
```

Figure 2-11 Cterm Window Waiting for a Set Host Command

To open a connection to your computer:

1. Use the mouse to position the pointer in the Cterm window. You can type **`help`** and press **Enter** to see a list of Cterm commands.
2. Type:

   CTERM> **`sethost`** ***`hostname`***

   where ***`hostname`*** is the node address of the host.

```
CTERM> sethost 11.10
```

Figure 2-12 Cterm Set Host Command

Once a connection is made (Figure 2-13), either automatically or with the **sethost** command, you can log in:

1. Type your user name at the `Username:` prompt and press **Enter**.
2. Type your password at the `Password:` prompt and press **Enter**.

```
connected to host 11.10
Welcome to VAX/VMS V5.5

Username:
```

Figure 2-13 Cterm Window With a Host Connection

Continue with Chapter 3, *Using the Network Computer*.

Cterm connection and default Cterm host are specified by your system administrator through the remote configuration file or through Setup. The applicable commands are **Host Connect Method** (set to Cterm) and **Default Cterm Host** (set to your host address).

Closing a Cterm Window

If you are at the `Username:` prompt and do not want to log in to the host, wait until the network connection times out and closes. A message appears on the screen when the connection closes. Typically it takes 60 seconds to time out.

To close the Cterm window from the `NSH>` or `CTERM>` prompt, type **`quit`** or **`exit`** and press **Enter**.

Logging In with the WinDD ICA Client

The WinDD Client screen shown in Figure 2-14 has three areas for server information:

- The Server Browsing window (a frame containing a scrolling list).
- The Application Server input field.
- The Console window.

The Server Browsing window contains a list of servers that is automatically generated, as set up by your system administrator. You must connect to a server before you can log in.

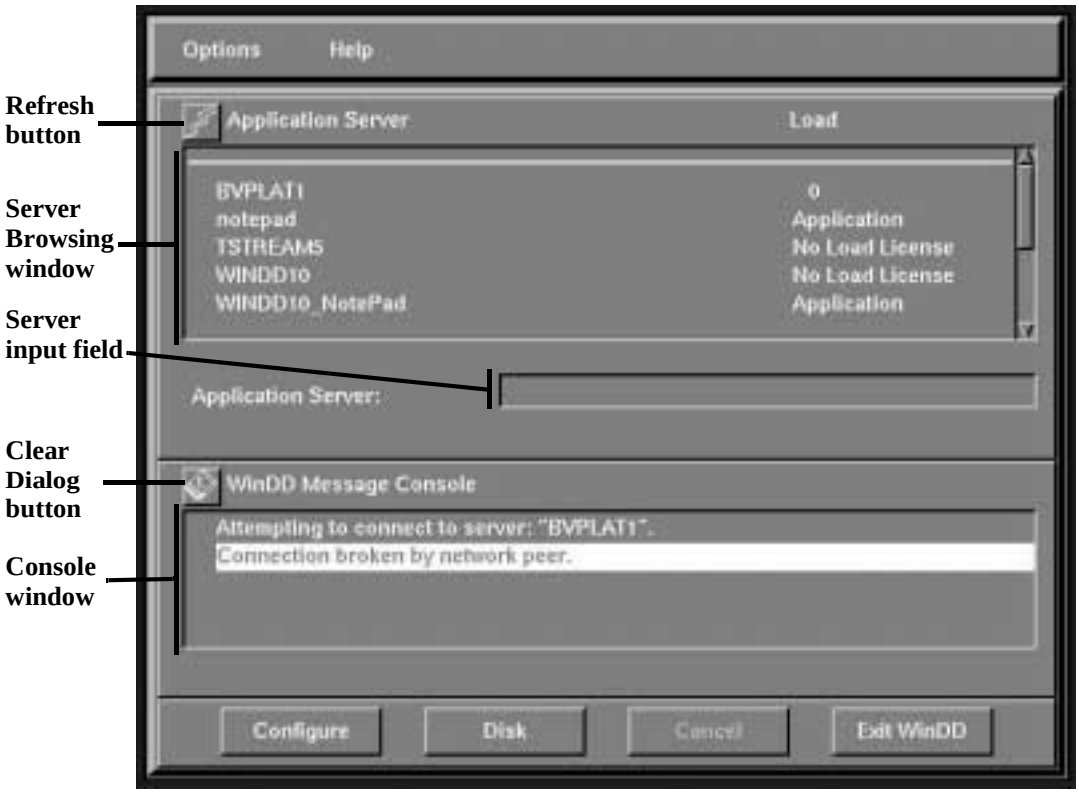


Figure 2-14 WinDD ICA Client Screen

There are two buttons on the WinDD ICA Client screen, a Refresh button for the list of application servers in the top frame and the Clear Dialog button to clear the lower frame.

Note: ***Additional WinDD information can be found in the topic,*** *WinDD ICA Client* ***on page 5-52 of Chapter 5,*** *Using Advanced Features.*

Logging in With the WinDD ICA Client

From the WinDD ICA Client screen (Figure 2-14) you must indicate the server you want to connect to before you can log onto the server. There are two ways to do this:

- By selecting one of the servers listed in the Browsing window (simply click on its name.)
- By entering the name of the server you want in the Server Input field.

Selecting a Host

There are two ways to select a host server, through ICA broadcast browsing or by command line entry. Select one of the multi-user Windows NT servers (application servers) listed in the top frame of the WinDD clients window. (See Figure 2-14.)

ICA Broadcast Browsing

The ICA Broadcast Browser automatically builds a list of the available Windows NT servers on the user's network. This allows you to select a server from the list of multi-user Windows NT servers—you want a server that can provide good performance; usually the one with the lightest load.

Remote Configuration or Command Line Selection

Remote Configuration method. If the server you want to use is listed (this means it has been defined for you by your system administrator), you can simply select it from the WinDD ICA client screen.

If you want to access an application server that is not listed, enter the server's name or its address in the Application Server input field and press **Enter**.

Next, the software generates a list and places it above the current list. The top list, called the Application Server list, is separated from the other servers in the list by a ===== line.

Command Line Selection. If you start WinDD using **xpsh**, you can use options on the command line to specify a server you want to access. There are a number of options for this; several of them (–c, –e, –ne, and –h) are explained here:

Use the **–h** option to add a named application server to the Application Server list. For example, to add the name of a server in the list, enter:

```
-h BVPLAT1
```

(To add more than one server at a time to the list, put a space between their names.)

Use the **–c** option to auto-connect to the first server in the Application Server list. If there are no servers in this list, this option is ignored and the software displays the client window.

Use the **–e** option to enable the Application Server edit field window. This makes it possible for users to add servers to the Application Server list.

Use the **–ne** option to disable the Application Server edit field window. This means users cannot add servers to the Application Server list.

The system administrator specifies the WinDD connection, default WinDD host, and Server entries through the remote configuration file or through Setup. The applicable commands are **Host Connect Method** (set to WinDD), **Default Windows NT Server Host** (set to your default server address), **WinDD Menu Entry** (lists Windows NT servers for HostMenu), and **WinDD Host Entry** (lists additional Windows NT servers for the WinDD client screen).

Setting the WinDD Window Size

From the WinDD ICA client screen, you can easily change your session attributes before you connect to a multi-user Windows NT server.

The **Configure** button brings up the WinDD Configuration dialog illustrated in Figure 2-15. The resolution determines the size and number of colors of the WinDD window. The resolution must be selected prior to making a connection to the application server and cannot be interactively changed until the connection has been closed. The **Configure** button performs the same function as the **Options > Configure** command in the pulldown menu.

Figure 2-15 WinDD Configuration Dialog

Logging In

Once you have made a connection, press **Ctrl-Alt-Del** to bring up the log in screen, shown below in Figure 2-16. If you want to specify a different server or return to the Client screen for any reason, select **Options** > **Server**. The **Options** > **Server** function switches between the Client screen and the Log in screen after a server connection is made.

Figure 2-16 WinDD ICA Log In Screen

1. Enter your user name.
2. Use the mouse or Tab key to advance to the Password line.
3. Enter your password.
4. Press **Enter** or click **OK**.

Closing a WinDD Session

For Windows NT 3.51 servers, close your Windows NT session as usual, by closing each of your applications, then selecting **File** > **Logoff** from the Program Manager.

On Windows NT 4.0 or later servers, close your Windows NT session by closing each of your applications, then select **Start** > **Logoff** from the Program Manager.

If auto reconnect is on, the system displays the WinDD log in screen. If auto reconnect is off, the WinDD client screen appears. Select one of these methods to close the WinDD session:

- Choose **Options** > **Exit**.
- Click the **Exit WinDD** button on the client screen.
- Hold Shift and Ctrl, then click the middle mouse button. Select **Exit WinDD** from the menu. (This applies only if you still have a server connection.)

Note: ***Additional WinDD information can be found in the topic,*** *WinDD ICA Client* ***on page 5-52, of Chapter 5,*** *Using Advanced Features****.***

Logging In with Serial Port 0 or 1

There are several ways to connect to a host through the Serial Port window shown in Figure 2-17. Check with your system administrator to find out which options you can use on your particular network computer.

- Serial communications with no protocol.

Use Serial Port 0 or 1 depending on which port your serial cable is plugged into on the back of your network computer logic module.

If you have problems establishing communications, contact your system administrator.

Figure 2-17 Serial Port Window Waiting for Command

Closing a Serial Port Window

To close a Serial Port window without logging in, press **Enter** and then type **~.** (tilde (**~.**) followed by a period).

Entering Serial Parameters with Setup

The parameters on the host computer must match the parameters of your network computer's serial ports in order for serial communications to work. Your system administrator can set them up for you in the remote configuration file, or tell you what parameters need to be set so you can enter them in Setup.

To verify or change your serial parameters:

1. Select Setup from the Client Launcher. If you need a refresher on the terminology in these procedures, refer to Chapter 1, *A New Piece of Hardware*.
2. Drag on the Configuration Summaries menu and release on Peripheral Ports.
3. Determine if your cable is connected to Serial Port 0 or 1 by checking the back of the integrated network computer or the separate logic module.
4. Verify the parameters for the port are set to the values obtained from your system administrator. Change them if necessary.
5. Select the **Return to Main Menu** button.
6. Select the **Save Current Settings** button.
7. Select the **Exit Setup** button.

Serial Communications with No Protocol

From the Serial Port window pictured in Figure 2-17:

1. Position the mouse pointer in the Serial Port window.
2. If you are using a modem, type your dialing command, which is similar to this: (Refer to your modem manual.)

   `atdt` *`phone_number`*
3. Press **Enter** to bring up a `Login:` prompt.
4. Type your user name and press **Enter** to bring up the `Password:` prompt.
5. Type your password and press **Enter**.

Continue with Chapter 3, *Using the Network Computer*.

Serial Port connection is specified by the system administrator through the remote configuration file or through Setup. The applicable command is **Host Connect Method** (set to Serial Port 0 or 1).

Serial Communication via PPP

For communication using Point-to-Point Protocol (PPP), see the PPP support information in *PPP Support* on page 5-68.

Logging In with LAT

If your network computer displays a LAT> prompt like Figure 2-18, you are set up to log in through a Local Area Transport supported in a DECnet environment. To login, you must connect to a LAT service.

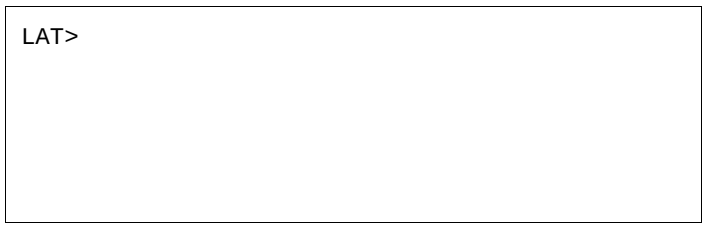


Figure 2-18 LAT Window Waiting for a Connect Command

To connect to a service:

1. Use the mouse to position the pointer in the LAT window. You can type **help** and press **Enter** to see a list of LAT commands.
2. Type:

   LAT> **services**

   to see a list of available services.
3. Type:

   LAT> **connect *service***

   where ***service*** is the name of a valid service.

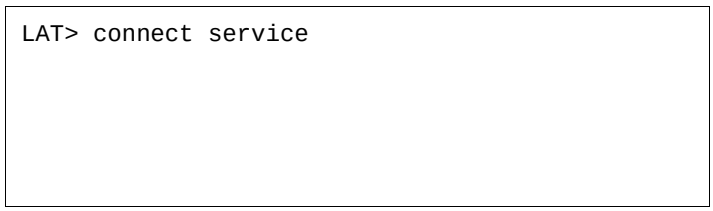


Figure 2-19 LAT Connect Command

If it is a password protected service, enter the password at the `Password:` prompt. You have up to three tries to enter the password before the connection attempt fails.

Once a connection is made (Figure 2-20) you can log in:

1. Type your user name at the `Username:` prompt and press **Enter**.
2. Type your password at the `Password:` prompt and press **Enter**.

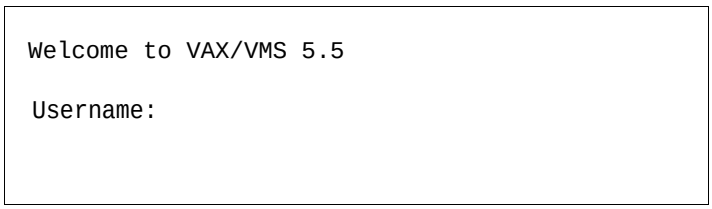


Figure 2-20 LAT Window With a Service Connection

Continue with Chapter 3, *Using the Network Computer*.

LAT connection can be specified by the system administrator through the remote configuration file or through Setup. The applicable command is **Host Connect Method** (set to LAT).

Closing a LAT Window

If you are at the `Username:` prompt and do not want to log in to the host, wait until the network connection times out and closes. A message appears on the screen when the connection closes. Typically it takes 60 seconds to time out.

To close the LAT window from the `LAT>` prompt, type **`quit`** or **`exit`** and press **Enter**.

Chapter 3

Using the Network Computer

What next? might be a more appropriate title for this chapter. There really is no single answer to the *What next?* question. Your network computer is designed to be as flexible as possible so it can be tailored to fit your needs and your computing environment. This tailoring process is performed by your system administrator, with help from the installation and reference manuals that are included with the network computer software.

While it is not possible to explain step-by-step how to get started here, this chapter does provide general information to help you figure out *What next?* Typically, one of these scenarios occurs:

- A window manager starts automatically.
- A client starts automatically.
- Both a window manager and client start automatically.
- Nothing starts (leaving you to initiate an action).

The sections in this chapter contain information to help you identify what is taking place on your network computer, and what choices you can make. These topics are discussed:

- X Window Software Components
- Getting Unstuck
- Window Managers
- Sessions
- Running Clients
- Locking the Display
- Local Floppy Manager (LFM)

X Window Software Components

Before diving into the details of the possible scenarios, an introduction to some of the common software components and terminology will be helpful.

The *X Window System* is a windowing system developed to enhance the usability of a host computer by utilizing an X server as a *device independent* interface between the host computer and your network computer. This means that you can run clients on computers made by different manufacturers, freeing you to focus on your applications without worrying about computer differences. Another advantage is that X is *multi-tasking*, so multiple applications can run simultaneously in different windows.

The *X server* is the interface that translates client requests from your network computer to the host computer. It also accepts input data from your mouse and keyboard and generates the appropriate actions.

Windows are bounded areas displayed on your network computer screen that determine how information is presented on the screen. They can contain text or graphics (pictures, graphs, animated sequences) generated by your application programs, such as word processors, or transaction processing software. The X server controls what gets displayed inside each window. Information does not spill over from one window to the next.

A *Window Manager* is a special program that runs on top of the X server and provides an easy to use interface for you to run and work with your clients. These items include (among others):

- Window title bars
- Scroll bars
- Manipulating windows (sizing, moving, iconifying, closing)

Those are the visible results of using a window manager. The invisible portions may be even more important to you. These items include:

- Managing window communications to make sure the correct window receives the correct information.
- Determining where your mouse pointer is positioned, so it correctly interprets where you want it to read any input you generate.

Session Windows are various types of communication protocols to establish communications between your network computer and one or more host computers.

Clients are applications that run on an X server in a session window. *Client* means that the application is typically subordinate to the window. If the window is closed, the client also closes.

Getting Unstuck

Occasionally something may go wrong and your network computer or a client may get stuck or hang. *Hang* means the network computer or the client is not responding to any input coming from you or being transmitted from the host. This is often due to a busy network. There are three recommended ways to attempt to restore communications:

- Reset the X Server.
- Reboot the network computer.
- If the keyboard is also locked up, power off on the network computer.

Resetting the X Server

This is the first method to try:

1. Select **Setup** from the Client Launcher.
2. Click the **Reset Server** button.
3. When prompted that this closes existing connections, click the **OK** button.

The screen is blanked when the reset occurs. It may take a minute or two for the server to reset. Be patient and wait. When the root weave or your login method appears, log back in as usual. Refer to Chapter 2, *Operating the Network Computer* if you need information on logging in to the computer.

Rebooting the Network Computer

Sometimes rebooting is necessary, even though it adds to the network load. Try Resetting the X server before you reboot.

If **Setup** does not come up, or if resetting the server did not work, try rebooting the network computer. Press the key sequence: Ctrl-Alt-Delete to reboot the network computer. If the reboot is successful, the boot screen is displayed while your network computer boots. Refer to Chapter 2, *Operating the Network Computer* for more information on booting.

Powering Off the Logic Module (Base)

Note: Turning off the power is the last-resort method. Try the other methods first, or call your system administrator for assistance.

If neither resetting the server nor rebooting the network computer works, turn the power off, then on with the power switch on your network computer logic module.

Window Managers

There are many different window managers available, but the concepts are similar. Several examples of window managers are:

- Motif (also called MWM)
- HP VUE (for Hewlett-Packard hosts)
- DECWindows (DEC hosts)
- XpressWare Window Manager (XPWM)

Your system administrator sets up and configures your window manager.

Determining Whether a Window Manager is Running

You can tell if a window manager is running by looking at the borders on an open window. If you do not have an open window, select Setup from the Client Launcher to display the Setup window. If a window manager is running, there is a border around the window, along with a title bar and usually some command buttons. Figure 3-1 illustrates a Telnet window with and without a window manager running.

Figure 3-1 Determining Whether a Window Manager is Running

Starting a Window Manager

If your system administrator configured your environment to automatically start a window manager, skip to the next section, *Using a Window Manager*.

Your system administrator must configure the window manager on your host computer before it can be used. If your network computer has the local MWM option, you can start it from Client Launcher. If the option does not appear, your network computer does not have it. Contact your system administrator.

To start the local MWM or XPWM from the default Client Launcher:

1. Open the Window Managers submenu.
2. Select *MWM* or *XPWM*.

Note: ***If MWM is not available, or if you use another window manager, call your system administrator. The command for starting a window manager is specific to your host and configuration.***

Using a Window Manager

The examples in this section are based on Motif, a host independent window manager included with your network computer software. *Host independent* means that it runs on hosts from different operating systems, rather than a proprietary manager such as HP VUE which is intended only for Hewlett-Packard systems. Your windows may look and operate differently from those described here because you are using a different window manager or because your system administrator has customized your MWM settings. Refer to your window manager documentation for more information.

Figure 3-2 shows a typical window and its standard elements. A window usually has command buttons for menu access, and to minimize and maximize the window. Try the various buttons displayed with your windows.

In addition to the window menu and buttons, there are typically pop-up menus that you can access outside of a window. These menus are controlled by various system files. To see if you have these pop-up menus:

1. Position the pointer outside of all windows.
2. Try pressing either the Select or Custom mouse buttons to see if a menu appears. Information on the menu choices would be included in your window manager or host documentation.

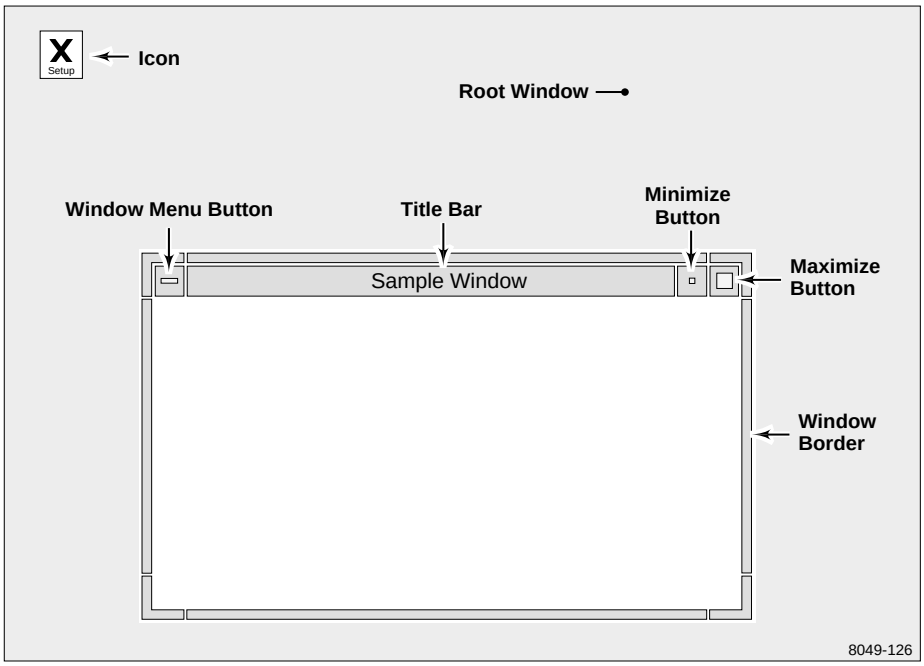


Figure 3-2 Elements of a Window

These window manipulations (actions) are described in this section:

- Moving a window
- Resizing a window
- Raising a window
- Lowering a window
- Maximizing a window
- Iconifying a window
- Restoring an icon
- Moving an icon

Figure 3-3 shows how to move a window.

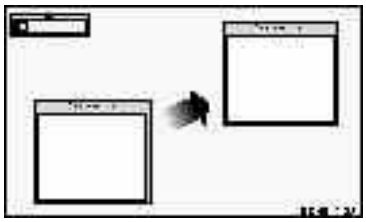


Figure 3-3 Moving a Window

You can move windows from one location to another on the display.

1. Position the pointer within the title bar or border of the window.
2. Drag the pointer. When you begin moving the window, the pointer changes to a cross-arrow pointer and a window outline appears. As you move the pointer, the outline tracks the movement. A small rectangle appears in the center of the screen and displays the x and y coordinates of the window as the window moves.
3. Once the window is in the desired location, release the mouse button. The window appears in the new location and becomes the active window.

   Figure 3-4 shows an alternate method for moving or resizing a window: Drag on the Window Menu, release on **Move**, position the window outline (by moving the mouse), and click a mouse button.

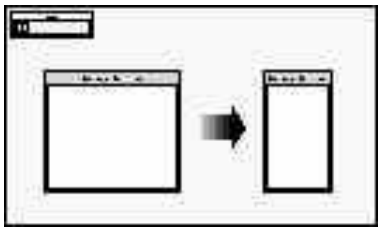


Figure 3-4 Resizing a Window

Many windows can be resized. The corners of the window border let you resize the window in two directions, while the horizontal borders and vertical borders let you resize the window in a single direction.

1. Position the pointer on the window border or resize corner controlling the window side(s) you want to resize. The pointer changes to either an arrow with a corner (for resizing two sides) or to an arrow with a perpendicular bar (for resizing in one direction).
2. Drag the corner or window border in the direction desired. As you resize the window, an image of the moving border(s) tracks the pointer movement.
3. Release the mouse button. The window appears in the new size.

   Alternate method: Drag on the Window Menu, release on **Size**, position the window outline (by moving the mouse), and click a mouse button.

   Figure 3-5 shows how to raise a window to the foreground.

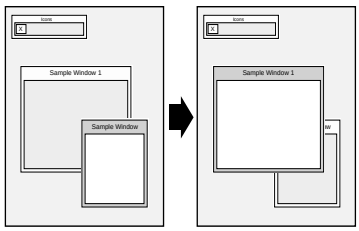


Figure 3-5 Raising a Window: Displaying a Window in Foreground

When you want to raise a window; that is, display the window in front of other overlapping windows so you can see the entire window, follow these steps:

1. Position the pointer (cursor) anywhere in the window (except on a command button).
2. Click the **Select** mouse button. Raising a window automatically makes that window active. Windows cannot be raised from the Window Menu.

Note: There is an X feature called autoraise. If this feature is configured for your window manager, windows are automatically raised as soon as you position your mouse pointer in the window.

Figure 3-6 shows how to lower a window to the background.

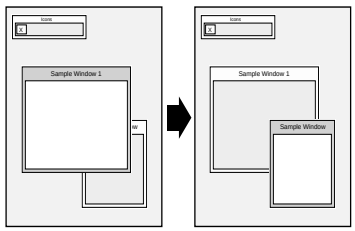


Figure 3-6 Lowering a Window

To place a window behind overlapping windows:

1. Drag on the Window Menu in the window to lower.
2. Release on **Lower**.

Figure 3-7 shows how to maximize a window.

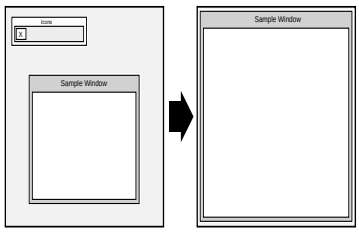


Figure 3-7 Maximizing a Window

A window can be maximized to take up the entire size of the display. Some clients do not support maximized windows.

1. Click the **Maximize** button in the window you want to maximize.
2. To return the window to its original size, click the **Maximize** button again.

Alternate method: Drag on the Window Menu and release on **Maximize**.

Figure 3-8 shows how to collapse a window down to an icon.

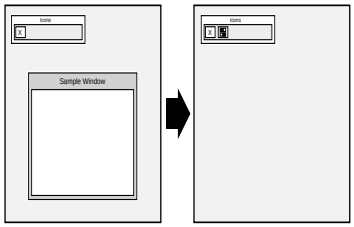


Figure 3-8 Iconifying a Window

Iconifying a window means to collapse it down to an icon, a small graphic representation of the window. This helps you keep multiple windows organized and easy to access. To iconify a window:

Click the **Minimize** button in the window you want to iconify.

Alternate method: Drag the Window Menu and release on **Minimize**.

MWM has a client called *Icons*. If this client is available, it provides a box to hold and sort all of your icons.

Figure 3-9 illustrates how to restore an icon to a window.

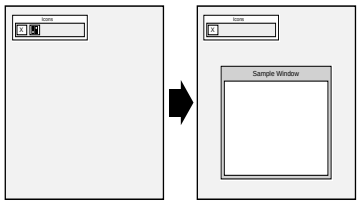


Figure 3-9 Restoring an Icon

You can change an icon into a window whenever you want to view the window contents or work in the window. To restore an icon:

Double-click the **Select** button on the icon you want to restore.

Alternate method: Click the icon once to display a pull-down menu, and then click **Restore**.

Figure 3-10 demonstrates how to move an icon.

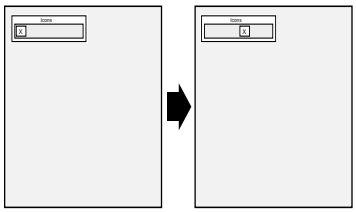


Figure 3-10 Moving an Icon

To move an icon from one location on the display to another:

1. Drag the pointer on the icon you want to move. When you begin moving the icon, the pointer changes to a cross-arrow and an icon outline appears.

   As you move the pointer, the outline tracks the movement.

2. Once the icon is in the desired location, release the mouse button. The icon appears in the new location.

   Alternate method: Click the icon once to display a pull-down menu, click **Move**, position the icon outline (by moving the mouse), and click a mouse button.

Starting Sessions

As presented in *Logging In to the Network Computer* in Chapter 2, there are many different ways to establish communications with one or more host computers. With a network computer you can have multiple sessions open and running simultaneously. For example, you might open a word processor, copy some text from a file, and paste it into window where you are composing some electronic mail. Or, you might open a session into another host to check if a customer order has been shipped. You can do all these kinds of tasks without having to exit any open applications.

Before you start a session, you typically need to know the name or address of the remote host. You can find this out by calling your system administrator.

There are different types of addresses based on the network protocol used at your site. *Internet protocol* (IP) addresses (128.06.70.01 for example) are used for networks running a protocol called *TCP/IP*. This is the most common network for hosts running a UNIX operating system. *Node* numbers (11.10:: for example) are used for networks running a protocol called *DECnet*. This is the most common network for hosts running a VMS operating system.

There are two easy ways to start a new session from Client Launcher. If you need a refresher on the terminology used in these procedures, refer back to Chapter 1, *A New Piece of Hardware*. Use one of these methods:

1. Select HostMenu. When the HostMenu client appears, use the mouse to select your host. Refer to *Logging In to the Network Computer* on page 2-3 for details.

   Note: If you logged in with XDMCP, the XDMCP list is not available on HostMenu. Only one XDMCP session can be running.

2. Select a session from the Host Connections submenu:

Telnet	(refer to *Logging In with Telnet* on page 2-12)
Console	(refer to *The Console Window* on page 6-3)
Cterm	(refer to *Logging In with Cterm* on page 2-14)
WinDD	(refer to *Logging In with the WinDD ICA Client* on page 2-16)
Serial Port 0 or 1	(refer to *Logging In with Serial Port 0 or 1* on page 2-22)
LAT	(refer to *Logging In with LAT* on page 2-24)

Note: Grayed text indicates an option that is not enabled for your particular network computer. If an option is not listed, it is not available for your network computer model.

Running Clients

Clients refer to applications that your network computer accesses across the network, such as a desktop publishing system, a computer-aided design program, or an on-line transaction processing system. Your network computer can access multiple clients simultaneously.

Your system administrator can set up your login files to automatically start one or more clients each time you login. The other alternative is for you to start the clients you need.

Typically you start clients from a session window or a command menu:

- From a session window, type the command to start your particular client and press **Enter**. Instructions for starting clients are included with your application documentation.
- If your host computer or window manager has command menus available, there may be menu choices available to automatically start your applications. If so:
  - Position the pointer outside of a window.
  - For MWM, you would press the **Select** mouse button and click on your client. For other window managers, follow the instructions for menu and item selection and select the client you want to run.

Refer to the documentation that came with your application for application-specific operation and information.

Locking the Display

You can lock your display and all open windows so that while away from your desk, an unauthorized user cannot access the information on your display. The *xlock* local client locks the keyboard only, or the keyboard and the display. You can combine xlock with xautolock to lock your display after a specified time idle. Xautolock uses the Xidel server extension to determine the time since input last occurred. When that time reaches the specified "lockTime" then xlock is invoked. If no "lockTime" is specified, the default is 5 minutes.

1. **xlock** can be started from the Client Launcher (select Lock Screen) or with **xpsh** from the command prompt, as shown here:

   `xpsh –display` ***`nc_address`*****`:0 xlock –mode`** ***`n`***

   To determine the network computer address, select **Setup** from the Client Launcher. Drag on Configuration Summaries and release on TCP/IP (for a UNIX host) or TDEnet (for a VMS host). The address displays as the network computer IP Address or the TDEnet Address.

   The **–mode *n*** setting is optional. If set to **–mode 1**, **xlock** locks the keyboard only. If set to **–mode 0**, **xlock** locks the keyboard and the screen. If a **–mode** setting is not given, **xlock** locks the keyboard and the screen by default. If you receive a "Command not found" message, have your system administrator add **xpsh** to your path environment variable and try the **xpsh** command again.

   When **xlock** is started, the **xlock** window appears, asking for a password and confirmation. Upon entering the password, a blank screen with a floating lock appears. Pressing a key will prompt for a password. Only the correct password re-activates the screen.

2. At the `Password` prompt, enter a password and press **Enter**.

3. At the `Retype` prompt, enter the password again and press **Enter**. This verifies you have entered the password correctly. **xlock** remains in effect until you re-enter the password. The password is valid until you reboot the network computer or reset the server.

4. To unlock the display or keyboard, press any key for the **xlock** window. At the `Password` prompt, enter the password.

   Note: If you forget your password, you must reboot the network computer or reset the server to unlock the display or keyboard.

Local Floppy Manager Client for UNIX Hosts

The Local Floppy Manager (LFM) client provides a Graphical User Interface (GUI) for copying files between the local floppy drive attached to the network computer via the parallel interface and a UNIX host server. The GUI provides a point and click operation. The LFM client is available with NCBridge version 3.2 or higher.

The LFM client is compatible with both the current network computer product and earlier NCs and X terminals. The compatible platforms are XP117C, XP119C, XP119M, XP200, XP350, XP400, NC200, NC400, and NC900 series products.

To start the LFM on a network computer, ensure that the floppy drive is connected to the parallel port of the network computer and powered up. Once done, then type these commands at the command-line prompt for an NC900 series product:

```
xpsh -display <ipaddr>:0 lfm.900
```

Example: `xpsh -display 134.6.5.12:0 lfm.900`

To start the LFM client on an XP series unit, type the following:

```
xpsh -display <ipaddr>:0 lfm.350
```

Example: `xpsh -display 134.6.7.14:0 lfm.350`

Once the client is properly executed, the local NC console window should indicate that the following files, **lfm.xxx** and **fdDrv.xxx**, have been loaded. The file name extensions (**.xxx**) vary according to the NC model, as shown in Table 3-1.

Table 3-1 File Extensions For NC Models

Platform	File Name Extension (.xxx)
NC900 series	.900
NC200 and NC400 series	.500
XP100, 200, 350, 400	.350

When the local floppy is first displayed, it has access to the local floppy drive only. You must click on one of the A drive buttons and select NET. A window displays as show in Figure 3-11. Each of the four entries (Host, User, Password,

Account) **must** be terminated with a carriage return at the end of the entry. The account entry represents the path. If not entered, the user's home path entry is used.

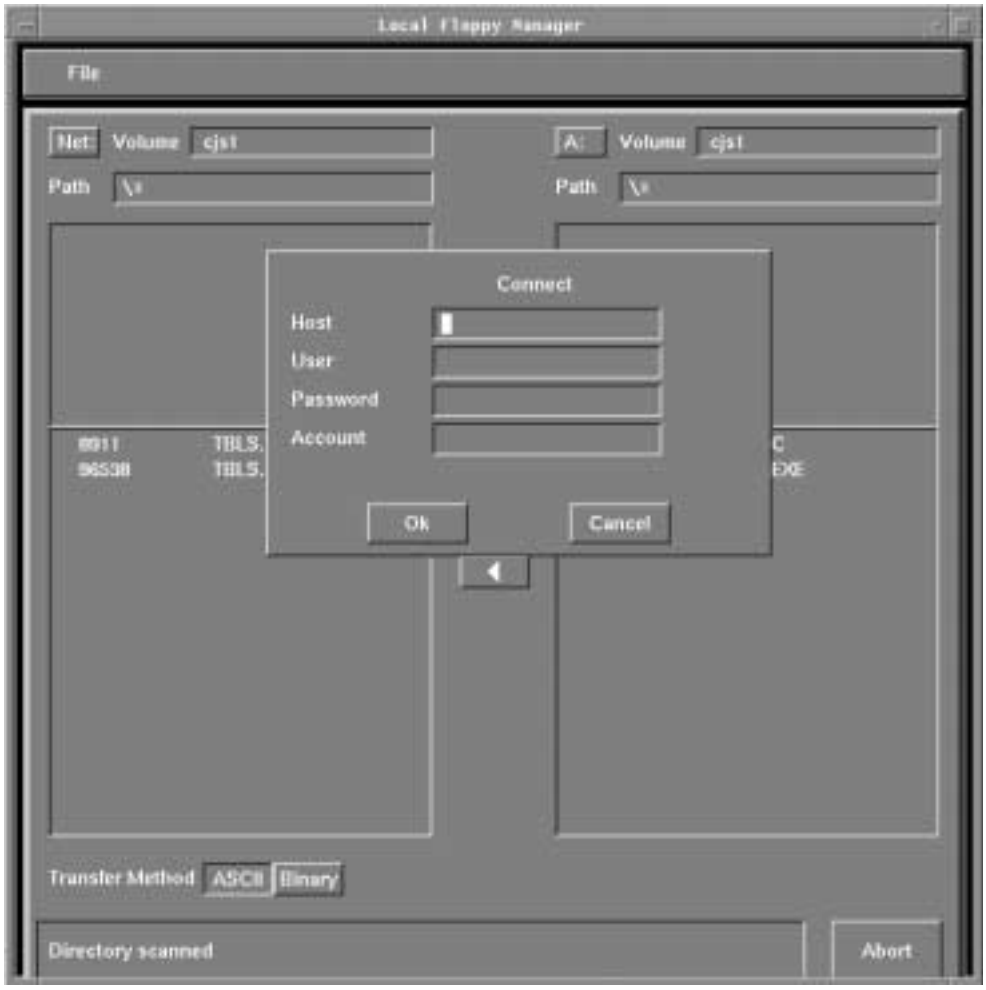


Figure 3-11 Local Floppy Manager Screen

The LFM Client Screen is shown in Figure 3-12.

Figure 3-12 Local Floppy Manager Client Screen

For more information, see the floppy disk section in the Field Kit Installation Guide.

Chapter 4

Local Browser Support

The NC Series network computer supports a local Netscape NC Navigator browser. There are two versions of Netscape NC Navigator 4.06 provided on the NCBridge media:

- Netscape
- Netscape_lite

The NCD version of Netscape 4.06 includes all features of the Netscape Navigator 4 Solaris version. It requires a minimum of 48MB of memory to run on the network computer. A total of 80MB is recommended for most Netscape Navigator 4 applications, especially when Java applets are executed. The Netscape_lite binary version of the browser includes all Netscape 4.06 features except email and news.

Launching and Exiting Local Netscape Browser

The following feature is available for users of Netscape who start the browser using the **xpsh** command.

To prevent file corruption in the event a user powers down the network computer too quickly during a browser exit, a window pops up to remind the user to wait until Netscape has finished saving files. The popup window appears only if the environment variable *PAUSE_FOR_EXIT* has been set. This variable can be set from **xpsh** using one of the following commands, depending on the browser used:

```
xpsh -display NC_NAME:0 -xpenv “PAUSE_FOR_EXIT=1” -access xpsh netscape_lite
```

or

```
xpsh -display NC_NAME:0 -xpenv “PAUSE_FOR_EXIT=1” -access xpsh netscape
```

Even if this environment variable is not set, the browser saves files before destroying the windows. Consequently, with NCBridge 3.2 or higher, the windows will remain longer upon exit than in previous versions.

WinDD ICA Client Plug-in for Web Browser

The Netscape browser supports an ICA plug-in. This allows users to create a web page that uses the WinDD ICA client to run Windows applications directly within the browser.

For example, suppose your group of users on mixed UNIX and PC workstations uses Microsoft Word to create and update documents. You might wish to have a web page that lists all the documents created or supported by your group, allowing the user to select a document and edit that document within the browser. The user could create a web page that provides a Navigator or other list of your documents, supports selection of a document, and initiates the WinDD ICA client plug-in to open that document in Microsoft Word.

Netscape NC Navigator (4.06) is the supported browser.

Using the WinDD ICA client plug-in in a web page requires:

- Installation of NCBridge 4.1 (or higher) onto a UNIX host or NT PC (system administrator).
- Web server setup to allow application launching based on file type (system administrator).
- Creation of a web page invoking the WinDD ICA client and a Windows application (user).

Installation of NCBridge on a UNIX or NT Server

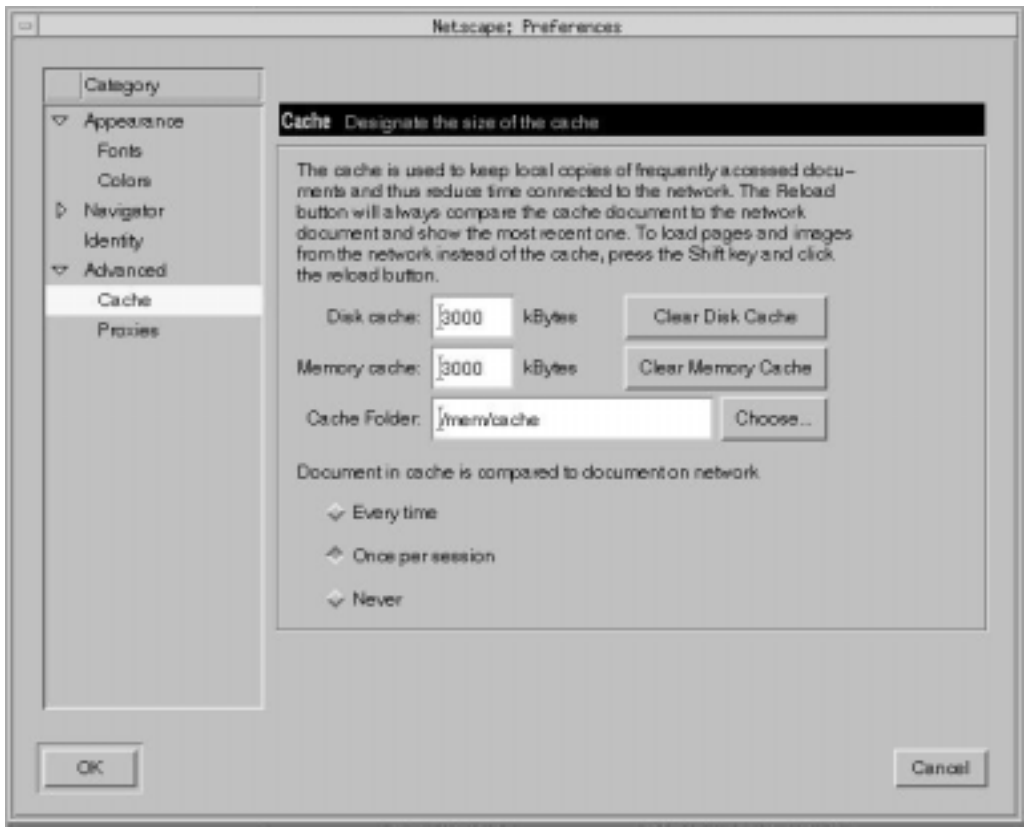
The installation of NCBridge onto a UNIX or Windows NT host automatically installs the Netscape NC Navigator browsers. Each browser is configured at this time to define a MIME type/sub-type, **application/x-ica** which is associated with the WinDD ICA client plug-in client provided with this release. This association ensures that the browser knows to invoke the WinDD ICA client upon trying to read a file of MIME type/sub-type **application/x-ica**.

Typically, to run the local browser from your network computer, the network computer must be connected to the UNIX or Windows NT host on which NCBridge was installed and the network computer must be authorized. Once you are running the browser, you can check that the WinDD ICA client plug-in is installed in the browser's plug-in table.

Setting a Kiosk Browser to Start the WinDD Plug-in for *.ica* Files

To set a kiosk browser so it can initiate the WinDD plug-in for *.ica* files:

1. Use **Options > GeneralPreferences > Helpers** to bring up the table and look for the plug-in listing.
2. Go to your internet browser and make the setting shown here:



3. Set the disk cache folder to */mem/cache* as shown in the figure.

Note: ***Files will be saved to memory, but are lost when you exit the browser.***

Web Server Setup to Allow Application Launching

Note: This step is only required if you are creating a web page that uses the WinDD ICA client plug-in as an embedded plug-in (see the next section).

Basically, using the WinDD ICA client as an embedded plug-in of a web page requires that you specify to the browser the data stream on which the WinDD ICA client is to act (the ICA input file which specifies the Windows NT Terminal Server host starting parameters).

The browser must be configured so that files with file extension *ica* are handled by the WinDD ICA client plug-in. This is done by associating the file extension *ica* with the MIME type/sub-type **application/x-ica**, which the browser already knows (from install) will be handled by the WinDD ICA client plug-in.

This is done by including the following line in the UNIX browser setup file, (usually named *mime.types*—your system administrator will know the location and name of the *mime.types* file on your server):

```
application/x-ica ica
```

Creation of a Web Page Invoking a Windows Application

Browser plug-ins can be “embedded” plug-ins, meaning that they appear as visible, rectangular windows integrated into your web page, or they can be “full-screen” plug-ins, which take over the entire current browser window to display the plug-in contents.

Both the following methods of invoking the WinDD ICA client plug-in from a web page for the local browser requires that you create a web page and an ICA file from which the WinDD ICA client will take its starting parameters. Two different methods to do this are described in the following sections.

WinDD ICA Client Embedded Plug-in

Web Page

Specifying an embedded plug-in requires including the **EMBED** html tag in the html source for the web page. An example follows:

```
<EMBED SRC="http://www.NCD.com/word.ica" HEIGHT=640 WIDTH=480>
```

In this example, the **EMBED** tag format uses the keywords "EMBED", "SRC=", "HEIGHT=", and "WIDTH=". The "SRC=" tag specifies the URL for the file which is to be read as input to the WinDD ICA client plug-in. In this example, the file *word.ica* is located in the web server's public root directory. The "HEIGHT=" and "WIDTH=" parameters specify the dimensions of the embedded application, in this case, the WinDD ICA client window dimensions.

ICA File

The data in the ICA file tells the WinDD ICA client which Windows NT terminal server to connect to and which application to launch when connected (for example, Microsoft Word). Make sure that the application you want to run is installed on your Windows NT server.

You can use a simple text editor such as Notepad to create the ICA file. Put the following information into the ICA file:

- The IP address or DNS name of the Windows NT server.
- The full path name of the program to be run in your WinDD ICA client session. This information is optional. If you leave this information out of your ICA file, a full WinDD client session will start Program Manager.
- The working directory (optional).
- The logon user name and password (optional).

The following is an example ICA file. Lines preceded with ";" are comments to explain the contents. Lines encased in "[ ]" are section headers.

```
------------Sample ICA file--------------------
[ApplicationServers]
; The [ApplicationServers] section must contain as its value the name
; of the application server entry used to describe the connection. The
; entry is simply the name of the next section (the application section)
; followed by an equal sign.
; The value /name given (in this example, Access) will appear in the
; titlebar of the client window.
Access=
[Access]
; The [Application] section describes the attributes of the Access
; application entry.
; The application name in the square brackets must match the name
; given as the value to the [ApplicationServers] section above.
TransportDriver= TCP/IP
; This value must be "TCP/IP"
Address=206.103.132.12
; The Address value is the TCP/IP address of the Windows NT server.
; It can be either a DNS name or an IP address.
WinStationDriver=ICA 3.0
; This value must be "ICA3.0"
Username=JOE SCHUMAN
Domain=ABC
Password=000100
; The Username, Domain, and Password fields are optional. The
; Username is the user name of a valid WinDD ICA client user. The
; Domain is the Windows NT domain the user belongs to, and the
; Password is the logon password for the user. The password, if used,
; must be encrypted.
; To enter an encrypted password into the ICA file, use the WinFrame
; Client Remote Application Manager New Entry Wizard to create a
; remote application entry. When you are prompted for the username and
; password, enter the password that you want to use in the ICA file.
; Finish the New Entry wizard.
; Open the file APPSRV. INI in the Windows directory and locate the
; entry you just created. Copy the password value and paste it into
; your ICA file. Note that the APPSRV.INI file looks a lot like the ICA
; file you are creating.
; The ICA file is, in fact, a subset of the
; APPSRV.INI file. You can use the entries in this file to help you
; create new ICA files.
```

```
InitialProgram=d:\word\msword.exe
;The InitialProgram value specifies the path, on the Windows NT server,
; of the application to be automatically launched when the
; connection is made. Include any command-line options.
WorkDirectory=d:\word
; The WorkDirectory is the directory that the application should use for
; its default directory.
ScreenPercent=75
; The ScreenPercent sets the horizontal and vertical pixel resolution
; based on client desktop size.
DesiredHRES=640
DesiredVRES=480
; Alternately, use either ScreenPercent or DesiredHRES and DesiredVRES
; to specify the size of the client window in pixel resolution.
; NOTE: If both ScreenPercent and DesiredHRES and DesiredVRES
; are specified, only ScreenPercent is used. ScreenPercent is not
; available with the WinFrame 1.6 Client, only the Web Client.
DesiredColor=2
; DesiredColor sets the color palette depth. Use “1” for 16-color and
; “2” for 256-color. The default is 2 (256-color).
[WFClient]
Version=2
; The WFClient section describes the WinFrame Client. Enter as shown.
----------------End sample ICA file-------------
```

WinDD ICA Client Configuration GUI as Full-Screen Plug-In

NCD provides an HTML form and CGI script (Bourne shell) with the WinDD ICA client plug-in binary. This example shows you a way to create a web page such that the entire web page contents are a GUI form that configures a WinDD ICA client session and brings up a user-specified Windows application using the WinDD ICA client plug-in.

The form includes input areas for the Windows NT host name, user name, domain, password, initial program path, and working directory path. Some, all, or none of the input fields can be entered. The input fields correspond to the WinDD ICA client command-line arguments. Input in a GUI field is the same as starting the WinDD ICA client with that command-line parameter. An input field with no input is the same as not using the command-line argument.

The form also contains a button to start the WinDD ICA client. This button creates an ICA file whose contents are determined by the values you set in the input fields of the form.

The HTML form and CGI script can be found after Netscape installation at:

```
.../tekxp/examples/plugins/(windd.bsh, windd.htm)
```

Copy the CGI script to a CGI script directory on the web server host (example path: **X/Y/Z**). Use the HTML form as the source for your web page. Open that source and change the value of the **ACTION** field to be the path to the new location **X/Y/Z** of the CGI script.

You could use the web page you just created to give your users an automatic method of invoking Microsoft Word by specifying Word as the default initial program in the HTML form.

Here is the HTML code for the WinDD ICA client configuration form:

```
-------------Sample HTML Code-------------------
<HTML>
<HEAD>
< TITLE>WinDD ICA client Configuration</TITLE>
<HEAD>
<BODY>
<H2>WinDD ICA client Configurationc/H2>
<! change the path below to your directory structure >
<FORM METHOD=“POST” ACTION=“/cgi-bin/windd.bsh”>
<PRE> WinDD host: <INPUT TYPE=“TEXT” NAME=“Address” SIZE=40>
Login username: <INPUT TYPE=“TEXT” NAME =“Username” SIZE=40>
Domain Name: <INPUT TYPE=“TEXT” NAME =“Domain” SIZE =40>
Password: <INPUT TYPE=“password” NAME =“Password” SIZE =40>
Initial Program: <INPUT TYPE=“TEXT” NAME=“InitialProgram”SIZE=40>
Work Directory:<INPUT TYPE=“TEXT” NAME =“Workdirectory” SIZE=40>
<P>
<INPUT TYPE=“submit” VALUE=“Start WinDD”>
<INPUT TYPE=“reset” VALUE=“CLEAR”>
<PRE>
<FORM>
<BODY>
<HTML>
----------End sample HTML-----------------------
```

Here is the Bourne shell script that creates an ICA file for the WinDD ICA client to read:

```
---------------Sample script--------------------
#!/bin/sh
#
# Use this script to see what comes back from a FORM submission
# with method=“GETf“
#
read my_data

echo Content-type: application/x-ica
#echo Content-type: text/plain
echo
my_data=`echo $my_data | tr '\015' \&`


my_data=`echo $my_data | sed -e 's/Address=&//g'`
my_data=`echo $my_data | sed -e 's/Domain=&//g'`
my_data=`echo $my_data | sed -e 's/Password=&//g'`
my_data=`echo $my_data | sed -e 's/InitialProgram=&//g'`
my_data=`echo $my_data | sed -e 's/Workdirectory=&//g'`
my_data=`echo $my_data | sed -e 's/Username=&//g'`
my_data=`echo $my_data | tr \+ '\ '`
my_data=`echo $my_data | sed -e 's/\%3A/:/g'`
my_data=`echo $my_data | sed -e 's/\%5C/\\\\/g'`

echo $my_data | awk -F\& '{ for( i=1; i < NF+1; ++i) print $i }'
echo


-------------End sample script------------------
```

Local Browser Kiosk Support

The local browser kiosk mode provides:

- Simpler methods of launching the local browser.
- Local browser support in VAX VMS boot host environments.
- Support for a 16MB flash memory option on the NC200, NC400, and NC900 series.

Local browser kiosk support applies to all network computers that can run the browser, including:

- XP100, XP200, XP300V, XP350, NC200, NC400, and NC900.

The browser is not available for:

- XP10, XP10T, XP20, XP100D, or XP330.

Although this section applies primarily to NC200, NC400, and NC900 network computers with either the 12MB or 16MB flash card, you can still take advantage of most of these features with older network computer models.

Browser-Related Features

Prior to the NCBridge 3.1 release, the only way to launch the browser was to use the **xpsh** command from a host login account, using **xpsh**'s file access mechanism to read and write browser preference settings and history data into the user's home directory. While this might remain the preferred method for many users, there are some circumstances—for example, using a network computer as an information kiosk—where it is either impossible or undesirable to log in to launch a browser. To support using the browser in such an environment, there are two other methods of launching the browser.

Due to **xpsh** limitations in VAX VMS environments, the browser would not run when the network computer booted from a VMS host. With NCBridge 3.1 or higher, it is possible to boot a network computer from a VMS host using the MOP boot protocol and start the browser with the Launcher or the *xp.cnf* file. When operating this way, the browser will use DAP file access to read the configuration files from the *.netscape* directory for Netscape or Netscape_Lite under the boot directory.

The 12MB flash memory option in the NC200 and NC400 allows you to store all the Netscape_Lite browser files in flash memory so that the network computer can operate as a stand-alone kiosk. The 16MB flash memory option allows you to store all of the full Netscape browser files in flash memory so that the network computer can operate as a stand-alone kiosk. With the browser in flash, the network computer doesn't need a boot host, and users don't need login accounts. The network computer can be configured to start the browser upon power-up and immediately connect to a web server home page.

Starting Netscape NC Navigator

Prior to the NCBridge 3.1 release, the only way to start the local browser was with the **xpsh** command:

```
xpsh -access xpsh netscape_lite
```

With NCBridge 3.1 or higher, there are two other methods for starting the local browser, the simplest being through the Launcher, as shown in Figure 4-1. A default menu item for the Netscape_lite browser has been added at the top of Launcher's **Host Connections** pull-down menu. (See the NCBridge Installation Manual for instructions on how to modify this menu.)

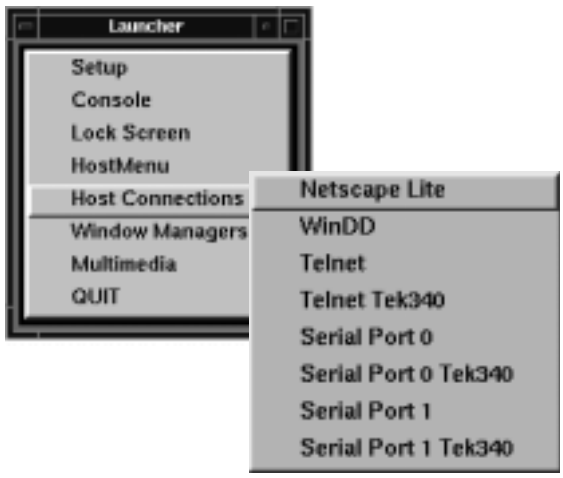


Figure 4-1 Starting the Netscape_lite Browser with a Launcher Pull-down Menu

Another way to start the browser is to add a start command to your *xp.cnf* file. The following are two example start commands that may be used to start the two different binary versions of the browser:

```
start NETSCAPE YES
start NETSCAPE_LITE YES
```

Note: Only one version of the browser may be run at one time.

It is also possible to pass command-line parameters and environment variable settings with this command. The following examples start the browser with a default geometry and override the proxy auto configuration URL with a different one:

```
start NETSCAPE YES -args “-geometry 860x900+80+60” -envs
“AUTOCONF_URL=http://proxy.mydomain.com”
start NETSCAPE_LITE YES -args “-geometry 860x900+80+60” -envs
“AUTOCONF_URL=http://proxy.mydomain.com”
```

Note that all the parameters must be specified on the same line in the *xp.cnf* file.

Configuring the Browser for Kiosks

An easy way to configure the browser for kiosk operation is to invoke it in non-kiosk mode (with the **xpsh** command) and then make changes with the **Preferences** menu. Once the browser is configured, copy the essential configuration files from the *.netscape* for Netscape/Netscape_Lite created in your home directory to the *.netscape* directory for Netscape/Netscape_Lite under the boot directory. (Use the configuration files listed in Table 4-1, *Netscape Browser Configuration Files*, on page 4-13 as a guide.) If you choose this method to configure the browser, be aware that you may have to modify some of the entries in the files, to remove references to .signature, .mailcap, or other personal files. Sometimes you can make the necessary changes by editing the configuration files directly, although these database files are not generally editable.

Note: Netscape writes preferences to the preferences.js file, a Javascipt file.

Table 4-1 lists the Netscape browser configuration files and their purposes.

Table 4-1 Netscape Browser Configuration Files

File	Description
config/plugins.tbl	list of plug-ins to support
.netscape/bookmarks.html	defaults for the “Bookmarks” menu
.netscape/cert7.db	default SSL certificates database
.netscape/cookies	default cookie database
.netscape/history.db	default history menu database
.netscape/key3.db	default encryption key database
.netscape/mailcap	default helper applications
.netscape/mime.types	default mime file extension/application bindings
.netscape/preferences.js	default browser configuration preferences
usascii/app-defaults/Netscape	X resource defaults for Netscape

Because kiosk administrators don’t want their carefully configured browser environments altered by casual users, browser configuration files in kiosk mode, by default, are not writable. So users can change browser settings in the **Preferences** menu, but the changes will not be saved. The same restriction applies to bookmarks and history data. While this behavior may be desirable when operating a kiosk, it means you’ll have an extra step when setting up the browser for kiosk operation.

Environment Variables Used by the Browser

The Netscape browser uses certain environment variables for setting certain parameters (see Table 4-2). The *-envs* parameter of the **xp.cnf preload** and **start** commands can be used to alter the value of environment variables passed into the browser..

Table 4-2 Browser Environment Variables

Environment variable	Description
AUTOCONF_URL	Sets the URL for obtaining the proxy auto configuration file.
HOME	Locates the *.netscape* configuration directory if NULL kiosk mode settings are used.
NNTPSERVER	Sets the default news server.
WWW_HOME	Sets the default web page.

Preferences File Entries

For Netscape browsers, it is generally best to create a *.netscape/preferences* file by running the browser in non-kiosk mode and using the **Preferences** menu to make changes. The resulting *.netscape/preferences* in your home directory can then be copied to the *.netscape* directory in the boot directory. Sometimes it is only necessary to make a minor change, in which case you might want to edit the preferences file directly. Table 4-3 explains a few commonly edited items in the preferences file.

Table 4-3 Navigator Preferences

Preference name	Description
HOME_DOCUMENT	Sets the default document visited when the browser is started.
PROXY_MODE	Determines how proxy info is configured: 0: Proxies are not used. 1: Proxies are manually configured (HTTP_PROXY, FTP_PROXY, etc. 2: Proxy autoconfig script is loaded from an HTTP server.
PROXY_URL	URL used for PROXY_MODE 2.
SHOW_MENUBAR	Another item that can be used to limit what kiosk users can do. When set to False, kiosk users won't be able to exit the browser.
SHOW_TOOLBAR	When set to False, it turns off the icon buttons along the top of the browser. This is useful for restricting what users can do in a kiosk.

Netscape browsers keep configuration information in a Javascript file called *preferences.js*. This file is modified by the Netscape browser preference menu, accessed after launching Netscape.

Note: To get updated browser configuration files onto flash, you'll need to reflash. See "Flashing the Local Browser into Memory" in Chapter 2 of the NCBridge Reference Manual.

Proxy Host Configuration

By default, the Netscape NC Navigator browser is configured to use the boot host as an HTTP server that provides the proxy autoconfiguration file. (This is the same file format used to configure standard Netscape browsers.) If you receive an error pop-up when the browser is started in kiosk mode, it will be necessary to change the proxy autoconfiguration setting.

When running in kiosk mode, the browser reads configuration files from the *.netscape* directory under the boot directory. By default the *.netscape* directory contains a preferences file with entries configured to get proxy configuration information automatically from the boot host using this URL:

```
http://xp_boothost
```

With this configuration, the browser expects an HTTP server on the boot host to return a proxy autoconfiguration file with an "application/ x-ns-proxy-autoconfig" MIME type, which is typically found on Netscape HTTP servers.

The proxy host configuration can be changed by setting the *AUTOCONF_URL* environment variable in the **preload** or **start** command *–envs* parameter, or by editing the preferences file. (See Table 4-3, *Navigator Preferences*, on page 4-15 for descriptions of the appropriate parameters.) Again, you may want to generate the preferences file first by using the browser in non-kiosk mode, then edit it directly with a text editor.

Forcing Kiosk Mode Operation

When started, the browser looks up the value of the *HOME* environment variable to determine the path to its *.netscape* directory for Netscape. If the *HOME* variable is not set, the browser assumes it has not been started with **xpsh** and immediately enters kiosk mode, using the kiosk mode configuration parameters to determine where to find a *.netscape* directory.

It is sometimes desirable to operate the browser in kiosk mode even when it is started with **xpsh**. Add this line to your *xp.cnf* file to force the browser to operate in kiosk mode:

```
parameter browser_kiosk_enable YES
```

Replacing `YES` with `NO` does not force non-kiosk mode operation; rather, it tells the browser to check the *HOME* environment variable to determine kiosk mode operation.

Displaying PDF Files Using the Local Browser

You can set up the local browser as a "helper application" so that when a user clicks on a PDF file within the browser window, the file is displayed on the NC screen using a host-based Adobe Acrobat Reader. To do this:

1. Load the Acrobat acroread binary on the host computer.
2. Place this line in the user's *.mailcap* file in their home directory:

```
application/pdf; acread %s
```

When the browser gets a PDF file from a web server, it starts up the *acroread* program on the host computer and feeds the PDF file to it. The PDF file is displayed in a window on the NC screen.

The user also set up the "helper application" by starting the browser, as follows:

1. Navigate to the Edit > Preferences > Navigator > Application menu.
2. Click **New**.
3. Enter **acrobat** in the Description window.
4. Enter **application/pdf** in the MIME type window.
5. Enter **pdf** in the Suffixes window.
6. Click on **application** in the Handled by window.
7. Enter **acroread** at the prompt.

Note: Use the xpsh command from the user's login session to start the local browser. Otherwise, the local browser will not know where the Acrobat Reader resides.

Chapter **5**

Using Advanced Features

This chapter provides information about these advanced NCBridge software features:

- *Audio Player* for recording and playing audio files on the network computer.
- *Audio Mixer* for controlling the audio volume for the line in and microphone on the network computer.
- *Digital Video Player* for playing NTSC or PAL video sources on the network computer.
- *Analog Video Player* for playing analog video sources on the network computer.
- *WinDD* to run Windows NT applications on a PC server.
- *Font Caching* for storing fonts in your network computer's memory.
- *Printing Color Hardcopies* from your network computer.
- *TekLogin Local Client* to simplify login and application access.
- *PPP Support* for network connections via serial lines (phone lines).
- *Screen Saver Support* that enables you to display *.gif* images.
- *16-Bit Plane True Color Support* for better visual effects.
- *24-Bit Plane True Color Support* for better visual effects.
- *Simultiple Color*
- *Web-Based Administrator*
- *Seriald* for Remote COM Support from Windows NT Applications.
- *XDMCP_keepalive*
- *Termctrl Client*

Table 5-1 shows the advanced features provided on the XP, NC200, NC400, and NC900 NCBridge models.

Table 5-1 compares the features on each platform:

Table 5-1 Features by Model Chart

Feature	XP	NC200/ NC400	NC900
Audio Player	♦	♦	♦
Audio Mixer	♦	♦	♦
Digital Video Player	XP400	♦	
Analog Video Player	X317CVJ		
WinDD	♦	♦	♦
Font Caching	♦	♦	♦
Printing Color Hardcopies	♦	♦	♦
TekLogin Local Client	♦	♦	♦
PPP Support	♦	♦	♦
Screen Saver Support	♦	♦	♦
16-Bit Plane True Color Support		♦*	♦
24-Bit Plane True Color Support			♦
Web-based Administrator	♦	♦	♦
Seriald	♦	♦	♦
Simultiple Color			♦
xdmcp_keepalive	♦	♦	♦
termctrl Client	♦	♦	♦

*Requires 4MB of video memory.

Audio Player

The Audio Player plays and records digital audio files. When started, the Audio Player displays as shown in Figure 5-1.

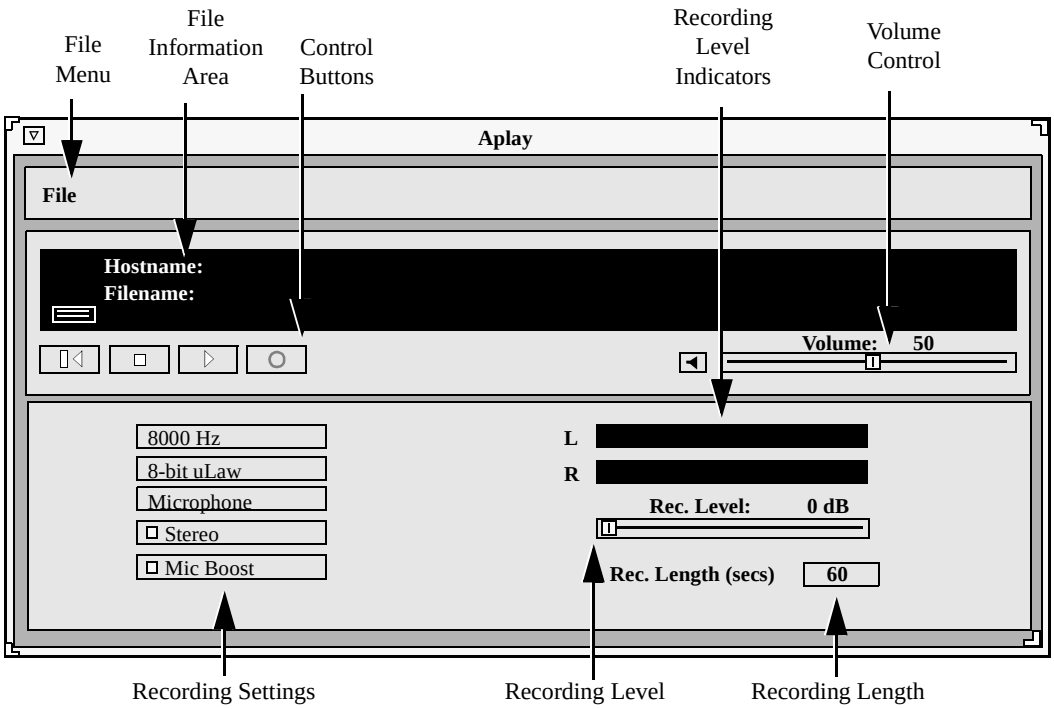


Figure 5-1 Audio Player

The player can play files that have these extensions:

.au	Sun file type
.wav	Microsoft file type
.voc	Sound Blaster file type (play only)
.aiff	Macintosh file type
.snd	Macintosh file type
.raw	no file header

If a file does not have an extension, the player attempts to read its header information. If there is no header information, the player plays it as a headerless file (.raw).

The Audio Player supports the file formats 8-bit linear, 8-bit uLaw, 8-bit aLaw, and 16-bit linear (LSB & MSB).

The following topics present information about using the Audio Player:

- *Starting the Audio Player* on page 5-4 provides information about the various ways to start the Audio Player
- *Opening or Creating an Audio File* on page 5-9 provides information about opening and creating audio files
- *Connecting External Audio Devices* on page 5-17 provides information about the types of external devices that can be used with recording audio files
- *Recording an Audio File* on page 5-21 provides the steps for recording an audio file
- *Playing an Audio File* on page 5-23 provides the steps for playing an existing audio file
- *Audio File Information* on page 5-24 provides information about obtaining original audio file recording information

Starting the Audio Player

The Audio Player can be started from the Client Launcher, from the remote configuration file, or with the **xpsh** command.

>>> ***CAUTION Before connecting any audio device to the network computer (such as microphones or headsets), close all clients, remote connections, and power down the network computer. Connecting devices to the network computer's audio connectors with power applied could result in a loss of data. After the devices are connected, start the Audio Player.***

Starting the Audio Player from the Client Launcher

From the Multimedia submenu, select Audio Player. Figure 5-1 shows the Audio Player.

Starting the Audio Player from the Remote Configuration File

The **start AUDIO_PLAYER** command in the remote configuration file (*xp.cnf*) automatically downloads and starts the Audio Player when the network computer boots. Refer to the **start** command in Chapter 2 of the *NCBridge Reference Manual* for details.

Starting the Audio Player with xpsh

xpsh can start the **Audio Player** client, shown in Figure 5-1, or can simply play an audio file without opening the Audio Player. To start the Audio Player with **xpsh**, enter:

```
xpsh –display nc_name:0 aplay
```

The following options can be set on the **xpsh** command-line:

–h *host* specifies the host name or address on which the audio file resides. The host must be entered in the network computer's Internet Host Table in Setup. This host displays in the Audio Player's File Information area.

–f *filename and path* specifies the audio file name and its entire path. This file displays in the Audio Player's File Information area.

–a *access method* specifies the access method used to access the audio file. Available access methods are **tftp**, **nfs**, and **dap**.

–v *volume level* specifies the volume level to use when playing the audio file. Specify a number between 0 and 100, with 0 indicating no volume, and 100 indicating the loudest volume setting.

–p when used with the **–h**, **–f**, **–a**, and **–v** options, the specified file plays without opening the Audio Player. The entire file plays and cannot be interrupted.

–propcmd enables the "property command" interface, which allows other clients to send command strings to control the **aplay** client remotely. (See the examples that follow.)

–title "*string*" assigns a title for the *aplay* window.

Examples

This example starts the Audio Player on the network computer named *sierra*:

```
xpsh –display sierra:0 aplay
```

This example starts the Audio Player with the host **portland** and the audio file */usr/adam/story.au* preloaded in the Audio Player's File Information Area:

```
xpsh –display sierra:0 aplay –h portland –f /usr/adam/story.au
```

This example plays the audio file */usr/adam/story.au* (located on the host **portland**) on the network computer without opening the Audio Player:

```
xpsh –display sierra:0 aplay –h portland –f /usr/adam/story.au –a tftp –p
```

Example 1-1. Aplay examples

```
xpsh -display sierra:0 aplay
xpsh -display sierra:0 aplay -h eugene -f /usr/adam/story.au
xpsh -display sierra:0 aplay -h eugene -f /usr/adam/story.au -a tftp -p
```

The first **xpsh** example above starts the **aplay** client on a network computer named **sierra***;* the second starts the Audio Player with the host **eugene** and the audio file */usr/adam/story.au* preloaded in the Audio Player's File Information Area; and the third example plays the audio file */usr/adam/story.au* (located on the host **eugene**) on the network computer without opening the Audio Player.

Property Command Interface

The property command interface lets other clients remotely control the command-line version of the **aplay** client by allowing these other clients access to four "properties" created by the **aplay** client on the X server. (See Table 5-1, *Audio Player Properties*.) If the **aplay** client is executed with the **-propcmd** option, atoms (which uniquely identify each property) are created and become associated with these character strings. The **aplay** client's shell window ID is then assigned to the _TEK_APLAY_WID property.

Table 5-2 Audio Player Properties

Property name	Description
_TEK_APLAY_WID	Gets the ID of the *aplay* shell window
_TEK_APLAY_CMD	Passes commands to the **aplay** client
_TEK_APLAY_REPLY	Sends replies to the client issuing the commands
_TEK_APLAY_STATUS	Returns the status of the **aplay** client

To use these properties to control the **aplay** client, get the value of _TEK_APLAY_WID. You will need to know the client's window ID when setting the value of _TEK_APLAY_CMD, getting the value of _TEK_APLAY_REPLY, and finding the status of _TEK_APLAY_STATUS.

Commands that can be sent to the **aplay** client via the _TEK_APLAY_CMD are of two types: *value-free* and *valued*.

Value-free commands. A value-free command is simply a request for an action to be performed. Value-free commands include: PLAY, STOP, PAUSE, REWIND, and MUTE.

Valued commands. A valued command sends a command and a value to be used in the performance of that command. Valued commands include: FILE, VOLUME, ACCESS, and HOST. Valued commands can be used to set a value, or to query the client for a value.

The format for setting a value is:

```
<command>:<value>
```

There is no white space separating the command, colon, or value. The value is different depending on the command. The **FILE** command requires a full absolute path to a file.

```
FILE:/usr/audio/speech.au
```

Valued commands can also be used to query a particular value. This is done by sending the command and getting the string associated with the _TEK_APLAY_REPLY property. If the command string FILE is loaded into the _TEK_APLAY_CMD property, the current file name is stored in the _TEK_APLAY_REPLY property. If the command string VOLUME is loaded into the _TEK_APLAY_CMD property, the current volume level is stored into the reply property.

- User puts FILE in _TEK_APLAY_CMD
- **aplay** puts `/usr/audio/speech.au` into _TEK_APLAY_REPLY

Once the **aplay** client gets notification that the _TEK_APLAY_CMD property has changed, it gets the command string associated with it and deletes the property value. This is an acknowledgment that the **aplay** client has handled the property command.

To find the status of the **aplay** client, simply check the string associated with the _TEK_APLAY_STATUS property. The value of status is either STARTED, PAUSED, or EOF.

Opening or Creating an Audio File

The **Open** command on the File menu creates a new file to record, or opens an existing file.

1. Select the **Open** command from the File menu. The File Selection window appears as shown in Figure 5-2.
2. To select the access method to use, position the mouse pointer on the **NFS** button and click. A drop down menu displays the available methods: TFTP, NFS, or DAP. The File Selection window changes to reflect the chosen access method.

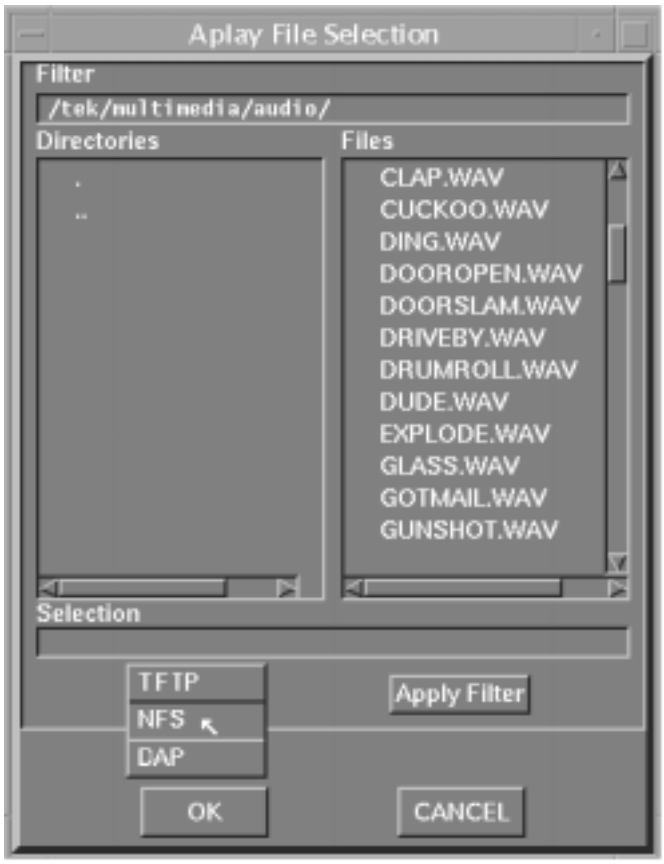


Figure 5-2 File Selection

Using TFTP Access

The TFTP File Selection window shown in Figure 5-3 displays when TFTP is the access method:

Figure 5-3 Aplay TFTP File Selection Window

Note: ***Use TFTP as the access method only if NFS is not available. NFS provides better and more accurate data transfer rates required to maintain continuous audio stream.***

If using TFTP as the access method, the Audio Player cannot play a file that is greater than 16MB. If you attempt to play a file larger than 16MB, the player will ignore the file.

Creating a New Audio File Using TFTP Access

When creating a new audio file using TFTP as the file access, the file must exist and have world-write permissions before the audio data can be written to it. In addition, only the *.au*, and *.raw* file extensions can be used with TFTP.

1. Create the new audio file and give it world-read and -write permissions.
2. Enter the Host name or address on which the file will be stored in the Host field.
3. Enter the filename, path, and extension in the Path field. Use only the *.au* (Sun file type) or *.raw* (no header) file extensions.
4. Click on **OK** to open the file. The Host and file names display in the File Information Area.

Opening an Existing Audio File Using TFTP Access

1. Enter the name or address of the Host on which the file is located in the Host field.
2. Enter the file's path, filename, and extension in the Path field. Files with the following extensions can be played on the Audio Player:

.au	Sun file type
.wav	Microsoft file type
.voc	Sound Blaster file type
.aiff	Macintosh file type
.snd	Macintosh file type
.raw	no file header

   If no extension is given, the player attempts to read the file's header information. If the file does not have a header, the player plays it as a headerless file (*.raw*).
3. Click **OK**. The Host and file names display in the File Information Area.

When opening an existing file, you can choose the **Info** command to see the file's original recording information. Refer to the **Info** command later in this chapter for more information.

Using NFS Access

Figure 5-4 displays the NFS File Selection Window when NFS is the access method.

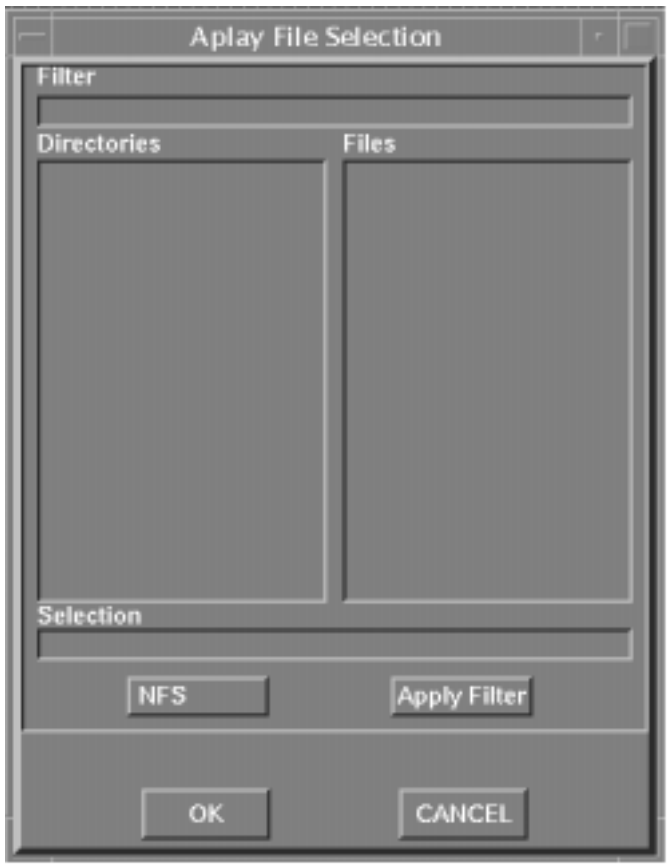


Figure 5-4 Aplay NFS File Selection Window

Creating a New Audio File Using NFS Access

When using NFS as the file access, an NFS mount must be established to the Host on which the file resides and must have world-read and -write access.

1. Enter the local NFS mount point to the network computer in the Filter field.

2. Enter the full path, filename, and extension in the Selection field. The following file extensions are available:

   .au Sun file type
   .wav Microsoft file type
   .aiff Macintosh file type
   .snd Macintosh file type
   .raw no file header

   If no extension is given, the file is recorded as a headerless file (.raw).

3. Click **OK**. The Host and file names display in the File Information Area.

Opening an Existing Audio File Using NFS Access

1. Enter the NFS mount point in the Filter field.
2. Click on the **Apply Filter** button. All subdirectories and files are listed in the Directories and Files areas.
3. To view files in a different directory, click on the directory name in the Directories area, and then click on the **Apply Filter** button. The files in that directory are listed in the Files area.
4. Select the file you want in the Files area. The full path and filename prefills in the Selection field. Enter one of these file extensions:

   .au Sun file type
   .wav Microsoft file type
   .voc Sound Blaster file type
   .aiff Macintosh file type
   .snd Macintosh file type
   .raw no file header

   If no extension is given, the player attempts to read the file's header information. If the file does not have a header, the player plays it as a headerless file (.*raw*).

5. Click **OK**. The Host and file names display in the File Information Area.

When opening an existing file, you can choose the **Info** command to see the file's original recording information. Refer to the **Info** command later in this chapter for more information.

Using DAP Access

The following File Selection window displays when DAP is the access method.

Figure 5-5 Aplay DAP File Selection Window

Creating a New Audio File Using DAP Access

1. Enter the node name or address in the Node field. This is the node on which the file will be stored.

2. Enter the full path, filename, and extension in the Selection field. The following file extensions are available:

   .au Sun file type

   .wav Microsoft file type

   .aiff Macintosh file type

   .snd Macintosh file type

   .raw no file header

   If no extension is given, the file is recorded as a headerless file (.raw).

3. Click **OK**. The Host and file names display in the File Information Area.

Opening an Existing Audio File Using DAP Access

1. Enter the node name or address in the Node field. This is the node on which the file is located.
2. Enter the file's path and directory in the Filter field.
3. Click on the **Apply Filter** button. All subdirectories and files are listed in the Directories and Files areas.
4. To view files in a different directory, click on the directory name in the Directories area, and then click on the **Apply Filter** button. The files in that directory are listed in the Files area.
5. Select the file you want in the Files area. The full path and filename prefills in the Selection field. Enter one of the following file extensions:

   .au Sun file type

   .wav Microsoft file type

   .voc Sound Blaster file type

   .aiff Macintosh file type

   .snd Macintosh file type

   .raw no file header

   If no extension is given, the player attempts to read the file's header information. If the file does not have a header, the player plays it as a headerless file (.raw).

6. Click **OK**. The Host and file names display in the File Information Area.

When opening an existing file, you can choose the **Info** command to see the file's original recording information. Refer to the **Info** command later in this chapter for more information.

Connecting External Audio Devices

- Figure 5-6 shows the audio input and output connectors for the XP, NC200, and NC400 series. All of the jacks accept a 3.5 mm phone plug.

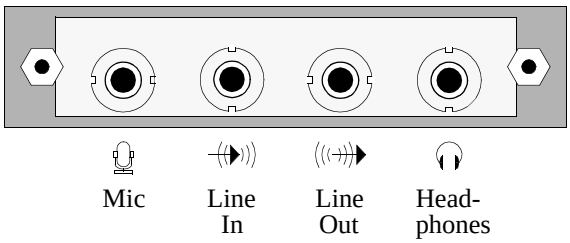


Figure 5-6 Input and Output Jacks for XP, NC200, and NC400

The NC900 provides two 3.5 mm audio connectors, one for microphone in and one for speaker out as shown in Figure 5-7.

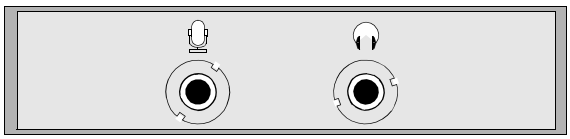


Figure 5-7 NC900 Audio Jacks

>>> ***CAUTION: Before connecting any audio device to the network computer, close all clients, remote connections, and power down the network computer. Connecting devices to the network computer's audio connectors with power applied could result in a loss of data.***

- If you are using a microphone for audio input, plug it into the Mic input jack.

  Notes: ***The commonly available PC99-compatible microphone works with the NC900, but not with the earlier XP, NC200, or NC400 series. This microphone requires a bias voltage, sometimes referred to as "phantom-power". The connector plug of a PC99-type microphone has three conductors (tip, ring, and shaft). On this type of plug, the middle conductor (ring) provides DC power for the microphone.***

  The XP, NC200, or NC400 series require a dynamic or self-biased microphone that has a two conductor plug (tip and shaft). The audio option design of these earlier models predates the PC99 specification, so they do not support PC99-type microphones.

  Self-biased microphones such as an electret condenser microphone have an internal battery and a two conductor plug. These are compatible with the XP, NC200, NC400, and NC900 series.

  The NC900 supports dynamic, electret condenser (self-biased), and the newer PC99-type microphones.

- A line level signal from a stereo audio source such as an audio mixer, pre-amplifier, compact disc player, or tape player, plugs into the line-in jack. NC900 models use the symbol to identify the line-in/microphone jack, while XP, NC200, and NC400 models employ the symbol to show the line-in jack.
- The line-out jack provides a line-level stereo signal for use by a mixer, pre-amplifier, tape player, or other equipment that can accept a line level input. This output provides the highest quality audio. NC900 models use the symbol to denote the line-out/headphone jack, while XP, NC200, and NC400 models use the symbol to indicate the line-out jack.
- The headphone jacks on NC200, NC400, and NC900 models work with stereo headphones and 32 Ω powered stereo speaker sets. The XP series supports 8 Ω unpowered and powered speaker sets. Inserting the headphone plug into this jack disables the internal monitor speaker.

Audio Accessory Specifications for XP, NC200, and NC400 Series

The following specifications can assist you when choosing accessories to use with the Audio board.

Microphone Specifications

Microphone Type	• Dynamic • Electret (or condenser) with integrated battery
Impedance	Medium to High (600 to 1000 Ω at 1 kHz)
Sensitivity	–55 to –70 db (at 1 kHz)
Frequency Range	50 Hz to 16 kHz
Cord Length	6 feet or longer (for ergonomic reasons)
Plug	3.5 mm monaural phone plug

Line Input Specifications

Signal Level	0.775 Vrms nominal
Input Impedance	High (greater than 20 KΩ)
Plug	3.5 mm stereo phone plug

Line Output Specifications

Signal Level	0.775 Vrms into a 600 Ω load
Plug	3.5 mm stereo phone plug

Speaker/Headphone Specifications

Impedance	8 Ω (minimum) on XP only 32 Ω (minimum) on NC200, NC400)
Plug	3.5 mm stereo phone plug

Audio Accessory Specifications for NC900 Series

The following specifications can assist you when choosing accessories to use with the Audio board.

Microphone Specifications

Microphone Type	• Dynamic • Electret (or condenser) with integrated battery • PC99-compatible
Impedance	Medium to High (600 to 1000 Ω at 1 kHz)
Sensitivity	–55 to –70 db (at 1 kHz)
Frequency Range	50 Hz to 16 kHz
Cord Length	6 feet or longer (for ergonomic reasons)
Plug	3.5 mm monaural phone plug

Line Input Specifications (same jack as microphone)

Signal Level	0.775 Vrms nominal
Input Impedance	High (greater than 20 KΩ)
Plug	3.5 mm stereo phone plug

Line Output Speaker/Headphone Specifications

Signal Level	0.775 Vrms into a 600 Ω load
Plug	3.5 mm stereo phone plug
Impedance	32 Ω (minimum)

Recording an Audio File

The Audio Player works much like a home stereo. It has a **Record** button, a **Stop** button, and a **Play** button. It also has a number of recording settings you can adjust so that the audio file is recorded for the type of device on which it will be played. Audio files can be played on almost any computer that has audio capabilities, including network computers, personal computers, and workstations.

When a new file is created, the default file settings reflect the device on which it will be recorded, in this case, the network computer.

If an existing file is opened, the settings displayed in the Audio Player reflect the settings at which the file was recorded if the network computer can support the settings. If not, the Audio Player adjusts the settings to best match the network computer's capabilities. To see the exact settings at which the audio file was recorded, select the **Info** command in the File menu.

Before recording, attach any external audio devices. Refer to the *Connecting External Audio Devices* topic on page 5-17.

Before recording, set the recording options listed here:

Frequency	Select a sampling frequency. The higher the frequency, the clearer the recording. The available frequency settings are limited to the network computer hardware. You cannot record at a frequency higher than the network computer supports. If you try to record at an unsupported frequency, a warning displays.
File Format	Select a file format. The File Format determines how the audio file is stored.
Input Source	Select the input source of the audio data: microphone, stereo line, video line, or a mix of multiple sources. Refer to the Audio Mixer for information about mixing input sources. Refer to the *Using the Audio Mixer* topic on page 5-26 for details about the Audio Mixer.
Stereo	This option toggles the stereo option. Select this option to record in Stereo, or de-select it to record in mono.
Mic Boost	This option toggles the Microphone boost option. Select this option to increase the sensitivity of the microphone.

Recording Levels	Sets and shows the recording level. Slide the recording level indicator to the right to increase the levels. The Left and Right feedback area shows the decibel levels during recording. If the levels reach the "red area", indicated by red bars, the recording may be at too high a level. Slide the recording indicator to the left to reduce the recording level.
Recording Length	Sets a maximum recording time limit (up to 999999 seconds). Use this option if you want to control the length of the recording. When the recording reaches the time limit, the player automatically stops recording.

After setting the recording options, you are ready to record:

1. Use the **Open** command to open an existing file, or to create a new file.

2. Click on the **Record** button. The recorder starts and continues to record until you click on the **Stop** button.

3. To stop recording, click on the **Stop** button.

4. To rewind to the audio file, click on the **Rewind** button. The file rewinds to the beginning.

5. To play the audio file, click on the **Play** button.

6. To adjust the volume, slide the volume controller to the right to increase the volume, or to the left to decrease the volume. Be sure the **Sound** button is on, or pushed in. The **Sound** button acts as a mute toggle; when it is pushed in, you can hear the sound, when it is off, the sound is muted.

To make recording adjustments, change any of the recording options and go back to Step 2. Repeat this procedure as needed.

Note: When you use TFTP to access files, some versions of TFTP overwrite the file's contents after the file is recorded when the file's header information is added. If this occurs, use NFS as the file access method.

Playing an Audio File

The Audio Player can play files that have these extensions:

.au	Sun file type
.wav	Microsoft file type
.voc	Sound Blaster file type
.aiff	Macintosh file type
.snd	Macintosh file type
.raw	no file header

Files that do not have an extension are played as raw files.

To play an audio file:

1. Use the **Open** command on the File menu to open the audio file. When the file is opened, use the **Info** command on the File menu to view the recording settings. These settings may differ from the settings displayed on the Audio Player. The Audio Player settings reflect the current hardware capabilities. The original recording settings may not be available on the hardware, so the Audio Player automatically adjusts the settings to best match those that are available with the hardware.

2. Click the **Play** button.

3. To adjust the volume, slide the volume controller to the right to increase the volume, or to the left to decrease the volume. Be sure the **Sound** button is on, or pushed in. The **Sound** button acts as a mute toggle; when it is pushed in, you can hear the sound, when it is off, the sound is muted.

4. To stop playing the file, click the **Stop** button. To restart the file from where it stopped, click the **Play** button.

5. To rewind the audio file to the beginning, click the **Rewind** button.

Audio File Information

After opening a file that already exists, use the **Info** command on the File menu to display a window with the file's original recording information. Figure 5-8 shows how the filename, frequency, format, channel, and duration information are displayed.

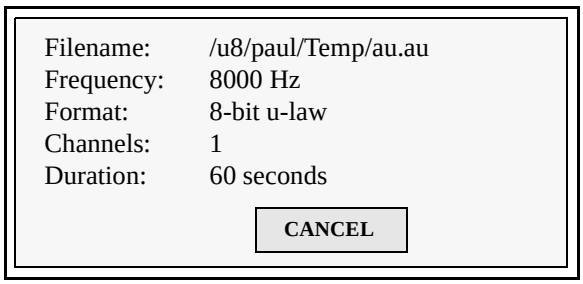


Figure 5-8 File Information Window

When opening an existing file, the options displayed on the Audio Player reflect the current hardware capabilities. The original recording settings may not be available on the hardware, so the Audio Player automatically adjusts the settings to best match those that are available with the hardware.

To close the File Information window, click the **CANCEL** button.

Closing the Audio Player

To close the Audio Player, select the **Quit** command from the File menu. Any open file information is saved and the player exits.

Audio Mixer

The Audio Mixer allows you to control the hardware volume for line in, microphone, and prerecorded (digital) sources. You are not required to use the Audio Mixer when recording or playing audio or video files. When started, the Audio Mixer displays as shown here:

Figure 5-9 Audio Mixer

The Audio Mixer is like a master volume control, much like the volume control on a home stereo receiver. The volume control on the stereo receiver controls the output volume for all the stereo components, such as the tape player and the CD player. Likewise, the mixer controls the input and output gain for the Line In, Digital, and Microphone sources.

Note: The Bell Gain control is available on NC900 models only.

Each volume control has a toggle **Sound** button. When clicked on, the sound is heard. When off, the sound is muted until it is selected again. This allows you to quickly mute the sound and then to resume.

Starting the Audio Mixer

The Audio Mixer can be started from the Client Launcher, from the remote configuration file, or with the **xpsh** command.

Starting the Audio Mixer from the Client Launcher

From the Multimedia submenu, select Audio Mixer. The software displays the Audio Mixer as shown in Figure 5-9.

Starting the Audio Mixer from the Remote Configuration File

The **start AUDIO_MIXER** command in the remote configuration file (*xp.cnf*) can be used to automatically download and start the Audio Mixer when the network computer boots. Refer to the **start** command in Chapter 2 of the *NCBridge Reference Manual* for details.

Starting the Audio Mixer with xpsh

xpsh can open the **Audio Mixer** client, as shown in Figure 5-9. To open the Audio Mixer with **xpsh**, enter this command:

```
xpsh –display nc_name:0 mixer
```

Using the Audio Mixer

To use the Audio Mixer to monitor input, adjust the volume levels of the Line In Gain, Digital Gain, and the Microphone Gain, depending on what you are using as the input source(s).

- When playing an audio file, the Audio Mixer sets the output levels for each of the input sources relative to each other.
- When recording an audio file, the Audio Mixer sets the recording levels of the input sources relative to all of the input sources. The combined input sources, except the microphone input, are then recorded as a single source (mixed).

Examples of Using the Audio Mixer

Below are some common examples of using the Audio Mixer.

- You can play a compact disc through the network computer's speaker (Line In) and use the Audio Mixer to control the volume.
- When recording an audio file using the Audio Player, you can open the **Audio Mixer** client and adjust the Line In Gain volume so that you can monitor the file as it records. (Note, you are not required to use the Audio Mixer when recording an audio file.)
- To selectively record specific segments of an audio source, adjust the Audio Player so that it is ready to record, open the Audio Mixer, and begin playing the audio source. When a segment plays that you want, start recording. When finished, stop the recording while still listening to the audio source. When another segment starts that you want to record, begin recording again. This allows you to selectively record only what you want without having to start

and stop the audio source.

- To record multiple inputs on NC200 and NC400 models, set the input source on the Audio Player to Mixed. The Audio Mixer controls the recording volume of each of the input sources. For example, to record sound from several input sources to go with a presentation, such as the Digital Video Player and a CD player, set the Line In Gain to a lower level than the Digital Video. (The Line In Gain controls the CD volume and the Digital Video gain controls the recording volume of video soundtracks.) Set the recording settings on the Audio Player, start recording the music, start the Vplay client, and then adjust its volume level. When finished, stop the recording and play back the audio file. If necessary, readjust the levels on the Audio Mixer and re-record until the relative gains are correctly set.
- NC900 models employ one input jack for both line-in and microphone gain, so it is not possible to record multiple inputs on NC900 models. If you click the Microphone Mute control, the Line In Gain control is no longer available; it is automatically muted. Conversely, clicking the Line Gain control on the Audio Mixer dialog toggles you to the Line Gain control and the Microphone Gain control is muted.

Keep in mind that after the relative gains for the input sources are set with the Audio Mixer, you can then use the Recording Level feature on the Audio Player to adjust the multiple sources as a single source at a higher or lower level.

Saving the Audio Mixer Level Settings

To save the level settings from one Audio Mixer session to another, note the dB values for the Line In Gain, Digital Gain, and Microphone Gain and add them to the **start AUDIO_SERVER** command in the *xp.cnf* remote configuration file. The next time the Audio Mixer starts, the dB values are preset.

Closing the Audio Mixer

To close the Audio Mixer, select the **Quit** command from the File menu.

Adjusting the Volume when Starting the Audio Server

The default volume (or gain) for the audio server may be adjusted when the audio server is first executed. The following *xp.cnf* command gives an example of how to reduce the volume for the audio server at start up.

```
start AUDIO_SERVER -args “dgain -10”
```

Digital Video Player

The Digital Video player allows you to play video files in a video window on your network computer. An optional digital video coprocessor card, available only on the XP400, NC200, and NC400, is required to support this feature. The video file must be in MPEG1 file format. When started, the Video Player displays as shown in Figure 5-10.

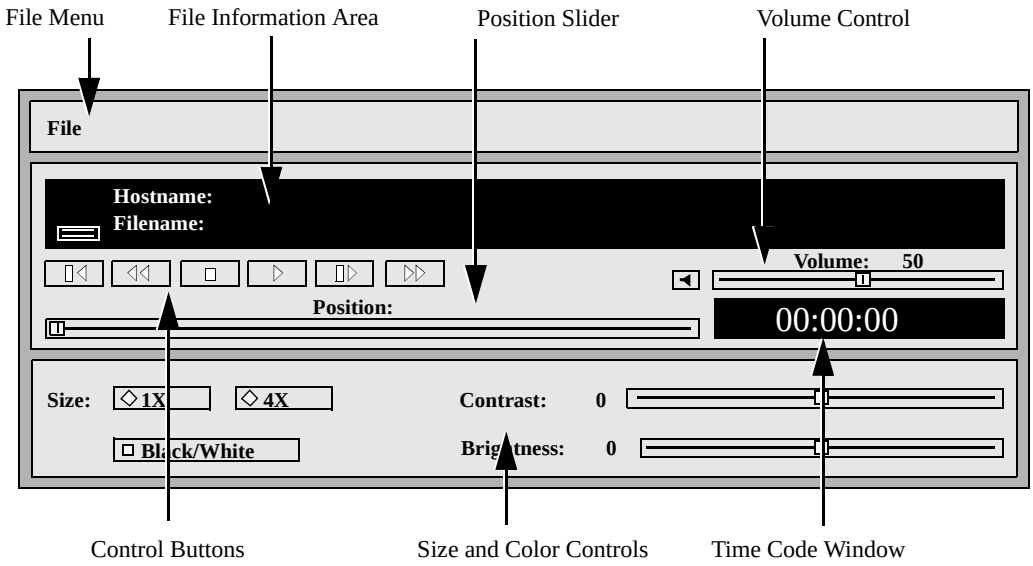


Figure 5-10 Video Player

The following information about the Video Player is available:

- *Starting the Video Player* provides information about the various ways of starting the Video Player.
- *Opening a Video File* provides information about opening video files.
- *Using the Video Player* provides the steps for playing video files.
- *Multicast* provides information about sending packets from a single point to multiple receivers.

Starting the Video Player

The video player can be started from the Client Launcher, from the remote configuration file, or with **xpsh**.

Starting the Video Player from the Client Launcher

From the Multimedia submenu, select Digital Video. The Video Player displays as shown in Figure 5-10.

Starting the Video Player from the Remote Configuration File

The **start DIGITAL_VIDEO** command in the *xp.cnf* remote configuration file can be used to automatically download and start the Video Player when the network computer boots. Refer to the **start** command in Chapter 2 of the *NCBridge Reference Manual* for details.

Starting the Video Player with xpsh

xpsh can start the **Video Player** client, as shown in Figure 5-10. To open the Video Player with **xpsh**, enter this command:

```
xpsh –display nc_name:0 vplay
```

The following **vplay** options can be set on the **xpsh** command-line:

–h (Host) specifies the Host name or address on which the video file resides. The Host must be entered in the network computer's Internet Host Table in Setup. This host displays in the Video Player's File Information area.

–f (Filename and path) specifies the video file name and its entire path. This file displays in the Video Player's File Information area.

–a (Access method) specifies the access method used to access the video file. Available access methods are **tftp**, **nfs**, **dap** and **multicast.** NFS is the preferred file access method for faster and more accurate data transfer rates required by the player. In addition, there is a 16MB limit on files transferred with TFTP.

–v (Volume level) specifies the volume level to use when playing the video file. Specify a number between 0 and 100, with 0 indicating no volume, and 100 indicating the loudest volume setting.

–m (Mute) specifies that the video file plays with no sound.

–c (Color) specifies that the video file displays in color (used only if the video was recorded in color).

–nc (No Color) specifies that the video file displays in greyscale images.

–b (Big) specifies that the video file displays in a frame four times the size of the original file.

–p (Play only) When used with the **–h**, **–f**, **–a**, and **–v** options, the specified file plays without showing the Video Player. The entire file plays and cannot be interrupted.

–all (Play All; software player only) plays all frames in a video file. Frame scheduling is ignored and the audio will not be in sync.

–title *"string"* assigns a title for the vplay windows.

–propcmd creates properties that allow other clients to send command strings to the Video Player. These properties can be used to control the Video Player from another client. For details about the properties, see the **vplay** man page.

–brightness *n* sets the brightness level of the video file. Specify a number between –50 and +50.

–contrast *n* sets the contrast level of the video file. Specify a number between –50 and +50.

–BUFSIZE *n* (Hardware player only) specifies the size of the Video Player's memory buffer (in kilobytes). The value defaults to 1024 and can not be set lower than 1kilobyte. If the value specified is greater than available memory when trying to play a file, the Video Player reduces its buffer to the available memory.

–CHKSIZE *n* (Hardware player only) specifies that the Video Player's memory buffer is divided into "chunks", measured in kilobytes. The network fills the chunks, and the Video Player empties them as they are accessed. The default is 32, which divides the buffer into 32 kilobyte chunks. If the chunk size is set to a number larger than the buffer size, the chunk size will be truncated to one half the buffer size. The chunk size cannot be set less than 1 kilobyte.

–CHKDELAY *n* (Hardware player only) specifies the time delay (in milliseconds) that the Video Player waits following each read request that fills a chunk.

Examples

This example opens the Video Player on the network computer named *sierra*:

```
xpsh –display sierra:0 vplay
```

This example opens the Video Player with the host **portland** and the video file */usr/adam/scene.mpg* preloaded in the Video Player's File Information Area:

```
xpsh –display sierra:0 vplay –h portland –f /usr/adam/scene.mpg –a tftp
```

This example plays the video file */usr/adam/scene.mpg* (located on the host **portland**) in color and with no sound on the network computer without showing the Video Player:

```
xpsh –display sierra:0 vplay –h portland –f /usr/adam/scene.mpg –a tftp \–c –m –p
```

Opening a Video File

The **Open** command on the File menu opens and displays an existing video file. Video files must be in MPEG file format only.

1. Select the **Open** command from the File menu. The File Selection window appears as shown in Figure 5-11

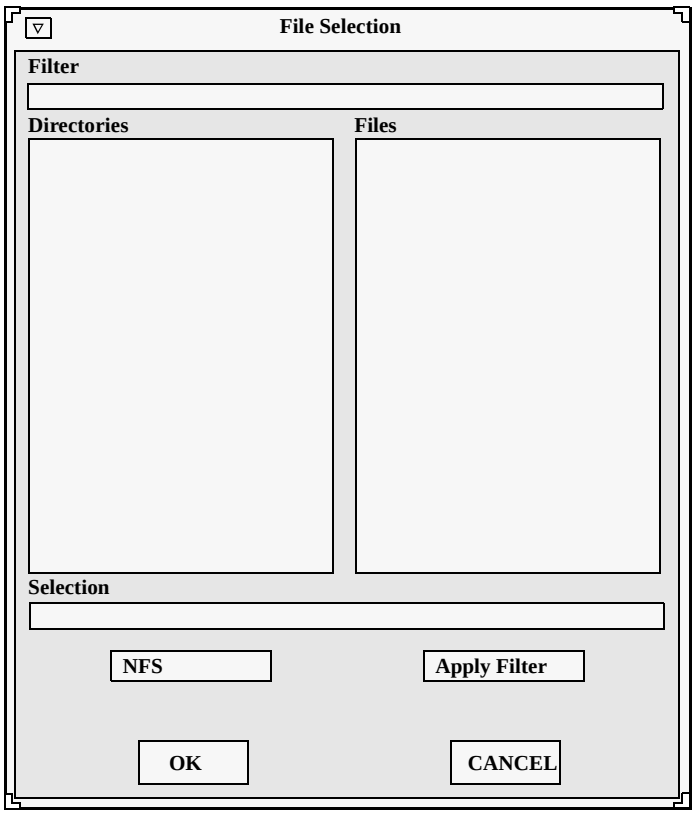


Figure 5-11 File Selection Window

2. To select the access method to use, position the mouse pointer on the **NFS** button and click. A drop down menu displays the available methods: TFTP, NFS, or DAP. The File Selection window changes to reflect the chosen access method.

Using TFTP Access

The File Selection window in Figure 5-12 displays when TFTP is the access method.

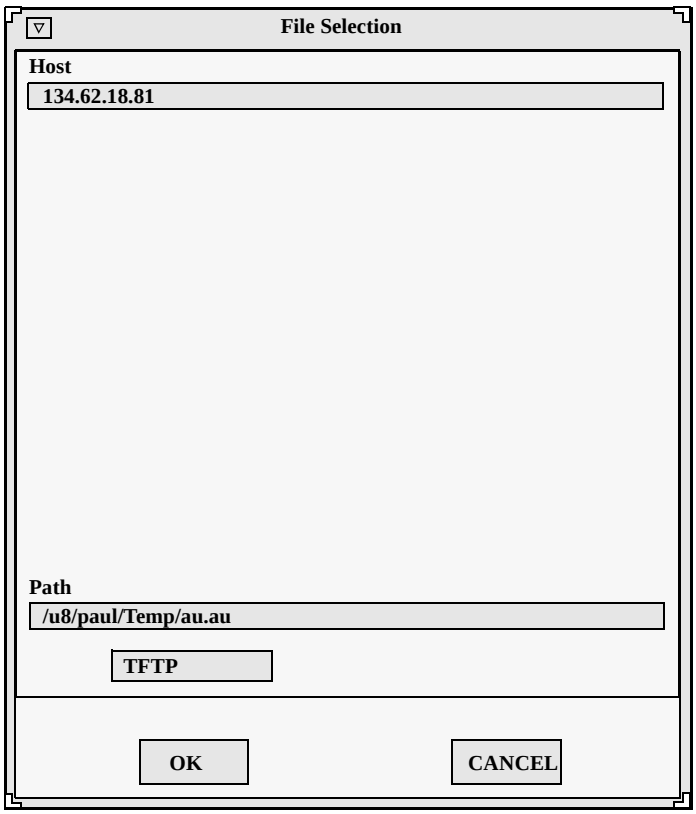


Figure 5-12 TFTP File Selection Window

Notes: ***Use TFTP as the access method only if NFS is not available. NFS provides better and more accurate data transfer rates required to maintain continuous audio and video stream.***

If using TFTP as the access method, and you attempt to play a file that is greater than 16MB of MPEG data, the Digital Video Player ignores the remaining data after 16MB has been reached.

In addition, inherent limitations in TFTP prevent fast forward and fast rewind from being supported.

1. Enter the name or address of the Host on which the file is located in the Host field.
2. Enter the file's path, filename, and extension in the Path field. The file must be an MPEG file.
3. Click **OK**. The Host and file names display in the File Information Area.

Using NFS Access

The File Selection window displays when NFS is the access method.

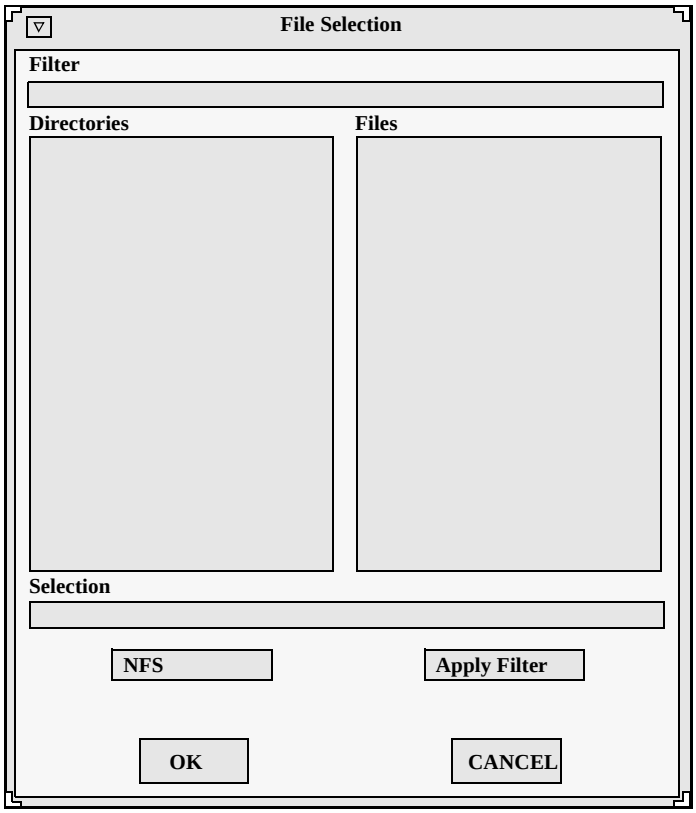


Figure 5-13 File Selection Window when NFS is the Access Method

To use the File Selection window when NFS is the access method:

1. Enter the NFS mount point in the Filter field.
2. Click on the **Apply Filter** button. All subdirectories and files are listed in the Directories and Files areas.
3. To view files in a different directory, click on the directory name in the Directories area, and then click on the **Apply Filter** button. The files in that directory are listed in the Files area.
4. Select the file you want in the Files area. The full path and filename prefills in the Selection field. The file must be an MPEG file.
5. Click **OK**. The Host and file names display in the File Information Area.

Using DAP Access

The File Selection window shown here displays when DAP is the access method.

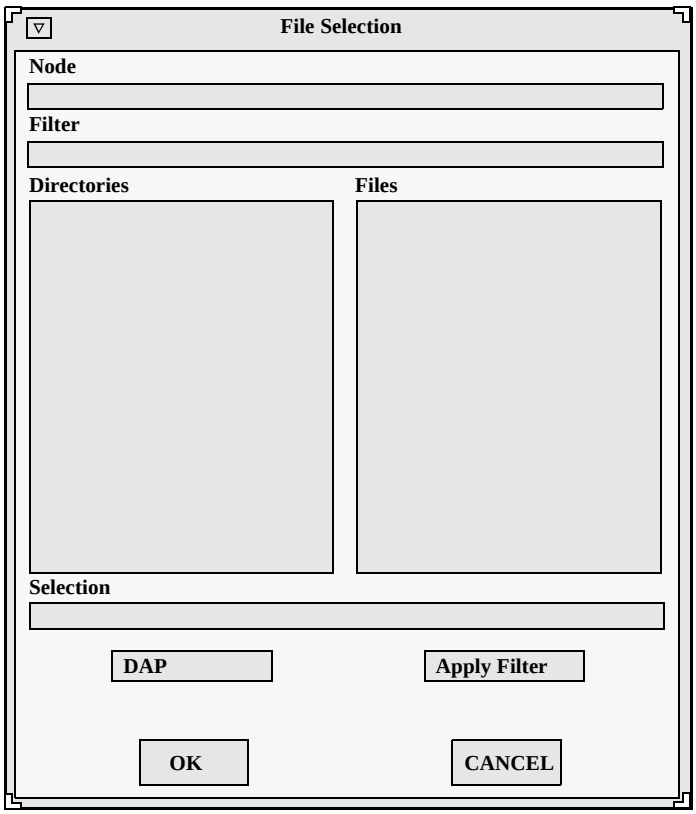


Figure 5-14 File Selection Window When DAP is the Access Method

1. Enter the node name or address in the Node field. This is the node on which the file is located.
2. Enter the file's path and directory in the Filter field.
3. Click on the **Apply Filter** button. All subdirectories and files are listed in the Directories and Files areas.

4. To view files in a different directory, click on the directory name in the Directories area, and then click on the **Apply Filter** button. The files in that directory are listed in the Files area.
5. Select the file you want in the Files area. The full path and file name prefills in the Selection field. The file must be an MPEG file.
6. Click **OK**. The Host and file names display in the File Information Area.

Playing a Video File

After opening the video file using the **Open** command, use the Control Buttons to play the file:

1. Click on the **Play** button to start playing the specified file. The video player plays MPEG files only.

   Note: ***If the file does not play, check the Console for messages. If the file is not an MPEG file format, the console displays the following message: <FileName> is not an mpeg file!***

   If the video file includes audio, the Audio Player must be set to a sample frequency rate of 8000Hz. Otherwise, the audio will not play.

2. To stop playing the file, click on the **Stop** button.

3. To rewind the video file to the beginning of the file, click on the **Rewind** button.

4. To advance one frame at a time, click on the **Forward** button. This button is not available if using TFTP as the file access method.

5. To fast forward through the file, click and hold the **Fast Forward** button. Release the button when you want to stop. Refer to the *Fast Forwarding and Rewinding* topic on page 5-39 for more information.

6. To fast rewind through the file, click and hold the **Fast Rewind** button. Release the button when you want to stop. Refer to the *Fast Forwarding and Rewinding* topic on page 5-39 for more information.

7. To adjust the volume, slide the volume controller to the right to increase the volume, or to the left to decrease the volume. Be sure the **Sound** button is on, or pushed in. The **Sound** button acts as a mute toggle; when it is pushed in, you can hear the sound, when it is off, the sound is muted.

While playing the video file, use the following controls to adjust the size and color of the video file.

Size	Plays the video in the size it was recorded (1X), or in a video window four times the size it was recorded (4X).
Black/White	Plays the video in color, or in greyscale. Turn this option on to play the file in black and white, or off to play the file in color.
Contrast	Sets the contrast level. Slide the level indicator to the left to decrease contrast levels, or to the right to increase the contrast levels.
Brightness	Sets brightness level. Slide the level indicator to the left to decrease brightness levels, or to the right to increase the brightness levels.

Fast Forwarding and Rewinding

The Fast Forward and Fast Rewind functions allow you to directly access any part of a video file. By using the Video Player's fast forward and fast rewind buttons or position slider, you can start playback from any location in a file, or replay a portion of a file any number of times, without having to start at the beginning.

Note: The Fast Forward, Fast Rewind, and Position Slider are not available if using TFTP as the file access method.

The slider (NFS only) and time-code window let you see how much of a file has already played. The slider represents a time index corresponding to the time code embedded in the MPEG stream. If the stream begins at zero, the time code acts as a simple timer of how long the video is. Whether you use the buttons or slider, the time-code window displays the time code of the current frame location in hours, minutes, and seconds. Both the slider and window are updated dynamically during playback.

To fast forward or fast rewind using the position slider, do the following:

1. Using any mouse button, grab and drag the slider to the right to fast forward or to the left to rewind.
2. Release the button when you reach the desired location.

To fast forward or rewind using the Video Player's buttons, do the following:

1. Using any mouse button, press and hold the fast forward or fast rewind button.
2. Release the button when you reach the desired location.

As you drag the slider or press the fast forward or fast rewind button, the video window is updated, displaying intermediate video portions. When you release the slider or button, the video player returns to its previous state. For example, if a video was playing when you repositioned the slider or pressed the button, the video restarts when you release it. If a video was on pause, it remains on pause.

As mentioned, you can use any mouse button to drag the slider. However, if you **click** on the first mouse button when the mouse is within the position slider track (but not on the slider button), the slider moves a tiny bit to that side of the slider button, no matter where in the track you place it. Essentially, the video is repositioned to the nearest MPEG Group of Pictures (GOP) boundary (generally about 1/2 second). If you **press** the second mouse button when it is in the slider track, the file is positioned at that location.

Multicast

Multicast is a way to send packets from a single point to multiple receivers. The receivers can determine when and if they receive the Multicasted packets. Multicast video takes advantage of networks that support Multicasting to decrease network bandwidth and provide a means of easily accessing video information.

The Digital Video player allows you to play video files in a video window on your network computer using Multicast. The video file must be in MPEG file format.

Note: Multicast is only available on XP400, NC200, and NC400 network computers.

Channels

Channel changing is an interface that maps "channel" numbers to Multicast addresses. This mapping is made in the *xp.cnf* remote configuration file and remains fixed until the network computer is rebooted.

Selection of a channel causes the client to cease reception on any current channel and attempt to join a transmission in progress on the selected channel. The client begins reading data from the Multicast IP address. When it reads sufficient data to properly set up the window size, the view window resets its size. A default sized window is started before this happens.

Choosing Multicast Channels

1. Edit the **video_multicast_entry** command-line in the *xp.cnf* remote configuration file to set your Multicast channel options. (Refer to the **video_multicast_entry** command in Chapter 2 of the *NCBridge Reference Manual*.) These channels display on the Video Player's Multicast menu option. If you omit this step, the Video Player does not display the Multicast menu.
2. In the Video Player, click on the Multicast menu to display the available channels.
3. Select the channel from the Multicast menu. The Video Player starts as soon as something is received on that channel.

Multicast Options

The following Multicast options can be added to the **xpsh** command-line when starting the Digital Video Player:

> ***Note: Where indicated, the following vplay options apply to both broadcast and Multicast, though in different ways. Only information relevant to Multicasting is included below.***

–h *host* specifies the Multicast IP address. This address must be the same as the address being used by the Multicast server. See your system administrator for valid choices.The address displays in the Video Player's Addr/Port Information Area.

–f *filename* specifies the Multicast port number. This port number must be the same as the port number being used by the Multicast server. See your system administrator for valid choices. The port number displays in the Video Player's Addr/Port Information Area.

–chan *n* specifies an index into an array of available Multicast channels. (Refer to the *Channels* topic on page 5-40 and *video_multicast_entry* in Chapter 2 of the *NCBridge Reference Manual*.) Do **not** use with the **–h, –f, –a,** or **–text** options.

–text "*string*" specifies the channel string displayed by the Video Player. Do **not** use with the **–chan** option.

–a *access method* specifies the access method used to access the video file. Use Multicast when Multicasting.

Example

This example starts the Video Player and plays the video being Multicast on IP address 224.200.50.1, port 3000. The Video Player displays the text "The Blues Channel".

```
xpsh –display twinkle:0 vplay –h 224.200.50.1 –f 3000
\–a MULTICAST –text "The Blues Channel"
```

The Video Player opens displaying the Multicast menu as shown in Figure 5-15.

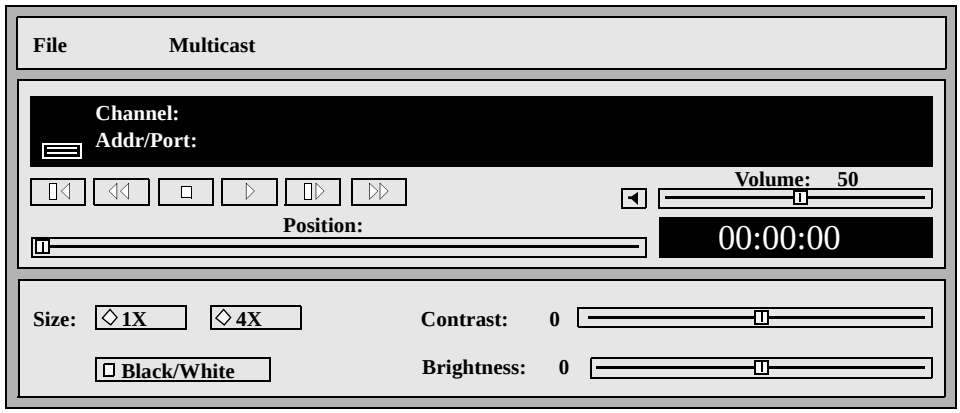


Figure 5-15 Video Player with Multicast Menu

When viewing a Multicast video, the **Forward**, **Fast Forward**, **Rewind**, and **Fast Rewind** buttons are not operational. However, the time index (displayed in the Time Code Window) shows the current time code within the current video segment of the Multicast video. You can note the video segment number and load it at a later time as a file, reposition to a specific location, and review a segment of the video previously seen during a Multicast session.

Closing the Video Player

To close the Video Player, select the **Quit** command from the File menu. Any open file information is saved and the player exits.

Analog Video Player

The Analog Video Player enables you to view NTSC (National Television System Committee) or PAL (Phase Alternation Line-rate) sources in a window on the network computer's display (XP300V or X317CVJ only). Common NTSC and PAL video sources are VCR's, video disc players, video cameras, and television tuners. When viewing a video on the network computer, you can control the volume, window size and placement, and color settings. When started the Analog Video Player displays as shown in Figure 5-16.

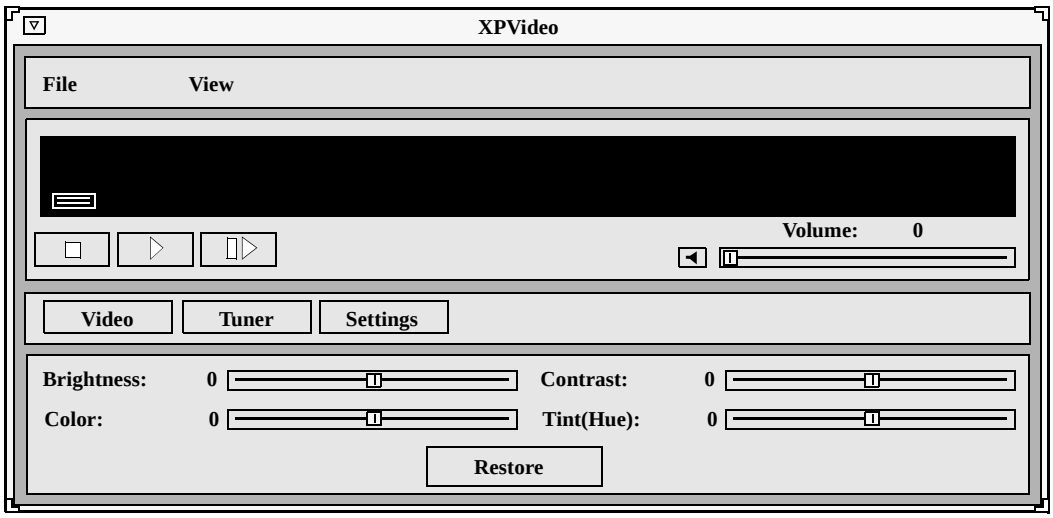


Figure 5-16 Analog Video Player

The Analog Video player requires the analog hardware. Not all network computer models have the analog hardware.

Before using the Analog Video Player, the xv server extension must be enabled. If the analog hardware is present, the xv server downloads automatically when the network computer boots. If for some reason the xv server extension is disabled, use the **enable_xv** command in the remote configuration file to enable it. Refer to Chapter 2, *Remote Configuration* in the *NCBridge Reference Manual* for details.

The following information about the Analog Video Player is available:

- The *Starting the Analog Video Player* topic on page 5-46 provides information about the various ways of starting the Analog Video Player.
- The *Connecting the Network Computer to an Analog Video Device* topic on page 5-47 provides information about the ports on the network computer and connecting the video device.
- The *Using the Analog Video Player* topic on page 5-48 provides the steps for viewing analog video sources.

Starting the Analog Video Player

The Analog Video Player can be started from the Client Launcher, from the remote configuration file, or with **xpsh**.

Starting the Analog Video Player from the Client Launcher

From the Multimedia submenu, select Analog Video. The Analog Video Player displays as shown in Figure 5-16.

Starting the Analog Video Player from the Remote Configuration File

The **start ANALOG_VIDEO** command in the *xp.cnf* remote configuration file can be used to automatically download and start the Analog Video Player when the network computer boots. Refer to the **start** command in Chapter 2 of the *NCBridge Reference Manual* for details.

Starting the Analog Video Player with xpsh

xpsh can start the **Analog Video Player** client, as shown in Figure 5-16. To open the Video Player with **xpsh**, enter the following:

```
xpsh –display nc_name:0 xpvideo
```

The following options can be set on the **xpsh** command-line:

–encode specifies the encoding format. Specify either NTSC, which is commonly used in the United States; or PAL, commonly used in Europe.

–source specifies the video source to which the video device is connected. Specify either COMPOSITE_1, COMPOSITE_2 or SVIDEO1.

–color specifies the color intensity of the video being played. Specify a number from –1000 to 1000. 0 is the default.

–bright specifies the color brightness intensity of the video being played. Specify a number from –1000 to 1000. 0 is the default.

–contrast specifies the color contrast intensity of the video being played. Specify a number from –1000 to 1000. 0 is the default.

–tint specifies the color tint of the video being player. Specify a number from –1000 to 1000. 0 is the default.

Connecting the Network Computer to an Analog Video Device

To use the Analog Video Player, first connect the video device to the network computer. The Analog Video Player plays NTSC and PAL video encoded sources.

Note: Refer to your video source user manual for cabling and encoding information.

There are several ports on the back panel of the network computer used for analog video. Connect composite sources to the Port 1 Composite, Port 2 Composite, or Port 1 SVideo ports. Refer to Figure 5-17 for the location of the video ports.

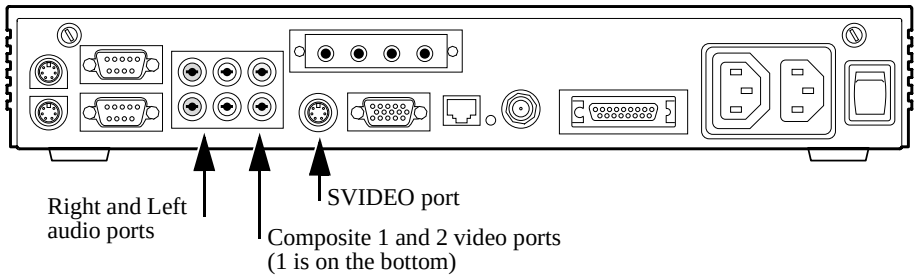


Figure 5-17 Back Panel Showing Audio and Video Ports

Note: You cannot have two video devices connected to Port 1 Composite and Port 1 SVideo at the same time.

Using the Analog Video Player

When the audio device is connected, you are ready to view the video on the network computer. When started, the Analog Video Player displays the video options as shown in Figure 5-18. (The **Video** button on the player is depressed.)

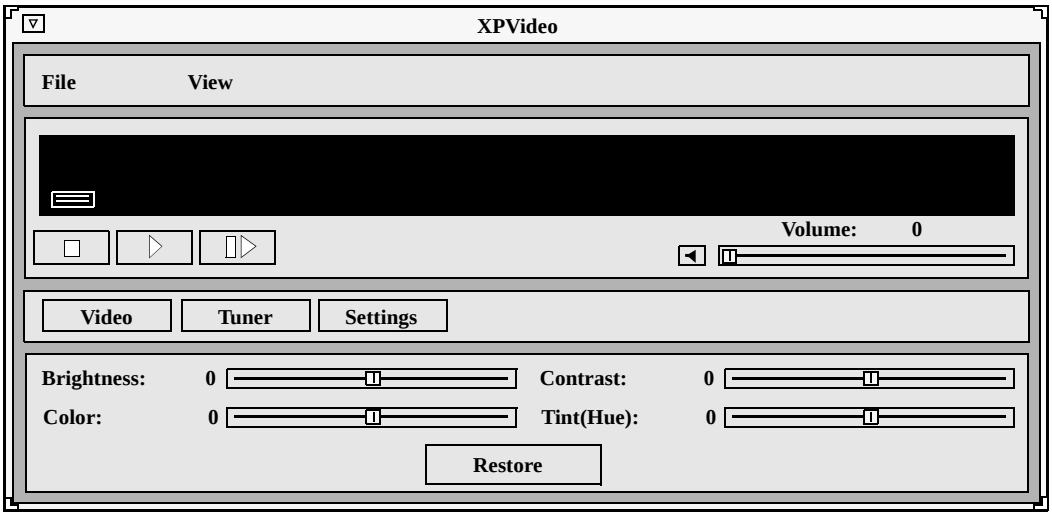


Figure 5-18 Analog Video Player Video Options

To play a video on the network computer:

1. Connect the video source to the network computer. Refer to the *Connecting the Network Computer to an Analog Video Device* topic on page 5-47.

2. Click on the **Play** button. A separate XPVIDEO window displays which is used to view the video. (This does not affect the video source. You must start the video source with its own play function.) The icon below the File menu changes to include a viewer window. If the viewer window is obstructed by other windows, clicking on this icon brings the viewer window to the top.

3. To adjust the volume, slide the volume controller to the right to increase the volume, or to the left to decrease the volume. Be sure the **Sound** button is on, or pushed in. The **Sound** button acts as a mute toggle; when it is pushed in, you can hear the sound, when it is off, the sound is muted.

4. To freeze a frame, click on the **Pause** button. This displays the frame in the viewer window; however, it has no effect on the video source which continues to play. Click on the **Play** button to resume viewing the video source.

5. To stop viewing the video, click on the **Stop** button. This has no effect on the video source and it continues to play.

While viewing a video, you can control the following window attributes:

Brightness	Sets the brightness level. Slide the level indicator to the left to decrease brightness levels, or to the right to increase the brightness levels.
Color	Sets the color level, or intensity. Slide the level indicator to the left to decrease color intensity, or to the right to increase the color intensity.
Contrast	Sets the contrast level. Slide the level indicator to the left to decrease contrast levels, or to the right to increase the contrast levels.
Tint/Hue	Sets the tint, or hue, levels. Slide the level indicator to the left to decrease the tint/hue levels, or to the right to increase the tint/hue levels.
Restore	Restores the video player options to the default settings.
View Menu	The View Menu contains the **ResetSize** command. This command returns the viewer window to its default size.

Clicking on the **Settings** button displays the Settings options as shown in Figure 5-19.

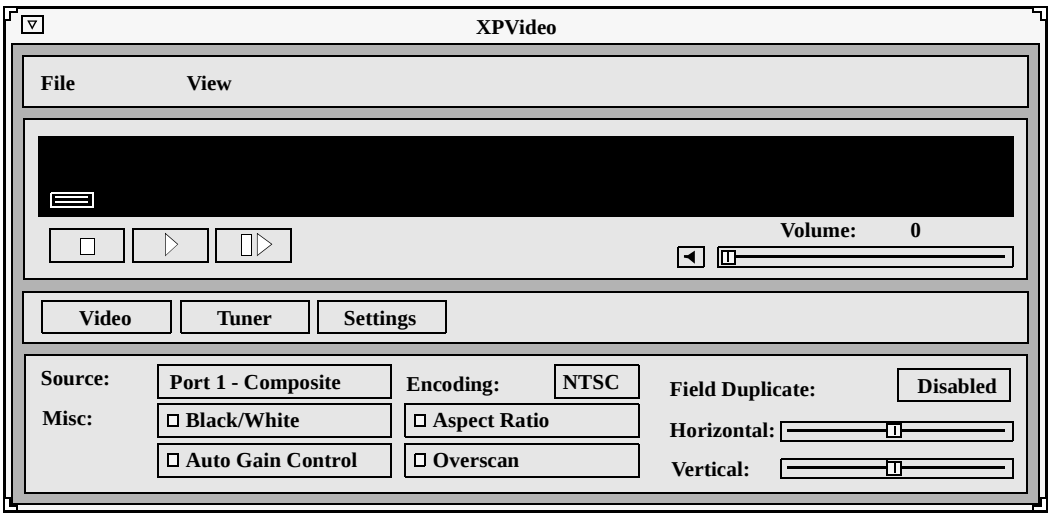


Figure 5-19 Analog Video Player Settings Options

You can change these settings:

Source	specifies the video source to use: Port 1 Composite, Port 2 Composite, or Port 1 SVideo.
Encoding	specifies the encoding format. Specify either NTSC, which is commonly used in the United States; or PAL, commonly used in Europe.
Black/White	specifies whether the image in the viewing window displays in color or in black and white.
Auto Gain Control	specifies the Automatic Gain Control setting. When turned ON, the video signal is automatically amplified for best picture quality.

Note: The Tuner options are not available at this time.

Aspect Ratio	specifies the window sizing attributes. Aspect ratio refers to the relative proportion of the video window's width and height. If you want to maintain this ratio when resizing a window, specify ON for this setting. Then when you change a window size, it is automatically adjusted to preserve the aspect ratio. If OFF, you can resize the window to any size and the aspect ratio is not maintained.
Overscan	specifies whether the image in the viewer window is in overscan mode. If ON, the full image displays. If OFF, the image is reduced by 10% to match the viewing area of typical consumer television screens.
Field Duplicate	specifies whether the Analog Video Player uses field duplication. Field duplication is used primarily to eliminate blurred images when viewing fast motion videos or images generated by graphics systems such as video games. AUTO specifies that the player determines whether to use field duplication based on the video window size.
Horizontal	positions the contents of the view window horizontally. Slide the indicator to the left or right to move the contents of the viewer window left and right.
Vertical	positions the contents of the view window vertically. Slide the indicator to the left or right to move the contents of the viewer window up and down.
View Menu	The View Menu contains the **ResetSize** command. This command returns the viewer window to its default size.

Closing the Analog Video Player

To close the Analog Video Player, select the **Quit** command from the File menu.

WinDD ICA Client

The **WinDD ICA** client provides access to PC servers running Microsoft's Windows NT Terminal Server Edition and Citrix Metaframe software. Once you are logged in to the PC server, you can run Windows NT and DOS based applications.

Note: ***DOS graphics applications are not supported (even if started from the* DOS Command Prompt *in the* Main *folder). DOS applications can only be run in character (text) mode. Refer to each application for startup options to invoke the application in this mode. If you try to run a DOS graphics application, an error is generated and the application terminates.***

Starting the Local WinDD ICA Client

The **WinDD ICA** client can be started using the Client Launcher, TekHostMenu, the remote configuration file, or from the command-line with **xpsh**.

Starting WinDD from the Client Launcher

From the Host Connections submenu, select WinDD. The **WinDD** local client is illustrated in Figure 2-14 on page 2-16.

Starting WinDD from TekHostMenu

Click the **WinDD** button (if necessary) to access the WinDD list. Click on a server, or enter the server name or address in the Application Server box.

Starting WinDD with *xp.cnf*

The **start WINDD** command in the *xp.cnf* remote configuration file automatically downloads and starts WinDD when the network computer boots. Refer to the **start** command in Chapter 2 of the *NCBridge Reference Manual* for details. Related WinDD remote configuration commands include:

```
host_connect_method     default_host_list
windd_menu_entry        windd_auto_connect
windd_auto_reconnect    windd_size
default_windd_host      windd_host_entry
windd_menubar           windd_entrybox
start                   preload
flash_feature           windd_auto_numlock
windd_keysym_only       windd_exit_on_logout
```

Starting WinDD with xpsh

xpsh starts the **WinDD** local client as needed. Enter the following (where *nc_name* is the name or address of your network computer):

xpsh –display *nc_name***:0 windd** [*options*]

The following options can be set on the **xpsh** command-line. If an option is not specified, the default setting is used.

–display *nc*:**0**
specifies the *network computer (nc)* name or address to display the **WinDD** local client.

–c means auto-connect to the first application server in the application server list. If there are no application servers in the list, this option is ignored and the client window is displayed.

–nc means do not auto-connect to an application server. (Default)

–d displays the menu bar and the internal borders. (Default)

–nd says do not display the menu bar or the internal borders. For example, this allows a 1280x1024 WinDD window to fully display on a 1280x1024 monitor (minus windows manager decorations).

–e enables the Application Server edit field window so that users can add application servers to the application server list. (Default)

–ne disables the Application Server edit field window so that users are not allowed to add application servers to the application server list.

–floppy
allows supported host versions of WinDD to use its local floppy drive as a network connected drive for the application server. Only the first host client to specify this option will be allowed to use the floppy device. NOTE: For host clients (with local floppy drive) only.

–no_floppy_cache
disables use of local floppy write cache. This is a fail-safe option to ensure the entire file has been updated in the event a user suddenly ejects a disk mechanically (when disks are ejected via the **GUI** button, that process flushes the cache so no information is lost).

–geometry <*geometry*>
means use the standard X11 geometry option, <WidthxHeight+X+Y>.

–h <*application server*>
adds the named application server(s) to the application server list. Multiple application servers can be added to the list by listing them separated by spaces.

–help
displays a brief help list on the available WinDD command-line options.

–initprog <*prog*> [**–initdir** <*dir*>]
specifies the application to execute upon application server login. The login session is terminated when the application is terminated.

Prog specifies the application and can also specify its path (up to 259 characters) and parameters. The program path and name are written consecutively (and not separated by a space) when they are both specified in *prog*. A space separates the program name and its parameters. These parameters are program specific and can specify program settings or data files to invoke on execution.

Dir specifies the path of the executable program.

–keysym_only
specifies that all NCD network computer keyboards are supported with keysym translations within WinDD.

–local_numlock
specifies that WinDD manages the state of the Num_Lock independent of any Xserver support.

–no_auto_numlock
specifies that WinDD does not control the Num_Lock setting.

–login <*username*> [**–pass** <*passwd*>] [**–domain** <*domainname*>]
specifies the application server user account login name, login password, and domain. These values will be used for user account verification.

When using a **WinDD** client and connecting to an application server, your username, password, domain, initial program, and initial directory are encrypted as they are sent across the network.

Username, *password*, *domainname*, *dir*, and *prog* are not viewable or changeable from the WinDD configuration window.

–r means reconnect to the application server after log off.

–nr says do not reconnect to the application server after log off. (Default)

–version
displays the WinDD version in use. (If the license is 8019, this option also prints *For evaluation purposes only*.)

–x exits the **WinDD** client upon logging out of, or disconnecting from, the application server.

–nx means do not exit the **WinDD** client upon logging out of, or disconnecting from, the application server. (Default)

–force_xcursor
specifies that monochrome pointers within the WinDD desktop are to be implemented using X cursors. Some monochrome pointers are xor'd with the underlying desktop. When this switch is specified, it is no longer xor'd, as X cursors do not support that mode.

Note: The force_xcursor feature is intended to compensate for workstations that do not have a particularly high performance X server. Consider using this option if the pointer flashes when move, or poor performance is observed entering text in dialog boxes. Using this switch improves user interactivity. The only side effect is the pointer is displayed in a single color.

–compress
enables compression of ICA network data to and from the **WinDD** client.

–no_compress
disables compression of ICA network data to and from the **WinDD** client.

–max_compress_disable
disables compression for *n* number of outgoing ICA commands from the **WinDD** client. The default is 0, which enables all compression. A count setting of 0 might "compress" client data larger than its original size during start of login session. Settings larger than 0 restrict expansion of the client data.

–a published_app
allows an ICA session to connect to any published application on a WinFrame/MetaFrame-based server. The argument *published_app* is the name of the published application.

-no_cm_req_notification
disables the colormap dialog that comes up at startup when a new colormap needs to be allocated.

Configuring your WinDD ICA Session from the Client Screen

From the **WinDD ICA** client screen shown in Figure 5-20, you can easily change your session attributes before you log in to a server.

Figure 5-20 WinDD Client Screen

The **Configure** button brings up the WinDD Configuration dialog illustrated in Figure 5-21. The resolution determines the size of the WinDD window. The resolution must be selected prior to making a connection to the application server and cannot be interactively changed until the connection has been closed. The **Configure** button performs the same function as the **Options** > **Configure** pull down menu choice.

Figure 5-21 WinDD Configuration Dialog

The **Reconnect After Logoff** button enables automatic reconnection to the application server after you have logged off of a WinDD session. If this button is on, then the WinDD log in screen (see Figure 2-16 on page 2-20) appears when you select **File > Logoff** from a Windows NT 3.51 session or **Start > Logoff** on a Windows NT 4.0 or later session. If this button is off, the WinDD client screen is displayed when you log off a session.

WinDD messages about connection status, error conditions, or other necessary user feedback appear in the message console area. All message are also sent to the network computer system console so that the information is available even if WinDD has been terminated. Use the **Clear Console** button to clear messages.

When configuration is complete, select the application server for your session.

Selecting an Application Server

The WinDD ICA client screen displays a list of application servers your system administration defined for you. Use the mouse to select one of the servers from the list. If the application server you want to access is not on the list, enter the name or address in the **Application Server:** field and press **Enter**. WinDD log-in information is in Chapter 2, *Operating the Network Computer*.

WinDD Local Client Options Menu

There are two ways to access the local client Options menu:

1. Select **Options** from the local client menu bar shown in Figure 5-22.

Figure 5-22 Local Client Options Pull Down Menu

2. Hold down Shift and Ctrl and click the middle mouse button shown in Figure 5-23. This method is only available after you have a server connection.

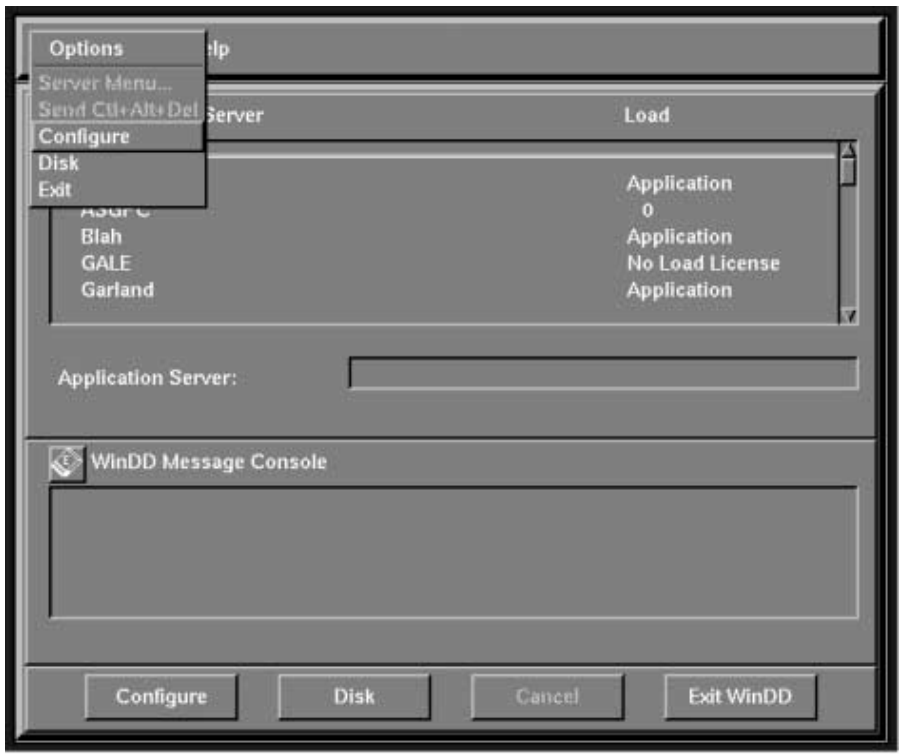


Figure 5-23 Local Client Options Menu

Log On

Toggles between the WinDD session window and the WinDD ICA client screen. This is only available after you have a server connection. The **Cancel** button on the client screen returns you to the session window.

Configure

Brings up the WinDD Configuration dialog shown in Figure 5-21. This is only available before you have a server connection.

Exit

Closes the **WinDD** client.

WinDD Help Menu

The WinDD Help Menu presents WinDD copyright and version information.

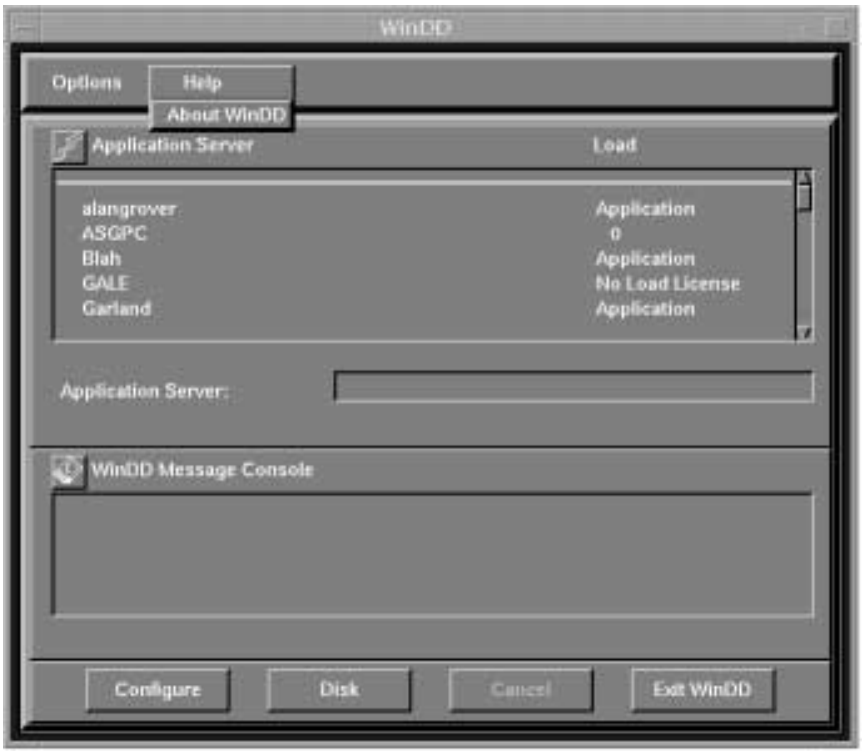


Figure 5-24 WinDD Help Menu

Font Caching

The font caching feature stores fonts in memory for later use. This eliminates the need to download a font each time the application using the font is executed. For example, if you open and close your word processor, then open it again, the fonts are still available if your network computer's memory. This is a more efficient use of resources, since fonts are cached once, instead of duplicated for each occurrence or downloaded over a busy network.

You can specify the amount of memory to allocate or you can flush cached fonts at any time. It is recommended that cache be flushed whenever new fonts (with a font path change) are added, to insure that the proper paths are cached. Flushing does not affect the current applications.

To set a Font Cache Limit:

1. Select **Setup** from the Client Launcher.
2. Check the amount of memory in your network computer by dragging on Statistics and releasing on **Memory**.
3. Drag on Configuration Summaries and release on X Environment.
4. Set Font Cache Limit to the amount of memory in kilobytes to allow for font caching. Do not exceed the total memory for your network computer.

To empty the Font Cache and free up network computer memory:

1. Select **Setup** from the Client Launcher.
2. Drag on Configuration Summaries Menu and release on X Environment.
3. Click the **Empty Font Cache** button.

Printing Color Hardcopies

This section explains how to print a hardcopy by using the MWM pop-up menu item or by entering a command on the command-line. Information in this section is specific to the MWM. If you are using another window manager, refer to the documentation you received with that window manager for more information about printing a hardcopy.

Note: The host computer must have the appropriate software installed before you can use these hardcopy commands. If you cannot print a hardcopy, contact your system administrator.

Printing from MWM

You can use a pop-up menu to make a hardcopy of a window or a hardcopy of the entire screen.

Making a Hardcopy of a Window

1. Move the pointer outside of all windows and drag the Custom mouse button to display the pull-down menu.
2. Release on Hardcopy to display another pull-down menu.
3. Click the Custom mouse button on **Window** to change the pointer shape into a cross.
4. Move the pointer into the window you want to copy.
5. Click the Select mouse button. A single beep indicates the window is being copied. A double beep indicates the copying process is complete.

Making a Hardcopy of the Screen

1. Move the pointer outside of all windows and drag the custom mouse button to display the pull-down menu.
2. Release on Hardcopy to display another pull-down menu.
3. Click the custom mouse button on **Screen**. A single beep indicates the screen is being copied. A double beep indicates the copying process is complete.

Printing from the Command-Line

Here is a general procedure for printing a hardcopy of a window:

1. Move the pointer into an X window and click the Select mouse button to activate the window.
2. Press the **PrintScreen** key. This key must be defined by your system administrator. Contact your administrator to find out which key to press and which printer your network computer is configured to use.

TekLogin Local Client

Many customers want to present their end-users a simplified environment with simple login methods and easy access to applications. The new **TekLogin** local client adds one more piece to that end, streamlining the login process and allowing system administrators to decide how much or how little control to offer their end-users.

The **TekLogin** local client is commonly used with the PPP support feature (refer to the *PPP Support* topic on page 5-68) to provide remote users access to host servers.

Starting TekLogin

There are several ways to launch the **TekLogin** client. You can launch it with:

- the **Setup** client
- the Launcher
- the **xpsh** command
- the *xp.cnf* remote configuration file

As noted in the previous section, you can choose TekLogin as your **Host Connect Method** in Setup's **Configuration Summaries > X Environment** menu. After a successful boot, the network computer will display the **TekLogin** client, as seen in Figure 5-25 on page 5-65.

Another method is to set Launcher to display and launch the **TekLogin** client. You can manually edit your *system.launcher* file to do this or set this line in your *xp.cnf* file to YES as shown here:

```
teklogin_show_sessions_in_launcher  YES
```

This will automatically display all eight of your pre-configured sessions in a pull-down menu in the Launcher.

A third way to start TekLogin is with the **xpsh** command:

```
xpsh -display <displayname>:0 teklogin &
```

Finally, you can have TekLogin start automatically with the *xp.cnf* file by un-commenting and altering this line in your *xp.cnf* file:

```
START TEKLOGIN  NO#[YES|NO]
```

Change the value for this line to YES.

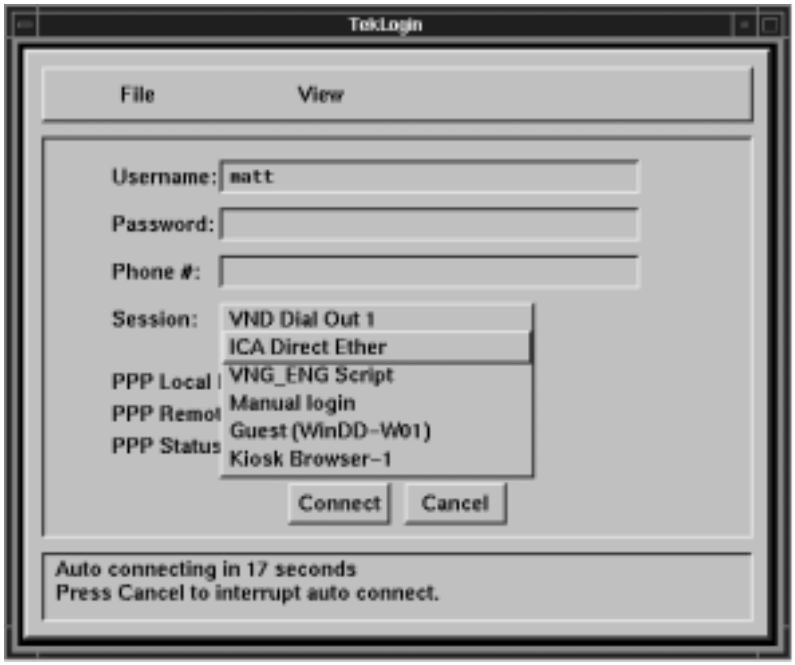


Figure 5-25 TekLogin Client

xp.cnf Commands for TekLogin

You can add these commands to your *xp.cnf* file to affect the **TekLogin** client. Refer to your *NCBridge Reference Manual* for details about these commands.

```
teklogin_show_sessions_in_launcher  [YES|NO]
teklogin_force_fullscreen_windd  [YES|NO]
teklogin_timeout  [SECONDS]
teklogin_require_login  [YES|NO]
teklogin_save_passwords  [YES|NO]
teklogin_default_session  [1-8]
teklogin_close_on_connect  [YES|NO]
```

The first two commands listed are notable in that they are not configurable with the **TekLogin** client itself, as most of the others are. The **teklogin_show_sessions_in_launcher** command will display the configured sessions in the **Launcher** client as pull-down selections. The **teklogin_force_fullscreen_windd** command forces the **WinDD ICA** client launched by **TekLogin** to take up the whole screen (rather than a 640x480 window, the default).

Configuring TekLogin Settings

In the **File** pull-down menu, you can select **Save Settings**, **Restore Settings**, or **Exit**.

Save Settings This saves the current user name, password, phone number, and session settings such that the next time the **TekLogin** client is launched, these settings will display.

Restore Settings Restores the last saved settings.

In the **View** pull-down menu, you can select **Setup** or **Options**. Both of these selections will require a password if you set password restriction in the **Setup** main menu.

Setup This launches the **Setup** client. System administrators can disable this feature if they do not wish end-users to have access to the **Setup** client. (See the *Security Between TekLogin and Setup* topic on page 5-67 for details.)

Options **Autologin Timeout.** The default timeout is 30 seconds, after which, if the user does not click the **Cancel** button, TekLogin will attempt to make the connection described by the session name. If the user cancels the autologin, he can then choose one of the other configured sessions in TekLogin by its session name. The autologin defaults to the last session connected to via TekLogin.

Interactive Login Required. This requires the user to enter his username and password after the PPP authentication has occurred.

Close on Connect. If TekLogin is not configured to close on connect (default), it will remain on the user's screen, allowing the user a simple method of disconnecting from one session and reconnecting to another. Some system administrators may wish to disable this functionality, forcing the network computer to connect using only session configuration.

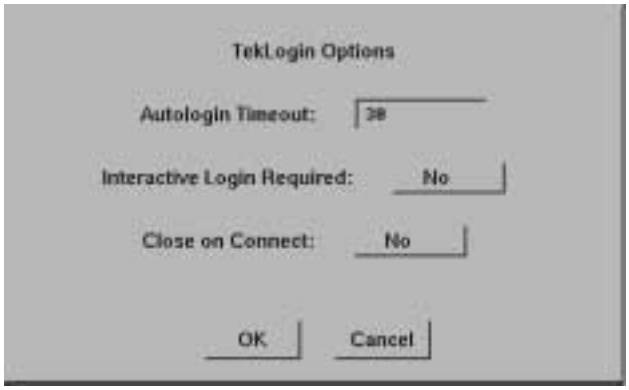


Figure 5-26 TekLogin options

Security Between TekLogin and Setup

System administrators can set the security mechanism for a network computer in Setup's main menu so that no user can tamper with the network computer's configuration without the password. The security is activated whenever a user enters something in Setup or presses a button. Some of the fields, however—such as username and password for both authentication and account login purposes—need to be alterable to end-users. With security activated on the **Setup** client, users will be able to enter their own user names and passwords, but will not be able to change the session names or other configuration parameters.

If security is enabled, the **TekLogin** client will not launch the **Setup** client, so system administrators can effectively "hide" **Setup** from novice users.

PPP Support

PPP is a reliable transparent Internet Protocol (IP) that allows network computers to make network connections via serial lines to remote devices. NCBridge's PPP passes TCP/IP information over the phone line in such a way that it appears as though your network computer has an Ethernet connection.

PPP support is available for the following devices:

- XP100, XP200, XP300V, XP350, NC200, NC400, and NC900.

It is **not** available for:

- XP10, XP10T, XP20, XP100D, or XP330.

Before You Begin

To run PPP successfully, you will need both the local PPP client process that runs on the network computer and the PPP server that runs on the remote host computer. NCBridge version 3.1 or higher software provides the **PPP** client; you will need to get the appropriate PPP server software from your host vendor.

There are several different ways you can connect your network computer via PPP to a remote host, but before you begin, you must first configure:

- The network computer's serial port
- The network computer's PPP settings
- The *xp.cnf* file (if you want PPP to start automatically after boot)
- Several other settings

Configuring the Network Computer's Serial Port

Before you can connect via PPP, you must configure one of your network computer's serial ports for your modem.

First, select a port on the rear panel of your network computer. Since many users may already have tablets or other peripheral devices connected to port 0, and since port 1 allows higher transmission rates (115.2K), we recommend you use **port 1** for your modem connection, especially if you are using ISDN lines.

On the NCD network computers, port 1 is the upper port; port 0 is the lower. Connect your modem's 9-pin female cable to the desired port. *(All examples in this section assume port 1 has been configured for PPP.)*

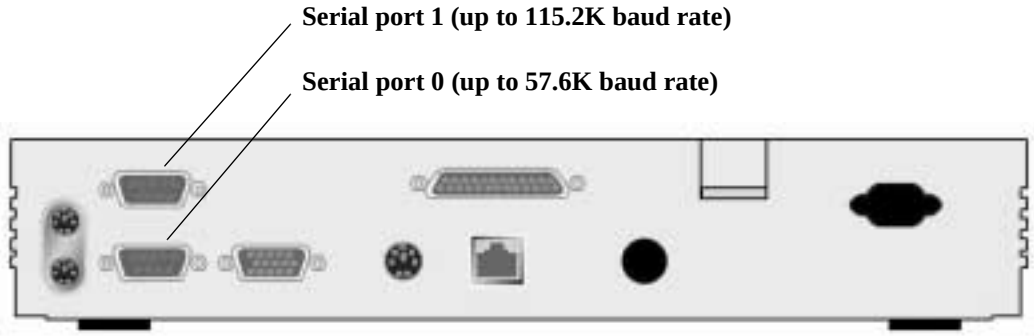


Figure 5-27 RS-232 Serial Ports on an NC900

After you have connected the modem cable to your serial port, you must configure the serial port for modem transmission. In Setup, go to **Configuration Summaries > Peripheral Ports**. (See Figure 5-28 on page 5-70.)

The fields in the lower half of this menu (from **Network-to-Port Process** down) do not affect your modem, so we will ignore them here. We are concerned with one of the two columns at the top, depending on the port you have chosen. For our example, this is Serial Port 1, on the right.

The “8”, “1”, and “None” default settings for the first three fields (**Data Bits**, **Stop Bits**, and **Parity**) will be correct for virtually all current production modems. (Check your modem user documentation to be sure.) The **Flow Control** and **Baud Rate** settings are really the only two you will need to configure.

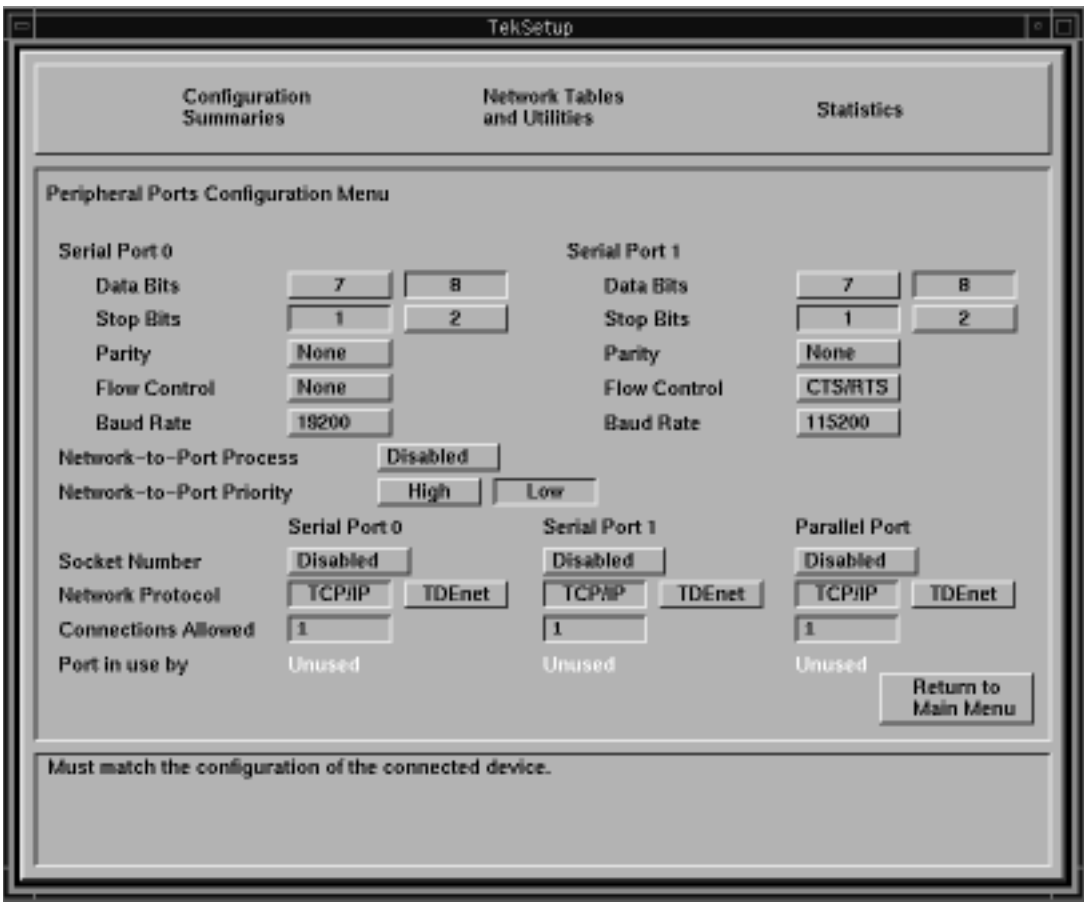


Figure 5-28 Peripheral Ports Configuration Menu

Flow Control. This field determines what kind of PPP "handshake" passes between the network computer and the server: None, XON/XOFF, or CTS/RTS.

- "None" tells the network computer to pass data through the modem without acknowledging transmission or reception of the data packets.
- "XON/XOFF" is a software handshake.
- "CTS/RTS" (recommended) is a hardware handshake. (Check your modem user documentation for the best handshake method.)

Baud Rate. This refers to your modem's transmission speed. We recommend setting this field to at least 57,600 to avoid starving the modem of data. Port 0 supports a maximum of 57,600 baud rate; Port 1 supports up to 115,200.

Note: ***Due to the complexity of the baud rate programming, port 0 cannot be used if port 1 is in use at 115,200 baud. If port 1 is in use at lower baud rates, port 0 is available for use with any appropriate device.***

Configuring the Network Computer's Session/PPP Settings

Next, you will have to configure your network computer's session and/or PPP settings. In **Setup**, go to **Configuration Summaries > Session**. This menu allows you to configure the network computer for PPP sessions and for Ethernet sessions.

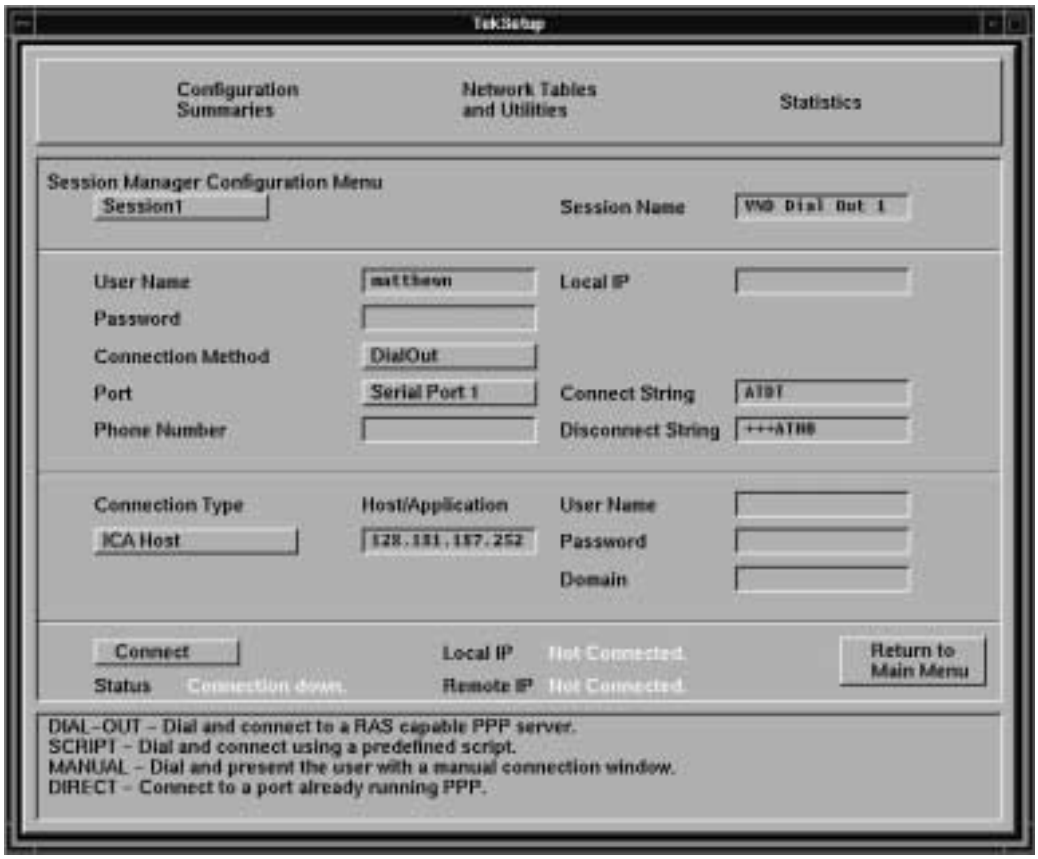


Figure 5-29 Session Manager Configuration Menu

As you can see in Figure 5-29, the **Session Manager Configuration Menu** is divided into four areas, known as identification, authentication, connection, and status.

Session Identification

In this area, identify each of up to eight session configurations.

Session. You can specify one of eight sessions in this field. For each session, you will configure the settings in the other fields listed below. When you select one of the eight sessions with this button, the settings you configure in the other fields described below will appear.

Session Name. Give each of your eight sessions a distinguishing name that will help users identify the correct session for their needs.

Session Authentication

The session authentication area is for authentication purposes. Each session requires some form of authentication to make the session connection.

User Name. You must provide a valid user name.

Password. You must provide a valid password. Your password will appear as asterisks as you type it in; the field itself will appear blank after you press **Enter**. These two authentication parameters (User Name and Password) are saved in NVRAM when you click the **Save Settings to NVRAM** button.

Connection Method. There are four choices: *Dial Out, Direct, Manual, Script*.

Dial Out	The dial out method—probably the most common—can only be used to connect to RAS servers (or servers emulating the RAS interface). *Dial Out* assumes PPP is already running on the Host.
Direct	This refers to a *true* direct serial cable connection from one device (your network computer) to another (an NT server, for example), in which the baud rate on the two devices' serial ports must be the same. We recommend you use this method only when you have a null-modem serial cable connecting your network computer *directly* to a server.
Manual	This selection automatically brings up a TIP window and forces the user to enter his/her username and password. If the PPP daemon is not running on the Host, the user will also have to start it manually.

Script	This allows you to specify a script to automate the authentication process.
Port	Select *Serial Port 0 (PPP)*, *Serial Port 1 (PPP)*, or *Ethernet*.
Serial Port 0 (PPP)	Select this if you have configured Serial Port 0 for PPP (up to a maximum of 57,600 baud rate).
Serial Port 1 (PPP)	Select this if you have configured Serial Port 1 for PPP (up to a maximum of 115,200 baud rate).
Ethernet	This selection disables all the PPP settings you may have configured in the **Session Configuration Menu** and connects directly through the network computer's Ethernet cable.

Local IP. By default, this field is disabled. Any attempt by the user to add an IP address or other string will be ignored. In the rare case when you wish to use this field, you will have to uncomment this line in your *xp.cnf* file and add an IP address value:

```
ppp_local_ip_addr    [IP_ADDRESS]
```

If you do this, be sure to enter a valid unassigned IP address on the same subnet as your server in the **Local IP** field; if you enter an invalid address, the Host will not allow you to log in.

The remaining fields in the session authentication area may or may not appear, depending on the Connection Method you select. For example, if you choose **Direct**, you will not need to provide values for the next four fields.

- **Phone Number.** You must provide a valid phone number for the network computer to dial out to if you select *Dial Out*, *Script*, or *Manual*. This field will not appear if you select *Direct* as your connection method.
- **Script.** If you leave this field empty, it will remain blank but will default to one of the supplied scripts. You can also specify another script or one of your own. Enter the name of the script in this field. This field will not appear if you select *Direct, Dial Out*, or *Manual* as your connection method.

– **Connect String.** You must provide a connect string only if you select *Dial Out*. This field will not appear if you select *Direct*, *Script*, or *Manual* as your connection method. This string is modem vendor-dependent. The default value (shown in Figure 5-29 on page 5-72) works with all Hayes-compatible modems. If you wish to alter the default string, or if it conflicts with your modem, consult your modem user manual for details.

– **Disconnect String.** (Same information as for the Connect String above.)

Session Connection

The session connection area is for your login connection *after* you have successfully passed PPP authentication.

Connection Type. There are several connection types you can choose from.

None	(Default.) *None* means that after the network computer has made the connection and been authenticated, the user will have to start his own session, launch clients manually, etc.
ICA Host	This selection will connect you to a WinDD/Windows NT host over an ICA connection. If you select *ICA Host*, you must specify a WinDD/Windows NT host (name or IP address) in the **Host/Application** field. Unless you specify an alternate configuration in your *xp.cnf* file, the default WinDD window (640x480, 16 colors) will appear. (Also, see the note below.)
ICA Application	This yields a result similar to the *ICA Host* connection type, except that the user, instead of getting an entire Windows NT session, will only get access to the specified application. If you select *ICA Application*, you must specify a (case-sensitive) application name in the **Host/Application** field. This application name is the name a master ICA browser broadcasts over the network to ICA clients. When you select *ICA Application*, the master ICA browser will connect you to the Windows NT host that can best serve you that application, based on the server's resources, number of users currently logged in, etc. *(Also, see note below.)*

TekHostMenu	This will launch the **TekHostMenu** client, allowing the user to choose amongst the various protocol/host combinations to make a post-authentication connection.
XDM Direct	This sends an XDMCP login from a specific host to the user's display immediately after PPP authentication.
Telnet	This launches a Telnet session to the selected Host.
Navio	This selection is not supported at this time.

Note: ICA (WinDD) connections WILL NOT work in 16-bit TrueColor environments. If you choose ICA Host or ICA Application as a connection type, be sure that your Default Visual and Root Depth settings are set to "PseudoColor" and "8" respectively. (See the PPP Support topic on page 5-68 for more details.)

Host/Application. This field is for one of two values: You can enter the IP address (or server name) of the ICA host to which the user will login; or the specific published application name. The published application name defaults to the local subnet, but you can optionally prepend the published name with a Windows NT server name or IP address, or with the subnet mask that points to a specific Application Master Browser location as shown, for example, in this entry:

```
192.168.15.255 notepad
```

This points to an Application Master Browser on the subnet 192.168.15.255. In such a case, the Application Master Browser selects the Notepad application from among the Hosts on the subnet based on server load.

User Name. Optional. This user name differs from the user name required in the session authentication area of this menu. This user name refers to the actual account the user must have on the server on which he wishes to login; the former user name is for authentication only. If this field is left empty, the user will have to manually login to the server after the session has been authenticated and established.

Password. Optional. This too differs from the password required in the session authentication area. If this field is left empty, the user will have to manually enter his/her password to login.

Domain. Optional. This is only for Windows NT environments. If you have entered a user name and password in the two previous fields, you might also want to specify a Windows NT domain on the login Host. Otherwise, the user will have to manually select a domain at the Windows NT login prompt.

Session status

The session status area is where you make and break session connections. It also displays information about your connection.

Connect/Disconnect. Use this button to make and break your session connections. (See the *PPP Connections* topic on page 5-80.)

Status. This gives PPP connection status information (terminated, connecting, connected, etc.). If you have selected Ethernet as your Port, **Status** will display "Connection Down."

Local IP. Local IP refers to the IP address the PPP server allocates to your network computer after the PPP connection has been established. If you have selected Ethernet as your Port, **Local IP** will display "Not Connected."

Remote IP. Remote IP refers to the IP address of the PPP server you are connected to. If you have selected Ethernet as your Port, **Remote IP** will display "Not Connected."

Configuring the *xp.cnf* File for PPP

Configuring the *xp.cnf* file will allow remote users to make PPP connections automatically, after they boot their network computers. You will need to complete the previous **Setup** configurations for each network computer you want to connect automatically. You will also need to uncomment and alter this line in your *xp.cnf* file:

```
START PPP   NO   #[YES | NO]
```

Change the value for this line to YES.

Final Network Computer Configuration Considerations

There are three other menu items in **Setup** that you should check before you are ready to make a PPP connection.

First, verify that your network computer has an Internet Host name. In **Setup**, go to **Configuration Summaries > TCP/IP**. If the first field on this menu is blank, enter a network computer name. If your network computer does not have a name, PPP will generate a unique name for you—based on your network computer's Ethernet address—so it is not critical that you enter one here; it is merely good practice.

Second, there are a few settings in **Configuration Summaries > X Environment** you should check. If you plan to use either the ICA Host or ICA Application connection type described in the previous section, make sure the **Default Visual** is set to "PseudoColor" and the **Root Depth** is set to "8". Also, with NCBridge 3.2 (or higher), there are additional methods (under **Host Connect Method**) you can use to connect to a Host computer (see Figure 5-30 on page 5-79).

TekLogin, a new local client which allows a simple connection automatically or with a single button-click, is explained in more detail in the *TekLogin Local Client* topic on page 5-64. You may want to change this setting for your network computer(s).

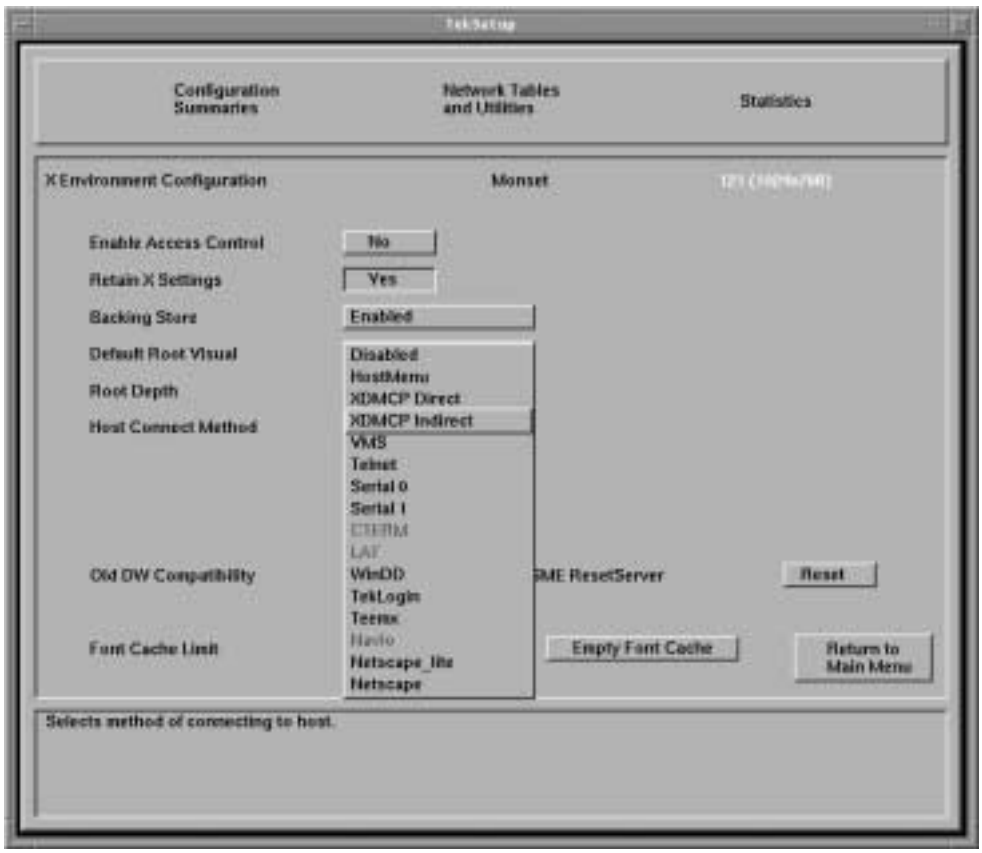


Figure 5-30 X Environment Configuration

Finally, you might want to save your settings so that you won't have to go through these procedures again the next time you reboot. To do this, click the **Return to Main Menu** button, then click the **Save Settings to NVRAM** button on the bottom left of the Setup main menu.

PPP Connections

After you have configured your network computer's serial port, PPP, and other settings, and have attached a modem to one of your network computer's serial ports, you can connect to a remote Host via PPP by using:

- The **TekLogin** client
- The **Connect/Disconnect** button in Setup's **Session Manager Configuration Menu**
- **xpsh** on a command-line; or
- Booting the network computer and automatically connecting via PPP with the *xp.cnf* remote configuration file.

Connecting Via TekLogin

TekLogin is a new local client that simplifies the connection process, not just for PPP connections, but for other Host connections as well. This method is recommended, especially in environments where the system administrator wishes to simplify the login procedure for inexperienced users. See the *TekLogin Local Client* topic on page 5-64 for more information.

Connecting Via Setup

Another way to start PPP is from **Setup** where the user can see the PPP status and, in case PPP exits, the reason for the connection failure. When PPP comes up, the user will see the IP address for the connection on the network computer (if the remote is assigning IP addresses) and the remote IP address.

For each of the following methods, in **Setup**, go to **Configuration Summaries > PPP** and click the **Connect/Disconnect** button to make your PPP authentication connection, then follow the rest of these procedures below.

Dial out and Direct

For a properly configured *Dial Out* or *Direct* session, no other steps are necessary to connect.

Manual

When you click the **Connect** button for a Manual session, one of the provided scripts (**start_man**) will start, launching a TIP window and dialing the number specified in the **Session Manager Configuration Menu**. The **start_man** script prompts you for your username and password. If the PPP daemon is *not* running on the Host, you will have to start it manually. The TIP window closes automatically as soon as the script detects that PPP is running on the Host. Otherwise, the TIP window remains open for 30 minutes before closing.

Figure 5-31 Connecting Manually via a TIP window

When your connection has been fully established, the remote device assigns you a remote IP address and displays it in the **Remote IP** field in Setup's **Session Manager Configuration Menu**.

Script

When you choose to connect via a script, the value you enter in the **Script** field names the parameter listed in Setup's **Network Tables and Utilities > Script Parameters**. (See Figure 5-32 on page 5-83.) NCBridge 3.2 (or higher) ships with three sample scripts (*start_ppp*, *start_man*, and *start_isp)* found in the */tekxp/boot/config/script* directory. The first of these is the default script when

you select **Script** as your connection method in the **Session Manager Configuration Menu**; the second starts when you select **Manual**; the third is included only as an example. You may use these scripts or create your own.

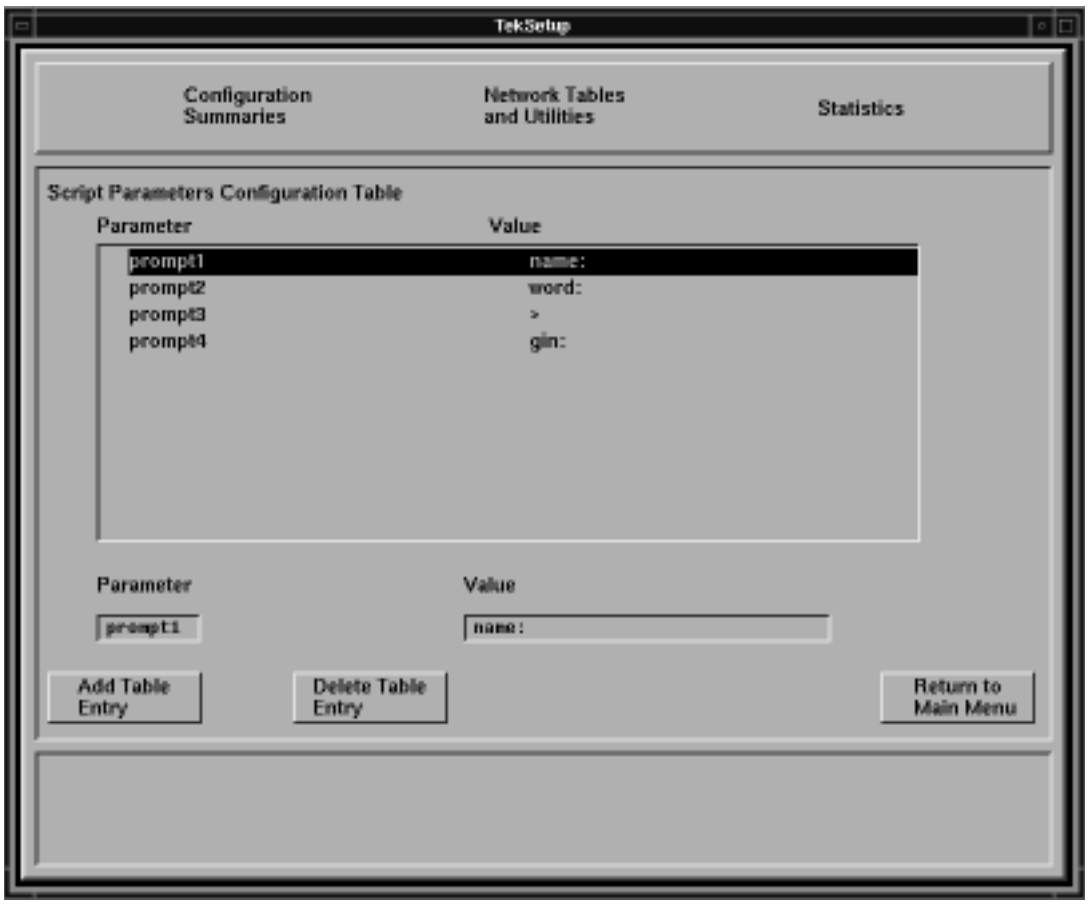


Figure 5-32 Script Parameters Configuration Table

Connecting Via xpsh

While it might not make sense to connect via PPP through the **xpsh** command (which requires you to be connected to another server in the first place), it is still possible to do so with this command:

```
xpsh -display <display_name>:0 pppd <parameters>
```

Connecting Via the *xp.cnf* File

If the system administrator has set up the PPP parameters in the *xp.cnf* file for remote network computer users, the PPP session starts automatically after the network computer boot.

Terminating PPP

With **TekLogin**, click the **Disconnect** button on the main menu. In **Setup**, go to **Configuration Summaries** > **PPP** and click **Disconnect**.

Note: When clicking the Disconnect button, PPP does not send the disconnect string to the serial port to reset the modem. When this occurs, turn off/on your modem to reset the modem.

Screen Saver Support

Kiosk administrators can use the screen saver support feature. NCBridge version 3.1 or higher provides a local client **ssadvt** that allows a customer to display a series of gif images as a screen saver on the network computer. Rather than having the network computer screen simply blank after a specified period of inactivity, system administrators can now display advertisements, corporate-endorsed images, and other images of general interest on inactive network computers. In non-kiosk systems, system administrators can implement the screen saver over an entire network, so that all network computers display the same images.

Note: ***"Screen savers" do not prolong the life of a monitor. At best, a screen saver turns off the video information; this prevents images from being burned into the phosphor. Screen savers do not turn off the filaments that heat the cathode, which is what generally wears out in a monitor first. A better way to "save" your screen is to select "PowerSave" in the Screen Saver field in Setup's main menu. This automatically saves the screen, the cathode, the CRT, and electrical energy.***

You can use *xp.cnf* or the **xpsh** command to start the screen saver local client **ssadvt**. Once started for a network computer, you cannot kill or override the process without rebooting the network computer.

Starting the Screen Saver with the *xp.cnf* File

To start the **ssadvt** client using *xp.cnf*, add a line similar to this one to your *xp.cnf* file:

```
start SSADVT YES –args " –t 600 –c 60 –f /home/ssadvt.list"
#<[ON | OFF]>
```

…where **–t** indicates the *timeout* in seconds, **–c** indicates the *cycle* time in seconds, and **–f** indicates the NFS-mounted *file* with the list of gif images to be displayed.

In this example, when the network computer has been inactive for a period equal to ten minutes (600 seconds), the screen saver displays the first image in the file */home/ssadvt.list*. After a minute, the next image in the file is displayed, and so on until the end of the file is reached, then it loops to the beginning and starts over. If a user "interrupts" the stream of screen saver images, for example by moving the mouse, the screen saver resumes with the next image in the list during a subsequent ten-minute period of inactivity.

Example 1-2. Screen Saver List of GIFs (ssadvt.list)

```
!Do not delete this line.
/local/GIFS/dilbert11.gif
/local/GIFS/subliminal3.gif
/local/GIFS/csun.gif
/local/GIFS/xena17.gif
/local/GIFS/brainwash.gif
/local/GIFS/pointy-hair.gif
```

The images in the *ssadvt.list* file must be *.gif* files; no other image format is supported. If you include a non-*.gif* image in the file, that image does not display. The console should mention the status of opening the file *ssadvt.list* and start displaying a different gif every minute.

Starting the Screen Saver with the xpsh Command

To start the **ssadvt** client using **xpsh**, enter this command:

```
xpsh –access <method> ssadvt –t <timeout> –c <cycle> –f <filename>
```

The default *method* value is **nfs**, and since no other method is available at this time, the **–access** argument can be omitted entirely; the default *timeout* value is ten minutes (**–t 600**) with a minimum value of 20 seconds; the default *cycle* time is one minute (**–c 60**).

16-Bit True Color Support

Note: 16-bit true color support is available only on NC200, NC400, and NC900 models.

NC200 and NC400 network computers with option V2 (or field kit NCFV2) provides a total of 4MB of video memory. With 4MB of video memory, these units can take advantage of NCBridge's 16-bit plane true color support. The NC900 comes standard with 4MB of video RAM to support 16-bit true color.

When a network computer is configured to operate in 16-bit plane mode, its X server exports a 16-bit plane TrueColor or DirectColor visual, so your application can display 65,536 colors instead of only 256 colors in 8-bit plane mode. That means you will see markedly better visual effects on applications that can take advantage of 16-bit color depth. Running your network computer in 16-bit plane mode will also eliminate irksome color flashes that occur when multiple color-intensive applications run simultaneously.

Configuration

You can configure a NC200, NC400, or NC900 network computer to operate in this mode either through the **Setup** client or through the remote configuration *xp.cnf* file.

In the **Setup** client, go to the **Configuration Summaries > X Environment** menu and select "16" for the **Root Depth** field. Then go back to the main menu and reset the X server by clicking on the **Reset Server** button. Once the server is reset, it will operate in16-bit plane mode. If you decide to go back to the 8-bit plane mode, reset the **Root Depth** field to "8" and click the **Reset Server** button again for 8-bit plane PseudoColor. If you want the network computer to retain the new root depth settings the next time it is booted, click the **Save Settings to NVRAM** button in Setup's main menu.

To configure the X server to operate either in 8-bit plane or 16-bit plane mode remotely, add this line to your *xp.cnf* file:

```
root_depth    16    # [8 | 16]
```

Limitations

There are some limitations with 16-bit plane mode. For one, the **WinDD ICA** client requires 8-bit PseudoColor and cannot be used in 16-bit plane mode. If you try to launch a **WinDD ICA** client in 16-bit plane mode, the ICA client writes a message to the console stating that it "cannot find the PseudoColor visual" and then exits.

Another limitation is that the digital video player *vplay* cannot be used in 16-bit mode, due to the fact that current software reserves a color index from the PseudoColor table for the chromakey that makes *vplay* work.

All local clients except **WinDD ICA** and *vplay* work in 16-bit mode.

24-Bit True Color Support

With NCBridge 4.0.8 or higher, the NC900 series supports a high resolution (1280x1024) 24-bit true color mode to display high-resolution images. This mode may be specified using the local Setup, Web-based Administrator or the remote configuration *xp.cnf* file.

To configure the NC900 X server to operate in 24-bit mode from the remote configuration file, add the following line to the *xp.cnf* file.

```
root_depth       24 #[8 | 16 | 24]
```

The Simultiple Color mode also supports a 24-bit true color mode; however, the NC900 resolution is limited to 1024x768 when it is in Simultiple Color mode.

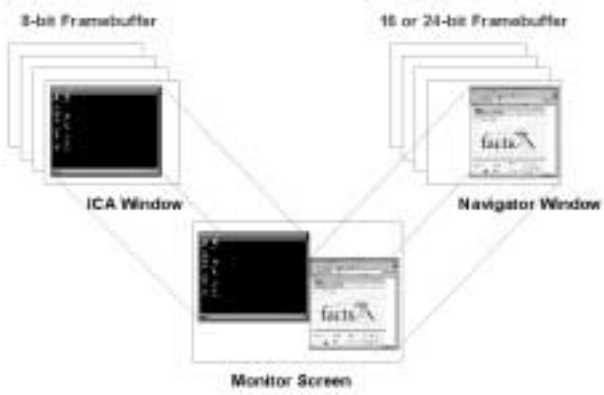
Limitations

Some X Clients, such as the WinDD ICA client, will only run when 8-bit planes are allocated for Pseudo Color. Hence, the WinDD ICA client will not run in 24-bit true color mode. See Simultiple Color for additional bit plane capability that will allow the WinDD ICA client to run on the NC900.

Simultiple Color for the NC900

The NCD NC900 Series offers Simultiple Color, which supports simultaneous multiple color depths. With Simultiple Color, X11 applications, such as either a local or host-based Netscape Navigator browser, can be displayed in 24-bit

color while 8-bit color applications are simultaneously displayed on the same screen. The following figure provides a graphical representation of how Simultiple Color works.



With NCBridge 4.0.4 or higher, the NC900 offers three new root depth parameters for supporting Simultiple Color:

- 8 & 16-bit
- 16 & 8-bit
- 24 & 8-bit

Any of these three new root depth parameters may be specified from the NC remote configuration file, Web-based administrator or the local Setup menu.

In order to specify one of the new root depth parameters using the local Setup menu, select Configuration Summaries, then select X Environment and finally select the desired Root Depth.

8 & 16-bit Mode

In the 8 & 16-bit mode, the root window is defined to be 8-bits deep. This mode allows both 8-bit and 16-bit color applications to be displayed simultaneously. Either the local or host-based Netscape Navigator browser will automatically

be displayed in 16-bit color. The colors used by the browser will remain stable and not change when the user selects other application windows. Also, the browser colors will not interfere with the 8-bit color applications.

8 & 16-bit Mode Limitations

Color flashing may occur between multiple 8-bit color applications that define their own colormap. Therefore, the preferred mode for eliminating color flashing is either the 16 & 8-bit mode or the 24 & 8-bit mode. Both of these other modes are designed to further reduce color flashing by displaying the X11 applications with more colors.

The maximum resolution supported in 8 & 16-bit mode is 1280 x 1024.

Note that in 8 & 16-bit mode, the Default Root Visual should be set to PseudoColor, which would apply to the 8-bit root window.

16 & 8-bit Mode

In the 16 & 8-bit mode, the root window is defined to be 16-bits deep. This mode is preferred to the 8 & 16-bit mode for eliminating color flashing between applications since most X11 applications can be displayed in 16-bit color. The local ICA client has been tuned to display its window in the secondary 8-bit color mode.

16 & 8-bit Mode Limitations

Some X11 applications may only be displayable when the root window is 8-bits deep. Such applications are not intelligent enough to identify the second 8-bit color mode. Therefore, for these 8-bit color applications, the NC900 offers the 8 & 16-bit mode described above, which defines the root depth to be 8-bits.

In 16 & 8-bit mode, some color flashing may occur between multiple 8-bit color applications, such as two local ICA clients. However, there is likely to be less color flashing in the 16 & 8-bit mode than the 8 & 16-bit mode since most X11 applications will display their applications in the 16-bit color, which prevents color flashing.

The maximum resolution supported in 16 & 8-bit mode is 1280 x 1024.

Note that in 16 & 8-bit mode, the Default Root Visual is always TrueColor.

24 & 8-bit Mode

In the 24 & 8-bit mode, the root window is defined to be 24-bits deep. This mode provides the best color fidelity for displaying X11 applications while also providing 8-bit color for displaying ICA-based PC applications. Either the local or host-based Netscape Navigator browser will be automatically displayed in 24-bit color. Color flashing will not occur between the 24-bit color applications.

24 & 8-bit Mode Limitations

Some X11 applications may not be displayable when the root window is not 8-bits deep. Such applications are not intelligent enough to identify the second 8-bit color mode. Therefore, for these 8-bit color applications, the NC900 offers the 8 & 16-bit mode described above, which defines the root depth to be 8-bits.

In 24 & 8-bit mode, some color flashing may occur if multiple 8-bit color applications are displayed, such as with two local ICA clients. However, there is likely to be less color flashing in the 24 & 8-bit mode than with the 8 & 16-bit color depth parameter since most X11 applications can display their applications in the 24-bit color mode, which prevents color flashing.

The maximum resolution supported in 24 & 8-bit mode is 1024 x 768.

Note that in 24 & 8-bit mode, the Default Root Visual is always TrueColor

Note that when using the local Setup menu to select the Root Depth, the user must select Save Settings to NVRAM and then select Reset Server before the new root depth is activated. These two button selections are located on the main Setup menu.

Web-Based Administrator

The Web-based Administrator allows a system administrator the ability to view a network computer's setup parameters using a standard Internet browser, like Netscape Navigator. If a network computer parameter is set incorrectly, the administrator can identify the problem from his own desktop and change the parameter to the appropriate value without having to visit the user's desk.

Implementation

Using the **start** command in the *xp.cnf* file, start the network computer's local HTTP server. Here is an example:

```
start http YES
```

After you put this command in the *xp.cnf* file, reboot the terminal for it to take effect.

When a browser points to the network computer's IP address, the network computer provides its setup parameters.

Note: A password may be defined for security reasons in the xp.cnf file so that other users may not view or change a network computer's setup parameters.

To Access the Web-Based Administrator

1. Bring up Netscape Navigator.
2. Go to the **File** > **Open** menu.
3. Type in the IP address of your network computer. For example, if your network computer's IP address is 192.1.2.3, you would type in:

   ```
   http://192.1.2.3/
   ```

4. This should bring up the NC Setup menu within your browser.

Password

If a password is set in the NC, then when the brower connects to the NC, a login window displays to request username and password. You may ignore the username, but you must enter the password.

Note: Click Apply to activate your changes.

Figure 5-33 NC Parameters Viewed with the Web-based Administrator

Seriald Provides Remote COM Support for Windows NT Applications

Seriald is a local daemon that executes on the network computer. It provides the ability for a Windows NT application to transmit and receive data to and from a peripheral device connected to a remote network computer serial port. Typical peripheral devices include printers, credit card readers, and PalmPilots. Figure 5-34 shows how peripheral devices, Windows NT servers running NCD ThinPATH Plus, and network computers running Seriald are connected.

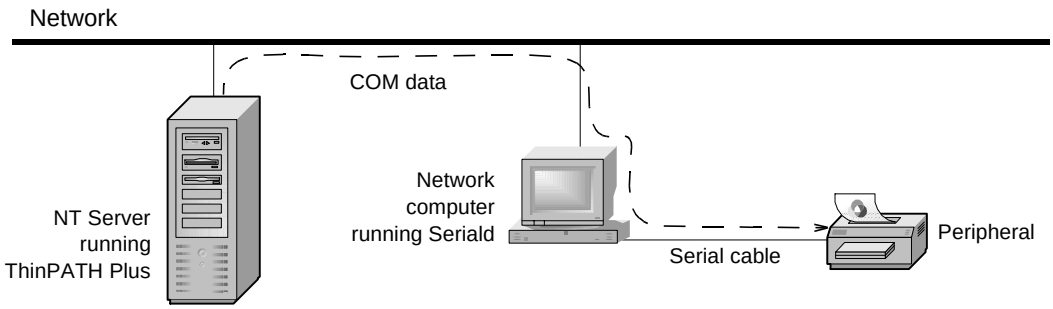


Figure 5-34 How Seriald Redirects Data to a Peripheral Device

Seriald interacts with the ThinPATH Plus software, which runs under Windows NT 4.0, Terminal Server Edition (TSE). ThinPATH Plus adds suppport for peripheral devices such as local printers.

For example, as an NT application transmits data to a standard COM port, ThinPATH Plus intercepts the data and redirects it to the network computer located on the network. Upon receiving the data, the Seriald daemon passes the data on to the network computer serial port where the peripheral device is connected.

Seriald provides several benefits. For example, Seriald makes it possible for an unmodified NT application to interact with a peripheral device connected to a remote network computer serial port. Seriald also provides the ability to synchronize the data on a PalmPilot with an application executing on an NT server.

By default, Seriald automatically starts when the network computer boots (restarts). You can use these two *xp.cnf* commands to control the Seriald daemon:

```
start    SERIALD   NO     # [YES | NO]
preload  SERIALD   PERM   # [NO | TEMP | PERM]
```

Refer to the *NCBridge Reference Manual* for details on how the *xp.cnf* commands work.

Note: ThinPATH Plus also supports redirection of audio and LPT data from an NT application to either a PC or a ThinSTAR Windows-based terminal; however, these features are not supported on the network computer at this time.

For more information about the ThinPATH Plus software, see the Network Computing Devices, Inc. (NCD) website, *www.ncd.com*, under Products.

XDMCP_keepalive

When the NC uses the XDMCP protocol to connect to a host computer, the xdmcp_keepalive feature is available for automatically checking to see if the host session is still communicating with the NC. This feature is designed to close all windows should the NC determine that communication has ceased between the NC and the XDM session. The windows are closed to notify the user that the session has terminated. The absence of communication may be due to a network failure.

Implementation

With xdmcp_keepalive enabled, the NC will wait for a predefined time interval to expire and if no communication has taken place, the NC will send a message to the XDM session and wait for a response. For example, the default timeout interval is 3 minutes. If no communication occurs for three minutes, the NC will send a message to the XDM session. If the session does not respond, the NC will try to send two more messages. If the XDM session still does not respond, the NC will close all windows on the screen. The NC closes all windows in order to notify the user that the host is no longer responding.

One other note regarding the xdmcp_keepalive feature is that when the host XDM session fails to respond and the NC closes all windows, the NC may also automatically redisplay the HostMenu with the list of available xdm hosts, provided:

1. The NC has flash memory.
2. The HostMenu binary is stored in the flash memory.
3. The NC is set up to display the HostMenu using the Host_Connect_Method parameter.

XP.cnf Commands Associated with xdm_keepalive

1. xdmcp_keepalive: enable or disables the feature, parameter range: on or off
2. xdmcp_keepalive_timeout: defines interval of no activity before the NC will send a message to xdm session, parameter range: 1-255 minutes, default 3 minutes
3. xdmcp_keepalive_wait_timeout: length of interval before the NC will send a follow-up message to the XDM session after the previous message was not answered, parameter range: 1-255 seconds, default 20 seconds

Other Relevant Information

If either the console or the launcher clients (or both) are displayed, the session won't ever time out. Both console and launcher constantly do XSync's which cause messages to go between themselves and the X server and that causes the X server to think that host xdm session is still alive. The NC X server doesn't distinguish local clients from host-based clients.

Termctrl Client

The termctrl client can be used from a remote host to:

- Reboot the NC
- Reset the NC’s X server
- Restart the NC’s local MWM client

The following are three different examples as to how to use the termctrl client from a host computer in order to cause an action on an NC located on the network:

```
xpsh –display nc_ip_address:0 termctrl –reboot
xpsh –display nc_ip_address:0 termctrl –reset
xpsh –display nc_ip_address:0 termctrl –mwm
```

Note: For security reasons, the termctrl command does not work on an NC that has a password defined.

Termctrl Client Application

The termctrl command can be used to reboot numerous NCs on a network by placing the command in a UNIX script and issuing the command repeatedly while only changing the display variable value. This type of application would be useful when the system administrator has loaded a new version of NCBridge on the boot host and wants to reboot all of the NCs on the network so that the NCs are running the latest software. The script can be set to run at midnight when no users are working with their NCs.

Using the Termctrl Client with the Launcher

The termctrl client may be used from the local Launcher menu, such as to restart the local MWM client. The following describes how to add a selection to the Launcher menu that would allow the user to restart the local MWM.

The contents of the menu items in the Launcher menu are defined in the *system.launcher* file, which is located in the following directory:

```
/<NCBridge install directory>/tekxp/boot/config
```

The following is how the MAINMENU is typically defined in the system.launcher file.

```
MAINMENU
"Setup"             f.exec "setup"
"Console"           f.exec "console"
"HostMenu"          f.menu HOSTMENU
"Host Connections"  f.menu HOSTCONNECTIONS
"Window Managers"   f.menu WMMENU
"Quit"              f.exec "quit"
```

The following adds one line to the MAINMENU. This additional line will allow the user to restart the local mwm client.

```
MAINMENU
“Setup”                 f.exec “setup”
“Console”               f.exec “console”
“HostMenu”              f.menu HOSTMENU
“Host Connections”      f.menu HOSTCONNECTIONS
“Window Managers”       f.menu WMMENU
“Restart MWM”           f.exec “termctrl –mwm”
“Quit”                  f.exec “quit”
```

Now when the user displays the local Launcher menu, the new selection “Restart MWM” will be displayed on the menu. When the user selects this menu item, the MWM borders surrounding all windows will disappear because the local MWM client is being terminated. A few seconds later, the borders will reappear on all windows and the user will be able to perform all MWM functions. The application windows themselves will not disappear during this action.

Chapter 6

Troubleshooting

Solving Power Problems

If you press the power button(s) and nothing happens:

- Check the back of the network computer and separate logic module (if you have one) to verify the power cord is firmly attached.
- Check the electrical outlet to make sure the power cord is firmly plugged in.
- Try a different electrical outlet, or try plugging something else into the outlet to verify the outlet has power.

If keyboard lights flash or a bell sounds but nothing is displayed on the screen:

- On the network computer, check to see if the video cable is connected to the video port.
- On the monitor, check to see if the video cable is connected to the correct video inputs (video in).

Solving Boot Problems

If the network computer powers up, but the boot fails, there are various options to try. After each option, try to boot the network computer from the BOOT> prompt by typing **`b`** or **`boot`** and then pressing **Enter**.

- Verify that the network computer keyboard, mouse and network cables are all firmly attached.

For advanced users who have access to the *NCBridge Reference Manual*, refer to Chapter 4, *Boot Monitor* and do the following:

- Verify the boot method. It typically is TFTP or NFS for UNIX computers, MOP for DEC computers, or ROM if you have an optional Flash or ROM option.
- Verify host and gateway communications from the boot monitor with **ping.** If **ping** does not find the host, verify the host and network computer subnet masks are correctly set.

- If an error message says the boot file is not found:
  - Verify that the expected information was obtained from the network.
  - Verify that the boot path is correct. It should contain both the path and the boot file name.
  - Verify that all the files have world read permissions.
- If the configuration files are not found:
  - Verify the messages to determine which host is being polled for the files.
  - Verify that the primary and secondary paths are correctly set.
  - Verify the paths and read permissions on the files.

Solving Log in Problems

If your network computer boots, but you are unable to log in:

- If the mouse or keyboard does not respond, check the cables and then reboot.
- If an error message is generated saying that the log in failed:
  - Retry entering your username and password.
  - Verify you are connected to a host where you have a login account.
- If a message is displayed saying that a connection timed out, restart the connection as detailed in the *Logging In to the Network Computer* topic on page 2-3.
- Check the Console window for error messages. Refer to the next topic, *The Console Window* on page 6-3.

The Console Window

The *Console window* is a valuable tool for determining what is happening on the network computer. It enables you to see messages the network computer generates, such as a confirmation that a file was located or that a command generated an error. You must explicitly open and close the Console window through the Client Launcher.

Opening the Console Window

You can display the Console window at any time. To open the Console window:

Select Console from the Client Launcher. If you need a refresher on the terminology used in these procedures, refer back to the *Mouse Operations* topic on page 1-5.

The Console window shown in Figure 6-1 appears on your screen.

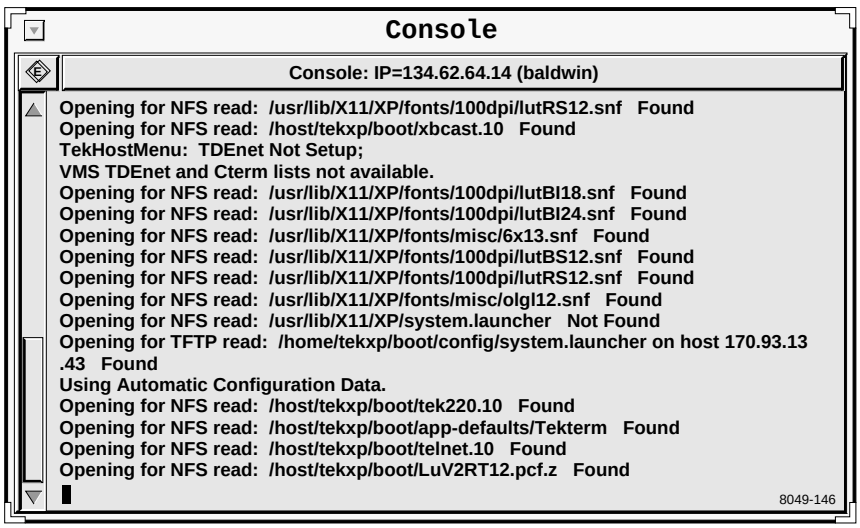


Figure 6-1 Console Window

This window is updated each time the network computer receives a confirmation or error message. You cannot delete or add to the information that appears in the Console window. The network computer's address and name (if defined) appear on the title bar of this window.

Using the Console Window

Often there is more information available than will fit in the Console window. Since the Console window cannot be resized, use the methods listed below to view additional information. You can also copy and paste information from the Console to a command window.

- To display the previous screen of messages:

  Position the mouse pointer in the scroll bar anywhere above the slider box and click the **Select** (left) button.

- To display the next screen of messages:

  Position the mouse pointer in the scroll bar anywhere below the slider box and click the **Select** (left) button.

- To scroll through the messages one line at a time:

  Position the mouse pointer on the up or down arrow (on the scroll bar) and click the **Select** (left) button once for each line.

- To clear the contents of the Console window:

  Click on the Erase icon. The Console scrolls to just below the last line of information. Drag the slider box up to view the Console information.

- To copy information from the Console window and place it in the Console buffer:

  Position the mouse pointer on the first character to copy and click the **Select** (left) button. Drag the mouse to the last character to copy. The selected text is highlighted.

- To paste information from the Console buffer into a window:

  Position the mouse pointer in the window where you want to paste the information and click the **Menu** (middle) button. Information can be pasted in Telnet, Cterm, Lat, and xterm windows.

Closing the Console Window

Select Console from the Client Launcher.

The Console Window will disappear from your screen.

Remote Diagnostics

NCBridge offers two different methods for a system administrator to remotely troubleshoot a problem a user is having with a network computer.

In the first method, administrators use the Web-Based Administrator (see the *Web-Based Administrator* topic on page 5-92) to view and change the parameter settings of a remote NC.

The second method provides a way for administrators to display the remote NC's Setup Screen on their own X terminal device. The command in the following example shows how to display the NC's setup screen on another NC:

```
xpsh -display 10.2.2.1:0 -xpenv "TEKSETUP_DISPLAY=10.2.2.3:0" setup
```

In this example, the `-display` device is the device where the `setup` client is running. For the **xpsh** command to work, the X terminal must *not* be already running the `setup` client.

The TEKSETUP_DISPLAY device is where the user wants the setup client to be displayed. The device where setup is displayed must first be running an X server and secondly, it must allow other devices to access its X server. (On workstations, use the command xhost + to allow other devices to access the X server.)

Chapter 6 Troubleshooting

Appendix **A**

Special Keyboard Characters

This appendix describes how to work with special characters on different keyboards.

- *Entering North American Special Characters from International Keyboards* tells how to enable data processing keys so that you can use the North American character set on international keyboards.
- If you are using an LK401/VT200-style keyboard, refer to the *Compose and Diacritical Sequences* topic on page A-22 for information on creating special characters and symbols by using compose characters.

Keyboard Charts

Figures A-1 through A-11 show examples of the standard types of keyboards available with the network computers. Refer to Appendix B, *Keyboards* in the *NCBridge Reference Manual* for information about the key codes (the numbers below the keys in the following figures).

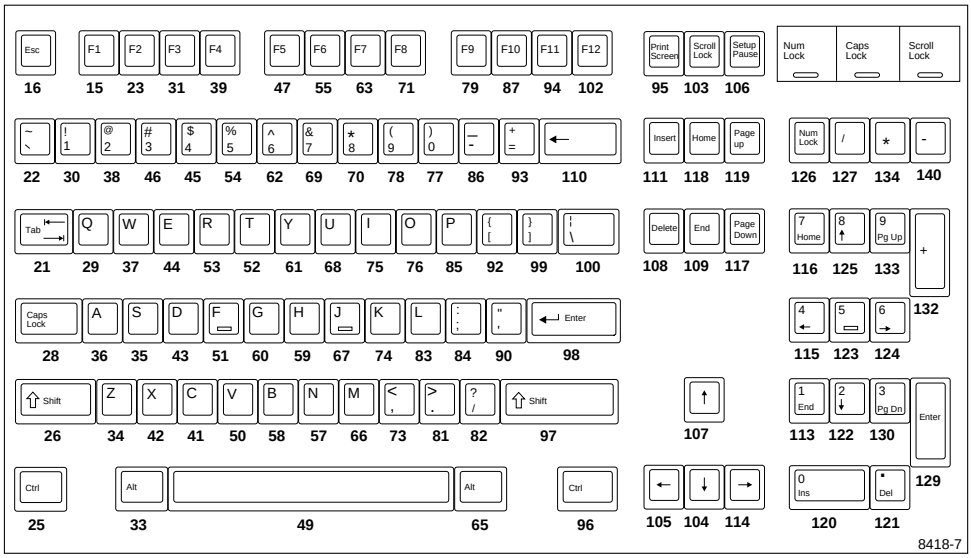


Figure A-1 101 with Pause North American Keyboard

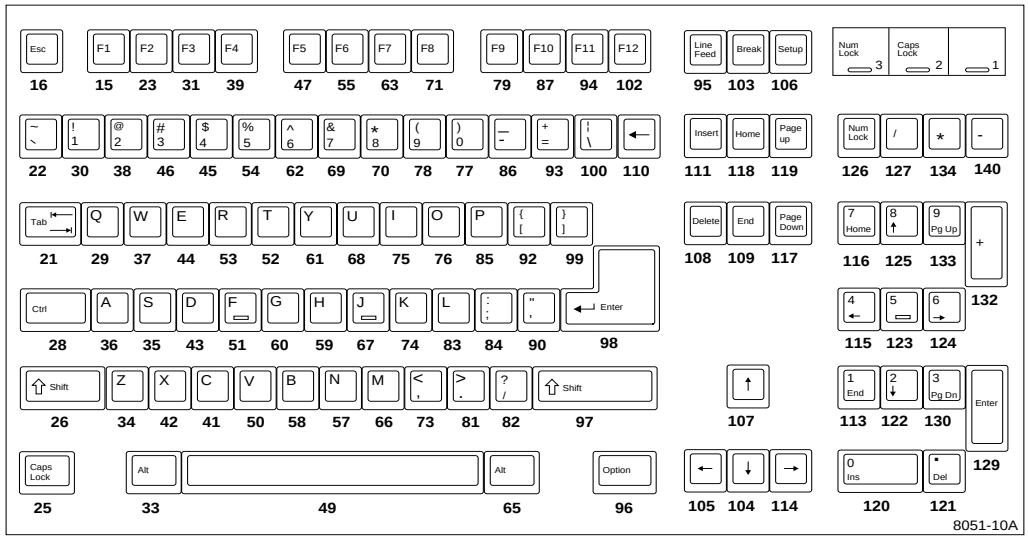


Figure A-2 101 with Setup North American Keyboard

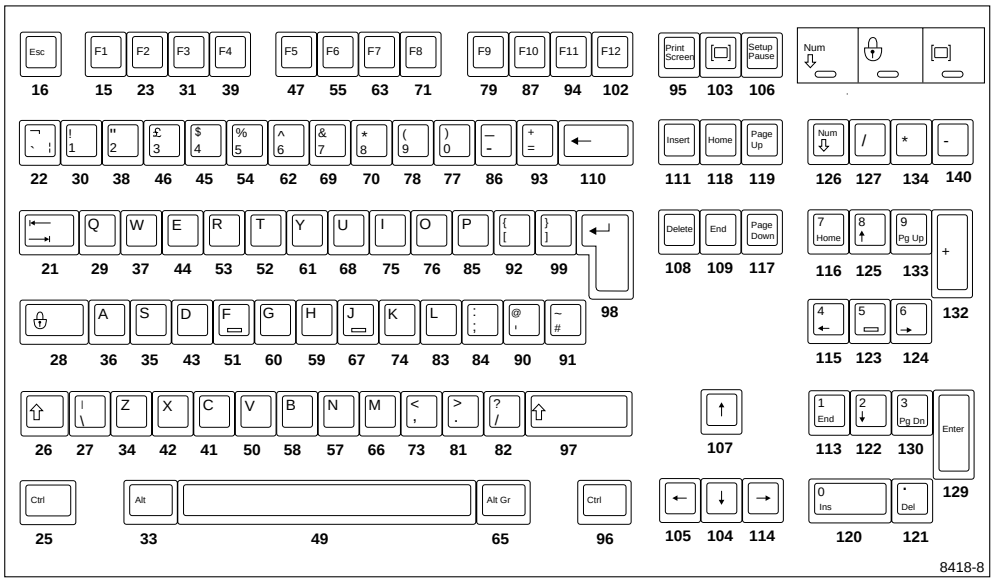


Figure A-3 102 with Pause United Kingdom Keyboard

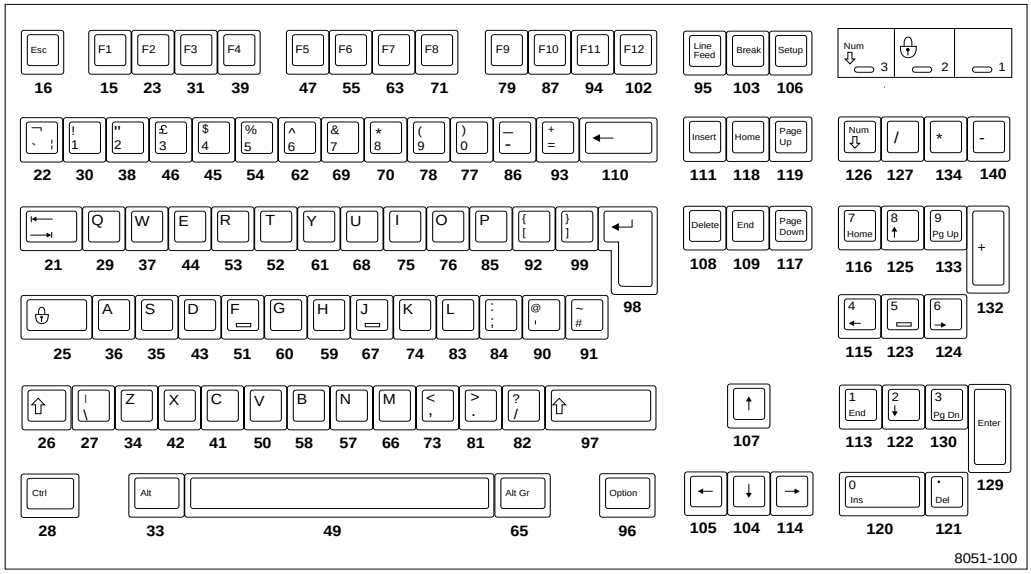


Figure A-4 102 with Setup United Kingdom Keyboard

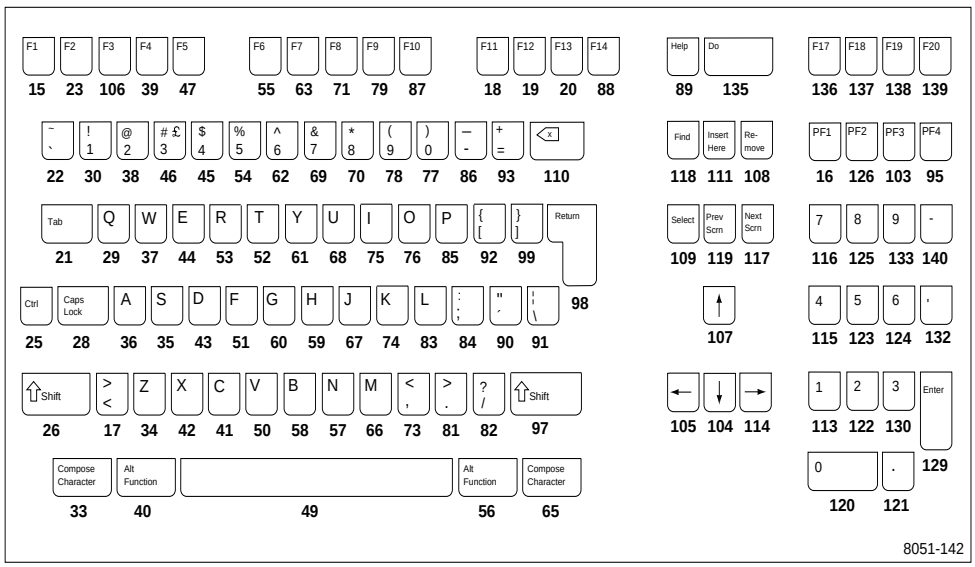


Figure A-5 VT200/LK401–Style North American Keyboard

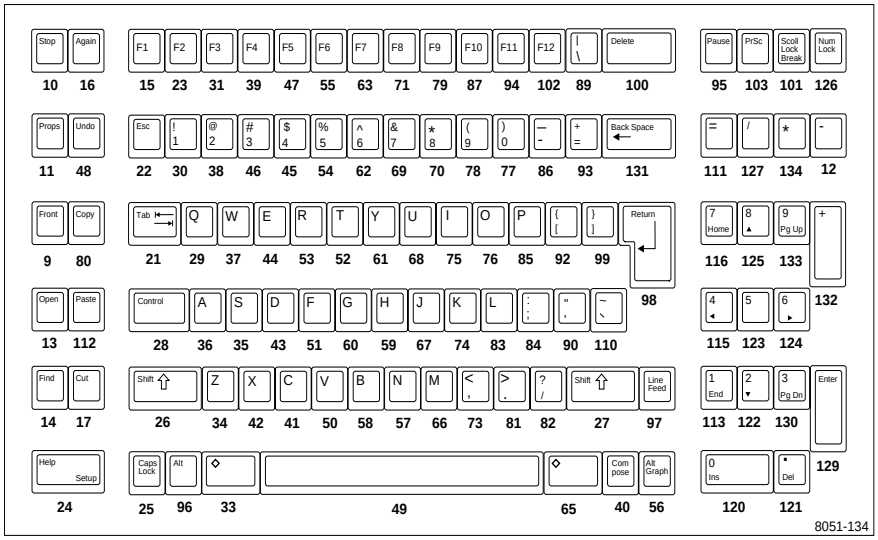


Figure A-6 UNIX Keyboard

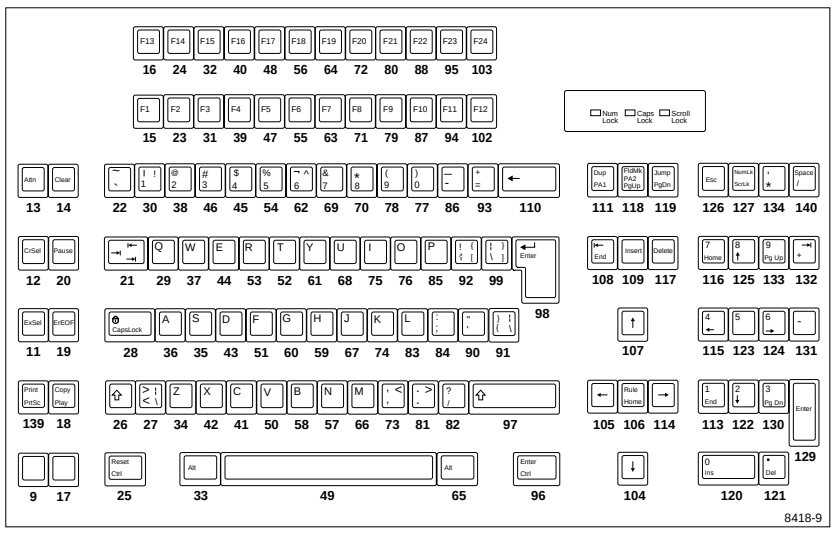


Figure A-7 3270 Keyboard

Note: For details about the 3270 keyboard, see the 3270 User Manual.

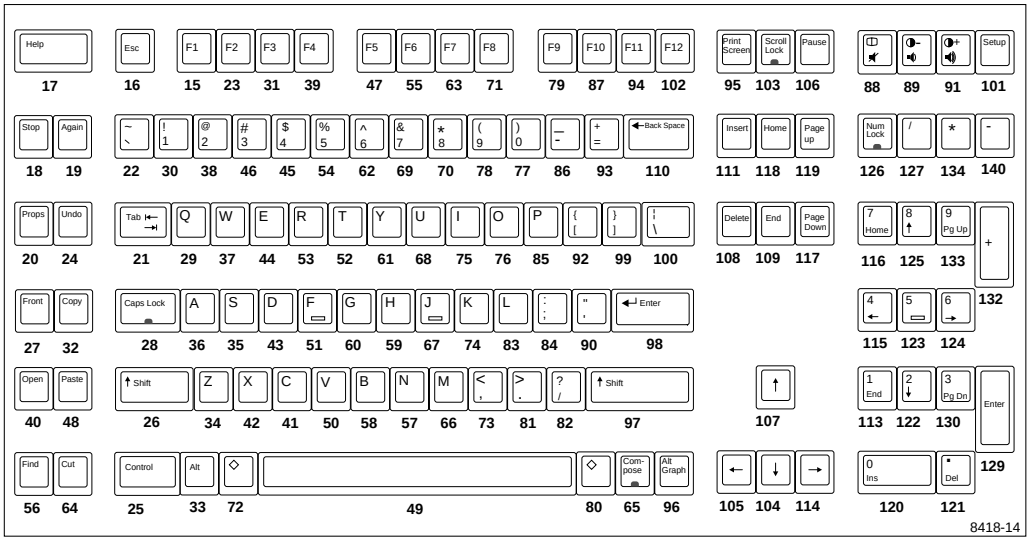


Figure A-8 Sun V Keyboard, KS 1

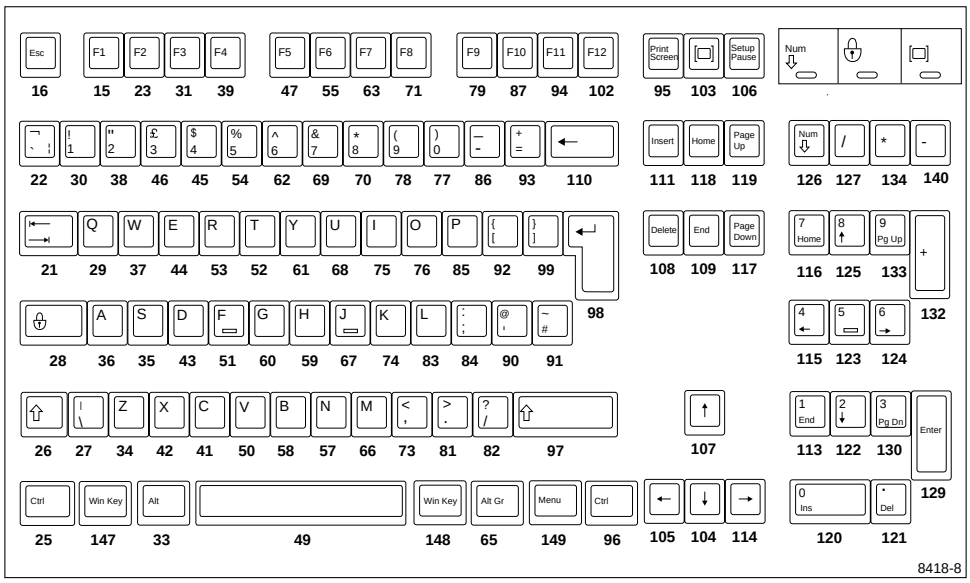


Figure A-9 105 Windows 95 Keyboard, Europe

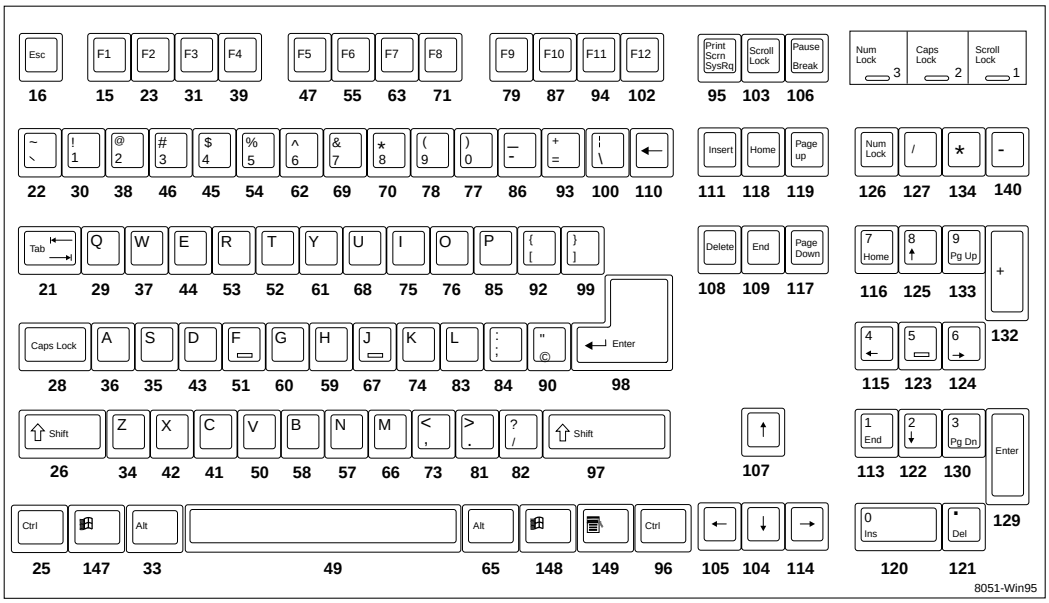


Figure A-10 104 Windows 95 Keyboard, North American

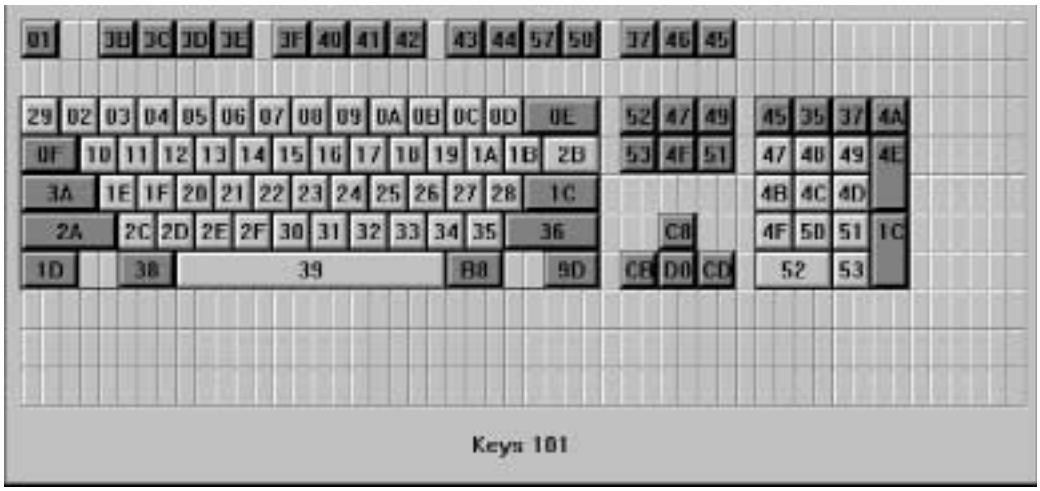


Figure A-11 Eurokey Keyboard

Entering North American Special Characters from International Keyboards

Some data processing programs require entry of characters from the North American keyboard that are not available on all international keyboards. The characters needed but not always available are: { } [ ] \ @ # * $ |

To permit entry of the full North American character set from all keyboards, some international keyboards have one or more keys with dual legends on them. Legends on the left of LK401/VT200 keyboards are *typewriter* legends and legends on the right are *data processing* (DP) legends. (Legends on the right of 102-key keyboards are *alternate graphic* legends.)

You can enable DP legends for the LK401/VT200 keyboards from the Main Menu of *Setup*. The Main Menu displays a DP Mode item when you set Keyboard Type to VT200 and Language to one of the international languages. When you need these special symbols, enable the DP keys by clicking DP Mode to On. Click this item to Off when you need the usual national characters of the keyboard. If you want to run TekXpress compose, load the compose sequences. For details, refer to the *Compose and Diacritical Sequences* topic on page A-22 of this appendix.

If TekXpress compose is enabled, you can also access DP legends from the keyboard (rather than through *Setup*) by using Compose sequences. To enter a DP legend, press the **Compose** key and then the desired key. So that you can enter all ASCII characters, several keyboards have compose sequences for DP keys that do not have DP legends on the keycaps. These compose sequences appear in the tables that follow. For more information about Compose sequences, refer to the *Compose and Diacritical Sequences* topic on page A-22.

When DP mode is off, the two-key sequences for accessing DP characters (Tables A-1 through A-9) supersede the three-key compose sequences involving the Compose-DP keys.

Tables A-1 through A-9 summarize the DP characters that are sent for each LK401/VT200-style international keyboard. These tables show both the Typewriter Mode and Data Processing Keys mode. As noted, some compose sequences do not have DP legends. Keyboards not appearing in these tables do not offer DP keys.

Table A-1 VT200/LK401 Danish Keyboard

Mode		**DP Keys**					**Compose–DP Keys**		
VT200	**Key State**	**§ @ 3**	**Å [ ]**	**Ø \ #**			*** '**	**(8**	**) 9**
Typewriter	Normal	3	å	ø			|	{	}
	Shft	§	Å	Ø					
Data Processing Keys	Normal	3	]	#					
	Shft	@	[	\					
LK401	**Key State**	**§ @ ~**	**£ # 3**	**Æ [{**	**Å] }**	**Ø \ |**	*** '**	**(8**	**) 9**
Typewriter	Normal	~	3	æ	å	ø	|	{	}
	Shft	§	£	Æ	Å	Ø			
Data Processing Keys	Normal	~	3	{	}	|			
	Shft	@	#	[	]	\			

Table A-2 VT200/LK401 French Keyboard

Mode	**Key State**	**DP Keys**						**Compose–DP Keys**		
VT200		**6 § [**	**7 è]**	**% ù **				**@ #**	**9 ç**	**0 à**
Typewriter	Normal	§	è	ù				|	{	}
	Shft	6	7	%						
Data Processing Keys	Normal	[	]	\						
	Shft	6	7	%						
LK401	**Key State**	**6 § [**	**7 è]**	**% ù **	**2 è |**	**9 ç {**	**0 à }**	**@ #**	**9 ç**	**0 à**
Typewriter	Normal	§	è	ù	2	9	0	|	{	**à**
	Shft	6	7	%						
Data Processing Keys	Normal	[	]	\	è	ç	à			
	Shft	6	7	%	|	{	}			

Table A-3 VT200 German Keyboard

Mode VT200	Key State	DP Keys		Compose–DP Keys		
		Ü \ @	Ä [ ]	’ #	(8	) 9
Typewriter	Normal	ü	ä	|	{	}
	Shft	Ü	Ä			
Data Processing Keys	Normal	@	]			
	Shft	\	[			

Table A-4 LK401 German Keyboard

Key Cap	Typewriter		Data Processing Keys		Compose–DP Keys
	Normal	Shft	Normal	Shft	
, #					|
(8					{
) 9					}
° ^ ¬	^	°	¬	°	
! 1 ¡ 1	1	!	1	¡	
" 2 2	2	"	2	"	
§ £ 3 3	3	§	3	£	

Table A-4 LK401 German Keyboard (continued)

Key Cap	Typewriter		Data Processing Keys		Compose–DP Keys
	Normal	Shft	Normal	Shft	
$ ¤ **4** 1/4			1/4	¤	
% **5** 1/2		%	1/2	%	
& **6** 3/4	6	&	3/4	&	
/ **7** **{**	7	/	{	/	
(**8** **[**	8	(	[	(	
) ± **9** **]**	9	)	]	±	
= ° **O** **}**	O	=	}	°	
? ¿ β \	β	?	\	¿	
` ´ ¸	´	`	¸	`	
Q **@**	q	Q	@	Q	
R ® ¶	r	R	¶	®	
Z ¥	z	Z	z	¦¥	
O **Ø**	o	O	**Ø**	o	

Table A-4 LK401 German Keyboard (continued)

Key Cap	Typewriter		Data Processing Keys		Compose–DP Keys
	Normal	**Shft**	**Normal**	**Shft**	
P ρ	p	P	p	ρ	
Ü °	ü	**Ü**	¨	°	
* ~ +	+	*	~	–	
A **Æ**	a	A	æ	**Æ**	
S § β	s	S	β	§	
D ~~**Đ**~~ δ	d	D	δ	~~**Đ**~~	
F ª	f	F	f	ª	
; **X** ,	,	;	,	X	
K **&**	k	K	k	&	
Ö ´	ö	Ö	´	Ö	
Ä ^	ä	Ä	^	Ä	
´ ¦ # `	#	´	`	´	
> < |	<	>	|		

Table A-4 LK401 German Keyboard (continued)

Key Cap	Typewriter		Data Processing Keys		Compose–DP Keys
	Normal	Shft	Normal	Shft	
Y **<** **y** <<	y	Y	<<	<	
X **>** **x** >>	x	X	>>	>	
C © ¢	c	C	¢	©	
M **o** µ	m	M	µ	o	
: ÷ . •		:	•	÷	

Table A-5 VT200/LK401 Italian Keyboard

Mode		**DP Keys**								**Compose–DP Keys**		
VT200	**Key State**	**1 £ @**	**2 é #**	**9 ç [**	**0 à]**	**§ \ ***				**% ù**	**= `**	**§ $**
Typewriter	Normal	£	é	ç	à	*				|	{	}
	Shft	1	2	9	0	§						
Data Processing Keys	Normal	@	#	[	]	*						
	Shft	1	2	9	0	\						
LK401	**Key State**	**1 £ @**	**2 é #**	**9 ç [**	**0 à]**	**§ \ ***	**% ù {**	**= ; }**	**! ò |**	**% ù**	**= `**	**§ $**
Typewriter	Normal	£	é	ç	à	*	ù	;	ò	|	{	}
	Shft	1	2	9	0	§	%	=	!			
Data Processing Keys	Normal	@	#	[	]	*	{	}	|			
	Shft	1	2	9	0	\	%	=	!			

Table A-6 VT200/LK401 Norwegian Keyboard

Mode / **VT200**	**Key State**	**DP Keys**			**Compose–DP Keys**		
		§ @ 3	**Å [ ]**	**Æ \ #**	*** ’**	**(8**	**) 9**
Typewriter	Normal	3	å	æ	|	{	}
	Shft	§	Å	Æ			
Data Processing Keys	Normal	3	]	#			
	Shft	@	[	\			
LK401	**Key State**	**Å] }**	**Æ [{**	**Ø \ |**	*** ’**	**(8**	**) 9**
Typewriter	Normal	å	æ	ø	|	{	}
	Shft	Å	Æ	Ø			
Data Processing Keys	Normal	}	{	|			
	Shft	]	[	\			

Table A-7 VT200/LK401 Spanish Keyboard

Mode		**DP Keys**				**Compose–DP Keys**		
VT200	**Key State**	**¡ \ ¿ @**	**ª [º]**			**~ ç**	**(8**	**) 9**
Typewriter	Normal	¿	º			|	{	}
	Shft	¡	ª					
Data Processing Keys	Normal	@	]					
	Shft	\	[					
LK401	**Key State**	**¡ \ ¿ @**	**ª [º]**	**Ñ } {**	**~ ç |**	**~ ç**	**(8**	**) 9**
Typewriter	Normal	¿	º	ñ	ç	|	{	}
	Shft	¡	ª	Ñ	~			
Data Processing Keys	Normal	@	]	{	|			
	Shft	\	[	}	ç			

Table A-8 VT200/LK401 Swedish/Finnish Keyboard

Mode		**DP Keys**						**Compose–DP Keys**		
VT200	**Key State**	**§ @ 3**	**¤ $ 4**	**Å [ ]**	**Ü \ #**			**Ä**	**(8**	**) 9**
Typewriter	Normal	3	4	å	ü				{	}
	Shft	§	¤	Å	Ü			|		
Data Processing Keys	Normal	3	4	]	#					
	Shft	@	$	[	\					
LK401	**Key State**	**§ @ 3**	**$ 4**	**Å [ ]**	**Ü \ #**	**Ö { }**	**Ä |**	**Ä**	**(8**	**) 9**
Typewriter	Normal	3	4	å	ü	Ö	ä		{	}
	Shft	§	$	Å	Ü	ö	Ä	|		
Data Processing Keys	Normal	3	4	]	#	}	ä			
	Shft	@	$	[	\	{	|			

Table A-9 VT200/LK401 Swiss/German Keyboard

Mode		**DP Keys**					**Compose–DP Keys**		
VT200	**Key State**	**ç @ 4**	**è \ ü**	**é [ö**	**à] ä**	**£ # $**	**£ # $**	**(8**	**) 9**
Typewriter	Normal	4	ü	ö	ä	$	|	{	}
	Shift	ç	è	é	à	£			
Data Processing Keys	Normal	4	ü	ö	ä	$			
	Shift	@	\	[	]				
LK401	**Key State**	**ç @ 4**	**è \ ü |**	**é [ö {**	**à] ä }**	**£ # $**	**£ # $**	**(8**	**) 9**
Typewriter	Normal	4	ü	ö	ä	$	|	{	}
	Shift	ç	è	é	à	£			
Data Processing Keys	Normal	4	|	{	}	$			
	Shift	@	\	[	]	#			

Table A-10 VT200/LK401 United Kingdom Keyboard

Mode		**DP Key**
	Key State	**£ # 3**
Typewriter	Normal	3
	Shft	£
Data Processing Keys	Normal	3
	Shft	#

Eurokey Support

NCBridge 4.1 includes two fonts (7x13 euro and 7x13 euroB) in the boot directory. These fonts can be specified by an application so that the user can display the Euro characters within an application. The EuroSign keysym value is 0x00A4. Table A-11 lists the keystrokes used to display the Euro characters within an application..

Table A-11 EuroSign Character Support

Keyboard	Country	Keystroke
102 Setup & 102 Pause, including support for Windows 95 keyboards	Danish French Finnish German Italian Norwegian Spanish Swedish Swiss-German United Kingdom	AltGr+E AltGr+E AltGr+E AltGr+E AltGr+E AltGr+E AltGr+E AltGr+E AltGr+E AltGr+4
3270	French German United Kingdom	AltGr+E AltGr+E AltGr+4
Sun V	French German United Kingdom	AltGr+E AltGr+E AltGr+4

Example 1-3. Setting up the NC900 to use the Euro Key

This example demonstrates how to map the F12 function key to the Euro key so that the Euro key may be displayed within an xterm window. The Euro character is defined in the font file 7x13euro. The 7x13 euro file is located in:

```
<NCBridge install directory>/tekxp/boot
```

The F12 function key on the North American Windows 95 keyboard has a key code of 102. To confirm the keycode for your keyboard, use the standard **xev** application on a UNIX server.

The following command maps the Euro key to the F12 function key.

```
xmodmap -e “keycode 102 = 0x00a4”
```

The following command starts the xterm application and specifies the font file 7x13euro.

```
xterm -fn 7x13euro
```

Now when the focus is on the xterm window and you press F12, the Euro character is displayed in the xterm window.

Eurokey Keysym Not Displayed Correctly

The **xmodmap** and **xev** programs do not correctly display the name of the Eurosign keysym. Instead, it is displayed as the following:

```
0x20ac (no name)
```

The keysym can still be accessed and the keyboard mapping modified, if necessary, using the hexadecimal value 0x20ac. For more information about the Eurokey keysym, see Appendix B, *Keyboards* in the *NCBridge Reference Manual*.

Compose and Diacritical Sequences

On LK401/VT200-style keyboards you can use compose characters to type special characters and symbols that are not available as single keystrokes. These might be common characters, such as the cent sign (¢), or letter forms particular to a certain language, for example, a lowercase “e” with an acute accent.

Network computers directly support compose characters for all X11 clients with LK401/VT200 keyboards, other than North American. DEC VMS and ULTRIX X applications provide their own compose characters. Refer to your DECWindows documentation for information about DEC compose characters.

To use DEC compose characters:

1. Select **Setup** from the Client Launcher. Select either VT200/LK401 ULTRIX (ESC) or VT200/LK401 VMS (F11) as the Keyboard Type.
2. Set the Compose Sequences option to **No**.
3. Use a DEC VMS or ULTRIX X application.
4. Begin a compose sequence by pressing the **Compose** key.

To use TekXpress compose characters:

1. Select **Setup** from the Client Launcher.
2. Select VT200/LK401 X (ESC-BS-LF) or VT200/LK401 X (F11-F13) as the Keyboard Type.
3. Set the Compose Sequences option to **Yes**.
4. Select a Keyboard Nationality. (To use North American, use xmodmap to clear the modifier by entering this command:

   `xmodmap –e "clear mod1"`)

There are two ways to compose TekXpress compose characters:

- Press a diacritical key (described in the *Using the Diacritical Keys* topic on page A-24), and then the character to be combined with it (valid combinations are shown in Table A-12 on page A-25).
- Press the **Compose** key (described in the *Using the Compose Key* topic on page A-27), and then type the two composing characters (valid combinations are shown in Table A-13 on page A-27).

Note: To enter a special character, your application must support 8-bit characters and select fonts. If you cannot enter special characters, contact your system administrator.

Using the Diacritical Keys

There are from one to five diacritical keys on all international VT200-style keyboards (except North American). These keys do not send characters when you press them; rather, they combine with the next character you type to form a special symbol.

For example, on keyboards for which tilde (~) is a diacritical mark, you compose the ñ Spanish character by pressing the "~" key and then pressing the "n" key.

To cancel a diacritical key sequence:

- Press the **Delete** key, or
- Press another diacritical key (if you want to start a new sequence).

If you type an invalid sequence: the entry is ignored, the bell on the network computer rings, and the diacritical sequence terminates.

The Compose light turns OFF when you complete the compose sequence.

The acute accent (´) character is a special case: on the keyboard, it shares its visual representation with the apostrophe (’). Depending on the keyboard nationality, the keyboard character on the network computer represents an acute accent (a diacritical mark) or an apostrophe (a character).

Table A-12 shows the diacritical keys available on various keyboards.

Table A-12 Diacritical Keys

Keyboard	Diacritical Keys				
Danish/Norwegian[a]		`	´	^	¨
French	~	`		^	¨
German[a]	~	`	´	^	
Italian	~	`		^	
North American	none				
Spanish[b]	~	`	´	^	¨
Swedish	~	`		^	
Swiss–German	~	`		^	¨
United Kingdom		`			

a Two single-quote symbols appear on the keyboard. The one on the top row of keys is a diacritical mark and can be thought of as an acute accent (´). The other one is not a diacritical mark and can be thought of as an apostrophe (’).

b Two single-quote symbols appear on the keyboard. The one on the top row of keys is not a diacritical mark and can be thought of as an apostrophe (’). The other one, next to the ñ key, is the diacritical mark.

Variations from DEC Compose Sequences

The following differences exist between the NCD network computer and the DEC VT200 compose sequences:

- The sequence that generates a double quote on the VT200 generates an umlaut on the NCD network computer.
- There is no difference on the VT200 between an apostrophe and an acute accent. Depending on keyboard nationality, you can treat the acute accent on the keyboard as a diacritical mark (an acute accent). You can access the apostrophe symbol on the keyboard through a compose sequence.
- The NCD network computer provides compose sequences for dollar sign, small and capital Icelandic eth, small and capital Icelandic thorn, small and capital y with an acute accent, three-fourths fraction, division sign, multiplication sign, acute accent, umlaut, overbar, cedilla, registered sign, broken vertical bar, not sign, no-break space, and soft hyphen.
- You access TekXpress and DEC three-key compose characters by pressing **Compose**, rather than holding the **Compose** key and pressing the spacebar as described for DEC workstations.
- DEC compose sequences do not have the "Compose-DP" sequence.

Using the Compose Key

The **Compose** key starts a three-key compose sequence for all LK401/ VT200-style international keyboards (except North American). For example, to compose a cent sign, press the **Compose** key followed by the "c" and "|" keys. When you press the **Compose** key, the Compose light turns ON to indicate that you are composing a special character.

To cancel a compose sequence:

- Press the **Delete** key, or
- Press the **Compose** key (if you want to start a new sequence).

If you type an invalid sequence: the entry is ignored, the bell on the network computer rings, and the compose sequence terminates.

The Compose light turns OFF when you complete the compose sequence.

Compose Sequences

Table A-13 lists all the compose characters and the two- or three-key sequences used to form the characters. You can enter the last two keys of three-key sequences in any order. The notes in the table refer to:

a To compose a character with a three-key sequence, press Compose Character followed by the two keys shown in this column.

b Two-key compose sequences are only available on national keyboards that support the requisite diacritical marks.

c You can use either two apostrophes (' ' – available on all keyboards) or two acute accents (´ ´ – available only on the German, Danish/Norwegian, and Spanish keyboards) to compose an acute accent.

Table A-13 Compose Sequences for VT200-Style Keyboards

Symbol	Description	Compose Sequence	
		Three-Key[a]	Two-Key[b]
[	Left bracket	((	
\	Backslash	/ /	
		/ <	

Table A-13 Compose Sequences for VT200-Style Keyboards (continued)

Symbol	Description	Compose Sequence	
		Three-Key[a]	Two-Key[b]
]	Right bracket	))	
{	Left brace	(–	
|	Vertical bar	^ /	^ /
}	Right brace	) –	
#	Pound sign	+ +	
ˆ	Circumflex	^ SP	^ SP
		^ ^	^ ^
˜	Tilde	~ SP	~ SP
		~ ~	~ ~
@	Commercial At sign	A A	
		a a	
$	Dollar sign	S /	
		s /	
		S |	
		s |	
á	Apostrophe	' SP	
		´ SP	´ SP
á	Small a with acute accent	´ a	´ a
Á	Capital A with acute accent	´ A	´ A
à	Small a with grave accent	` a	` a
À	Capital A with grave accent	` A	` A

Table A-13 Compose Sequences for VT200-Style Keyboards (continued)

Symbol	Description	Compose Sequence	
		Three-Key[a]	Two-Key[b]
â	Small a with circumflex	^ a	^ a
Â	Capital A with circumflex	^ A	^ A
ä	Small a with umlaut	a "	
		¨ a	¨ a
Ä	Capital A with umlaut	A "	
		¨ A	¨ A
ã	Small a with tilde	~ a	~ a
Ã	Capital A with tilde	~ A	~ A
å	Small a with ring	a *	
		× ° a	
Å	Capital A with ring	A *	
		×° A	
æ	Small ae ligature	a e	
Æ	Capital AE ligature	A E	
ç	Small c with cedilla	c ,	
Ç	Capital C with cedilla	C ,	
D	Capital Icelandic Eth	D –	
	Small Icelandic eth	d –	
é	Small e with acute accent	´ e	´ e
É	Capital E with acute accent	´ E	´ E
è	Small e with grave accent	` e	` e
È	Capital E with grave accent	` E	` E

Table A-13 Compose Sequences for VT200-Style Keyboards (continued)

Symbol	Description	Compose Sequence	
		Three-Key[a]	Two-Key[b]
ê	Small e with circumflex	^ e	^ e
Ê	Capital E with circumflex	^ E	^ E
í	Small i with acute accent	´ i	´ i
Í	Capital I with acute accent	´ I	´ I
ì	Small i with grave accent	` i	` i
Ì	Capital I with grave accent	` I	` I
î	Small i with circumflex	^ i	^ i
Î	Capital I with circumflex	^ I	^ I
ï	Small i with diaeresis	i "	
		¨ i	¨ i
Ï	Capital I with diaeresis	I "	
		¨ I	¨ I
ñ	Small n with tilde	~ n	~ n
Ñ	Capital N with tilde	~ N	~ N
ó	Small o with acute accent	´ o	´ o
Ó	Capital O with acute accent	´ O	´ O
ò	Small o with grave accent	` o	` o
Ò	Capital O with grave accent	` O	` O
ô	Small o with circumflex	^ o	^ o
Ô	Capital O with circumflex	^ O	^ O
ö	Small o with umlaut	o "	
		¨ o	¨ o

Table A-13 Compose Sequences for VT200-Style Keyboards (continued)

Symbol	Description	Compose Sequence	
		Three-Key[a]	Two-Key[b]
Ö	Capital O with umlaut	O "	
		¨ O	¨ O
õ	Small o with tilde	~ o	~ o
Õ	Capital O with tilde	~ O	~ O
ø	Small o with slash	o /	
Ø	Capital O with slash	O /	
ß	Small German sharp s	s s	
þ	Small Icelandic thorn	p p	
Þ	Capital Icelandic Thorn	P P	
ú	Small u with acute accent	´ u	´ u
Ú	Capital U with acute accent	´ U	´ U
ù	Small u with grave accent	` u	` u
Ù	Capital U with grave accent	` U	` U
û	Small u with circumflex	^ u	^ u
Û	Capital U with circumflex	^ U	^ U
ü	Small u with umlaut	u "	
		¨ u	¨ u
Ü	Capital U with umlaut	U "	
		¨ U	¨ U
´y	Small y with acute accent	´ y	´ y
´Y	Capital Y with acute accent	´ Y	´ Y

Table A-13 Compose Sequences for VT200-Style Keyboards (continued)

Symbol	Description	Compose Sequence	
		Three-Key[a]	Two-Key[b]
ÿ	Small y with diaeresis	y "	
		¨ y	¨ y
	No-break space	$_{SP}$ $_{SP}$	
1/4	Fraction one-fourth	1 4	
1/2	Fraction one-half	1 2	
3/4	Fraction three-fourths	3 4	
^{1}	Superscript 1	^ 1	^ 1
^{2}	Superscript 2	^ 2	^ 2
^{3}	Superscript 3	^ 3	^ 3
±	Plus-or-minus sign	+ –	
÷	Division sign	– :	
×	Multiplication sign	X X	
		x x	
¤	Currency sign	X 0	
		X O	
		x 0	
		x o	
£	Pounds currency sign	L –	
		L =	
		l –	
		l =	

Table A-13 Compose Sequences for VT200-Style Keyboards (continued)

Symbol	Description	Compose Sequence	
		Three-Key[a]	Two-Key[b]
¢	Cent sign	C /	
		C |	
		c /	
		c |	
¥	Yen sign	Y –	
		Y =	
		y –	
		y =	
´	Acute accent[c]	' '	
		´ ´	´ ´
`	Grave accent	` SP	` SP
		` `	` `
¨	Diaeresis or umlaut	" SP	
		" "	
		¨ SP	¨ SP
		¨ ¨	¨ ¨
¯	Macron or overbar	_ _	
¸	Cedilla	, ,	
–	Soft hyphen	– -	
µ	Small mu or micro sign	/ U	
		/ u	

Table A-13 Compose Sequences for VT200-Style Keyboards (continued)

Symbol	Description	Compose Sequence	
		Three-Key[a]	Two-Key[b]
°	Degree sign	^ 0	^ 0
		$^{S}_{P}$ *	
		$^{S}_{P}$ °	
º	Masculine ordinal indicator	O _	
		o _	
ª	Feminine ordinal indicator	A _	
		a _	
§	Section sign	S 0	
		s 0	
		S O	
		s o	
¶	Paragraph or pilcrow	P !	
		p !	
·	Centered dot	^ .	^ .
©	Copyright sign	C 0	
		c 0	
		C O	
		c o	
®	Registered sign	R 0	
		r 0	
		R O	
		r 0	

Table A-13 Compose Sequences for VT200-Style Keyboards (continued)

Symbol	Description	Compose Sequence	
		Three-Key[a]	Two-Key[b]
¡	Inverted exclamation mark	! !	
¿	Inverted question mark	? ?	
«	Angle quotation mark left	< <	
»	Angle quotation mark right	> >	
¦	Broken vertical bar	! =	
¬	Not sign	– !	

French Canadian Keyboard

This topic presents three ways to set up a network computer to use a French Canadian Windows 95 keyboard.

Boot Monitor Method

This method involves entering two commands at the Boot Monitor prompt:

1. Using the *keyid* command, set the LAYOUT to CUSTOM in the boot ROM.
2. Use the *kfile* command to set the custom keyboard mapping file name to *kb102frca0001*. (You can also use the *keyid* command to do this.)

Remote Configuration File Method

This is an alternative to entering commands at the NC keyboard:

1. Put these commands in the *xp.cnf* remote configuration file:

```
keyboard_type CUSTOM
key_map_file kb102frca0001
```

Setup Method

Another alternative is to set up the NC for the French Canadian keyboard to use local setup.

1. In *setup*, set the Keyboard Type to CUSTOM.
2. Set the Mapping File to *kb102frca0001*.

Note: ***You can optionally turn on or turn off the compose sequences in the file using the compose_sequences YES | NO command in xp.cnf. Another way to do this is to use the Compose Sequences button in setup.***

Glossary

Active Window

The window where the input (focus) is directed.

Application Program

Programs such as word processors, transaction processors, and computer-aided drafting, that you run on your network computer. Also know as client. See *Client*.

Aspect Ratio

Aspect ratio refers to the proportion, or ratio, between a window's width and height. If you want to maintain the relative proportion between the window's width and height when you change the size of a window, set the aspect ratio setting to ON. Then, when you change a window size, the aspect ratio is automatically adjusted to preserve the aspect ratio. If this setting is OFF, you can resize the window to any size and the aspect ratio is not maintained. Aspect ratio is a window sizing attribute.

Button (on the display)

A small display box that has a raised appearance and contains text. Generally, clicking on a button activates a function or performs some action. See *Clicking*.

Button (on the mouse)

The three buttons on the top of the mouse. See *Select*, *Menu*, and *Custom*.

Clicking

Quickly pressing and releasing the Select mouse button without moving the pointer.

Client

An application program that connects to the server. A client program performs a variety of tasks, including window management.

Chroma

A term that describes the saturation or vividness of a color. A chroma of 0 describes a neutral, gray color. Chroma ranges to the most vivid color a screen or printer generates for a specific hue and value. See *Hue* and *Value*.

Colormap

Consists of a set of entries defining color values. A pixel value indexes into the colormap thereby producing intensities of red, green, and blue which are visible on a display.

Command-Line

The line that you type to invoke a program or initiate an action. A command-line usually contains the name of an X client or application program, along with optional arguments known as command-line options.

Cterm

A user-level protocol which is part of the DECnet Protocol set. *Cterm* provides a Network Virtual Terminal, which allows you to log in to a remote host on the network as if you are using a terminal directly attached to the remote host.

Custom (mouse button)

The factory default defines this as the right mouse button.

Cursor

The visible shape of a pointer on the screen. Defining a cursor for a window controls the visible appearance when the pointer is in that window. See *Pointer*.

DAP

See *Data Access Protocol*.

Data Access Protocol (DAP)

A protocol that provides read and write support for font files, the color definition file, or remote configuration files.

Dialog Box

A box where you choose options and enter information. Use the mouse to move from field to field, click on buttons and position the text cursor. Enter information with the keyboard.

Display

A device that receives video output from the logic module and displays the video output on a screen.

Dragging

Pressing and holding down the Select mouse button while moving the pointer.

Ethernet

An IEEE standard protocol used within various networks, including TCP/IP.

Ethernet Address

The factory-defined hardware address of the network computer. Network hardware uses the Ethernet address when communicating to the network. This address is on the serial number label on the back of the logic module. You can also display the Ethernet address by viewing the TCP/IP Configuration Summary Menu in *Setup*.

Event

In the X Window System, information sent by the X server to an X client, for example, notification to the client that you pressed a mouse button.

Factory Default

The value assigned to a parameter as delivered from the factory.

Firmware

Software instructions that are permanently stored in the memory of a computer and are not lost when you turn the power off. Also called NVRAM.

Hardcopy

A physical copy (typically printed on paper) of a file.

Host Computer

A computer device that controls the exchange of data between itself and another network computer. Network computers typically boot from a host.

Hue

A term that describes a color family (for example, red or yellow). Hue is a polar coordinate—that is, it moves in a circular motion around the color spectrum—and ranges from 0° to 360°, with 0° being red. Hue is measured in degrees. See *Chroma* and *Value*.

Index Area

A box on the screen that lets you enter a color index—an integer used to label a particular color—from the keyboard.

Input Device

A device that allows you to send information to a window. Typical input devices include keyboards, mice, tablets, and trackballs. See *Pointer* and *Pointing Device*.

Interface

A common connection that is used for sending or accepting information and control between programs and machines.

Internet Address (IP Address)

A system administrator-assigned address for the network computer. This address is used under TCP/IP when the network software of the network computer generates messages to another host. The IP address is in the form *nnn.nnn.nnn.nnn* where *nnn* is a decimal number in the range 0 to 255. You can display the IP address by viewing the Network Configuration Summary Menu in *Setup*.

Internet Protocol (IP)

The network layer protocol for the Internet Protocol Suite. Internet Protocol is responsible for addressing and routing packets between hosts.

LAN

See *Local Area Network*.

LAT

See *Local Area Transport*.

Local Area Network (LAN)

The linking together of terminals, network computers, and computers via cables and microwave links. This allows you to access more than one computer.

Local Area Transport (LAT)

A client which provides a connection to a host computer that supports LAT.

Local Clients

Programs running on the same host as the server.

Logic Module (Base Unit)

A device that gets data from a host, a keyboard, or a peripheral, and processes it for viewing on the display. The logic module runs the X server and local clients. It can be a separate unit or integrated into the base of the monitor.

Memory

A part of a network computer that stores data.

Menu

A list of commands or functions that you select with a pointer. A menu is normally displayed in a small window.

Menu (mouse button)

The factory default defines this as the middle mouse button.

Move

Change the location of the pointer on the screen by moving the mouse.

Mouse

An input device that, when moved across a flat surface, causes the pointer to move across a screen. The mouse usually has buttons that you press to send signals. These signals, in turn, accomplish certain functions. The representation of the *mouse* on the screen is called the pointer. See *Pointer*.

Network

The physical wires connecting two or more computers. These connections allow information to move electronically between computers.

Network Computer (NC)

A computer that displays information which usually resides on another computer. A network computer consists of a display, a keyboard, a mouse or other pointing device, a logic module, an X server, and local clients. See *Display*, *Logic Module*, *Mouse*, *Pointer*, and *X Server*.

Parameter

A variable that is given a specific value. This value is passed to a program before execution.

Peripheral Device

A device used to input or output data for the network computer. The XPT/A graphics tablet is a supported peripheral device for network computers.

Pixel

The smallest part of a screen surface that can be addressed.

Pointer

The *pointer* allows you to make selections in menus, to size and position windows and icons, and to select the window where you want to send the input. The window manager determines the shape of the pointer. See *Pointing Device*.

Pointing Device

Typically a mouse, tablet, or some other device with effective dimensional motion. The core protocol defines only one visible cursor, which tracks whatever pointing device is attached as the pointer. See *Pointer*.

Port

A physical connection (such as a multi-pin connector or coaxial connector) and its associated firmware, that permits one computing device to communicate data and control information with another computing device or peripheral device.

Protocol

A set of rules that allows computers to transfer information across a network to other computers that speak different computer languages.

Read-Only Memory (ROM)

Special firmware in the network computer that allows it to boot without being connected to a host computer.

RGB

An additive method of combining percentages of red, green, and blue primary colors to form other colors.

ROM

See *Read-Only Memory*.

Root Weave

The window that fills the screen during an X session. All windows opened by clients appear on top of the root window. See *Stipple Pattern*.

RS-232-C

A standard communications interface defined by the Electronic Industries Association (EIA) to control data communications using standard voltages, signal lines, and device interactions.

Screen

The monitor. This is where text and graphical information is displayed for viewing. See *Window*.

Select (mouse button)

The factory default defines this as the left mouse button.

Setup Key

A special key on the keyboard, marked Setup. Pressing this key takes you to the *Setup* program.

Serial Port

One or more optional physical connectors on your network computer. Attach a serial cable (RS 232) to communicate with a peripheral device such as a modem or printer.

Serial Port Session

A session started through one of the serial ports: either Serial Port 0 or Serial Port 1.

Server

The combination of graphics display, hardware, and server software that provides display services for clients. The server also handles keyboard and mouse input. See *Client* and *X Server*.

Setup

A local X client program used to configure the network computer.

Software

A set of instructions that tell the computer to perform a certain task in order to obtain a specific result. See *Client*.

Stipple Pattern

In the X Window System, the underlying pattern displayed (with the X cursor) when there are no other windows on the screen. If a window is created, the window appears on top of the stipple pattern. See *Root Weave*.

TCP

See *Transmission Control Protocol*.

TCP/IP

See *Transmission Control Protocol/Internet Protocol*.

Telnet

A user-level protocol which is part of the Internet Protocol set. *Telnet* provides a Network Virtual Terminal, which allows you to log in to a remote host on the network as if you are using a terminal directly attached to the remote host.

HostMenu

A window showing a list of host computer names and network addresses. Use the mouse to select a computer where you have a login account.

Terminal

An interactive input/output device used in computer systems or networks.

Text Cursor

The I-shaped pointer which appears in a text input area. Clicking the mouse in a text input area causes the text cursor to appear in that area. Whatever information you type on the keyboard appears in the text input area displaying the text cursor.

TFTP

See *Trivial File Transfer Protocol*.

Transmission Control Protocol (TCP)

The Internet transport layer protocol which provides a reliable, bi-directional byte stream connection between two cooperating user-level processes.

Transmission Control Protocol/Internet Protocol (TCP/IP)

Using the TCP and IP protocols to obtain a reliable, bi-directional byte stream connection between two cooperating user-level processes. Commonly this refers to the entire Internet Protocol suite, including TCP, IP, UDP, ICMP, and other protocols.

Trivial File Transfer Protocol (TFTP)

A protocol used for downloading server images. It is also used for reading and writing font files, the color definition file, or remote configuration files.

UNIX

A host operating system.

Value

A term describing the lightness or darkness of a color. Value ranges from 0 (black) to 100 (white). See *Chroma* and *Hue*.

WinDD

A local ICA client that allows you to access Windows 2000 applications using your network computer with Microsoft's Windows 2000 Terminal Server Edition and Citrix Metaframe server software.

Window

In the X Window System, typically a region on the screen of a display created by an X client for displaying data. (An X client can create more than one *window*.) For example, the xterm terminal emulator, xfd font displayer, and the bitmap graphics editor all create windows. You can use a window manager to manipulate windows on the screen. See *Window Manager*.

Window Manager

An X client that allows you to organize and rearrange windows. The window manager controls the size and placement of windows and can also control window attributes such as border size.

Xhost

A host X program that controls access to the server from the host program.

X Server

A program that runs locally on a network computer and lets you use the screen of the network computer. The X server processes a request (for example, a request to create a window), collects input data, and sends information (called an event) to clients. See *Event*.

Xterm

An X client that emulates an ANSI-style terminal for programs that do not use the capabilities of windows directly.

X Window System

A set of network protocols developed by MIT for workstations; also called X or X11.

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