



# X Display Station User's Guide

**VISUAL**  
T E C H N O L O G Y



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## **FCC notice**

The equipment described in this manual generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with this manual, this equipment may cause interference with radio communications. The Visual X Display Station has been tested and found to comply with the FCC limits set for a Class A computing device, pursuant to Subpart J of Part 15 of FCC rules. These rules are designed to protect against such interference when operating in a commercial environment.

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## To the Reader

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### About the Visual X Display Station Family

Each member of the Visual family of X Display Station™ (XDS™) terminals is a full Version 11 implementation of the X Window System server. As an X server, the XDS receives your keyboard and mouse input and sends it over communications lines to applications running on host computers. In turn, the XDS receives input from applications and displays their execution on its screen.

You can connect to multiple hosts with different operating systems and run a number of applications at the same time. The XDS displays the applications in a hierarchy of windows, which overlap on the screen like papers on a desktop. In effect, the XDS brings the resources of multiple systems right to your terminal, allowing you to move from host to host and application to application merely by moving your mouse.

In general, there are two ways that you can connect to hosts when you use the XDS:

- You can connect to hosts manually, using the facilities provided by the XDS.
- You can use the XDS with an auto-connection program that connects you to a host when you start up the X server.

### Connecting to hosts manually

When you connect to a host manually, you use a built-in facility--the Connection Window--to connect to hosts and start a terminal emulation program.<sup>1</sup>

You may prefer to use the XDS without an auto-connection program: you're guaranteed to connect to your host (as long as it is responding) and you don't need to port software to host machines. The steps for connecting are easy and take very little time. These steps are outlined in Chapter 1, "Installing the XDS."

If you're using the XDS without an auto-connection program, you may still be able to use a font server program that connects you to a font host, handles requests for fonts, searches for them, and

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X Display Station and XDS are trademarks of Visual Technology Incorporated.

X Window System is a trademark of the Massachusetts Institute of Technology.

<sup>1</sup> Throughout this manual, you'll see the phrase "using the XDS without an auto-connection program," which refers to using the XDS without software that automatically connects you to a host.

delivers them to the XDS. If your system supports the Network File System (NFS), or the Trivial File Transfer Protocol (TFTP), you can use one as a font server program. If you do not use a font server program, you may use only the local fonts.

### Connecting to hosts with an auto-connection program

Alternatively, you can use the XDS with an auto-connection program that automatically connects you to your host and starts an X Windows session. You can write your own program to perform these tasks, or you can use the XDS Host Software (please contact your sales representative) from Visual Technology. The XDS Host Software contains a sample auto connection program, which you may install on or modify for your system.<sup>2</sup>

For instructions on selecting an auto-connection program, see "The Auto-Connection menu," in Chapter 3.

You can get a copy of the XDS Host Software from Visual Technology.

The XDS auto-connection feature is based on a precursor to the MIT X.V11R4 XDMCP protocol and cannot currently work automatically with the R4 *xdm* program. This issue will be addressed in a future release of the software program.

The XDS Host Software also contains the Font Daemon--the XDS Font Server Program--which handles requests for fonts and downloads them to the XDS. If you're using the XDS Host Software, you may choose to use NFS, or TFTP (if your system supports them) as the font server program--or you may choose to work without a font server program and use only the local fonts.

For instructions on selecting a font server program, see "The Font Management menu," in Chapter 3.

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<sup>2</sup> The Network File System (NFS) is a trademark of SUN Microsystems. Throughout this manual, you'll see the phrase "using the XDS with an auto-connection program," which refers to using the XDS with either the XDS Host Software or another auto connection program.

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## How to use this manual

This manual is divided into two sections. Section 1, "Installing and Setting Up the XDS," includes basic instructions for installing and setting up the XDS and connecting to a host, and a complete reference to all the Setup options. Section 2, "Using the XDS," includes more advanced instructions for connecting to hosts.

### To the user

You can install and set up the XDS easily, no matter what your level of experience. In Chapter 1, "Installing the XDS," you'll find instructions for verifying that you have received all the XDS parts and for connecting the XDS properly.

Chapter 2, "Getting Started with the XDS," walks you through the Setup process, gives you instructions on how to use the XDS Setup menus to prepare the XDS software, and how to make a manual connection to a host.

Chapter 2 provides you with the most basic steps for setting up the XDS and connecting to a host. These steps work for the most common configurations--an XDS communicating over the Ethernet using ThickWire connections. Some configurations may require you to follow different steps. In that case, see Chapter 3, "Setting Up the XDS: Reference," and Section 2, "Using the XDS," for the information you need.

Section 2, "Using the XDS," provides instructions for using the XDS to run the X Window System server. Section 2 includes Chapter 4, "Working with Applications" which provides instructions for connecting to hosts and displaying X-based applications; and Chapter 5, "When Things Go Wrong," which gives instructions for diagnosing problems you may have with the XDS and for working around these problems.

If you will be using the XDS with the XDS Host Software, or with a similar auto-connection program, make sure that the software is installed on your system before you start working with the XDS.

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## Formatting conventions used in this manual

This manual uses certain formatting conventions to distinguish different text items from each other. These are explained below.

- Anything that you need to type in exactly as it is written follows the word "type" and is formatted in **bold**. For example, to insert a value in a list, you need to type the letter "i". The instructions for this are written:

Type **i**

- Anything that you need to type substituting a name of your own choosing, follows the word "type" and is formatted in *bold italic*. For example, the instructions for executing the Telnet command are written:

Type:

**telnet *hostname***

--meaning that you need to substitute a host name of your own choosing for hostname. (Notice that telnet is bold but not italic, meaning that you type it exactly as it is written.)

- Any key that you need to press is written in ALL CAPS; for example, SETUP, CTRL, or RETURN.
- Options that you select on menus and in windows, and the menus and windows themselves, are formatted in bold, and presented as they appear on the XDS; for example, the **Connection Window**, and the option **Close All Connections (logout)**.
- Prompts and messages that you see on the screen are presented as they appear on the XDS and enclosed in quotation marks; for example, "Enter value:".

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## Other manuals you should know about

For detailed guides to programming for and using the X Window System, see:

*X Window System C Library and Protocol Reference*, by Robert Scheifler, James Gettys, and Ron Newman.

These publications, authored by the developers of the X Window System, are available from Digital Press.

*Xlib Programming Manual*, *Xlib Reference Manual*, and *X Window System User's Guide*, by Adrian Nye.

This three-volume set is a complete reference to programming for the X Window System. The manuals are published by O'Reilly and Associates, Inc., of Newton, MA.

*X Window System Programming and Applications with Xt*, by Douglas Young.

This reference to programming for the X Window System is available from Prentice Hall, of Englewood Cliffs, NJ.

If you are a system or network administrator, you should already have the documentation distributed with the X Window System software by the Massachusetts Institute of Technology. The documentation contains the most current information about the X Window System, Version 11, as well as guides to programming, and a reference to X Window System commands. You can get a copy of the documentation (as well as the X Window System software) from

MIT Microcomputer Center  
MIT 11-209  
77 Massachusetts Avenue  
Cambridge, MA 02139

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## Where you can get help

Your system and/or network administrator can provide you with the Setup information you need. You can find the page references for all the Setup options and menus in the Index. The Index also lists major topics and commands. If you need to find detailed information about a topic discussed in the manual, look here to find out where else in the manual the topic is covered. In addition, Chapter 3, "Setting Up the XDS: Reference," contains explanations for all the Setup options, arranged according to the menus on which they appear.

If you are already in Setup and you need help understanding the menu, select **HELP** from the menu. The XDS shows you Help for that menu—a page of answers to the questions "most commonly asked" about using that menu.

If you are confused about the meaning of a term used in this manual, turn to the Glossary, which defines many of the terms this manual uses.

If something goes wrong, for example, if an option does not work as you expected, or if the connections are unsuccessful, turn to Chapter 5, "When Things Go Wrong." In this chapter, you'll find instructions for diagnosing problems you may have with the XDS and for working around these problems.

If you're having problems with something that the manual does not cover, or if you're absolutely stuck, call Visual Technology at 1-800-537-6004 (outside MA) or 1-800-345-8998 (inside MA). A member of the Technical Support staff will be glad to help you.

**Section 1**  
**Installing and Getting Started with the XDS**

# Chapter 1

## Installing the XDS

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### In this chapter

This chapter tells you how to unpack the XDS shipping boxes and how to install the XDS. All XDS models are installed using the same procedure, except that the X-15 XDS model does not have a power cord between the monitor and the base unit, and the video cable varies between models.

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### What you'll receive

The XDS shipping cartons contain the following parts:

- the XDS monitor
- the XDS base unit (with firmware module installed)
- the keyboard
- the mouse and mouse pad
- a power cord to connect the unit to an electrical outlet
- the video cord
- a power cord to connect the monitor to the base unit (*not on the X-15 XDS model*).

When you unpack the XDS, save the shipping cartons and packing materials in case you have to ship the XDS somewhere else.

Make sure you have received all the parts and that none are damaged. If any parts are missing or damaged, contact your Visual sales representative and/or the shipping agent right away.

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### Installing the XDS

When you are deciding where you're going to place the XDS, bear in mind the following things you need to do to ensure successful and safe operation:

- Select an area in which the operating conditions fall within the ranges described below:

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Operating temperature:	10 degrees to 40 degrees Celsius 50 degrees to 104 degrees Fahrenheit
Operating humidity:	10-90 percent non-condensing
Operating altitude:	10,000 feet maximum
Vibration:	Satisfies MIL STD 810, Method 514.2, Procedure X testing
Shock:	Satisfies 40g, .006-second pulse, MIL-STD-810D testing
Storage temperature:	-20 degrees to 60 degrees Celsius -4 degrees to 140 degrees Fahrenheit
Storage humidity:	10-90 percent non-condensing
Storage altitude:	40,000 feet maximum

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- Select a secure and level surface, in an area where it is not likely to be damaged by bumps or spills.
- Make sure all the connecting cables will reach the appropriate connectors in the XDS without being strained.
- Make sure the main power cord will be connected to a grounding-type AC outlet only. The three prongs of the plug should fit easily into the outlet.

If you have trouble fitting the plug into the outlet, contact a licensed electrician to have the outlet replaced, or use a different outlet. Do not try to force the plug in or modify the outlet with an adaptor.

- Make sure the power cord will not obstruct traffic and that it won't be in an area where it can be tripped over or kicked out of the outlet.
  - Make sure the vents in the back or on the top of the terminal are not obstructed or covered up.
- 

## Putting the XDS together

Once you've selected a proper location, you're ready to install the XDS. To do so, follow these steps (refer to Figures 1, 2, and 3 for the X-15, X-19, and X-19 Turbo models, respectively):

### Place the base unit and the monitor together

1. Place the XDS base unit on the selected surface. Make sure the power switch (located on the front-right-hand of the base unit) is off.
2. Place the XDS monitor on top of the base unit, so that the monitor screen is facing away from the base unit ports. Make

sure that the widest part of the monitor is closest to the front edge of the base unit and is not obstructing the vent holes on the top of the base unit.

3. Remove the Voltage Warning Label.

When you receive the XDS, you'll see a yellow or orange fluorescent label covering the power connector on the monitor. The label is there to advise you that the XDS is set up to use a 115 VAC power supply.

- If you are using the XDS with a 115 VAC power supply, simply remove the Voltage Warning Label and go on to the next step.

Before you proceed to the step below, make sure that no power cord is connected.

- If you are using the XDS with a 230 VAC power supply, remove the Voltage Warning Label and switch the Voltage Select Switch so that it reads "230."

After you've switched the XDS to 230 VAC mode, you'll need to use a different power cord with the XDS. Replace the supplied power cord with a cord that is approved by local safety agencies, in accordance with local electrical codes.

### Connect the monitor power cord

*(Skip this step if you are installing an X-15 XDS.)*

1. Locate the black male-female monitor-to-base power cord. (There are two black power cords: the monitor-to-base cord is hooded on one end.)
2. Connect the female end of the power cord to the power connector on the back of the monitor, as shown in Figure 1.
3. Connect the male end to the power connector at the left-rear of the base unit, as shown in Figures 2 and 3.

### Connect the main power cord

1. Locate the other black male-female power cord.
  2. If you are installing an X-19 or an X-19 Turbo model, connect the power cable to the power connector at the left-rear of the base unit, as shown in Figures 2 and 3.
- or
2. If you are installing an X-15 model, connect the power cable to the power connector at the left rear of the monitor, as shown in Figure 1.
  3. Plug the power cord into a properly grounded AC outlet.

Figure 1: Rear View of the X-15

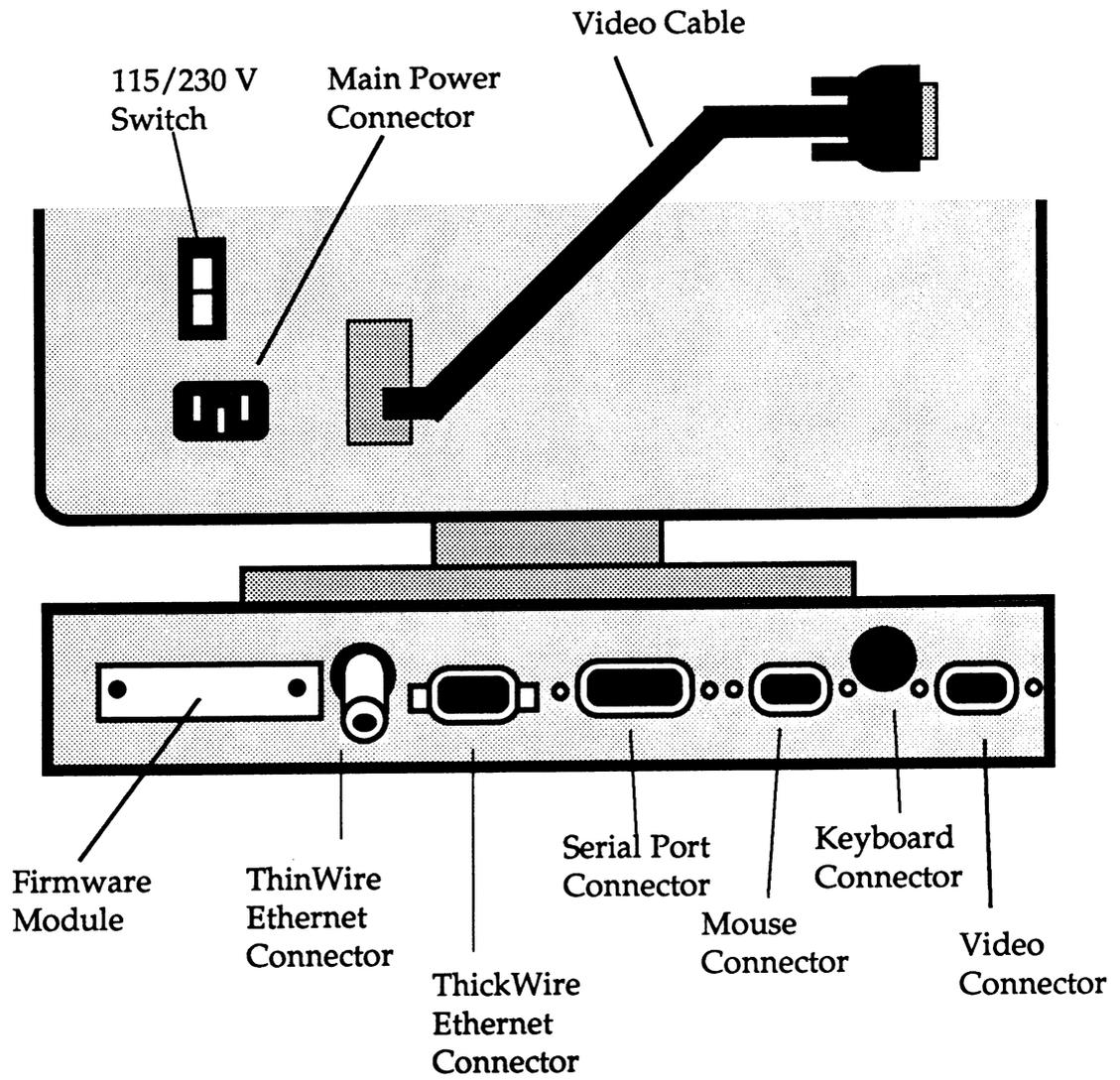


Figure 2: Rear View of the X-19

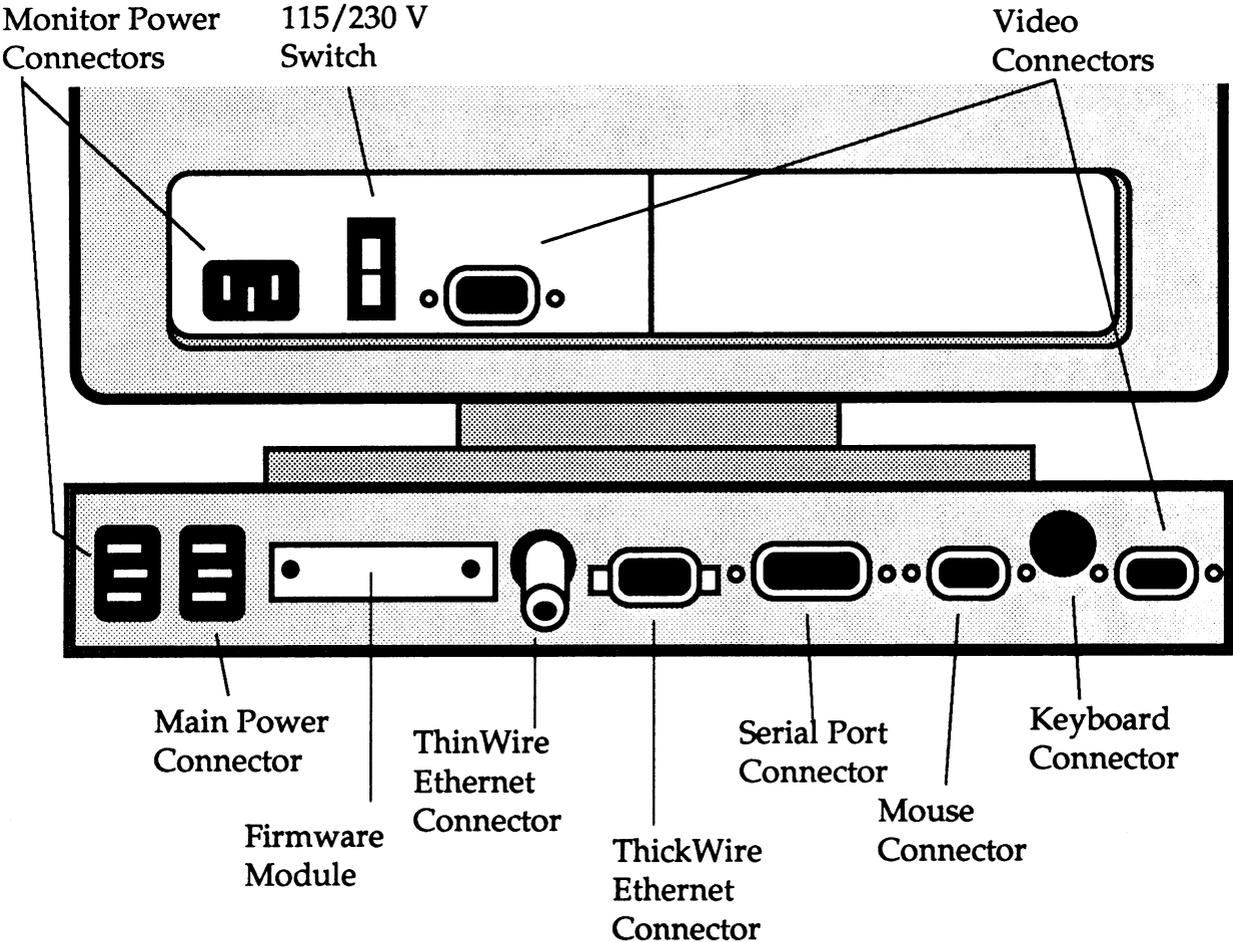
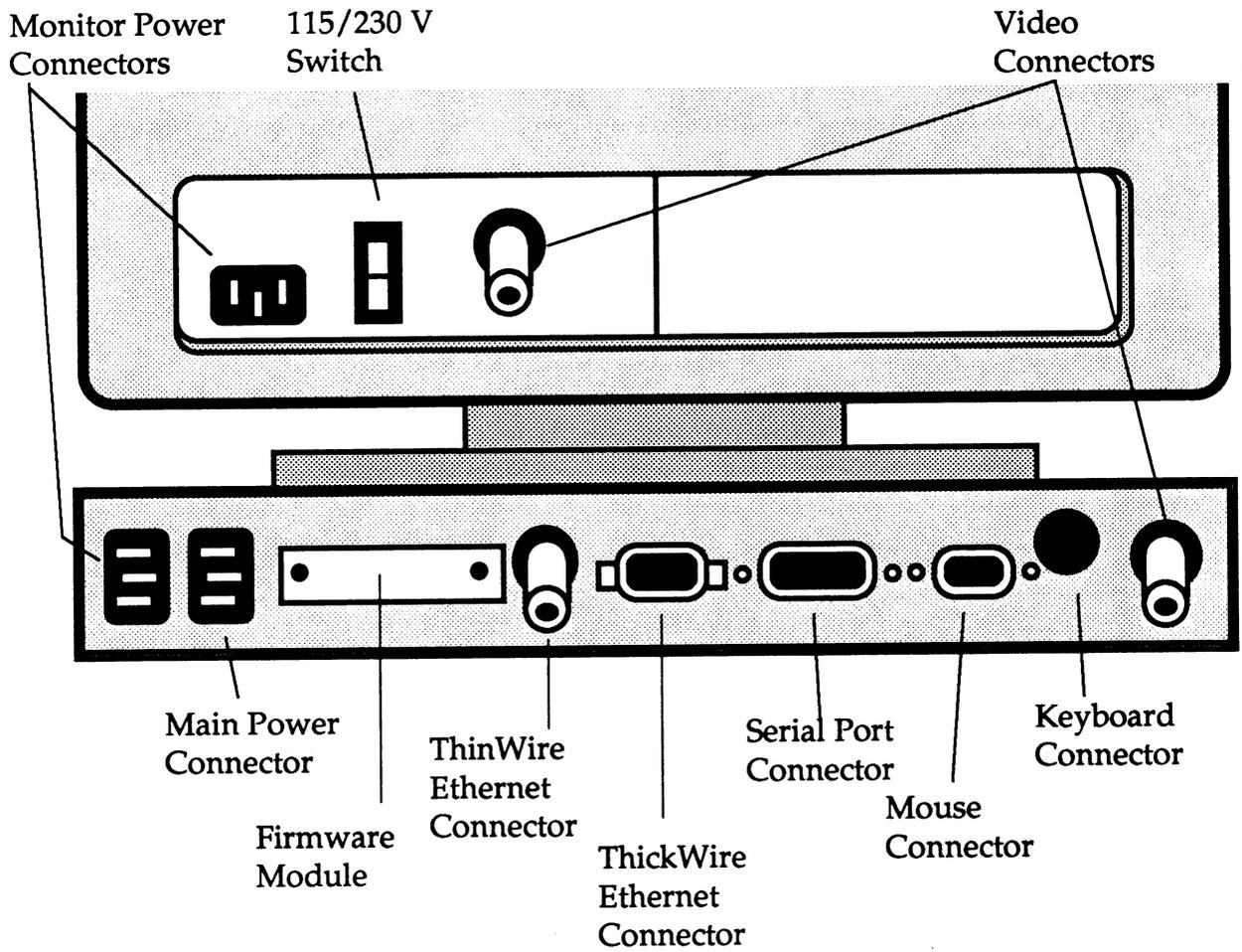


Figure 3: Rear View of the X-19 Turbo



## Connect the video cable

1. On the X-15 XDS, the video cable is permanently attached to the monitor. Connect the other end to the video connector on the base unit, as shown in Figure 1.

or

1. Locate the video cable. On the X-19 model, it is a gray cable with a male 9-pin connector at one end and a female connector at the other. On the X-19 Turbo it is a short black cable with a BNC connector at each end.
2. Connect the female end of the cable or one end of the BNC cable to the Video port on the back of the monitor, as shown in Figure 1.
3. Connect the male end of the cable or the BNC connector at the other end of the cable to the port labeled VIDEO at the right-rear of the base unit, as shown in Figure 2 or 3.

## Connect the network cable

1. Connect the network cable<sup>3</sup> (refer to Figures 1, 2, and 3):
  - If you're using Transceiver AUI (ThickWire) connections, connect the Transceiver cable to the 15-pin Ethernet port at the rear of the base unit.

When you receive the XDS, you will find a BNC terminator attached to the ThinWire port on the back of the base unit. If you intend to use the ThickWire port, you must leave the BNC terminator attached to the ThinWire port.

- If you're using ThinWire connections, remove the BNC terminator from the ThinWire port at the rear of the base unit and connect the ThinWire cable.

When you receive the XDS, it is set for ThickWire connections. You'll need to set up the XDS to work with ThinWire connections. For more information, see "Setting up the XDS software for the first time," in Chapter 2, "Getting Started with the XDS."

Never attach both the ThinWire and ThickWire ports to networks simultaneously.

- If you're using an RS232/423 cable, connect it to the 25-pin port at the rear of the base unit.

<sup>3</sup> You need to supply the cables appropriate to the type of network connections you will be using.

## Connect the keyboard

1. Connect the end of the keyboard cable to the keyboard port (labeled KEYBD) at the right-rear of the case unit, as shown in Figures 1, 2, and 3.

## Set up the mouse and mouse pad

1. Connect the mouse cable to the 9-pin port labeled MOUSE at the rear of the base unit, as shown in Figures 1, 2, and 3.
2. Place the mouse pad next to the XDS in such a way that when you look at the pad, it is wider than it is tall.
3. Place the mouse on the mouse pad so that the three buttons are vertical (or roughly so) and the cable is away from you.

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## Adjusting the brightness

The brightness for the XDS display was set at the factory; however, you may want to adjust the setting to your own liking. To do this, follow the instructions below after the unit has been powered on for more than ten minutes or so.

### X-15 and X-19 XDS

1. Locate the brightness control on the lower left front of the monitor bezel. It is marked with an icon that resembles a sun.
2. Adjust the brightness to the desired level using this control.

### X-19 Turbo XDS

1. Locate the brightness and contrast controls on the lower left front of the monitor bezel. The brightness knob is above the icon that resembles a sun and the contrast is above the icon which is a bisected circle, have light, half dark.
2. Turn the brightness control to the maximum level. If you can see a faint raster pattern surrounding the normal viewing area, back off the brightness until the raster just disappears.
3. Now adjust the luminance to the desired level using the contrast control

After you have set up the XDS hardware, you need to set up the XDS software. To do this, turn to Chapter 2, "Getting Started with the XDS."

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## Where to go from here

**To learn about:**  
Setting up the XDS software

**Look here:**  
Chapter 2

# Chapter 2

## Getting Started with the XDS

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### In this chapter

This chapter gives you step-by-step instructions for setting up the XDS software and connecting to a host. In this chapter, you'll learn how to use the XDS Setup menus and change the options that are most critical to using the XDS.

If you need to change Setup options other than those described below, turn to Chapter 3, "Setting Up the XDS: Reference," for explanations of all the Setup options.

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### Setting up the XDS software for the first time

#### About the XDS Setup menus

The XDS Setup window contains 14 pop-up menus, each with options that help you configure the XDS software to work properly with the hosts and network connections you have in place.

When you receive the XDS, most of the options are already set to work with your system. Other options have not been set or may need to be changed; you'll need to do this yourself. Check with your system administrator.

If you need to set other Setup options (your system administrator will tell you if this is the case), you can find detailed instructions in Chapter 3, "Setting up the XDS: Reference."

#### About the XDS keyboards and mouse

The XDS comes with a choice of two keyboards, a vt220-compatible keyboard, and an AT-compatible keyboard. With the vt220-compatible keyboard you can use a series of keys (each labeled appropriately) to move about Setup. The XDS Setup menus accommodate both keyboards by offering you options for moving about Setup by selecting options, using the mouse buttons, or pressing keys.

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## Using the XDS Setup menus

### Moving around the Setup menus

To move in and out of Setup, and from menu to menu, use the keys on the XDS keyboard or the buttons on the XDS mouse, as described below:

**To do this:**

Start Setup

Return to the Setup Window  
from a submenu

Leave Setup from any Setup  
menu

Undo any changes to Setup

**Do this:**

Press SETUP or SYS RQ and  
select **Setup Window** from  
the **System Window**

Press ESC, PREV SCRNL, or  
PAGE UP; select **Return to  
Setup Window**; or press the  
right mouse button

Press SETUP or SYS RQ, or  
select **Exit Setup** from the  
**Setup Window**

Select **Setup Utilities** from  
the **Setup Window** and  
select **Undo Changes to  
Setup**

### Moving within a menu

When you are in a menu or editing a list, you move the cursor from item to item by pressing the large up-arrow or down-arrow keys on the keyboard or by moving the mouse to the option or list item. In addition, you can use the HOME and END keys to move about a menu or list. Press HOME to place the cursor at the first menu option or at the first item in a list. Press END to place the cursor at the last menu option or at the last item in a list. Each time you move the cursor or mouse to an option, the XDS highlights the line in reverse video.

### Selecting and changing options

Follow the steps below to select or change each type of Setup option:

If you are using the mouse to select or change options, press the left or middle mouse button instead of pressing RETURN and press the right mouse button instead of PREV SCRNL, as described below.

**To do this:**

Select an option to go to another menu

**Do this:**

1. Move the cursor to the row containing the option, for example to **Setup Window**.
2. Press RETURN.  
The XDS leaves the current menu and opens the new menu.

Change the setting in a toggle option, for example, the **On/Off, Yes/No, or Enabled/Disabled** options.

1. Move the cursor to the row containing the option, for example, to **4.2 compatibility mode**.
2. Press RETURN.  
The XDS switches the setting; for example, it changes **On** to **Off**.
3. To change the value back, press RETURN again.

Change the value in an address or mask option.

1. Move the cursor to the row containing the option, for example, to **IP address**.
2. Press RETURN.  
The XDS displays the prompt "Enter value:" at the bottom of the screen.
3. After "Enter value:", type in the new address.
4. Press RETURN.  
The XDS returns you to the menu and changes the value displayed after the option.

Start editing a list

1. Move the cursor to the row containing the list option, for example, to **Local IP namelist**.
2. Press RETURN or the left mouse button.  
The XDS opens a window containing the current list.
3. Follow the directions below for each type of action you want to perform.

Insert a value in a list

1. Move the cursor to the line where you want the new value to go.
2. Type `i`  
Do not press RETURN.  
The XDS shows you the prompt "Enter value:".
3. Type in the new value.
4. Press RETURN.  
The XDS adds the new value at the insertion point.
5. To return to the menu, Press ESC or PREV SCR.N.

Append a value to a list

1. Move the cursor to the line above where you want the new value to go.
2. Type `a`  
Do not press RETURN.  
The XDS shows you the prompt "Enter value:".
3. Type in the new value.
4. Press RETURN.  
The XDS adds the new value below the insertion point.
5. To return to the menu, Press ESC or PREV SCR.N.

Change a value in a list

1. Move the cursor to the value you want to change.
2. Type `c`  
Do not press RETURN.  
The XDS shows you the prompt "Enter value:".
3. Type in the changed value.
4. Press RETURN.  
The XDS replaces the old value with the changed value.
5. To return to the menu, Press ESC or PREV SCR.N.

Delete a value from a list

1. Move the cursor to the value you want to delete.
2. Type **d**  
Do not press RETURN.  
The XDS deletes the value from the list.
3. To return to the menu,  
Press ESC or PREV SCRN.

Cancel or redo an edit (while typing after "Enter value:")

1. Press CTRL and type **c** (press CTRL-c).  
The XDS removes the prompt and returns you to the list without making the edit.  
or
2. Backspace over the error and retype the value.

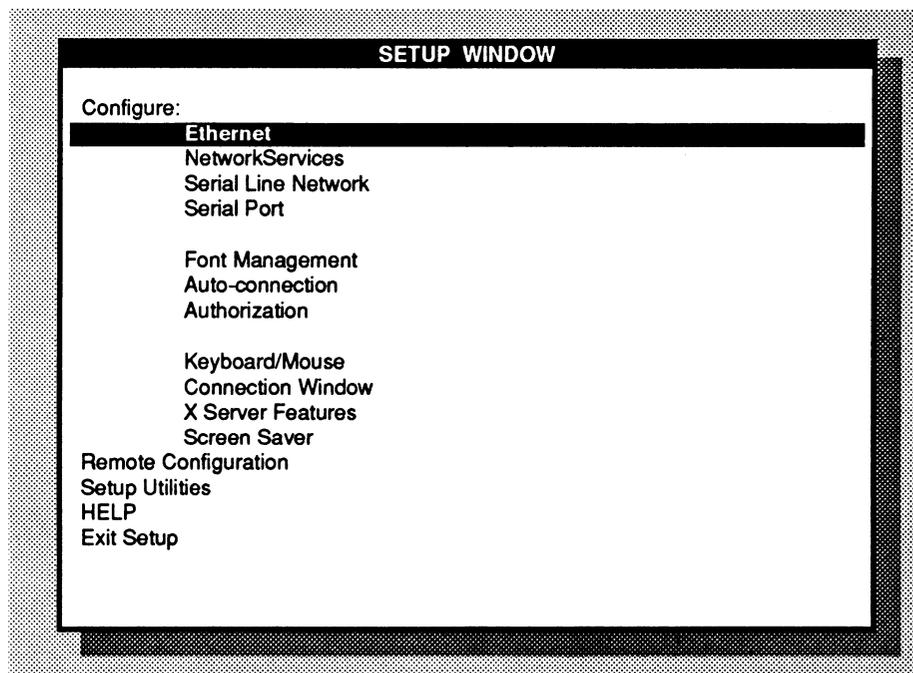
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## Setting up the software on a Standalone XDS

In most cases, the following steps are all you'll need to do to get a standalone XDS (one with a complete X server contained on the firmware module) up and running.

The first time you turn the XDS on, you'll see the **Setup Window**.



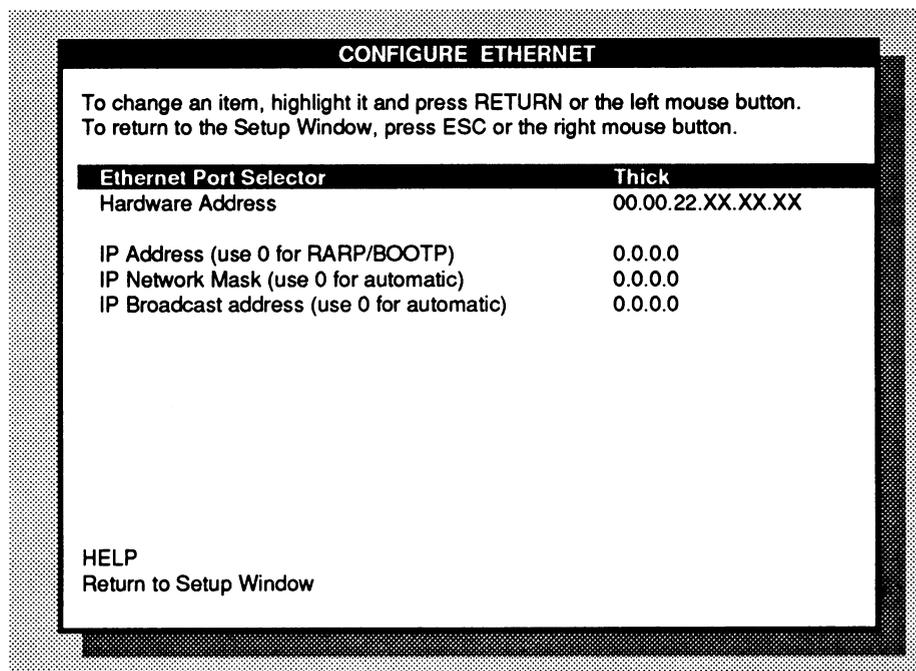
### Setting up the Ethernet port

If you will be using Ethernet connections, you may need to change the Ethernet port setting. By default, the Ethernet port is configured to use ThickWire (Transceiver AUI) connections. If you will be using ThickWire connections, skip this section and go on to "Setting the IP address," below.

If you will be using ThinWire BNC connections (or if you are not using Ethernet at all), then you need to change this setting. To change the Ethernet port setting, start from the **Setup Window** and follow these steps

1. Select **Ethernet**.

The XDS shows you the **Configure Ethernet** menu.



2. Select **Ethernet Port Selector**.

To change **Ethernet Port Selector** to **Thin**, press RETURN once.

The XDS changes the setting to **Thin**.

If you accidentally cycle past **Thin**, press RETURN again until you return the setting to **Thin**.

### Setting the IP address

To set the Internet Protocol (IP) address that identifies the XDS on the Ethernet, remain on the **Configure Ethernet** menu and follow these steps.

1. Select **IP address**.

The XDS shows you the prompt "Enter value:" at the bottom of the menu.

2. After "Enter value:", type in the IP address.

If you make a mistake while you're typing, backspace over the error and retype the value, or press CTRL-c to cancel the edit. To retype the value, press RETURN again.

3. Press RETURN.

The XDS returns you to the menu and fills in the address.

4. Save your changes and leave Setup:

- If you have a vt220-style keyboard, press SETUP.

The XDS saves your changes and leaves Setup.

- If you have an AT-style keyboard, follow these steps:

1. Press SYS RQ

or

1. Press the right mouse button.

The XDS returns you to the **Setup Window**.

2. Select **Exit Setup**.

The XDS saves your changes and leaves Setup.

## Setting up the software on a Download XDS

In most cases, the following steps are all you'll need to do to get a download XDS (one with a complete X server contained on the firmware module) up and running.

The first time you turn the XDS on, you'll see messages resembling the following.

**Selftest passed: (2048+0) 2048K bytes memory.**

**68000 ROM version 2.0 - April 10, 1990**

**Load error: not configured**

**Configure Ethernet**

Since the XDS has never been configured, you must enter at least enough configuration information for the XDS to successfully be able to load the X Window server over the network. Note that the Setup Menus are loaded along with the X server, and are not available at this time. The XDS software will now ask you to fill in some information, as follows.

Note that a value presented by the XDS enclosed in square brackets is the default that will be set if you simply press ENTER at that point.

1. After the prompt:

**Thick AUI or Thin BNC [thick]:**

press RETURN to select the ThickWire ethernet port, or type **thin** and press RETURN to select the ThinWire Ethernet port.

2. Make sure you have received an IP address from your network administrator. After the prompt:

**IP address [0.0.0.0]:**

type in the IP address for your XDS, then press RETURN.

3. After the XDS responds with the prompt:

**Boot host and filename []:**

type in the IP address of the host machine where your XDS's download image is located, followed by a space, then the filename of the image, for example:

**128.0.0.1 /usr/lib/X11/Visual/X19image**

4. The XDS will respond:

Standalone configuration saved  
 Ethernet address is 00.00.22.xx.xx.xx, Thick AUI selected  
 and the command menu will be displayed.

For information on using the commands, see *Using the Boot ROM Command Menu* in Chapter 3.

5. Type `boot` and press RETURN twice to download and execute the X server.

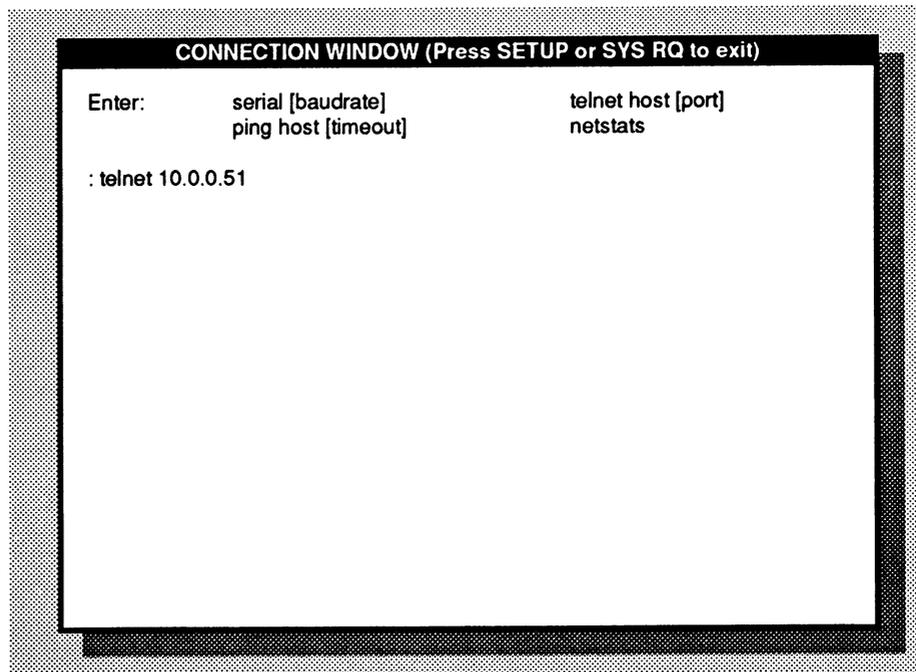
From now on on power-up, the XDS will automatically boot the configured server image and come up running with no further intervention on your part.

## Starting a connection to a host

You need to make a manual Telnet connection to a connection host in order to start working with X clients. You do this using the built-in facility on the XDS, the **Connection Window**

To use Telnet, follow these steps:

1. If you have a vt220-style keyboard, press **CONNECT**.  
 The XDS shows you the **Connection Window**.



1. If you have an AT-style keyboard, start from the **System Window** and follow these steps:
2. Select **Connection Window**.

The XDS opens up the **Connection Window**.

## Logging in to a host

1. After the prompt (:), type:

`telnet` (or `t`) *hostname* and, optionally, the port to which you want to make the connection.

Format the host name using one of the following formats:

- dotted decimal IP address of the host machine
- absolute hexadecimal address of the host machine

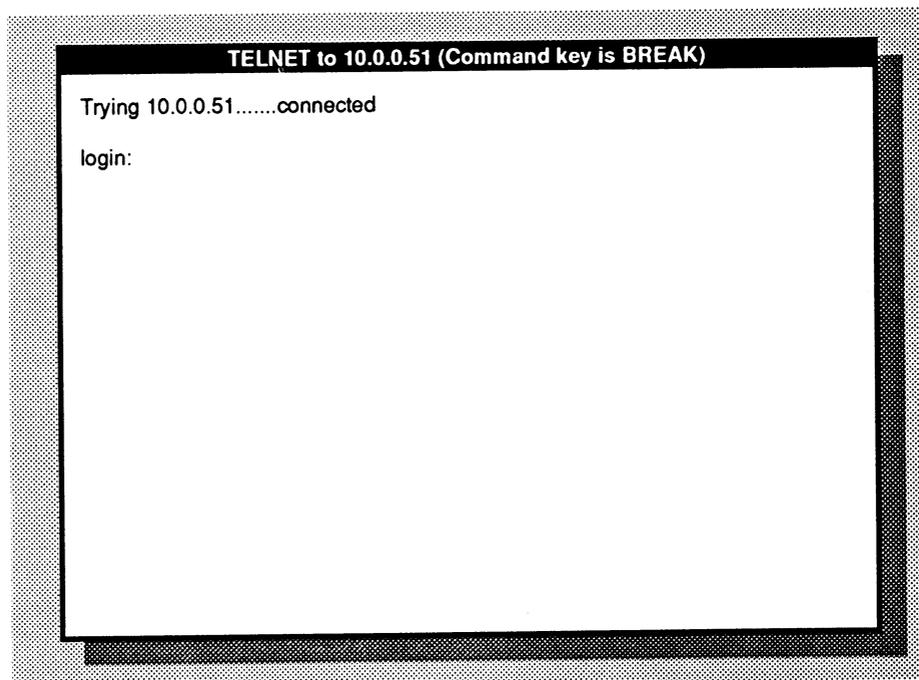
If you aren't sure what the IP address is for the host machine, you can typically find it in the host system in a file labeled `/etc/hosts`.

for example, you might type:

```
telnet 10.0.0.51
```

2. Press RETURN.

The XDS leaves the **Connection Window** and enters Telnet mode. The title bar at the top of window tells you you're in Telnet mode and the identity of the host you're connected to.



You'll see the login prompt you normally see when you connect to that host.

3. Login to your host, using the steps appropriate to your host.

While you're in Telnet, you can use the following escape sequences. (Press BREAK and one of the following characters to perform an escape sequence.)

To see the list of commands, press BREAK plus any key not listed below. The XDS shows you the list of commands.

- a asks the host "are-you-there" and displays a message if it receives a "YES"
- b sends a break to the remote Telnet
- f flushes any output
- h erases a character
- q closes the Telnet connection
- s displays Telnet and TCP statistics
- x aborts by resetting the Telnet connection
- z suspends the Telnet session and displays the list of **Connection Window** commands. To resume the session, type Telnet (or t) and press RETURN. The XDS resumes the connection to the host.

Pressing CONNECT or SYS RQ also suspends the Telnet session and exits you from the **Connection Window**.

After you have successfully logged in to your host, you need to start a terminal emulation program on the XDS display. The following section shows steps for starting an **xterm** terminal emulation program.

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## Starting an xterm terminal emulation program

After you have successfully logged in to your host, you need to start a terminal emulation program on the XDS display. This section provides instructions for starting an **xterm** terminal emulation program.

**xterm** is actually an application that lets you run other X applications on the XDS. When you start an **xterm** program, then, you may need to place it in the background of your host environment (so you can run other applications in the foreground) and direct it to the XDS display.

To display applications on your XDS screen, you need to know your XDS IP address. If you don't already know it, start from anywhere except the **Connection Window** and follow these steps:

1. Press SETUP or SYS RQ.

The XDS shows you the **System Window**. At the bottom of the menu, the XDS shows you a message with the XDS IP address (two addresses if you use both Ethernet and serial line connections).

2. Write down the IP address for the connection you'll be using.

3. Press SETUP.

The XDS leaves Setup and returns you to where you were before.

To start an xterm program, follow these steps:

4. After the host's prompt, type:

```
xterm -display IPaddress:0
```

and, if you need to, the command that places applications in the background of your system (this depends on the system you're using).

For example, if you're working on a UNIX system and your XDS IP address is 1.2.3.4, you would type:

```
xterm -display 1.2.3.4:0 &
```

The ampersand (&) is the UNIX command telling the host to place the application in the background. Your system may use a different command. Type everything else as it is written, though, substituting your XDS IP address for 1.2.3.4.

5. Press RETURN.

Your host shows you a prompt.

6. Press CONNECT or SYS RQ to suspend Telnet and leave the **Connection Window**.

The XDS leaves the **Connection Window** and displays the message "Suspending...". After a few seconds, the XDS returns you to where you were before you entered the **Connection Window**. After a brief time, the XDS shows you a new window in the upper-left corner of the XDS, with a prompt showing that you are already logged in. An xterm program is already running.

From the xterm window, you can start other applications, login remotely to other machines, or use the **Connection Window** to connect to another host. The first application you'll probably want to start is a window manager to create, resize, and move windows on your XDS display. For more information on running other applications on the XDS, see *X Window System User's Guide*.

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## Setting up remote configuration

You have the option of configuring the XDS manually using the Setup Menus or having a Remote Configuration File downloaded to the XDS from a network server. The values in the Remote Configuration File will, at each XDS power-on or reboot, automatically replace the current Setup Menu values as if they were entered through the Setup Menus.

The format and contents of the Remote Configuration File are specified in Appendix D. Refer to the **Remote Configuration Menu** for information on controlling the remote configuration feature.

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## Where to go from here

<u>To learn about:</u>	<u>Look here:</u>
Formatting Setup options	Chapter 3
Information on Setup options for different system configurations	Chapter 3
Connecting to a host through a modem	Chapter 4

# Chapter 3

## Setting Up the XDS: Reference

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### In this chapter

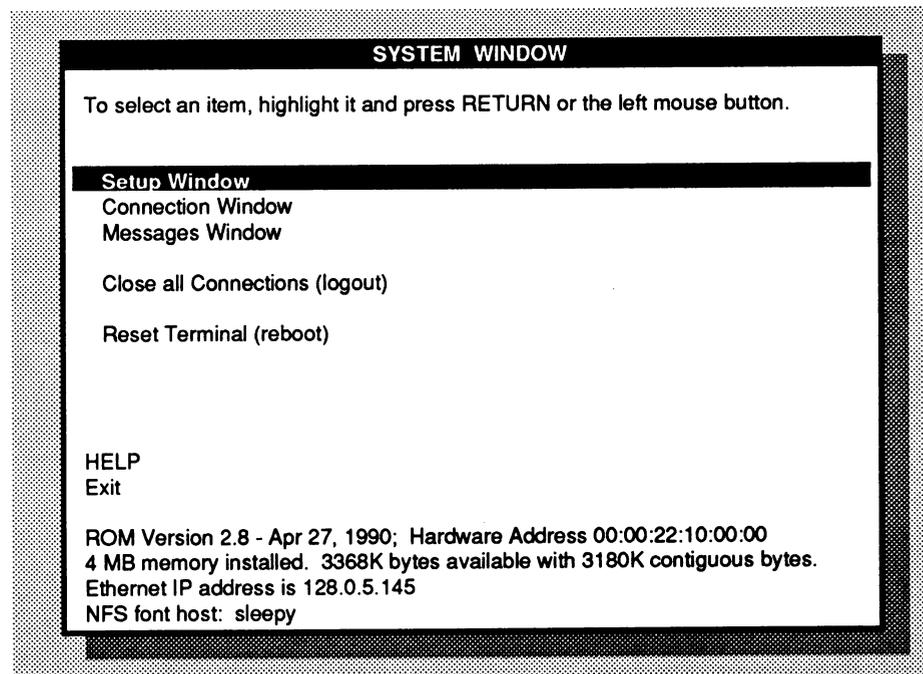
This chapter discusses in detail all the options in the XDS Setup menus, providing explanations for each option and instructions for determining the settings. The options are arranged according to the menus they are in. To find the explanation for a specific option, turn to the Index for the page reference.

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### The System Window

The options in the **System Window** allow you to enter Setup, start a connection to a host, diagnose problems with the XDS, and perform other activities. In addition, the **System Window** provides you with information that you can use to connect to hosts. These options are described below.



#### Setup Window

Select this option to enter Setup and access the Setup submenus: the **Configure Ethernet** menu, the **Configure TCP/IP Services**

menu, the **Configure Serial Line Network** menu, the **Configure Serial Port** menu, the **Configure Font Management** menu, the **Configure Auto-Connection** menu, the **Configure Authorization** menu, the **Configure Keyboard/Mouse** menu, the **Configure Connection Window** menu, the **Configure X Server Features** menu, and the **Configure Screen Saver** menu.

### Connection Window

Select this option to start a connection to a host through Telnet, to connect through a modem, to check the status of a host, or view network statistics.

The activities you can perform through the Connection Window are described in Chapter 4, "Working with Applications."

### Messages Window

Select this option to view messages issued by the XDS.

For more information on diagnosing problems with the XDS, see Chapter 5, "When Things Go Wrong."

### Close All Connections (logout)

Select this option to end a session with a connection host and break all connections to host computers.

Close all connections (logout) does not close a Telnet session.

### Reset Terminal (reboot)

Select this option to end a session with a connection host, break all connections to host computers, and reboot the server. This is useful for restarting the terminal when necessary, for example if memory gets too fragmented to get useful work done. It is equivalent to turning the XDS off and back on.

Reset Terminal (reboot) may cause Telnet sessions to be left hanging around on the host. Please logout of any Telnet session before resetting the XDS.

### Exit

Select this option to leave the **System Window**. The XDS returns you to where you were before you entered the **System Window**.

In addition to the options described above, the **System Window** provides the following information about the XDS.

**Firmware (ROM) information**

The version of Read-Only Memory (ROM) running on the XDS. If the X server was downloaded, this becomes instead the version of the downloaded program.

**Memory usage information**

The amount of Random Access Memory (RAM) installed (in Mbytes), the amount of RAM available (in Kbytes), and the size of the largest contiguous block of RAM available (in Kbytes).

**Ethernet address information**

The current settings for the Ethernet and/or serial line Internet Protocol (IP) addresses.

**Font host information**

The host the XDS currently receives fonts from.

**Hardware address information**

The unique Ethernet hardware address for this XDS.

**Formatting values in Setup**

Some Setup options--those options that ask you to identify a machine<sup>4</sup>--require that you format values in specific ways. The instructions after each option specify the formats you can use. This section describes these formats.

- dotted decimal ; for example, **10.0.0.51**
- absolute hexadecimal; for example, **0a000033**. A value in this form is directly readable by the XDS; it must begin with a number.

The XDS converts any value that you enter in absolute hexadecimal format into a corresponding 32-bit address. For example, the XDS accepts **0a000033** and converts it to its dotted decimal equivalent, **10.0.0.51**.

- a string; for example, you might designate a host by typing in a name.

<sup>4</sup> These options are **Edit Local Namelist**, **Edit Domain Nameserver List**, **Edit IEN116/UDP Nameserver List**, **IP Address**, **Network Mask**, **Broadcast Address**, **Edit Authorized Hosts List**, **Edit Connection Hosts List**, and **Edit Font Hosts List**.

You can use a string only if your system uses nameservice and you have designated a nameserver to resolve the string.<sup>5</sup> For more information on designating nameservers, see "When you may use a string," below.

- a broadcast address

To format a broadcast address, use:

- dotted decimal format
- absolute hexadecimal format
- or
- type in the word **broadcast**

When you use a broadcast address to identify a machine, designate only one machine for each list. For example, if you use a broadcast address to identify a host in the **Edit Connection Host List** option, don't designate any other hosts.

You can use more than one broadcast address if you are broadcasting to a subnetwork and you want to specify a host on the subnetwork.

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## Designating nameservers to resolve strings

In many cases, you may want to use a string (name) instead of addresses to designate a machine. The following describes the conditions under which you may use a string.

### When you may use a string

The XDS can recognize another machine only by its Internet Protocol (IP) address. Therefore, you may use a string only if your system uses nameservice (domain, or IEN116<sup>6</sup>) to match strings to their IP addresses. (Your system administrator will tell you if your system uses nameservice.) You designate the nameservers in Setup, using the **Edit IEN116/UDP Nameserver List** or **Edit Domain Nameserver List** options (on the **Configure TCP/IP Services** menu) depending on the type of nameservice your system uses.

<sup>5</sup> These requirements do not apply to the options **Telnet TERMINAL-TYPE**, **Edit Local Namelist**, or **Edit Font Path List**.

<sup>6</sup> IEN116 stands for Internet Engineering Note 116, that document that set out the original specifications for this type of nameservice. Sometimes, IEN116 nameservice is referred to as "UDP" nameservice. For the sake of familiarity, the XDS Setup menus use both names.

If your system doesn't use domain or IEN116 nameservice, you can create a small local data base that matches names with known IP addresses. You do this using the Edit Local IP Namelist option (on the Configure TCP/IP Services menu). In general, you should rely on this type of nameservice only when the number of host names is small and the changes to names or addresses are infrequent.

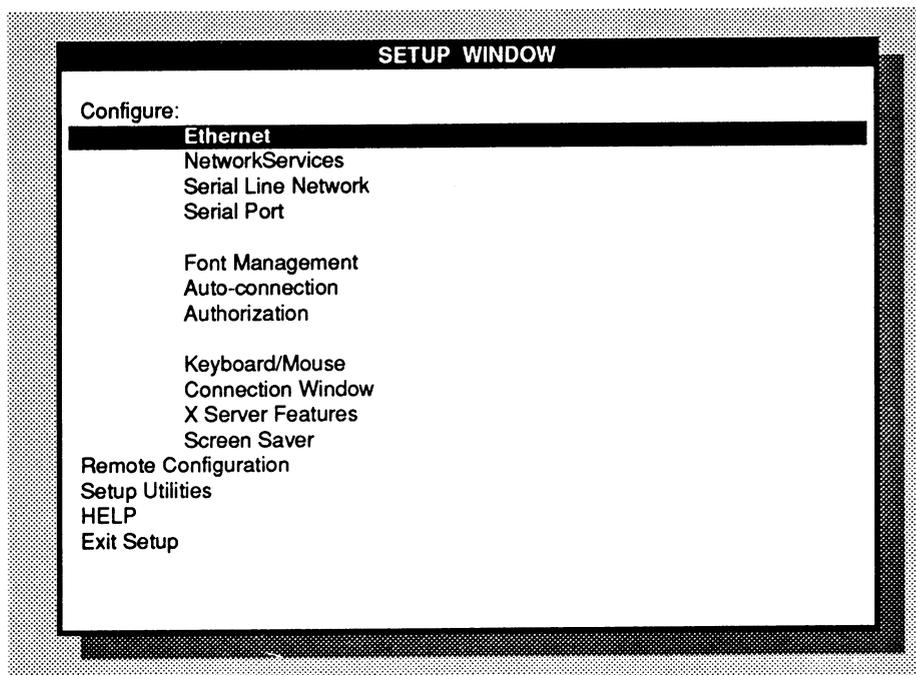
If you use no nameservice at all, you can still designate hosts--just remember to use dotted decimal or absolute hexadecimal format, or a broadcast address.

The XDS uses only the first three valid nameservers. You can format the nameservers themselves as strings, but don't format all the nameservers using strings. Because the nameserver strings must *themselves* be resolved by a nameserver, you need to format at least one of the nameservers using dotted decimal format, absolute hexadecimal format, or a broadcast address. This nameserver can then match the string you used to its IP address.

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## The Setup Window



The **Setup Window** allows you to access the Setup submenus to begin configuring the XDS software. The following describes the options on the **Setup Window**:

### Configure Ethernet

Select this option if you will be using Ethernet communications over the network. The XDS exits the **Setup Window** and opens the **Configure Ethernet** menu. For more information, see "The Configure Ethernet menu," below.

### Configure Network Services

Select this option to set up a list of nameservers to match host names you supply with IP addresses, to set other nameservice variables, and to set other options related to TCP/IP. The XDS exits the **Setup Window** and opens the **Configure Network Services** menu. For more information, see "The Configure Network Services menu," below.

### Configure Serial Line Network

Select this option if you will be using serial line (SLIP) communications to communicate with hosts. The XDS exits the **Setup Window** and opens the **Configure Serial Line Network** menu. For more information, see "The Configure Serial Line Network menu," below.

### Configure Serial Port

Select this option if you will be connecting to a host directly or through a modem. The XDS exits the **Setup Window** and opens the **Configure Serial Port** menu. For more information, see "The Configure Serial Port menu," below.

### Configure Font Management

Select this option if you will be using a font server program, NFS, or TFTP to connect you to font hosts, handle requests for fonts, search for them, and deliver them to the XDS. The XDS exits the **Setup Window** and opens the **Configure Font Management** menu. For more information, see "The Configure Font Management menu," below.

### Configure Auto-Connection

Select this option if you will be using an auto-connection program to connect to hosts and start a terminal emulation program. The XDS exits the **Setup Window** and opens the **Configure Auto-Connection** menu. For more information, see "The Configure Auto-Connection menu," below.

### Configure Authorization

Select this option to limit the hosts the XDS can connect to. The XDS exits the **Setup Window** and opens the **Configure Authorization** menu. For more information, see "The Configure Authorization menu," below.

### Configure Keyboard/Mouse

Select this option to set up options that determine how the X server accepts keyboard and mouse input. (For example, you can change key functions or make each key press audible.) The XDS exits the **Setup Window** and opens the **Configure Keyboard/Mouse** menu. For more information, see "The Configure Keyboard/Mouse menu," below.

### Configure Connection Window

Select this option to set up options that determine the way the XDS displays the **Connection Window**, for example, the font the XDS uses to display text. The XDS exits the **Setup Window** and opens the **Configure Connection Window** menu. For more information, see "The Configure Connection Window menu," below.

### Configure X Server Features

Select this option if you will be using the Backing Store and Input Synthesis features of the X Server. The XDS exits the **Setup Window** and opens the **Configure X Server Features** menu. For more information, see "The Configure X Server Features menu," below.

### Configure Screen Saver

Select this option if you will be using the screen saver capability to save your screen display when there is no input to the display. The XDS exits the **Setup Window** and opens the **Configure Screen Saver** menu. For more information, see "The Configure Screen Saver menu," below.

### Remote Configuration

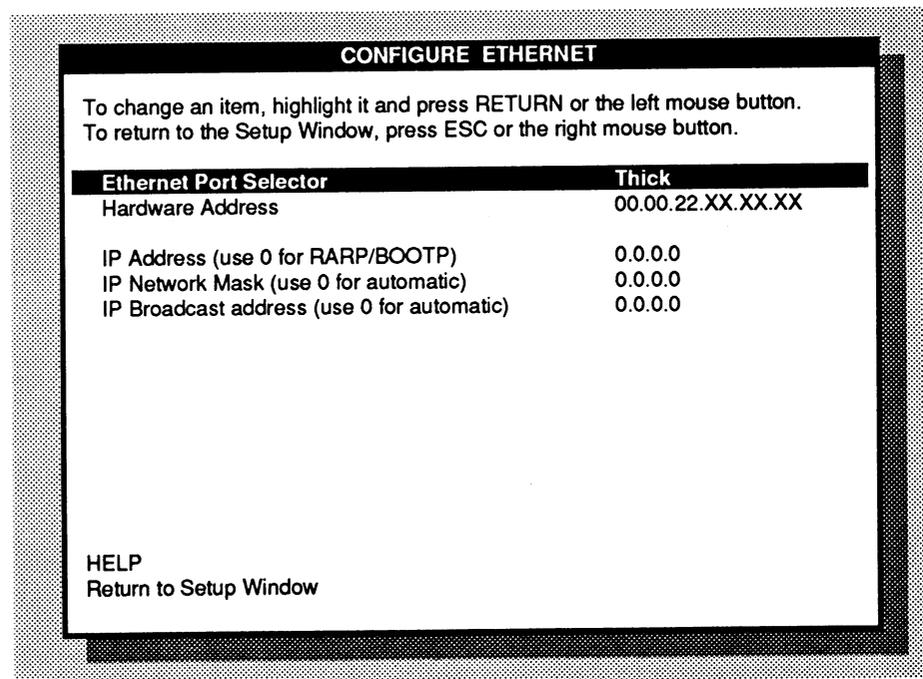
Select this option to enter the **Remote Configuration** menu and control X server booting, remote configuration file downloading, and RGB database downloading. The XDS exits the **Setup Window** and opens the **Remote Configuration** menu. For more information, see "The Remote Configuration menu," below.

### Setup Utilities

Select this option to enter the **Setup Utilities** menu if you want to set a password to protect the setup configuration, or if you want to undo the changes you have made or restore default values. The XDS exits the **Setup Window** and opens the **Setup Utilities** menu. For more information, see "The Setup Utilities menu," below.

---

## The Configure Ethernet menu



The following describes the options on the **Configure Ethernet** menu:

### Ethernet Port Selector

Select **Thick** if you will be using Transceiver AUI (ThickWire) connections to communicate over the Ethernet.

Select **Thin** if you will be using ThinWire BNC connections to communicate over the Ethernet.

Select **Disabled** to turn off Ethernet processing, for example if you are using only SLIP.

**Ethernet Port Selector** is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

The default is **Thick**.

### Hardware Address

Displays the physical address that identifies the XDS on the Ethernet. You cannot change this value.

### IP Address

Set the Internet Protocol (IP) address that identifies the XDS on the Ethernet.

Format the address using one of the following formats:

- dotted decimal
- absolute hexadecimal

If you use 0, the XDS tries to discover its IP address by sending Reverse Address Resolution Protocol (RARP) and Bootstrap protocol (BOOTP) requests on the local Ethernet. The XDS accepts the first response it receives, whether through RARP or BOOTP. Make sure the XDS is entered in the RARP and BOOTP data bases.

## The RARP and BOOTP data bases

Unless you have supplied a specific Internet Protocol (IP) address, the XDS knows only its hardware address, and not its protocol address, when it starts up.

The XDS works only if it knows its IP address. If you don't specify an IP address, or if you use 0, the XDS sends out Reverse Address Resolution Protocol (RARP) and Bootstrap (BOOTP) requests on the network to discover its IP address from a server on the network. This server matches the hardware address with a corresponding IP address.

In order for the server to recognize the XDS hardware address as corresponding to an IP address, the XDS hardware address must be entered in the RARP or BOOTP data bases on the servers. The network administrator who maintains these data bases should be notified of the XDS hardware address.

---

### IP Network Mask

Set to the mask of IP network and subnetwork bits used on the local Ethernet.

Format the mask using one of the following formats:

- dotted decimal
- absolute hexadecimal

If you use 0, the XDS uses information from the Setup menus plus information from the network to determine a correct mask. The default is 0.

### IP Broadcast Address

Set to the preferred broadcast address for the local Ethernet.

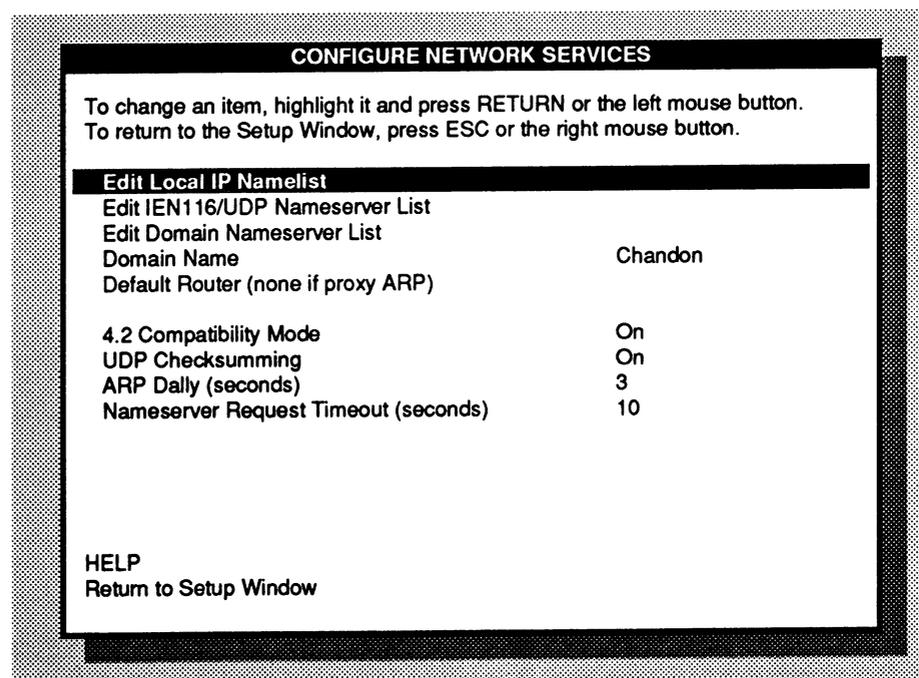
Format the address using one of the following formats:

- dotted decimal
- absolute hexadecimal
- a broadcast address

If you use 0, the XDS uses information from the Setup menus plus information from the network to determine a correct address. The default is 0.

---

## The Configure Network Services menu



The following describes the options on the **Configure Network Services** menu:

### **Edit Local IP Namelist**

If you want to use host names (instead of IP addresses) in Setup and Telnet, and you do not use domain or IEN116 nameservice, or want to supplement it, select this option to create a local database matching host names to their IP addresses.

For more information on resolving host names to their IP addresses, see "Designating nameservers to resolve strings," above.

Type in a list of host names and their corresponding IP addresses. Format the values using the following format:

*IPaddress namestring*

You may enter up to 12 values.

The nameservice you will achieve through **Edit Local IP Namelist** may not be as reliable as the nameservice you receive with domain or IEN116 nameservice (see below) because someone can change names and addresses without notifying you of the change. In general, then, you should rely on **Edit Local IP Namelist** for nameservice only if the number of hosts you use is small and the changes in name or address are infrequent.

### **Edit IEN116/UDP Nameserver List**

Set this option if your system uses IEN116 nameservice.<sup>7</sup>

Type in a list, in order of priority, of nameservers for handling IEN116 nameservice requests. The XDS uses only the first three valid nameservers.

Do not use 0 for any of the nameservers.

Format the nameservers using the following formats:

- dotted decimal
- absolute hexadecimal
- a string

Do not format all the nameservers as strings. In order for the XDS to look up the name indicated by a string, at least one server must already be configured and must respond successfully to the request.

<sup>7</sup> IEN116 stands for Internet Engineering Note 116, that document that set out the original specifications for this type of nameservice. Sometimes, IEN116 nameservice is referred to as "UDP" nameservice. For the sake of familiarity, the XDS Setup menus use both names.

- a broadcast address

### Edit Domain Nameserver List

Set this option if your system uses domain nameservice.

Type in a list, in order of priority, of nameservers for handling domain requests. The XDS uses only the first three valid nameservers.

Do not use 0 for any of the nameservers.

Format the nameservers using the following formats:

- dotted decimal
- absolute hexadecimal
- a string

Do not format all the nameservers as strings. In order for the XDS to look up the name indicated by a string, at least one server must already be configured and must respond successfully to the request.

- a broadcast address

### Domain Name

Set this value if your system uses domain nameservice, and you want users to be able to type in only the machine name (and not the domain) for machines in the local domain.

Type in the default suffix to be appended to a nameserver request that does not already have a domain suffix (indicated by the "." separators in the request). Use the local domain name.

You must use a name that begins with a letter and contains only letters, digits, "-", and ".".

### Default Router

Set the router (gateway) that you want the XDS to use when it sends packets to a host that is not on the local IP network.

Use the address of a gateway that is directly accessible by the XDS and can perform the packet routing. If another gateway is able to act as proxy and route packets, or if you do not want gateway connections, leave the setting blank.

The default is blank.

Format the router using one of the following formats:

- dotted decimal
- absolute hexadecimal
- a string

### 4.2 Compatibility Mode

Select **On** if the XDS will be communicating with hosts that use 4.2 BSD networking. Select **Off** if the host will not be communicating with hosts that use 4.2 BSD networking.

**4.2 Compatibility Mode** is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

The default is On.

#### 4.2 compatibility mode

Some examples of systems that use 4.2 BSD networking operating system are Ultrix 1.x and 2.x and SUN OS 3.0-3.2. When **4.2 compatibility mode** is On, the XDS selects broadcast addresses as net.0 if you do not specify an explicit broadcast address, and makes other internal changes to ensure compatibility.

If **4.2 compatibility mode** is set to Off, broadcast addresses are selected as net.-1 if you do not specify an explicit broadcast address.

### UDP Checksumming

Select **Enabled** to have the XDS check for errors in packet transmission.

Select **Disabled** to turn off UDP checksumming.

Select **Disabled** only in rare cases when data transmission is not working.

**UDP Checksumming** is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

The default is Enabled.

### ARP Dally

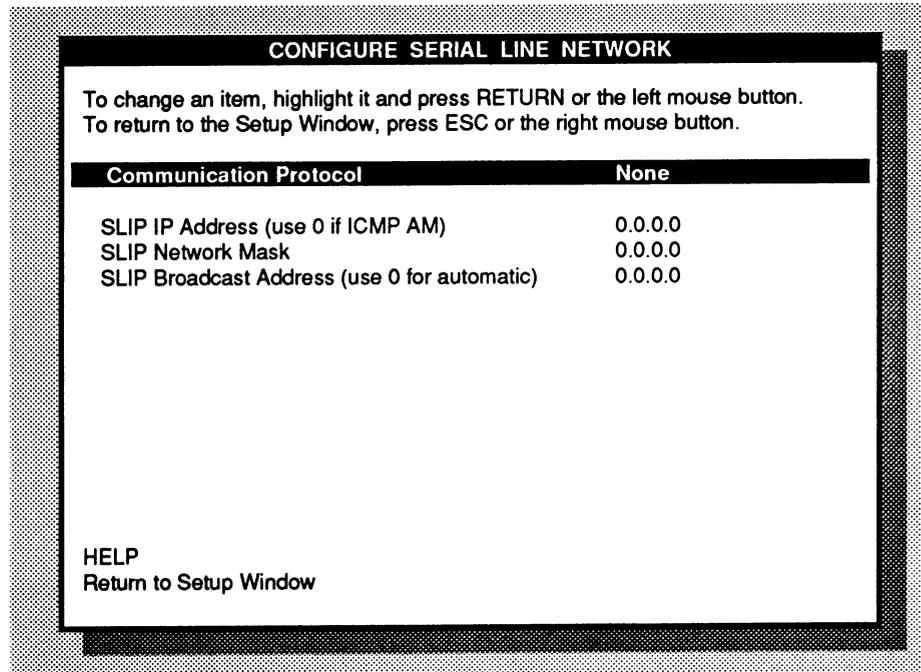
Set the time (in seconds) that the server is to wait for an Address Resolution Protocol (ARP) reply to match a machine's IP address with a hardware address. before it discards the packet. Select an integer between 1 and 5. The default is 3.

### Nameserver Request Timeout

Set the time (in seconds) that the XDS is to wait for a response from a listed nameserver (see "Edit domain nameserver list," , and "Edit IEN116/UDP nameserver list," below) before it gives up. Select an integer between 1 and 60. The default is 10.

---

## The Configure Serial Line Network menu



If you will be communicating with hosts using Serial Line Internet Protocol (SLIP), you need to set options on the **Configure Serial Line Network** menu.

The following described the options on the **Configure Serial Line Network** menu.

### Communication Protocol

Select **SLIP** if you will be communicating over serial line.

Select **None** if you will not be communicating over serial line.

**Communication Protocol** is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

The default is **None**.

### SLIP IP Address

Set the Internet Protocol (IP) address to be used by the XDS on the serial line connection.

Format the address using one of the following formats:

- dotted decimal
- absolute hexadecimal

If you use 0, the XDS tries to establish its identity at power-up by sending Internet Control Message Protocol Address Mask (ICMP AM) requests. Few hosts (with the exception of those that use 4.3 BSD networking) will reply appropriately or usefully to such requests. Therefore, unless you know that such a host is configured and responding on the serial line connection, use the actual IP address to ensure a successful network connection.

### **SLIP Network Mask**

Set to the mask of the IP network used on the local serial line network.

Format the address using one of the following formats:

- dotted decimal
- absolute hexadecimal

If you use 0, the XDS uses information from the Setup menus, plus information from the network to determine a correct mask. The default is 0.

### **SLIP Broadcast Address**

Set to the preferred broadcast address for the local serial line connection.

Format the address using one of the following formats:

- dotted decimal
- absolute hexadecimal

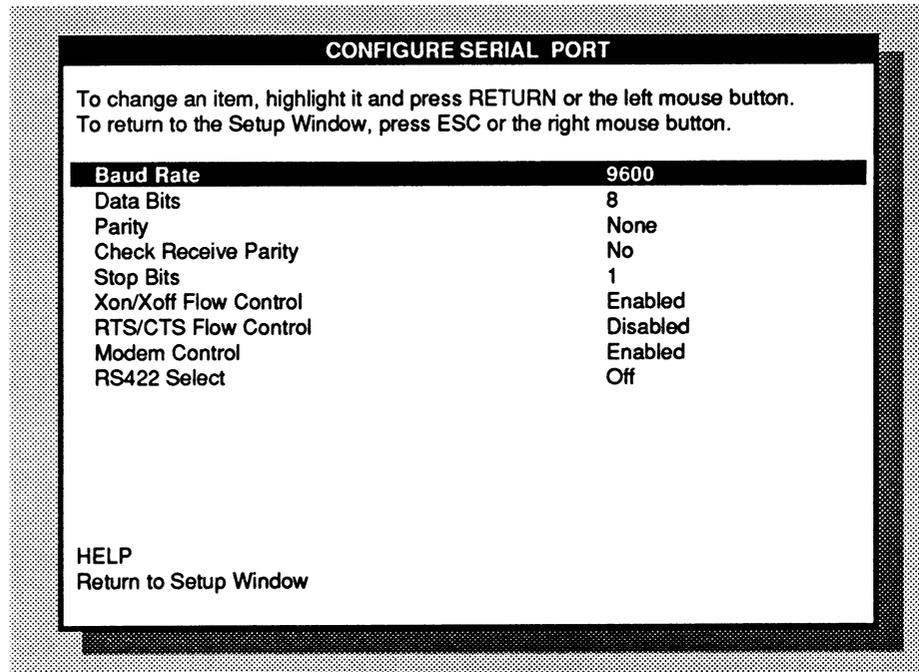
If you use 0, the XDS uses information from the Setup menus plus information from the network to determine the correct address. The default is 0.

---



---

## The Configure Serial Port menu



The following describes the options on the **Configure Serial Port** menu:

### Baud rate

Set to the baud rate the serial line driver uses. Use 300, 600, 1200, 2400, 4800, 7200, 9600, 19200, or 38400. Because of the amount of data required by X server communications, you should use a setting greater than or equal to 9600. The default is 9600.

**Baud Rate** is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

### Data Bits

Set the number of bits that make up each character transmitted. Select from 8 or 7.

**Data Bits** is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

The default is 8.

### Parity

Set the type of parity the XDS generates when it transmits a character. Select from **None**, **Mark** (to use 1), **Space** (to use 0), **Even**, or **Odd**.

Parity is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

The default is **None**.

### Check Receive Parity

Select **Yes** to cause the XDS to check that the parity of each character it receives matches the parity selected (see "Parity," above). If you select **Yes**, the XDS discards characters that do not match the selected parity.

Select **No** to cause the XDS to accept characters it receives without checking the parity.

Check Receive Parity is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

The default is **No**.

### Stop Bits

Set the number of bits the XDS sends to signal the end of each character. Select from **1** or **2** bits.

Stop Bits is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

The default is **1**.

### Xon/Xoff Flow Control

Select **Enabled** to use Xon (CTRL-S) and Xoff (CTRL-Q) ASCII characters to dynamically enable or disable the data flow.

Select **Disabled** if the device you're using does not require or support Xon/Xoff flow control.

Xon/Xoff Flow Control is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

The default is **Enabled**.

### RTS/CTS Flow Control

Select **Enabled** to use RTS/CTS signals to control the flow of data through the RS232/423 interface. Select **Enabled** only if the

device you are using (for example, a modem) supports RTS/CTS flow control.

The XDS does not normally need to use RTS/CTS flow control, except at the highest baud rate during busy communications. The device or modem you're using may require it, though. Check with your system administrator.

Select **Disabled** if the device you're using does not require or support RTS/CTS flow control.

**RTS/CTS Flow Control** is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

The default is **Disabled**.

### Modem Control

Select **Enabled** if you are using a modem to cause the XDS to assert the DTR line when a connection to a host through the serial port is present.

Select **Disabled** if you are not using the serial port to connect to a host.

**Modem Control** is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

The default is **Enabled**.

### RS422 Select

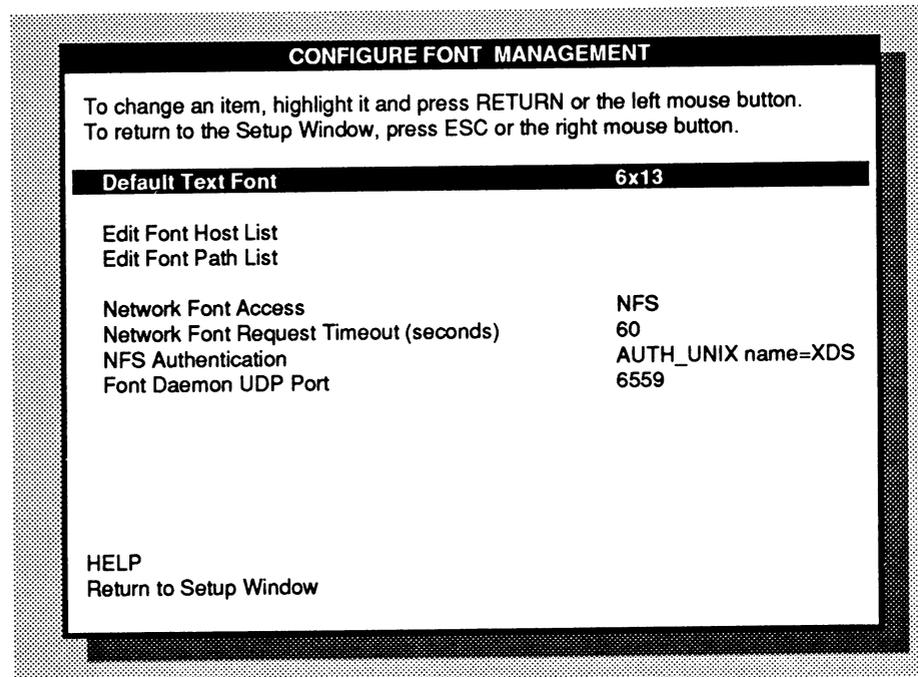
Select **On** if the host port to which the serial port is connected is an RS422-compatible interface..

Select **Off** if the host port is an RS422C-compatible interface..

**RS422 Select** is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

The default is **Off**.

## The Configure Font Management menu



The following described the options on the **Configure Font Management** menu:

### Default Text Font

Set the font the XDS uses to display text when an application does not request a specific font or when the XDS cannot find the font the application requested. Choose a font from the local fonts available on the XDS

**Default Text Font** is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings. For a complete list of the XDS local fonts, see Appendix A.

The font named **fixed** is aliased to the **Default Text Font**

The default for the X-19 XDS is 6 x 13. The default for the X-15 XDS is 9x15.

### Edit Font Host List

If you're using the XDS with the Network File System (NFS), XDS Font Server Program, or the Trivial File Transport Protocol (TFTP), the XDS can request fontservice (responding to font requests, and downloading the fonts) from a set of hosts. You specify these hosts using the **Edit Font Host List** option. The

following explains how the XDS makes requests to font hosts, and how to format the list of font hosts.

When the XDS starts up, it makes a fontservice request to a set of font hosts, which you specify in the **Edit Font Host List** option. The XDS allows connection to the first host that responds. If no host responds, the XDS issues the request again.

Use font hosts that have NFS, the XDS Font Server Program, or TFTP loaded and compiled on them.

Format the hosts using the following formats:

- dotted decimal
- absolute hexadecimal
- a string
- a broadcast address

If you are using the XDS with NFS, do not format the hosts using a broadcast address.

The default is an empty list.

### Edit Font Path List

The font path list describes the font directories the XDS searches when an application requests a font. The XDS can use different sets of fonts, depending on:

- whether you use a font server program
  - the paths you specified in **Edit Font Path List**.
- and
- the order in which you specified the font path.

If you do not receive fonts through a font server program, you can use only those fonts that are available on the XDS. You don't need to specify a default font path. For a list of the fonts available on the XDS, see Appendix A.

Choose among the following types of directories:

- the local fonts available on the XDS. Format the local directory by typing **LOCAL/**.

Remember to use ALL CAPS and include the slash (/).

If you don't explicitly designate the local fonts (**LOCAL/**), the XDS searches them first.

- the path specifying the directories on your host machine that contain font files. Format the directories according to the requirements of the X Window System. The XDS can accept any fonts in Server Normal Format (SNF) with paddings up to 4 bytes and either big-endian or little-endian byte ordering.

For more information on formatting font directories, see Appendix B.

The default is an empty list. (When the list is empty, the XDS searches only the local fonts.)

## How the XDS searches for fonts

When an application requests a font, the XDS does one of the following, depending on the way you use the XDS:

- If you haven't specified a list of font paths or you do not use a font server program, the XDS looks for the font in the local fonts. If the font is unavailable, the XDS tells the requesting application that it can't find the font. Usually, the application asks the XDS to substitute a different font--the default text font--from the XDS local fonts. (This depends on the capabilities of the application, and not on the XDS.)
- If you have specified a list of default font paths and you do use a font server program, the XDS then looks for the font following the order you specified in **Edit Font Path List**.

These directories are on your font host machine(s) and are formatted according to the requirements of the X Window System. For more information on formatting font files, see Appendix B.

If the XDS can't find the font in the directory(ies) you specified, the XDS tells the requesting application that it can't find the font. Usually, the application asks the XDS to substitute a different font--the default text font--from the XDS local fonts. (This depends on the capabilities of the application, and not on the XDS.)

## Designating the font paths

To specify the directories the XDS searches, start from the **Configure Font Management** menu and follow these steps:

1. **Select Edit Font Path List.**  
The XDS opens a window containing the current list (in this case, an empty list).
2. **Type a**  
Do not press RETURN.  
The XDS shows you the prompt "Enter value:".
3. **After "Enter value:", type in the first directory you want the XDS to search when an application requests a font.**

If you make a mistake while you're typing, backspace over the error and retype the value, or press CTRL-c to cancel the edit. To retype the value, press RETURN again.

If you accidentally type the list out of order, move the cursor to the value(s) you want to alter, and type a to append, c to change, i to insert, and d to delete a value.

The XDS adds the font path to the list.

4. If you need to add other font paths to the list, repeat steps 2 - 3 for every font path needed.
5. Press ESC.

The XDS returns you to the **Configure Font Management** menu.

When an application requests a font, the XDS looks for the font following the order you specified in **Edit Font Path List**. If the XDS finds the font in a host directory (rather than in the local fonts), it downloads the font to the XDS through the font server program you're using.

### Some examples

1. You are using the Font Daemon and have three font directories (*dir1*, *dir2*, *dir3*) on your font host that you want the XDS to search. Because you frequently use some fonts that are not in the local fonts, you don't want the XDS to search the local fonts first.

Your list of default font paths might look like this:

```
dir2
LOCAL/
dir3
```

2. You are using the Network File System (NFS) and have two font directories (*dir1*, *dir2*) on your font host. *dir2* contains a font that is also in the local fonts, but the set in *dir2* contains a greater number of characters. You want the XDS to search *dir2* before it searches the local fonts.

Your list of default font paths might look like this:

```
dir2
LOCAL/
dir1
```

---

### Network Font Access

Select the access method by which the XDS will receive fonts across the network.

Select **Font Daemon** to receive fonts through the XDS Host Software's Font Daemon.

Select **NFS** to receive fonts through the Network File System (NFS).

Select **TFTP** to receive fonts through the Trivial File Transfer Protocol (TFTP).

Make sure that the network file server that you want to load fonts from is running the TFTP protocol. On UNIX-based systems, this means launching the TFTP daemon, `tftpd`, or perhaps enabling the internet daemon, `inetd`, to listen for TFTP requests.

Note that on many host systems TFTP may be running in "secure" mode, which generally means the the font directories must be put in a "secure directory" on that host (for example, in `/tftpboot`).

Select **None** to use only the local fonts available on the XDS.

For a list of the local fonts available on the XDS, see Appendix A.

**Network Font Access** is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

The default is **None**.

### Network Font Request Timeout

Set the time (in seconds) that the XDS is to wait for a response from a listed font host before it reissues the request. The default is 60.

The default is 60.

### NFS Authentication

If you use NFS to receive fonts (see above) select this option to set the mechanism by which NFS checks the XDS address and host name to provide security over NFS.

Select **AUTH\_NONE** to have the XDS provide no authentication information in its requests over NFS.

**AUTH\_NONE** may not be acceptable to many NFS servers. Select **AUTH\_NONE** only if you are certain that your server can accept it.

Select **AUTH\_UNIX name=XDS** to have the XDS provide information about its general identity in its requests over NFS. The NFS server looks up "XDS" to verify that it matches the IP address of XDS units.

In order for the server to look up the name, "XDS" must be listed in a name table and/or export list. For more information on setting up your system to provide NFS authentication, see Appendix C.

Select `AUTH_UNIX unique name=XDSxxxx` to have the XDS provide unique information about its identity. The NFS server looks up "XDSxxxx" to verify that it matches the IP address of your XDS.

`xxxx` represents a unique 5-character id, a converted form of the Ethernet IP address. You cannot change this number. In order for the server to look up the name, "XDSxxxx " must be listed in a name table and/or export list. For more information on setting up your system to provide NFS authentication, see Appendix C.

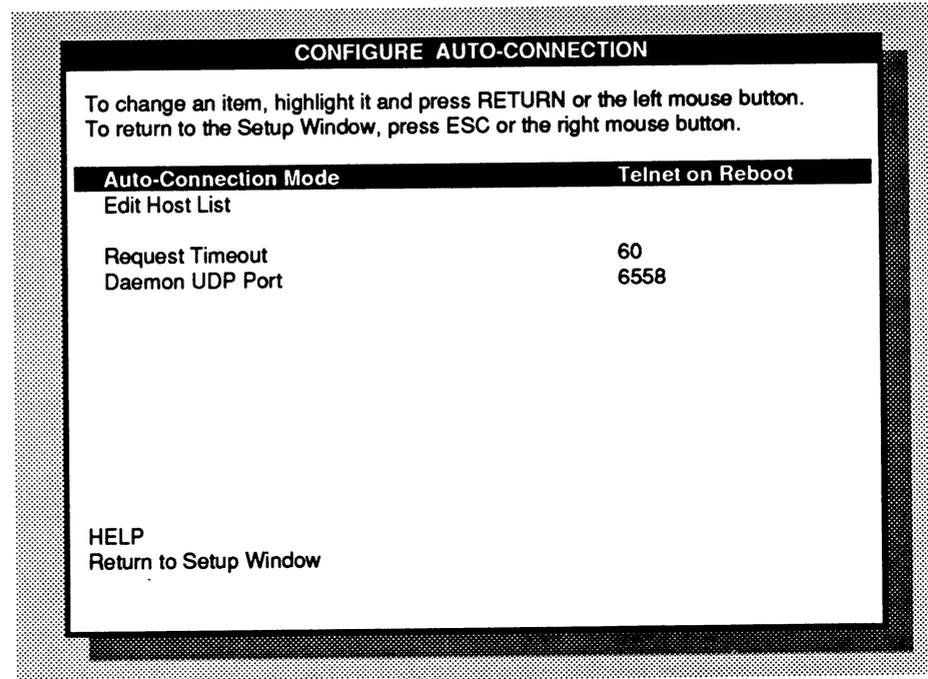
**NFS Authentication** is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

The default is `AUTH_UNIX name=XDS`.

### Font Daemon UDP Port

If you use the Font Daemon for fonts (see "Network Font Access," above), set the port to which the XDS directs Font Daemon requests. The default is 6559.

## The Configure Auto-Connection menu



If you're using the XDS with the XDS Host Software or an auto-connection program, you need to specify the lists of hosts that you want the XDS to make connection requests to. To do this, use the options on the **Configure Auto-Connection** menu.

The following describes the options on the **Configure Auto-Connection** menu:

### Auto-Connection Mode

When **Disabled** is selected, the XDS makes no attempt to connect to anything at power-up or at server reset (after the last X client connection is closed).

When **XDM** is selected, the XDS will attempt to connect to a special version of the X.V11R3 *xm* display manager program that runs as a daemon and listens for connection requests from XDSs. The XDS will attempt to connect to every host in the **Host List** simultaneously – the first one that responds wins. This interaction is *not compatible* with the XDMCP protocol which is supported by the X.V11R4 version of *xm*; you have to get a special version of *xm* from Visual called *xdsxm*.

When **Telnet on Reboot** is selected, the XDS will automatically bring up the Connection Window on power-up and whenever you reboot the terminal using the **Reset Terminal (reboot)** option on the System Window. If there is a host in the Host List (only the first host in the list matters), the command line will contain the

string telnet *hostname*, and to actually initiate the telnet session, just press the ENTER key. If you'd rather connect to a different host than the default, simply backspace over the host name and type in another.

When **Telnet on Logout** is selected, the XDS will bring up the Connection Window not only on power-up and reboot, but also whenever the last X client connection closes (such as when you select the **Close All Connections (logout)** option on the System Window).

**Auto-Connection Mode** is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

The default is **Disabled**.

### **Edit Host List**

Type in a list of hosts to which the XDS makes a connection request when it starts up. The XDS issues a request to all connection hosts on the request list and allows connection to the first host that responds.

Format the hosts using the following formats:

- dotted decimal
- absolute hexadecimal
- a string
- a broadcast address

The default is an empty list.

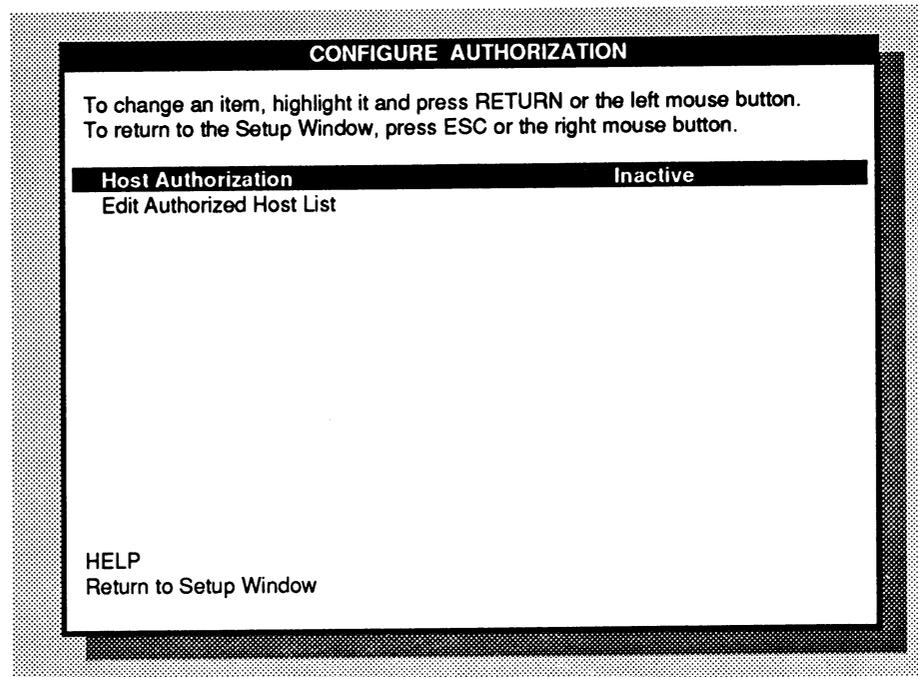
### **Request Timeout**

Set the time (in seconds) that the XDS is to wait for a response from a listed host before it reissues the request. The default is 60.

### **Daemon UDP Port**

Set the port to which the XDS directs connection requests. The default is 6558.

## The Configure Authorization menu



The following describes options on the **Configure Authorization** menu:

### Host Authorization

Select **Active** to initially (at each server reset) restrict connection with the XDS to those hosts specified in **Edit Authorization Host List** (see below). X clients on authorized hosts may change the authorized host list remotely.

Select **Inactive** to initially (at each server reset) allow any host to connect to the XDS. X clients may subsequently change the authorized host list remotely, activating the host restriction feature.

Select **Disabled** to completely disable the host authorization feature and always allow any hosts to connect. Note that this may result in confusing status messages from standard x applications such as *xhost*.

**Host Authorization** is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

The default is **Disabled**.

### Edit Authorized Host List

Type in a list of hosts that are authorized to connect to the XDS.

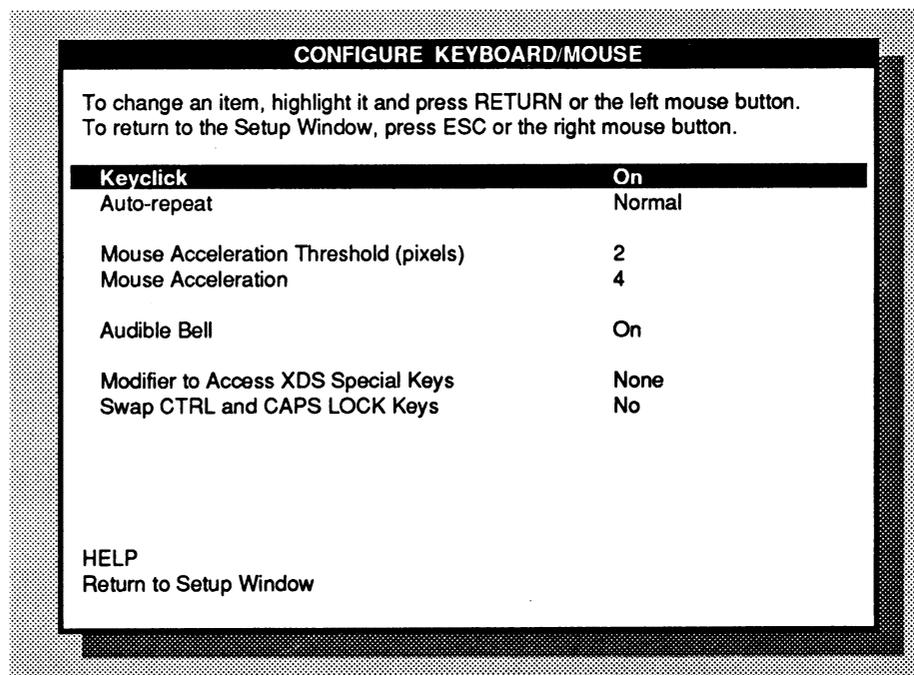
Format the hosts using the following formats:

- dotted decimal
- absolute hexadecimal
- a string

The XDS uses the list of authorized hosts only when **Host Authorization** (see above) is set to **Active**.

If **Host Authorization** is set to **Active** and there are no hosts listed in **Edit Authorized Host List**, then no host can connect to the XDS. Make sure when **Host Authorization** is **Active** that you have specified at least one host in **Edit Authorized Host List**.

## The Configure Keyboard/Mouse menu



The following describes the options on the **Configure Keyboard/Mouse** menu.

#### Keyclick

Select **On** to make each key press audible. Select **Off** to silence key presses. The default is **Off**.

Keyclick is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

### Auto-repeat

Set the rate at which the XDS repeats a character whose key you hold down. Select from **Off**, **Slow**, **Normal**, and **Fast**. The default is **Normal**

Auto-repeat is a toggle option. Select a rate by pressing RETURN or the left mouse button and cycling through the settings.

### Mouse Acceleration Threshold

Set the number of pixels that the mouse must move before mouse acceleration (see below) takes effect. The default is **4**.

### Mouse Acceleration

Set the ratio of actual mouse movement to how much movement is sent to the display. For example, if you have set the mouse acceleration to **3** and mouse acceleration threshold (see above) is **4**, when you move the mouse **14** pixels, the XDS will send a movement of **30** [ $3 \times (14-4)$ ] pixels, or the actual mouse movement minus the mouse threshold, times the mouse acceleration value.

### Audible Bell

Select **On** to hear a bell when an application issues a warning. Select **Off** if you do not want to hear a bell. The default is **Off**.

Audible bell is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

### Modifier to Access XDS Special Keys

If you use a VT220-style keyboard, set the key you press in addition to an XDS special key (**MESSAGES**, **RESET**, **SETUP**, **CONNECT**, and **BREAK**) to cause the XDS to read the key as a special key instead of a function key (F1-F5).

Select **None** to cause the XDS to assume a special key whenever you press a special key. When **None** is selected, F1-F5 are always assumed to be XDS special keys and do not work as function keys.

Select **Shift** to cause the XDS to assume an XDS special key only when you press **SHIFT** in conjunction with an XDS special key. When **Shift** is selected, the XDS assumes a function key (F1-F5) when you do not press **SHIFT**.

Select **Ctrl** to cause the XDS to assume an XDS special key only when you press **CTRL** in conjunction with an XDS special key.

When **Ctrl** is selected, the XDS assumes a function key (F1-F5) when you do not press **CTRL**.

**Modifier To Access XDS Special Keys** is a toggle option. Select a setting by pressing **RETURN** or the left mouse button and cycling through the settings.

### Swap CTRL and CAPS LOCK Keys

Select **Yes** to swap the functions of the **CTRL** and **CAPS LOCK** keys. If you select **Yes**, pressing **CTRL** locks caps and **CAPS LOCK** works as the **CTRL** key.

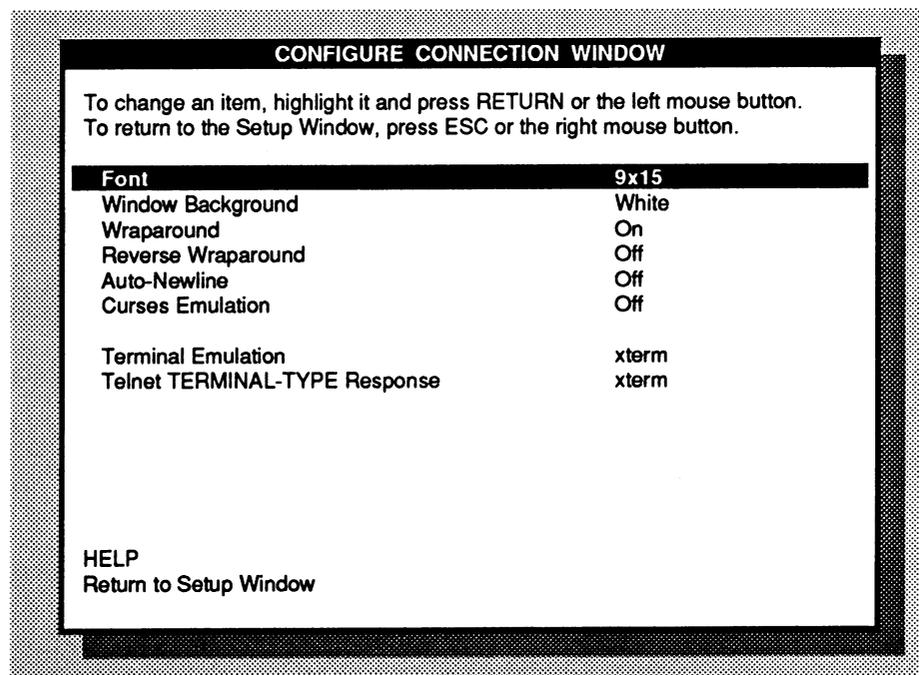
Select **No** to retain the original functionality of the **CTRL** and **CAPS LOCK** keys

**Swap CTRL and CAPS LOCK Keys** is a toggle option. Select a setting by pressing **RETURN** or the left mouse button and cycling through the settings.

The default is **No**.

---

## The Configure Connection Window menu



The following describes the options on the **Configure Connection Window** menu:

### Font

Set the font the XDS uses to display text in the Connection Window. Choose a font from the local fonts available on the XDS. The default for the X-19 XDS is 9x15.

Font is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings. For a complete list of the XDS local fonts, see Appendix A.

When you change the font for the Connection Window, note that the XDS applies this change to all system windows.

### Window Background

Select **White** to have the XDS use a white background when it displays the Connection Window.

Select **Black** to have the XDS use a black background when it displays the Connection Window.

Window Background is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

The default is **White**.

### Wraparound

Select **On** to cause the XDS to continue text to a new line when it reaches the end of a line.

Select **Off** to cause the XDS to continue text to a new line only after you press RETURN.

Wraparound is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

The default is **On**.

### Reverse Wraparound

Select **On** to cause the XDS to move the cursor backward or backspace to the line above when you reach the beginning of a line.

Select **Off** to cause the XDS to stop moving the cursor backward or backspacing when you reach the beginning of a line.

Reverse Wraparound is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

The default is **Off**.

### Auto-Newline

Select **On** to cause the XDS to place a new line character at the beginning of the next line each time you press RETURN.

Select **Off** to have the XDS create a new line without a new line character each time you press RETURN.

**Auto-Newline** is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

The default is **Off**.

### Curses Emulation

Select **On** if you are using the Curses UNIX application with the XDS.

Select **Off** if you are not using the Curses UNIX application with the XDS.

**Curses Emulation** is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

The default is **Off**.

### Terminal Emulation

Set the terminal emulation type for the **Connection Window**. Select from **ANSI, vt100, vt102, vt52, xterm, or TTY**.

**Terminal Emulation** is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

The default is **xterm**.

### Telnet TERMINAL-TYPE Response

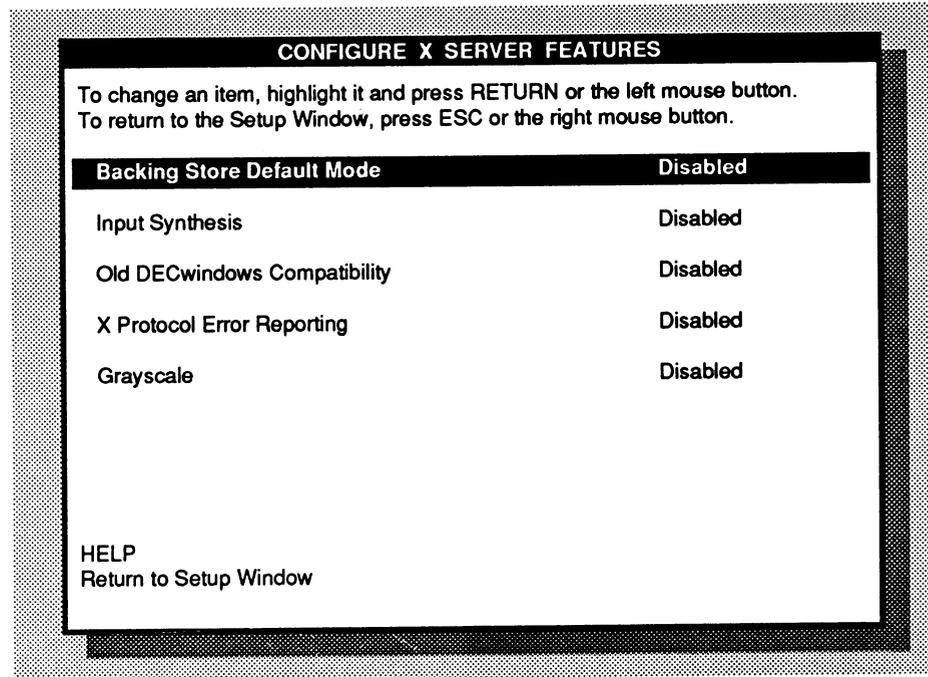
Set the terminal type response given in Telnet mode when there is a request for a **TERMINAL-TYPE**. This does not affect the terminal mode that you use in Telnet. You may use any string.<sup>8</sup>  
The default is **xterm**.

---

<sup>8</sup> You do not need to have designated a nameserver for this option.

---

## The Configure X Server Features menu



The following describes the options on the **Configure X Server Features** menu:

### Backing Store Default Mode

Select **Disabled** to have the XDS not save the contents of a window while it is obscured. While **Disabled** is selected, when you uncover a window or portion of a window, the XDS tells the application that owns the window to redraw it.

Select **When requested** to have the XDS save the contents of an obscured window or portion of the window when the application requests it. While **When requested** is selected, when you reveal a window or portion of a window, the XDS can display it without delay for the application to redraw it.

Select **When mapped** to have the XDS always save the contents of any window that is displayed and is not an icon. While **When mapped** is selected, when you reveal a window or portion of a window, the XDS can display it without delay for the application to redraw it (except in cases where the application requests a delay.)

The default is **Disabled**.

**Backing Store Default Mode** is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

When XDS available memory gets low, requests for backing store will be denied, and memory currently in use for backing store will be reclaimed.

For more information on the X Window System's backing store feature, see *Xlib Programming Manual*.

### Input Synthesis

Select **Enabled** to allow client applications to use the Input Synthesis feature of the X Window System to capture keyboard and mouse input to the XDS. (For more information on Input Synthesis, see "Recreating input to the XDS," on page 101.) If you select **Enabled**, you can use Input Synthesis to capture keyboard and mouse input to the XDS and play it back later without intervention on the part of an operator or user.

Select **Disabled** to prevent client applications from capturing keyboard and mouse input to the XDS. The default is **Disabled**.

Client applications can use the Input Synthesis feature to capture any information given to the XDS through the mouse or keyboard, including passwords and other security information. In general, then, leave **Input Synthesis** at **Disabled** and change it only when you know a client will be using the Input Synthesis feature.

**Input Synthesis** is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

### Old DECwindows Compatibility

Select **Enabled** to force the XDS to bit-swap any image data on a connection made from a byte-order-switched host. This effectively masks a problem with old versions of DECwindows<sup>9</sup> that made images loaded from a VAX look very strange, indeed.

Select **Disabled** to use image data as-is.

<sup>9</sup> DECwindows is a trademark of Digital Equipment Corp.

Old DECwindows Compatibility is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

The default is Disabled.

### X Protocol Error Reporting

Select **Enabled** to have the XDS print a message in the **Messages Window** whenever an X Protocol error event is sent to an X client. Because of the asynchronous nature of X error reporting, this is a valuable debugging feature.

Select **Disabled** to silently send client error events.

X Protocol Error Reporting is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

The default is Disabled.

### Grayscale

*(X-19 Turbo with Video Expansion Option installed only.)*

Select **Enabled** to have the XDS report and use a four-entry color map consisting of the shades black, dark gray, light gray, and white.

Select **Disabled** to have the XDS ignore the extra plane of video memory and make black and white the only available colors.

Grayscale is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

Changing the value of the **Grayscale** option has no effect until the X server running on the XDS restarts. You can force this action by selecting the **Close All Connections (logout)** or the **Restart Terminal (reboot)** option on the System Window.

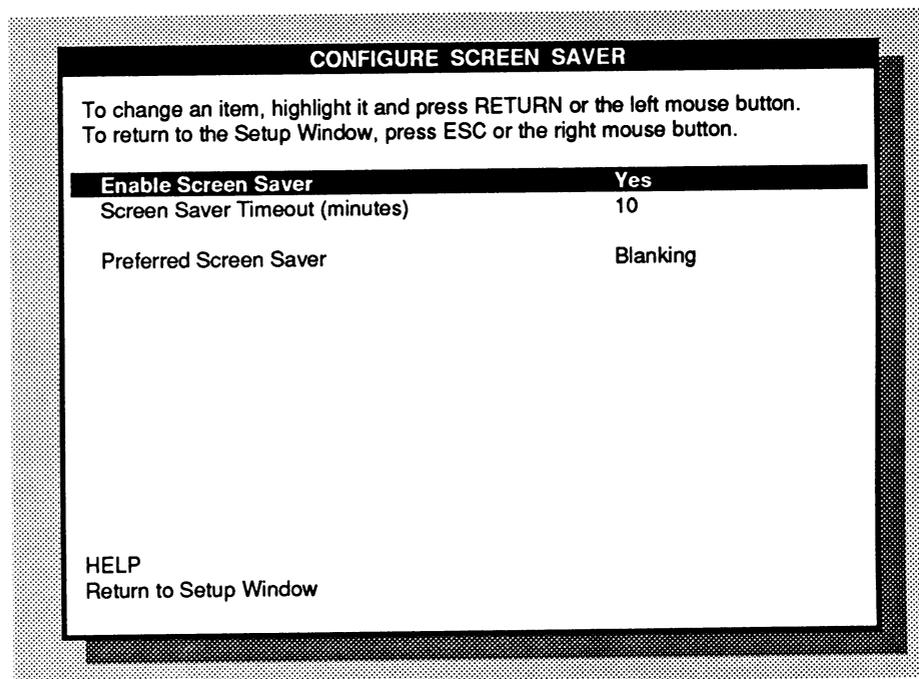
The default is Disabled.

The mapping of colors to gray shades is shown in Appendix E.  
For information on using gray shades, see *Using Grayscale* in Chapter 4.

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## The Configure Screen Saver menu



The following describes the options on the **Configure Screen Saver** menu:

### Enable Screen Saver

Select **Yes** to replace screen contents with the preferred screen saver image (see "Preferred Screen Saver," below) when screen save is in effect. Select **No** to continue to display screen contents when there is no input to the display. The default is **Yes**.

To interrupt screen saver and return the previous display to the screen, move the mouse or press any key.

**Enable Screen Saver** is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

**WARNING!** We strongly suggest that you do not disable the screen saver function, as the result could be burning of the phosphor when the same image is continuously displayed.

### Screen Saver Timeout

Set the time (in minutes) that the XDS is to wait after receiving the last keyboard or mouse input before it replaces screen contents with an image of the X logo or a blank screen. Use 0 if you do not want screen saver. The default is 10.

### Preferred Screen Saver

Select **Blanking** to have the XDS replace screen contents with a blank screen when there is no input to the display and screen saver is enabled (see "Enable Screen Saver," above).

Select **X logo** to have the XDS replace screen contents with an image of the X Window System logo when there is no input to the display and screen saver is enabled (see "Enable Screen Saver," above).

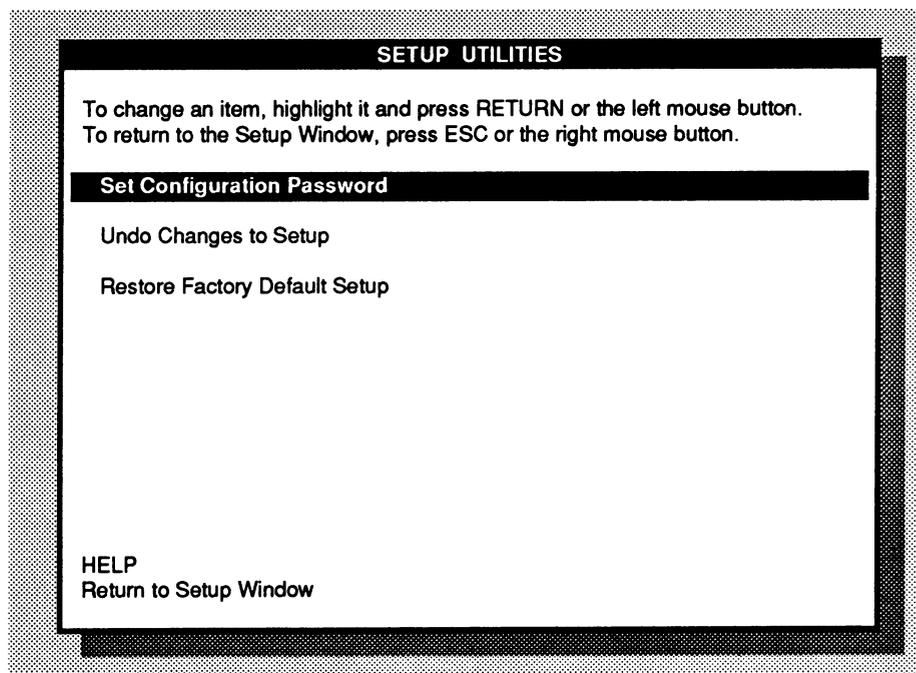
**Preferred Screen Saver is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.**

The default is **blanking**.

---

---

## The Setup Utilities Menu



The following describes the options on the **Setup Utilities** menu.

### Set Configuration Password

Select this option to restrict access to the XDS Setup submenus to those authorized to use them. Type an up-to-8-character password and press RETURN.

The next time you select an option on the **Setup Window** to go to a Setup submenu, the XDS asks you for your Configuration Password. Type the password and press RETURN.

If you forget your password, all Visual Technology at 1-800-537-6004 (outside MA) or 1-800-345-8998 (inside MA). A member of the Technical Support staff will provide you with a password based on your XDS hardware address.

The default is no password.

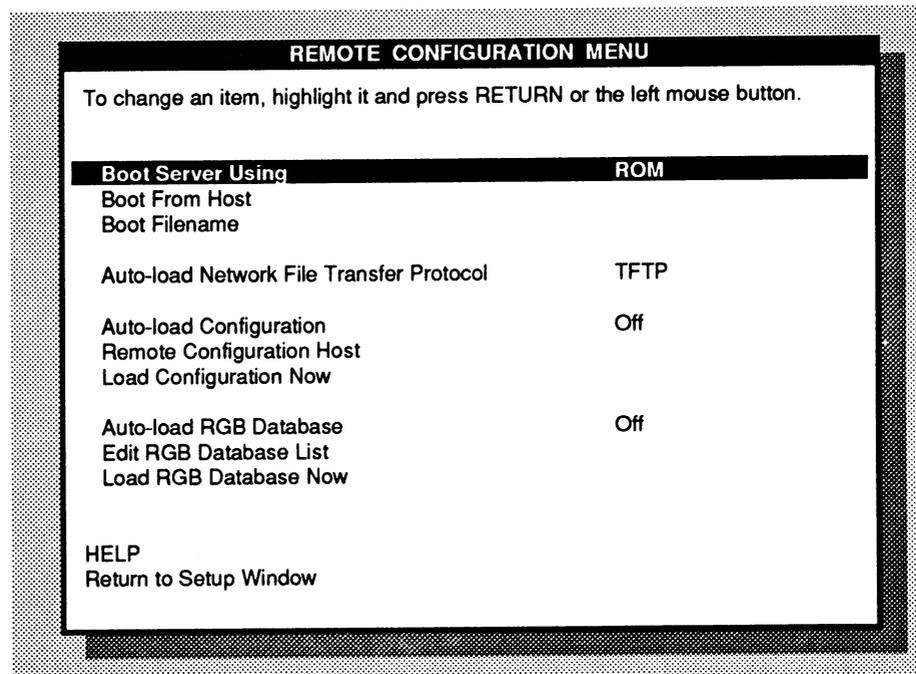
### Undo Changes to Setup

Select this option to undo any changes you made to the Setup configuration since you last saved your Setup changes.

### Restore Factory Default Setup

Select this option to reset all Setup options to their original default settings. The XDS shows you the prompt "The action will change current settings. Continue?" at the bottom of the screen. To continue, press Y. To cancel the selection, press N or any other key.

## The Remote Configuration Menu



There are three types of objects downloaded from network hosts that are controlled by this menu: the X server itself, a remote setup configuration file, and an *RGB Database* which allows a user to customize the X server's default color mapping table.

### Boot Server Using

This option identifies how to boot the X Window System server.

Select **ROM** if you have a Firmware Module installed which has the complete X server onboard and you want to use that server. The term ROM refers to the Read-Only Memory on the Firmware Module.

Select **TFTP** if you have a Firmware Module installed which does not contain the X server, or if it does contain the X server and you wish to override it with a downloaded version. The TFTP protocol is currently the only one supported for this booting operation. If you select TFTP here, you must make sure to have filled in the next two options, **Boot Host** and **Boot File**

correctly. The next time you power on or reboot the terminal (using the **Restart Terminal (reboot)** option on the System Window), the XDS will go into network boot mode. See "The Boot ROM Command menu" for more information.

**Boot Server Using** is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

Note that if you select **ROM** this does not mean that the server will be "booted" from ROM into main memory. In that case the X server is actually run in read-only memory.

The default for this option is **ROM** if a full-server firmware module is installed, or **TFTP** otherwise.

### Boot Host Boot File

When **TFTP** is selected as the method for booting the X Window server (above) these options identify the host where the X Server file resides and the file name to retrieve there.

Format the host using the following formats:

- dotted decimal
- absolute hexadecimal
- a string (which may be empty)

The format of the path will depend on the host environment. For example, on a UNIX system it should be an absolute path name, such as:

```
/usr/lib/X11/Visual/X19server
```

If the value for the **Boot Host** option is the empty string and the XDS received its IP address using the BOOTP protocol, the XDS will try to boot from the BOOTP host using the boot file name supplied in the BOOTP record. If anything fails, the XDS will prompt the user for a boot host and file.

For a full-server firmware module unit, the defaults are empty strings. For a boot module, the defaults are the names used to boot the current X server.

### Auto-load Network File Transfer Protocol

Select which network protocol will be used to download the *Remote Configuration File*, and the *RGB Database*, as described below. It can only be set to **TFTP** in this release, but we expect to support more protocols in future releases.

**Auto-load Network File Transfer Protocol** is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

### Auto-load Configuration

Select **On** to have a *Remote Configuration File* be downloaded to the XDS after each power-on and XDS reboot (see the *Reboot Terminal* command on the System Window). The format of the configuration file, which greatly resembles an X resource file, is specified in Appendix A. The values in the configuration file will replace the default values in the Setup Menus, just as if the values had been modified manually in the menus. If you select **On** for this option, you must also specify a **Remote Configuration Host**, below.

Select **Off** to use the saved Setup Menu values as defaults on power-up and reboot. The default is **Off**.

Auto-load Configuration is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

### Remote Configuration Host

Identify the host where the *Remote Configuration Files* for this XDS may be found. Unlike the other download items, you cannot specify file names for these files; there are two pre-defined file names which are searched for in order:

`/usr/lib/X11/Visual/ipaddress`

`/usr/lib/X11/Visual/xds-config`

where *ipaddress* is the IP (Internet Protocol) network address, in "dotted decimal" format (e.g. 128.0.5.145), of the particular XDS. Obviously this is UNIX-specific and case is important. Only one or the other of the files is downloaded.

There is no default for this item.

### Load Configuration Now

Select this item to have the XDS immediately attempt to download a *Remote Configuration File*, as detailed above. The new values in the file will replace the current *Setup Menu* values.

**Load Configuration Now** is a instant-action option. Force the load action to occur immediately by highlighting the option and pressing RETURN or the left mouse button.

**WARNING:** there is no way to undo this operation.

### Auto-load RGB Database

Select **On** to have one or more *RGB Databases* be downloaded to the XDS after each power-on and XDS reboot (see the *Reboot Terminal* command on the System Window). You specify where to find the databases using the *Edit RGB Database List* option. The RGB database file is simply an ASCII text file with lines formatted as follows:

*RRR GGG BBB ColorName*

where *RRR*, *GGG*, and *BBB* are integer numbers between 0 and 255 representing fractional intensities of red, green, and blue color components respectively. For example:

```
255 0 0      red
255 127 0    coral
128 128 128  gray
143 143 188  light steel blue
```

The values in the configuration file will augment (or replace, for the same color names) the current values of the X server color mapping table. These RGB numbers are translated into black and white or gray shade values based on a formula tuned to human vision. For a full listing of colors defined in the default server color mapping table and the gray shades they map to, see Appendix E.

Select **Off** to use the built-in default color mapping table alone on power-up and reboot. The default is **Off**.

Auto-load RGB Database is a toggle option. Select a setting by pressing RETURN or the left mouse button and cycling through the settings.

### Edit RGB Database List

Identify RGB database files to be automatically downloaded (when the **Auto-load RGB Database** option is **On**, or manually using the **Load RGB Database** option).

Each item in the list is formatted as

*hostname:filename*

where *hostname* is the host where this RGB database file is located, formatted as:

- dotted decimal
- absolute hexadecimal
- a string

and *filename* is the name of the RGB database file on that host machine, formatted as appropriate for that type of host.

The default for this option is the empty list.

### Load RGB Database Now

Select this item to have the XDS immediately attempt to download one or more *RGB Databases*, as detailed above. The new values in the database will augment or replace the current values in the X server's color mapping table.

**Load RGB Database Now** is a instant-action option. Force the load action to occur immediately by highlighting the option and pressing RETURN or the left mouse button.  
**WARNING:** there is no way to undo this operation.

---

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## The Boot ROM Command Menu

If your XDS contains a download version of the firmware module, or if you have a standalone version and you have configured it to download the server from a networked host instead, you could end up faced with the Boot ROM Command Menu under certain circumstances:

- You pressed ENTER during the autoboot sequence when faced with the message "Press ENTER within 10 seconds to prevent auto-boot."
- The download image file or the file server host you have configured does not exist.
- The file server where the download image is located cannot be contacted, for whatever reason.

The commands accessible to you at this time are described here. Unless ambiguous, you only need to type the first letter or two of the command as an abbreviation (for example **bo** instead of **boot**).

### **boot [host file]**

Use this command to download and execute an X server. To boot the default configured file from the default host:

0. Make sure that the network file server that you want to load the image from is running the TFTP protocol. On UNIX-based systems, this means launching the TFTP daemon, `tftpd`, or perhaps enabling the internet daemon, `inetd`, to listen for TFTP requests.
1. After the prompt ">" type **boot**.
2. Press RETURN.

The XDS will respond with the query "*host filename?*" showing you the default host and filename.

3. Press RETURN.

The XDS will commence the boot process, responding with load image sizing information.

To load and execute an image other than the configured default:

1. After the prompt ">" type **boot *host filename***, with the desired host file server IP address and the name of the load image file.
2. Press RETURN.

The XDS will commence the boot process, responding with load image sizing information.

The XDS uses the TFTP internetworking protocol to download server images. Make sure your file server has TFTP access enabled before you attempt to boot.

Note that on many host systems TFTP may be running in "secure" mode, which generally means the boot image must be put in a "secure directory" on that host (for example, in `/tftpboot`).

### **configure [full]**

Use this command to change configuration items when you are having trouble booting, and therefore do not have access to the Setup Menus.

Type `config`, then press RETURN, if you only need to change the Ethernet port selection, the IP address of the XDS, or the boot host and filename.

To change any other configuration parameter, type `config full`, then press RETURN, which will lead you through every Setup Menu configuration item.

For each item you wish to leave as is, simply press RETURN to get to the next item. If you wish to change an option, type in the new value, then press RETURN to get to the next option.

For more information on this command, see "Setting up the software on a Download XDS" in Chapter 2. For information on each configuration parameter, please refer to the corresponding Setup Menu option.

### **reset [factory]**

Type `reset` then press RETURN to simply reboot the XDS. To set every configuration parameter back to the original factory defaults before rebooting, type `reset factory`, then press RETURN.

There is no way to undo the effects of a factory reset, except to re-enter all the option values.

### **netstats**

### **ping**

### **serial [baudrate]**

### **telnet [host [port]]**

These commands are very similar to the commands available from the **Connection Window**, as described in Chapter 5, *When Things Go Wrong*.

### **diagnostics**

This command leads you to a menu of diagnostics commands, which are intended for use by Visual Technology Customer Support staff only.

**romboot**

Use this if you have a full-server firmware module and you want to boot the firmware server, overriding a saved configuration that by default boots from the network.



**Section 2**  
**Using the XDS**



# Chapter 4

## Working with Applications

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### In this chapter

In this chapter, you'll learn about using the XDS to work with applications, including:

- Connecting to hosts if you're using the XDS with an auto-connection program
  - Connecting to hosts if you're using the XDS without an auto-connection program
  - Starting an xterm terminal emulation program and other X-based applications
  - Changing options in Setup after you've started working with applications
  - Connecting to a host through a modem
  - Recreating input to the XDS
  - Using the grayscale option on an X-19 Turbo
- 
- 

### Connecting to hosts if you're using the XDS with auto-connection

If you're using auto-connection and you've set up the XDS properly (see Chapter 2, "Setting up the XDS Software for the First Time"), then when you first leave Setup, the XDS connects to a host and shows you a login window.

Let's review the steps that you took to get the XDS to make these connections.

You did:

1. You installed the XDS and connected it to the network.
2. You set up the IP address(es) and enabled the proper network connections.
3. You set up a list of authorized hosts.
4. You selected a font access method (if you're using NFS, TFTP, or the Font Daemon to receive fonts).

Using:

**The Configure Ethernet or the Configure Serial Line Network menu**

**The Configure Auto-Connection and Configure Authorization menus**

**The Configure Font Management menu**

5. You set up a list of font hosts and specified a list of default font paths (if you're using NFS, TFTP, or the Font Daemon to receive fonts).
6. You set up any other options that you needed to set to make the connections.
7. You left Setup, thereby saving your changes.

### The Configure Font Management menu

When you leave Setup, the XDS makes a connection request to the hosts on the Connection Host List. If a host responds to the connection request, the XDS shows you (after a little while, depending on the host) a login window.

The auto-connection program will have started an xterm terminal emulation program on your XDS. Using xterm, you can work with both X-based applications (designed for a bitmapped display) and other applications designed for standard alphanumeric displays (like a mail program).<sup>10</sup>

In addition, if you're using the Font Daemon, NFS, or TFTP to receive fonts, you will be connected to a font host. When an application requests a font, the XDS will look for the font following the paths you specified.

Once you login to your host, you can start other applications (you'll probably want to start a window manager program first), connect remotely to other machines, or start other xterm programs. At any time, you can also use the XDS Connection Window to connect to other hosts. For information on using the Connection Window to connect to other hosts, see "Starting a Telnet connection," on page 92.

## Connecting to hosts if you're using the XDS without auto-connection

If you are using the XDS without auto-connection, when you leave Setup, the XDS opens the Connection Window so you can make a manual connection to a host.

<sup>10</sup> Your Xlogin program should have placed your display address in your system environment so that the output of all subsequent applications is sent to your XDS display. If this is not the case, then you need to set the display variable yourself, using steps appropriate to your operating system. For example, if you use a UNIX-based operating system, you would first login to your host. Then, after the prompt, you might type:

```
setenv DISPLAY IPaddress:0
```

(substituting your XDS IP address), and press RETURN. The output of all subsequent applications would be sent to the XDS. See your system administrator for information on setting the display for the system you use.

First, let's review the steps you took up to the point where you left Setup.

<u>You did:</u>	<u>Using:</u>
1. You installed the XDS and connected it to the network.	
2. You set up the IP address(es) and enabled the proper network connections.	The <b>Configure Ethernet</b> or the <b>Configure Serial Line Network</b> menu
3. You selected a font access method (if you're using NFS or TFTP to receive fonts).	The <b>Configure Font Management</b> menu
4. You set up a list of font hosts (if you're using NFS or TFTP to receive fonts)	The <b>Configure Font Management</b> menu
5. You set up any other options that you needed to set.	
6. You saved your changes and left Setup.	

When you leave Setup, the XDS saves your Setup and shows you the **Connection Window**, but doesn't connect you to a host (it needs more information). If you are using NFS or TFTP for fonts, the XDS connects you to your font host.

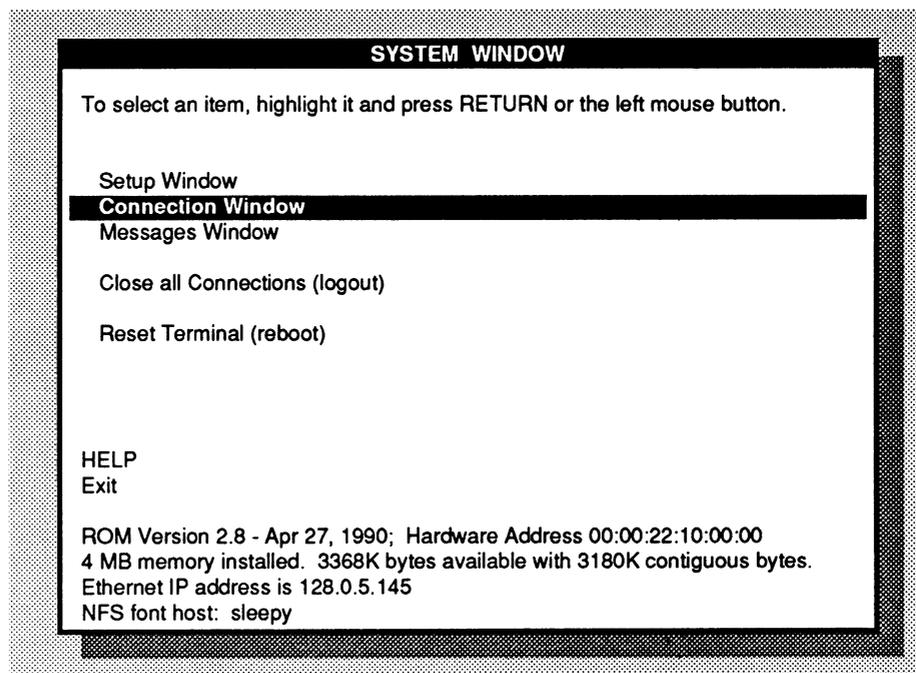
To connect to a host and start a login session, you need to make a manual Telnet connection to the host. You do this using the built-in facility on the XDS, the **Connection Window**. To use Telnet, follow the instructions in "Starting a Telnet connection," below.

## Starting a Telnet connection to a host

You need to make a manual Telnet connection to a connection host in order to start working with X clients. You do this using the built-in facility on the XDS, the **Connection Window**.

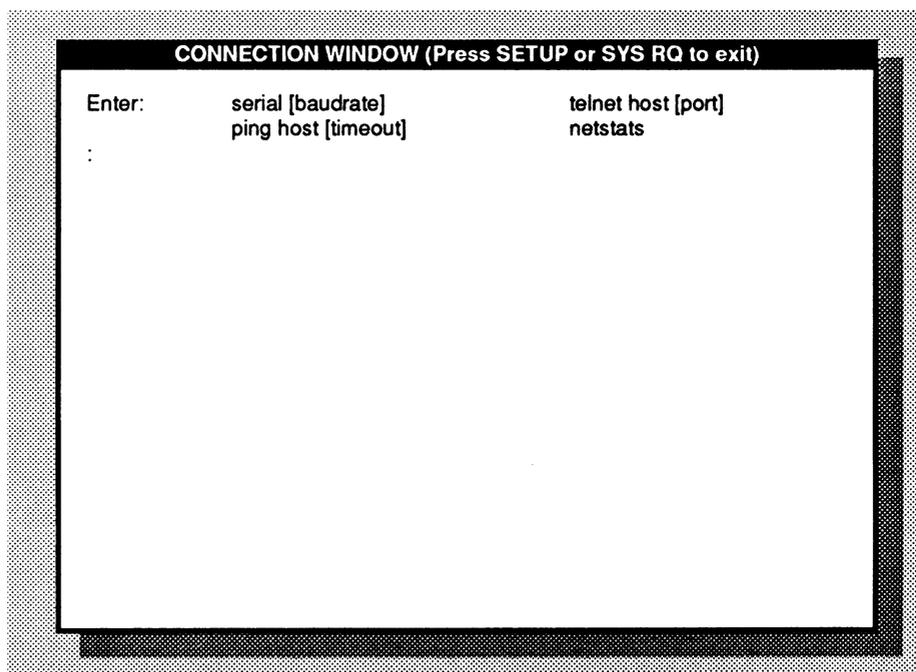
To use Telnet, follow these steps:

1. If you have a vt220-style keyboard, press **CONNECT**.  
The XDS shows you the **Connection Window**.
1. If you have an AT-style keyboard, start from the **System Window** and follow these steps:



2. Select Connection Window.

The XDS shows you the Connection Window.



## Logging in to a host

1. After the prompt (:), type:

`telnet` (or `t`) *hostname* and, optionally, the port to which you want to make the connection.

Format the host using one of the following formats:

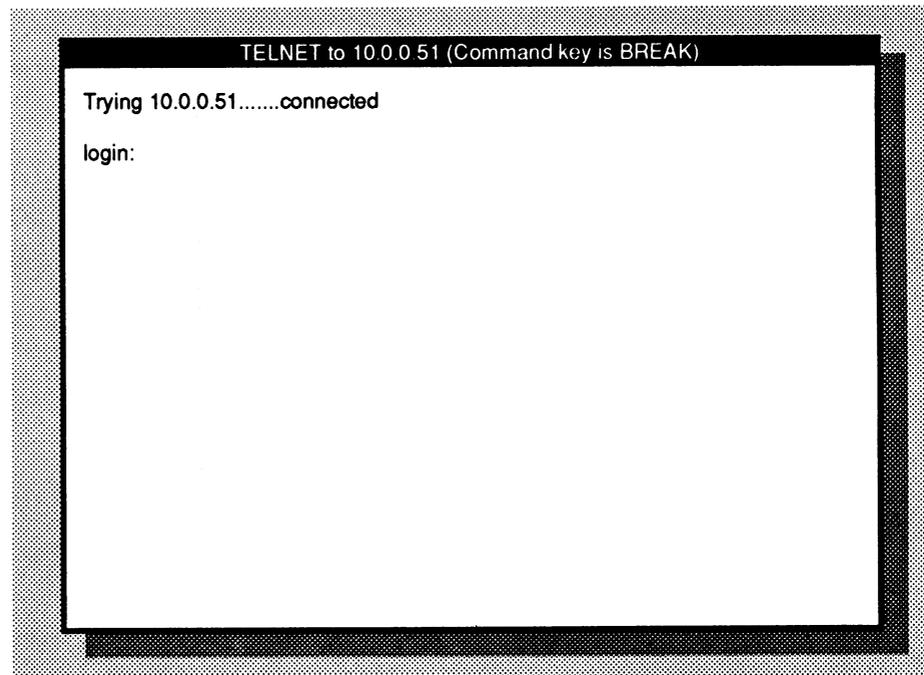
- dotted decimal
- absolute hexadecimal
- a string

If you aren't sure how to format values for Setup, follow the instructions in "Formatting values in Setup," in Chapter 3. For example, you might type the host's IP address in dotted decimal format:

```
telnet 10.0.0.51
```

2. Press RETURN.

The XDS leaves the **Connection Window** and enters Telnet mode. The title bar at the top of window tells you you're in Telnet mode and the identity of the host you're connected to.



You'll see the login prompt you normally see when you connect to that host.

3. Login to your host, using the steps appropriate to your host.

While you're in Telnet, you can use the following escape sequences. (Press BREAK and one of the following characters to perform an escape sequence.)

To see the list of commands, press **BREAK** plus any key not listed below. The XDS shows you the list of commands.

- a asks the host "are-you-there" and displays a message if it receives a "YES"
- b sends a break to the remote Telnet
- f flushes any output
- h erases a character
- q closes the Telnet connection
- s displays Telnet and TCP statistics
- x aborts by resetting the Telnet connection
- z suspends the Telnet session and displays the list of **Connection Window** commands. To resume the session, type **Telnet** (or **t**) and press **RETURN**. The XDS resumes the connection to the host.

Pressing **CONNECT** or **SYS RQ** also suspends the Telnet session and exits you from the **Connection Window**.

After you have successfully logged in to your host, you need to start a terminal emulation program on the XDS display. The following section shows steps for starting an **xterm** terminal emulation program.

---

## Starting an **xterm** terminal emulation program

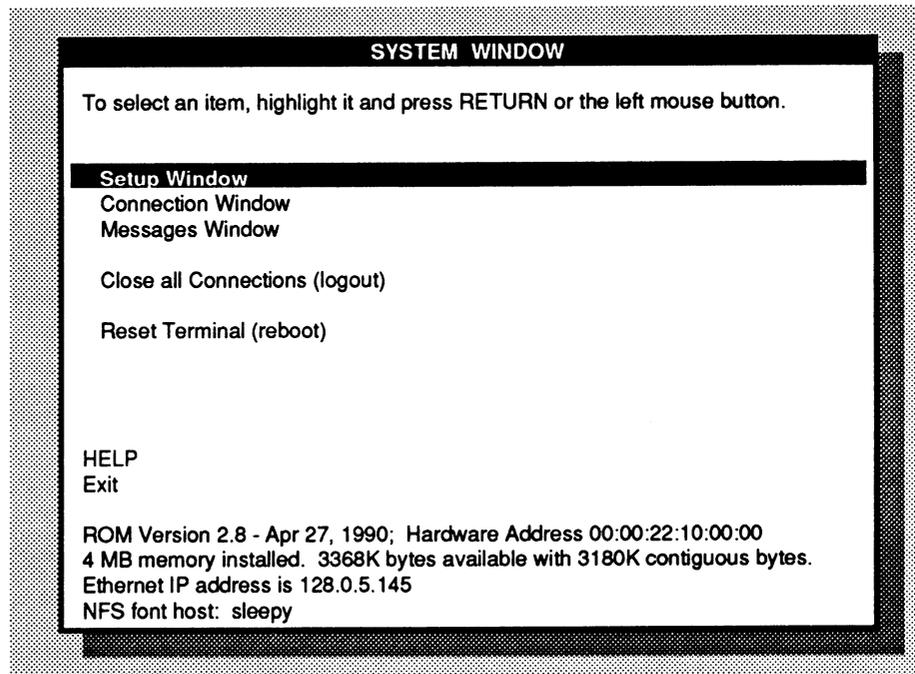
After you have successfully logged in to your host, you need to start a terminal emulation program on the XDS display. This section provides instructions for starting an **xterm** terminal emulation program.

**xterm** is actually an application that lets you to run other X applications on the XDS. When you start an **xterm** program, then, you may need to place it in the background of your host environment (so you can run other applications in the foreground) and direct it to the XDS display.

To display applications on your XDS screen, you need to know your XDS IP address. If you don't already know it, start from anywhere except the **Connection Window** and follow these steps:

1. Press **SETUP**.

The XDS shows you the **System Window**.



At the bottom of the menu, the XDS shows you a message with the XDS IP address (two addresses if you use both Ethernet and serial line connections).

2. Write down the IP address for the connection you'll be using.
3. Press SETUP.

The XDS leaves Setup and returns you to where you were before.

To start an `xterm` terminal emulation program on your XDS display, start a Telnet connection to a connection host and login to the host (as described in "Starting a connection to a host," above.) When you have successfully logged in to the host, you'll see the host's prompt.

To start an `xterm` program, follow these steps:

4. After the host's prompt, type:  
`xterm -display IPaddress:0`

and, if you need to, the command that places applications in the background of your system (this depends on the system you're using).

For example, if you're working on a UNIX system and your XDS IP address is 1.2.3.4, you would type:

```
xterm -display 1.2.3.4:0 &
```

The ampersand (&) is the UNIX command telling the host to place the application in the background. Your system may use a different command. Type everything else as it is written, though, substituting your XDS IP address for 1.2.3.4.

5. Press RETURN.  
Your host shows you a prompt.
6. Press CONNECT or SYS RQ to suspend Telnet and leave the **Connection Window**.

The XDS leaves the **Connection Window** and displays the message "Suspending...". After a few seconds, the XDS returns you to where you were before you entered the **Connection Window**. After a brief time, the XDS shows you a new window in the upper-left corner of the XDS, with a prompt showing that you are already logged in. An xterm program is already running.

From the login window, you can start other applications, login remotely to other machines, or use the **Connection Window** to connect to another host. The first application you'll probably want to start is a window manager to create, resize, and move windows on your XDS display. For more information on running other applications on the XDS, see *X Window System User's Guide*.

## Connecting through a modem

You can use the **Connection Window** to gain access to the serial port to dial a modem. To do this, you need to configure serial line connections properly. If you have not already done this, start from the **Configure Serial Line Network** menu and follow these steps:

For more information on setting up serial line communications, see "The Configure Serial Line Network menu," in Chapter 3.

**CONFIGURE SERIAL LINE NETWORK**

To change an item, highlight it and press RETURN or the left mouse button.  
To return to the Setup Window, press ESC or the right mouse button.

Communication Protocol	SLIP
SLIP IP Address (use 0 if ICMP AM)	0.0.0.0
SLIP Network Mask	0.0.0.0
SLIP Broadcast Address (use 0 for automatic)	0.0.0.0

HELP  
Return to Setup Window

1. Select **Communication Protocol**.  
The XDS changes the value from **None** to **SLIP**.
2. Select **SLIP IP address**.  
The XDS shows you the prompt "Enter value:".
3. After "Enter value:", type in the serial line IP address, using the address displayed in the **System Window**.

If you make a mistake while you're typing, backspace over the error and retype the value, or press CTRL-c to cancel the edit. To retype the value, press RETURN again.

4. Press RETURN.

The XDS returns you to the menu and fills in the address after IP address.

5. If you want to set a baud rate to use automatically in the **Connection Window**, select **Baud rate**.

The XDS shows you the prompt "Enter value:"

6. After "Enter value:", select the baud rate for the serial line interface by pressing return and cycling through the settings. Choose from 300, 600, 1200, 2400, 4800, 7200, 9600, 19200, or 38400. The default is 9600.

Press RETURN.

The XDS fills in the rate you selected after **Baud rate**.

7. Press SETUP or SYS RQ.

The XDS saves your changes and exits Setup.

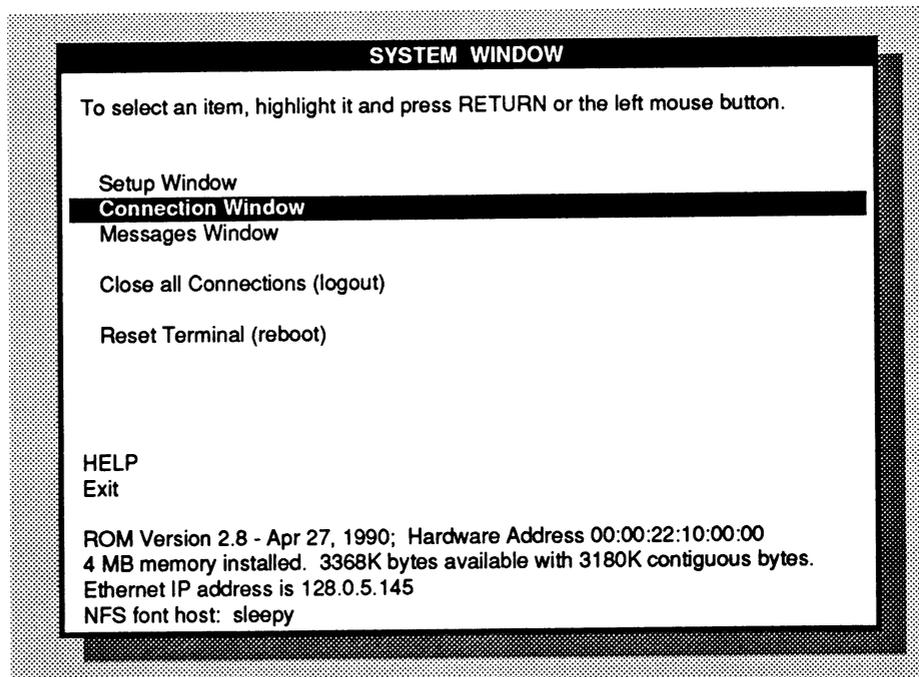
Once you've set the serial line connections, you can go on to connect to a host through a modem. The XDS is compatible with most modems. The modem should be set to 8-bits data, no parity, 1-stop bit. See your system administrator to make sure your modem is set up properly.

To connect to a host through a modem, start from anywhere except Setup or the **Messages Window** and follow these steps:

1. If you have a vt220-style keyboard, press CONNECT.

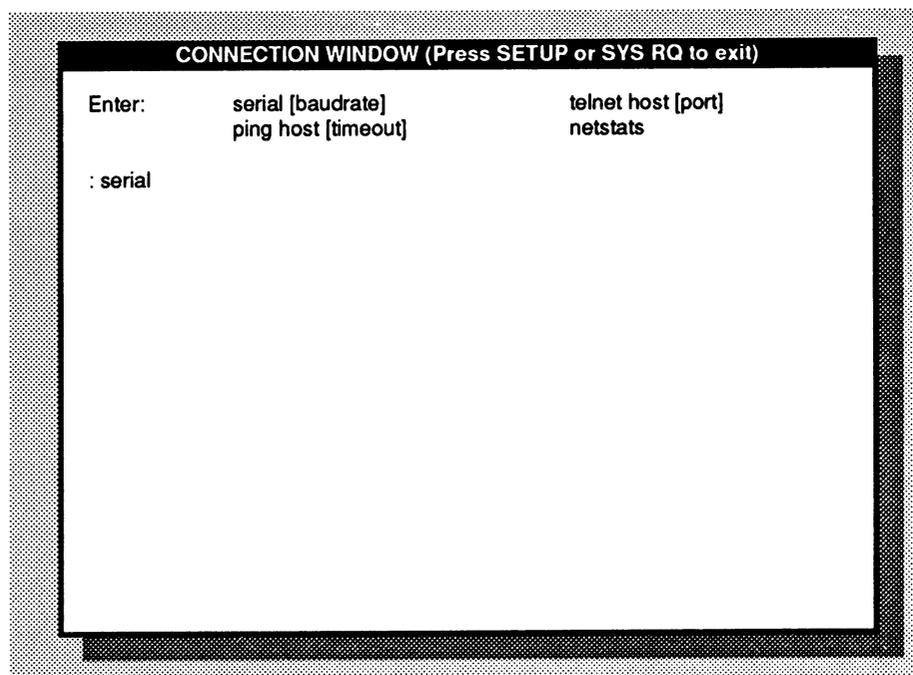
The XDS shows you the **Connection Window**.

1. If you have an AT-style keyboard, start from the **System Window** and follow these steps:



2. Select **Connection Window**.

The XDS shows you the Connection Window.



After the prompt (:), type:

**serial** (or **s**) and, optionally, the baud rate. Choose from **300, 600, 1200, 2400, 4800, 7200, 9600, 19200, or 38400**. If you do not enter anything, the XDS uses the baud rate you set for the serial line interface in the **Configure Serial Port** menu.

For example, you might type:

**serial 9600**

2. Press RETURN.

The XDS leaves the **Connection Window** and enters the terminal emulation mode you selected on the **Configure Serial Port** menu. The characters you type in will be sent; characters you receive will be displayed.

If the serial line connection is enabled, then the XDS temporarily shuts down transmission so that it can use the serial port. The XDS reinitializes serial line when you leave the **Connection Window**.

3. Use the appropriate procedures to dial the modem.
4. Connect to the host, using steps appropriate to your modem; for example, you might login to the host.
5. Press **CONNECT** to leave serial mode.

The XDS shows you the list of **Connection Window** commands.

From here, you need to connect to the host by making a Telnet connection to the host over serial line. For instructions on connecting through Telnet, see "Starting a Telnet connection," above.

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## Recreating input to the XDS

You can use the XDS to run demonstrations or create automated tests that require no intervention on the part of an operator or user. Using the Input Synthesis feature—an extension of the X protocol—a client application can capture and record input from the XDS mouse and keyboard. Later, you can play back the session on the XDS display. In addition, the XDS can process synthetic input from the client as if it were receiving the input from the keyboard and mouse.

Clients using Input Synthesis can capture any keyboard input to the XDS, including passwords and other security information. If clients will be using Input Synthesis with your XDS, you may want to enhance security by disabling Input Synthesis during normal operation and enabling it only when you know a client will be capturing input. You do this in Setup, using the **Input Synthesis** option of the **Configure X Server Features** menu. For more information on using this option, see "The Configure X Server Features menu," in Chapter 3.

For more information on using the Input Synthesis feature, contact the Visual technical support staff at 1-800-537-6004 (outside MA) or 1-800-345-8998 (inside MA).

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## Using Grayscale

When requested by an application, each of the color names in the X-19 Turbo's built-in color map will be displayed as the gray shade most closely matching the luminance of the particular color. For example, for a color X display the UNIX command:

```
xterm -fg goldenrod -bg firebrick
```

would result in a terminal emulator with yellowish characters on a dark red background. On the X-19 Turbo the terminal window appears with white characters on dark gray when grayscale is enabled and as white characters on a black background when the grayscale option is disabled. The colors *black*, *white*, *light gray* (or *light grey*), and *dark gray* (or *dark grey*) are defined to directly specify the four colors available with the grayscale option.

Two notes with regard to matching color names with color table entries: (1) case is ignored, and (2) by convention, when a color name consists of more than one word, there is a second entry in the table with the words all run together. Thus the following three UNIX commands would all give identical results:

```
xterm -fg white -bg DarkSlateGray
xterm -fg white -bg "Dark Slate Gray"
xterm -fg white -bg darkslategray
```

But the following UNIX command will fail:

```
xterm -fg white -bg "darkslate gray"
```

because the color *darkslate gray* will not be found in the color table (unless you have modified the color table, by loading your own values; see the **Remote Configuration Menu** for details).

For a list of the other colors defined in the default color table and what gray shades they map to, see Appendix E. For a sample X resource file which makes common X applications appear in living grayscale, see Appendix F.

# Chapter 5

## When Things Go Wrong

---

---

### In this chapter

The first thing you should do when you encounter a problem is review the steps you took before the problem occurred. Make sure you did not make a mistake in typing and that you followed the directions correctly. Sometimes, though, it isn't that easy to discover the source of a problem. This chapter describes the facilities the XDS provides for diagnosing problems and outlines the steps you should take when something goes wrong.

---

---

### Using the Messages Window

While you are using the XDS, various parts of the system may generate error messages that alert you to a problem. The most common errors are generated by the network drivers and the name and font request routines, which check many of the values you provided in the XDS Setup procedure. The XDS sends the error messages to the **Messages Window**, which stores them for you.

When an error message arrives, the XDS lights up the Error or SCROLL LOCK light, indicating that there is a new message in the **Messages Window**. To look at the contents of the **Messages Window**, follow the steps below:

If you have a VT220-style keyboard, start from anywhere in the system, (except Setup or the **Connection Window**) and follow these steps:

1. Hold down **MESSAGES**.

The XDS shows you the **Messages Window**.

Keep **MESSAGES** key pressed down while you read the messages.

2. Release **MESSAGES**.

The XDS extinguishes the Error light.

If you have an AT-style keyboard, start from the **System Window** and follow these steps:

1. Hold down **SCROLL LOCK**.

The XDS shows you the **Messages Window**.

Keep **SCROLL LOCK** key pressed down while you read the messages.

2. Release **SCROLL LOCK**.

The XDS extinguishes the **SCROLL LOCK** light.

You should look at the **Messages Window** each time the **Error** or **SCROLL LOCK** light comes on, because the window can hold only a certain amount of information. Once the window becomes full, the XDS cycles its contents and you will not be able to read the lost messages.

---

---

## Working around problems

Please contact Visual if you encounter any problem that you cannot work around.

### If you didn't supply an IP address

If you did not specify an IP address in the appropriate **IP address** option, the XDS tries to discover its IP address by sending RARP and BOOTP requests over the network. If no one responds to the RARP or BOOTP requests, the XDS continues to send requests for several minutes.

To discontinue requests, press **BREAK**. The XDS stops sending requests and brings up the X server without a network connection.

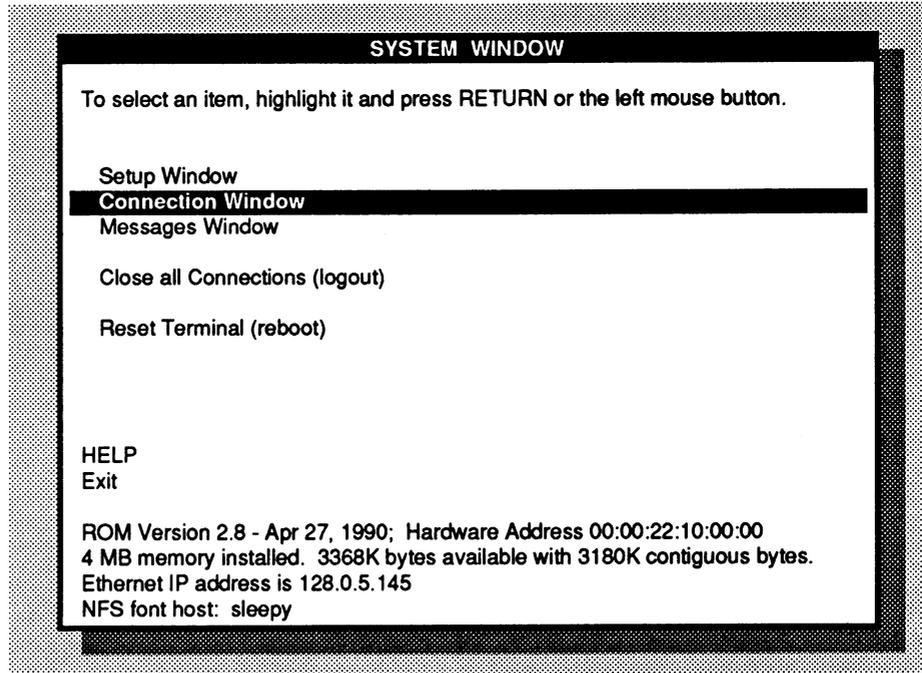
To supply an IP address, press **SETUP** or **SYS RQ**, then follow the directions for supplying the IP address in Chapter 2.

### If you cannot establish a connection

If you are using auto-connection and you are having trouble establishing connections through Setup, you may want to login manually, or check that your host is responding on the network. The XDS lets you do this by using the commands in the **Connection Window**.

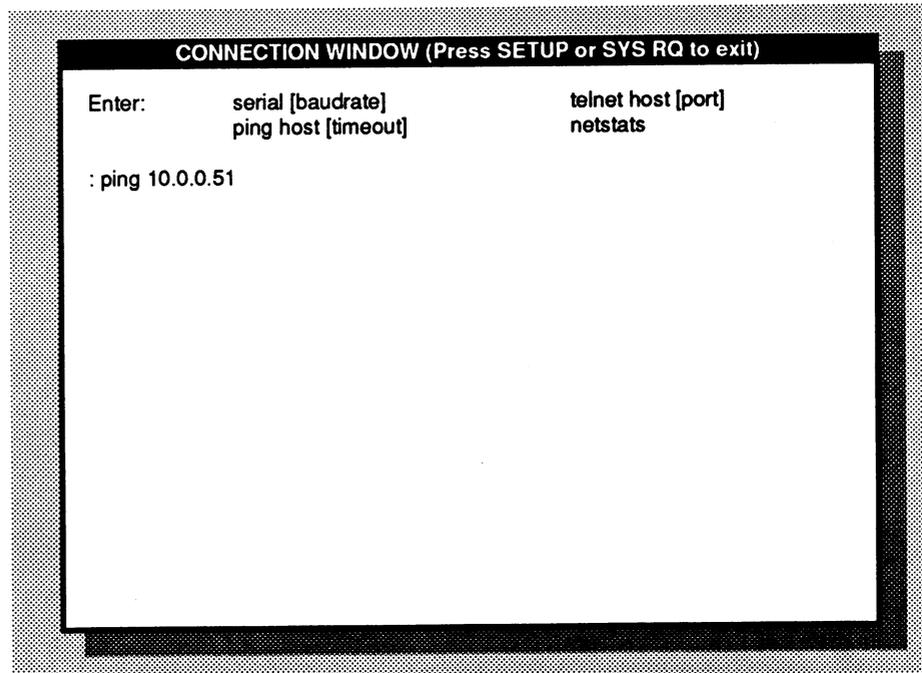
To use the **Connection Window**, follow these steps:

1. If you have a VT220-style keyboard, press **CONNECT**.  
The XDS shows you the **Connection Window**.
1. If you have an AT-style keyboard, start from the **System Window** and follow these steps:



2. Select Connection Window.

The XDS shows you the Connection Window.



### Checking if a host is responding

If you cannot establish a connection to a host, it may be because the host you selected is not configured or responding. You can check the host's status by sending out a ping packet to the host from the **Connection Window**. To do this, follow these steps:

1. Type **ping** (or **p**) *hostname* and, optionally, the amount of time (in seconds) after which you want the XDS to give up if it does not receive a response. The default for the timeout is 5.

Format the host using one of the following formats:

- dotted decimal
- absolute hexadecimal
- a string

(Follow the instructions in "Formatting values in Setup," on page 51.) For example, you might type the host's IP address in dotted decimal format:

```
ping 10.0.0.51
```

2. Press RETURN.

After the XDS determines the host's status, the XDS displays the results of the ping. If the ping determined that the host was responding, the XDS displays a message telling you the host responded, and the time it took for the host to respond. If the host does not respond, the XDS shows a message telling you the host did not respond, and the time it took to discover this.

### Starting a Telnet connection

If you cannot establish an automatic connection to a host, you can use the **Connection Window** to login manually through Telnet. For instructions on using Telnet, see "Connecting to hosts if you're using the XDS without an auto-connection program."

### Connecting through a modem

You can also use the **Connection Window** to gain access to the serial port to connect to a host through a modem. For instructions in on connecting through a modem, go to "Connecting through a modem."

---

---

## Looking at network statistics

The XDS collects and displays information on network use, for example, the hosts the XDS is connected to, the number of data packets received and dropped, and so on. To look at the network information, start from the **Connection Window** and follow these steps:

1. Type **netstats** (or **n**).
2. Press RETURN.

The XDS shows you one panel of network statistics. If there is another panel, the XDS shows you the message "--More--" at the bottom.

3. To look at the next panel, press the space bar.

The XDS shows you the remaining statistics. If it is the last panel, the XDS displays the menu of **Connection Window** commands at the bottom.

---

---

## Leaving the Connection Window

To leave the **Connection Window**, press **CONNECT** or **SYS RQ**. The XDS exits the **Connection Window** and returns you to where you were before.

## If you forget your Configuration Password

If you forget your Configuration Password (see "The Setup Utilities Menu," in Chapter 3), call Visual Technology at 1-800-537-6004 (outside MA) or 1-800-345-8998 (inside MA). A member of the Technical Support staff will provide you with a password based on your XDS hardware address.



## Appendix A XDS Local Fonts

The following lists the fonts that are available on the XDS. For illustrations of these fonts, see Appendix J in *Xlib Reference Manual*.

6x13	cursor
8x13	fixed
9x15	variable
10x16	vtsingle
12x20	



## Appendix B Formatting Fonts

If you are using the XDS Host Software, the font files you use are the standard fonts for the X Window System, provided by MIT and compiled to the XDS's internal format. These files are in the XDS Host Software and have the form *fontname.bdf*.

### Formatting font files

In order to use fonts with the XDS, you must first compile them to X internal format. To do this, follow these steps:

The program `xdsfc` is part of the XDS Host Software. Contact your Sales Representative for details.

1. Type:  
`xdsfc fontname.bdf>fontname.snf`
2. Press RETURN.  
The files are converted from `.bdf` to `.snf` format.
3. Place the fonts in directories where they can be accessed by the font server program you are using. Make sure the directories match the paths you specified in Edit default font path list (in the Configure X Server menu).

### Formatting the font directory

The directory holding your font files must also contain a `font.dir` file and, optionally, a `font.alias` file (to match font names with alias names). To create these files, follow the steps for `MKFONTDIR`, as outlined in the documentation for the X Window System, provided by MIT.

## Appendix C

# Setting Up NFS Authentication

Many NFS servers require authentication. If the NFS server your XDS communicates with requires NFS authentication, you need to configure the XDS to match the server's requirements. The way you configure it depends on the configuration of the NFS server you use. You configure the NFS server using an export list and a name table.

The XDS supports two kinds of authentication:

### AUTH\_NONE

AUTH\_NONE is useful only for servers that do not require authentication. Many servers, however, will not communicate fully with a machine that uses AUTH\_NONE. If you are not sure that your NFS server does not require authentication, do not use AUTH\_NONE.

### AUTH\_UNIX

AUTH\_UNIX provides some authentication information, passing two pieces of information in each packet:

- the name of the XDS

There are two options for the XDS name:

- AUTH\_UNIX name=XDS

You may choose to set up all XDS units this way in order to allow all XDS units to access files with a generic permission. Add the name "XDS" to the export list only once. To add the name to the name table, add the alias "XDS" for each XDS unit.

- AUTH\_UNIX unique name=XDSxxxx

where *xxxxx* represents a unique 5-character id.

You may choose to set up each XDS unit this way in order to restrict access of some files to only a specified list of XDS units. Add each unique name to the export list and name table. To find the unique name, select **NFS Authentication** from the **Configure TCP/IP Services** menu in Setup.

- the UNIX-style user identity

A UNIX NFS server uses the information to determine whether the XDS user is privileged to access the desired files over NFS. The XDS always sets the identity information to the following values:

- *uid* (userid)                    0
- *gid* (groupid)                    0
- group membership list            empty

By setting the information to these values, the XDS indicates that it is a system seeking access, and not a user. The NFS server therefore grants access only to files that are accessible to all users on the system.

Note that the font host **must recognize xds or xdsxxxx** as a valid alias for your terminal if you choose one of those options. In many systems, this means adding the appropriate name to the list of host aliases in the file `/etc/hosts`.

## Setting up the export list and name table

The way you set up the export list and name table depends on your NFS server's system. For example, many UNIX NFS servers use the files `/etc/exports` and `/etc/hosts` for this purpose. The following presents suggestions for setting up the export list and name table. You'll need to adapt these to your system.

### Exports

You must export each font directory to the XDS. To do this, specify to the NFS server in its export list the directories that the XDS can access, making sure to use the name setting you selected for the XDS in Setup.

You may already have configured the NFS server to allow all NFS machines to access the font directories. You don't need to add the XDS to the export list if your NFS server is set up in this way.

For each directory, specify:

- the directory name
- the XDS name(s) authorized to access the directory

If you selected `AUTH_UNIX name=XDS`, you need to add the name only once. If you selected `AUTH_UNIX unique name=XDSxxxx`, you must add an entry for each unique name.

### Name tables

The name you selected in Setup for NFS authentication may not match the hostname of the XDS in the name table. You may need to provide an alias to make sure the NFS server recognizes the XDS name as matching its hostname. To do this, add the alias "XDS" or "XDSxxxx" to the name table. You must add the proper alias for each XDS unit.

# Appendix D

## Remote Configuration File Specification

The Remote Configuration File is formatted much like an X resource file, consisting of one or more lines of the form:

*Manufacturer.MachineModel.Option:*      *Value*

For Visual Technology the manufacturer portion is **Visual** and the three possible *MachineModel* types are **X15**, **X19**, and **X19TURBO**. The *Value* depends on the particular option being set. For example:

**Visual.X19.MouseAcceleration:**                      2

Some of the settable options allow a list to be entered, in which case the list items should be separated by commas. A continuation to the next line is indicated by a backslash (\) in the last position on the line. For example:

**Visual.X19.AutoConnectionHostList:**    *nina,pinta,santamaria*

**Visual.X19.FontPathList:**    */usr/lib/X11/Visual/fonts/100dpi,\*  
*/usr/lib/X11/Visual/fonts/misc*

Blank lines are ignored. If an exclamation point (!) appears anywhere on a line, the rest of that line is considered a comment and is ignored. If no value appears on a line after the colon, that option is not altered when the file is downloaded (i.e. the option is not "cleared"). For example:

**Visual.X19.KeyClick:**                      *! Use current setting*

The *Manufacturer* or the *MachineModel* and their associated period separators may be replaced by an asterisk (\*) for universal applicability. For example:

**Visual\*AudibleBell:**                      *On*

would turn on the bell on all Visual products, while:

**\*AutoRepeat:**                              *Off*

would turn off autorepeat on all manufacturers models that this file is downloaded to (provided, of course, that they accept this format file).

Case is not important anywhere except, of course, when it matters to a particular option value, such as a UNIX file name. It is important to check carefully for syntax errors and misspellings, as many options are not checked until actually used by the X terminal.

A sample Remote Configuration File template can be found on the Visual Host Utilities Tape product, which you can obtain by calling Visual's Customer Support Department . Following is a template showing all current Visual options.

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```
! Remote Configuration File Template
!
! NOTE THAT WHERE A SAMPLE VALUE IN THE COMMENTS AREA APPEARS IN
! DOUBLE QUOTES, DO NOT INCLUDE THE QUOTE MARKS

!
! Ethernet Menu
!
Visual*IpNetworkMask:                ! NONE for automatic
Visual*IpBroadcastAddress:          ! NONE for automatic
Visual*DcpAddress:                   ! DECnet option ONLY!

!
! Network Services Menu
!
Visual*LocalIpNamelist:              ! <ipaddr name> pairs
Visual*Ien116UdpNameserverList:     ! host IDs
Visual*DomainNameserverList:       ! Host IDs
Visual*DomainName:                  !
Visual*DefaultRouter:               ! Host IDs
Visual*42Compatibility:              ! On or Off
Visual*UdpChecksumming:             ! On or Off
Visual*ArpDally:                    ! Number of seconds
Visual*NameserverRequestTimeout:    ! Number of seconds

!
! Serial Line Network Menu
!
Visual*SerialCommunicationProtocol:  ! NONE or SLIP
Visual*SlipIpAddress                ! IP Address
Visual*SlipNetworkMask:              ! NONE for automatic
Visual*SlipBroadcastAddress:        ! NONE for automatic

!
!Serial Port Menu
!
Visual*SerialPortBaudRate:           ! 300, 600, 1200, 2400,
                                       ! 4800, 7200, 9600,
                                       ! 19200, or 38400

Visual*SerialPortDataBits:           ! 7 or 8
Visual*SerialPortParity:             ! None, Even, Odd, Mark
                                       ! or Space

Visual*SerialPortCheckReceiveParity: ! Yes or No
Visual*SerialPortStopBits:           ! 1 or 2
Visual*SerialPortXonXoffFlowControl: ! Enabled or Disabled
Visual*SerialPortRtsCtsFlowControl:  ! Enabled or Disabled
Visual*SerialPortModemControl:       ! Enabled or Disabled
Visual*SerialPortRs422Select:        ! On or Off

!
!Font Management Menu
!
Visual*DefaultTextFont:              ! 6x13, 8x13, 9x15,
                                       ! 10x16, or 12x20

Visual*FontHostList:                 ! Host IDs
Visual*FontPathList:                 ! Font directory names
```

## Remote Configuration File Specification 101

```
Visual*NetworkFontAccess:           ! None, FontDaemon,
                                      ! NFS, DAP, or TFTP
Visual*NetworkFontRequestTimeout:   ! Number of seconds

!
! Auto-Connection Menu
!
Visual*AutoConnectionMode:          ! Disabled, XDM,
                                      ! "Telnet on Logout",
                                      ! "Telnet on Reboot",
                                      ! or SetHost

Visual*AutoConnectionHostList:      ! Host IDs
Visual*AutoConnectionRequestTimeout: ! Number of seconds
Visual*AutoConnectionDaemonUdpPort: ! Font host port

!
! Authorization Menu
!
Visual*HostAuthorizationMode:        ! Disabled, Inactive,
                                      ! or Active
Visual*AuthorizedHostList:          ! Host IDs

!
! Keyboard/Mouse Menu
!
Visual*KeyClick:                     ! On or Off
Visual*AutoRepeat:                   ! Off, Slow, Normal,
                                      ! or Fast

Visual*MouseAccelerationThreshold:   ! Number of pixels
Visual*MouseAcceleration:            ! Multiplier
Visual*AudibleBell:                  ! On or Off
Visual*ModifierToAccessXdsSpecialKeys: ! None, Shift, or Ctrl
Visual*SwapCtrlAndCapsLockKeys:      ! Yes or No

!
! Connection Window Menu
!
Visual*ConnectionWindowFont:         ! 9x15, 10x16, 12x20
Visual*ConnectionWindowBackground:   ! White or Black
Visual*ConnectionWindowWraparound:   ! On or Off
Visual*ConnectionWindowReverseWraparound: ! On or Off
Visual*ConnectionWindowAutoNewline:  ! On or Off
Visual*ConnectionWindowCursesEmulation: ! On or Off
Visual*ConnectionWindowTerminalEmulation: ! xterm, ANSI, VT102,
                                      ! VT100, VT52, or TTY

Visual*ConnectionWindowTelnetTerminalTypeResponse: ! a string

!
! X Server Features Menu
!
Visual*BackingStoreDefaultMode:      ! Disabled,
                                      ! "When Requested",
                                      ! or "When Mapped"

Visual*InputSynthesis:                ! Enabled or Disabled
Visual*OldDecWindowsCompatibility:    ! Enabled or Disabled
Visual*XProtocolErrorReporting:       ! Enabled or Disabled
Visual.X19Turbo.Grayscale:           ! Enabled or Disabled
```

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```
!  
!Screen Saver Menu  
!  
Visual*EnableScreenSaver:           ! Yes or No  
Visual*ScreenSaverTimeout:          ! Number of minutes  
Visual*PreferredScreenSaver:        ! Blanking or "X Logo"  
  
!  
! Remote Configuration Menu  
!  
Visual*BootServerUsing:              ! ROM or TFTP  
Visual*BootFromHost:                 ! Host ID  
Visual*BootFilename:                 ! Path to file to boot  
Visual*NetworkFileTransferProtocol: ! TFTP  
Visual*AutoLoadConfiguration:        ! On or Off  
Visual*RemoteConfigurationHost:      ! Host ID  
Visual*AutoLoadRgbDatabase:          ! On or Off  
Visual*RgbDatabaseList:              ! Host ID
```

## Appendix E

### Default Color Mapping Table

<u>Color Name</u>	<u>Black &amp; White Mapping</u>	<u>Grayscale Mapping</u>	<u>Aliases</u>
aquamarine	white	light gray	
black	black	black	
blue	black	black	
blue violet	black	dark gray	blueviolet
brown	black	dark gray	
cadet blue	white	light gray	cadetblue
coral	white	light gray	
cornflower blue	black	dark gray	cornflowerblue
cyan	white	light gray	
dark gray	black	dark gray	darkgray, dark grey, darkgrey
dark green	black	dark gray	darkgreen
dark olive green	black	dark gray	darkolivegreen
dark orchid	black	dark gray	darkorchid
dark slate blue	black	dark gray	darkslateblue
dark slate gray	black	dark gray	darkslategray, dark slate grey, darkslategrey
dark turquoise	white	light gray	darkturquoise
dim gray	black	dark gray	dimgray, dim grey, dimgrey
firebrick	black	dark gray	
forest green	black	dark gray	forestgreen
gold	white	light gray	
goldenrod	white	white	
gray	black	dark gray	
green	white	light gray	
green yellow	white	light gray	greenyellow
indian red	black	black	indianred
khaki	white	light gray	
light blue	white	white	lightblue
light gray	white	light gray	lightgray, light grey, lightgrey
light steel blue	white	light gray	lightsteelblue
lime green	white	light gray	limegreen

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magenta	black	dark gray	
maroon	black	dark gray	
medium aquamarine	white	light gray	mediumaquamarine
medium blue	black	dark gray	mediumblue
medium forest green	black	dark gray	mediumforestgreen
medium goldenrod	white	white	mediumgoldenrod
medium orchid	white	light gray	mediumorchid
medium sea green	black	dark gray	mediumseagreen
medium slate blue	black	dark gray	mediumslateblue
medium spring green	white	light gray	mediumspringgreen
medium turquoise	white	light gray	mediumturquoise
medium violet red	white	light gray	mediumvioletred
midnight blue	black	black	midnightblue
navy	black	black	navy blue, navyblue
orange	black	dark gray	
orange red	black	dark gray	orangered
orchid	white	light gray	
pale green	white	light gray	palegreen
pink	white	light gray	
plum	white	white	
red	black	dark gray	
salmon	black	dark gray	
sandy brown	white	light gray	sandybrown
sea green	black	dark gray	seagreen
sienna	black	dark gray	
sky blue	black	dark gray	skyblue
slate blue	black	dark gray	slateblue
spring green	white	light gray	springgreen
steel blue	black	dark gray	steelblue
tan	white	light gray	
thistle	white	white	
turquoise	white	white	
violet	black	black	
violet red	black	dark gray	violetred
wheat	white	white	
white	white	white	
yellow	white	white	
yellow green	white	light gray	yellowgreen

Notes: Case does not matter in matching color names, as in *YellowGreen*.  
 In addition to the above colors, there are also defined 200 names of the form **gray0** through **gray100** and **grey0** through **grey100** where the N in **grayN** or **greyN** represents a percentage of white. These colors map as follows:

Color Name	Monochrome	Grayscale
gray0 - gray24	black	black
gray25 - gray50	black	dark gray
gray51 - gray75	white	light gray
gray76 - gray100	white	white

## Appendix F Sample X Resource File

```
! X Resource file to show off Gray Scale.  Add these to your
! .Xdefaults file or download them using the xrdb command.
!
! Motif Window Manager
!
mwm*background:                light gray
mwm*foreground:                black
mwm*bottomShadowColor:        dark gray
mwm*topShadowColor:           white
mwm*activeBackground:         light gray
mwm*activeForeground:         black
mwm*activeBottomShadowColor:  dark gray
mwm*activeTopShadowColor:     white
!
xclock*background:            dark gray
xclock*foreground:            white
xclock*hands:                 light gray
xclock*highlight:             white
!
xmh*folders*foreground:       light gray
xmh*folders*background:       dark gray
xmh*folderButtons*foreground: black
xmh*folderButtons*background: light gray
xmh*compButtons*foreground:   black
xmh*compButtons*background:  light gray
xmh*toc*foreground:           white
xmh*toc*background:          dark gray
xmh*seqButtons*foreground:    light gray
xmh*seqButtons*background:    white
xmh*tocButtons*foreground:    black
xmh*tocButtons*background:   light gray
xmh*viewButtons*foreground:   black
xmh*viewButtons*background:  light gray
!
xcalendar*background:         light gray
xcalendar*foreground:         black
xcalendar*daynames.*Background: black
xcalendar*daynames.*Foreground: light gray
xcalendar*daynames.SAT*Background: light gray
xcalendar*daynames.SAT*Foreground: white
xcalendar*daynames.SUN*Background: light gray
xcalendar*daynames.SUN*Foreground: white
xcalendar*markBackground:     dark gray
xcalendar*markForeground:     white
```



# Glossary

## **4.2 compatibility mode**

the ability of the XDS to connect to hosts running 4.2BSD UNIX with TCP/IP. (Some examples of systems that use this are SUN 3.0-3.2 and Ultrix 1.x and 2.x.) See also TCP/IP.

## **abort**

to terminate (deliberately) a processing activity because it is undesirable or impossible for the activity to proceed.

## **absolute hexadecimal**

a way of representing a 32-bit integer address. Addresses formatted in absolute hexadecimal start with a number.

The XDS converts any value that you enter in absolute hexadecimal format into a corresponding 32-bit address.

## **address**

a unique code assigned to each device attached to a network. See also **hardware address**, **IP address**.

## **Address Resolution Protocol**

See **ARP**.

## **application**

a computer program designed to perform a specific function or group of functions. Synonymous in the X Window System client-server architecture with **client**. See also **client-server architecture**.

## **ARP**

Address Resolution Protocol. A protocol that matches a machine's Internet Protocol (IP) address with a physical (hardware) address. See also **proxy ARP**.

## **auto-connection program**

an application that uses information in Setup to connect the XDS to a host. See also **host**, **xterm**.

## **background**

a condition in which low-level programs run simultaneously on the same host with other high-level programs. For example, when you start an xterm terminal emulation program, you place it in the background so that you can use other applications at the same time.

## **baud rate**

the transmission speed of an interface.

## **Bootstrap protocol**

See **BOOTP**.

## **BOOTP**

Bootstrap Protocol. A protocol that, at startup, matches the XDS hardware address with its IP address. In order for a BOOTP request to be responded to, the XDS must be in the BOOTP data base on a configured and running machine. The XDS sends BOOTP requests in conjunction with RARP requests. See also **BOOTP data base**, **RARP**.

## **BOOTP data base**

a data base on a machine, containing hardware addresses and corresponding IP addresses. In order for a BOOTP request to work, the XDS must be in the BOOTP data base and the machine must be running and configured.

## **broadcast**

transmission of data that is received by all machines on a network.

## **broadcast address**

an address, which, when used as a destination, is received by all stations on a network.

## **character cell**

the maximum area in which a character and all associated elements (such as the cursor, an underline, and white space surrounding the character) can be displayed or printed.

## **client**

synonym for **application** in the X Window System client-server architecture. See also **application**, **client-server architecture**.

**client-server architecture**

the model of interaction used by the XDS. The XDS (as the X server) handles keyboard and mouse input and sends it over a network to client applications running on host computers. In turn, the XDS displays the client output in a hierarchy of multiple, resizable overlapping windows. See also **client**, **X server**, **X Window System**.

**compatibility**

the ability of a device or software to interface with software of another model or from another vendor. See also 4.2 **compatibility mode**.

**configuration**

the arrangement of a computer system or network as determined by the nature, number, and the chief characteristics of its functional units.

**configure**

to alter a configuration. For example, in the XDS Setup process, you determine network connections and X server characteristics. See also **configuration**.

**connection host**

a host that you connect to in order to start an xterm terminal emulation program and other X clients. If you are using the XDS with auto-connection, it connects to the connection host and starts xterm automatically.

**connection window**

A window with a login prompt, usually created when you start an xterm. See also **login**, **xterm**.

**default**

a value that is already supplied, or is assumed when no other value is specified.

**domain**

a part of the Internet naming hierarchy in which the data processing resources are under common control. The domain structure can be thought of like a telephone number, where each segment (area code, exchange, etc.) delineates a smaller group within the preceding group.

**domain name**

See **domain**.

**domain nameservice**

the type of nameservice used by machines that use the domain protocol. See also **nameservice**.

**dotted decimal**

a way of representing a 32-bit integer address. Dotted decimal format consists of four 8-bit numbers written in base 10, separated from each other by periods.

**download**

to transfer data from a processing unit to an attached device; for example, you can download a font from a host to the XDS.

**Ethernet**

a popular local-area network technology. An Ethernet itself is a passive coaxial cable; all active components are housed in the interconnections. The XDS can use ThinWire, a lighter coaxial cable, as well as Transceiver connections. The XDS is shipped with ThinWire connections already set up. See also **ThinWire**.

**firmware**

the XDS software fixed in the ROM. The XDS firmware includes the X Window System Server software, and the operating system, networking, and graphics software. The XDS firmware is housed in the ROM in the XDS memory module. See also **ROM**.

**fixed font**

a font set whose characters are contained in uniformly-spaced character cells. The distance between reference points is uniform from character-to-character, although the amount of white space between characters may vary. Contrast with **variable-width font**. See also **character cell**, **font**.

an alias for a font set whose characters correspond to those in the Default Text Font of the XDS local fonts.

**flow control**

control of the rate at which hosts or gateways inject data into the network, usually to avoid congestion. See also **RTS/CTS flow control**.

**font**

a family or assortment of characters of a given size and style. See also **fixed font**, **font server**, **local fonts**, **variable font**.

**Font Daemon**

a font server program in the XDS Host Software, or a similar program you write yourself. Synonymous with **font server program**.

**font directory**

the directory on your font host that contains fonts that may be accessed by a font server program.

**font host**

a host computer containing font files and software that allows other machines to access the font files. Synonymous with **font server**.

**font server**

See **font host**.

**font server program**

software loaded on a font host that allows other machines to access fonts on the host.

**glyph**

a component of a font set; for example, character.

**glyph padding**

the process by which a font component is expanded to occupy a certain number of bytes. For example, when executed as described in Appendix C, the program **bdfstosnf** expands each font component to occupy a multiple of 4 bytes.

**hardware address**

a physical address that identifies a machine on a physical network. The Ethernet uses 48-bit hardware addresses. The XDS hardware address is assigned by Visual Technology Incorporated and cannot under normal circumstances be changed. Contrast with **IP address**.

**host**

a computer that provides end users with services such as computation and data bases. See also **font host**, **connection host**.

**ICMP AM request**

Internet Control Message Protocol Address Mask request. A part of the IP that handles requests for address (network) masks and responses to the requests. See also **network mask**.

**IEN116**

Internet Engineering Note 116. The document that set out the original specifications for IEN116 nameservice. See also **IEN116 nameservice**, **nameservice**.

**IEN116 nameservice**

an older name resolution protocol still used by many systems. The XDS uses IEN116 nameservice to ensure compatibility with these systems. See also **nameservice**, **IEN116**.

**IEN116/UDP nameservice**

IEN116 nameservice is sometimes referred to as UDP nameservice. For the sake of familiarity, the XDS Setup menus use both terms. See also **IEN116 nameservice**.

**Input Synthesis**

a feature of the X Window System that allows a client application to capture and record input from the XDS mouse and keyboard, so that users can play back the session later on the XDS display. In addition, Input Synthesis allows the XDS to process synthetic input from the client as if it were receiving the input from the keyboard and mouse.

**Internet**

the collection of networks and gateways, and the protocols that allow them to function as a single, cooperative, virtual network.

**Internet Protocol**

See **IP**.

**Internet Protocol address**

See **IP address**.

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### **IP**

Internet Protocol. The Internet standard protocol that defines the Internet datagram (similar to a packet) as the unit of information passed across the Internet, and provides the basis for the Internet connectionless, best-effort packet delivery service. See also **Internet**, **TCP/IP**.

### **IP address**

Internet Protocol address. A 32-bit address assigned to machines using the Internet with TCP/IP. See also **Internet**, **TCP/IP**.

### **local fonts**

fonts contained in XDS ROM that can be used without a font server program. See also **font**, **font server program**.

### **login**

to start a terminal session on a host computer, using steps appropriate to the host.

### **login host**

See **connection host**.

### **memory**

the part of storage where instructions are executed, and local fonts and some network management software reside.

### **memory module**

the board in the XDS that contains the XDS fonts, and the XDS firmware. See also **firmware**.

### **menu**

a list of items and functions that can be selected or modified by the user.

### **modem**

Modulator/Demodulator. A device that converts digital data from the XDS to an analog signal that can be transmitted on a phone line, and converts the analog signal received to digital for the XDS.

### **nameserver**

a server program that matches a string (name) identifying a machine to a corresponding IP address. See also **nameservice**.

### **nameservice**

the process by which a nameserver machine matches a string (name) identifying a machine to a corresponding IP address.

### **Network File System**

See **NFS**.

### **network mask**

a mask used to select bits from an Internet address for network addressing. The mask is 32 bits long.

### **NFS**

a protocol developed by SUN Microsystems that uses TCP or UDP to allow a set of computers to access each others' file systems as if they were local. The XDS uses NFS as a font server program between the XDS and font hosts, and uses only UDP. See also **font server program**, **UDP**.

### **packet**

a unit of data sent across a packet-switching network.

### **ping**

Packet InterNet Groper. A program that tests whether a destination is reachable by sending it an ICMP echo request and waiting for a reply.

### **protocol**

a formal description of message formats and the rules two or more systems must follow to exchange the messages.

### **Proxy ARP**

the process by which another machine, usually a gateway, responds to ARP requests directed at another machine by supplying its own hardware address as the destination. The responding machine then forwards packets to the machine for which it responded. See also **ARP**.

**RARP**

Reverse Address Resolution Protocol. A protocol that, at startup, matches the XDS hardware address with its IP address. In order for a RARP request to work, the XDS must be in the RARP data base on a RARP server that is configured and running. The XDS sends BOOTP requests in conjunction with RARP requests. See also **BOOTP**, **RARP data base**.

**RARP data base**

a data base on a server machine, containing hardware addresses and corresponding IP addresses. In order for a RARP request to work, the XDS must be in the RARP data base and the RARP server must be running and configured. See also **RARP**.

**Read-Only Memory**

See **ROM**.

**Reverse Address Resolution Protocol**

See **RARP**.

**RGB Database**

a color mapping table that maps a string representing the name of a color to values for the intensities of the red, green, and blue (hence RGB) components of the color. In the XDS context the values are 0 - 255 representing the range of 0 to 100% intensity. For example the RGB value for "red" is normally the triple (255,0,0).

**ROM**

Read-Only Memory. Memory containing data that cannot be modified by the user. The XDS program code resides in ROM.

**RS232/423 cable**

a cable for serial interfaces between the XDS and communications devices, such as a modem. The cable connects to the 25-pin Communications port at the rear of the XDS.

**RTS/CTS flow control**

Request To Send/Clear To Send flow control. Enables flow control on the local serial line. RTS is pin-4 of the 25-pin RS232/423 connector. CTS is pin-5 of the connector. RTS is an output of the XDS; CTS is an input to the XDS. See also **flow control**, **RS232/423 cable**.

**Serial Line Internet Protocol**

See **serial line**.

**serial port**

a port to which you can attach serial devices (such as a modem). The port transmits data one bit at a time.

**serial line**

Serial Line Internet Protocol. serial line is a *de facto* standard protocol used for point-to-point serial connections running TCP/IP. serial line is useful for allowing network connections over dedicated or switched serial lines.

**TCP**

Transmission Control Protocol. See **TCP/IP**.

See **TCP/IP**.

**TCP/IP**

Transmission Control Protocol/Internet Protocol. The Internet transport-level protocol that provides the reliable, full-duplex, stream service needed by the X protocol.

**Telnet**

an application for remote terminal connection service. Using Telnet, an XDS user can interact with host at another site as if the XDS were a terminal directly connected to the host.

**terminal emulation program**

an application that allows a computer to display output from a system as if it were a particular terminal attached to the processing unit.

**ThinWire**

a light coaxial cable for Ethernet. Sometimes called *thinnet* or *cheapernet*. See also **Ethernet**.

**timeout**

a time interval allotted for certain operations to occur, for example, the amount of time allotted for the XDS to connect to a login host. After the timeout, the process is either repeated or discontinued.

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### **transceiver**

a device that connects the XDS to the Ethernet, which contains analog electronics that apply signals to the Ethernet and sense collisions. The transceiver connects to the 15-pin Ethernet port on the XDS.

### **UDP**

Universal Datagram Protocol. Similar to IP, but UDP datagrams include a UDP port number, allowing the receiver to distinguish among multiple applications on the host. UDP also performs checksumming of the data being sent. See also IP, UDP checksumming.

### **UDP checksumming**

a function performed by the UDP protocol software to check for errors in transmission. Before transmission, the protocol software computes a value from a packet by treating a sequence of octets (bytes made up of 8 binary elements) as integers and totalling their values. This value is included in the packet. When the packet is received, the software repeats the checksum and compares its result to the original value.

### **variable font**

a font with characters contained in graphic cells whose size varies with the size of each character. Contrast with **fixed font**. See also **character cell, font**.

### **window**

a rectangular region on the screen in which operations are performed. Under the X Window System, you can overlap windows without interference with the processes running in each. You create, resize, move, and close windows using a window manager program. See also **Xlogin window, window manager, X Window System**.

### **window manager**

an application that creates, resizes, opens, and moves windows on the XDS screen. An XDS may need to run a window manager program in the background in order to manipulate windows. See also **background**.

### **X**

See **X Window System**.

### **X server**

A program that, in the client server model, keeps track of keyboard and mouse input and sends it to clients. In turn, the X server receives information from clients and displays it on the screen in a hierarchy of overlapping resizable windows. The XDS is a full implementation of the X server, Version 11. See also **client-server model, X Window system**.

### **xterm**

a terminal emulation program that interfaces with the X server and supports the display of both bit-mapped X-compliant applications and those designed for standard alphanumeric terminals. See also **terminal emulation program, X server**.

### **X Window System**

a network-based graphics window system developed in 1984 at the Massachusetts Institute of Technology and used by the XDS.

The X Window System uses the client-server model of interaction to communicate simultaneously with multiple hosts running different operating systems. The X Window System allows you to work with multiple applications, displaying them on the X server (XDS) screen in a hierarchy of overlapping, resizable windows.

The X Window system is device-independent. Applications designed for different hardware and operating systems can be displayed on the XDS.

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