User Manual

Tektronix

TekXpress
Family of X Terminals

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This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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Die vom Betreiber zusammengestellte Anlage, innerhalb derer dies Gerät eingesetzt wird, muss ebenfalls den Voraussetzungen nach Par. 2, Ziff. 1 der Vfg. 1046/1984 genugen.

This software and documentation is based in part on BSD Networking Software Release 1 licensed from The Regents of the University of California. We acknowledge the role of the Computer Systems Research Group and the Electrical Engineering and Computer Sciences Department of the University of California at Berkeley in its development.

Manual Revision Status

TekXpress X Terminal User

Rev Date	Description
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MAR 1992	Revised to include Version 3 software information. Part number rolled to 070-8049-01.
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JUL 1992	This manual supports the TekXpress Version 2.1 *Utility* tape; the XP10 Version 2.0 *Quick Install* tape; the XP330 Version 5.1 *Quick Install* tape; and the XP20 Version 5.1 *Installation* tape. Part number rolled to 070-8049-04.
NOV 1992	This manual supports the TekXpress Version 6.0 *Quick Install and Utility* tapes and the XP20 Version 5.1 *Installation* tape. Part number rolled to 070-8049-05. Some features described require Version 3.0 boot ROM.
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OCT 1993	This manual supports TekXpress Version 6.3. Part number rolled to 070-8049-08.

Revision Status

Contents

Contents

Contents

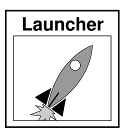
Tables

Preface

Typographical Conventions

This manual uses the following typographical conventions:

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



- This symbol indicates a *Launcher* Menu selection. Depending on how your account is set up, the *Launcher* may already be on your screen. If that is the case, simply use the mouse to select an option. If the *Launcher* is not present, press the Setup key on the keyboard. For 101/102 with Pause key keyboards, press and hold the Shift key and then press Setup to access the *Setup* window. For UNIX keyboards press the key sequence: AltGraph-Setup to access the *Launcher*. Refer to *Logging in with Client Launcher* on page 2-5.

Figure 1 illustrates the typographical conventions used in this manual.

The following terminology is used to describe mouse operations.

Pointing: use the mouse to position the pointer on an object on the display

Moving: use the mouse to change the location of the pointer on the display

Clicking: press and release a mouse button without moving the pointer

Dragging: press and hold down a mouse button while moving the pointer

Releasing: release the mouse button to complete a *dragging* action

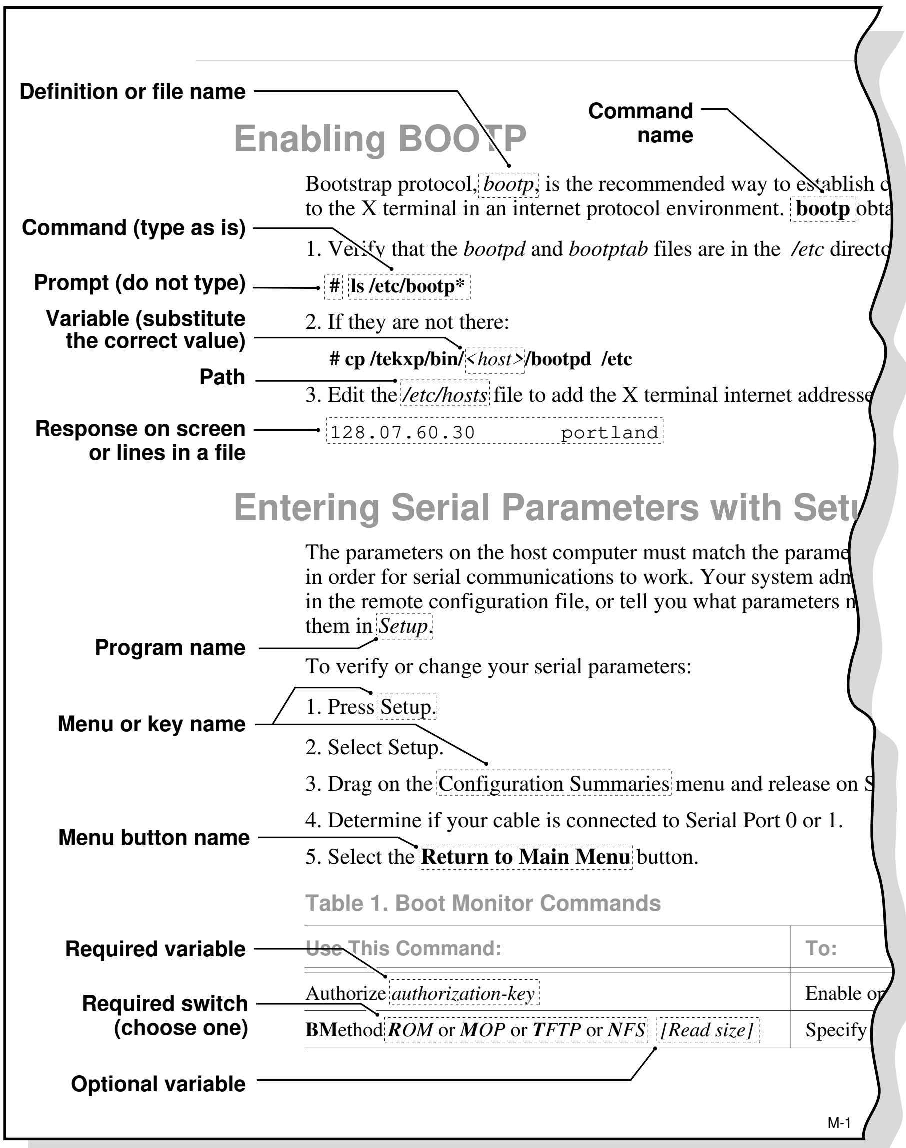


Figure 1 Typographical Conventions.

X Terminal Package

This manual assumes you have installed your X terminal according to the pictorial instructions included with your X terminal. Your X terminal is composed of the following components:

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

  The software is shipped on one or more magnetic tapes. The tapes, an *X Terminal Installation* manual and the *X Terminal Reference* manual are shipped with the software in a separate package from the X terminal.

Related Documentation

You can order this documentation from your X terminal representative:

- *Serial Xpress User — 070-8618-XX*

  Provides information about Serial Xpress, where you use a serial cable instead of a network cable to connect your X terminal with a remote host.

- *3270/3179G User — 070-8802-XX*

  Provides operating information for the 3270/3179G terminal emulator.

- *X Terminal Installation for Generic UNIX Environment* — 070-8417-XX
  X Terminal Installation for Hewlett-Packard Environment — 070-8423-XX
  X Terminal Installation for IBM Environment — 070-8425-XX
  X Terminal Installation for Silicon Graphics — 070-8751-XX
  X Terminal Installation for Sun Environment — 070-8419-XX
  X Terminal Installation for Ultrix Environment — 070-8415-XX
  X Terminal Installation for VMS Environment — 070-8422-XX

  Explains how to install an X terminal in the specified environment.

- *X Terminal Reference* — 070-8418-XX

  Provides detailed reference information about X terminals.

- *XPT/A Graphics Tablet Operators* — 070-8050-XX

  Provides installation and operation information for the Graphics Tablet.

- *Input Extensions Reference Manual* — 061-3800-XX

  Describes how to use input extensions for the touchscreen or trackball.

The following documentation is available from Prentice Hall:

- *OSF/Motif User's Guide* ISBN 0-13-640509-6

  Presents Motif fundamentals such sa creating and manipulating windows, customizing your environment, and using applications written for Motif.

The following documentation is available in local bookstores:

- *X Window System User's Guide* O'Reilly & Associates, Inc.
  ISBN 0-937175-29-3

  Presents window system concepts and includes tutorials for many clients.

Chapter 1

A New Piece of Hardware

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

What is an X Terminal

An *X terminal* is a device-independent, network-transparent, multi-tasking device connected to a host computer in a distributed computing environment. If that makes sense, skip to Chapter 2, *Operating the X Terminal*. Otherwise, it really is easy to understand what an X terminal is, and how it works when you consider each component used in the definition.

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

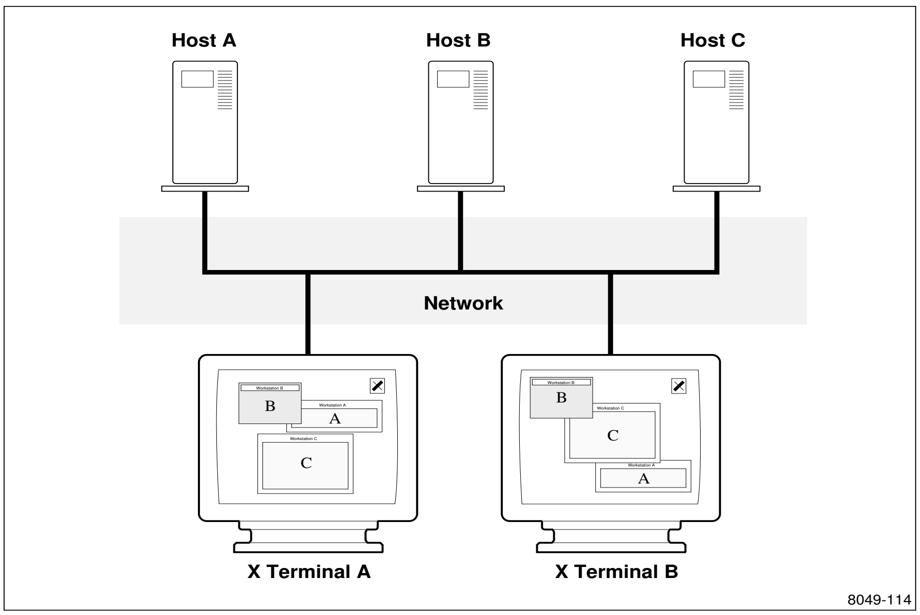


Figure 1-1 Typical Distributed-Computing Environment.

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

Why Use an X Terminal

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

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

    The X terminal advantage is that there is probably far more disk space available to the central computer than to a PC. Also, there is typically a support staff to load software and perform back ups on a central system.
  - PC software is typically licensed for a single user on a single PC.
  - X applications run on a network and are licensed for multiple users.

    Sharing software across the network is usually more cost effective than buying and maintaining separate copies for each user.
- Both devices run applications. Here are some differences:
  - PCs can run a single task at a time. Even in windowing environments, a PC can only have one *active* application running. Other applications may appear in windows or icons, but they are not active. If you started a recalculation command in a spreadsheet program, and then switched to a word processing program, the recalculation is suspended until you return to the spreadsheet.
  - X terminals are multi-tasking. In a multi-tasking environment, you can simultaneously run multiple applications. Consider the PC example above. With an X terminal, you can start the spreadsheet recalculation, switch to the word processing program while the recalculation continues to run.

    It is as if you have multiple PCs sitting on your desk. You do not have to sit idle if a command or program takes a long time to process. You can simply open a new window and work in a different application.

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

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

How Do You Use an X Terminal

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

Terminology

Like most new things, there are words and procedures that may need clarification. Before you continue, you may want to familiarize yourself with the terminology used throughout this manual. A more complete list of terms is listed in the Glossary of this book.

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

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

Table 1-1 Mouse Button Configuration.

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

Clicking Quickly pressing and releasing the Select mouse button without moving the pointer.

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

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

Moving Changing the location of the pointer on the screen by moving the mouse.

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

Pointing Positioning the pointer (such as the "x" or "↑" symbol appearing on the screen) on an object on the display by moving the mouse.

Chapter 2

Operating the X Terminal

Powering on the X Terminal

The first step is to power on your X terminal. For X terminal models with a separate logic module, power on both the display and the logic module. Figure 2-1 illustrates the location of the power switches on various models.

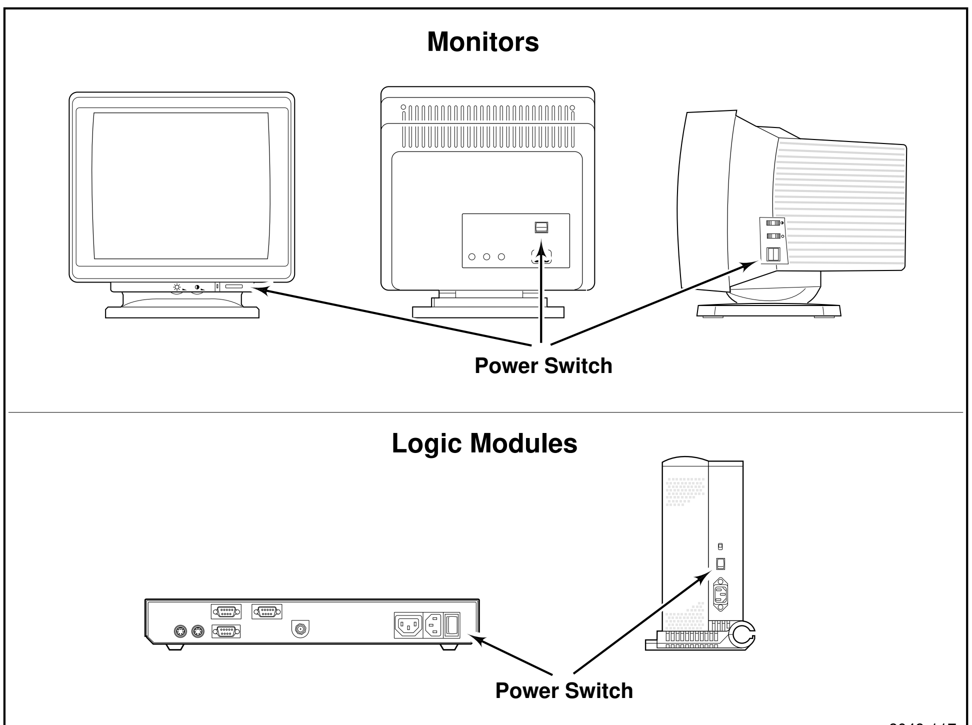


Figure 2-1 Power Switch Locations for Different Components.

If the X terminal does not power on, refer to Chapter 5, *Solving Power Problems* for troubleshooting information.

The X Terminal Boot Process

When your X terminal is powered on, it automatically begins booting. *Booting* means your X terminal is locating and reading its start up files. The boot screen (Figure 2-2) appears on your display as the X terminal is booting.

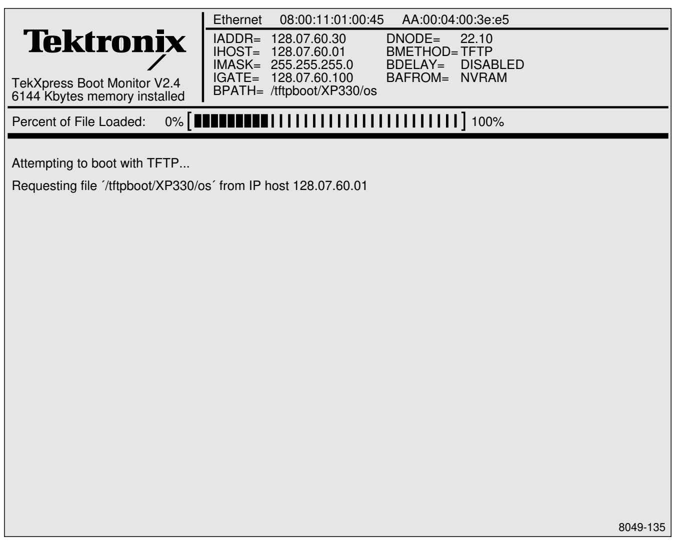


Figure 2-2 X Terminal Boot Screen.

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

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

If the boot fails again, call your system administrator or refer to Chapter 5, *Solving Power Problems* for more information. To help troubleshoot the boot problem, write down any messages that were displayed.

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

Logging in to the X Terminal

The next step is dependent on how your system administrator set up the X terminal software on the host computer. Each login method is illustrated and described in the following sections to help you identify your login method.

After your X terminal completes the boot process, one of the following should appear on your monitor:

- Gray pattern (called the *root weave*) with an **X** cursor (page 2-4)
- *Client Launcher* (page 2-5)
- *HostMenu* (page 2-6)
- Login window prompt (page 2-8)
- Telnet window (page 2-10)
- Cterm window (page 2-12)
- Serial Port Window (page 2-14)
- LAT Window (page 2-17)

If you cannot log in, refer to Chapter 5, *Solving Power Problems* for troubleshooting information.

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

Logging in from the Root Weave

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

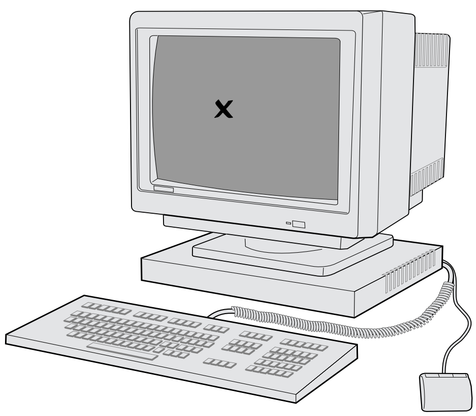
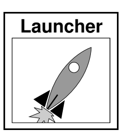


Figure 2-3 Root Weave with X Cursor.

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



Press Setup to bring up *Client Launcher*. Refer to *Logging in with Client Launcher* on page 2-5.

Logging in with Client Launcher

Client Launcher is used to start local clients by selecting a client from a menu. An arrow to the right of a *Client Launcher* entry indicates a submenu that contains additional local clients. In Figure 2-4, selecting Host Connections displays a sub-menu listing available host connections, such as Telnet or Cterm.

Your system administrator configures the *Client Launcher* to include the local clients you use most often. The *Client Launcher* on your X terminal may list different clients and submenus than those that appear in Figure 2-4.

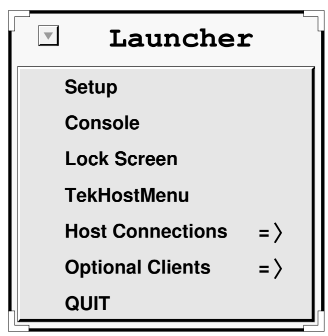


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Figure 2-4 Client Launcher menu.

To start a client listed on the *Client Launcher*:

- Position the pointer on the client name and click the *Select* mouse button.
- If the option is a submenu, position the pointer on the menu option. When the submenu is displayed, position the pointer on the client name and click the *Select* mouse button.

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

- *Logging in with HostMenu* on page 2-6
- *Logging in with Telnet* on page 2-10
- *Logging in with Cterm* on page 2-12
- *Logging in with LAT* on page 2-17

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

Logging in with HostMenu

HostMenu is a window showing a list of host computer names and network addresses. A sample *HostMenu* is illustrated in Figure 2-5.

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

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

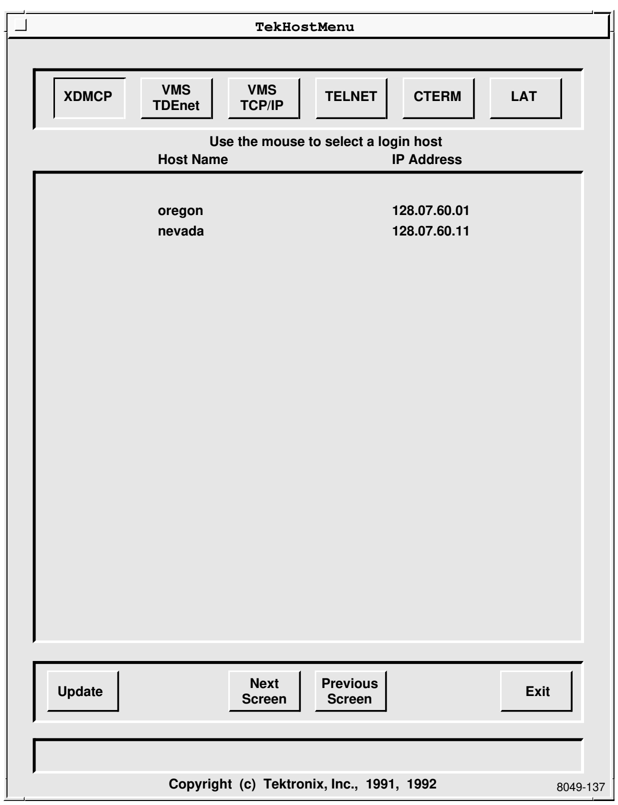


Figure 2-5 Example HostMenu.

To log in with *HostMenu*:

- Use the mouse to position the pointer on a host computer where you have a login account. If your host is not displayed, try the **Update** button or look for your host on one of the other lists (change lists by clicking one of the list buttons across the top).
- Click the *Select* button (left mouse button) to connect to the host

Some type of screen with a *Login:* prompt is displayed. If you selected the wrong host, press Ctrl-c to close the login box without logging in to the specified host.

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

For more information, see the applicable section:

- *Logging in at a Login Prompt* on page 2-8
- *Logging in with Telnet* on page 2-10
- *Logging in with Cterm* on page 2-12
- *Logging in with LAT* on page 2-17

Continue with Chapter 3, *Using the X Terminal*.

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

Logging in at a Login Prompt

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

Figure 2-6 Example UNIX Login Screen.

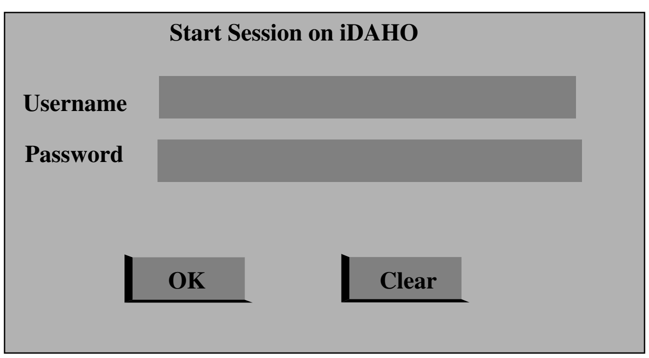


Figure 2-7 Example VMS Login Screen.

To login:

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

Continue with Chapter 3, *Using the X Terminal*.

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

Logging in with Telnet

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

```
Telnet>
```

Figure 2-8 Telnet Window Waiting for an Open Command.

To open a connection to your host computer:

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

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

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

```
Telnet> open oregon
```

Figure 2-9 Telnet Open Command.

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

- Type your user name at the *login:* prompt and press Enter
- Type your password at the *password:* prompt and press Enter

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


login:
```

Figure 2-10 Telnet Window With a Host Connection.

Continue with Chapter 3, *Using the X Terminal*.

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

Closing a Telnet Window

Press Ctrl-D at the *login:* prompt to return to the *Telnet>* prompt without logging in to the computer.

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

Logging in with Cterm

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

```
CTERM>
```

Figure 2-11 Cterm Window Waiting for an Set Host Command.

To open a connection to your computer:

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

  CTERM> **sethost** *hostname*

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

```
CTERM> sethost 11.10
```

Figure 2-12 Cterm Set Host Command.

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

- Type your user name at the *Username:* prompt and press Enter
- Type your password at the *Password:* prompt and press Enter

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

Username:
```

Figure 2-13 Cterm Window With a Host Connection.

Continue with Chapter 3, *Using the X Terminal*.

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

Closing a Cterm Window

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

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

Logging in with Serial Port 0 or 1

There are several ways to connect to a host through the Serial Port window (Figure 2-14). Check with your system administrator to find out which options you can use on your particular X terminal.

- Serial communications with no protocol
- Serial communications with *Serial Xpress* (SXp is an option, and is not supported on all X terminal models.)

You use Serial Port 0 or 1 depending on which port your serial cable is plugged into on the back of your X terminal logic module.

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

Figure 2-14 Serial Port Window Waiting for Command.

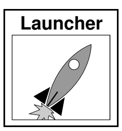
Closing a Serial Port Window

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

Entering Serial Parameters with Setup

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

To verify or change your serial parameters:



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

Serial Communications with No Protocol

From the Serial Port window pictured in Figure 2-14:

- Position the mouse pointer in the Serial Port window
- If you are using a modem, type your dialing command. Typically this is something like: **atdt** *phone_number* Refer to your modem manual.
- Press Enter to bring up a *Login:* prompt
- Type your user name and press Enter to bring up the *Password:* prompt
- Type your password and press Enter

Continue with Chapter 3, *Using the X Terminal*.

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

Serial Communications with Serial Xpress (SXp)

A separate manual is available for Serial Xpress. Refer to the *Related Documentation* section in the *Preface* for more information.

From the Serial Port window pictured in Figure 2-14:

- Position the mouse pointer in the Serial Port window
- If you are using a modem, type your dialing command. Typically this is something like: **atdt** *phone_number* Refer to your modem manual.
- Press Enter to bring up a *Login:* prompt
- Type your user name and press Enter to bring up the *Password:* prompt
- Type your password and press Enter
- Start SXp on the host: type **sxprocess** and press Enter

```
Connected

Login: username
Password: xxxxx
> sxprocess
```

Figure 2-15 Starting SXp on the Host (no modem).

The Serial Port window closes and a Serial Session window is opened for you.

Continue with Chapter 3, *Using the X Terminal*.

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

Logging in with LAT

If your X terminal displays a *LAT>* prompt like Figure 2-16, you are set up to log in through a Local Area Transport supported in a DECnet environment. To login, you must connect to a LAT service.

```
LAT>
```

Figure 2-16 LAT Window Waiting for an Connect Command.

To connect to a service:

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

  `LAT>` **services**

  to see a list of available services
- Type:

  `LAT>` **connect** *service*

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

```
LAT> connect service
```

Figure 2-17 LAT Connect Command.

Once a connection is made (Figure 2-18) you can log in:

- Type your user name at the *Username:* prompt and press Enter
- Type your password at the *Password:* prompt and press Enter

```
Welcome to VAX/VMS 5.5

Username:
```

Figure 2-18 LAT Window With a Service Connection.

Continue with Chapter 3, *Using the X Terminal*.

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

Closing a LAT Window

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

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

Chapter 3

Using the X Terminal

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

This chapter cannot tell you step-by-step how to get started, but it does provide general information to help you figure out *What next?*. Typically, one of the following scenarios occurs:

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

The sections in this chapter contain information on identifying what is happening on your X terminal, and what choices you can make. The following topics are discussed:

- X Window Software Components
- Getting Unstuck
- Window Managers
- Sessions
- Running Clients
- Locking the Display

X Window Software Components

Before diving into the details of the possible scenarios, it is a good idea to understand some of the common software components and terminology.

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

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

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

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

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

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

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

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

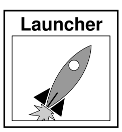
Clients are applications designed to run on an X server in a session window. *Client* refers to the fact that the application is typically subordinate to the window. This means if the window is closed, the client also closes.

Getting Unstuck

Occasionally something may go wrong and your X terminal or a client may get stuck or hang. *Hang* means the X terminal or the client is not responding to any input coming from you or being transmitted from the host. Often times, this is due to a busy network. There are three recommended ways to try and restore communications: resetting the X Server, rebooting the X Terminal, or, if the keyboard is also locked up, turn off the power on the X terminal.

Resetting the X Server

This is the first method to try.



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

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

Rebooting the X Terminal

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

If *Setup* does not come up, or if resetting the server did not work, try rebooting the X terminal. Press the key sequence: Ctrl-Alt-Delete to try and reboot the X terminal. If the reboot is successful, the boot screen is displayed while your X terminal boots. Refer to Chapter 2, *The X Terminal Boot Process* for more information on booting.

Powering off the Logic Module

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

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

Window Managers

There are many different window managers available, but the concepts are similar. Here is a list of the more popular window managers:

- Motif (also called MWM)
- OPEN LOOK Window Manager (OLWM) (Sun hosts)
- HP VUE (for Hewlett-Packard hosts)
- DECWindows (DEC hosts)
- Tom’s Window Manager (twm)

Your system administrator sets up and configures your window manager.

Determining if a Window Manager is Running

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

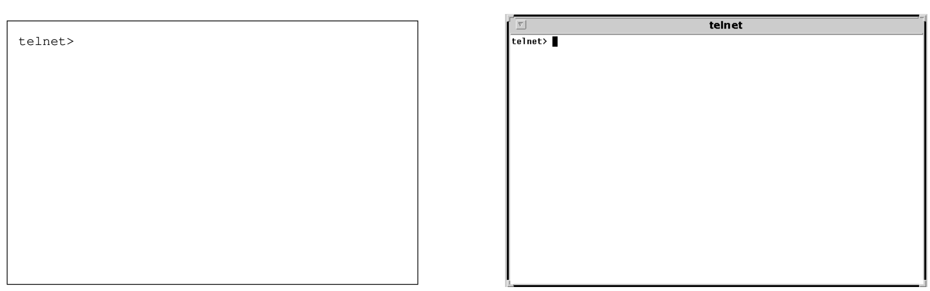


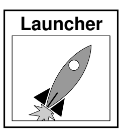
Figure 3-1. Determining if a Window Manager is Running.

Starting a Window Manager

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

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

To start local MWM or OLWM from default *Client Launcher*:



1. Open the Option Clients submenu.
2. Select *MWM* or *OLWM*.

   NOTE: If MWM or OLWM is not available, or if you use another window manager, call your system administrator. The command to start a window manager is specific to your host and configuration.

Using a Window Manager

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

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

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

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

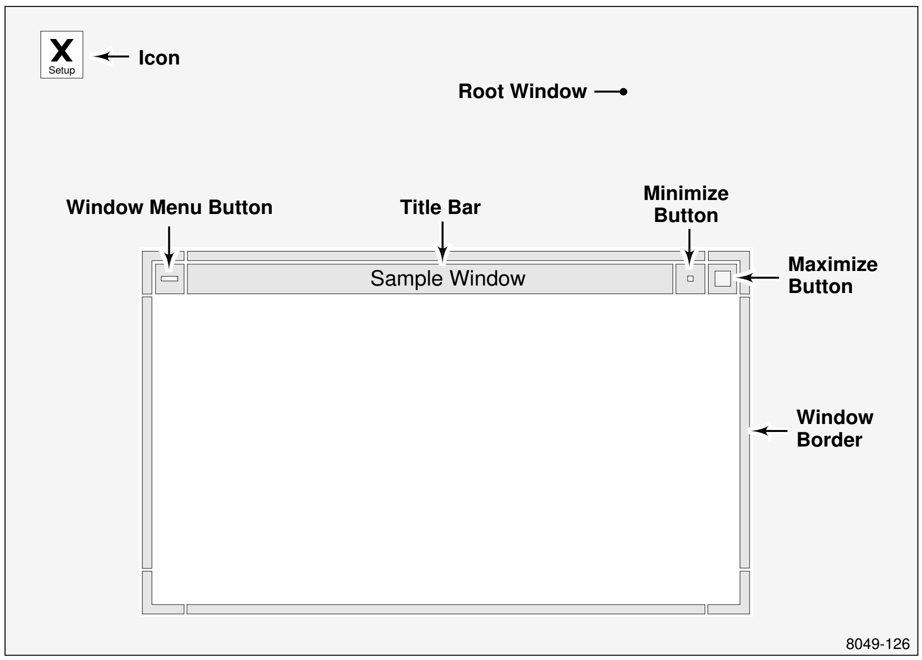
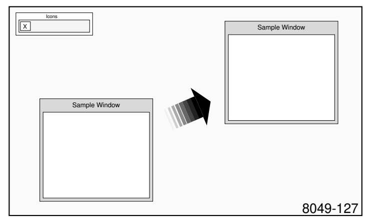


Figure 3-2. Elements of a Window.

These window manipulations are described in this sections:

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

Moving a Window

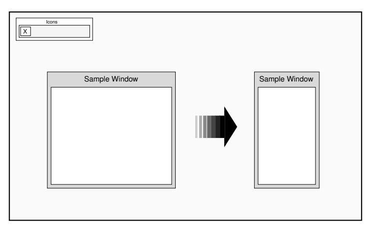


Windows can be moved from one location to another on the display.

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

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

Resizing a Window

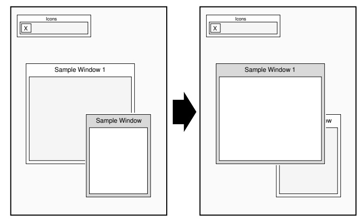


Many windows can be resized. The corners of the window border let you resize the window in two directions, while the horizontal borders and vertical borders let you resize the window in a single direction.

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

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

Raising a Window

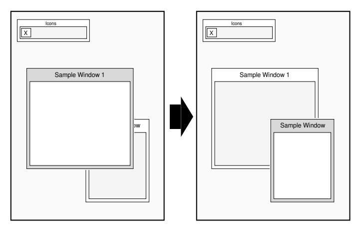


A window may need to be raised to be in front of any overlapping windows so you can see the entire window.

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

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

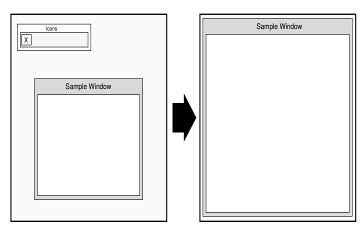
Lowering a Window



You can place a window behind overlapping windows.

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

Maximizing a Window

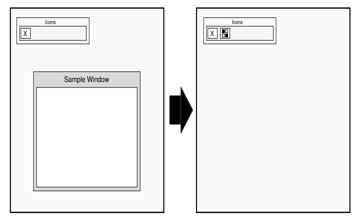


A window can be maximized to take up the entire size of the display. Some clients do not support maximized windows.

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

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

Iconifying a Window



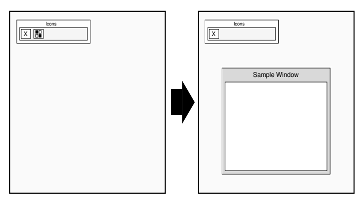
A window can be iconified. This helps keep your windows organized and easy to access.

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

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

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

Restoring an Icon

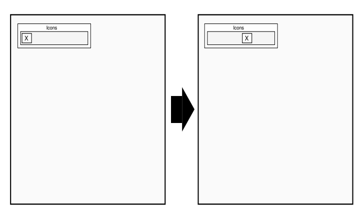


You can restore an icon back into a window if you want to see the window contents, or is you want to work in the window.

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

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

Moving an Icon



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

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

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

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

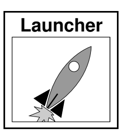
Alternate method: Click the icon once to display a pull-down menu, click on *Move*, position the icon outline (by moving the mouse), and click a mouse button.

Starting Sessions

As you learned when you read *Logging in to the X Terminal* in Chapter 2, there are many different ways to establish communications with one or more host computers. With an X terminal you can have multiple sessions open and running simultaneously. For example, you might open a word processor, cut some text out of file, and paste it into window where you are composing some electronic mail. Or, you might open a session into another host to check if a customer order has been shipped. All without having to exit your application.

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

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



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

1. Select TekHostMenu. When the *HostMenu* client appears, use the mouse to select your host. Refer to *Logging in with HostMenu* on page 2-6 for details.

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

2. Select a session from the Host Connections submenu:

   Telnet (refer to *Logging in with Telnet* on page 2-10)

   Console (refer to *The Console Window* on page 5-4)

   Cterm (refer to *Logging in with Cterm* on page 2-12)

   LAT (refer to *Logging in with LAT* on page 2-17)

   Serial Port 0 or 1 (refer to *Logging in with Serial Port 0 or 1* on page 2-14)

   NOTE: Grayed text indicates an option that is not enabled for your particular X terminal. If an option is not listed, it is not available for your X terminal model.

Running Clients

Clients refer to applications that run on your X terminal, such as a desktop publishing system, a computer-aided design program, or an on-line transaction processing system. Your X terminal can run multiple clients simultaneously.

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

Typically you start clients either of two ways:

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

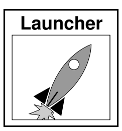
Refer to the documentation that came with your application for application-specific operation and information.

Locking the Display

You can lock your display and all open windows so that while away from your desk, an unauthorized user cannot access the information on your display. The *xlock* local client locks the keyboard only, or the keyboard and the display.

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

   xpsh -display *x terminal address***:0 xlock -mode** *n*



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

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

   When *xlock* is started, the *xlock* window appears (Figure 3-3).

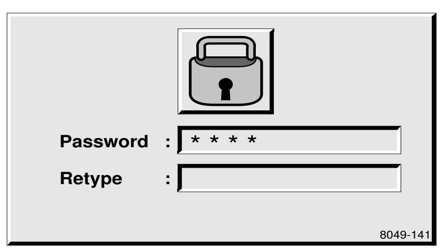


Figure 3-3. Xlock Window.

2. At the *Password* prompt, enter a password and press Enter.
3. At the *Retype* prompt, enter the password again and press Enter. This verifies you have entered the password correctly. *Xlock* remains in effect until you re-enter the password. The password is valid until you reboot the X terminal or reset the server.
4. To unlock the display or keyboard, press any key for the *xlock* window. At the *Password* prompt, enter the password.

   NOTE: If you forget your password, you must reboot the X terminal or reset the server to unlock the display or keyboard.

Chapter 4

Using Advanced Features

This chapter contains information on these features:

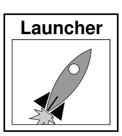
- Font caching for storing fonts in your X terminal's memory
- Printing color hardcopies from your X terminal

Font Caching

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

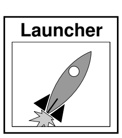
You can specify the amount of memory to allocate or you can flush cached fonts at any time. It is recommended that cache be flushed whenever new fonts (with a font path change) are added, to insure that the proper paths are cached. Flushing does not affect the current applications.

To set a Font Cache Limit:



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

To empty the Font Cache and free up X terminal memory:



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

Printing Color Hardcopies

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

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

Printing from MWM

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

Making a Hardcopy of a Window

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

Making a Hardcopy of the Screen

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

Printing from the Command Line

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

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

Chapter **5**

Troubleshooting

Solving Power Problems

If you press the power button(s) and nothing happens:

- Check the back of the X terminal and separate logic module (if you have one) to verify the power cord is firmly attached.
- Check the electrical outlet to make sure the power cord is firmly plugged in.
- Try a different electrical outlet, or try plugging something else into the outlet to verify the outlet has power.

If keyboard lights flash or if a bell sounds but nothing is displayed on the screen:

- On the X terminal, check that the video cable is connected to the video port.
- On the monitor, check that the video cable is connected to the correct video inputs (video in).

Solving Boot Problems

If the X terminal powers up, but the boot fails, there are various options to try. After each option, try to boot the X terminal from the *BOOT>* prompt by typing **b** or **boot** and then pressing Enter.

- Verify the X terminal keyboard, mouse and network cables are all firmly attached.

For advanced users who have access to the *X Terminal Reference* manual, refer to the Boot Monitor chapter:

- Verify the boot method. It typically is TFTP or NFS for UNIX computers, MOP for DEC computers, or ROM if you have an optional Flash or ROM option.
- Verify host and gateway communications from the boot monitor with **ping.** If **ping** does not find the host, verify the host and X terminal subnet masks are correctly set.
- If an error message says the boot file is not found:
  - Verify the expected information was obtained from the network
  - Verify the boot path is correct. It should contain both the path and the boot file name.
  - Verify that all the files have world read permissions
- If the configuration files are not found:
  - Verify the messages to verify which host is being polled for the files
  - Verify the primary and secondary paths are correctly set
  - Verify the paths and the read permissions on the files

Solving Log in Problems

If your X terminal boots, but you are unable to log in:

- If the mouse or keyboard do not respond, check the cables and then reboot.
- If an error message is generated saying that the log in failed:
  - Retry entering your username and password
  - Verify you are connected to a host where you have a login account
- If a message is displayed saying that a connection timed out, restart the connection as detailed in Chapter 2, *Logging in to the X Terminal*.
- Check the Console window for error messages. Refer to *The Console Window* on page 5-4.

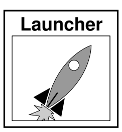
The Console Window

The *Console Window* is a useful tool to see what is happening with the X terminal. Messages, such as a confirmation that a file was located or that a command generated an error, are sent to this window. You must explicitly open and close the Console window through the *Client Launcher*.

Opening the Console Window

The Console window is a valuable tool to see messages being generated by the X terminal. You can display this window at any time.

To open the Console window:

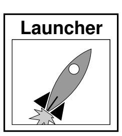


1. Select Console from the *Client Launcher*. If you need a refresher on the terminology used in these procedures, refer back to Chapter 1, *Terminology*.

The Console Window appears on your screen. You cannot add or delete information from the Console. This window is updated whenever a confirmation or error message is received by the X terminal.

Clicking the Select (left) mouse button in the Console window displays the next screen of messages. Clicking the Custom (right) mouse button displays the previous screen of messages. Clicking the Menu (middle) mouse button clears the Console window.

Closing the Console Window



1. Select Console from the *Client Launcher*.

The Console Window disappears from your screen.

Appendix **A**

Special Keyboard Characters

This appendix describes how to work with special characters on different keyboards.

- *Entering North American Special Characters from International Keyboards* tells how to enable data processing keys so that you can use the North American character set on international keyboards.
- If you are using an LK401/VT200-style keyboard, refer to *Compose and Diacritical Sequences* for information on creating special characters and symbols by using compose characters.

Keyboard Charts

Figures A-1, A-2, A-3, A-4, A-5, A-6, and A-7 show examples of the standard types of keyboards available with the X terminals. Refer to Appendix B, *Keyboards* in the *Reference Manual* for information about the key codes (which are the numbers that appear below the keys in the following figures).

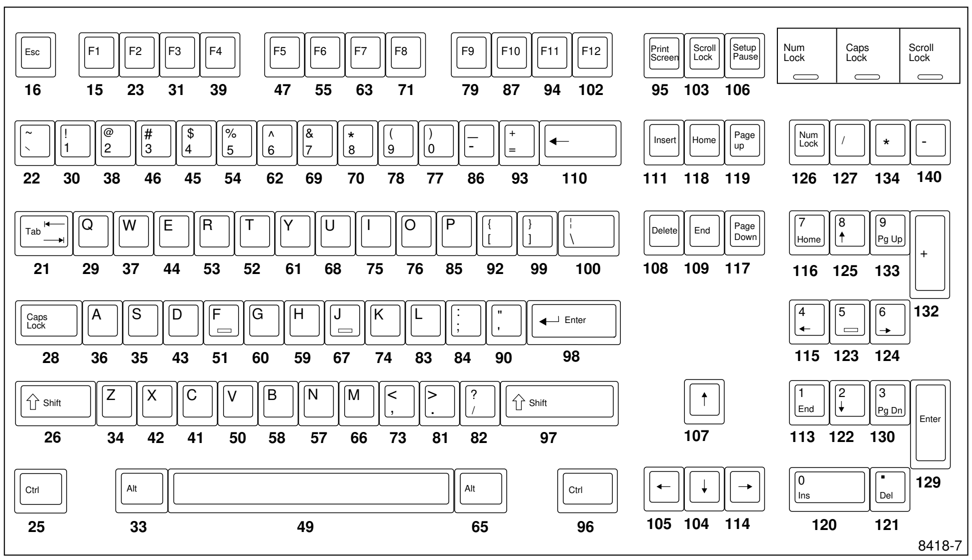


Figure A-1 101 with Pause North American Keyboard.

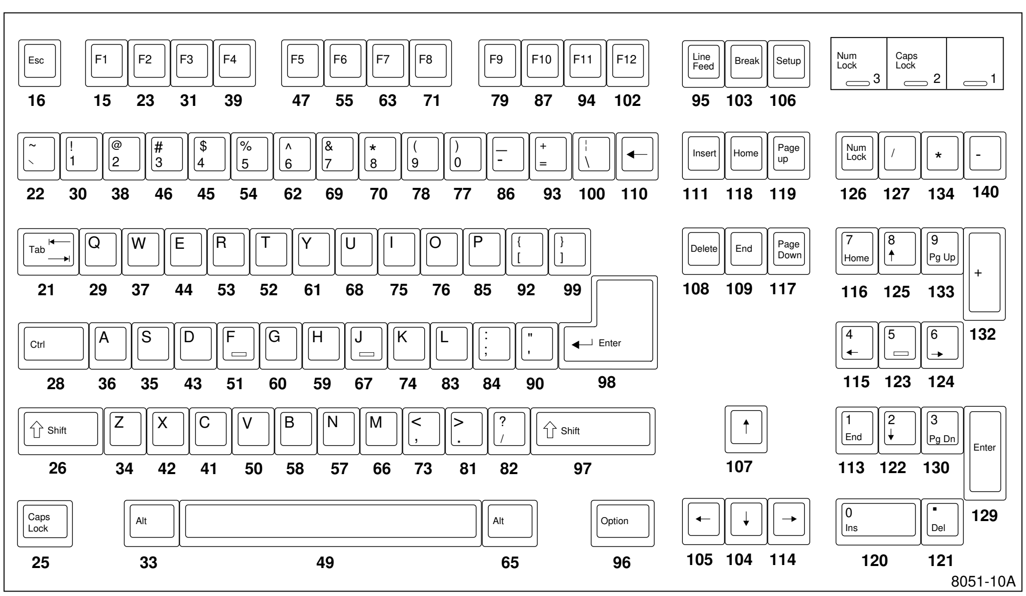


Figure A-2 101 with Setup North American Keyboard.

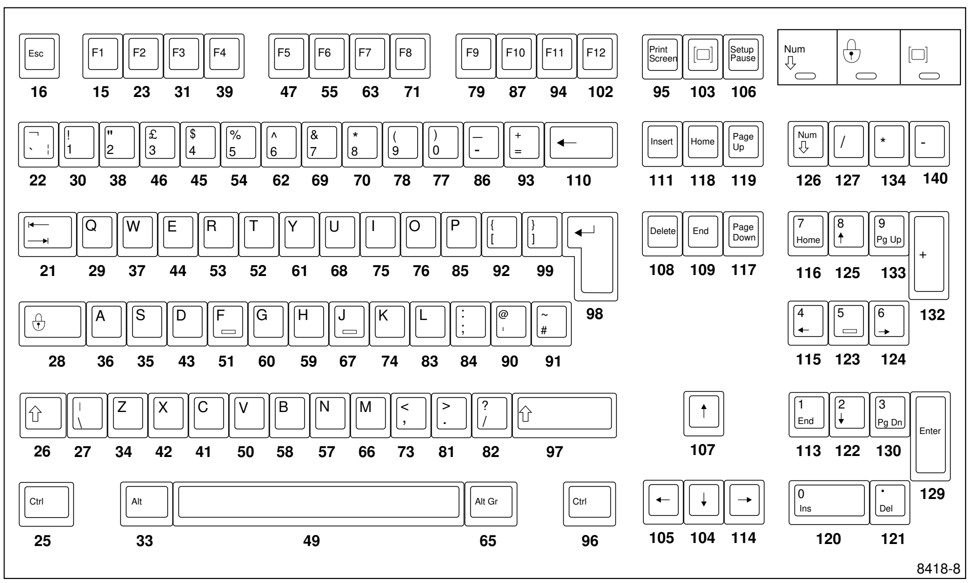


Figure A-3 102 with Pause United Kingdom Keyboard.

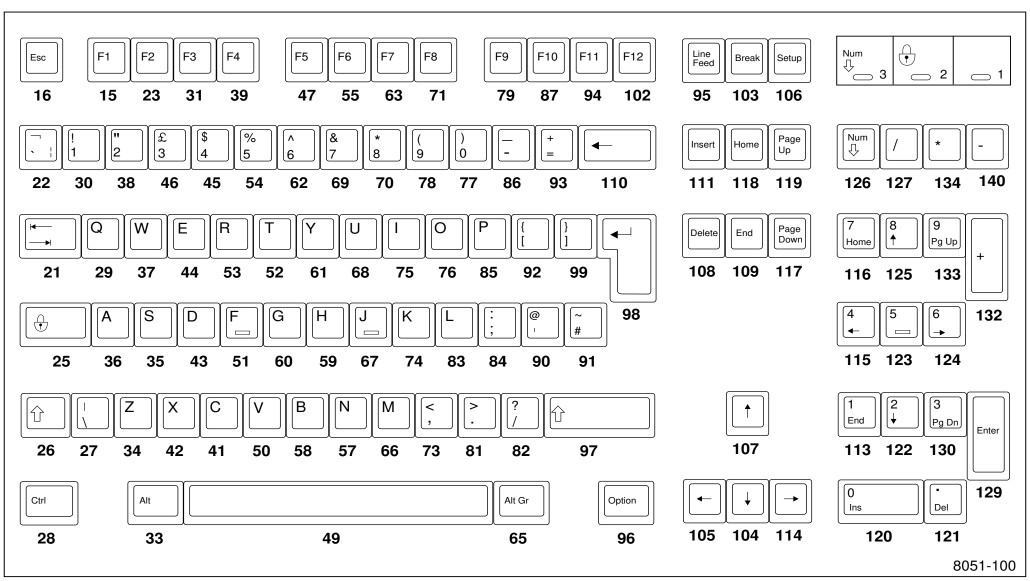


Figure A-4 102 with Setup United Kingdom Keyboard.

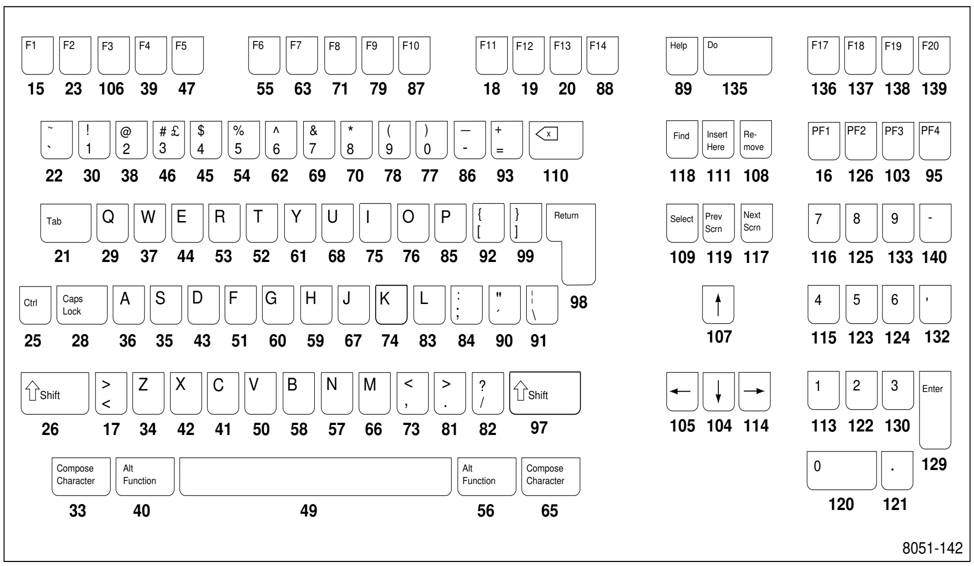


Figure A-5 VT200/LK401-Style North American Keyboard.

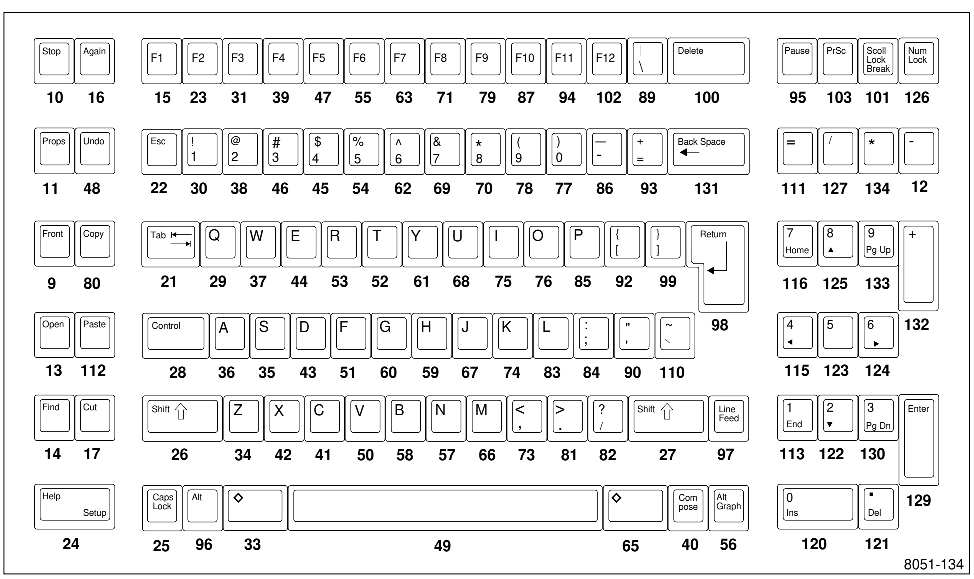


Figure A-6 UNIX Keyboard.

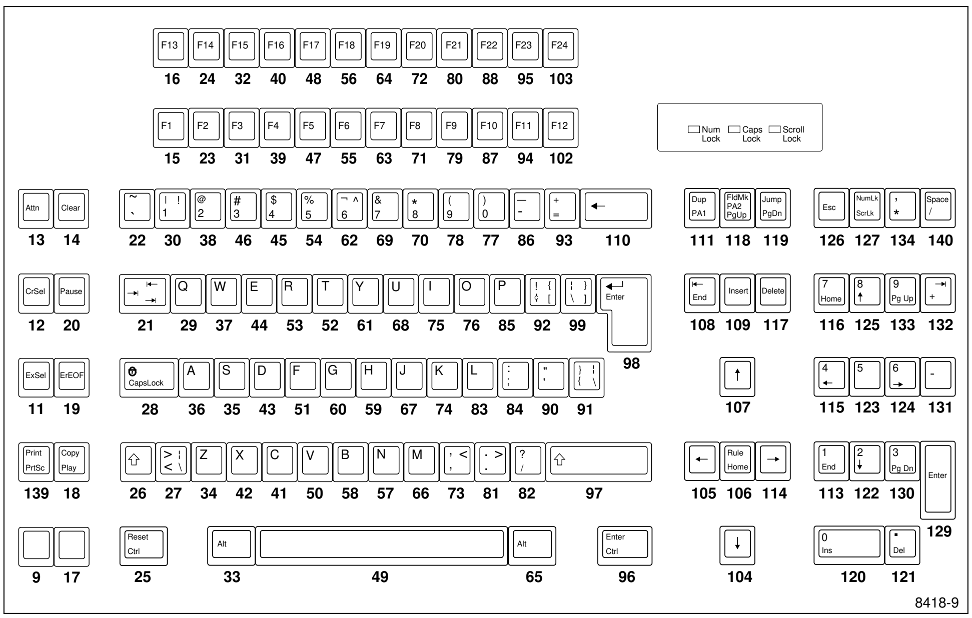
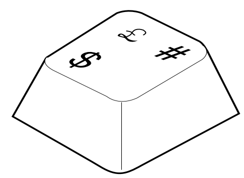


Figure A-7 3270 Keyboard.

NOTE: For information about the 3270 keyboard, refer to the 3270/3179G User Manual.

Entering North American Special Characters from International Keyboards



Some data processing programs require entry of characters from the North American keyboard that are not available on all international keyboards. The characters needed but not always available are: { } [] \ @ # * $ |

To permit entry of the full North American character set from all keyboards, some international keyboards have one or more keys with dual legends on them. Legends on the left of LK401/VT200 keyboards are *typewriter* legends and legends on the right are *data processing* (DP) legends. (Legends on the right of 102-key keyboards are *alternate graphic* legends.)

You can enable DP legends for the LK401/VT200 keyboards from the Main Menu of *Setup*. The Main Menu displays a DP Mode item when you set Keyboard Type to VT200 and Language to one of the international languages. When you need these special symbols, enable the DP keys by clicking DP Mode to On. Click this item to Off when you need the usual national characters of the keyboard. If you want to run TekXpress compose, load the compose sequences. For details, refer to the *Compose and Diacritical Sequences* section later in the manual.

If TekXpress compose is enabled, you can also access DP legends from the keyboard (rather than through *Setup*) by using Compose sequences. To enter a DP legend, press the Compose key and then the desired key. So that you can enter all ASCII characters, several keyboards have compose sequences for DP keys that do not have DP legends on the keycaps. These compose sequences appear in the tables that follow. For more information about Compose sequences, refer to *Compose and Diacritical Sequences* later in this appendix.

When DP mode is off, the two-key sequences for accessing DP characters (Tables A-1 - A-9) supercede the three-key compose sequences involving the Compose-DP keys.

Tables A-1 through A-9 summarize the DP characters that are sent for each LK401/VT200-style international keyboard. These tables show both the Typewriter Mode and Data Processing Keys mode. As noted, some compose sequences do not have DP legends. Keyboards not appearing in these tables do not offer DP keys.

Table A-1 VT200/LK401 Danish Keyboard.

<table>
<tr><th>Mode</th><th></th><th colspan="5">DP Keys</th><th colspan="3">Compose-DP Keys</th></tr>
<tr><th>VT200</th><th>Key State</th><th>§ @
3</th><th>Å [
]</th><th>Ø \
#</th><th></th><th></th><th>*
,</th><th>(
8</th><th>)
9</th></tr>
<tr><td rowspan="2">Typewriter</td><td>Normal</td><td>3</td><td>å</td><td>ø</td><td></td><td></td><td>|</td><td>{</td><td>}</td></tr>
<tr><td>Shft</td><td>§</td><td>Å</td><td>Ø</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">Data Processing Keys</td><td>Normal</td><td>3</td><td>]</td><td>#</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Shft</td><td>@</td><td>[</td><td>\</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><th>LK401</th><th>Key State</th><th>§ @
~</th><th>£ #
3</th><th>Æ [
{</th><th>Å]
}</th><th>Ø \
|</th><th>*
,</th><th>(
8</th><th>)
9</th></tr>
<tr><td rowspan="2">Typewriter</td><td>Normal</td><td>~</td><td>3</td><td>æ</td><td>å</td><td>ø</td><td>|</td><td>{</td><td>}</td></tr>
<tr><td>Shft</td><td>§</td><td>£</td><td>Æ</td><td>Å</td><td>Ø</td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">Data Processing Keys</td><td>Normal</td><td>~</td><td>3</td><td>{</td><td>}</td><td>|</td><td></td><td></td><td></td></tr>
<tr><td>Shft</td><td>@</td><td>#</td><td>[</td><td>]</td><td>\</td><td></td><td></td><td></td></tr>
</table>

Table A-2 VT200/LK401 French Keyboard.

Mode	Key State	DP Keys						Compose-DP Keys		
VT200		**6 § [**	**7 è]**	**% ù **				**@ #**	**9 ç**	**0 à**
Typewriter	Normal	§	è	ù				|	{	}
	Shft	6	7	%						
Data Processing Keys	Normal	[	]	\\						
	Shft	6	7	%						
LK401	**Key State**	**6 § [**	**7 è]**	**% ù **	**2 è |**	**9 ç {**	**0 à }**	**@ #**	**9 ç**	**0 à**
Typewriter	Normal	§	è	ù	2	9	0	|	{	**à**
	Shft	6	7	%						
Data Processing Keys	Normal	[	]	\\	è	ç	à			
	Shft	6	7	%	|	{	}			

Table A-3 VT200 German Keyboard.

Mode VT200	Key State	DP Keys		Compose-DP Keys		
		Ü \ @	Ä [ ]	' #	(8	) 9
Typewriter	Normal	ü	ä	|	{	}
	Shft	Ü	Ä			
Data Processing Keys	Normal	@	]			
	Shft	\	[			

Table A-4 LK401 German Keyboard.

Key Cap	Typewriter		Data Processing Keys		Compose-DP Keys
	Normal	Shft	Normal	Shft	
' #			¦		|
(8					{
) 9					}
° ^ ¬	^	°	¬	°	
! ¡ 1 ¹	1	!	¹	¡	
" 2 ²	2	"	²	"	
§ £ 3 ³	3	§	³	£	

Table A-4 LK401 German Keyboard. (Continued)

Key Cap	Typewriter		Data Processing Keys		Compose-DP Keys
	Normal	Shft	Normal	Shft	
$ ¤ **4 1/4**			1/4	¤	
% **5 1/2**		%	1/2	%	
& **6 3/4**	6	&	3/4	&	
/ **7 {**	7	/	{	/	
(**8 [**	8	(	[	(	
) ± **9]**	9	)	]	±	
= ° **0 }**	O	=	}	°	
? ¿ **β **	β	?	\\	¿	
` **´ ¸**	´	`	¸	`	
Q **@**	q	Q	@	Q	
R ® **¶**	r	R	¶	®	
Z ¥	z	Z	z	¥	
O Ø	o	O	Ø	o	

Table A-4 LK401 German Keyboard. (Continued)

Key Cap	Typewriter		Data Processing Keys		Compose-DP Keys
	Normal	Shft	Normal	Shft	
P ρ	p	P	p	ρ	
Ü °	ü	**Ü**	¨	°	
* - +	+	*	~	-	
A **Æ**	a	A	æ	**Æ**	
S **§** β	s	S	β	§	
D **Đ** δ	d	D	δ	Đ	
F ª	f	F	f	ª	
; **X** **,**	,	;	,	X	
K **&**	k	K	k	&	
Ö ′	ö	Ö	′	Ö	
Ä ^	ä	Ä	^	Ä	
´ # `	#	´	`	´	
> < |	<	>	|		

Table A-4 LK401 German Keyboard. (Continued)

Key Cap	Typewriter		Data Processing Keys		Compose-DP Keys
	Normal	Shft	Normal	Shft	
Y < **y** <<	y	Y	<<	<	
X > **x** >>	x	X	>>	>	
C © ¢	c	C	¢	©	
M o µ	m	M	µ	o	
: ÷ . •		:	•	÷	

Table A-5 VT200/LK401 Italian Keyboard.

<table>
<tr><th>Mode</th><th></th><th colspan="8">DP Keys</th><th colspan="3">Compose-DP Keys</th></tr>
<tr><th>VT200</th><th>Key State</th><th>1
£ @</th><th>2
é #</th><th>9
ç [</th><th>0
à]</th><th>§ \
*</th><th></th><th></th><th></th><th>%
ù</th><th>=
`</th><th>§
$</th></tr>
<tr><td>Typewriter</td><td>Normal</td><td>£</td><td>é</td><td>ç</td><td>à</td><td>*</td><td></td><td></td><td></td><td>|</td><td>{</td><td>}</td></tr>
<tr><td></td><td>Shft</td><td>1</td><td>2</td><td>9</td><td>0</td><td>§</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Data Processing Keys</td><td>Normal</td><td>@</td><td>#</td><td>[</td><td>]</td><td>*</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>Shft</td><td>1</td><td>2</td><td>9</td><td>0</td><td>\</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><th>LK401</th><th>Key State</th><th>1
£ @</th><th>2
é #</th><th>9
ç [</th><th>0
à]</th><th>§ \
*</th><th>%
ù {</th><th>=
; }</th><th>!
ò |</th><th>%
ù</th><th>=
`</th><th>§
$</th></tr>
<tr><td>Typewriter</td><td>Normal</td><td>£</td><td>é</td><td>ç</td><td>à</td><td>*</td><td>ù</td><td>;</td><td>ò</td><td>|</td><td>{</td><td>}</td></tr>
<tr><td></td><td>Shft</td><td>1</td><td>2</td><td>9</td><td>0</td><td>§</td><td>%</td><td>=</td><td>!</td><td></td><td></td><td></td></tr>
<tr><td>Data Processing Keys</td><td>Normal</td><td>@</td><td>#</td><td>[</td><td>]</td><td>*</td><td>{</td><td>}</td><td>|</td><td></td><td></td><td></td></tr>
<tr><td></td><td>Shft</td><td>1</td><td>2</td><td>9</td><td>0</td><td>\</td><td>%</td><td>=</td><td>!</td><td></td><td></td><td></td></tr>
</table>

Table A-6 VT200/LK401 Norwegian Keyboard.

Mode	Key State	DP Keys			Compose-DP Keys		
VT200		**§ @ 3**	**Å [ ]**	**Æ \ #**	*** ,**	**(8**	**) 9**
Typewriter	Normal	3	å	æ	|	{	}
	Shft	§	Å	Æ			
Data Processing Keys	Normal	3	]	#			
	Shft	@	[	\			
LK401	**Key State**	**Å] }**	**Æ [{**	**Ø \ |**	*** ,**	**(8**	**) 9**
Typewriter	Normal	å	æ	ø	|	{	}
	Shft	Å	Æ	Ø			
Data Processing Keys	Normal	}	{	|			
	Shft	]	[	\			

Table A-7 VT200/LK401 Spanish Keyboard.

Mode		**DP Keys**				**Compose-DP Keys**		
VT200	**Key State**	**¡ \\ ¿ @**	**ª [º]**			**~ ç**	**(8**	**) 9**
Typewriter	Normal	¿	º			|	{	}
	Shft	¡	ª					
Data Processing Keys	Normal	@	]					
	Shft	\	[					
LK401	**Key State**	**¡ \\ ¿ @**	**ª [º]**	**Ñ } {**	**~ ç |**	**~ ç**	**(8**	**) 9**
Typewriter	Normal	¿	º	ñ	ç	|	{	}
	Shft	¡	ª	Ñ	~			
Data Processing Keys	Normal	@	]	{	|			
	Shft	\	[	}	ç			

Table A-8 VT200/LK401 Swedish/Finnish Keyboard.

<table>
<tr><th>Mode</th><th></th><th colspan="6">DP Keys</th><th colspan="3">Compose-DP Keys</th></tr>
<tr><th>VT200</th><th>Key State</th><th>§ @
3</th><th>¤ $
4</th><th>Å [
]</th><th>Ü \
#</th><th></th><th></th><th>Ä</th><th>(
8</th><th>)
9</th></tr>
<tr><td rowspan="2">Typewriter</td><td>Normal</td><td>3</td><td>4</td><td>å</td><td>ü</td><td></td><td></td><td></td><td>{</td><td>}</td></tr>
<tr><td>Shft</td><td>§</td><td>¤</td><td>Å</td><td>Ü</td><td></td><td></td><td>|</td><td></td><td></td></tr>
<tr><td rowspan="2">Data Processing Keys</td><td>Normal</td><td>3</td><td>4</td><td>]</td><td>#</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Shft</td><td>@</td><td>$</td><td>[</td><td>\</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><th>LK401</th><th>Key State</th><th>§ @
3</th><th>$
4</th><th>Å [
]</th><th>Ü \
#</th><th>Ö {
}</th><th>Ä |</th><th>Ä</th><th>(
8</th><th>)
9</th></tr>
<tr><td rowspan="2">Typewriter</td><td>Normal</td><td>3</td><td>4</td><td>å</td><td>ü</td><td>Ö</td><td>ä</td><td></td><td>{</td><td>}</td></tr>
<tr><td>Shft</td><td>§</td><td>$</td><td>Å</td><td>Ü</td><td>ö</td><td>Ä</td><td>|</td><td></td><td></td></tr>
<tr><td rowspan="2">Data Processing Keys</td><td>Normal</td><td>3</td><td>4</td><td>]</td><td>#</td><td>}</td><td>ä</td><td></td><td></td><td></td></tr>
<tr><td>Shft</td><td>@</td><td>$</td><td>[</td><td>\</td><td>{</td><td>|</td><td></td><td></td><td></td></tr>
</table>

Table A-9 VT200/LK401 Swiss/German Keyboard.

Mode		DP Keys					Compose-DP Keys		
VT200	Key State	ç @ 4	è \ ü	é [ö	à] ä	£ # $	£ # $	(8	) 9
Typewriter	Normal	4	ü	ö	ä	$	|	{	}
	Shft	ç	è	é	à	£			
Data Processing Keys	Normal	4	ü	ö	ä	$			
	Shft	@	\	[	]				
LK401	**Key State**	**ç @ 4**	**è \ ü |**	**é [ö {**	**à] ä }**	**£ # $**	**£ # $**	**(8**	**) 9**
Typewriter	Normal	4	ü	ö	ä	$	|	{	}
	Shft	ç	è	é	à	£			
Data Processing Keys	Norma	4	|	{	}	$			
	Shft	@	\	[	]	#			

Table A-10 VT200/LK401 United Kingdom Keyboard.

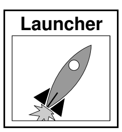
Mode	Key State	DP Key £ # 3
Typewriter	Normal	3
	Shft	£
Data Processing Keys	Normal	3
	Shft	#

Compose and Diacritical Sequences

On LK401/VT200-style keyboards you can use compose characters to type special characters and symbols that are not available as single keystrokes. These might be common characters, such as the cent sign (¢), or letter forms particular to a certain language, for example, a lowercase "e" with an acute accent.

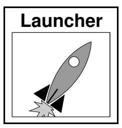
X terminals directly support compose characters for all X11 clients with LK401/VT200 keyboards, other than North American. DEC VMS and Ultrix X applications provide their own compose characters. Refer to your DECWindows documentation for information about DEC compose characters.

To use DEC compose characters:



1. Select Setup from the *Client Launcher*. Select either VT200/LK401 Ultrix (ESC) or VT200/LK401 VMS (F11) as the Keyboard Type.
2. Set the Compose Sequences option to No.
3. Use a DEC VMS or Ultrix X application.
4. Begin a compose sequence by pressing the Compose key.

To use TekXpress compose characters:



1. Select Setup from the *Client Launcher*.
2. Select VT200/LK401 X (ESC-BS-LF) or VT200/LK401 X (F11-F13) as the Keyboard Type.
3. Set the Compose Sequences option to Yes.
4. Select a Keyboard Nationality. (To use North American, use xmodmap to clear the modifier by entering the following: **xmodmap -e "clear mod1"**)

You can compose TekXpress compose characters in two ways:

- Press a diacritical key (described under *Using the Diacritical Keys* later in this appendix), and then the character to be combined with it (valid combinations are shown in Table A-10).
- Press the Compose key (described under *Using the Compose Key* later in this appendix), and then type the two composing characters (valid combinations are shown in Table A-11).

NOTE: To enter a special character, your application must support 8-bit characters and select fonts. If you cannot enter special characters, contact your system administrator.

Using the Diacritical Keys

There are from one to five diacritical keys on all international VT200-style keyboards (except North American). These keys do not send characters when you press them; rather, they combine with the next character you type to form a special symbol.

For example, on keyboards for which tilde (~) is a diacritical mark, you compose the ñ Spanish character by pressing the "~" key and then pressing the "n" key.

To cancel a diacritical key sequence:

- Press the Delete key, or
- Press another diacritical key (if you want to start a new sequence).

If you type an invalid sequence: the entry is ignored, the bell on the X terminal rings, and the diacritical sequence terminates.

The Compose light turns OFF when you complete the compose sequence.

The acute accent (´) character is a special case: on the keyboard, it shares its visual representation with the apostrophe ('). Depending on the keyboard nationality, the keyboard character on the X terminal represents an acute accent (a diacritical mark) or an apostrophe (a character).

Table A-11 shows the diacritical keys available on various keyboards.

Table A-11 Diacritical Keys.

Keyboard	Diacritical Keys				
Danish/Norwegian[a]		`	´	^	¨
French	~	`		^	¨
German[a]	~	`	´	^	
Italian	~	`		^	
North American	none				
Spanish[b]	~	`		^	¨
Swedish	~	`		^	
Swiss-German	~	`		^	¨
United Kingdom		`			

[a] Two single-quote symbols appear on the keyboard. The one on the top row of keys is a diacritical mark and can be thought of as an acute accent (´). The other one is not a diacritical mark and can be thought of as an apostrophe (').

[b] Both single quote symbols generate an apostrophe character.

Variations from DEC Compose Sequences

The following differences exist between the TekXpress X terminal and the DEC VT200 compose sequences:

- The sequence that generates a double quote on the VT200 generates an umlaut on the TekXpress X terminal.
- There is no difference on the VT200 between an apostrophe and an acute accent. Depending on keyboard nationality, you can treat the acute accent on the keyboard as a diacritical mark (an acute accent). You can access the apostrophe symbol on the keyboard through a compose sequence.
- The TekXpress X terminals provide compose sequences for dollar sign, small and capital Icelandic eth, small and capital Icelandic thorn, small and capital y with an acute accent, three-fourths fraction, division sign, multiplication sign, acute accent, umlaut, overbar, cedilla, registered sign, broken vertical bar, not sign, no-break space, and soft hyphen.
- You access TekXpress and DEC three-key compose characters by pressing Compose, rather than holding the Compose key and pressing the spacebar as described for DEC workstations.
- DEC compose sequences do not have the "Compose-DP" sequence.

Using the Compose Key

The Compose key starts a three-key compose sequence for all LK401/VT200-style international keyboards (except North American). For example, to compose a cent sign, press the Compose key followed by the "c" and "|" keys. When you press the Compose key, the Compose light turns ON to indicate that you are composing a special character.

To cancel a compose sequence:

- Press the Delete key, or
- Press the Compose key (if you want to start a new sequence).

If you type an invalid sequence: the entry is ignored, the bell on the X terminal rings, and the compose sequence terminates.

The Compose light turns OFF when you complete the compose sequence.

Compose Sequences

Table A-12 lists all the compose characters and the two- or three-key sequences used to form the characters. You can enter the last two keys of three-key sequences in any order. The notes in the table refer to:

[a] To compose a character with a three-key sequence, press Compose Character followed by the two keys shown in this column.

[b] Two-key compose sequences are only available on national keyboards that support the requisite diacritical marks.

[c] You can use either two apostrophes (' ' – available on all keyboards) or two acute accents (´ ´ – available only on the German and Danish/Norwegian keyboards) to compose an acute accent.

Table A-12 Compose Sequences for VT200-Style Keyboards.

Symbol	Description	Compose Sequence	
		Three-Key[a]	Two-Key[b]
[	Left bracket	((	
\	Backslash	/ /	
		/ <	
]	Right bracket	))	
{	Left brace	(-	
|	Vertical bar	^ /	^ /
}	Right brace	) -	
#	Pound sign	+ +	
ˆ	Circumflex	^ SP	^ SP
		^ ^	^ ^
˜	Tilde	~ SP	~ SP
		~ ~	~ ~

Table A-12 Compose Sequences for VT200-Style Keyboards. (Continued)

Symbol	Description	Compose Sequence	
		Three-Key[a]	Two-Key[b]
@	Commercial At sign	A A	
		a a	
$	Dollar sign	S /	
		s /	
		S |	
		s |	
á	Apostrophe	’ SP	
		´ SP	´ SP
á	Small a with acute accent	´ a	´ a
Á	Capital A with acute accent	´ A	´ A
à	Small a with grave accent	` a	` a
À	Capital A with grave accent	` A	` A
â	Small a with circumflex	^ a	^ a
Â	Capital A with circumflex	^ A	^ A
ä	Small a with umlaut	a "	
		¨ a	¨ a
Ä	Capital A with umlaut	A "	
		¨ A	¨ A
ã	Small a with tilde	~ a	~ a
Ã	Capital A with tilde	~ A	~ A

Table A-12 Compose Sequences for VT200-Style Keyboards. (Continued)

Symbol	Description	Compose Sequence	
		Three-Key[a]	Two-Key[b]
å	Small a with ring	a *	
		° a	
Å	Capital A with ring	A *	
		° A	
æ	Small ae ligature	a e	
Æ	Capital AE ligature	A E	
ç	Small c with cedilla	c ,	
Ç	Capital C with cedilla	C ,	
D	Capital Icelandic Eth	D -	
	Small Icelandic eth	d -	
é	Small e with acute accent	´ e	´ e
É	Capital E with acute accent	´ E	´ E
è	Small e with grave accent	` e	` e
È	Capital E with grave accent	` E	` E
ê	Small e with circumflex	^ e	^ e
Ê	Capital E with circumflex	^ E	^ E
í	Small i with acute accent	´ i	´ i
Í	Capital I with acute accent	´ I	´ I
ì	Small i with grave accent	` i	` i
Ì	Capital I with grave accent	` I	` I
î	Small i with circumflex	^ i	^ i
Î	Capital I with circumflex	^ I	^ I

Table A-12 Compose Sequences for VT200-Style Keyboards. (Continued)

Symbol	Description	Compose Sequence	
		Three-Key[a]	Two-Key[b]
ï	Small i with diaeresis	i "	
		¨ i	¨ i
Ï	Capital I with diaeresis	I "	
		¨ I	¨ I
ñ	Small n with tilde	~ n	~ n
Ñ	Capital N with tilde	~ N	~ N
ó	Small o with acute accent	´ o	´ o
Ó	Capital O with acute accent	´ O	´ O
ò	Small o with grave accent	` o	` o
Ò	Capital O with grave accent	` O	` O
ô	Small o with circumflex	^ o	^ o
Ô	Capital O with circumflex	^ O	^ O
ö	Small o with umlaut	o "	
		¨ o	¨ o
Ö	Capital O with umlaut	O "	
		¨ O	¨ O
õ	Small o with tilde	~ o	~ o
Õ	Capital O with tilde	~ O	~ O
ø	Small o with slash	o /	
Ø	Capital O with slash	O /	
ß	Small German sharp s	s s	
p	Small Icelandic thorn	p p	

Table A-12 Compose Sequences for VT200-Style Keyboards. (Continued)

Symbol	Description	Compose Sequence	
		Three-Key[a]	Two-Key[b]
P	Capital Icelandic Thorn	P P	
ú	Small u with acute accent	´ u	´ u
Ú	Capital U with acute accent	´ U	´ U
ù	Small u with grave accent	` u	` u
Ù	Capital U with grave accent	` U	` U
û	Small u with circumflex	^ u	^ u
Û	Capital U with circumflex	^ U	^ U
ü	Small u with umlaut	u "	
		¨ u	¨ u
Ü	Capital U with umlaut	U "	
		¨ U	¨ U
´y	Small y with acute accent	´ y	´ y
´Y	Capital Y with acute accent	´ Y	´ Y
ÿ	Small y with diaeresis	y "	
		¨ y	¨ y
	No-break space	S_P S_P	
$^1/_4$	Fraction one-fourth	1 4	
$^1/_2$	Fraction one-half	1 2	
$^3/_4$	Fraction three-fourths	3 4	
^{1}	Superscript 1	^ 1	^ 1
^{2}	Superscript 2	^ 2	^ 2
^{3}	Superscript 3	^ 3	^ 3

Table A-12 Compose Sequences for VT200-Style Keyboards. (Continued)

Symbol	Description	Compose Sequence	
		Three-Key[a]	Two-Key[b]
	Plus-or-minus sign	+ -	
÷	Division sign	- :	
×	Multiplication sign	X X	
		x x	
¤	Currency sign	X 0	
		X O	
		x 0	
		x o	
£	Pounds currency sign	L -	
		L =	
		l -	
		l =	
¢	Cent sign	C /	
		C |	
		c /	
		c |	
¥	Yen sign	Y -	
		Y =	
		y -	
		y =	
´	Acute accent[c]	’ ’	
		´ ´	´ ´

Table A-12 Compose Sequences for VT200-Style Keyboards. (Continued)

Symbol	Description	Compose Sequence	
		Three-Key[a]	Two-Key[b]
`	Grave accent	` Sp	` Sp
		` `	` `
¨	Diaeresis or umlaut	" Sp	
		" "	
		¨ Sp	¨ Sp
		¨ ¨	¨ ¨
¯	Macron or overbar	_ _	
¸	Cedilla	, ,	
-	Soft hyphen	- -	
µ	Small mu or micro sign	/ U	
		/ u	
°	Degree sign	^ 0	^ 0
		Sp *	
		Sp °	
º	Masculine ordinal indicator	O _	
		o _	
ª	Feminine ordinal indicator	A _	
		a _	
§	Section sign	S 0	
		s 0	
		S O	
		s o	

Table A-12 Compose Sequences for VT200-Style Keyboards. (Continued)

Symbol	Description	Compose Sequence	
		Three-Key[a]	Two-Key[b]
¶	Paragraph or pilcrow	P !	
		p !	
·	Centered dot	^ .	^ .
©	Copyright sign	C 0	
		c 0	
		C O	
		c o	
®	Registered sign	R 0	
		r 0	
		R O	
		r 0	
¡	Inverted exclamation mark	! !	
¿	Inverted question mark	? ?	
«	Angle quotation mark left	< <	
»	Angle quotation mark right	> >	
¦	Broken vertical bar	! =	
¬	Not sign	- !	

Glossary

Active Window

The window where the input (focus) is directed.

Application Program

Programs such as word processors, transaction processors, and computer-aided drafting, that you run on your X terminal. Also know as client. *See* Client.

Button (on the display)

A small display box that has a raised appearance and contains text. Generally, clicking on a button activates a function or performs some action. *See* Clicking.

Button (on the mouse)

The three buttons on the top of the mouse. *See* Select, Menu, and Custom.

Clicking

Quickly pressing and releasing the Select mouse button without moving the pointer.

Client

An application program that connects to the server. A client program performs a variety of tasks, including window management.

Chroma

A term that describes the saturation or vividness of a color. A chroma of 0 describes a neutral, gray color. Chroma ranges to the most vivid color a screen or printer generates for a specific hue and value. *See* Hue *and* Value.

Colormap

Consists of a set of entries defining color values. A pixel value indexes into the colormap thereby producing intensities of red, green, and blue which are visible on a display.

Command Line

The line that you type to invoke a program or initiate an action. A command line usually contains the name of an X client or application program, along with optional arguments known as command-line options.

Cterm

A user-level protocol which is part of the DECnet Protocol set. *Cterm* provides a Network Virtual Terminal, which allows you to log in to a remote host on the network as if you are using a terminal directly attached to the remote host.

Custom (mouse button)

The factory default defines this as the right mouse button.

Cursor

The visible shape of a pointer on the screen. Defining a cursor for a window controls the visible appearance when the pointer is in that window. *See* Pointer.

DAP

See Data Access Protocol.

Data Access Protocol (DAP)

A protocol that provides read and write support for font files, the color definition file, or remote configuration files.

Dialog Box

A box where you choose options and enter information. Use the mouse to move from field to field, click on buttons and position the text cursor. Enter information with the keyboard.

Display

A device that receives video output from the logic module and displays the video output on a screen.

Dragging

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

Ethernet

An IEEE standard protocol used within various networks, including TCP/IP.

Ethernet Address

The factory-defined hardware address of the X terminal. Network hardware uses the Ethernet address when communicating to the network. This address is on the serial number label on the back of the logic module. You can also display the Ethernet address by viewing the TCP/IP Configuration Summary Menu in *Setup*.

Event

In the X Window System, information sent by the X server to an X client — for example, notification to the client that you pressed a mouse button.

Factory Default

The value assigned to a parameter as delivered from the factory.

Firmware

Software instructions that are permanently stored in the memory of a computer and are not lost when you turn the power off. Also called NVRAM.

Hardcopy

A physical copy (typically printed on paper) of a file.

Hardware

The physical parts of a computing device, such as an X terminal or computer.

Host Computer

A computer device that controls the exchange of data between itself and another computer or X terminal. X terminals typically boot from a host.

HostMenu

A window showing a list of host computer names and network addresses. Use the mouse to select a computer where you have a login account.

Hue

A term that describes a color family (for example, red or yellow). Hue is a polar coordinate — that is, it moves in a circular motion around the color spectrum — and ranges from 0° to 360°, with 0° being red. Hue is measured in degrees. *See* Chroma *and* Value.

Index Area

A box on the screen that lets you enter a color index — an integer used to label a particular color — from the keyboard.

Input Device

A device that allows you to send information to a window. Typical input devices include keyboards, mice, tablets, and trackballs. *See* Pointer *and* Pointing Device.

Interface

A common connection that is used for sending or accepting information and control between programs and machines.

Internet Address (IP Address)

A system administrator-assigned address for the X terminal. This address is used under TCP/IP when the network software of the X terminal generates messages to another host. The IP address is in the form *nnn.nnn.nnn.nnn* where *nnn* is a decimal number in the range 0 to 255. You can display the IP address by viewing the Network Configuration Summary Menu in *Setup*.

Internet Protocol (IP)

The network layer protocol for the Internet Protocol Suite. Internet Protocol is responsible for addressing and routing packets between hosts.

Keyboard

An input device that allows you to communicate with your client program.

LAN

See Local Area Network.

LAT

See Local Area Transport

Local Area Network (LAN)

The linking together of terminals, X terminals, and computers via cables and microwave links. This allows you to access more than one computer.

Local Area Transport (LAT)

A client which provides a connection to a host computer that supports LAT.

Local Clients

Programs running on the same host as the server.

Logic Module

A device that gets data from a host, a keyboard, or a peripheral, and processes it for viewing on the display. The logic module runs the X server and local clients. It can be a separate unit, or integrated into the base of the monitor.

Memory

A part of a computer or X terminal that stores data.

Menu

A list of commands or functions that you select with a pointer. A menu is normally displayed in a small window.

Menu (mouse button)

The factory default defines this as the middle mouse button.

Move

Change the location of the pointer on the screen by moving the mouse.

Mouse

An input device that, when moved across a flat surface, causes the pointer to move across a screen. The mouse usually has buttons that you press to send signals. These signals, in turn, accomplish certain functions. The representation of the *mouse* on the screen is called the pointer. *See* Pointer.

Network

The physical wires connecting two or more computers. These connections allow information to move electronically between computers.

Parameter

A variable that is given a specific value. This value is passed to a program before execution.

Peripheral Device

A device used to input or output data for the X terminal. The XPT/A graphics tablet is a supported peripheral device for X terminals.

Pixel

The smallest part of a screen surface that can be addressed.

Pointer

The *pointer* allows you to make selections in menus, to size and position windows and icons, and to select the window where you want to send the input. The window manager determines the shape of the pointer. *See* Pointing Device.

Pointing Device

Typically a mouse, tablet, or some other device with effective dimensional motion. The core protocol defines only one visible cursor, which tracks whatever pointing device is attached as the pointer. *See* Pointer.

Port

A physical connection (such as a multi-pin connector or coaxial connector) and its associated firmware, that permits one computing device to communicate data and control information with another computing device or peripheral device.

Protocol

A set of rules that allows computers to transfer information across a network to other computers that speak different computer languages.

Read-Only Memory (ROM)

Special firmware in the X terminal that allows it to boot without being connected to a host computer.

RGB

An additive method of combining percentages of red, green, and blue primary colors to form other colors.

ROM

See Read-Only Memory.

Root Weave

The window that fills the screen during an X session. All windows opened by clients appear on top of the root window. *See* Stipple Pattern.

RS-232-C

A standard communications interface defined by the Electronic Industries Association (EIA) to control data communications using standard voltages, signal lines, and device interactions.

Screen

The monitor. This is where text and graphical information is displayed for viewing. *See* Window.

Select (mouse button)

The factory default defines this as the left mouse button.

Setup Key

A special key on the keyboard, marked Setup. Pressing this key takes you to the *Setup* program.

Serial Port

One or more optional physical connectors on your X terminal. Attach a serial cable (RS 232) to communicate with a peripheral device such as a modem or printer.

Serial Port Session

A session started through one of the serial ports: either Serial Port 0 or Serial Port 1.

Serial Xpress (SXp)

A serial protocol used for fast serial communications between a host computer and an X terminal. Can be used with or without a modem.

Server

The combination of graphics display, hardware, and server software that provides display services for clients. The server also handles keyboard and mouse input. *See* Client *and* X Server.

Setup

A local X client program used to configure the X terminal.

Software

A set of instructions that tell the computer to perform a certain task in order to obtain a specific result. *See* Client.

Stipple Pattern

In the X Window System, the underlying pattern displayed (with the X cursor) when there are no other windows on the screen. If a window is created, the window appears on top of the stipple pattern. *See* Root Window.

SXp

See Serial Xpress.

TCP

See Transmission Control Protocol.

TCP/IP

See Transmission Control Protocol/Internet Protocol.

Telnet

A user-level protocol which is part of the Internet Protocol set. *Telnet* provides a Network Virtual Terminal, which allows you to log in to a remote host on the network as if you are using a terminal directly attached to the remote host.

TekHostMenu

See HostMenu.

Terminal

An interactive input/output device used in computer systems or networks.

Text Cursor

The I-shaped pointer which appears in a text input area. Clicking the mouse in a text input area causes the text cursor to appear in that area. Whatever information you type on the keyboard appears in the text input area displaying the text cursor.

TFTP

See Trivial File Transfer Protocol.

Transmission Control Protocol (TCP)

The Internet transport layer protocol which provides a reliable, bi-directional byte stream connection between two cooperating user-level processes.

Transmission Control Protocol/Internet Protocol (TCP/IP)

Using the TCP and IP protocols to obtain a reliable, bi-directional byte stream connection between two cooperating user-level processes. Commonly this refers to the entire Internet Protocol suite, including TCP, IP, UDP, ICMP, and other protocols.

Trivial File Transfer Protocol (TFTP)

A protocol used for downloading server images. It is also used for reading and writing font files, the color definition file, or remote configuration files.

UNIX

A host operating system.

Value

A term describing the lightness or darkness of a color. Value ranges from 0 (black) to 100 (white). *See* Chroma *and* Hue.

Window

In the X Window System, typically a region on the screen of a display created by an X client for displaying data. (An X client can create more than one *window*.) For example, the xterm terminal emulator, xfd font displayer, and the bitmap graphics editor all create windows. You can use a window manager to manipulate windows on the screen. *See* Window Manager.

Window Manager

An X client that allows you to organize and rearrange windows. The window manager controls the size and placement of windows and can also control window attributes such as border size.

Xhost

A host X program that controls access to the server from the host program.

X Server

A program that runs locally on an X terminal and lets you use the screen of the X terminal. The X server processes a request (for example, a request to create a window), collects input data, and sends information (called an event) to clients. *See* Event.

Xterm

An X client that emulates an ANSI-style terminal for programs that do not use the capabilities of windows directly.

X Terminal

A computer that displays information which usually resides on another computer. An X terminal consists of a display, a keyboard, a mouse or other pointing device, a logic module, an X server, and local clients. *See* Display, Logic Module, Mouse, Pointer, *and* X Server.

X Window System

A set of network protocols developed by MIT for workstations; also called X or X11.

Index