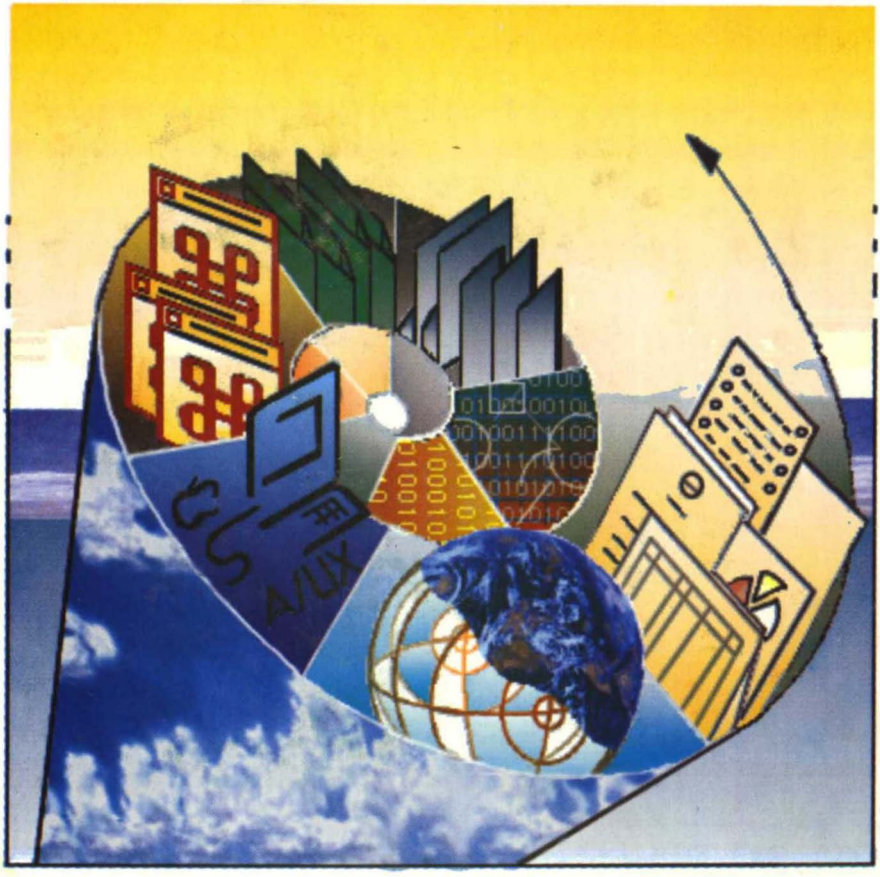
Getting Started with X Window System for A/UX®



Getting Started with X Window System for A/UX®

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Preface

The X Window System, called X for short, was developed at the Massachusetts Institute of Technology (MIT). It lets UNIX® users display multiple X applications in windows. These applications run over a network or on a user's stand-alone computer. Developers are currently producing word processors, spreadsheets, and other productivity applications for X. Users of A/UX® software have access to these X applications through the Apple® X Window System for A/UX.

The Apple X Window System for A/UX provides two different X products: MacX™ and X11. These two products give A/UX users the flexibility to create a personalized X environment on their computers. Both products are based on MIT's X Window System, Version 11, Release 4.

This guide is a starting point for users interested in the Apple X Window System for A/UX. Read it to

- learn about MacX and X11
- install MacX on A/UX
- install X11 on A/UX

About this guide

Here's what you'll find in this guide:

- Chapter 1, "Introduction to X Window System for A/UX," describes what MacX and X11 include and shows you ways to use them on a network.
- Chapter 2, "Installing MacX for A/UX," presents step-by-step instructions for installing MacX on the A/UX operating system. It describes what you need for installing and using MacX, including software, system requirements, and documentation.
- Chapter 3, "Installing X11," gives step-by-step instructions about installing X11 on A/UX. It describes what you need for installing and using X11, including software, system requirements, and documentation.
- The Appendix, "Setting Up a Network Kernel," explains how to use the `newconfig` command to configure an A/UX kernel with the network support required by MacX and X11.

Who should read this guide

You should read this guide if you are

- any user who wants to install MacX or X11
- a beginning X user who wants an introduction to the X Window System, MacX, or X11
- an experienced X user who just wants to know what MacX and X11 include

If you're new to X, don't worry if you don't immediately become an X "expert." Most of the concepts introduced in this guide are described in detail in the user guides included in the X Window System for A/UX package. And once you start using the X products, you'll understand more about how the X Window System works.

How to use this guide

Depending on what you want to do, read one or more of the following chapters:

- If you're installing MacX, read Chapter 2.
- If you're installing or updating X11, read Chapter 3.
- If you're installing both MacX and X11, read Chapters 2 and 3.

What you should already know

You should know how to perform such Macintosh® actions as pressing the mouse button ("clicking"), dragging icons, and choosing menu commands. For a review of Macintosh basics, see the owner's guide that came with your Macintosh computer. You should also have some familiarity with A/UX 2.0 or later versions. For a review of A/UX basics, read the guide *A/UX Essentials* that came with your A/UX Accessory Kit.

Conventions used in this guide

A/UX guides follow specific conventions. Words that require special emphasis appear in specific fonts or font styles. The following sections describe the conventions used in all A/UX guides.

Keys and key combinations

Certain keys on the keyboard have special names. These modifier and character keys, often used in combination with other keys, perform various functions. In this guide, the names of these keys are in Initial Capital letters followed by SMALL CAPITAL letters.

The key names are

CAPS LOCK	ESCAPE	SHIFT
COMMAND	LEFT ARROW	TAB
CONTROL	RETURN	UP ARROW
DOWN ARROW	RIGHT ARROW	

For example, suppose you enter

```
Applee
```

instead of

```
Apple
```

To erase the additional *e*, you would position the cursor (or insertion point) to the right of the word and press the DELETE key once.

Sometimes you will see two or more names joined by hyphens. The hyphens indicate that you use two or more keys together to perform a specific function. For example,

Press COMMAND-K

means "Hold down the COMMAND key and press the K key."

Terminology

In A/UX guides, a certain term can represent a specific set of actions. For example, the word *enter* indicates that you type an entry and press the RETURN key. The instruction
Enter `ls`

means "Type `ls` and press the RETURN key."

Here is a list of common terms and the corresponding actions you take.

Term	Action
Choose	Activate a command in a menu. To choose a command from a pull-down menu, click once on the menu title while holding down the mouse button, and drag down until the command is highlighted. Then release the mouse button.
Click	Press and then immediately release the mouse button.
Drag	Position the pointer on an object, then press and hold down the mouse button while moving the mouse. Release the mouse button when the object reaches the desired position on the screen.
Enter	Type the letter or letters and press the RETURN key.
Press	Type a *single* key *without* pressing the RETURN key. Or position the pointer on an object and hold down the mouse button.
Select	Position the pointer on a selectable object and click the mouse button.
Type	Type an entry *without* pressing the RETURN key.

The `Courier` font

Throughout A/UX guides, words that you see on the screen or that you must type exactly as shown are in the `Courier` font.

For example, suppose you see the instruction

Type `date` on the command line and press RETURN.

The word `date` is in the `Courier` font to indicate that you must type it.

Suppose you then read this explanation:

Once you type `date` and press RETURN, you'll see something like this:

```
Tues Oct 17 17:04:00 PDT 1989
```

In this case, `Courier` is used to represent exactly what appears on the screen.

All A/UX manual page names are also shown in the `Courier` font. For example, the entry `ls`(1) indicates that `ls` is the name of a manual page.

Font styles

Words that you must replace with a value appropriate to a particular set of circumstances appear in *italics*. For example, if you see

`cat` *filename*

replace the italicized word with the name of the file you wish to view. If you want to view the contents of a file named `Elvis`, type the word `Elvis` in place of *filename*. In other words, enter

```
cat Elvis
```

New terms appear in **boldface** where they are defined.

A/UX command syntax

A/UX commands follow a specific command syntax. A typical A/UX command has this form:

`command` [*flag-option*] [*argument*]...

The following table outlines the elements of an A/UX command.

Element	Description
`command`	The command name.
flag-option	One or more optional arguments that modify the command. Most flag options have the form [-*opt*...], where *opt* is a letter representing an option. Most commands have one or more flag options.
argument	A modification or specification of a command, usually a filename or symbols representing one or more filenames.
[]	Brackets used to enclose an optional item—that is, an item that is not essential for execution of the command.
...	Ellipses used to indicate an argument that can be repeated any number of times.

For example, the `wc` command is used to count lines, words, and characters in a file. Here is the full syntax for that command, including all possible flag options and the optional argument *name*.

`wc [-c] [-l] [-w] [name...]`

Thus, you can enter

```
wc -w /Priscilla
```

to count all of the words in the file `/Priscilla`, where `wc` is the name of the command, `-w` is the flag option that instructs the command to count all of the words in the file, and the optional argument `/Priscilla` is the file to be searched.

Command reference notation

A/UX Command Reference, A/UX Programmer's Reference, and *A/UX System Administrator's Reference* contain references for commands, programs, and other related information. Material is organized within these references by section numbers. The standard A/UX cross-reference notation is

cmd (sect)

where *cmd* is the name of the command, file, or other facility; *sect* is the section number where the entry resides.

- Items followed by section numbers (1M), (7), and (8) are listed in *A/UX System Administrator's Reference.*
- Items followed by section numbers (1), (1C), (1G), (1N), and (6) are listed in *A/UX Command Reference.*
- Items followed by section numbers (2), (3), (4), and (5) are listed in *A/UX Programmer's Reference.*
- Items followed by section number (1X) are listed in *X11 Command Reference for A/UX.*
- Items followed by section numbers (3X) and (3Xt) are listed in *X11 Programmer's Reference for A/UX.*

For example,

`cat(1)`

refers to the command `cat`, which is described in Section 1 of *A/UX Command Reference.*

References can be also called up on the screen. Use the `man` command to display pages from reference manuals, known as manual pages, directly on the screen. For example, enter the command

```
man cat
```

to display the manual page for the `cat` command, including its description, syntax, options, and other pertinent information. To exit, press the Space bar until you see a shell prompt, or type `q` at any time to return immediately to your shell prompt.

Cross-referencing

An A/UX guide often refers to information discussed in another guide in the suite. The format for this type of cross-reference is "Chapter Title," *Name of Guide.*

For a complete description of A/UX guides, see *Road Map to A/UX.* This guide contains descriptions of each A/UX guide, part numbers, and ordering information for all the guides in the A/UX documentation suite.

Additional reading

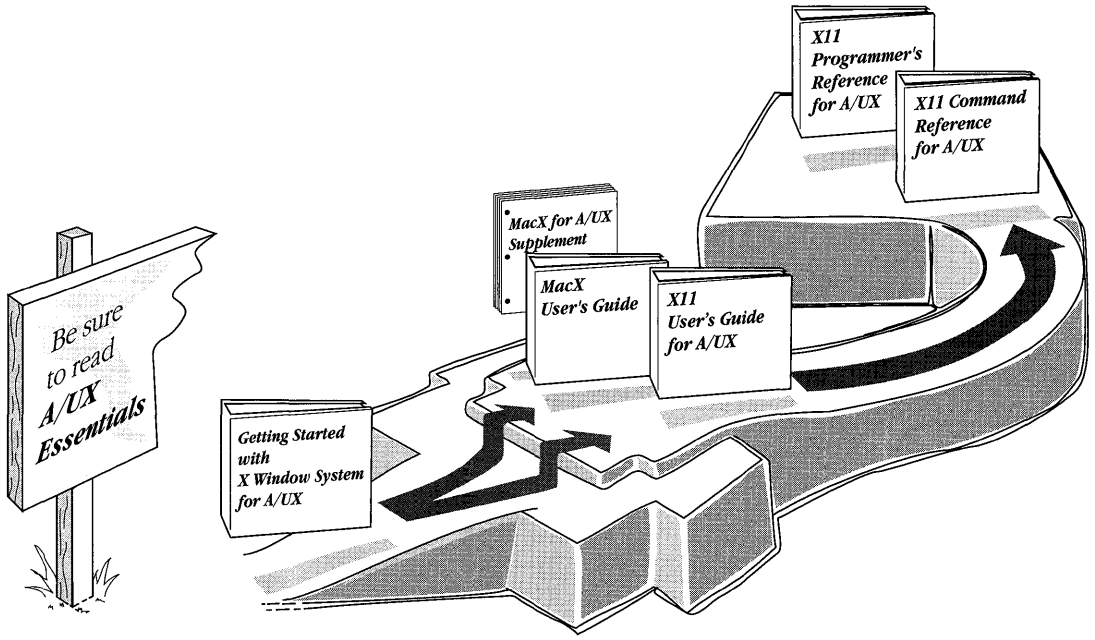
You receive several guides in the X Window System for A/UX package. Depending on how you decide to set up your X environment, you may want to focus on one guide in particular. The following list presents short summaries of each guide.

- *MacX for A/UX Supplement* provides information about using the MacX display server on A/UX. A/UX users who want to use the MacX server should read this supplement before reading the *MacX User's Guide.*
- *MacX User's Guide* describes how to use the MacX display server on the Macintosh Operating System. It does not address A/UX users specifically, but most of the information applies to using the MacX server on A/UX.
- *X11 User's Guide for A/UX* explains how to use X11. It presents instructions about using menus, manipulating windows, and working with client applications in the X11 environment.

- *X11 Command Reference for A/UX* presents detailed information about client applications and X commands, including command syntax, flag options, examples, and references to related information.
- *X11 Programmer's Reference for A/UX* provides information that is intended for X developers and programmers. It presents descriptions of the Xlib and X Toolkit programming libraries that come with X11.

Figure P-1 illustrates the path you take when reading the X guides.

- **Figure P-1** Road map to X guides



Chapter 1 Introduction to X Window System for A/UX

With the Apple® X Window System for A/UX®, you can create a personalized X windowing environment. You have the choice of using the MacX™ or X11 product, or elements of both. Whether you're a beginning X user or an experienced X programmer, these two products provide a flexible solution to all of your X needs.

If you're new to X or you prefer the Macintosh® user interface, you'll want to use MacX. If you want your favorite Macintosh applications to share the desktop with X applications, you'll also want to use MacX. If you're an experienced X user or programmer who prefers the traditional X Window System interface, you'll want to use X11.

This chapter can help you decide how to set up an X environment that best suits your needs. You'll find

- an explanation of what the X Window System, MacX, and X11 are and how they work
- an overview of the different ways you can use MacX and X11 on a network
- a description of the different options you have for choosing your X environment

This chapter presents a general introduction to the X Window System, MacX, and X11. You can find detailed descriptions of MacX and X11 in the user guides included in the X Window System for A/UX package.

Understanding X

The X Window System, called X for short, was designed at the Massachusetts Institute of Technology (MIT) and adapted by Apple for A/UX. You can use X to

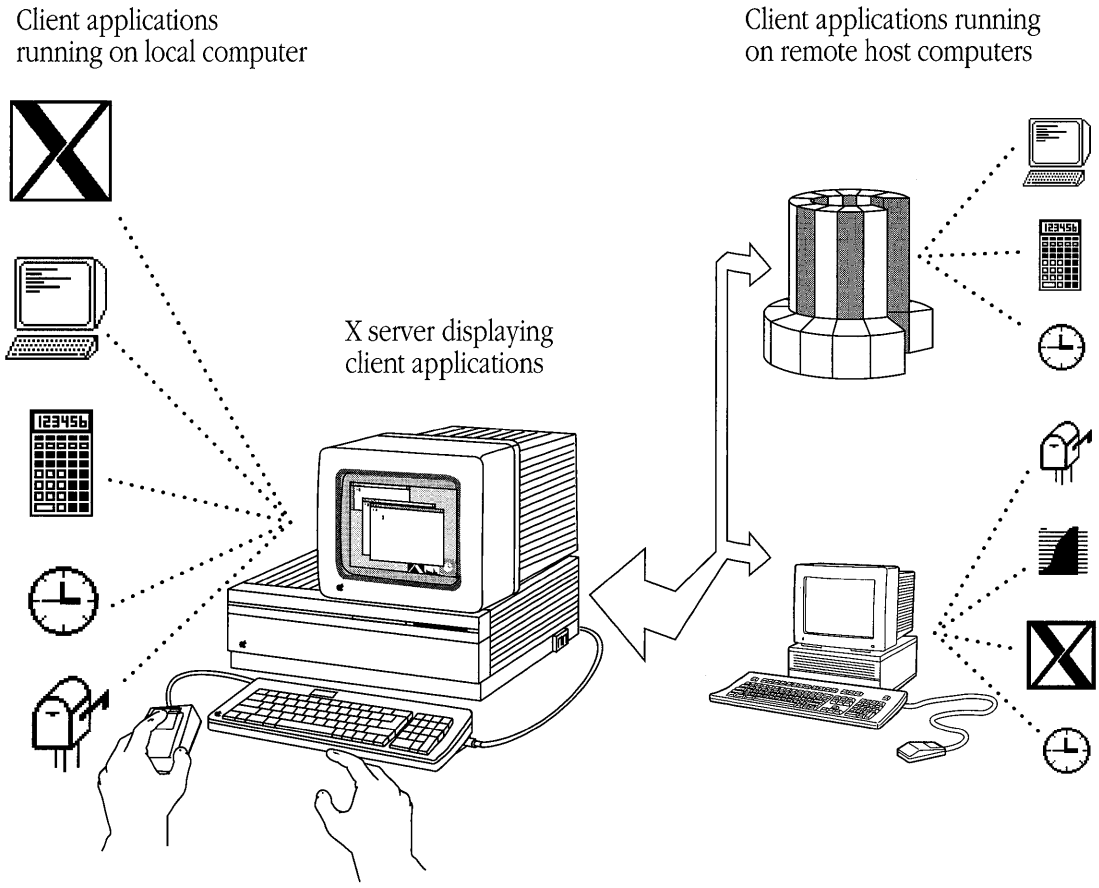
- integrate different types of computers transparently on a network
- run applications on other computers while displaying them on your computer screen
- work with multiple applications simultaneously on your computer screen

For example, you can display in a window an application running on a computer such as a mainframe, and at the same time display in another window an application running on another computer, such as a minicomputer. You can also run an application on your own computer and display it in a third window on your screen. You see no apparent difference in how the applications appear on your screen, even while they are running on different computers.

X works through the interaction of two types of programs: display servers and client applications. A **display server** controls the flow of information between you, using the keyboard and mouse, and client applications. A **client application** is an X program, such as a word processor, that performs a certain task. You can run the server on your computer and use it to display client applications on your screen. The client applications can run on the same computer as the server or on other computers on a network, called **host computers.**

Figure 1-1 illustrates how a server and client applications may interact.

■ **Figure 1-1** The client-server model



X Window System for A/UX

The X Window System for A/UX gives you MacX and X11. You decide how you want to use the two products. This section describes MacX and X11 and includes several examples of how you can use them on a network.

MacX

MacX is based on X Window System, Version 11, Release 4. When you receive MacX as a part of the X Window System for A/UX, you get

- the display server
- the `xcalc` client application

When you run MacX under A/UX, you get

- a fully integrated environment

  MacX allows X client applications, Macintosh productivity applications, and UNIX® programs and applications to share your computer screen.
- the familiar, intuitive Macintosh user interface

  You can manipulate client applications using pull-down menus, size boxes, and scroll bars.
- the ability to cut and paste between different applications

  You can use the mouse and keyboard to cut and paste text and graphics between Macintosh, UNIX, and X applications.
- network transparency

  Client applications that you display on your screen can be running on different remote computers on a network or on your local computer. You see little difference in how the client applications appear on your screen, regardless of the computer on which they are running.

- an optional mode in which to display client applications

  You can display client applications in a special type of window, called a **root window.** You can simulate different X Window System environments inside the root window.

For more information about what MacX provides, see *MacX User's Guide.*

X11

X11 is based on X Window System, Version 11, Release 4. It includes

- the display server
- client applications and commands
- programmer libraries
- programmer toolkits

When you run X11 under A/UX, you get

- a complete X development environment

  You can create new X programs and applications using the libraries and toolkits that come with X11.

- an integrated UNIX and X environment

  You can run multiple X and UNIX applications simultaneously in X11, each in its own window on your screen. You can access the A/UX command line by using the `xterm` client application.

- an X Window System user interface

  You can use pop-up menus and the mouse to manipulate windows and open client applications. You can also open client applications by entering commands in an `xterm` window.

- network transparency

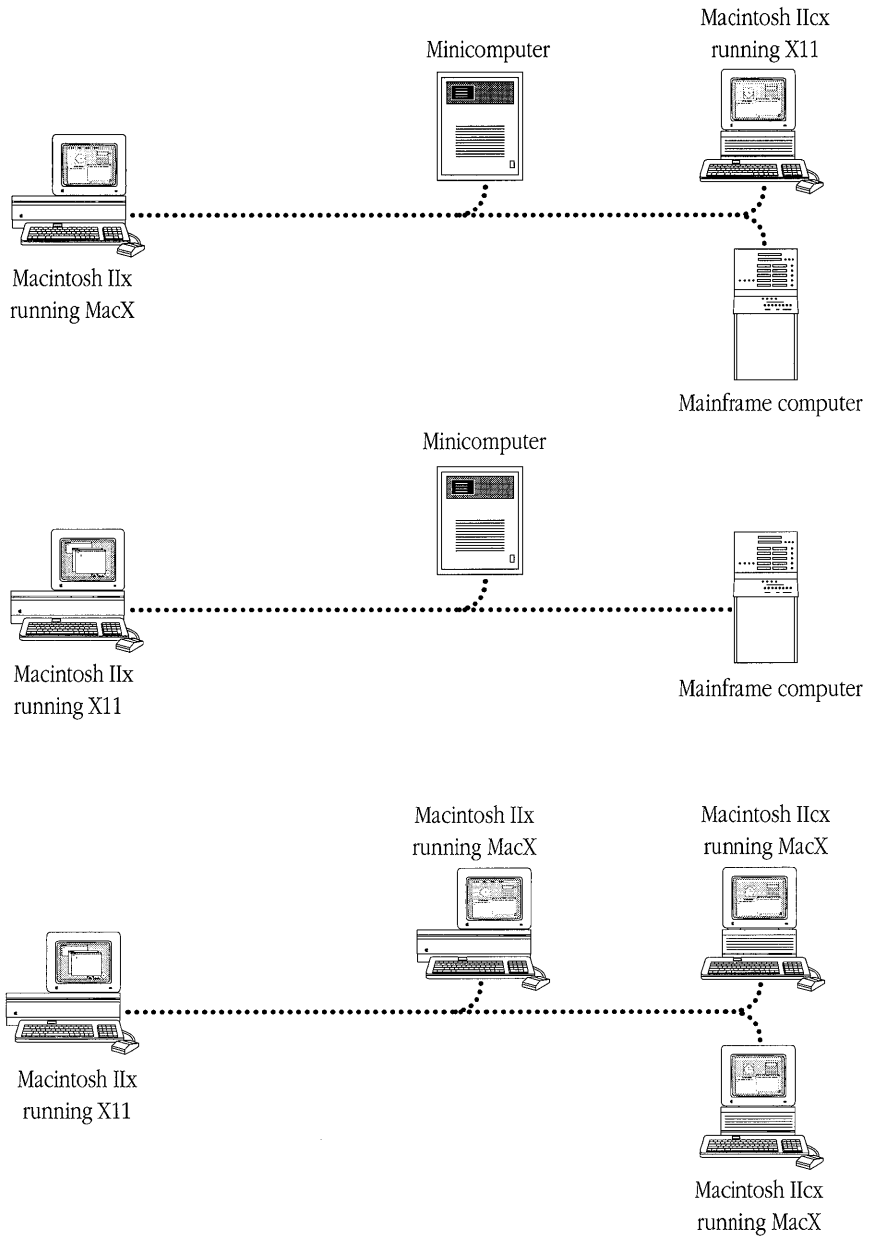
  Client applications that you display on your screen can run on different remote computers on a network or on your local computer. You see little difference in how the client applications appear on your screen, regardless of the computer on which they are running.

For more information about what X11 provides, see *X11 User's Guide for A/UX.*

Using MacX and X11 on a network

You can use MacX and X11 on a stand-alone computer, but X is really designed to be used on a network. Whether you run MacX, X11, or both X products on your computer, you can use them in a variety of ways on a network. Figure 1-2 illustrates several of these uses. Each illustration shows a different scenario for using MacX and X11 on a network with different types of computers.

■ **Figure 1-2** Three ways to use MacX and X11 on a network



- The first scenario shows how you can use MacX on a network with computers made by different manufacturers. You run MacX on your Macintosh computer. You use the MacX server to display simultaneously on your screen client applications that are running on a minicomputer, a mainframe, and a Macintosh IIcx computer running X11.
- The second scenario shows how you can use X11 on a network with computers made by different manufacturers. You run X11 on your Macintosh computer. You use the X11 server to display simultaneously on your screen client applications that are running on a minicomputer and a mainframe.
- The third scenario shows how you can use your computer as a host computer. You run X11, which includes the full set of client applications, on your Macintosh computer. The Macintosh computers on the network are running MacX. Using the MacX server, the Macintosh computers on the network display client applications that are running on your computer.

These are just a few of the many ways you can use MacX and X11 on a network to display client applications. Read the following section, "Choosing Your X Environment," to find out how you can choose the environment in which you use the client applications.

Choosing your X environment

Both MacX and X11 allow you to display client applications. Each product provides a different environment in which to use the client applications. Depending on which environment you prefer, you have several options for creating an X environment on your computer.

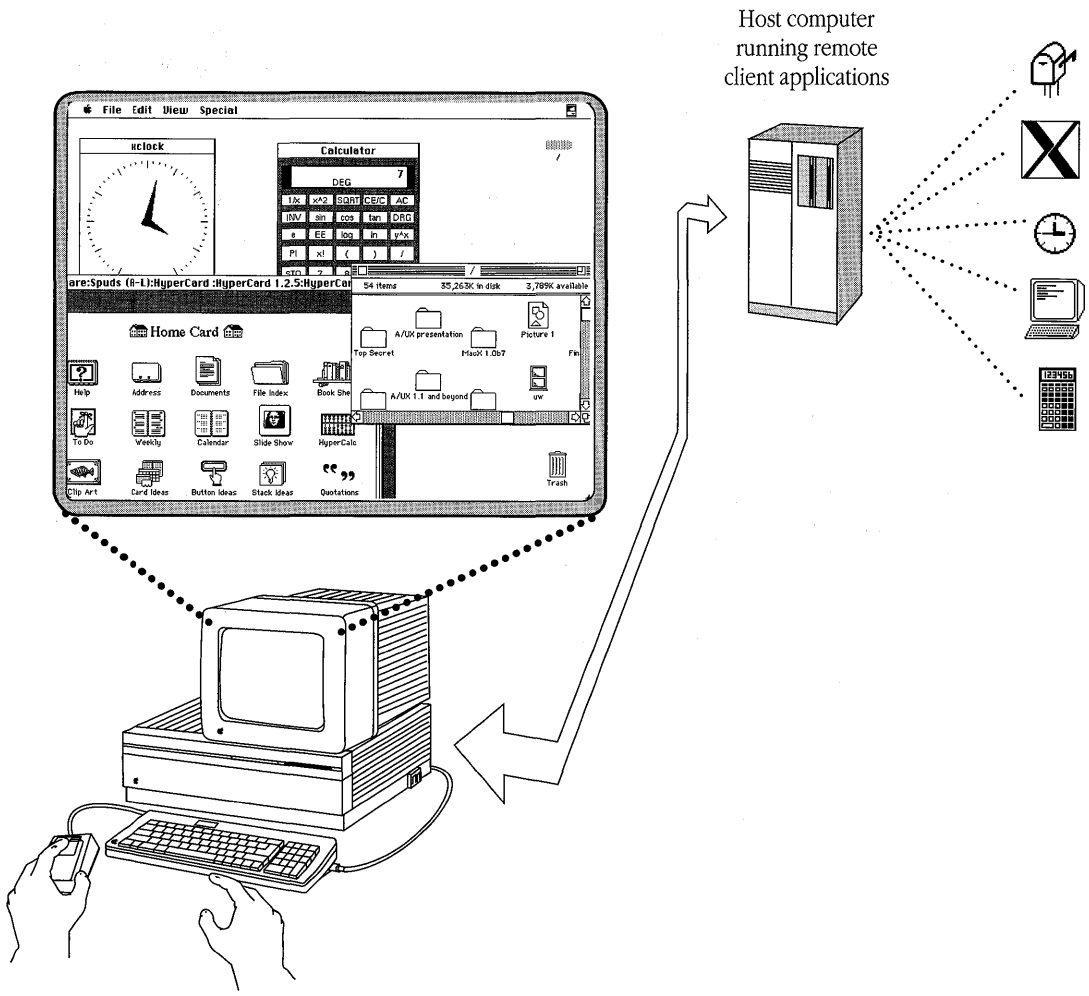
To help you decide which option you want to use, read the following sections describing the MacX and X11 environments. The accompanying figures show how your screen might look, depending on how you use MacX and X11.

The MacX environment

MacX gives you an X environment with the Macintosh flair. You can open and run MacX as you would other Macintosh applications in A/UX. Once MacX is running, you can open and display multiple X client applications on your screen. The client applications appear in Macintosh windows, and you can manipulate the windows using Macintosh-style menus and the mouse. You can also run UNIX programs, and other Macintosh applications such as Microsoft Word, concurrently with MacX.

Figure 1-3 shows what your screen may look like when you run MacX on your computer. A HyperCard® stack shares the desktop with the `xclock` and `xcalc` client applications. You can access files, folders, and applications on the hard disk by double-clicking their icons in the window. You use MultiFinder® to switch between MacX, HyperCard, and the A/UX Finder™.

■ **Figure 1-3** The MacX environment

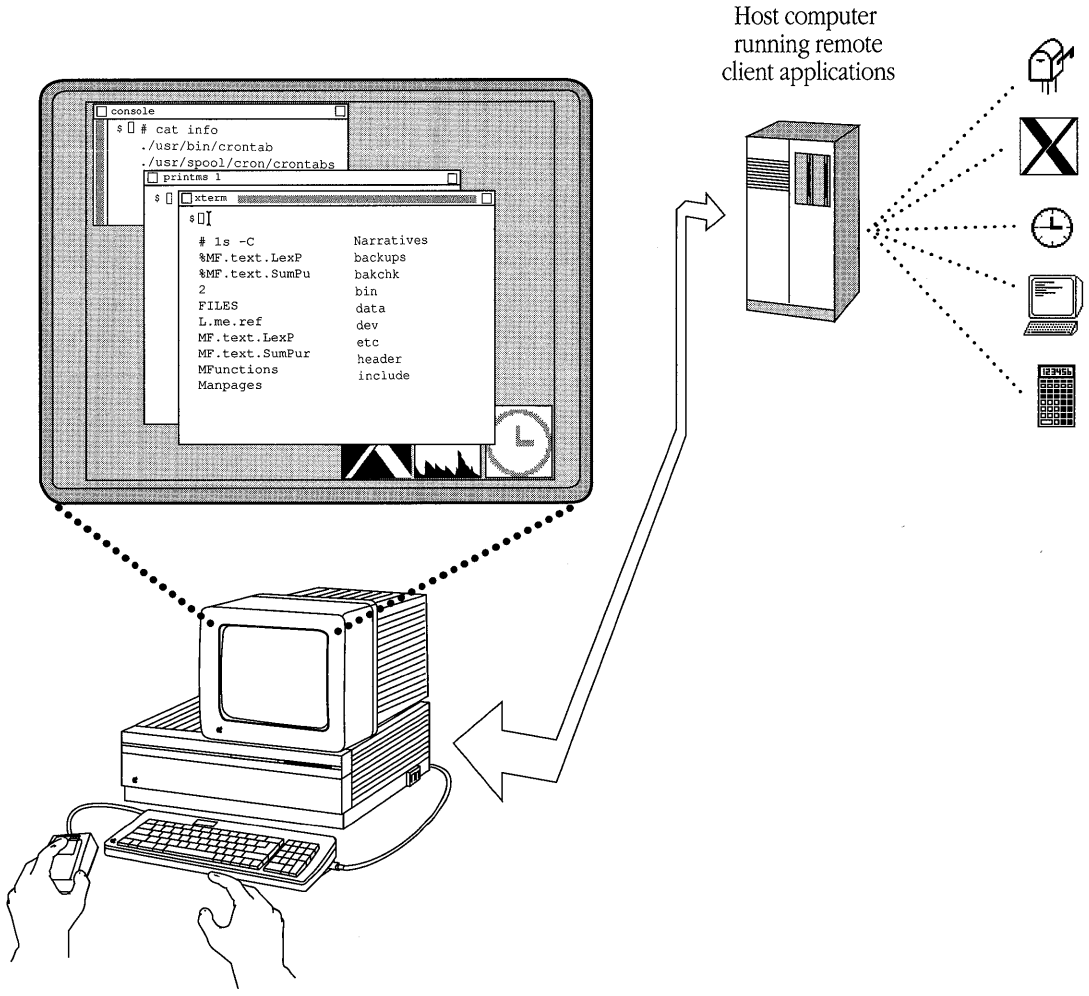


The X11 environment

X11 gives you the standard X Window System environment. You can open client applications by entering commands at an A/UX command prompt. The client applications appear in windows that you can manipulate using pop-up menus and the mouse. You can also run UNIX programs simultaneously with client applications.

Figure 1-4 shows what your screen may look like when you run X11. Once you've installed X11 on your computer, you can log in to the X11 environment from the A/UX login dialog box. X11 opens several client applications automatically when it starts up, including several `xterm` windows. You can access your A/UX file system and run UNIX commands from an `xterm` window. While you are in X11, you do *not* have access to the Finder desktop environment and its accompanying Macintosh user interface features.

■ **Figure 1-4** The X11 environment



Where to go from here

Now that you've been introduced to the Apple X Window System for A/UX, you're ready to install the X product that best fits your needs. Figure 1-5 illustrates which chapter you should read to install the X product that you need.

■ **Figure 1-5** Where to go from here

Requirements	Use this product	Go to this chapter
■ Macintosh user interface ■ A/UX Finder desktop integration ■ Macintosh, UNIX, and X applications sharing the desktop	 MacX	Chapter 2, "Installing MacX for A/UX"
■ X Window System interface ■ UNIX command line ■ X development environment	 X11	Chapter 3, "Installing X11"

Chapter 2 **Installing MacX for A/UX**

You can install the MacX display server on your computer if you are running A/UX software version 2.0 or later. This chapter shows you how to

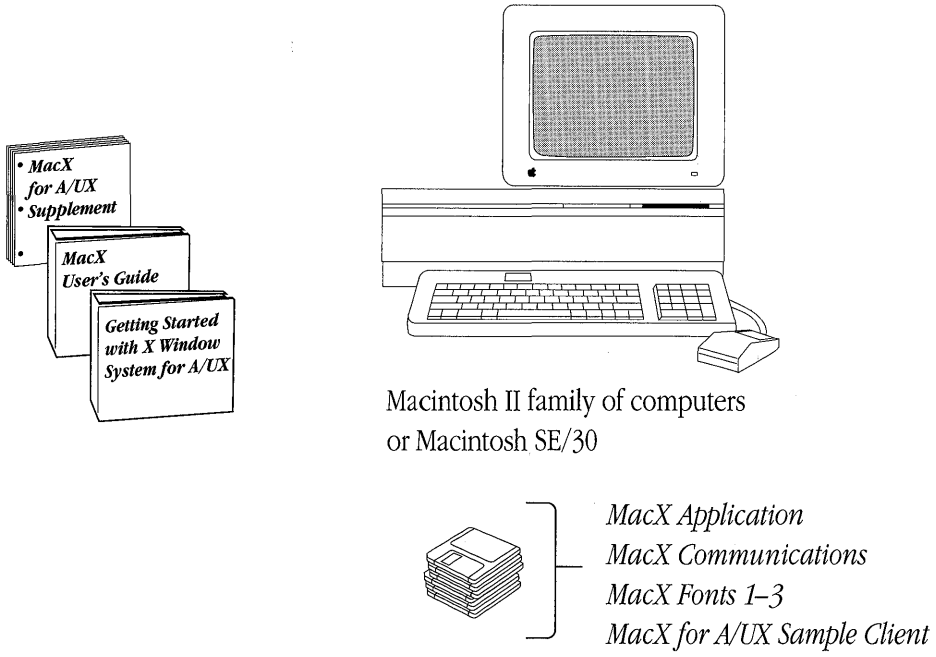
- check whether you have the necessary hardware, software, and documentation to install MacX
- check whether your computer has the required 3.6 megabytes (MB) of free disk space
- check whether your computer has a kernel configured with the network capabilities required by MacX
- install the MacX application files
- install the MacX connection tool
- install the MacX fonts
- install the sample client application
- open MacX

To learn how to use MacX on A/UX, see *MacX for A/UX Supplement.* For detailed information about MacX, see *MacX User's Guide,* which describes how to use the various MacX features.

What you need

Before you install the MacX software on your Macintosh computer that is running A/UX, make sure you have everything you need. This includes a Macintosh computer that supports the MacX server and A/UX, the floppy disks that contain the MacX software, and the MacX documentation. Figure 2-1 illustrates what you need.

■ **Figure 2-1** What you need for using MacX on A/UX



- *Note:* The sample client application allows you to use the MacX server to display a client application without requiring that you either install the entire set of X11 client applications on your computer or set up client applications on another computer on the network. You must fully install MacX before you can open the sample client application.

Starting up A/UX and logging in

To install MacX, you must start up A/UX and log in to the A/UX Finder as the root user. A/UX is set by default to open the Finder desktop when you log in.

1. **Start your Macintosh computer.**

   The computer displays the message "Welcome to Macintosh."

   If A/UX Startup is set as the startup application on your startup disk, the system automatically starts up and loads A/UX. Skip to step 4 and follow the login procedures.

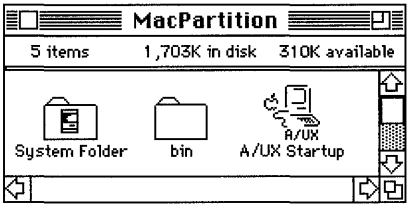
   If A/UX does not start automatically, continue with the next step and follow the instructions to run A/UX Startup manually.

2. **Open the MacPartition hard disk icon by double-clicking it.**

   You double-click an icon by positioning the pointer on the icon and pressing the mouse button twice in rapid succession. You can also open an icon by selecting it and choosing Open from the File menu.

   The MacPartition window appears, as shown in Figure 2-2.

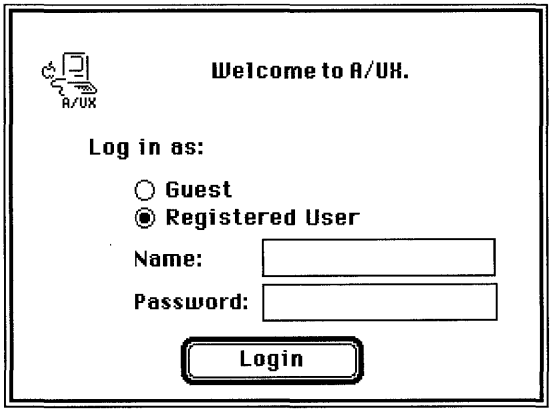
■ **Figure 2-2** The MacPartition window



3. Open the A/UX Startup application by double-clicking its icon.

Your screen displays messages that report the progress toward loading and initializing A/UX. Next, the A/UX login dialog box appears, as shown in Figure 2-3.

■ **Figure 2-3** The A/UX login dialog box



4. Type `root` in the Name text box and press TAB.

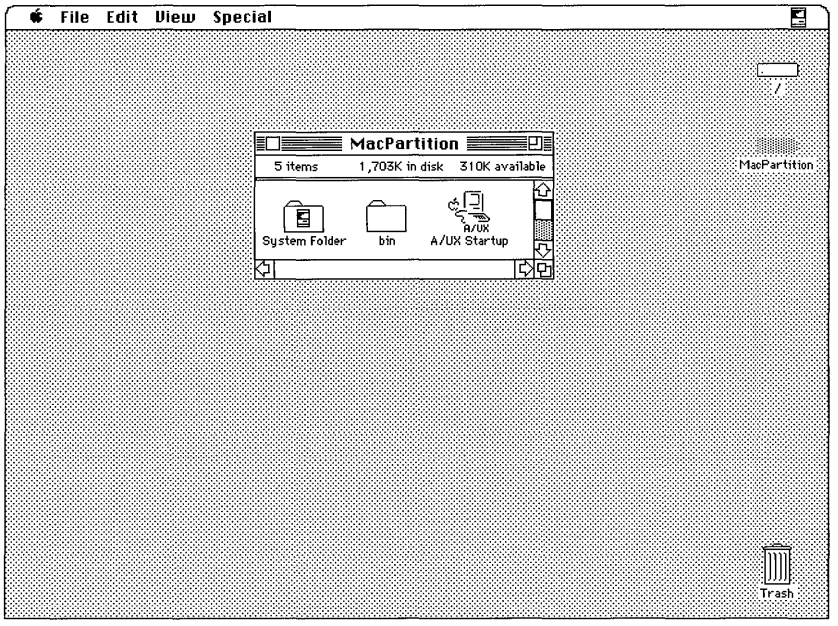
5. Type the password for the root account in the Password text box.

If the root account does not have a password, just press RETURN. This automatically starts the login process; you do not have to go to step 6. When you are successfully logged in, the Finder desktop appears, as shown in Figure 2-4.

6. Click Login or press RETURN.

You see a message about starting a session for `root`. When you are successfully logged in, the Finder desktop appears, as shown in Figure 2-4.

■ **Figure 2-4** The Finder desktop in A/UX



Checking your system's configuration

Before you can install and run MacX on your computer, you need to check for sufficient disk space and check for a network kernel.

- *Note:* If you know that your computer has 3.6 MB or more of disk space, and if you have already configured a network kernel into your system, you can skip this section. Go to the section "Installing the MacX Software on A/UX" later in this chapter for step-by-step instructions that describe how to install and set up MacX.

Checking free disk space

You can use the `df` command to check the amount of free disk space on your computer. You need approximately 3.6 MB of free disk space to run the MacX server on A/UX. The following steps describe how to use `df` in a CommandShell window. If necessary, see the section "Starting Up A/UX and Logging In" earlier in this chapter to get to the Finder desktop in A/UX.

1. **On the desktop, choose CommandShell from the Apple menu.**

   To choose a command from a menu, you position the pointer on the menu title in the menu bar and press the mouse button. While holding down the mouse button, drag to the command you want, and then release the mouse button. A CommandShell window appears with a command prompt. (If a CommandShell window does not appear, press COMMAND-N or choose New from the File menu while in the CommandShell application.)

2. **Enter `df` at the command prompt.**

   To enter a command, you type the command and press RETURN. The system returns the number of free disk blocks, for example,

   ```
   /   /dev/dsk/c5d0s0    33720 blocks        9112 i-nodes
   ```

   A block consists of 512 bytes. You need approximately 7200 blocks for the 3.6 MB of free disk space that MacX requires. If you do not have enough blocks, delete unnecessary files or archive old files to free disk space.

If you need to check whether you have a network kernel configured for MacX, leave the CommandShell window open and go to the next section, "Checking for a Network Kernel."

If you know that you already have a network kernel configured for MacX, you can close the CommandShell window now by clicking its close box. Go to the section "Installing the MacX Software on A/UX" later in this chapter.

For additional information about obtaining more disk space, read the section "Reclaiming Disk Space" in Chapter 6, "Managing Disks," of *A/UX Local System Administration.*

Checking for a network kernel

Whether you plan to run MacX on a network or stand-alone system, you need to have a network kernel set up. Follow these steps to check whether your system has a network kernel. If necessary, see the section "Starting Up A/UX and Logging In" earlier in this chapter to get to the Finder desktop in A/UX.

1. **If you don't already have a CommandShell window open, choose CommandShell from the Apple menu on the desktop.**

   A CommandShell window appears with a command prompt. (If a CommandShell window does not appear, press COMMAND-N or choose New from the File menu while in the CommandShell application.)

2. **Enter `rlogin loop` at the command prompt.**

   - If you have a network kernel set up, this command "remotely" logs you in to your own computer. The system prompts you for your terminal type. For example, you see `TERM = (vt100)`. This means that MacX can run on your computer.

     Go to step 3.

   - If a network kernel is *not* set up, you see the message

     ```
     loop: Connection refused
     ```

     This means that you need to create a network kernel on your A/UX computer before you can run MacX.

Go to the Appendix, "Setting Up a Network Kernel," for instructions about using the `newconfig` command to create an NFS kernel or a plain TCP/IP kernel. If you are planning to put your computer on a network, see Chapter 2, "Establishing a Two-System Network," in *A/UX Network System Administration* for more information about using the `newconfig` command.

3. **Press RETURN to accept the terminal type, and enter `exit`.**

   This ends the remote login session and returns you to the prompt in the CommandShell window.

4. **Click the close box in the CommandShell window.**

   The current CommandShell window closes, but CommandShell is still active.

Installing the MacX software on A/UX

The installation procedures are divided into four sections. You must follow the steps in all four of these sections to run MacX on A/UX:

- "Installing the MacX Application Files"
- "Installing the MacX Connection Tool"
- "Installing the MacX Fonts"
- "Installing the Sample Client Application"

◆ *Note:* Before you begin inserting the MacX disks, lock them to ensure that you don't accidentally erase any information. A disk is locked when you can see through the square hole on the top-right side of the disk.

Installing the MacX application files

Follow these steps to install the MacX application files on your system. These steps assume that you are starting from the Finder desktop in A/UX. For instructions about getting to the desktop, read "Starting Up A/UX and Logging In" earlier in this chapter. On the desktop you install the MacX files using traditional Macintosh actions such as clicking and dragging to copy files.

1. **Open the hard disk icon labeled `/`.**

   You double-click the icon to open it. A disk directory window appears that contains the files, folders, and commands on your hard disk.

2. **Open the `/users` folder by double-clicking its icon.**

   You may need to scroll through the window to find the `/users` folder. Click the scroll bar arrows on the right side of the window to scroll up or down.

   A directory window appears containing folders that represent the home directories of the various user accounts, such as `Guest` and `start`.

3. **Find the folder whose name is the same as your A/UX user name.**

   The folder whose name is the same as your A/UX user name represents your home directory. Your home directory is set up when your user account is created.

   △ **Important** If you do not have a user account, you can install the MacX files into the `/users` directory now and copy them to your home directory later. To learn about user accounts and home directories, see Chapter 2, "Adding and Managing User Accounts," in the guide *Setting Up Accounts and Peripherals for A/UX.* △

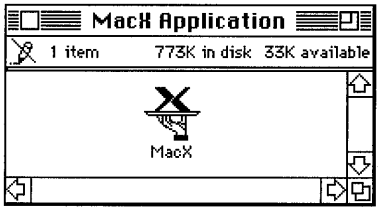
4. **Insert the *MacX Application* disk.**

   The MacX Application disk icon appears.

5. **Open the MacX Application disk icon by double-clicking it.**

   A window like the one in Figure 2-5 appears with an icon for the MacX application. If necessary, position the MacX Application window so that you can also see the folder representing your home directory in the `/users` window.

■ **Figure 2-5** The MacX Application window



6. **Drag the MacX icon to the folder that represents your home directory.**

   The folder whose name is the same as your A/UX user name represents your home directory. When you release the mouse button, the MacX application is copied to your hard disk. This may take a minute.

7. **Click the close box in the MacX Application window.**

8. **Eject the *MacX Application* disk by dragging its icon to the Trash.**

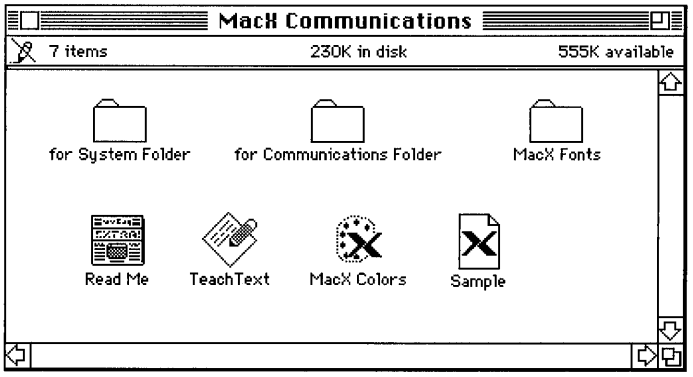
9. **Insert the *MacX Communications* disk.**

   The MacX Communications disk icon appears.

10. **Open the MacX Communications disk icon by double-clicking it.**

    A window like the one in Figure 2-6 appears with icons that represent a folder named "for System Folder," a folder named "for Communications Folder," the MacX Fonts folder, a Read Me document, the TeachText application, the MacX Colors file, and a MacX settings document called Sample. If necessary, position the MacX Communications window so that you can also see the folder representing your home directory in the `/users` window.

■ **Figure 2-6** The MacX Communications window



◆ *Note:* For now, ignore the folders named "for Communications Folder" and "for System Folder." The files in the folder named "for Communications Folder" require a different installation procedure from the one described in this section. You won't need to install any of the files in the folder named "for System Folder." See the next section, "Installing the MacX Connection Tool," for more information.

11. Select all the icons except the folders named "for System Folder" and "for Communications Folder."

You should select the MacX Fonts folder, the Read Me document, the TeachText application, the MacX Colors file, and the MacX settings document called Sample.

To select multiple icons, hold down the SHIFT key and click the icons. When all the icons you want are selected, release SHIFT. The icons remain selected. You can use the mouse to drag the icons to another location, such as a folder or hard disk icon.

12. Drag the selected icons from the MacX Communications window to the folder that represents your home directory.

This procedure copies the selected files to your hard disk. The folder representing your home directory should now contain the MacX application file that you installed in the previous section and the files you copied from the *MacX Communications* disk.

△ **Important** Leave the MacX Communications window open. In the following section, you will be copying additional files from the *MacX Communications* disk to your system. △

Follow the instructions in the next section, "Installing the MacX Connection Tool," to continue the MacX installation.

Installing the MacX connection tool

MacX provides a connection tool, called the MacTCP Tool, that allows MacX to communicate with other computers over a network. Installing the connection tool is a little more complicated than installing the other MacX files. You must install the MacTCP Tool in the folder on your hard disk named Communications Folder. This folder is located in the folder named System Folder, which is located in the `sys` folder, which is located in the `mac` folder. If you're familiar with UNIX terminology, think of what you're about to do as installing the MacTCP Tool in the directory `/mac/sys/System Folder/Communications Folder`.

These steps assume that you can see the MacX Communications window on your desktop. If you do not have the *MacX Communications* disk in your floppy disk drive, find the *MacX Communications* disk, insert it, and double-click the disk icon to open it.

1. Find the MacX Communications window.

The MacX Communications window should be open if you have completed the procedures described in the previous section, "Installing the MacX Application Files."

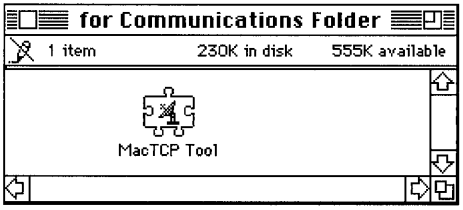
Figure 2-6 shows the icons in the MacX Communications window. Notice the folder labeled "for Communications Folder." This is the only folder you need to use. The files in the folder named "for System Folder" are already included with A/UX.

△ **Important** Do not install any of the files in the folder named "for System Folder." △

2. **Open the folder named "for Communications Folder" by double-clicking its icon.**

   The "for Communications Folder" window in Figure 2-7 appears containing the MacTCP Tool.

■ **Figure 2-7** The "for Communications Folder" window



3. **Go to the `/mac/sys/System Folder` directory on your hard disk.**

   To get to the `/mac/sys/System Folder` directory, open the `mac` folder in your hard disk window by double-clicking the folder. The `mac` window appears. In the `mac` window, open the `sys` folder. In the `sys` window that appears, open the System Folder. (Make sure you open the folder named System Folder, not Login System Folder or Startup System Folder.) The System Folder window displays the directory that is referred to as `/mac/sys/System Folder`.

4. **Find the Communications Folder in the System Folder window.**

   You may need to scroll through the window to find the Communications Folder. Click the scroll bar arrows on the right side of the window to scroll up or down.

5. **Drag the MacTCP Tool icon from the "for Communications Folder" window to the Communications Folder in the System Folder window.**

   You may need to reposition the windows on your desktop in order to see both the MacTCP Tool icon and the Communications Folder.

   When you release the mouse button, MacTCP Tool is copied to the `/mac/sys/System Folder/Communications Folder` directory on your hard disk.

6. **Click the close box in the "for Communications Folder" window.**
7. **Click the close box in the MacX Communications window.**
8. **Eject the *MacX Communications* disk by dragging it to the Trash.**
9. **Close the System Folder, `sys`, and `mac` windows by clicking the close box in each window.**

   You should still see open windows representing `/users` and your hard disk.

△ **Important** If you have a personal System Folder in your user account, you must perform an additional step in order to install and open MacX. You need to copy the MacTCP Tool to the Communications Folder in your personal System Folder (as well as to the Communications Folder in the global System Folder). Specifically, you must copy the MacTCP Tool to

`/users/`*username*`/System Folder/Communications Folder`

where *username* represents your A/UX user name. For example, if your user name is `chris`, you drag the MacTCP Tool from the *MacX Communications* disk to the Communications Folder in the System Folder located in your home directory. In other words, you copy the MacTCP Tool to the folder that represents this directory:

```
/users/chris/System Folder/Communications Folder
```

For information about personal System Folders, see Chapter 3, "Customizing Your Work Environment," in *A/UX Essentials.* △

Follow the instructions in the next section,"Installing the MacX Fonts," to continue the MacX installation.

Installing the MacX fonts

Three MacX disks contain the MacX fonts. You need the fonts on all three disks in order to run MacX. Follow these steps to install the MacX fonts.

1. **Open the folder representing your home directory.**

   A folder directory window appears. It contains the MacX files that you installed in the previous sections. Notice that it includes a folder named MacX Fonts. When you install the MacX fonts in the next step, you must copy them to this folder.

   △ **Important** Do *not* change the name of the MacX Fonts folder. Whenever you open the MacX server, the MacX application looks for a folder named MacX Fonts. If the application cannot find a folder with that name, MacX won't run. △

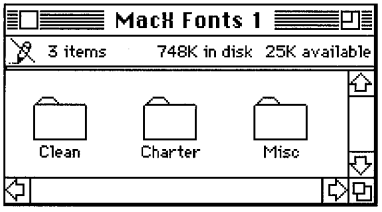
2. **Insert the *MacX Fonts 1* disk.**

   The MacX Fonts 1 disk icon appears.

3. **Open the MacX Fonts 1 disk icon by double-clicking it.**

   The MacX Fonts 1 window appears, as shown in Figure 2-8. Notice the three font folders in the window. You need to install all of these in order to run MacX. If necessary, position the MacX Fonts 1 window so that you can also see the MacX Fonts folder in the window that contains the MacX application files on your hard disk.

■ **Figure 2-8** The MacX Fonts 1 window

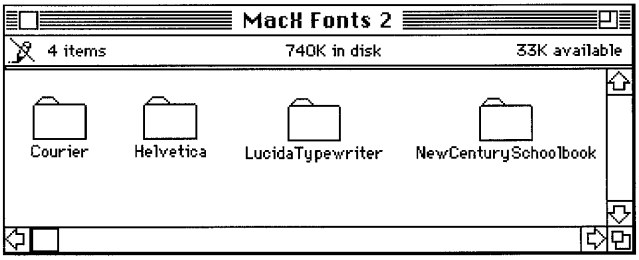


4. **Select all of the folders in the MacX Fonts 1 window by pressing COMMAND-A.**
5. **Drag the folders to the MacX Fonts folder.**

   When you release the mouse button, the folders and the fonts in them are copied to the MacX Fonts folder, which is on your hard disk.
6. **Click the close box in the MacX Fonts 1 window.**
7. **Eject the *MacX Fonts 1* disk by dragging its icon to the Trash.**
8. **Repeat steps 2 through 7 for the *MacX Fonts 2* disk.**

   There are four font folders on the *MacX Fonts 2* disk. You need to install all of these folders in order to run MacX. When you open the MacX Fonts 2 disk icon, you'll see a window, as shown in Figure 2-9.

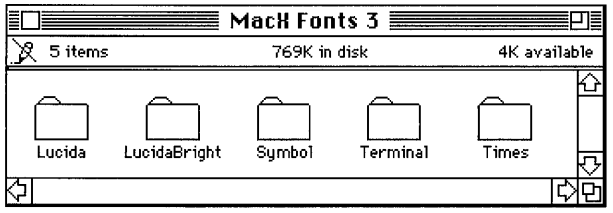
■ **Figure 2-9** The MacX Fonts 2 window



9. **Repeat steps 2 through 7 for the *MacX Fonts 3* disk.**

   There are five font folders on the *MacX Fonts 3* disk. You need to install all of these folders in order to run MacX. When you open the MacX Fonts 3 disk icon, you'll see a disk window, as shown in Figure 2-10.

■ **Figure 2-10** The MacX Fonts 3 window



Continue installing the MacX software by going to the next section, "Installing the Sample Client Application," which provides step-by-step instructions for installing the `xcalc` client application.

Installing the sample client application

Installing the sample client application is a lot like installing the MacX connection tool. In addition to copying the `xcalc` client application to your hard disk, you need to install the `xcalc` Commando dialog in the directory `/mac/lib/cmdo/x`.

Follow these steps to install the sample client application.

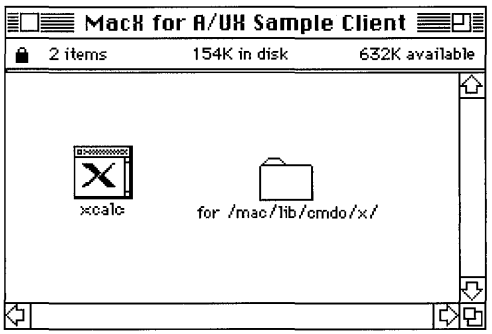
1. **Insert the *MacX for A/UX Sample Client* disk.**

   The MacX for A/UX Sample Client disk icon appears.

2. **Open the MacX for A/UX Sample Client icon by double-clicking it.**

   A window appears that contains an icon for the `xcalc` client application and a folder named "for `/mac/lib/cmdo/x/`." Figure 2-11 shows the MacX for A/UX Sample Client window.

■ **Figure 2-11** The MacX for A/UX Sample Client window



3. **Drag the `xcalc` icon to the window representing your home directory.**

   This is the window whose name is the same as your A/UX user name. When you release the mouse button, the `xcalc` client application is copied to your hard disk.

4. **Go to the `/mac/lib/cmdo` directory on your hard disk.**

   To get to the `/mac/lib/cmdo` directory, open the `mac` folder in the hard disk window by double-clicking it. The `mac` window appears. In the `mac` window, open the `lib` folder. In the `lib` window that appears, open the `cmdo` folder. (Opening the `cmdo` folder may take a few moments.)

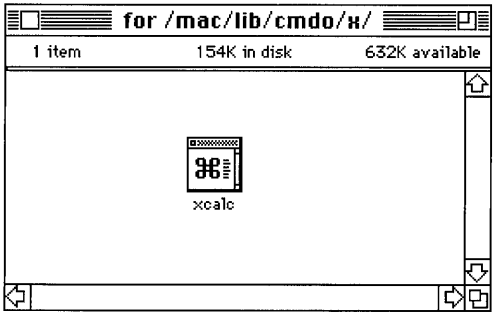
5. **Find the folder named `x` in the `cmdo` window.**

   You may need to scroll through the window to find the `x` folder. Click the scroll bar arrows on the right side of the window to scroll up or down.

6. **In the MacX for A/UX Sample Client window, open the "for `/mac/lib/cmdo/x/`" folder by double-clicking it.**

   The "for `/mac/lib/cmdo/x/`" window appears, as shown in Figure 2-12. It contains a Commando icon named `xcalc`. This icon represents the `xcalc` Commando dialog box.

■ **Figure 2-12** The "for `/mac/lib/cmdo/x/`" window



7. **Drag the `xcalc` Commando icon to the `x` folder in the `cmdo` window.**

   When you release the mouse button, the `xcalc` Commando dialog box is copied to the `/mac/lib/cmdo/x/` directory on your hard disk.

8. **Press OPTION and click the close box in any window.**

   This closes all the open windows on your screen.

9. **Eject the *MacX for A/UX Sample Client* disk by dragging its icon to the Trash.**

Go to the next section, "Opening the MacX Application," for information about opening MacX for the first time.

Opening the MacX application

Follow these steps to open MacX.

1. **Open the folder that contains the MacX application icon.**

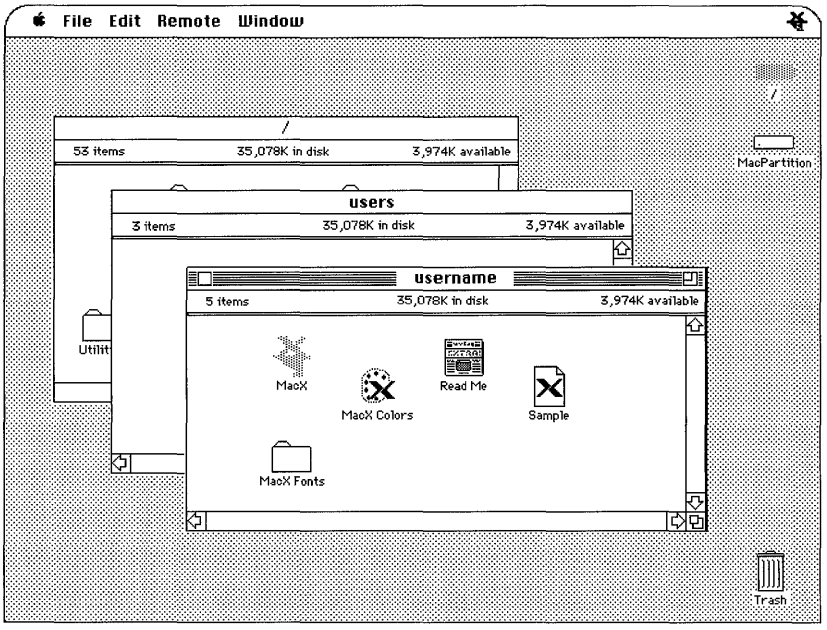
   The MacX application should be in the folder that represents your home directory. If necessary, open your hard disk icon, open the `/users` folder, and then open the folder labeled with your A/UX user name.

2. Double-click the MacX application icon to open the MacX server.

A window about MacX appears, followed by a window that contains messages about updating the Font Directory file. When MacX is successfully loaded, your desktop should look similar to Figure 2-13. Notice the menu titles in the menu bar and the icon at the right edge of the menu bar. You are now in the MacX application.

To quit MacX quickly and simply, press COMMAND-Q or choose Quit from the File menu.

■ **Figure 2-13** MacX



Optimizing MacX performance

You may want to adjust the size of the MacX application to optimize the performance of MacX, especially if you plan to display a significant number of client applications. Follow these steps to change the application size of MacX.

1. **Open the folder that contains the MacX application icon.**

   The MacX application should be in the folder that represents your home directory. If necessary, open your hard disk icon, open the `/users` folder, and then open the folder labeled with your A/UX user name.

2. **Select the MacX application icon.**

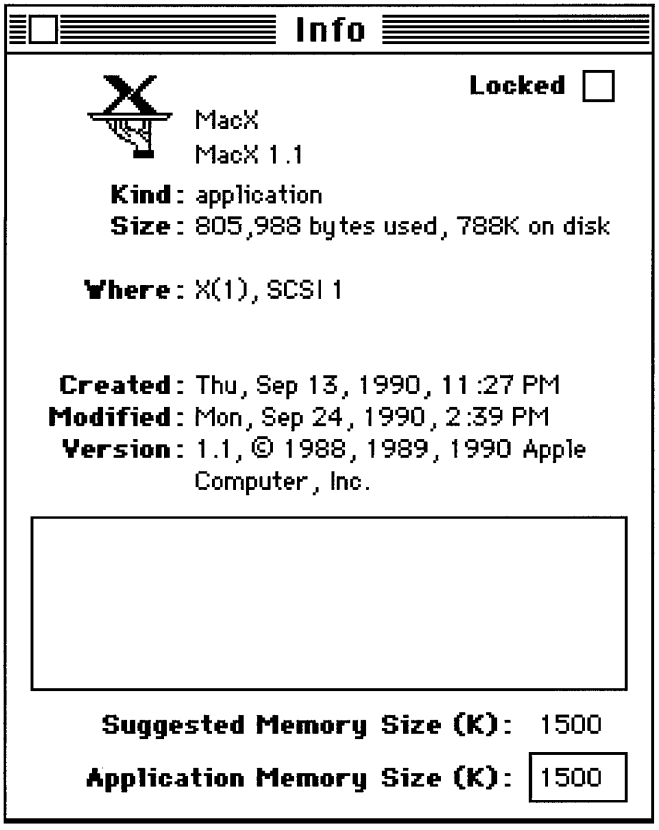
   You select an icon by positioning the pointer on the icon and pressing the mouse button once. This highlights the MacX application icon.

   - *Note:* Make sure you do not double-click the MacX application icon. Double-clicking the icon starts the application. If you accidentally start MacX, simply quit MacX by pressing COMMAND-Q, and then repeat step 2 correctly.

3. **Choose Get Info from the File menu or press COMMAND-I.**

   An Info window appears, as shown in Figure 2-14. This window contains information about the MacX application, including modification dates and application size.

■ **Figure 2-14** The MacX Info window



4. **Double-click the number in the Application Memory Size box or press TAB.**
5. **Type a new application size.**

   If your computer is low on random-access memory (RAM), you may want to increase the size by increments of 500 (K). You can experiment with different sizes for the MacX application to find the maximum size your system will support.

△ **Important** If you exceed the maximum application size that your system is able to support, you will see an alert box when you try to open MacX. If this happens, click Cancel, repeat steps 2–5 in this section, and type a smaller application size in the Info window. △

6. **Click the close box in the Info window.**

   The changes you made to the size of the MacX application take effect immediately.

Where to go from here

Go to *MacX for A/UX Supplement* to learn how to use the MacX server on A/UX. The supplement provides tutorial steps for using the MacX server to display local client applications. Read *MacX User's Guide* to learn how to use additional MacX features.

If you want to install X11, go to Chapter 3, "Installing X11."

Chapter 3 **Installing X11**

This chapter describes how to install the X11 software. To install and set up X11, you need to

- check whether you have the necessary hardware, software, and documentation to install X11
- check whether your computer has the required 16 megabytes (MB) of free disk space
- check whether your computer has a kernel configured with the network support required by X11
- install the X11 software
- set up X11 startup files
- start X11 for the first time

For detailed information about using X11, see *X11 User's Guide for A/UX.*

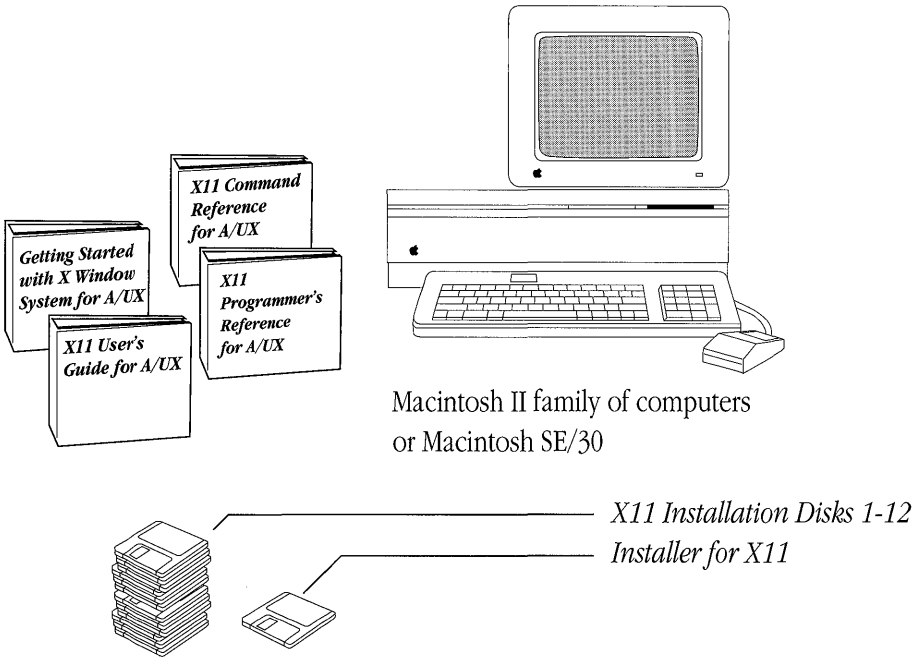
If you are an advanced A/UX user and want to install X11 on a separate A/UX partition, make sure you have available *A/UX Installation Guide* and *Setting Up Accounts and Peripherals for A/UX.* Those guides are included in the Accessory Kit that comes with your A/UX system.

◆ *Note:* If you have a previous version of X11 installed on your computer, skip the following sections about checking your system's configuration and go to the section "Installing the X11 Software."

What you need

Before you install the X11 software on your Macintosh computer that is running A/UX, make sure you have everything you need. This includes a Macintosh computer system that supports X11 and A/UX, the floppy disks that contain the X11 software, and the X11 documentation. Figure 3-1 illustrates what you need.

■ **Figure 3-1** What you need for using X11



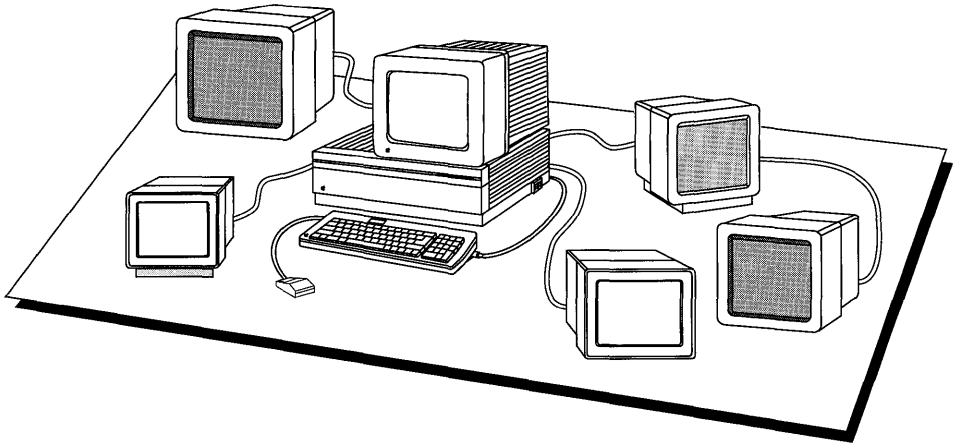
Monitors and video cards

X11 can use any A/UX software–compatible NuBus™ video card and high-resolution monitor. It can use any size and number of monitors, which can be either color or monochrome. It can also make use of the built-in video feature available in such computers as the Macintosh IIci and the Macintosh SE/30. (The X11 display server supports 1-bit monochrome and 8-bit color depths.)

A/UX informs X11 of the size, numbers, and depths of all built-in video cards and of all video cards installed in the system's expansion slots. You do not need to take any special actions when setting up different display configurations.

You can connect up to six monitors to a system running X11, as Figure 3-2 illustrates. The monitors do not need to be the same make or type. For example, you can run a monochrome monitor and a color monitor from X11. Such a configuration would consist of X11 being used by one user, with one keyboard, one mouse, and several monitors.

■ **Figure 3-2** Multiple monitors



X11 is not designed for, nor does it support the use of, an ASCII terminal connected to a serial port. Rather, each monitor must be a high-resolution monitor connected to its own NuBus video card or to a built-in video port.

Starting up A/UX and logging in

To install X11, you must start up A/UX and log in to the A/UX Finder as the root user. A/UX is set by default to open the Finder desktop when you log in.

1. **Start your Macintosh computer.**

   The computer displays the message "Welcome to Macintosh."

   If A/UX Startup is set as the startup application on your startup disk, the system automatically starts up and loads A/UX. Skip to step 4 and follow the login procedures.

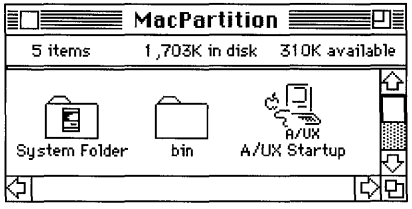
   If A/UX does not start automatically, continue with the next step and follow the instructions to run A/UX Startup manually.

2. **Open the MacPartition hard disk icon by double-clicking it.**

   You double-click an icon by positioning the pointer on the icon and pressing the mouse button twice in rapid succession. You can also open an icon by selecting it and choosing Open from the File menu.

   The MacPartition window appears, as shown in Figure 3-3.

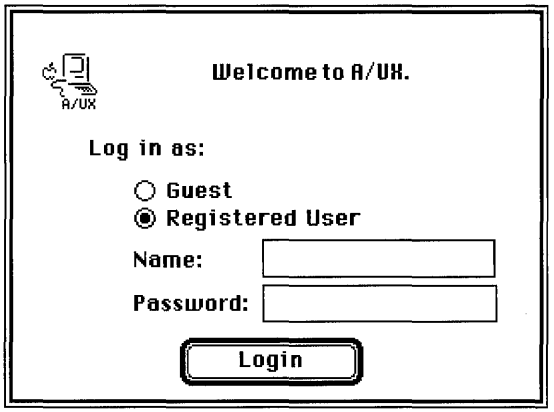
■ **Figure 3-3** The MacPartition window



3. **Open the A/UX Startup application by double-clicking its icon.**

   Your screen displays messages that report the progress toward loading and initializing A/UX. Next, the A/UX login dialog box appears, as shown in Figure 3-4.

■ **Figure 3-4** The A/UX login dialog box



4. **Type `root` in the Name text box and press TAB.**

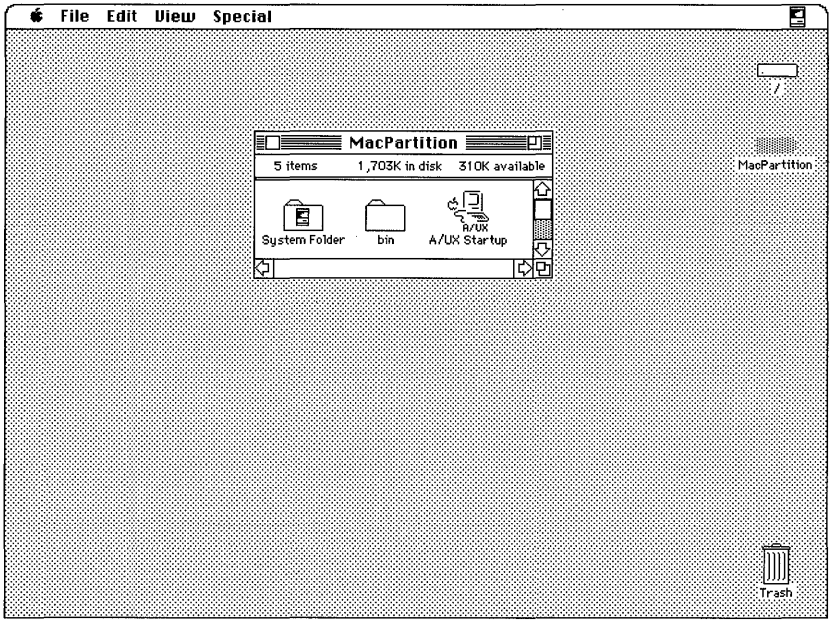
5. **Type the password for the root account in the Password text box.**

   If the root account does not have a password, just press RETURN. This starts the login process automatically; you do not have to go to step 6. When you are successfully logged in, the Finder desktop appears, as shown in Figure 3-5.

6. **Click Login or press RETURN.**

   You see a message about starting a session for `root`. When you are successfully logged in, the Finder desktop appears, as shown in Figure 3-5.

■ **Figure 3-5** The Finder desktop in A/UX



Checking your system's configuration

Before you can install and run X11 on your computer, you need to check for sufficient disk space and check for a network kernel.

◆ *Note:* If you already know that your computer has 16 MB of disk space, and if you have already configured a network kernel into your system, you can skip this section. Go to the section "Installing the X11 Software" later in this chapter for step-by-step instructions that describe how to install and set up X11.

Checking free disk space

You can use the `df` command to check the amount of free disk space on your computer. You need to have at least 16 MB of free disk space to run X11 on A/UX. The following steps describe how to use `df` in a CommandShell window. If necessary, see the section "Starting Up A/UX and Logging In" earlier in this chapter to get to the Finder desktop in A/UX.

1. **On the desktop, choose CommandShell from the Apple menu.**

   To choose a command from a menu, you position the pointer on the menu title in the menu bar and press the mouse button. While holding down the mouse button, drag to the command you want, and then release the mouse button. A CommandShell window appears with a command prompt. (If a CommandShell window does not appear, press COMMAND-N or choose New from the File menu while in the CommandShell application.)

2. **Enter `df` at the command prompt.**

   To enter a command, you type the command and press RETURN. The system returns the number of free disk blocks, for example,

   ```
   /   /dev/dsk/c5d0s0    33720 blocks        9112 i-nodes
   ```

   A block consists of 512 bytes. You need 32,000 blocks for the 16 MB of free disk space that X11 requires. If you do not have enough blocks, delete unnecessary files or archive old files to free disk space.

   If you need to check whether you have a network kernel configured for X11, leave the CommandShell window open and go to the next section, "Checking for a Network Kernel."

   If you know that you already have a network kernel configured for X11, you can close the CommandShell window now by clicking its close box. Go to the section "Installing the X11 Software" later in this chapter.

For additional information about obtaining more disk space, read the section "Reclaiming Disk Space" in Chapter 6, "Managing Disks," of *A/UX Local System Administration.*

Checking for a network kernel

Whether you plan to run X11 on a network or stand-alone system, you need to have a network kernel set up. Follow these steps to check whether your system has a network kernel. If necessary, see the section "Starting Up A/UX and Logging In" earlier in this chapter to get to the Finder desktop in A/UX.

1. **If you don't already have a CommandShell window open, choose CommandShell from the Apple menu on the desktop.**

   A CommandShell window appears with a command prompt. (If a CommandShell window does not appear, press COMMAND-N or choose New from the File menu while in the CommandShell application.)

2. **Enter `rlogin loop` at the command prompt.**

   - If you have a network kernel set up, this command "remotely" logs you in to your own computer. The system prompts you for your terminal type. For example, you see `TERM = (vt100)`. This means that X11 can run on your computer.

     Go to step 3.

   - If a network kernel is *not* set up, you see the message

     ```
     loop: Connection refused
     ```

     This means that you need to create a network kernel on your computer before you can run X11.

     Go to the Appendix, "Setting Up a Network Kernel," for instructions about using the `newconfig` command to create an NFS kernel or a plain TCP/IP kernel. If you are planning to put your computer on a network, see Chapter 2, "Establishing a Two-System Network," in *A/UX Network System Administration* for more information about using the `newconfig` command.

3. **Press RETURN to accept the terminal type, and enter `exit`.**

   This ends the remote login session and returns you to the prompt in the CommandShell window.

Go to the next section, "Installing the X11 Software."

Installing the X11 software

To install the X11 software, you perform the following steps.

- Copy the X11 Installer program from the *Installer for X11* disk to your A/UX system. Follow the instructions in the section "Copying the X11 Installer Program to Your Hard Disk."
- Use the X11 Installer to install the X11 files from the floppy disks.
  - If you are installing X11 for the first time and want to install X11 on the hard disk that contains your A/UX root file system, follow the instructions in the section "Installing X11 on Your A/UX System."
  - If you are updating an existing X11 system to a new version, make sure you back up any X11 files you may have changed. After you've backed up files, follow the instructions in the section "Installing X11 on Your A/UX System."
  - If you are an advanced A/UX user and plan to install X11 on a hard disk other than the one containing your A/UX root file system, follow the instructions in the section "Installing X11 Under a Different Directory."

After installing X11, go to the section "Setting Up X11" for instructions about how to prepare you A/UX system to run X11.

◆ *Note:* On the desktop, the hard disk icon labeled / represents your A/UX root file system.

Copying the X11 Installer program to your hard disk

Follow these steps to copy the X11 Installer program to your Macintosh computer running A/UX. These instructions assume you are starting from the Finder desktop in A/UX. For instructions on getting to the desktop, see "Starting Up A/UX and Logging In" earlier in this chapter.

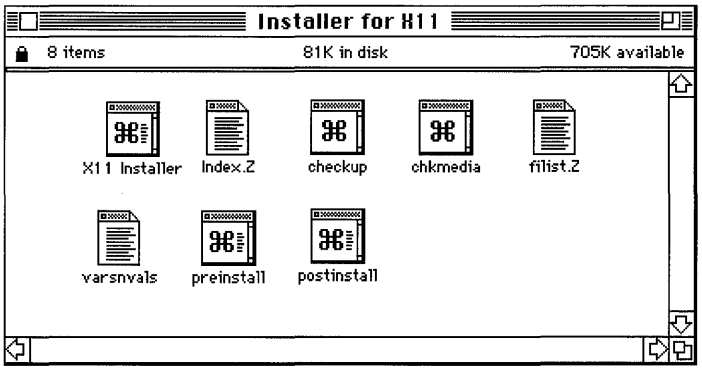
1. **Insert the *Installer for X11* disk into the right-hand disk drive.**

   If a dialog box appears and asks you to identify the type of floppy disk, click the button labeled Macintosh to specify that the disk contains Macintosh files.

2. **Open the Installer for X11 disk icon by double-clicking it.**

   A window like the one in Figure 3-6 appears with several icons. Notice the icon labeled X11 Installer. You use this program to install the X11 files.

■ **Figure 3-6** The Installer for X11 window



3. **Select all the icons that appear in the Installer for X11 window by pressing COMMAND-A.**

4. **Drag the files to the hard disk (/) that contains your A/UX root file system.**

   This copies the X11 Installer program to your hard disk.

5. **Close the Installer for X11 window and eject the disk.**

   Click the window's close box, and eject the disk by dragging the disk icon to the Trash.

△ **Important** Make sure you eject and remove the *Installer for X11* disk before starting the X11 Installer program. Once you start the X11 Installer program, you will need to insert the disks containing the X11 files into the right-hand disk drive. △

After you have copied the X11 Installer program to your hard disk, you are ready to install the X11 files from *X11 Installation Disks 1–12.*

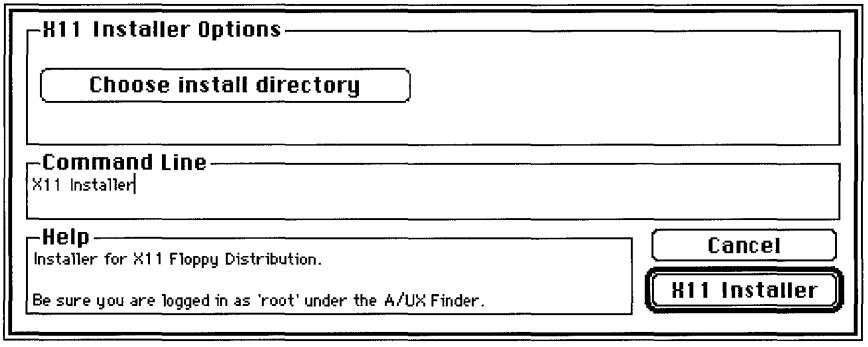
Installing X11 on your A/UX system

Follow these steps to install the X11 files on the hard disk, called /, that contains your A/UX root file system. These instructions assume you are starting from the Finder desktop in A/UX. For instructions on getting to the desktop, see "Starting Up A/UX and Logging In" earlier in this chapter.

1. **Open your hard disk (/) and find the X11 Installer icon.**
2. **Start the X11 Installer program by double-clicking its icon.**

   A Commando dialog box appears for the X11 Installer, as shown in Figure 3-7.

■ **Figure 3-7** The X11 Installer Commando dialog



3. **Click X11 Installer to accept / as the default directory.**

   - *Note:* Unless you're an advanced A/UX user, it's a good idea to install the X11 files under the root (/) directory. If you want to install X11 in a different directory, go to the section "Installing X11 Under a Different Directory," later in this chapter, for more information.

   After you click X11 Installer, a CommandShell window appears displaying the following messages about the X11 installation:

```
Welcome to the X Window System for A/UX Installation
Procedure.

If you have two floppy disk drives, be sure to insert all
disks only into drive 0 when prompted.

It is not recommended that you interrupt this procedure.
However, if you must do so, you may type q at any time while
the program is waiting for a floppy.

Press RETURN to continue
```

   For information about interrupting the X11 installation, go to the section "Stopping and Restarting the Installation" later in this chapter.

4. **Press RETURN to continue with the installation.**

   You see the following message:

```
Checking to see if there is enough room to install X11 ...
```

   If you have the required 16 MB of free disk space on your computer, you see the following messages:

```
Please insert X11 Installation Disks as prompted.
Waiting for floppy          Insert disk 1
```

   - *Note:* If you do not have the required amount of free disk space, the X11 Installer stops the installation and returns a command prompt. After you have created the necessary 16 MB of free disk space by backing up and removing files, begin the installation again by starting with step 1 in this section.

△ **Important** If you have two floppy disk drives, you must use the right-hand disk drive (drive 0) during the X11 installation procedure. △

5. **Insert *X11 Installation Disk 1* into the right-hand disk drive.**

△ **Important** Do *not* press RETURN after you insert the floppy disk. △

The X11 Installer loads the files from *X11 Installation Disk 1* onto your computer and displays the following message:

```
Processing disk 1.
```

When all files on *X11 Installation Disk 1* are loaded, you see these messages:

```
Waiting for floppy          Insert disk 2
```

6. **Install the 11 remaining X11 installation disks.**

These disks are labeled *X11 Installation Disk 2* through *X11 Installation Disk 12*. The X11 Installer continues to prompt you to insert the rest of the disks. When it finishes loading the final disk, the program displays the following messages:

```
Finished with installation.
Cleaning up ...
```

After several moments, you see messages about finishing the X11 installation.

To complete the X11 installation, you must give yourself access to X11. Follow the instructions in the section "Setting Up X11" later in this chapter.

Installing X11 under a different directory

This section describes how to install X11 on a separate hard disk that does not contain your A/UX root file system.

△ **Important** The installation procedure described in this section is for advanced A/UX users only. All other users should follow the installation instructions presented in the section "Installing X11 on Your A/UX System." The following procedure assumes that you understand the UNIX concepts of partitioning and mounting hard disks. △

1. **Prepare your external hard disk drive.**

   To prepare a hard disk, you must perform these procedures:

   - If necessary, initialize the hard disk using the Apple HD SC Setup program.
   - Partition the hard disk using the Apple HD SC Setup program.
   - Make a file system on the hard disk using the `newfs` command.
   - Mount the file system using the `mount` command.

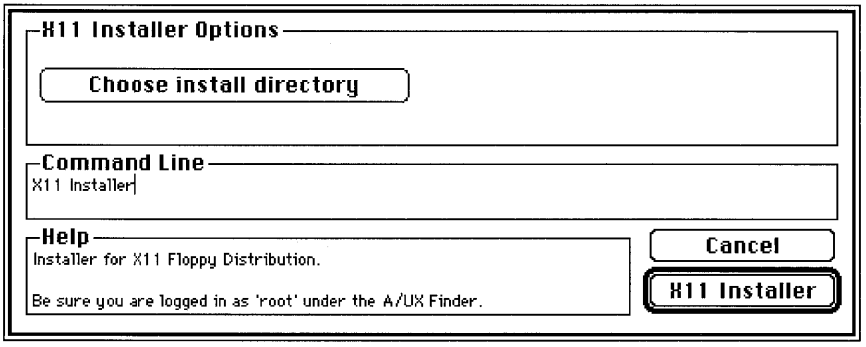
   The procedures listed above are described in detail in Chapter 4, "Adding and Managing Hard Disk SCs," in the guide *Setting Up Accounts and Peripherals.*

2. **Open your hard disk (/) and find the X11 Installer icon.**

3. **Start the X11 Installer program by double-clicking its icon.**

   A Commando dialog box appears for the X11 Installer, as shown in Figure 3-8.

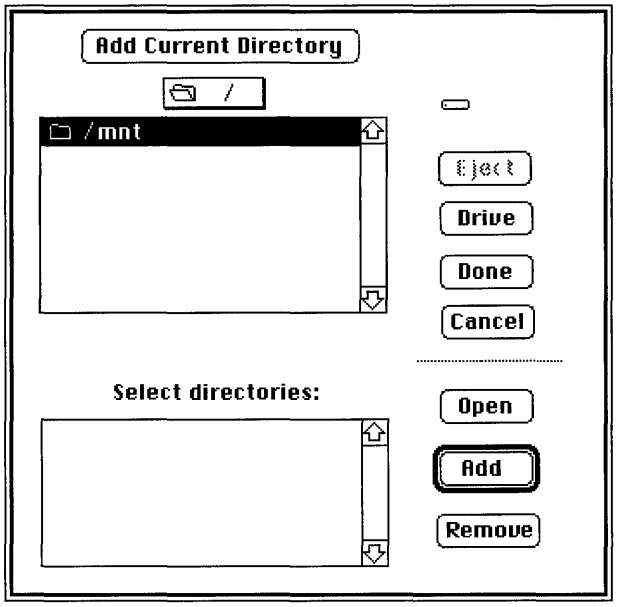
■ **Figure 3-8** The X11 Installer Commando dialog



4. **Click "Choose install directory."**

   The dialog box in Figure 3-9 appears.

■ **Figure 3-9** Choosing an installation directory



5. Find the directory under which you want to install X11, and select it by clicking it once.

Select the directory at which you mounted the hard disk you set up for X11.

For example, if you mounted the file system on your hard disk at the `/mnt` directory, you would select `/mnt` as the directory under which to install X11. Figure 3-9 shows `/mnt` selected. This means that when you install X11, its directories and files will be created under `/mnt`. For example, the `xterm` client application will be in the `/mnt/usr/bin/X11` directory.

6. Click Add.

The name of the directory you selected appears in the "Select directories" box. Make sure this directory is the one under which you want to install X11.

7. Click Done.

You return to the X11 Installer Commando dialog box.

8. Click X11 Installer to start the X11 Installer program.

After you click X11 Installer, a CommandShell window appears displaying the following messages about the X11 installation:

```
Welcome to the X Window System for A/UX Installation
Procedure.

If you have two floppy disk drives, be sure to insert all
disks only into drive 0 when prompted.

It is not recommended that you interrupt this procedure.
However, if you must do so, you may type q at any time while
the program is waiting for a floppy.

Press RETURN to continue
```

For information about interrupting the X11 installation, go to the section "Stopping and Restarting the Installation" later in this chapter.

9. Press RETURN to continue with the installation.

You see the following message:

```
Checking to see if there is enough room to install X11 ...
```

If you have the required 16 MB of free disk space on your hard disk, you see the following messages:

```
Please insert X11 Installation Disks as prompted.
Waiting for floppy          Insert disk 1
```

- *Note:* If you do not have the required amount of free disk space, the X11 Installer stops the installation and returns a command prompt. After you have created the necessary 16 MB of free disk space by backing up and removing files, begin the installation again by starting with step 1 in this section.

△ **Important** If you have two floppy disk drives, you must use the right-hand disk drive (drive 0) during the X11 installation procedure. △

10. Insert *X11 Installation Disk 1* into the right-hand disk drive.

△ **Important** Do *not* press RETURN after you insert the floppy disk. △

The X11 Installer loads the files from *X11 Installation Disk 1* onto your hard disk and displays the following message:

```
Processing disk 1.
```

When all files on *X11 Installation Disk 1* are loaded, you see these messages:

```
Waiting for floppy          Insert disk 2
```

11. Install the 11 remaining X11 installation disks.

These disks are labeled *X11 Installation Disk 2* through *X11 Installation Disk 12.* The X11 Installer continues to prompt you to insert the rest of the disks. When it finishes loading the final disk, the program displays the following messages:

```
Finished with installation.
Cleaning up ...
```

After several moments, you see messages about finishing the X11 installation.

To complete the X11 installation, you must give yourself access to X11. Follow the instructions in the section "Setting Up X11" later in this chapter.

Stopping and restarting the installation

During the X11 installation, you may need to stop the installation procedure. The following sections describe how to interrupt the X11 installation and how to resume after an interruption.

Interrupting the X11 installation

To interrupt the X11 installation procedure, enter `q` when the X11 Installer program prompts you to insert an X11 installation disk. You see this message:

```
Quitting installation procedure.
```

The X11 Installer program returns a command prompt. You can either resume the installation immediately by restarting the X11 Installer or perform the X11 installation at a later date. See the following section, "Resuming the X11 Installation," to learn how to restart the installation.

△ **Important** Do not interrupt the X11 installation at any point other than when the X11 Installer program prompts you for a disk. △

Resuming the X11 installation

If the X11 installation is interrupted for any reason, the X11 Installer program resumes at the correct point the next time you run it. To resume an interrupted installation, follow these steps.

1. **Find the X11 Installer on your hard disk (/).**
2. **Double-click the X11 Installer icon to start the program.**

   The X11 Installer automatically prompts you for the correct X11 installation disk. This feature saves you the trouble of reloading the X11 files that are already installed. You see the following messages:

   ```
   X11 has been partially installed; continuing with disk n
   Press RETURN to continue
   ```

3. **Press RETURN.**
4. **Return to the section of this chapter that describes the X11 installation you want to perform.**

   If you are an advanced user, go to the section "Installing X11 Under a Different Directory." Otherwise, go to the section "Installing X11 on Your A/UX System."

Setting up X11

Once you have installed the X11 software, you need to perform two sets of tasks:

- Copy startup files to your home directory.
- Adjust the PATH environment variable in your shell startup script.

△ **Important** Make sure you perform these tasks for each person who will be using X11. You must copy the startup files to each user's home directory and adjust the PATH environment variable in each user's shell startup script. △

Copying startup files

These steps assume that you are logged in to the Finder desktop in A/UX as the root user.

1. **If you don't already have a CommandShell window open, choose CommandShell from the Apple menu on the desktop.**

   A CommandShell window appears with a command prompt. (If a CommandShell window does not appear, press COMMAND-N or choose New from the File menu while in the CommandShell application.)

2. **Copy the `/usr/lib/X11/.x11start` file to your home directory.**

   For example, if your user name is `chris`, you enter

   ```
   cp /usr/lib/X11/.x11start /users/chris
   ```

   ◆ *Note:* Make sure you type a capital X when you type `X11`, but not when you type `.x11start`.

3. **Copy the `/usr/lib/X11/Sample.twmrc` file to the `.twmrc` file in your home directory.**

   For example, if your user name is `chris`, you enter

   ```
   cp /usr/lib/X11/Sample.twmrc /users/chris/.twmrc
   ```

Notice that the prefix `Sample` is dropped from `.twmrc`.

- *Note:* Make sure you type a capital X when you type `X11`.

4. **Set user ownership of the `.x11start` file.**

   For example, if your user name is `chris`, you enter

   ```
   chown chris /users/chris/.x11start
   ```

5. **Set user ownership of the `.twmrc` file.**

   For example, if your user name is `chris`, you enter

   ```
   chown chris /users/chris/.twmrc
   ```

The changes take effect immediately.

Adjusting the startup file

When you install X11, you create a directory called `/usr/bin/X11` that contains X commands and client applications. For A/UX to find these new files, you need to tell it where to look. You do this by adding the pathname of the X11 directory to the `PATH` environment variable. You can find the `PATH` environment variable in your shell startup script. The shell reads this startup script every time you start A/UX.

If you are using the Bourne or Korn shell, your startup file is `.profile`. If you are using the C shell, your startup file is `.login`. Follow the steps for the type of shell you are using. Each person who will use X11 must perform these steps. If you are not sure which shell you are using, follow the procedures in both sections.

Editing the `.profile` file

Follow these steps to add the pathname of the X11 directory to the `PATH` variable in the `.profile` file. These steps assume that you are at a command prompt in a CommandShell window.

1. **Make sure you are in your home directory.**

   Check your current directory by entering

   ```
   pwd
   ```

For example, if your user name is `chris`, you should be in the `/users/chris` directory. If you are not in your home directory, enter `cd /users/`*username* to get to your home directory.

2. **Use a text editor to edit your `.profile` file.**
3. **At the first occurrence of the phrase `PATH=`, after the first quotation mark (") and before the list of pathnames, add**
   `/usr/bin/X11:`

   The first occurrence of `PATH` should now look similar to the following example:

   ```
   PATH="/usr/bin/X11:/bin:/usr/bin:/usr/ucb:/mac/bin:/etc:/usr
   /etc:."
   ```

   Be sure to include the colon (`:`) to separate the pathnames. Do not include spaces between the various pathnames.
4. **At the second occurrence of the phrase `PATH=`, after the first quotation mark (") and before the list of pathnames, add**
   `:/usr/bin/X11`

   Notice the addition of the colon (`:`) before `/usr`.

   The second occurrence of `PATH` should now look similar to the following example:

   ```
   PATH=":/usr/bin/X11:/bin:/usr/bin:/usr/ucb:/mac/bin:/etc:
   /usr/etc"
   ```

   Be sure to include the colon (`:`) to separate the pathnames. Do not include spaces between the various pathnames.
5. **Save the file and quit the editor.**
6. **Choose Logout from the Special menu.**

   You return to the A/UX login dialog box.

The changes take effect next time you log in.

Editing the `.login` file

Follow these steps to add the pathname of the X11 directory to the `PATH` variable in the `.login` file. These steps assume that you are at a command prompt in a CommandShell window.

1. **Make sure you are in your home directory.**

   Check your current directory by entering

   `pwd`

   For example, if your user name is `chris`, you should be in the `/users/chris` directory. If you are not in your home directory, enter `cd /users/`*username* to get to your home directory.

2. **Use a text editor to edit your `.login` file.**

3. **At the first occurrence of the phrase `setenv PATH`, after the first quotation mark (") and before the list of pathnames, add**
   `/usr/bin/X11:`

   The first occurrence of the phrase `setenv PATH` should now look similar to the following example:

   ```
   setenv PATH "/usr/bin/X11:/bin:/usr/bin:/usr/ucb:
   /mac/bin:/etc:/usr/etc:."
   ```

   Be sure to include the colon (`:`) to separate the pathnames. Do not include spaces between the various pathnames.

4. **At the second occurrence of the phrase `setenv PATH`, after the first quotation marks (") and before the list of pathnames, add**
   `:/usr/bin/X11`

   Notice the addition of the colon (`:`) before `/usr`.

   The second occurrence of the phrase `setenv PATH` should now look similar to the following example:

   ```
   setenv PATH ":/usr/bin/X11:/bin:/usr/bin:/usr/ucb:
   /mac/bin:/etc:/usr/etc"
   ```

   Be sure to include the colon (`:`) to separate the pathnames. Do not include spaces between the various pathnames.

5. **Save the file and quit the editor.**

6. **Choose Logout from the Special menu.**

   You return to the A/UX login dialog box.

The changes take effect next time you log in.

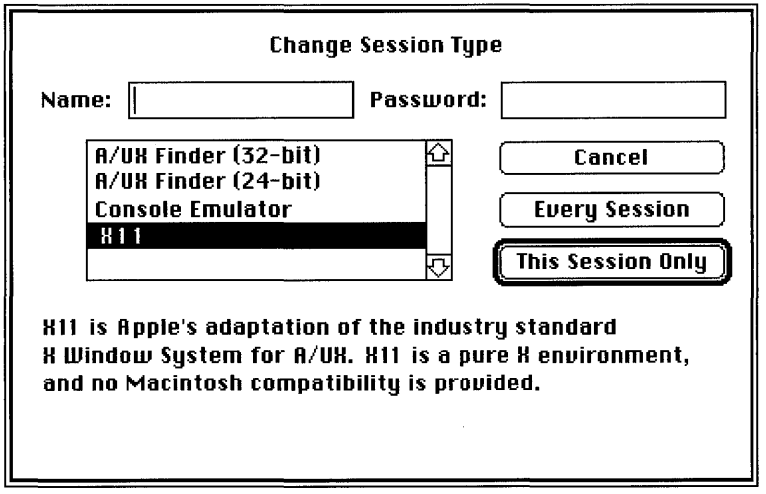
Starting X11 for the first time

After you have installed X11 and set up your user account, you can start using X11 right away. Follow these steps to start X11 at the point of logging in to A/UX. If your screen displays the Finder desktop, choose Logout from the Special menu to return to the A/UX login dialog box.

1. **While in the A/UX login environment, choose Change Session Type from the Options menu, or press COMMAND-S.**

   The Change Session Type dialog box appears, as shown in Figure 3-10. If you installed X11 correctly, you will see X11 as one of the environment choices.

■ **Figure 3-10** The Change Session Type dialog box



2. **Select X11 by clicking it.**
3. **Enter your user name in the Name text box and press TAB.**
4. **Type your A/UX password in the Password text box.**

5. Click This Session Only.

X11 is set as the environment for the current session only. The Change Session Type dialog box disappears, and you return to the A/UX login dialog box.

- *Note:* You can choose X11 as your default environment by clicking Every Session. Then whenever you start up A/UX and log in, X11 automatically starts up.

6. Click Login or press RETURN.

After a few moments, the X11 startup screen appears, as shown in Figure 3-11.

■ **Figure 3-11** The X11 startup screen

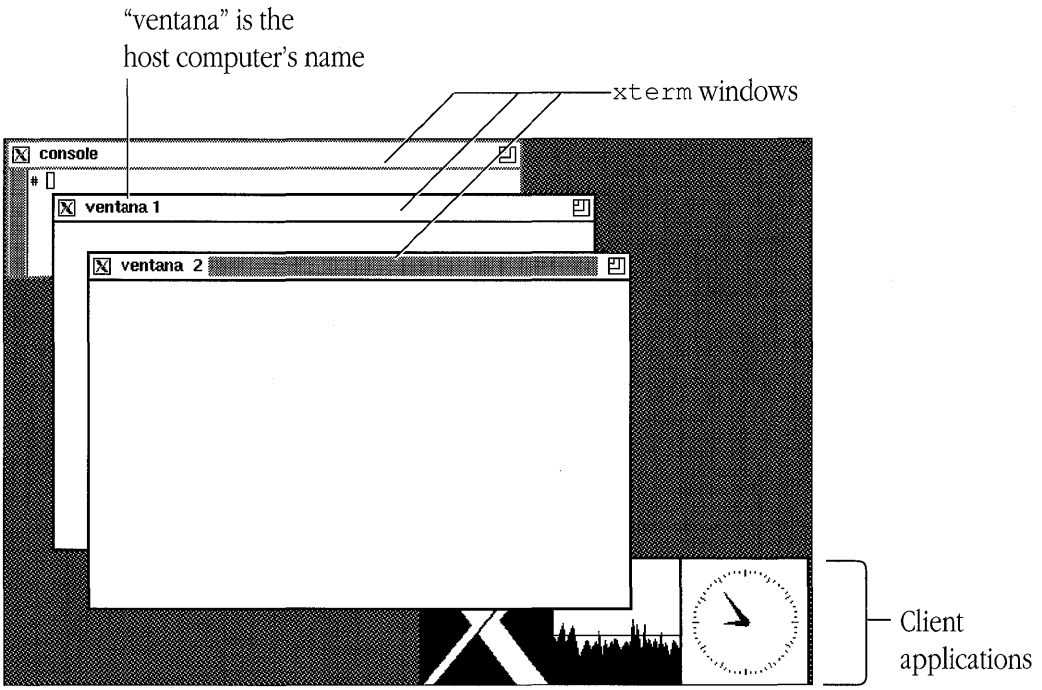


Figure 3-11 identifies the different parts of a typical X11 startup screen. In this sample screen, the name of the host computer is "ventana." When you start X11, you see the name of your computer in place of "ventana."

To exit from X11 quickly, type `exit` in the window named "console." When you exit X11, you return to the A/UX login dialog box.

Where to go from here

You can learn how to use X11 by reading *X11 User's Guide for A/UX,* which explains how to work with client applications, windows, pop-up menus, and other X11 features.

Appendix **Setting Up a Network Kernel**

This Appendix describes how to use the `newconfig` command to create a network kernel on your computer. You need a network kernel before you can install and use either MacX or X11.

If you have already configured your computer for network capabilities using `newconfig` according to either *Setting Up Accounts and Peripherals for A/UX* or *A/UX Network System Administration,* you do not need to repeat those steps.

Before you begin

When you run the `newconfig` command according to the steps in the next section, you will need to know the following information. You can obtain it from your system administrator.

- host name—a word, for example, "`bolinas`"
- Yellow Pages domain name—a word, for example, "`ucsd`"
- Internet address—a series of digits and periods, for example, `89.10.0.23`
- Broadcast address—a series of digits and periods ending with `.255`, for example, `89.10.0.255`
- netmask (optional)—a series of digits and periods, for example, `255.255.255.0`

Creating a network kernel

Follow these steps to use `newconfig` to create a network kernel on your computer. These steps are designed to set up a Network File System (NFS) network kernel. If you prefer a plain TCP/IP kernel, replace all instances of `NFS` with `BNET`.

You should have started A/UX and logged in as the root user.

1. **On the A/UX Finder desktop, choose CommandShell from the Apple menu.**

   To choose a command from a menu, you position the pointer on the menu title in the menu bar and press the mouse button. While holding down the mouse button, drag to the command you want, and then release the mouse button. A CommandShell window appears with a command prompt.

2. **Enter `newconfig nfs` at the command prompt.**

   - If your computer has an Ethernet card, you see the messages

     ```
     newconfig: Preparing to build a new A/UX kernel.
     Do you want this machine to be an NFS server (y or n)?
     [default: n]
     ```

     Go to step 3.

- If your computer does *not* have an Ethernet card, the system does not prompt you for any networking information but displays these messages instead:

```
newconfig: Building a new A/UX kernel (this may take
           awhile)
newconfig: Adjusting kernel parameters.
newconfig: Checking for any installation information.
newconfig: The new configuration will take effect when the
system is rebooted.
```

  Go to step 9 to restart your computer.

3. Press RETURN for "no."

- *Note:* If you want your computer to be an NFS server, type `y` for "yes" and press RETURN. You will see several messages in addition to the ones shown in this step.

You see the following messages:

```
newconfig: Building a new A/UX kernel (this may take
           awhile).
newconfig: Adjusting kernel parameters.
newconfig: Checking for any installation information.

Please enter a host name (it must be unique):
```

4. Enter the name of your computer.

For example, type `bolinas` and press RETURN.

You see the message

```
Please enter a domain name:
```

5. Enter your domain name.

For example, type `ucsd` and press RETURN.

- *Note:* If you do not have a Yellow Pages domain name, enter `nodomain` as a placeholder.

You see the messages

```
1 EtherNet card(s) installed.
ae0: Please enter an Internet address:
```

6. **Enter your Internet address.**

   For example, type `89.10.0.23` and press RETURN.

   You see the message

   ```
   ae0: Please enter a Broadcast address:
   ```

7. **Enter your Broadcast address.**

   For example, type `89.10.0.255` and press RETURN.

   You see the message

   ```
   ae0: Please enter a netmask (none):
   ```

8. **If you have a netmask, enter it.**

   For example, type `255.255.255.0` and press RETURN.

   If you do not have a netmask, press RETURN.

   You see a summary of the information that you entered, for example,

   ```
   ae0: host name is bolinas with IP address of 89.10.0.23
   broadcasting with 89.10.0.255
   newconfig: The new configuration will take effect when the
   system is rebooted.
   ```

9. **Choose Restart from the Special menu to restart your computer.**

   Restarting your computer puts the new network kernel into effect. After restarting, you return to the A/UX login dialog box. Depending on how your A/UX system is set up, you may instead return to the Macintosh desktop.

   Now that you've created a network kernel, you can log back in to A/UX and continue with the installation procedures in either Chapter 2 or Chapter 3.

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