



Setting Up Accounts and Peripherals for A/UX

Release 3.0

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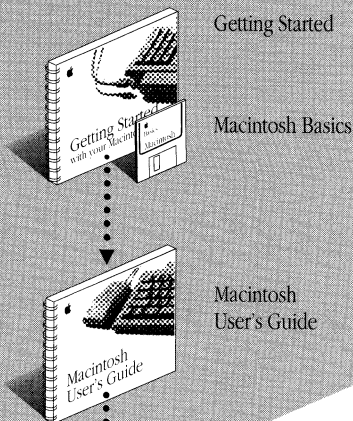
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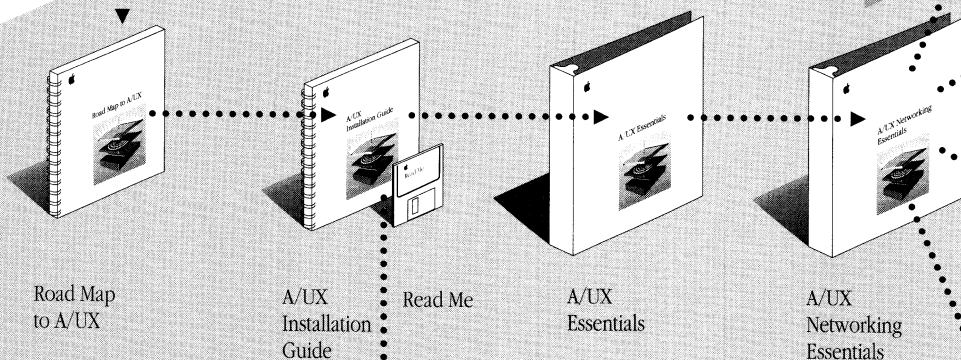
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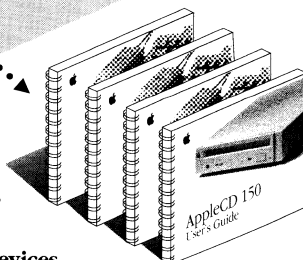


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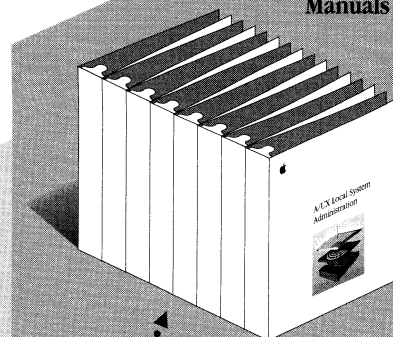


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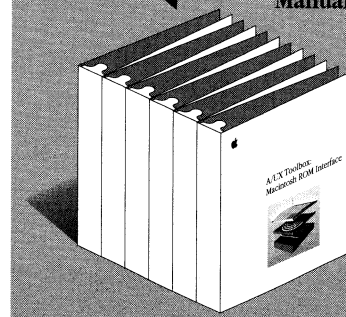
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About This Guide

This guide provides general instructions for setting up user accounts and peripheral devices for your Macintosh computer running A/UX. This guide and the owner's guides accompanying your Apple peripheral devices are the only books you'll need to do this. The owner's guides accompanying your Apple peripheral devices describe how to physically connect the cables and power cords for peripheral devices; this book describes how to configure the A/UX operating system to support these devices.

This guide describes how to set up the following for A/UX:

- a user account
- Apple printers
- Apple and some third-party hard disk SCs
- the AppleCD SC
- the Apple scanners
- an Apple Data Modem 2400 or Apple Personal Modem, or compatible modem
- a Macintosh computer as a terminal

What's in this guide

Connecting LaserWriter and ImageWriter printers directly to your computer

Creating a new user account with the default settings, including a home directory in `/users`, a personal System Folder, and the C Shell for the login shell

Preparing an Apple or non-Apple hard disk for use with A/UX, using a Berkeley (UFS) file system and specifying a permanent mount point

Adding the Apple Data Modem 2400, the Apple Personal Modem, or a Hayes-compatible modem

What's not in this guide

Gaining access to a printer on a LocalTalk or TCP/IP network; see *A/UX Networking Essentials*

Setting up a printer for access by more than one computer; see *A/UX Network System Administration*

Creating a user account with other than the default settings, or modifying an account after it's created; see *A/UX Local System Administration*

Customizing a user account for Network Information Services (NIS), formerly called Yellow Pages; see *A/UX Network System Administration*

Designing, setting up, and maintaining a computer network; see *A/UX Network System Administration*

Creating a System V type of file system, or mounting a file system temporarily; see *A/UX Local System Administration*

Installing A/UX, or adding an installation package from the *A/UX 3.0 CD-ROM* sometime after installing A/UX; see *A/UX Installation Guide*

Adding non-Apple peripheral devices other than hard disks and Hayes-compatible modems; see the documentation accompanying the peripheral device

Who should use this guide

This book is intended primarily for a novice A/UX user. This guide is also for the professional system administrator who oversees dozens of Macintosh computers and who wants quick instructions on how to attach peripheral devices to a single A/UX computer. However, if you are interested in the complete documentation of system administration concerns, see *A/UX Local System Administration*. If you are interested in setting up or maintaining a computer network, see *A/UX Network System Administration*.

What you should already know

You need to be familiar with basic Macintosh terms, concepts, and techniques. These are presented in the training disks and manuals that come with your computer. You also need to be familiar with the information in *A/UX Essentials* on using A/UX.

How to use this guide

First read Chapter 1 for an overview of system setup. Then use the guide chapter-by-chapter, as needed.

Conventions used in this guide

A/UX guides follow specific conventions. For example, 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	DOWN ARROW (↓)	OPTION	SPACE BAR
COMMAND (⌘)	ENTER	RETURN	TAB
CONTROL	ESCAPE	RIGHT ARROW (→)	UP ARROW (↑)
DELETE	LEFT ARROW (←)	SHIFT	

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 then 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 a series of characters on the command line and press the RETURN key. The instruction

Enter 1s

means “Type 1s and press the RETURN key.”

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

<i>Term</i>	<i>Action</i>
Click	Press and then immediately release the mouse button.
Drag	Position the mouse pointer, press and hold down the mouse button while moving the mouse, and then release the mouse button.
Choose	Activate a command in a menu. To choose a command from a pull-down menu, position the pointer on the menu title and hold down the mouse button. While holding down the mouse button, drag down through the menu until the command you want is highlighted. Then release the mouse button.

Select	Highlight a selectable object by positioning the mouse pointer on the object and clicking.
Type	Type a series of characters <i>without</i> pressing the RETURN key.
Enter	Type the series of characters indicated and press the RETURN key.

The Courier font

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

After you press RETURN, information such as this appears on the screen:

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

In this case, `Courier` is used to represent the text that 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 in an A/UX reference manual. See “Manual Page Reference Notation,” later in this preface for more information on the A/UX command reference manuals.

Font styles

Italics are used to indicate that a word or set of words is a placeholder for part of a command. For example,

```
cat filename
```

tells you that *filename* is a placeholder for the name of a file you want to display. For example, if you wanted to display the contents of a file named `Elvis`, you would type the word `Elvis` in place of *filename*. In other words, you would enter

```
cat Elvis
```

New terms appear in **boldface** where they are defined. Boldface is also used for steps in a series of instructions.

A/UX command syntax

A/UX commands follow a specific command syntax. A typical A/UX command gives the command name first, followed by options and arguments. For example, here is the syntax for the `wc` command:

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

In this example, `wc` is the command, `-l`, `-w`, and `-c` are options and *filename* is an argument. Brackets (`[]`) enclose elements that are not necessary for the command to execute. The ellipsis (...) indicates that you can specify more than one argument. Brackets and ellipses are *not* to be typed. Also, note that each command element is separated from the next element by a space.

The following list gives more information about the elements of an A/UX command:

<i>Element</i>	<i>Description</i>
<i>command</i>	The command name.
<i>option</i>	A character or group of characters that modifies the command. Most options have the form <code>-option</code> , where <i>option</i> is a letter representing an option. Most commands have one or more options.
<i>argument</i>	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 that you can enter more than one argument.

For example, the `wc` command is used to count lines, words, and characters in a file. Thus, you can enter

```
wc -w Priscilla
```

In this command line, `-w` is the option that instructs the command to count all of the words in the file, and the argument `Priscilla` is the file to be searched.

Manual page reference notation

The *A/UX Command Reference*, the *A/UX Programmer's Reference*, the *A/UX System Administrator's Reference*, the *X11 Command Reference for A/UX*, and the *X11 Programmer's Reference for A/UX* contain descriptions of commands, subroutines, and other related information. Such descriptions are known as *manual pages* (often shortened to *man pages*). For information on ordering these reference books, see *Road Map to A/UX*.

Manual pages are organized by section numbers. The standard A/UX cross-reference notation is

command(*section*)

where *command* is the name of the command, file, or other facility; and *section* is the number of the section in which the item resides.

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

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

You can display manual pages on the screen by using the `man` command. For example, you could 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 a manual page, press the SPACE BAR until you see a command prompt, or type `q` at any time to return immediately to your command prompt.

For more information

To find out where you need to go for more information about how to use A/UX, see *Road Map to A/UX*. This guide contains descriptions of each A/UX guide and ordering information for all the guides in the A/UX documentation suite.



1 About Customizing Your A/UX System

You can customize your A/UX system in many ways. *A/UX Essentials* describes how to customize your work environment, for example, changing the time zone and the default text editor. This guide, *Setting Up Accounts and Peripherals for A/UX*, describes how to add peripheral devices and user accounts. When adding these to your system, you are acting as the system administrator.

The system administrator

Whenever you act as a system administrator for an A/UX system, you do so in one of several capacities. You can

- administer your own system but not anyone else's
- have access to an official system administrator but choose to set up devices or user accounts for your own system
- be the system administrator of many A/UX systems

A system administrator is responsible for many tasks other than adding peripheral devices and user accounts. These other administration tasks, which might include making a plan for backing up files on a regular basis or checking the condition of the A/UX file systems, are beyond the scope of this guide. For complete documentation of system administration concerns, see *A/UX Local System Administration*.

When performing system administration tasks, keep a log of the modifications you make to a system. This record can be useful when troubleshooting the system later on. If you aren't the system administrator, review your plans with your administrator before performing setup tasks. This way you can learn and follow conventions used by your administrator and prevent causing problems to the system.

Performing system administration tasks requires the use of a special account in A/UX called *root*.

The superuser and the root account

Setting up the system involves not only physically connecting peripheral devices but also altering A/UX system files so that A/UX recognizes the devices. Altering system files can only be done by the *superuser*.

Just as your bank account identifies you as a bank customer with certain privileges, all A/UX users have accounts that identify them and specify their privileges.

There are two kinds of A/UX users: normal users and the superuser. Normal users have user accounts, and the superuser has the root account, which is only used for system administration. The superuser (that is, a user logged in to the root account) can

work with *all* A/UX files, including all the system files, whereas normal users can only work with three kinds of files:

- files in their own user account
- files that are accessible to them through a group they belong to
- files that are explicitly made available to anyone using the computer

The next figure shows the A/UX hierarchy of directories, and contrasts the “territory” open to the superuser with that open to normal users. The user accounts in Figure 1-1 are jeff, li, and lori.

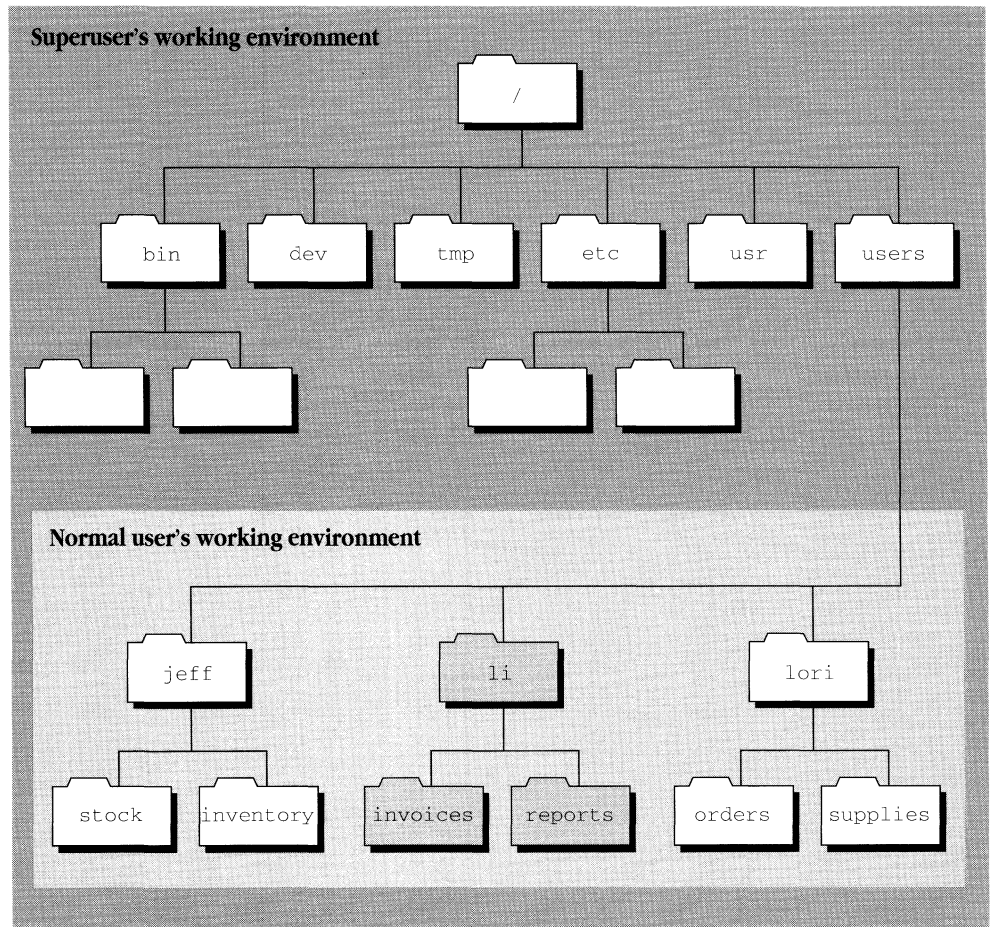


Figure 1-1 A/UX hierarchy of directories

See Chapter 5 of *A/UX Essentials* for more information on file permissions for normal user accounts.

Only use the root account when necessary. Unrestricted access to the root account lets you alter or remove any file in the system. A user account does not allow this, and hence safeguards against the danger of inadvertently affecting system files.

- △ **Important** You need to assign a password to the root account to protect your system from illegitimate use. You can do so with the `passwd` command. If you haven't yet assigned a password to the root account, see *A/UX Installation Guide* for instructions to do so. △

Logging in to the root account

To perform system configuration or administration tasks you must be logged in to the root account.

- ▲ **Warning** Don't use the `su` (substitute user) command to become the superuser if you want to continue with superuser privileges in another CommandShell window or in the Finder. The `su` command is relevant only to the shell in which you are currently working. When you move to another CommandShell window or to the Finder, your `su` status will be unavailable. ▲

If A/UX is not running

If A/UX is not running (if the computer is turned off or the Macintosh Operating System is running), follow these steps:

1 **Start A/UX.**

If you need help, see Chapter 1 of *A/UX Essentials* for instructions.

After the startup screens are displayed, the Login dialog box appears.

2 In the Login dialog box, click Registered User, unless it is already selected.

3 Enter `root` in the Name text box.

The computer prompts you for the password. If you haven't assigned a password to the root account, see *A/UX Installation Guide* for instructions.

4 Type the password.

A gray rectangle expands through the Password box as you enter each character.

5 Click Login or press RETURN.

If the password is correct, you are now logged in to the root account and thus have the status of superuser.

If A/UX is running and you're already logged in

If A/UX is running, and you are logged in to a user account, follow these steps to log in to the root account:

■ **In the Finder, choose Logout from the Special menu.**

The system reminds you to save all unsaved work.

The Login dialog box appears, indicating you have logged out successfully.

Follow the procedure in the previous section, "If A/UX Is Not Running," beginning with step 2, to log in to the root account.

Commando and scripts ease the job

The job of system configuration is made easier through the use of Commando and scripts.

Commando is an application that provides a graphical user interface to UNIX commands. It is very useful when running an unfamiliar command, or when running a command you haven't used for a while. In this guide you'll use Commando to ease the job of entering commands to configure the system. *A/UX Essentials* provides a complete description of Commando; previous experience with Commando, however, is not necessary to use this guide.

A script automates a repeated task. It is like a program, but written in a small programming language called a *shell* or a *command-line interpreter*. This guide shows how to use the A/UX scripts that simplify the tasks of adding user accounts and devices. System administrators often write scripts to make their job easier. The scripts described in this book were written with the Korn and Bourne shells. For further information about shells and how to use them to write your own scripts, see *A/UX Shells and Shell Programming*.

Connecting devices

Adding peripheral devices to A/UX usually requires two main steps: connecting the hardware and activating the software that informs A/UX about that piece of hardware.

There are limits to the number of peripheral devices you can connect to an A/UX system. The limits are imposed by the capacity of the ports, as described in the next two sections.

Printers, modems, and terminals

You connect printers, modems, and terminals through the two serial ports on the back of your Macintosh computer, as shown in Figure 1-2.

The two ports allow you to connect any two serial devices (printers, modems, and terminals) at one time. For information on adding devices through the serial port, see Chapter 3, "Adding and Managing Printers," Chapter 7, "Adding and Managing Modems," and Chapter 8, "Adding and Removing Terminals."

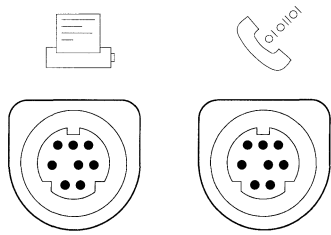


Figure 1-2 Serial ports

Hard Disk SCs, AppleCD SC, Apple scanners, and Tape Backup 40SC

You connect all Small Computer Systems Interface (SCSI) devices through the SCSI port on the back of your Macintosh computer, shown in Figure 1-3.

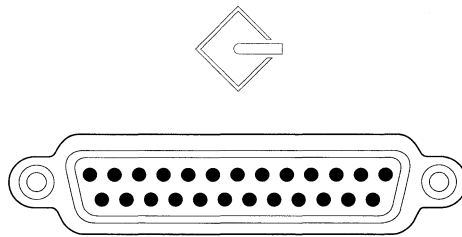


Figure 1-3 SCSI port

These SCSI (pronounced *scuz-ee*) devices include: Apple Hard Disk SCs, third-party hard disk SCs, the Apple Scanner, the Apple Tape Backup 40SC, and the AppleCD SC.

The Macintosh computer has just one SCSI port, but you can connect up to six external SCSI devices through it at one time by linking them together. For example, you could have one Apple Scanner, one AppleCD SC, and four Hard Disk SCs connected simultaneously. Figure 1-4 shows a SCSI device used to its maximum capability.

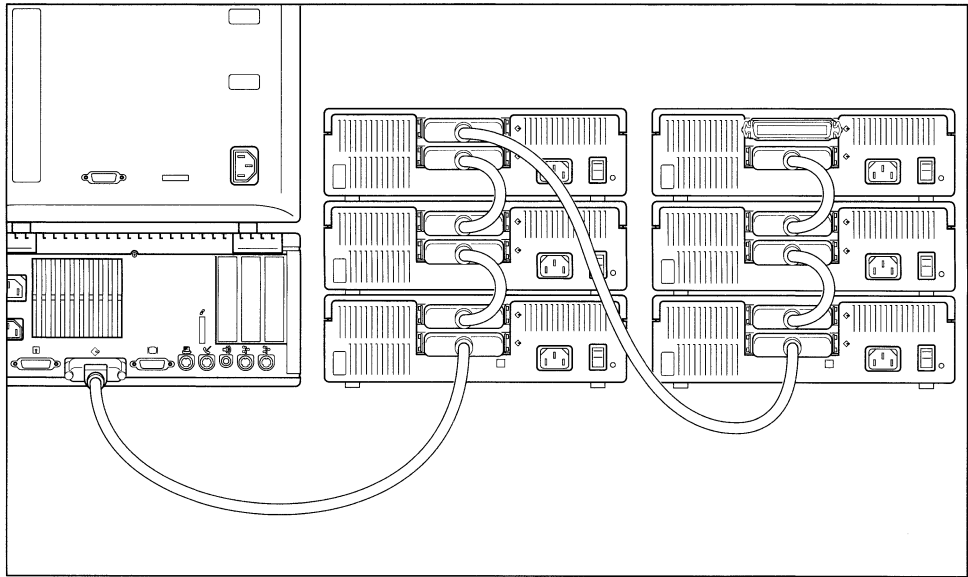


Figure 1-4 SCSI port used to its maximum capability

For instructions on adding SCSI devices, see the chapter that describes your device.



2 Adding and Removing User Accounts

By enabling each user to have his or her own account, A/UX lets several users work on the same computer with security and privacy.


A/UX is shipped with two user accounts: start and Guest. These accounts serve specific needs: the start account contains files for use with the A/UX tutorials in *A/UX Essentials*, and the Guest account allows a guest (that is, someone without a user account) to log in to the system. These two accounts are explained in more detail in *A/UX Essentials*, Chapter 1, “Starting and Finishing a Work Session.”

You need to add a user account for each individual who wants to use an A/UX system on a regular basis.

This chapter describes how to

- add user accounts
- remove user accounts

For information on modifying an account that is already created, such as to change its shell or its home directory path, see *A/UX Local System Administration*.



This chapter describes the user and group accounts in UNIX[®], which should not be confused with Macintosh file-sharing user and group designations. Though the two systems are similar in scope, they are unrelated.

Why create user accounts?

A user account provides a secure work environment that can be customized. Security is provided by a password; only the person who knows the password can log in and use the account. This protects the files from outside tampering. (In contrast, the current Macintosh Operating System (Macintosh OS) allows anyone who turns on the computer to work with all the files stored on that computer.) When you create an account, you can customize it by choosing from three login shells, assigning group memberships with other accounts, assigning a personal or the global System Folder, and setting file-permissions for the account. Once the account is made, its owner can change the file permissions on the files in the account and change the login shell. The owner, however, cannot change group memberships, since doing so requires superuser status.

The system administrator is responsible for initially determining the characteristics of a user account. When creating an account with the `adduser` script, as described in this chapter, the account acquires the following characteristics, unless you make other choices:

- *The C shell as the login shell* (the Login shell is the program that runs “behind the scenes” in CommandShell.)
- *Membership in a new group, of which the new user is the only member*
- *The following access permissions to its files:*
 - For all files except executable (program) files:
owner: read, write
group: read
others: read
 - For folders and executable files:
owner: read, write, execute
group: read, execute
others: read, execute

For a complete description of file permissions, see *A/UX Essentials*, Chapter 5, “Permissions.”

- *A home directory in the /users directory* Each user account has a home directory within `/users`. Don’t confuse the `/users` directory with the `/usr` directory, which contains the on-line manual pages, frequently used commands, and other files. For more information on the importance of the distinction between these two directories, see Chapter 4, “Adding and Managing Hard Disk SCs.”

- *A personal System Folder* The `adduser` command creates a personal System Folder for each user account. A personal System Folder allows a user to keep fonts and desk accessories for sole use by their account. In the absence of a personal System Folder, the global System Folder, stored in `/mac/sys` and named “System Folder,” determines the fonts and desk accessories available to an account.

Adding a new account

With the following procedure, you add an account by using the Commando utility and the `adduser` script. Previous experience with Commando is unnecessary to use this procedure.

- ◆ **NIS users** If your computer is connected to a network that uses NIS (Network Information Services), previously called Yellow Pages Service, and you want your user account to receive that service, you need to do more than follow the procedure described on the following pages. After adding the account, see *A/UX Network System Administration*, Chapter 4, “Setting Up the Network Information Service.” Refer to the section “Administering NIS,” and follow the steps to add your computer to the network. ◆

Follow these steps to add a new user account:

1 **Log in to the root account.**

See “Logging In to the root Account” in Chapter 1 if you need instructions.

2 **Choose CommandShell from the Applications menu.**

A CommandShell window appears.

3 **Type `adduser` and press COMMAND-K.**

The `adduser` Commando dialog box appears.

adduser Options

Operation

Add one user

Add many users

Login names:

Office address:

Office telephone:

Home telephone:

Login name:

Real name:

Customizing **Advanced options**

Command Line

adduser

Help

Add a user account. You must be logged in to the root account to use this command. If no names are given, you are prompted interactively for all missing data. If Yellow Pages are in use, add new users on the server.

Cancel

adduser

4 Type the account owner's full name in the "Real name" text box.

The insertion point (blinking vertical bar) is already in this box.

Do not press RETURN after typing the name or you'll close this dialog box prematurely. If you inadvertently pressed RETURN, start again with step 3.

The next figure shows the name appearing as part of the `adduser` command in the Command Line box.

adduser Options

Operation

Add one user

Add many users

Login names:

Office address:

Office telephone:

Home telephone:

Login name:

Real name:

Tim Bear

Customizing **Advanced options**

Command Line

adduser -r 'Tim Bear'

Help

Add a user account. You must be a super-user to use this command. If no names are given, you will be prompted interactively for all missing data. If Yellow Pages are in use, new users must be added on the server.

Cancel

adduser

5 **Click in the “Login name” text box and then type the login name for the account.**

You can also press the TAB key four times to move to this text box.

It is best to name the account with some part of the owner’s name. For example, `timb` is used for Tim Bear’s account, as shown in the next figure. This makes it easier to relate login names to the people who use them when you’re doing such things as sending mail or using the `who` command to see who’s logged in. Of course, if there are only two or three people with accounts on your system, you would not have trouble matching fanciful names to a person’s proper name.

adduser Options

Operation

Add one user
 Add many users

Login name:
timb

Real name:
Tim Bear

Login names:

Office address:

Office telephone:

Home telephone:

Customizing Advanced options

Command Line
adduser -r 'Tim Bear' timb

Help
Add a user account. You must be a super-user to use this command. If no names are given, you will be prompted interactively for all missing data. If Yellow Pages are in use, new users must be added on the server.

Cancel
adduser

6 **Optionally, type the account owner’s office address and office and home phone numbers in the provided text boxes.**

To move from box to box, press the TAB key and not the RETURN key. Pressing RETURN closes this dialog box.

Typing information in these fields is optional. You can leave them blank without affecting the user account. This information is recorded in the `/etc/passwd` file for future reference.

The account is given the C shell as its login shell. The account also is assigned membership in a new group that has an identification number but not a name, and in which this account is the sole member. It is also given a personal System Folder. If these are acceptable to you, continue with the next step.

- △ **Important** If you want to have the account use the global System Folder instead of a personal System Folder, or assign the account a shell other than the C shell, or assign the account to a group by name, go directly to “Specifying the Group, Login Shell, or System Folder,” the next section in this chapter. △

7 Click the “adduser” radio button (at the lower right) or press RETURN.

You return to the CommandShell window and see the `adduser` command line that you built with Commando.

8 Press RETURN.

The command takes less than a minute to run. When it finishes, the screen displays information about the new account, which is ready for use. You can see an entry for the new account by entering `ls /users`. The home directory folder for the account will appear in the Finder when the user logs into the account. The home directory folder is the login name followed by *alias*, for example, *timb alias*. The folder is an alias to the `/users/accountname` directory.

To assign a password to the new account rather than wait for the account owner to assign one, see “Adding a Password to an Account,” later in this chapter.

Specifying the group, login shell, or System Folder

Selecting another login shell, adding the account to an existing group, and specifying use of the global System Folder are common and easily made changes while creating the account. The following procedures show you how.

To change the default file permissions for the account or the directory in which the account is stored, see *A/UX Local System Administration*. Also see that guide for instructions on modifying an account after it’s created.

About groups

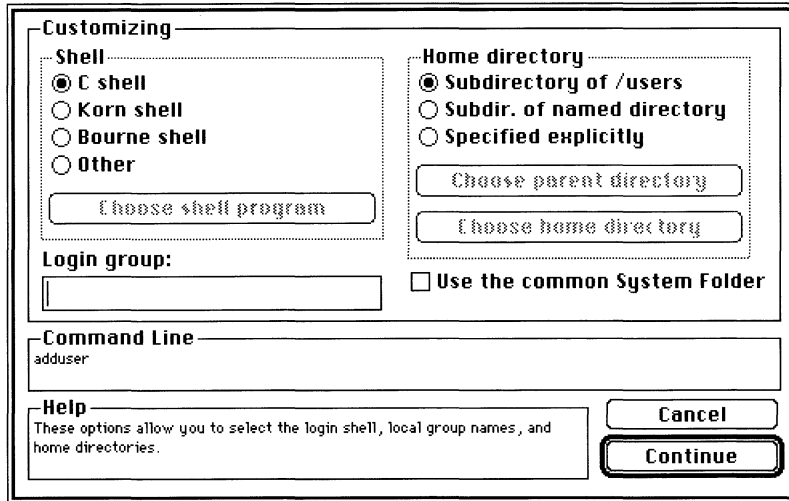
If your office or work environment consists of a group of people who work together, such as a project team, it makes sense to establish them as a group in A/UX. Group status allows a restricted group of users to open, read, or change a file or to run a program. Group permissions ensure that only users with the correct access permissions can use certain files or directories. Typically, an entire directory is given group access permissions. See *A/UX Essentials*, Chapter 5, “Permissions,” for further information on access permissions and *A/UX Local System Administration* for even more information on the topic.

A group is identified by its group name or group ID number. Because a name is easier to remember than a number, this procedure refers to groups by name.

If you’re adding this account to an existing group for which you don’t know the name, look at the `/etc/group` file to discover the name of the group before you proceed with the following steps.

◆ **Note** The following procedure is a continuation of the procedure to create an account. To make changes to an account that’s already created, see *A/UX Local System Administration* for instructions on editing the `/etc/passwd` file. ◆

- 1 Click Customizing in the `adduser` dialog box.**
The Customizing dialog box appears, as shown at the top of the facing page.
- 2 From the Shell options select the login shell of your choice.**
- 3 To use the global System Folder rather than create a personal one, click the “Use the common System Folder” box.**
- 4 Type the Login group name to which you want to add this account.**
If the group does not exist, create a name for the group by typing in this box.



5 Click **Continue**.

6 Click the **adduser** radio button or press **RETURN**.

You return to the `CommandShell` window.

7 Press **RETURN**.

The command takes less than a minute to run. When the command finishes running, the screen displays information about the new account. To verify the account has been created, enter `ls /users`. The home directory folder for the account will appear in the Finder when the user logs in to the account, and the folder will bear the user's login name, followed by *alias*. The home directory folder is an alias to the directory `/users/accountname`.

Now you need to assign the account a password, as explained in the next section.

Adding a password to an account

Until your account has a password, anyone can log in to it. To maintain the security of your system, immediately log in and assign it a password.

A password must follow certain restrictions. The restrictions are shown in the screen prompts when you log in to the account for the first time. Follow those prompts when creating a password.

After assigning a password, if it is for someone other than yourself, be sure to tell it to the account owner so he or she can log in and change the password to something of their liking. The process to change a password is easy, and instructions are provided in *A/UX Essentials*, Chapter 8, “Customizing Your Work Environment.”

Removing a user account

If a user account is no longer needed, it's a good idea to remove the account to prevent an unauthorized person from using it and to remove the account's files from the disk to create space for other files. Deleting many files always demands great care. The procedure to remove an account and its files is given in three parts to ensure that it is done carefully:

- finding the files owned by the user and making backup copies of them
- deleting the same files from the disk to create space
- removing the account

Find and back up files

1 **Find all the files owned by the user, regardless of location, by entering the command**

```
find / -user login name -print > file
```

where *login name* is the name of the user account and *file* is the name of a file in which you want to save the list of filenames owned by the user.

2 **Open the list of filenames to see them all, and make backup copies of them.**

The simplest way to copy files is to drag them to a floppy disk. Select the files or folder in the Finder and drag them to the floppy disk. If the directory is too large to fit on one floppy disk, you must select files in the directory and copy them to one floppy disk, and copy other files to additional disks, until you have copied all the files in the directory. If you need help with this procedure, or with formatting a floppy disk, see *A/UX Essentials*, Chapter 2, “Using Files, Folders, and Directories.”

You can also make backup copies of A/UX files using the UNIX utilities `cpio`, `tar`, `pax`, or `dump.bsd`. For a complete description of these choices and for specific instructions on using them to back up to tape, hard disk, or floppy disk, see *A/UX Local System Administration*.

Delete files from the disk

1 **Check that no one is using the files you’re about to remove.**

If someone is using a file, give that person ownership of the file. For instructions in changing ownership of a file, see *A/UX Essentials*, Chapter 5, “Permissions.”

2 **Remove the files by dragging them to the Trash while in the Finder, or by using the `rm` command while in CommandShell.**

- ▲ **Warning** Carefully consider your actions before using the `rm` command. Files that you remove with this command cannot be retrieved. Files in the Trash can be retrieved however, but not after choosing the Empty Trash command from the Special menu or after shutting down your computer. ▲

The files are removed from the disk. All that remains is the entry for the user account in the `/etc/passwd` file. The next procedure removes this entry.

Remove the account

1 Open a CommandShell window if one isn't open already.

2 Open the file `/etc/passwd`

For example, to open the file using TextEditor, enter `TextEditor /etc/passwd`.

3 Delete the line beginning with the user account's name.

For example, to remove the account `timb`, delete the line

```
timb:GPaJO6mo:1000:1000:,,,:/users/timb:/bin/csh
```

4 Save the changes and close the file.

▲ **Warning** Be sure you've backed up all valuable files in the user account's directory before giving the following command. ▲

5 Enter `rm -r /users/accountname`

The account's home directory is deleted. Enter `ls /users` to verify this.

3 Adding and Managing Printers


You can either connect a printer directly to your Macintosh computer for exclusive use by yourself and others who may use your computer, or you can connect your computer to a network and use the printers available on the network.

This chapter explains how to connect a printer directly to your Macintosh computer. Specifically, it explains how to

- choose the printer from the Chooser
- test the printer
- print a file

For instructions on connecting your computer to an existing network to use the printers connected to it, see *A/UX Networking Essentials*, Chapter 2, “Connecting to an Existing Network.”

If you want to set up your printer on an existing network, see *A/UX Networking Essentials*, Chapter 3, “Printing Over the Network.”



You can use any Apple LaserWriter or ImageWriter printer with A/UX except for the LaserWriter IISC and the Personal LaserWriter SC. To add non-Apple printers, see *A/UX Local System Administration*.

Connecting a printer

Follow the instructions in the owner's guide that came with your printer to physically connect the printer to your computer. Then return to this chapter to complete the process of setting up your Macintosh computer to print with A/UX.

Choosing a printer

After you've unpacked your printer and physically connected it to your Macintosh computer, you're ready to choose the printer. For each user account that has a personal System Folder assigned (as described in *A/UX Essentials*), you need to perform the following steps to choose a printer.

- 1 Switch on the printer and confirm that it starts correctly according to your owner's guide.**

Depending on your printer, you may see a green Select light flash and the printer may print a test page to confirm that the printer is starting correctly.

- 2 Switch on the Macintosh and start A/UX.**
- 3 Log in to your account.**
- 4 Choose the Chooser from the Apple (🍏) menu.**

5 If your printer is connected with LocalTalk cables and connectors, make sure the AppleTalk Active radio button is selected.

This button is in the Chooser window. Click the button if it isn't selected.

◆ **Note** Whenever you use LocalTalk cable or a telephone-wire product to connect your printer, you need to select the AppleTalk Active radio button. If the AppleTalk Active radio button is not selected, and needs to be, you'll see a message on your screen reminding you to select it. ◆

6 From the upper-left box, select the icon for the type of printer you connected.

The name of the printer will appear in the box at the right.

7 Select the name of the printer in the box at the right.

This remains your chosen printer until you select another.

8 Close the Chooser.

Proceed to "Testing the Printer," the next section.

Testing the printer

To be sure the printer is working in A/UX, follow these steps:

1 Choose CommandShell from the Applications menu.

If a CommandShell window does not appear, choose New from the File menu.

2 Open a file stored in the start account by entering

```
TextEditor /users/start/letter1
```

This starts TextEditor and automatically opens the file `letter1`. The file contains a bland business letter.

3 Choose Print Window from the File menu.

4 Click OK in the Print dialog box.

This sends the letter to the printer if the printer is working.

If the letter isn't printed, see the troubleshooting section in the owner's guide that comes with your printer for help locating the problem.

You are finished connecting and testing the printer. You can quit the TextEditor application by choosing Quit from the File menu. The next section provides instructions on the two ways to print a file in A/UX.

Printing a file

This section describes first how to print a file the Macintosh way, that is, by choosing Print from the File menu. Then it describes how to print using `lpr`, the A/UX print utility. (A/UX supplies several standard UNIX text processors, such as `troff` and `tbl`, which process text for printing with `lpr`. See *A/UX Text Processing Tools* for information on formatting and printing files with these utilities.)

The files that you can print the Macintosh way include files created with Macintosh applications and ASCII text files. Macintosh applications make use of the Macintosh graphical user interface. An example of this kind of application is TextEditor, which is distributed with A/UX as its default text editor. TextEditor gives you the capability to create, edit, and print text files with the help of a mouse and pull-down menus.

You can also print A/UX text files and shell script files, which are represented by these icons:



The files you can print with the A/UX print utility, `lpr`, are files created with A/UX text editors, such as TextEditor and `vi`, and files that are part of the A/UX distribution, for example, `/etc/passwd`.

◆ **Note** If you have a Personal LaserWriter or StyleWriter connected to a Macintosh running A/UX, you can only print the Macintosh way. ◆

Printing a file the Macintosh way

Follow these steps to use the Macintosh way to print a file:

1 Select the file you want to print from the Finder.

2 Choose Print from the File menu.

This automatically starts the application that created the file and opens the file on your screen. A Print dialog box also appears. With TextEditor as the default editor under A/UX, you can select text files such as `/etc/passwd` and send them to the printer in this way.

However, if you have changed your default editor to `vi`, then you can't print files like `/etc/passwd` using the Macintosh way without seeing subtle changes in the text, such as text appearing in a different font. Instead of printing these files the Macintosh way, use the `lpr` command to obtain a printed copy of the file as it appears on screen.

For instructions on changing the default editor, see “Changing Your Work Environment” in *A/UX Essentials*.

3 Click OK in the Print dialog box.

This sends the file to your printer.

Alternately, if an application is already running, you can open the file from the application and then choose Print from the File menu. Again, click OK when the Print dialog box appears.

Printing a text file using `lpr`

Follow one of these steps to print a file using the `lpr` utility:

- **If you have a printer connected with LocalTalk cables and connectors, enter the following command from a CommandShell window:**

```
lpr filename
```

For *filename*, type the name of the file you want to print.

◆ **Note** If you have a problem printing the file, the entries in the `/etc/printcap` file may have been changed. For more information on `/etc/printcap`, see “Managing Other Peripheral Devices” in *A/UX Local System Administration*. ◆

- **If you have a printer connected with a serial cable, enter the following command from a CommandShell window:**

```
lpr -Piw filename
```


For *filename*, type the name of the file you want to print.

4 Adding and Managing Hard Disk SCs

Adding one or more hard disks to an A/UX system provides not only more storage space but also more ways to divide up the space. This chapter describes how to devise a plan to allocate disk space for A/UX. Your plan may include making space for UNIX user files, for large application programs, or for the Macintosh Operating System (OS) if you need to run it without running A/UX. Or, your plan might include all three. In any case, Apple provides the Apple Hard Disk SC Setup program to accomplish these tasks. This chapter describes how to use Apple Hard Disk SC Setup to do the following.

- prepare a disk in a general way, for any partitioning scheme
- prepare a disk to store only UNIX user files
- prepare a disk to store files for both A/UX and the Macintosh OS
- prepare a disk with a separate `/usr` partition to store large application programs
- mount file systems into A/UX

Experienced administrators Go directly to the section in this chapter called “Brief Steps for Any Partitioning Scheme.” It describes briefly how to use the Apple disk partitioning software. If you prefer to use the UNIX utilities, such as `dp`, to partition a disk, see *A/UX Local System Administration*.



If you're partitioning a disk using a third-party program The general description of partitions and file systems at the beginning of this chapter will be of interest to you. The remainder of the chapter doesn't pertain to you; it describes the Apple Hard Disk SC Setup program. Use the manual accompanying your program for guidance on partitioning a disk.

Understanding partitions and file systems

Novice A/UX administrators are often confused by the difference between a partition and a file system. Understanding the difference between the two helps when performing the steps to create them.

A **partition** is a sectioned off area of a disk. You can partition a disk in numerous ways. Partitioning a disk is much like placing the shelves in a bookcase to divide the bookcase into useful spaces (see Figure 4-1). Numerous shelf configurations are available to you, and the one you choose is determined by what you'll put on the shelves. To display a large plant you'll need a large area between shelves; to display books you'll need a shorter area, and perhaps several of them to accommodate all your books. The same is true when partitioning a disk. You determine how to partition a disk based on what you'll put on the disk.

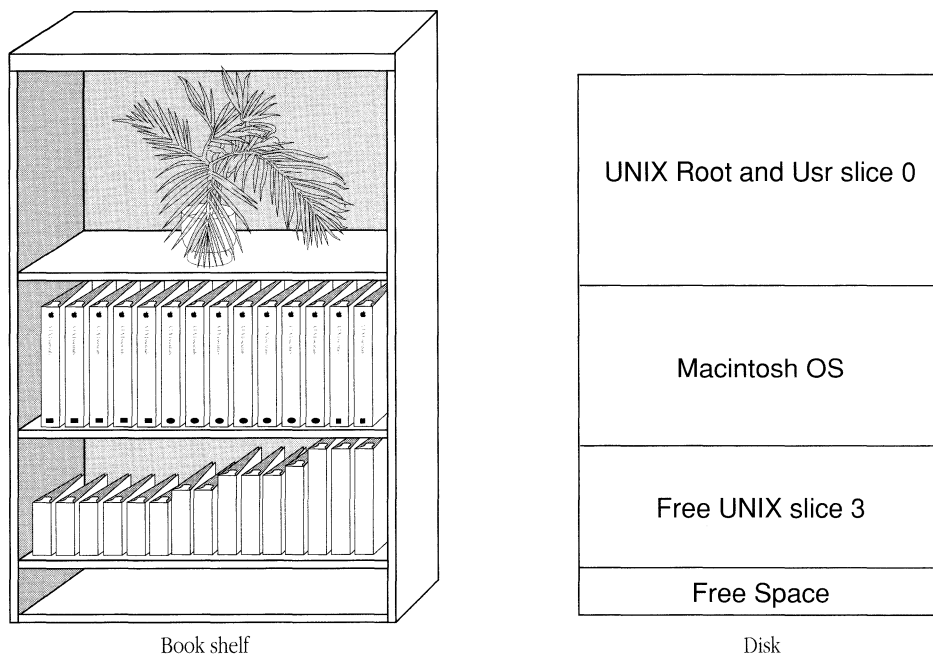


Figure 4-1 Disk partitions are like shelves in a bookcase

Files within a partition require an organized structure, with rules for storage and retrieval, and this organization is called a **file system**. For example, you could place the books on one shelf according to their height, from taller to shorter. On another shelf you could group the books according to subject. On both shelves you use rules for storage and retrieval; on each shelf you've used a different filing system.

With a computer, a file system resides in a partition. Different partitions can have different file systems. A/UX and the Macintosh OS use different types of file systems. One of the major differences is that the Macintosh OS and related files usually reside in one partition, whereas A/UX resides in several partitions, typically with each having a special use. Having several partitions generally adds flexibility to the system. For example, an A/UX system often has a file system within it dedicated to files created by users. This keeps the user-created files separate from the A/UX system files, which eases the chore of backing up files. (For more information on this, see the section called “Keeping User Files in a Separate File System.”)

A separate file system requires its own **mount point**. A mount point is the directory at which the file system “hooks” into the larger UNIX file system. A file system often takes on the name of the mount point, for example the file system mounted at `/users` will be called the *users file system*. You specify the mount point in the course of creating a new file system with Apple Hard Disk SC Setup.

What is Apple Hard Disk SC Setup?

The job of Apple Hard Disk SC Setup is to create partitions and assign a file system to each. Apple Hard Disk SC Setup is compatible with some third-party devices. See your certified Apple dealer for more information. (You can also create partitions by using the `dp(1M)` utility provided with A/UX. But be forewarned: Using this utility requires a solid understanding of A/UX file systems and partitions.)

A/UX supports two types of UNIX file systems: Berkeley and System V. However, the Berkeley file system is the type created by Apple Hard Disk SC Setup. Unless you have a reason to do otherwise, we recommend you stay with the Berkeley file system, as it offers faster access time and allows longer filenames. (Creating a System V type of file system requires the `mkfs(1M)` utility.)

With Apple Hard Disk SC Setup you choose from several predefined partitioning and file system schemes. These schemes provide typical combinations of partitions and file

systems for UNIX system files, UNIX user files, and the Macintosh OS. If these schemes don't match your needs, you can easily customize any one of them.

Some of the predefined partitioning schemes are applicable only to disks of a certain size. The Apple Hard Disk SC Setup program displays a help box on the screen to give you this type of information when selecting partitioning and file system schemes.

Planning the use of your disk space

There's no substitute for a good plan when it comes to making efficient use of hard disks. Before partitioning your disk, you need to answer several questions:

- What's your total disk capacity? Of course, the larger the available disk space, the more flexibility you have in designing your system.
- How much disk space do you require for user accounts? This will help you decide how much disk space you need to add and which distribution files you'll choose not to install.
- How much space do you require for large application programs you might add? Such programs are commonly stored in `/usr/local`.
- Do you need to use the Macintosh OS without A/UX? If so, you'll need to increase the size of MacPartition because, as shipped, it is 4 megabytes (MB) in size and filled to capacity with the files necessary to start up A/UX.
- Are there distribution packages such as the on-line man (manual) pages that you didn't install at installation time because of limited disk space? If so, you might want to install them after adding a hard disk to your system.
- Do you have file systems in use that you'd like to increase or decrease in size? With Apple Hard Disk SC Setup you can't shrink or expand the size of a partition without losing the data in it. Instead, you need to back up the files in the partition, remove the partition, create a new partition at the desired size, and restore the files to it.

When calculating the required size of the partition for the UNIX root file system, you need to increase the number by 10 percent or 10 MB, whichever is smaller. This extra space is necessary for buffers, log files, and other system activities that require temporary space on the disk.

Keeping user files in a separate file system

Typical user files are files created with the A/UX text editors, files created with application programs you run in A/UX, and programs you've written. A/UX is shipped with a `/users` directory so you can keep user files separate from distribution files.

Over time, the number of user files increases, while the number of distribution files remains constant. Therefore, when you add disk space to your A/UX system, you're probably adding it to hold user files. The exceptions to this are adding disk space to hold application software you now want to use, or to hold distribution files you left out when installing A/UX because of limited disk space.

When you disperse A/UX over multiple disks, put the user files in a separate file system from the distribution files. This will let you manage the process of backups using less time and disk space. It will let you concentrate on backing up the file system that contains the user files, which change frequently and thus need backing up frequently, and not the file system containing the system files, which seldom change and thus seldom need backing up.

Users will not know that the user files are actually stored in a separate file system and possibly on a separate disk. The desktop makes no show of this fact because it has no affect on the way users see or gain access to the files.

Novice administrators often make the mistake of creating user accounts in the `/usr` directory. This is not a good idea because `/usr` is one of the largest directories in the A/UX file system and contains commands, on-line man (manual) pages, libraries, games, and many other files. Putting user accounts here would make backing up only the user account files more difficult. It's recommended that you instead use `/usr` to store large application programs you may install, such as X Window System. And to store user accounts, use the `/users` directory, as described in this chapter, or use another directory that you create.

Connecting the Hard Disk SC

Your *Apple Hard Disk SC Owner's Guide* describes how to attach additional SCSI disks to your computer. It also describes how to attach an additional hard disk to a system for which a Tape Backup 40SC or an AppleCD SC drive is already connected. See the *Apple Hard Disk SC Owner's Guide* for instructions on physically connecting an additional Hard Disk SC, then return to “Starting Apple Hard Disk SC Setup,” the next section in this chapter.

If you're connecting a third-party disk, see the owner's manual for the disk for instructions on physically connecting it. Then, partition the disk using either a third-party disk-partitioning program or the Apple Hard Disk SC Setup program.

Starting Apple Hard Disk SC Setup

Here are the steps to prepare a disk for A/UX, or for A/UX and the Macintosh OS. These steps apply to both new disks and disks that already contain data

1 Start up A/UX and log in to the root account.

You must run HDSC Setup from A/UX and the root account to partition a disk for A/UX. See “Logging In to the root Account” in Chapter 1 if you need instructions.

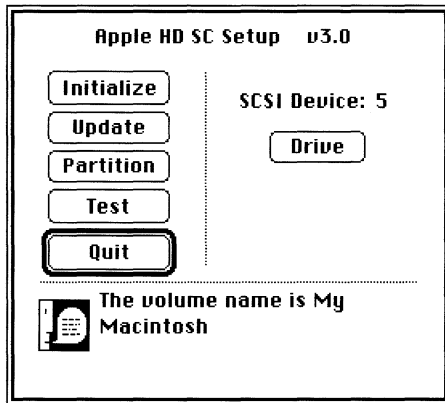
2 Start up Apple Hard Disk SC Setup.

To start it up from the Finder, double-click the `/` disk, double-click the `mac` folder, double-click the `bin` folder, and then double-click the Apple HD SC Setup icon.

To start it up from CommandShell, enter

```
launch /mac/bin/"Apple HD SC Setup"
```

The main dialog box of Apple Hard Disk SC Setup appears, as shown on the following page.



- ▲ **Warning** Apple Hard Disk SC Setup is preset to select the disk with the lowest SCSI ID number. Be sure the SCSI Device ID shown on screen matches the disk you want to initialize. ▲

Do I need to initialize?

Initializing a disk is required in just two cases. If your disk doesn't meet one of the following criteria, skip to the next section, "Partitioning a Disk."

- The disk is new and uninitialized. This is rare. If your disk falls into this category, the Initialize button will be the only one you can select.
- You've been trying to use the disk with A/UX, but it's been giving you trouble.

To use the disk for A/UX, start the disk preparation procedure from scratch (that is, starting with the initializing process), so that by the end of this procedure either the disk will function properly or you'll know that the problem lies with the disk and not with the software.

- ◆ **Note** Reinitializing destroys any information on the disk. If your disk contains important files, make a backup of them before reinitializing. ◆

Initializing a disk

1 Click Drive until you see the SCSI number of the disk you want to initialize.

On Apple disks, the SCSI number is located on the back panel of the hard disk, below the SCSI ports. For help locating the SCSI number on non-Apple disks, see your owner's manual.

2 Click Initialize.

An alert message tells you that initializing erases all information from the disk.

3 Click Init.

Initialization takes approximately 10 minutes for an 80 MB disk, and more time for a larger disk.

If the disk has not been previously partitioned with a Macintosh partition, you are prompted to name the Macintosh volume. This initialization procedure automatically partitions the disk with one large Macintosh volume.

If your disk has been previously partitioned with a Macintosh partition, it will use the previously given name and you won't see a prompt to name the Macintosh volume. Skip to the next section, "Partitioning a Disk."

4 If you are prompted to name the Macintosh volume, type a name and click OK.

Macintosh file systems are called *volumes*. If your desired partitioning scheme for this disk includes a Macintosh partition, the name you supply will appear in the Finder to identify the Macintosh file system. Enter a name even if the partitioning scheme you have in mind will not include a Macintosh partition.

You're ready to partition the disk.

Partitioning a disk

Though you can partition a disk in numerous ways, three partitioning schemes are common. A partitioning scheme for general use and the common schemes are described in the following list. Use this list to decide which partitioning scheme you want, then follow the procedure provided in that section.

- *Partitioning a disk for any scheme:* These brief steps are for the confident system administrator looking for a general procedure rather than a procedure specific to a partitioning scheme. See “Brief Steps for any Partitioning Scheme.”
- *Partitioning a disk for UNIX user files exclusively:* See “Creating a Partition for UNIX User Files Only.”
- *Partitioning a disk for UNIX user files and the Macintosh OS:* See “Creating Partitions for UNIX User Files and the Macintosh OS.”
- *Partitioning a disk for UNIX user files and a `/usr` partition to store large application programs such as X Window System:* See “Creating Partitions for UNIX User Files and `/usr`.”

The partitioning schemes described here assume that the A/UX system is already installed on a hard disk. If you need instructions to install A/UX, whether it be a repeat installation or your first installation of A/UX, see *A/UX Installation Guide*.

Brief steps for any partitioning scheme

The procedure described here is applicable to any partitioning scheme you might create for an A/UX disk. However, if you're inexperienced with partitioning a disk for A/UX, skip this section and go to one of the following sections; those sections provide detailed steps for creating specific partitioning schemes that you're likely to use.

- ▲ **Warning** Back up your disk before proceeding if the disk contains information you want to keep. Partitioning destroys all information on a disk, except when retaining the partition type and size. ▲

1 **Start the Apple Hard Disk SC Setup program.**

Follow the instructions in “Starting Apple Hard Disk SC Setup,” earlier in this chapter.

- ▲ **Warning** Make sure you are partitioning the correct disk. Does the SCSI device number displayed on screen match the SCSI ID number of the hard disk you want to partition? If not, click Drive until they match. ▲

2 **To start the partitioning process, click Partition.**

3 **Select the partitioning scheme that matches or most closely matches the partitioning scheme you want to create.**

4 **To display a graphic representation of the partitioning scheme currently on the disk, click Custom.**

Your current partitioning scheme is shown.

You can't shrink or expand an existing partition. Therefore, to resize existing partitions you need to remove them and then recreate them in the new sizes. Note that all data in a partition will be lost by removing the partition.

If no partition is displayed but instead it is all gray or “free” space, skip to step 6.

5 To remove a partition, click the partition and then click Remove.

If you want to remove another partition, you can do so now.

- ▲ **Warning** The free space at the end of the disk is necessary for proper use of the disk. The MacDriver partition is necessary if the disk will contain a Macintosh file system, otherwise it can safely be removed. ▲

6 Click and drag inside the partition map to describe the size and placement of the new partition.

7 Select the type of partition you want to create.

You can type a number in the text box located between *Minimum* and *Maximum* to enter an exact size for the partition.

8 Click OK to accept the size for the partition, highlighted at the side, or change this size by editing it from the keyboard.

If you selected a Macintosh partition, name the partition and skip to step 10.

If your partitioning scheme includes a Free UNIX partition, a dialog box for specifying a mount point for the new file system appears.

9 Click the text entry box and type the name of a directory. Or, select an existing directory.

If you typed a new directory, the new directory will be created for you.

A/UX will automatically mount the new file system each time A/UX starts up.

10 Click Done.

11 Repeat steps 2–10 to create more partitions until you're satisfied with your partitioning scheme.

12 Click Quit.

Creating a partition for UNIX user files only

Follow these steps if you want to prepare a disk to hold UNIX user files, to the exclusion of A/UX system files and the Macintosh OS.

In this procedure you make a partition called Maximum Free UNIX, then specify a directory to serve as the mount point for the new file system. While performing this procedure, be sure no one is using your A/UX system, such as from a terminal, as they would most likely experience problems.

1 **Prepare your system for moving the files from `/users` on your A/UX system disk to the new file system on the disk you're adding.**

This step is necessary only if you want to save the files in your existing `/users` directory. If you do not want to save those files, skip to step 2.

Open a CommandShell window and enter

```
mv /users /users.old
```

2 **Start the Apple Hard Disk SC Setup program.**

Follow the instructions in “Starting Apple Hard Disk SC Setup,” earlier in this chapter.

- △ **Important** Make sure you are partitioning the correct disk. Does the SCSI device number displayed on screen match the SCSI ID number of the hard disk you want to partition? If not, click Drive until they match. △

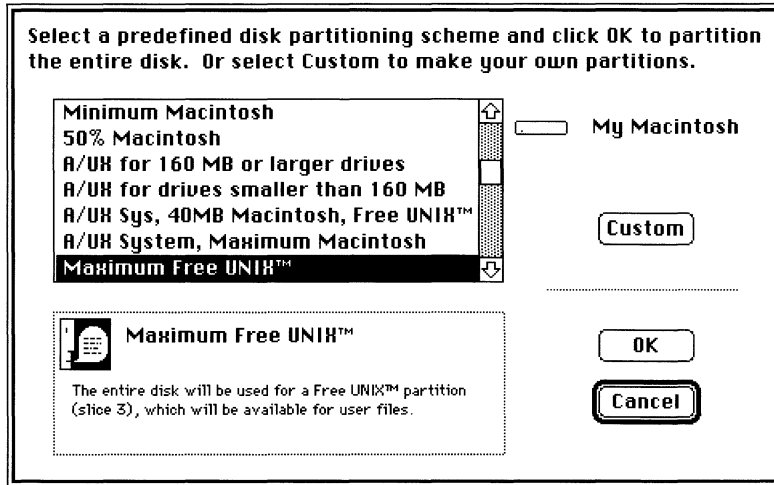
3 **Click Partition.**

The Partition dialog box appears.

4 **Select Maximum Free UNIX.**

You need to press the down scroll arrow to see it.

A brief description of this partitioning scheme appears in the following dialog box.



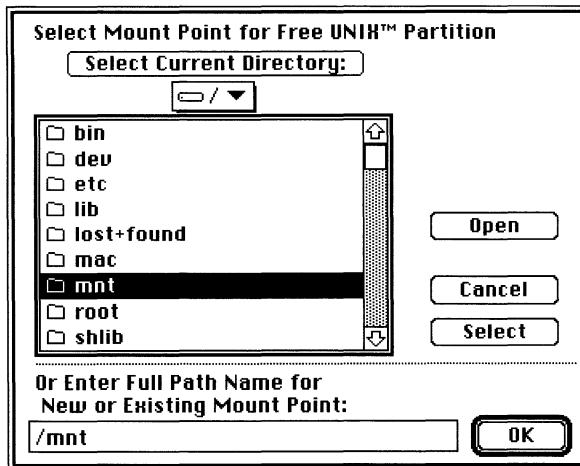
5 Click OK to confirm your selection.

A message warns you that partitioning erases any information on your hard disk. If you click Cancel, you return to the main dialog box, and no partitioning takes place.

6 Click OK to continue.

Partitioning takes approximately two minutes for an 80 MB disk, and longer for larger disks.

When partitioning is complete, the following dialog box appears in which you specify the mount point directory.



7 Click the text entry box.

The text entry box contains `/mnt`, the directory that's preselected.

8 Type a name for the mount point directory.

For example, type `/users2` to mount the file system at the `/users2` directory.

9 Click OK.

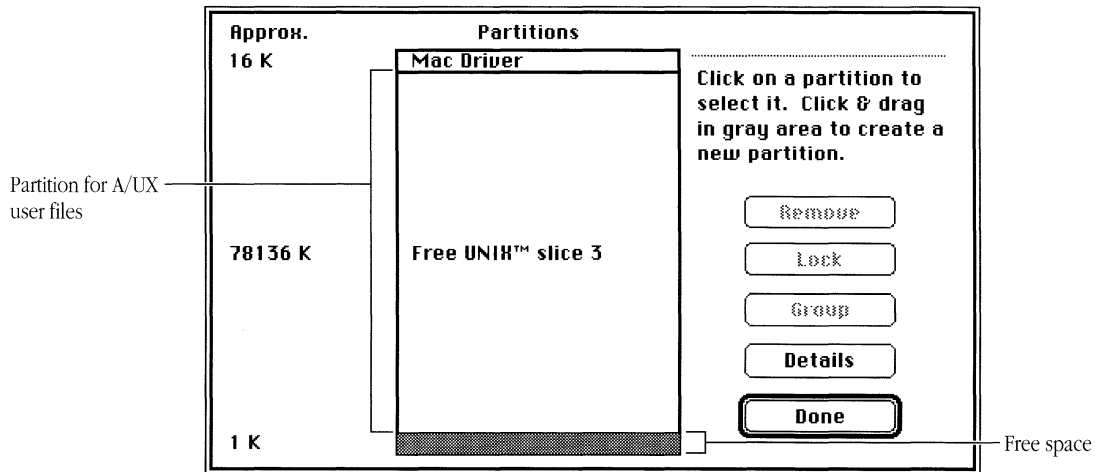
An alert message confirms the mount point. Your new file system is now mounted and will be mounted each time A/UX is started up.

10 Click OK.

You're returned to the Hard Disk SC Setup main dialog box.

11 To see a graphic representation of your newly partitioned disk, click Partition, and then click Custom.

The Custom Partition dialog box appears.



The disk is divided into three partitions, with the largest partition for UNIX user files. The MacDriver partition contains disk-management software. The gray rectangle is free space at the end of the disk. The size of each partition, in kilobytes (K), is shown to the left of the rectangle that represents the partition.

- ▲ **Warning** Do not remove the free space at the end of the disk as it is necessary for proper use of the disk. However, you can remove the MacDriver partition. The MacDriver partition is necessary only when a disk contains a Macintosh partition. ▲

12 **Click Done.**

You return to the main dialog box.

13 **Click Quit.**

An icon for your newly partitioned A/UX disk will not appear in the Macintosh Finder or in the A/UX Finder.

If you are saving files from your existing `/users` directory, continue with the next steps. If you aren't saving those files, you are finished with this procedure.

14 **Move files from the previous `/users` directory to the file system you've just created.**

Open a CommandShell window.

```
Enter cd /users.old
```

```
Enter find . -print | cpio -pmvd /users
```

You are finished with the procedure for creating a new file system and moving existing files into it. Work with your system until you're confident that you no longer need the old `/users` directory. Then free up space on your system disk by removing the old `/users` directory by entering

```
rm -r /users.old
```

Creating partitions for UNIX user files and the Macintosh OS

There may be a circumstance in which you want to use the Macintosh OS without running A/UX. To do this, you would need to create a partition for the Macintosh OS other than the MacPartition provided with A/UX. The MacPartition is only 4 MB in size, which is sufficient for its purpose in starting up the computer, but insufficient for working on and storing files. (Apple Hard Disk SC Setup can create only one Macintosh partition per disk. When using this program to add a Macintosh partition, you must add the partition to a disk other than the one containing MacPartition.)

◆ **Saving disk storage space** If you want access to an application program from both the Macintosh OS and A/UX, store the program in the Macintosh OS file system. This will enable you to start up and use the program from either A/UX or the Macintosh OS. ◆

In this procedure you select the partitioning scheme 50 percent Macintosh, 50 percent Free UNIX and modify the size of the partitions to the sizes you want. Your end result will be a Macintosh partition of useable size, and a partition for storing UNIX user files. While performing this procedure, be sure no one is using your A/UX system, such as from a terminal, as they would likely experience problems.

1 **Prepare your system for moving the files from /users on your A/UX system disk to the new file system on the disk you're adding.**

This step is necessary only if you want to save the files in your existing /users directory. If you do not want to save those files, skip to step 2.

Open a CommandShell window and enter

```
mv /users /users.old
```

2 **Start the Apple Hard Disk SC Setup program.**

Follow the instructions in “Starting Apple Hard Disk SC Setup,” earlier in this chapter.

△ **Important** Make sure you are partitioning the correct disk. Does the SCSI device number displayed on screen match the SCSI ID number of the hard disk you want to partition? If not, click Drive until they match. △

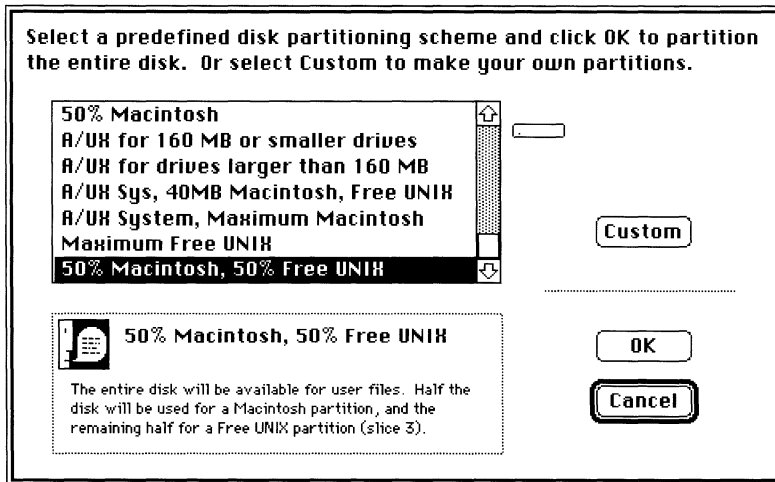
3 Click Partition.

The Partition dialog box appears.

4 Select 50% Macintosh, 50% Free UNIX.

You need to press the down scroll arrow to see it.

A brief description of this partitioning scheme appears in the dialog box.



5 Click OK to confirm your selection.

An alert message warns you that partitioning erases any information on your hard disk. If you click Cancel, you return to the main dialog box, and no partitioning takes place.

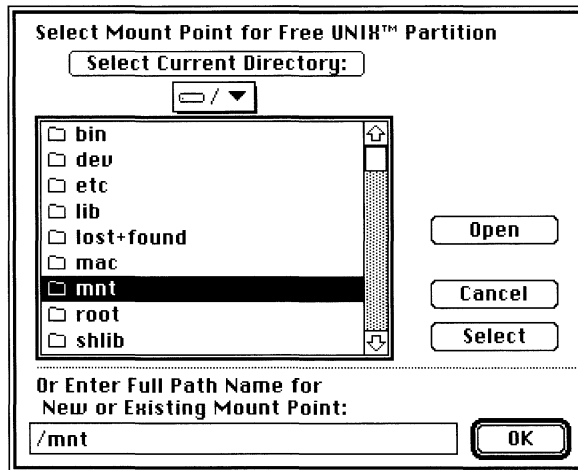
6 Click OK to continue.

If the disk has not been partitioned with a Macintosh partition before, you are prompted to name the volume.

7 If a message prompts you to name the Macintosh volume, type a name and click OK.

Volume is another word for file system. The name you supply will appear in the Finder to identify the Macintosh file system.

Partitioning takes approximately two minutes for an 80 MB disk, and longer for a larger disk. When partitioning is complete, the following dialog box appears in which you specify the mount point directory.



8 Click the text entry box.

The text entry box contains `/mnt`, the directory that's preselected.

9 Type a name for the mount point directory.

For example, type `/users` to mount the file system at the `/users` directory.

10 Click OK.

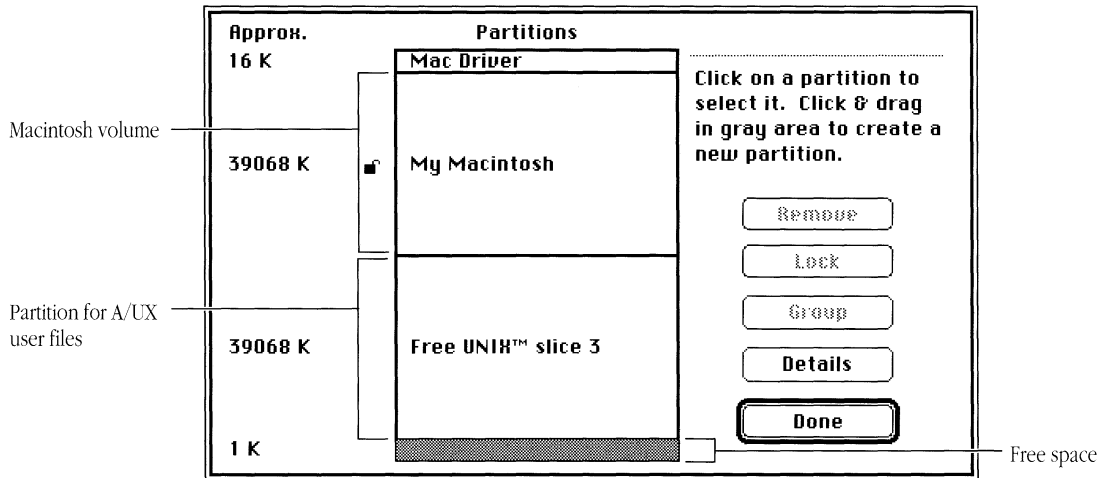
An alert message confirms the mount point.

11 Click OK.

You're returned to the Hard Disk SC Setup main dialog box.

12 Click Partition, and then click Custom.

The Custom Partition dialog box appears.



The disk is divided into two main partitions of equal size: one for A/UX user files and one for the Macintosh OS. The Macintosh partition has the name you gave it. The size of each partition, in kilobytes, is shown to its left.

If the 50 percent Macintosh, 50 percent UNIX partitioning scheme fits your needs, you are finished partitioning.

However, if you want to change the sizes of these two partitions, turn to “Adjusting the Size of Partitions,” later in this chapter, and begin with step 4. When finished with that procedure, you’ll need to return to step 15 of this procedure if you are saving the files in your existing `/users` directory.

- ▲ **Warning** The MacDriver partition and the free space at the end of the disk are necessary for proper use of this disk. Do not remove them. ▲

13 **Click Done.**

14 **Click Quit.**

An icon for your newly partitioned A/UX disk will not appear in the Finder. All A/UX partitions are subsumed in the `/` file system, so the `/` icon in the Finder represents all your A/UX file systems.

If you are saving files from your existing `/users` directory, continue with the next step. If you aren't saving those files, you are finished with this procedure.

15 **Move files from the previous `/users` directory to the file system you've just created.**

Open a CommandShell window.

```
Enter cd /users.old
```

```
Enter find . -print | cpio -pmvd /users
```

You are finished with the procedure for creating a new file system and moving existing files into it. Work with your system until you're confident that you no longer need the old `/users` directory. When you are confident in the new directory, remove the old `/users` directory by entering

```
rm -r /users.old
```

Creating partitions for user files and `/usr`

In this procedure you start with the partitioning scheme Maximum Free UNIX. You then replace that scheme with two partitions, one for user files and one for `/usr`. While performing this procedure, be sure no one is using your A/UX system, such as from a terminal, as they would most likely experience problems.

1 **Prepare your system for moving the files from `/users` on your A/UX system disk to the new file system on the disk you're adding.**

This step is necessary only if you want to save the files in your existing `/users` and `/usr` directories. If you do not want to save those files, skip to step 2.

Open a CommandShell window and enter

```
mv /users /users.old
```

And then enter

```
mv /usr /usr.old
```

2 Start the Apple Hard Disk SC Setup program.

Follow the instructions in “Starting Apple Hard Disk SC Setup,” earlier in this chapter.

- ▲ **Warning** Make sure you are partitioning the correct disk. Does the SCSI device number displayed on screen match the SCSI ID number of the hard disk you want to partition? If not, click Drive until they match. ▲

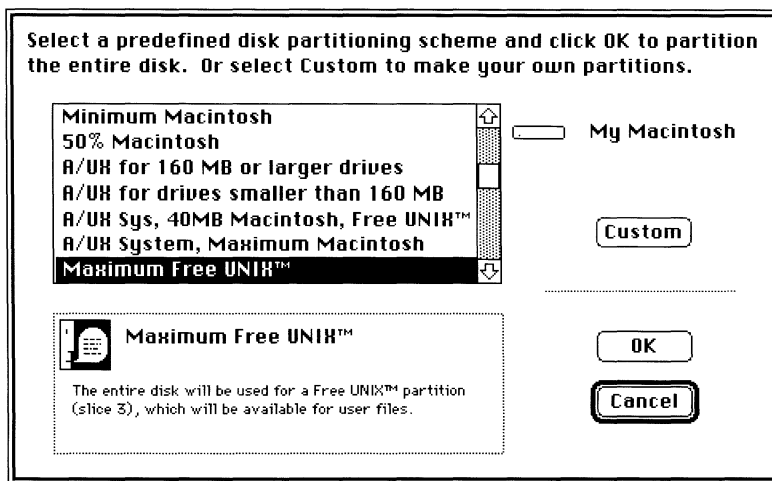
3 Click Partition.

The Partition dialog box appears.

4 Select Maximum Free UNIX.

You need to press the down scroll arrow to see it.

The dialog box displays some information about this partitioning scheme.

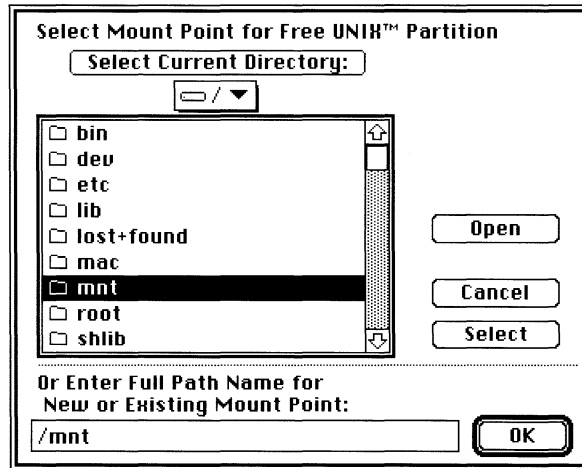


5 Click OK.

An alert message warns you that partitioning erases any information on your hard disk. If you click Cancel, you return to the main dialog box, and no partitioning takes place.

6 **Click OK to continue.**

Partitioning takes approximately two minutes for an 80 MB disk, and longer for a larger disk. When partitioning is complete, the following dialog box appears in which you specify the mount point directory.



7 **Click the text entry box.**

The text entry box contains `/mnt`, the directory that's preselected.

8 **Type a name for the mount point directory.**

For example, type `/users` to mount the file system for user created files at the `/users` directory.

9 **Click OK.**

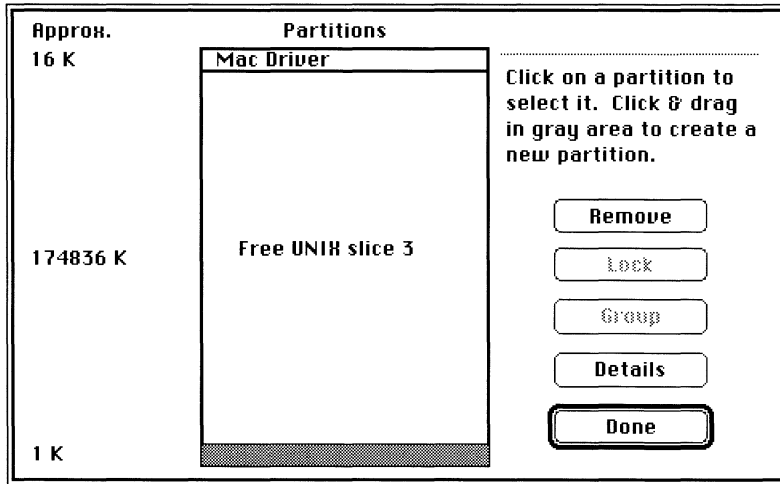
An alert message prompts for confirmation of the new directory.

10 **Click OK.**

You're returned to the Hard Disk SC Setup main dialog box.

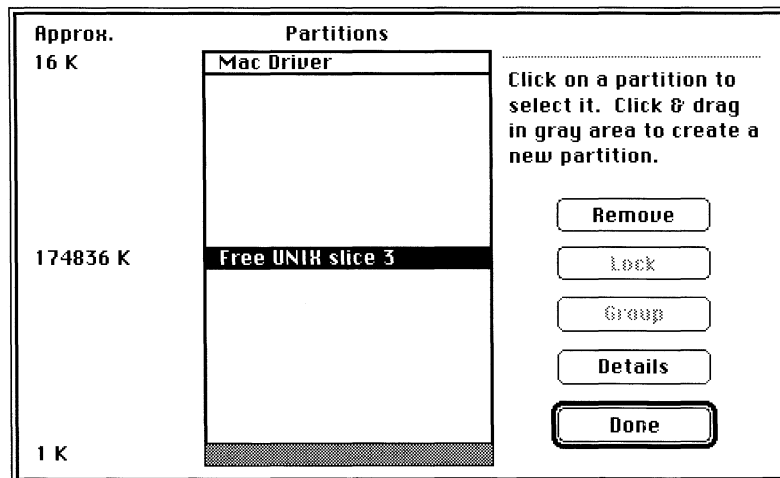
11 Click Partition, and then click Custom.

The Custom Partition dialog box appears.



The partition is represented by a rectangle, and its size, in kilobytes, is shown to the left of the rectangle. You need to remove the partition in order to replace it with two partitions.

12 Click the partition name to select it.

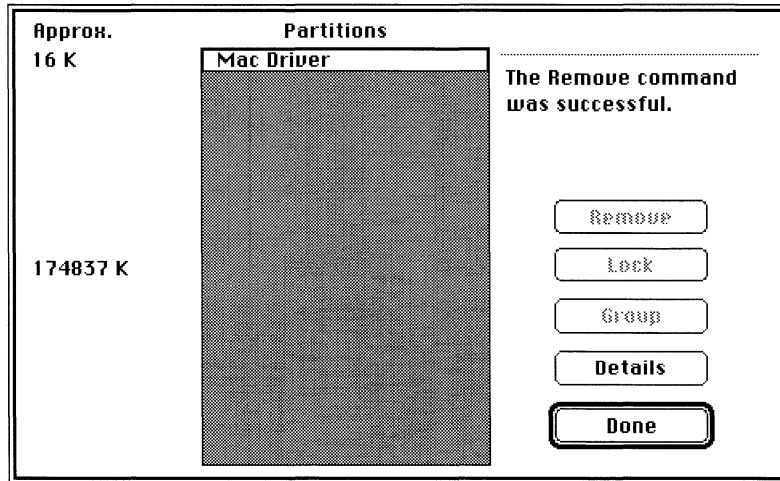


13 **Click Remove.**

A warning message asks you to confirm that you want to erase the information in the partition.

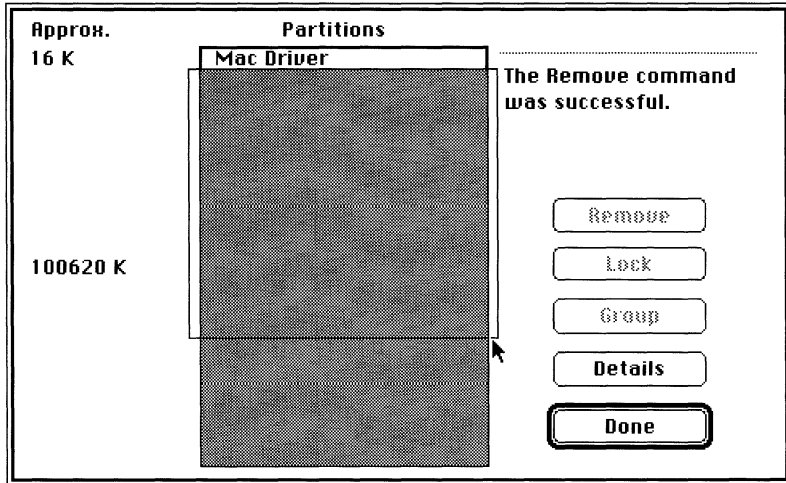
14 **Click OK to continue.**

Free space replaces the removed partition.



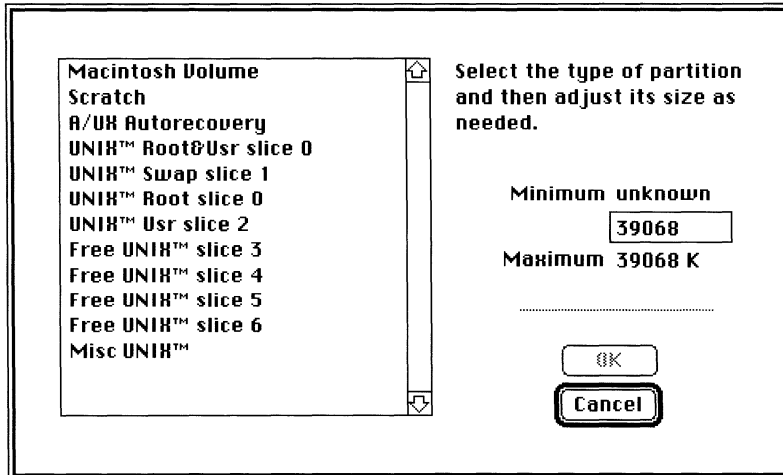
15 **Press and drag downwards from the top of the gray area to select the space for the new `/users` partition.**

As you drag, a rectangle indicates the selection, as shown on the following page.



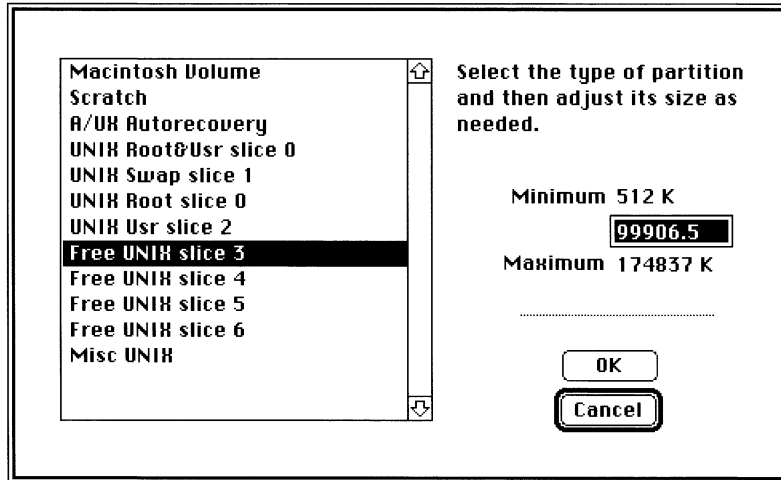
- ◆ **Note** Be sure to leave adequate space for the `/usr` partition. You'll need a minimum of 60 MB for `/usr` if X11 will be part of your installed system. Without X11, the minimum size for `/usr` is 40 MB. ◆

After selecting the free space, the list of individual partition types appears.



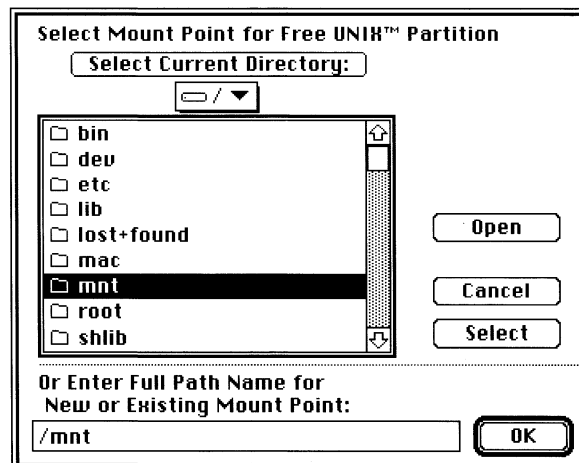
16 Click “Free UNIX slice 3” to select it.

To the right appears the proposed size, in kilobytes, for the new partition. In addition, the minimum and maximum sizes for this type of partition are displayed. In this case, the minimum size is 512 kilobytes (K) and the maximum size is your proposed size.



17 Click OK.

Partitioning takes approximately two minutes for an 80 MB disk, and longer for a larger disk. When partitioning is complete, the following dialog box appears, in which you specify the mount point directory.



18 **Click the text entry box.**

19 **Type a name for the mount point directory.**

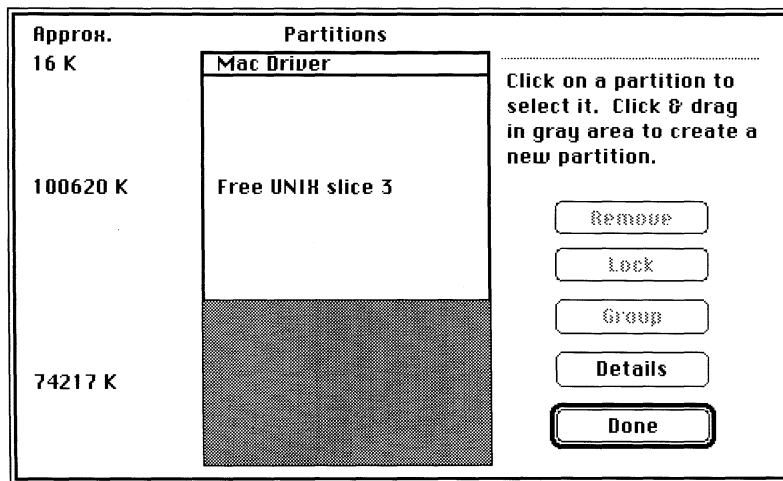
For example, type `/users` to mount the file system at the `/users` directory.

20 **Click OK.**

An alert message prompts for confirmation of the directory.

21 **Click OK.**

The Custom Partition dialog box shows the new partitioning scheme.

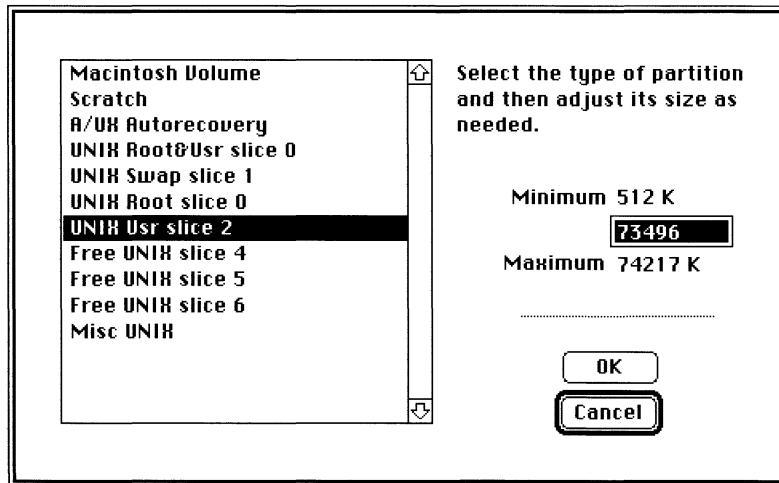


22 **Select the remaining free space.**

◆ **Note** Leave 1K of free space at the end of the disk. The system needs this space as a buffer. ◆

After selecting the free space, the list of individual partition types appears.

23 Click “UNIX Usr slice 2” to select it.



To the right appears the proposed size, in kilobytes, for the new partition.

24 **Click OK.**

Partitioning takes approximately a minute depending on the size of the partition and the size of the disk. The program automatically mounts this file system at `/usr` so you won't be prompted to enter a mount point directory.

25 **Click Done.**

You return to the main dialog box.

26 **Click Quit.**

An icon for your newly partitioned A/UX disk will not appear in the Finder. All A/UX file systems are subsumed in the `/` file system, so the `/` icon represents all your A/UX file systems.

27 Move files from the previous directories to the file systems you've just created.

Open a CommandShell window.

```
Enter cd /users.old
```

```
Enter find . -print | cpio -pmvd /users
```

```
Enter cd /usr.old
```

```
Enter find . -print | cpio -pmvd /usr
```

The new file systems are created and the files from the old `/users` and `/usr` are moved into them. Work with your system until you are confident that you no longer need the old `/users` and `/usr` directories, then remove the old directories by entering

```
rm -r /users.old
```

And then entering

```
rm -r /usr.old
```

Adjusting the size of partitions

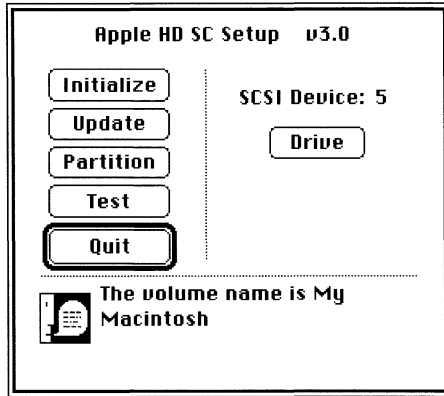
In the following steps, the figures illustrate a particular repartitioning scheme. But you can easily modify these steps to adjust the sizes of other partition types as well.

- ▲ **Warning** Any data in a partition that you resize will be lost. Be sure to back up important files before proceeding. ▲

1 Start the Apple Hard Disk SC Setup application.

Follow the instructions in “Starting Apple Hard Disk SC Setup,” earlier in this chapter. The main dialog box of Apple Hard Disk SC Setup appears, as shown in the next figure.

- ▲ **Warning** Make sure you are partitioning the correct disk. Does the SCSI device number displayed on screen match the SCSI ID number of the hard disk you want to partition? If not, click Drive until they match. ▲

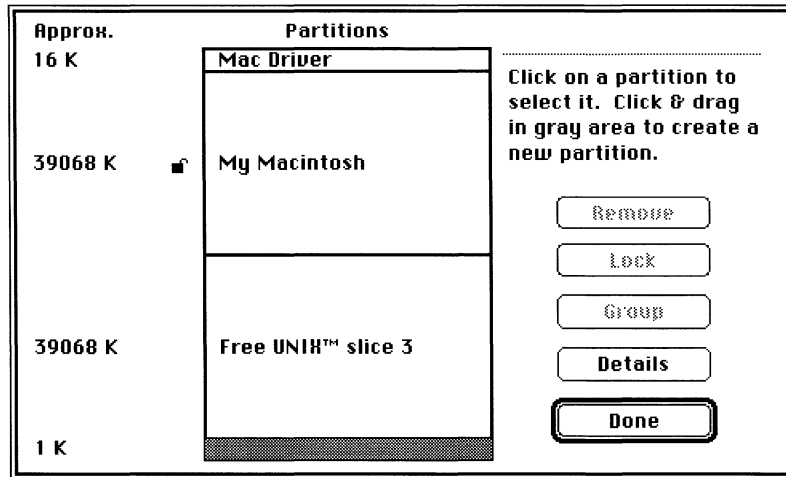


2 Click Partition.

The Partition dialog box appears.

3 Click Custom.

The Custom Partition dialog box appears.



The contents of the dialog box vary depending on the partitioning scheme of your disk.

4 **Select the partition you want to reduce in size.**

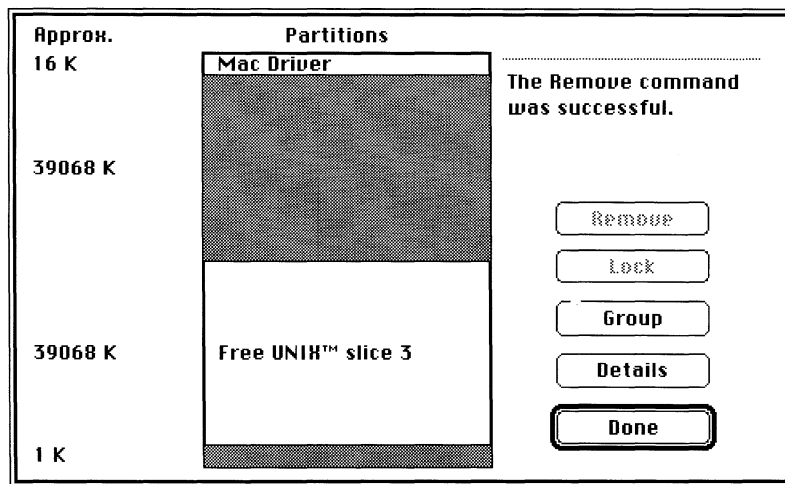
5 **Click Remove.**

This is temporary; you'll add the partition back in the next steps.

An alert message warns you that removing causes loss of all data on the partition.

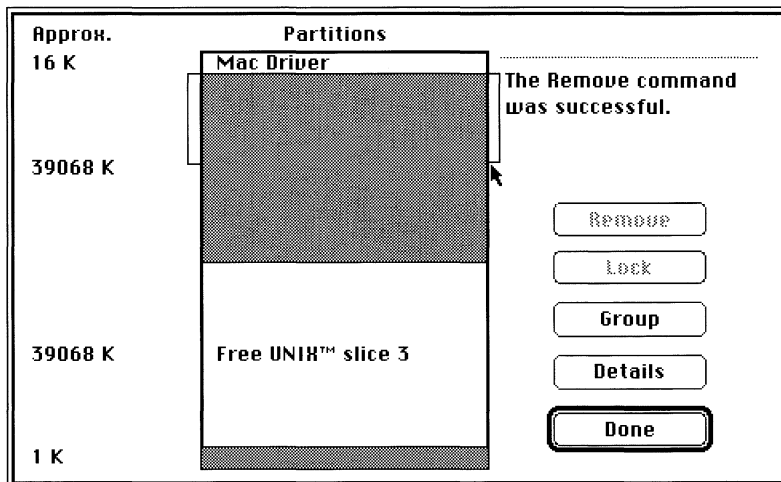
6 **Click OK to continue.**

Free disk space replaces the removed partition, as shown in the next figure. You need to specify the size of the partition you want to add back.



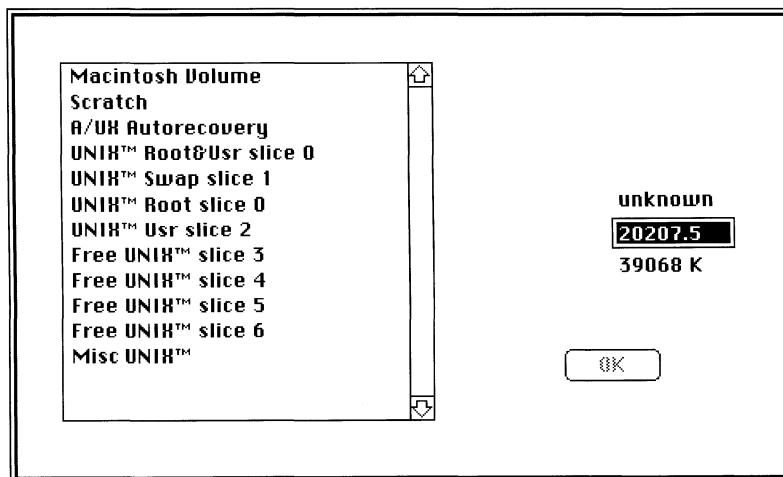
7 **Press and drag downwards from the top of the gray area, and release the mouse button when the partition is the approximate size you want.**

◆ **Note** Don't click the MacDriver partition or you'll move this partition instead of selecting the free space. ◆



You don't have to be exact; you can enter the exact size in the next dialog box.

After selecting the free space, the list of individual partition types appears, as shown in the next figure. The size, in kilobytes, of the partition awaiting a type appears to the right under Minimum. You can type a number to enter an exact size for the partition.



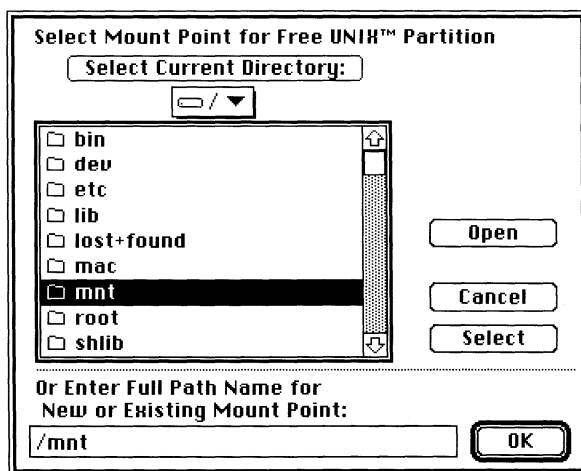
8 Select the type of partition you want to add back.

For example, if you removed the Macintosh partition, select Macintosh Volume.

9 Click OK to continue.

Partitioning takes approximately two minutes for an 80 MB disk, and longer for a larger disk.

If you're adding a partition for which you need to specify the mount point, the following dialog box appears when partitioning is complete. If you're not adding such a partition, skip to step 13.



10 Click the text entry box.

The text entry box contains `/mnt`, the directory that's preselected.

11 Type a name for the mount point directory.

For example, type `/users2` to mount the file system at the `/users2` directory.

12 Click OK.

An alert message confirms your mount point.

13 Click OK.

The effects of your changes are shown in the Custom Partition dialog box.

You're half way to creating your desired partitioning scheme.

Now you need to repeat the procedure from steps 4 through 13, but this time at step 4 remove the partition that you want to enlarge. Then your partitioning scheme will be complete.

14 To quit Hard Disk SC Setup, click Quit.

Your disk is ready for use.

Removing a Hard Disk SC from A/UX

You can remove a Hard Disk SC to free the SCSI ID number for other uses. Removing a disk takes away access to all the files on it.

1 Log in to the root account.

See “Logging In to the root Account” in Chapter 1 if you need instructions.

2 In the Finder, double-click the / disk icon to open it.

3 Double-click `etc` to open it.

4 Double-click `fstab` to open it.

5 **Delete the file system entry for the disk.**

The entry in `/etc/fstab` for the file system looks similar to the following line:

```
/dev/dsk/c4d0s0 /users 4.2 rw 0 2
```

◆ **Note** If you plan to add the disk back to the system, instead of deleting the entry, at the beginning of the entry insert a number sign (#). The number sign causes A/UX to ignore the line. When you next connect the disk, mount the file system using the `mount` command, then remove the number sign from this line. The file system is entered in the file system table and A/UX will automatically mount it each time A/UX starts. ◆

6 **Save the change and close the file.**

7 **Click the CommandShell window to make it active.**

8 **Shut down A/UX by choosing Shutdown from the Special menu.**

9 **Disconnect the Hard Disk SC from your Macintosh computer.**

You need to have a SCSI terminator on the last device in your SCSI chain. If the Hard Disk SC was the last device on your SCSI chain, remember to move the terminator to the device that is now last on your SCSI chain.

The disk is removed from A/UX.

5 Adding and Managing the AppleCD SC

The AppleCD SC peripheral device is extremely useful for accessing large amounts of information stored on CD-ROM discs. (CD-ROM is an acronym for *compact disc read-only memory*.) The information on a CD-ROM can be read but it cannot be added to, changed, or deleted. A compact disc (CD) can hold more than 500 megabytes (MB) of data, supplying six times the storage capacity of a commonly used 80 MB hard disk. In this chapter, *CD-ROM* and *CD* are used interchangeably.

Though you cannot make changes to the information on a CD-ROM, you can read it, or you can copy files to your hard disk and make changes to the information there. Because the CD-ROM is an excellent means for storing reference material or delivering large amounts of information or huge programs, more products and Macintosh related information are likely to be available on CD-ROM discs in the near future.

This chapter explains how to

- use CDs that contain Macintosh file systems, ISO (International Standards Organization) file systems, or UNIX file systems
- install the AppleCD SC to use CD-ROM discs as permanent or temporary sources of reference information

- open the files on a CD-ROM
- copy the files from a CD-ROM to a hard disk
- remove the AppleCD SC from an A/UX system

Connecting the AppleCD SC drive

Follow the instructions in the *AppleCD SC Owner's Guide* to connect it to your Macintosh by using the cables and power cord. Then turn to the section in this chapter that describes the type of CDs you need to use, and follow the instructions.

Identifying the file system on your CD

Your AppleCD SC supports CDs that use Macintosh, ISO (International Standards Organization), and UNIX file systems. You work differently with each kind of CD. The following three sections discuss how to use each kind of CD. You only need to review the section that pertains to your particular kind of CD. Skip the rest of this section if you know what kind of CD you have.

If you're unsure about what kind of CD you have and if you're unable to get this information from your CD supplier, check the CD jacket for information that identifies the CD. For example, the CDs that use ISO file systems are typically identified as such on the CD jacket. As a final resort, you can attempt to mount the CD in the Macintosh OS without A/UX running (see "Using CDs Containing Macintosh File Systems"). If its icon does not appear on the desktop, try mounting it as a UNIX CD (see "Using CDs Containing UNIX File Systems").

Using CDs containing Macintosh file systems

To work with a CD containing Macintosh applications and files, insert the CD into the CD-ROM drive. The CD icon will appear on your desktop much like the icon of a Macintosh disk appears on your desktop after you insert it into your disk drive. Open the CD by double-clicking its icon or selecting the icon and choosing Open from the File menu. With the CD open, you can work with applications and files on the CD without any further handling of the CD. To eject the CD, drag its icon to the Trash.

Using CDs containing ISO file systems

To use CDs containing applications and files in an ISO file system, you need to copy three key files from your Apple CD-ROM software, version 3.2 or later. The Apple CD-ROM software comes on a floppy disk that accompanies your Apple CD-ROM drive. See your authorized Apple dealer for a software upgrade if your CD-ROM software is earlier than version 3.2.

Follow these steps to copy the necessary files:

1 Log in to the root account.

See “Logging In to the root Account” in Chapter 1 if you need instructions.

2 Open the Apple CD-ROM software (version 3.2 or later) disk.

3 Select the three ISO CD files: ISO 9660 File Access, High Sierra File Access, and Foreign File Access.

4 Drag the three files to each System Folder that you want to support ISO CDs.

Each user account from which people will access ISO CDs needs these key files in its personal System Folder. To save disk space, drag the files into one system folder, then link them to the other personal system folders. For information on the `ln` (link) command, see `ln(1)`.

5 Log out of A/UX by choosing Finder from the Applications menu and choosing Logout from the Special menu.

6 Log in to A/UX.

You now have access to ISO CD-ROM products when you run A/UX.

Using CDs containing UNIX file systems

This section only pertains to CDs that contain UNIX file systems.

Installing the AppleCD SC with an A/UX system

The following sections describe the choices you have when setting up the AppleCD SC with a Macintosh running A/UX. Choose the setup you want and follow the instructions.

◆ **A/UX and audio CDs** A/UX cannot recognize the sound portion of a CD as the Macintosh Operating System can. Therefore, if you try to play a music-only CD, A/UX will display an alert message and you won't be able to hear anything from the CD. If you try to access a CD containing sound and data tracks, A/UX will access the data but not the sound. Do not install an audio-CD driver in A/UX because it will cause a system error. ◆

Installing permanently

This section describes how to install the AppleCD SC so the files on a CD-ROM are readable whenever A/UX is in use.

The steps in this section take you through using the `fentry` script, which makes an entry for the CD-ROM in the file system table `/etc/fstab`. This file contains a list of all the file systems that A/UX automatically mounts each time it starts.

If you only want to access the CD-ROM temporarily, such as to copy its files to a hard disk, then mount it when you need it rather than mounting it permanently. Turn to the next section, "Installing Temporarily," for instructions.

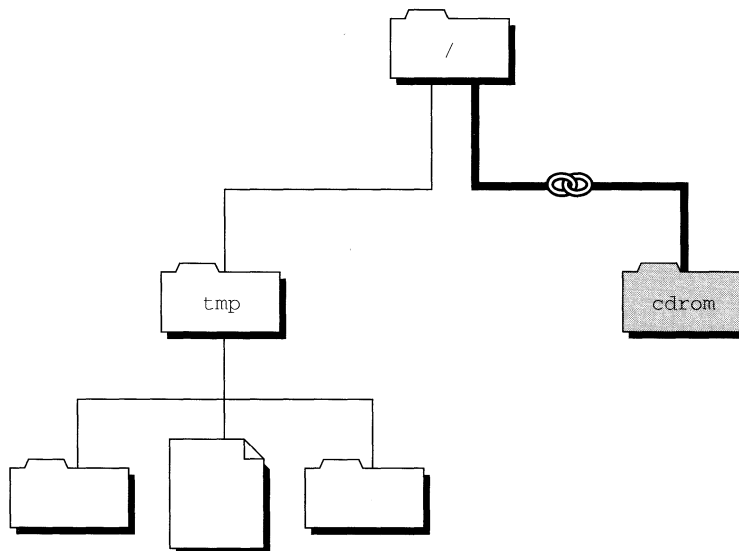


Figure 5-1 A CD-ROM installed permanently

1 Log in to the root account.

See “Logging In to the root Account” in Chapter 1 if you need instructions.

2 Choose CommandShell from the Applications menu.

If a CommandShell window does not appear, choose New from the File menu.

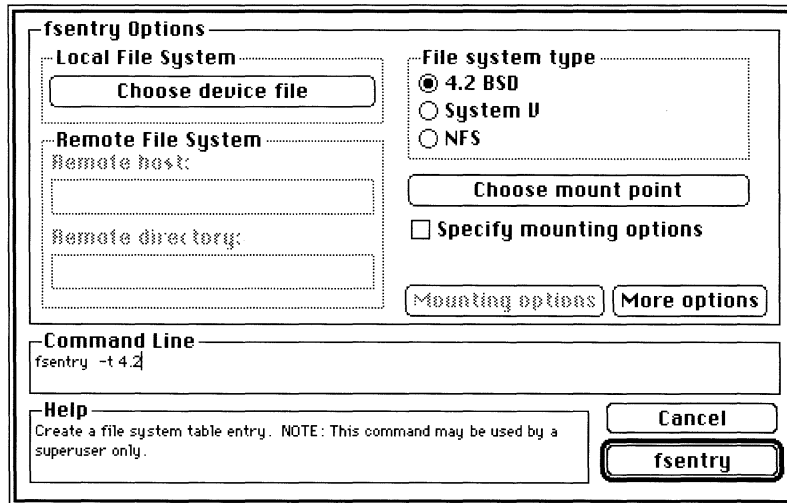
3 Enter `mkdir /cdrom`

This command creates a directory called `cdrom`. In the next steps, you will mount the CD-ROM at this directory.

4 Type `fsentry` and press COMMAND-K.

The `fsentry` Commando dialog box appears, as shown on the facing page.

The file system type is preset to 4.2 BSD, with which A/UX is shipped. Use this file system type unless you know you need to use the NFS or System V type of file system. If you need to use one of these types of file systems, click System V or NFS as the option for File system type.



5 Click “Specify mounting options.”

6 Click “Mounting options” and then click “Read-only.”

You must mount the CD-ROM with read-only access because you cannot write to a CD-ROM.

7 Click **Continue**.

Now you need to specify the device name for the CD-ROM.

8 Click “Choose device file” to enter the name of the device to mount.

The device name for a CD-ROM begins with `dev/dsk`, so this is what you need to specify.

9 To trace your way back to the `/` directory, click the current directory name displayed at the top of the dialog box and drag to select `/`.

The contents of the `/` folder are displayed.

10 Double-click `dev` to open it.

You see a list of its contents.

11 Double-click `dsk` to open it.

You see a list of its files.

12 Scroll to the filename that describes the file system on your CD-ROM.

For example, if the device is SCSI ID 5 and the file system on the CD-ROM is slice 0, the name you want to select is `c5d0s0`. And if your device is SCSI ID 4 and the file system on the CD-ROM is slice 2, the name you want to select is `c4d0s2`.

◆ **Note** The documentation accompanying your CD-ROM states whether the files on the disc are divided among different slices. Most likely, all the files are contained in one slice. For a disc that keeps all its files in one slice, slice 0 is likely to be the slice used. ◆

13 Double-click the filename that describes the file system on your CD-ROM.

The filename is selected and you return to the `fentry` dialog box.

14 To specify the directory at which to mount the CD-ROM, click “Choose mount point.”

15 To trace your way back to the `/` directory, press on the current directory name displayed at the top of the dialog box and drag to select `/`.

The contents of the `/` folder are displayed.

16 Click `cdrom` to select it. Do not double-click it.

17 Click Directory to select `/cdrom` as the mount point.

You return to the `fentry` dialog box and are ready to run the command displayed in the Command Line box.

18 Click `fentry`.

You return to the CommandShell window.

19 **Press RETURN.**

This runs the command. The files on the CD-ROM are now accessible through the `cdrom` folder.

Installing temporarily

If you need to reference the information on the CD-ROM temporarily, meaning from now until you next shut down A/UX or unmount the CD-ROM, then mount its files using the `mount` command. This procedure is useful if you intend to copy files from the CD-ROM to a hard disk and then disconnect the AppleCD SC.

◆ **Note** If you mount the CD-ROM with the following steps and then restart the system or move the system into single-user mode and back into multi-user mode, you will unmount the CD-ROM. ◆

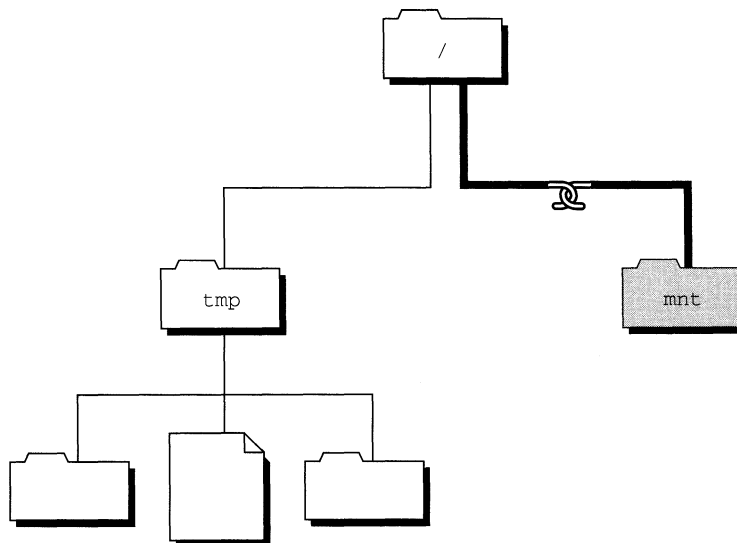


Figure 5-2 A CD-ROM installed temporarily

1 Log in to the root account.

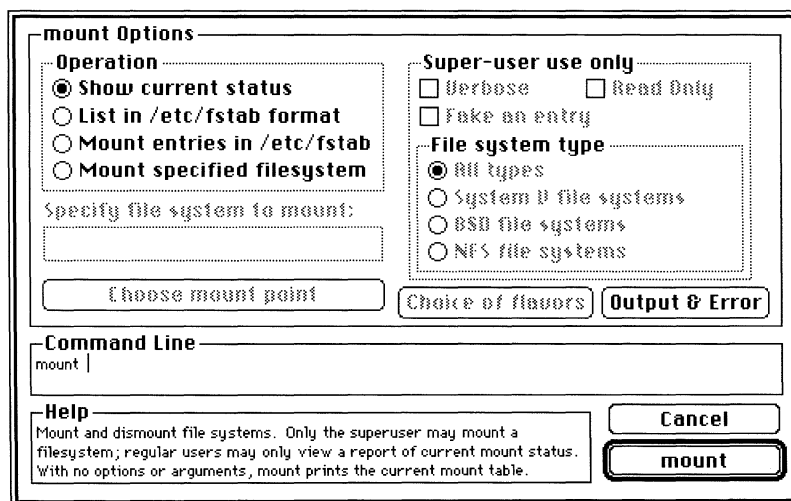
See “Logging In to the root Account” in Chapter 1 if you need instructions.

2 Choose CommandShell from the Applications menu.

If a CommandShell window does not appear, choose New from the File menu.

3 Type `mount` and press **COMMAND-K**.

The `mount` Commando dialog box appears.



4 From the Operation options, select “Mount specified filesystem.”

5 Type the device name that describes your partition.

You must type the name in the form of `/dev/dsk/cnd0sx`, where *n* is the SCSI ID number of the device, and *x* is the slice number containing the files you want to copy.

For example, if the device is SCSI ID 5 and the file system is on slice 0, type

`/dev/dsk/c5d0s0`

◆ **Note** The documentation accompanying your CD-ROM states whether the files on the disc are divided among different slices. Most likely, all the files are contained in one slice. For a disc that keeps all its files in one slice, slice 0 is most often the slice used. ◆

6 Click “Choose mount point.”

A dialog box displays the available folders in which to place the files.

7 To trace your way back to the / directory, press on the current directory name displayed at the top of the dialog box and drag to select /.

The contents of the / directory are displayed.

8 Click `mnt` to select it. Do not double-click it.

9 Click Directory.

Clicking Directory confirms `mnt` as the chosen directory and closes the dialog box.

10 Click “Choice of flavors” and then click “Read-only.”

11 Click Continue.

You return to the `mount` main dialog box and are ready to run the command displayed in the Command Line box.

12 Click mount.

You return to the CommandShell window.

13 Press RETURN.

This runs the command. The CD-ROM is now mounted. To the user, there is no difference between reading the files on the CD-ROM and reading files on a hard disk.

Opening files

You can reference files on a CD-ROM by opening and reading them, or you can copy them to a hard disk where you can change them from read-only files to files that you can change.

Opening files from the Finder

Follow these steps to open files on a CD-ROM from the Finder:

1 Go to the Finder.

Choose Finder from the Applications menu if the Finder isn't already displayed.

2 Double-click the / disk icon, then double-click the folder that contains the files on the disc.

For example, if you mounted the CD-ROM on `/mnt`, double-click the `mnt` folder. And if you mounted the CD-ROM on `/cdrom`, double-click the `cdrom` folder.

The folder opens and shows the files on the CD-ROM.

3 Double-click a file to open it.

If you want to copy files from the CD-ROM to a hard disk, turn to “Copying Files to Disk” later in this chapter.

Opening files from CommandShell

Follow these steps to open files on a CD-ROM from a CommandShell window:

1 Choose CommandShell from the Applications menu if a CommandShell window isn't already displayed.

If a CommandShell window does not appear, choose New from the File menu.

2 **Enter** `cd /directoryname`

The *directoryname* is the name of the directory on which you mounted the CD-ROM.

For example, if you mounted the CD-ROM on `/mnt`, enter `cd /mnt`. And if you mounted the disc on `/cdrom`, enter `cd /cdrom`.

You have changed directories.

3 **Enter** `ls -C`

The files in the current directory are listed in columns.

4 **Enter** `TextEditor /filename`

The file is opened. Notice the “read-only” message in the window. This message reminds you that you can read the file but you cannot make changes (write) to the file.

Copying files to disk

By copying files from a CD-ROM to a hard disk, you can then make changes to the files.

Files meant to be copied from a CD-ROM to a hard disk can be in one of several formats:

- a UNIX file system
- an archive created with the `tar` utility
- an archive created with the `cpio` utility

To determine the format of the files on a CD-ROM, read the information accompanying the disc. The documentation for the disc explains the format the files are in and how you are to list and copy them. In case the documentation does not describe how to copy the files to a hard disk, the following subsections are provided. Turn to the section that applies to the file format of your CD-ROM and follow the instructions.

Files in a UNIX file system

Follow these steps if the files are in the form of a UNIX file system:

1 Log in to the root account.

See “Logging In to the root Account” in Chapter 1 if you need instructions.

2 In the Finder, double-click the / disk icon to open it.

In the next few steps you create a new folder within the `/usr/local` folder to hold the files from the CD-ROM. If you like, you can put the CD-ROM files in another directory. However, putting them in the `/usr/local` folder makes them easily accessible to all user accounts on the system. The `/usr/local` directory is provided in A/UX to hold programs that you add for use with A/UX, for example a Macintosh application that you want to be available to all users.

3 Double-click `usr` to open it.

4 Double-click `local` to open it.

5 Choose New Folder from the File menu.

6 Type a name for the folder.

This folder will hold the files you are copying from the CD-ROM.

7 Click in the / window to make it active.

8 Double-click the folder containing the files on the CD-ROM.

For example, if you mounted the CD-ROM at the `/mnt` directory, double-click `mnt`.

9 Select the file or folder you want to copy.

10 Drag the file or folder to the new folder you created in `/usr/local`

The files on the CD-ROM, which you mounted temporarily at the `/mnt` directory, are now in the new folder.

You are ready to unmount the device. Turn to the section “Removing the AppleCD SC From A/UX” for instructions.

Files in a tar archive

Follow these steps if the files are in the form of a `tar` archive:

1 Log in to the root account.

See “Logging In to the root Account” in Chapter 1 if you need instructions.

2 Choose CommandShell from the Applications menu.

If a CommandShell window does not appear, choose New from the File menu.

3 Enter `mkdir /usr/local/directoryname`

The *directoryname* is the name of the new directory for the files you are copying from the CD-ROM.

4 Enter `cd /usr/local/directoryname`

Your current directory is now `/usr/local/directoryname`.

5 If the CD-ROM contains a tar archive but does not contain a file system, enter the following command. Otherwise, skip to step 6.

```
tar xvf /dev/dsk/cnd0sx
```

where *n* is the SCSI ID number of the CD-ROM drive and *x* is the slice number containing the `tar` archive you want to copy.

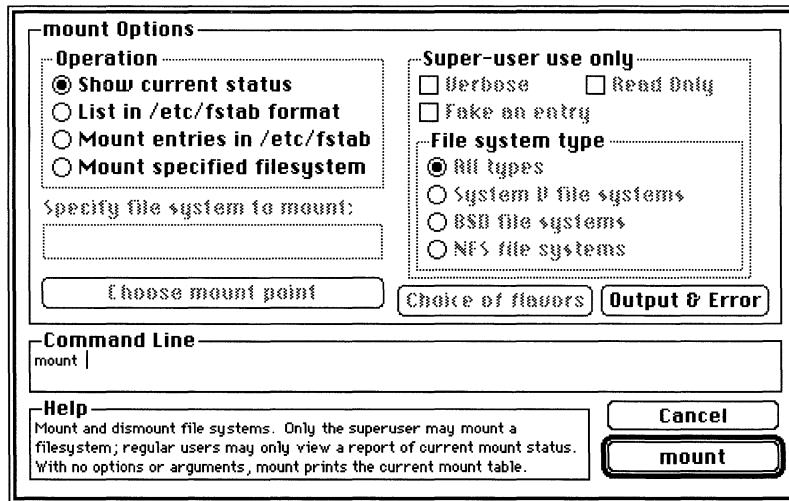
For example, if your CD-ROM drive is SCSI ID 5 and the file system is slice 0, the name you want to select is `c5d0s0`. And if your CD-ROM is SCSI ID 4 and the file system is slice 2, the name you want to select is `c4d0s2`.

The files are copied into `/usr/local/directoryname` and you are finished with this procedure. If an error message appears on your screen, see the man page for the `tar` commands. You probably need to specify a block size in units of 512 bytes.

6 If the CD-ROM contains a `tar` archive and a file system, mount the file system and then copy its files using the following steps.

7 Type `mount` and press **COMMAND-K**.

The `mount` Commando dialog box appears.



8 Under **Operation**, click “Mount specified filesystem.”

9 Click in the “Specify file system to mount” text box.

10 Type the device name that describes your CD-ROM.

You must type the name in the form of `/dev/dsk/cnd0s x` , where n is the SCSI ID number of the device, and x is the slice number containing the files you want to copy.

For example, if the device is SCSI ID 5 and the file system is on slice 0, type

`/dev/dsk/c5d0s0`

◆ **Note** The documentation accompanying your CD-ROM states whether the files on the disc are divided among different slices. Most likely, all the files are contained in one slice. For a disc that keeps all its files in one slice, slice 0 is likely to be the slice used. ◆

11 **Click “Choice of flavors” and then click “Read-only.”**

12 **Click “Choose mount point.”**

A dialog box displays the available folders in which to place the files.

13 **To trace your way back to the `/` directory, click the current directory name displayed at the top of the dialog box and drag to select `/`.**

The contents of the `/` folder are displayed.

14 **Click `mnt` to select it. Do not double-click it.**

15 **Click Directory.**

Clicking Directory confirms `/mnt` as the chosen directory and closes the dialog box.

16 **Click “Choice of flavors” and then click “Read-only.”**

17 **Click Continue.**

You return to the `mount` main dialog box and are ready to run the command displayed in the Command Line text box.

18 **Click mount.**

You return to the CommandShell window.

19 **Press RETURN.**

This runs the command. The CD-ROM is now mounted.

20 **To copy the files from the CD-ROM, enter `tar xvf /mnt/archivename`**

The *archivename* is the name of the directory on the CD-ROM containing the files you want to copy.

The files are copied to `/usr/local/directoryname`.

You are ready to unmount the device. Turn to the section “Removing the AppleCD SC from A/UX” for instructions.

Files in a cpio archive

Follow these steps if the files are in the form of a `cpio` archive:

1 Log in to the root account.

See “Logging In to the root Account” in Chapter 1 if you need instructions.

2 Choose CommandShell from the Applications menu.

If a CommandShell window does not appear, choose New from the File menu.

3 Enter `mkdir /usr/local/directoryname`

The *directoryname* is the name of the new directory for the files you are copying from the CD-ROM.

4 Enter `cd /usr/local/directoryname`

Your current directory is now `/usr/local/directoryname`.

5 Enter `cpio -ivd < /mnt/archivename`

The *archivename* is the name of the directory on the CD-ROM containing the files you want to copy.

The files on the CD-ROM are now in `/usr/local/directoryname`.

You are ready to unmount the device. Turn to the next section, “Removing the AppleCD SC,” for instructions.

Removing the AppleCD SC

You can remove the AppleCD SC to free the SCSI ID number for other uses. Removing the AppleCD SC takes away access to all the files on an inserted CD-ROM.

If you were using CDs containing Macintosh file systems or ISO file systems, you only need to shut down A/UX and your computer, then physically disconnect the drive from the computer. If the AppleCD SC was the last device in your SCSI chain, replace the terminator on the device that is now last in your SCSI chain. Follow the guidelines in your *AppleCD SC Owner's Guide* about handling SCSI devices.

If you were using CDs containing UNIX file systems, you need to follow one of the following procedures depending on how you mounted the CD-ROM drive.

If the CD-ROM was mounted permanently

If the CD-ROM was mounted with `fsentry`, you need to follow these steps to remove it from A/UX.

◆ **Note** You cannot unmount a file system if any of its files are in use. This means if you are in a directory in the file system that you are trying to unmount, the unmount command will fail. It also means if you share the A/UX system with someone, and while you are attempting to unmount the CD-ROM that person has a file from the CD-ROM displayed on screen or in some other way has one of its files in use, your command to unmount the CD-ROM will be blocked. ◆

1 **Log in to the root account.**

See “Logging In to the root Account” in Chapter 1 if you need instructions.

2 **Choose CommandShell from the Applications menu.**

If a CommandShell window does not appear, choose New from the File menu.

3 **Enter** `umount /cdrom`

◆ **Note** The command is spelled *umount* and not *unmount* as you might expect. ◆

This command unmounts the CD-ROM drive.

In the next steps you must open the `/etc/fstab` file.

4 **In the Finder, double-click the / disk icon to open it.**

5 **Double-click** `etc` **to open it.**

6 **Double-click** `fstab` **to open it.**

7 **Delete the entry for the CD-ROM.**

It is probably the last line in the `/etc/fstab` file and looks similar to the following line:

```
/dev/dsk/c5d0s0    /cdrom    4.2    ro    0    2
```

8 **Save the change and close the file.**

9 **Click in the CommandShell window to make it active.**

10 **Shut down A/UX by choosing Shutdown from the Special menu.**

11 **Disconnect the AppleCD SC from your Macintosh.**

You need to have a SCSI terminator on the last device in your SCSI chain. If the AppleCD SC was the last device on your SCSI chain, remember to replace the terminator on the device that is now last on your SCSI chain.

If the CD-ROM was mounted temporarily

Follow these steps to unmount a CD-ROM that is mounted temporarily.

1 Log in to the root account.

See “Logging In to the root Account” in Chapter 1 if you need instructions.

2 Choose CommandShell from the Applications menu.

If a CommandShell window does not appear, choose New from the File menu.

3 Enter `umount /mnt`

◆ **Note** The command is spelled *umount* and not *unmount* as you might expect. ◆

This command unmounts the CD-ROM.

4 Shut down A/UX by choosing Shutdown from the Special menu.

5 Disconnect the AppleCD SC from your Macintosh.

You need to have a SCSI terminator on the last device in your SCSI chain. If the AppleCD SC was the last device in your SCSI chain, remember to replace the terminator on the device that is now last in your SCSI chain.

6 Adding and Managing the Apple Tape Backup 40SC

You use the Apple Tape Backup 40SC device to make backup copies of large amounts of data and to install software delivered on a tape cartridge. A single cartridge tape holds up to 38.5 megabytes (MB) of data.

△ **Important** Tapes you may have made with the Apple Tape Backup 40SC software cannot be restored into A/UX 3.0. The Apple Tape Backup 40SC software does not work with System 7 and so does not work with A/UX 3.0. If you want to restore data from tapes made with the Apple Tape Backup 40SC software, you need to convert them to one of the formats, listed next, that can be understood by A/UX 3.0 before restoring the data. △

In addition to the Apple Tape Backup device, A/UX supports many tape devices that use the following formats:

- 9 track
- 4 millimeter DAT (Digital Audio Tape)
- 8 millimeter
- Qic-36 (which uses a 600 megabyte tape)



For more information, refer to *A/UX Local System Administration* and to the manuals accompanying your tape device.

In this chapter you'll find instructions to

- add an Apple Tape Backup 40SC to your A/UX system
- remove an Apple Tape Backup 40SC from an A/UX system

Backing up your system on a regular basis so that you can reconstruct it after suffering a problem with the system or with a hard disk is a very important part of system administration. For information on devising a backup plan for your files as well as procedures to back up data by using the A/UX backup utilities, see “Backing Up Your System” in *A/UX Local System Administration*.

Connecting an Apple Tape Backup 40SC

The Apple Tape Backup 40SC is a SCSI (Small Computer System Interface) device that you connect to the Macintosh through the SCSI port on the back of the computer.

As with other SCSI devices—such as hard disk drives and the AppleCD SC—the way you connect the cables varies slightly depending on whether or not you have other SCSI devices connected to your Macintosh. Each of the SCSI devices connected to your Macintosh needs a unique SCSI ID number, and you may need to place a SCSI terminator on the last device in your SCSI chain. See your *Apple Tape Backup 40SC Owner's Guide* for complete information on connecting the tape backup device to your Macintosh.

Preparing and formatting a tape cartridge

Formatting a tape cartridge prepares it to store data. You can format tapes in A/UX by using the three steps listed in this section. It is a good idea to format all unformatted tape cartridges as soon as you receive them.

◆ **Note** If you have Apple tape cartridges, you can skip this section, because Apple tape cartridges are formatted at the factory for you. ◆

Since a tape cartridge stores up to 38.5 MB of data, you'll need two cartridges to back up a 40 MB hard disk that is completely full.

You'll need only two tapes to back up a full 80 MB disk, however. Two tapes can hold the contents of an 80 MB disk because approximately 3 MB of an 80 MB disk is reserved for the disk bookkeeping system, leaving about 77 MB of disk space for the data.

If you don't have two or more formatted tape cartridges before you start backing up a disk that contains more than 38 MB of data, you'll have to stop the backup procedure, format a tape, and begin the backup procedure again.

To format a tape cartridge with the Apple Tape Backup 40SC Drive in A/UX, follow these steps. The process lasts about 30 minutes and must not be interrupted.

1 **Insert the tape into the Tape Backup 40SC drive.**

When you insert the tape cartridge, make sure that the record-lock switch is in the unlocked position (to the left).

Push firmly until the tape cartridge is inside the Tape Backup 40SC.

It takes about a minute for the tension on the tape to be adjusted.

2 **Display a CommandShell window by choosing CommandShell from the Applications menu.**

If a CommandShell window does not appear, choose New from the File menu.

3 **Enter** `mt -f /dev/rmt/tcn format`

where *n* is the SCSI ID number of the tape unit.

Formatting time varies depending on your system. This process takes at least 40 minutes. You can copy data onto the tape.

Backing up data under A/UX

You can use any of the A/UX backup utilities—`tar`, `cpio`, `dump.bsd`, and `pax`—to make backup tapes for use with the Apple Tape Backup 40SC. The Apple Tape Backup archives and restores data only in 8K blocks. You can use `tcb` to store your data in 8K blocks.

- △ **Important** Make a note of the format you used to make your backup tapes. If you need to restore the data, you must read (restore) the data to your hard disk in the same format in which you wrote it (made the backup). △

How to use the Apple Tape Backup 40SC device is explained in detail in *Apple Tape Backup 40SC Owner's Guide*. For information on the A/UX backup utilities (`tar`, `cpio`, `dump.bsd`, and `pac`), see *A/UX Local System Administration*.

- △ **Important** After you copy information onto a tape cartridge, slide the record-lock switch to the locked position (to the right) to guard against copying over information by accident. △

Removing a Tape Backup 40SC from A/UX

Use the following procedure to remove the tape device:

- 1 Turn off power to the tape device.**
The power switch is on the back panel.
- 2 Shut down A/UX.**
In the Finder, choose Shutdown from the Special menu.
- 3 Disconnect the tape device from the SCSI port.**
- 4 If the tape device was the last device on a SCSI chain, replace the terminator on the device that is now the last device on the chain.**
- 5 Restart A/UX by opening the A/UX Startup application.**
A/UX is again ready for use.

7 Adding and Managing Modems

A modem connects your computer by means of telephone lines to other computers equipped with modems anywhere in the world. This chapter describes how to set up the Apple Data Modem 2400 and the Apple Personal Modem for use with an A/UX system. To set up other types of modems, see the manual accompanying your modem. This chapter describes the following procedures:

- setting up an Apple Data Modem 2400 to make calls only
- setting up an Apple Data Modem 2400 modem to receive calls only
- setting up an Apple Personal Modem to make and receive calls
- resetting an Apple Personal Modem to make calls only
- removing a modem from an A/UX system
- switching from an Apple Personal Modem or an Apple Data Modem 2400 to a Hayes-compatible modem

Connecting and using your modem

How you connect a modem varies according to the brand of modem and type of phone line and power source. The *Apple Data Modem 2400 Owner's Guide* describes how to connect that brand of modem to a Macintosh and how to use the modem. (Information on connecting and using an Apple Personal Modem is at the end of this chapter.)

- △ **Important** Once the modem is connected to your Macintosh, be sure to test it before you set up A/UX to use it. See your owner's guide for instructions on testing your modem. Testing the modem at this point lets you identify potential problems with your phone line or modem before you complicate the setup with your A/UX system. △

If you only need to dial into other computers and you don't want anyone to dial into your A/UX system, see "Setting Up an Apple Data Modem 2400 to Make Calls Only."

If you decide later to allow incoming calls, follow the instructions in "Setting up Your Apple Data Modem 2400 to Receive Calls Only." Similar instructions for using the Apple Personal Modem to make and receive calls are provided at the end of this chapter.

Once you've set up a modem, you can easily remove it or alter its setup. For example, you can disable it, or you can change it from receiving calls to making calls only. Follow the procedures that match your needs.

Knowing your communications software options

To use your modem, you need communications software (not included), such as Apple MacTerminal. Many Macintosh applications are available for this purpose but none are included in the A/UX distribution. You'll need to purchase an application separately. However, several UNIX communications packages that can be used over a modem are distributed with A/UX, including the following:

- UUCP (UNIX-to-UNIX Copy) reliably stores and forwards information such as mail and files. UUCP is a good choice if you want to share information with other A/UX systems or with other operating systems derived from the UNIX operating system. Posting information on an electronic bulletin board is one service performed well by UUCP. UUCP can also detect errors in transmission and correct them so that the data you receive is in the correct format.

UUCP lets you execute commands on the remote machine. For example, you can send a file from your computer to a printer connected to the system at the other end of the telephone line. However, UUCP doesn't let you communicate interactively with the remote computer.

UUCP is included with A/UX. See *A/UX Network System Administration* for information on setting up the UUCP system.

△ **Important** The major drawback with UUCP is the difficulty in setting it up. Allow about an hour or two to set up UUCP if it's your first time, and 15 minutes to set it up for each subsequent use. △

- The `cu` (call UNIX) program performs simple file exchange and is easier to set up and use than UUCP. `cu` allows you to access non-UNIX systems but without file-exchange capability. The `cu` program also lets you work interactively on the remote computer. Unlike UUCP, however, `cu` cannot detect errors in transmission and can only send ASCII text files. Its inability to detect errors makes `cu` inadequate for transmission over long distances or noisy phone lines.

When you use `cu` to log in to another computer over the telephone line, you are treated like any other user on that computer. You can also use `cu` to log in as a terminal to another computer that is connected by serial line to your system.

The `cu` program is included with A/UX. See *A/UX Networking Essentials* for information.

- The `slip` program provides a medium for packet exchange and allows interactive communication. You may want to use `slip` with `cu` or `kermit` since `slip` only provides the medium for packet exchange; it does not dial for you. `slip` is especially useful for exchanging data on a network that uses TCP/IP protocols. The `slip` program lets you run network programs such as `rlogin`, `telnet`, and `rcp` without requiring Ethernet hardware.

The `slip` program is included with A/UX. See *A/UX Network System Administration* for information.

- The `kermit` program is useful for sending information to any computer that's also running a `kermit` program. It performs error checking for increased reliability. As long as the remote terminal uses `kermit`, you only need a login account to start data transfer.

The `kermit` program is included with A/UX. See `kermit(1C)` in *A/UX Command Reference* or the on-line man page for information.

- The `ct` program is a good choice if your objective is to reverse the telephone charges. By using `ct`, you can call a remote computer, and then charge the telephone number of that computer's modem. `ct` does not provide file transfer so you may want to use this program with `slip` or another program that does provide a medium for file transfer.

Setting up an Apple Data Modem 2400 to make calls only

By using your modem to make calls only (see Figure 7-1), you can send data when you don't require a response and when you want to prevent dial-in access to your computer. You can send electronic reports to your home or office, or read and post articles on an electronic bulletin board. When you use your modem only to dial other computers, you secure data on your Macintosh from remote access.

Before performing the steps, remember you need a terminal emulation program such as `kermit`, `cu`, `tip`, or another terminal emulation program that's compatible with A/UX.

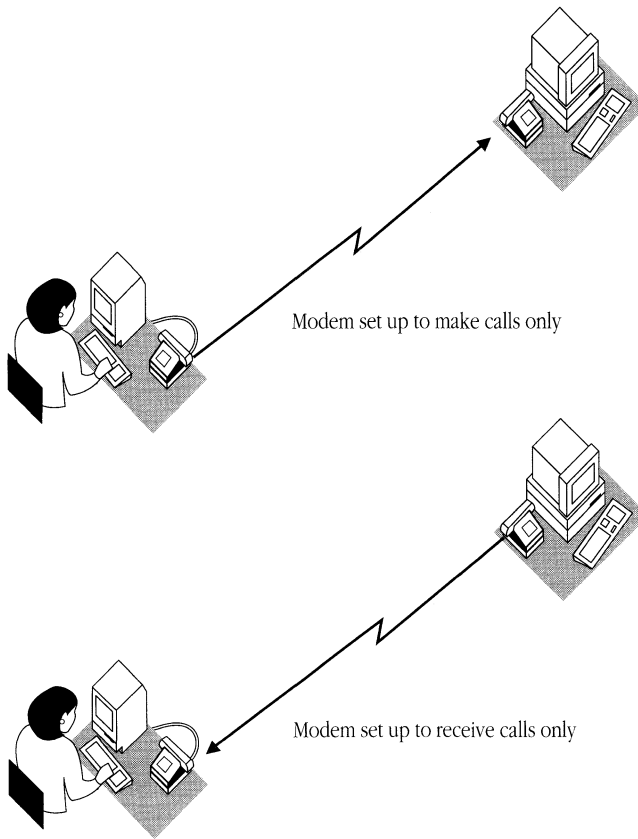


Figure 7-1 A modem set up to make calls only or to receive calls only

To use your Apple Data Modem 2400 to make calls only, perform the following steps:

1 Physically connect the Apple Data Modem 2400 to your Macintosh.

See your Apple Data Modem 2400 Owner's Guide for information.

2 Log in to the root account.

See "Logging In to the root Account" in Chapter 1 if you need instructions.

3 Choose CommandShell from the Applications menu.

If a CommandShell window does not appear, choose New from the File menu.

4 From CommandShell, open the `/etc/inittab` file by entering

```
TextEditor /etc/inittab
```

5 Find the line defining the settings for the modem port.

It looks like the following line and is probably the second-to-last line in the file:

```
00:2:respawn:/etc/getty tty0 at_9600 #Port 0 (modem); set  
to "respawn"
```

If the first word in this line is `off` instead of `respawn`, go to step 7. Otherwise, proceed to step 6.

6 Change the word `respawn` to `off` so that the line in step 5 looks like this:

```
00:2:off:/etc/getty tty0 at_9600 #Port 0 (modem); set to  
"respawn"
```

By editing this line, you kill the `getty`, `login`, or `shell` process that may be using the `tty0` port. This frees up the modem so you can make calls.

7 Choose Save from the File menu and close TextEditor.

When you close TextEditor, you return to CommandShell.

8 In CommandShell, enter `telinit q` at the UNIX command line.

This command instructs the `init` (initialization) process to read the file you just edited in step 6.

Now you're ready to set software parameters for the modem to have it make calls. You can use any communications package that's compatible with A/UX to set parameters in the modem. The rest of the procedures in this section use the UNIX command `cu` for example only. See *A/UX Networking Essentials* for more information on available UNIX communications packages.

9 **Enter** `cu -ltty0 -s2400`

The modem displays `Connected` on your screen.

This tells your modem to use the modem port on the computer and use 2400 bits per second (bps) for the transfer rate of data.

10 **Enter** `AT&F`

The modem displays `OK` on your screen.

This command restores the modem to its original factory defaults so that settings you may have made previously do not conflict with the commands in this procedure.

11 **Enter** `AT&D2`

The modem displays `OK` on your screen.

This command arranges for your modem to properly end the telephone connection when instructed to do so by your communications utility.

12 **Enter** `AT&W`

The modem displays `OK` on your screen.

This command saves the changes you made up to this point.

13 **Quit the UNIX utility.**

For example, if you're using `cu`, enter `~`.

Now the Apple Data Modem 2400 is ready to make calls. Refer to the documentation in your communication software for instructions on dialing other computers and transmitting information.

Setting up your Apple Data Modem 2400 to receive calls only

Some people use a modem with their computer to receive information via telephone lines (see Figure 7-1). For example, they might receive electronic reports from branch offices. Depending on how your communications software is configured for receiving calls, the caller may have access your computer as if she were using it directly.

Your Apple Data Modem 2400 cannot be set up in A/UX to both make and receive calls; it can only be set for one or the other. However, you can switch from one setup to the other according to your needs by using the procedures in this section and the previous one.

Perform the following procedures if you want the modem to receive calls from other computers:

1 **Physically connect the Apple Data Modem 2400.**

See your *Apple Data Modem 2400 Owner's Guide* for guidance.

2 **Log in to the root account.**

See “Logging In to the root Account” in Chapter 1 if you need instructions.

3 **Choose CommandShell from the Applications menu.**

4 **Enter** `cu -l tty0 -s2400`

You will see the message `Connected` on your screen.

This command tells your computer to use the modem port and to operate at 2400 bps for the transfer rate of data.

5 **Enter** `AT&F`

You will see the message `OK` on your screen.

This command restores the modem to its original factory defaults so that settings you may have made previously do not conflict with the commands in this procedure.

6 **Enter** `AT&D2`

You will see the message `OK` on your screen.

This command arranges for your modem to properly end the telephone connection when instructed to do so by your communications utility.

7 **Enter** `AT&K0`

You will see the message `OK` on your screen.

This command turns off flow control, a feature of your modem that normally prevents possible data loss resulting when the memory capacity of your modem is exceeded. Under A/UX, the modem's use of flow control may disrupt some of the data sent to you by some of the earlier UNIX utilities such as UUCP. By turning off flow control, you prevent possible conflicts with earlier UNIX communications utilities.

8 **Enter** `ATS0=1`

You will see the message `OK` on your screen.

This command instructs the modem to answer the telephone on the first ring.

9 **Enter** `ATQ1`

You will see the message `no response` on your screen.

This command suppresses certain built-in messages, called result codes or response messages, of your Apple Data Modem 2400. By suppressing the messages, you prevent the remote computer from incorrectly interpreting the result codes as A/UX login information.

10 **Enter** `ATE0`

You will see the message `no response` on your screen.

This command turns off the command `echo`, meaning that the commands you are sending do not appear on your screen. This is another form of silencing the modem, similar to the procedure in step 9, and helps prevent the remote computer from incorrectly interpreting result code messages as login information.

11 **Enter** `AT&W`

You will see the message `no response` on your screen.

This command saves the changes you made up to this point.

12 **Quit the UNIX utility.**

For example, if you're using `cu`, enter `~`.

The following steps show you how to configure A/UX so that it can communicate with the modem.

13 **From CommandShell, open the `/etc/inittab` file by entering**

```
TextEditor /etc/inittab
```

14 **Find the line defining the settings for the modem port.**

It looks like the following line and is probably the second-to-last line in the file:

```
00:2:off:/etc/getty tty0 at_9600 #Port 0 (modem); set to  
"respawn"
```

15 **Change the word `off` to `respawn` and change `at_9600` to `mo_2400` so that the line looks like this:**

```
00:2:respawn:/etc/getty tty0 mo_2400 #Port 0 (modem); set  
to "respawn"
```

16 **Choose Save from the File menu and close TextEditor.**

When you close TextEditor, you return to CommandShell.

17 **In CommandShell, enter `telinit q`**

This command instructs the `init` (initialization) process to read the file you just edited.

Your Apple Data Modem 2400 is ready to receive calls.

Switching from an Apple Data Modem 2400 to a Hayes-compatible modem

If you set up an Apple Data Modem 2400 to make calls as described at the beginning of this chapter, then you followed the basic procedures for setting up a Hayes-compatible modem to make calls as well. Follow the directions that came with your Hayes-compatible modem to identify the specific changes you need to make. For example, you may need to edit the `innittab` file to indicate a modem speed that's different from the Apple Data Modem 2400.

Setting up an Apple Personal Modem to make calls only

If you only need to dial in to other computers and you don't wish to allow anyone to dial in to your A/UX system, simply connect your modem to your Macintosh as described in the modem owner's manual. Once you plug in the modem, you're set up; the modem is already prepared to dial out. Refer to the user's guide for your communication software for instructions on dialing other computers and transmitting information.

If you later decide to allow incoming calls, follow the instructions in the next section, "Setting Up an Apple Personal Modem to Make and Receive Calls." Should you later decide to disallow incoming calls again, follow the instructions in "Resetting a Modem to Make Calls Only."

Setting up an Apple Personal Modem to make and receive calls

Follow this procedure if you want the Apple Personal Modem to make calls to and receive calls from other computers. Follow this procedure as well if you need only to receive calls, though you'll also be able to use the modem to make outgoing calls.

1 Log in to the root account.

See “Logging In to the root Account” in Chapter 1 if you need instructions.

2 Choose CommandShell from the Applications menu.

If a CommandShell window does not appear, choose New from the File menu.

3 Type `setport` and press **COMMAND-K**.

The `setport` Commando dialog box appears.

The screenshot shows the 'setport Options' dialog box. It is divided into several sections:

- Logins:** Two radio buttons. 'Enable logins' is selected (indicated by a filled circle), and 'Disable logins' is unselected (indicated by an empty circle).
- Ports:** Two checkboxes. 'Modem (tty0)' and 'Printer (tty1)' are both unselected.
- Speed (baud rate):** A list of radio buttons with the following options: '9600 (terminal)' (selected), '4800', '2400', '1200 (modem)', '300', and '19200'.
- Output:** A text input field.
- Error:** A text input field.
- Other ports:** A text input field with up and down arrow buttons on its right side.
- Command Line:** A text input field containing the command 'setport -r'.
- Help:** A text area containing the text: 'Set a serial port; adds or modifies entries for serial ports in /etc/inittab. NOTE: This command may be executed only by a superuser.'
- Buttons:** 'Cancel' and 'setport' buttons are located at the bottom right of the dialog.

4 Select “Enable logins” from the Logins options.

This setting allows A/UX to accept incoming calls.

5 Select “Modem (tty0)” from the Ports options.

This setting tells A/UX which port the modem is connected to.

If you connected the modem to the printer port, select Printer (tty1) instead.

6 Select 1200 from the Speed options.

The speed of transmission (baud rate) is normally 1200 bps.

7 Click setport.

You return to the CommandShell window.

8 Press RETURN to run the command.

9 From CommandShell, begin editing the `inittab` file by entering

```
TextEditor /etc/inittab
```

10 Find the line defining the settings for the modem port.

It looks like the following line and is probably the second-to-last line in the file:

```
00:2:respawn:/etc/getty tty0 at_1200 #Port 0 (modem)
```

11 Change `getty` to `apm_getty` so that the line looks like this:

```
00:2:respawn:/etc/apm_getty tty0 at_1200 #Port 0 (modem)
```

If you need instructions on using TextEditor, see *A/UX Essentials*.

12 Choose Save, then Quit from the File menu to make the change and close the file.

Now the Apple Personal Modem is ready to make and receive calls. Refer to the user's guide for your communication software for instructions on dialing other computers and transmitting information.

Resetting an Apple Personal Modem to make calls only

This procedure resets a modem that was previously set to both make and receive calls to now only make calls. For example, you might want to follow this procedure if you're going on vacation and you don't want people logging into your computer via telephone while you are away.

1 Log in to the root account.

See "Logging In to the root Account" in Chapter 1 if you need instructions.

2 Choose CommandShell from the Applications menu.

If a CommandShell window does not appear, choose New from the File menu.

3 Type `setport` and press COMMAND-K.

The `setport` Commando dialog box appears.

setport Options

Logins

Enable logins
 Disable logins

Ports

Modem (tty0)
 Printer (tty1)
Other ports:

Speed (baud rate)

9600 (terminal)
 4800
 2400
 1200 (modem)
 300
 19200

Output

Error

Command Line

setport -r

Help

Set a serial port; adds or modifies entries for serial ports in /etc/inittab.
NOTE: This command may be executed only by a superuser.

Cancel

setport

4 Select “Disable logins” from the Logins options.

This setting prevents calls from coming in but allows you to call out over the modem.

5 Select “Modem (tty0)” from the Ports options.

This setting tells A/UX which port the modem is connected to.

If you connected the modem to the printer port, select “Printer (tty1)” instead.

6 Click setport.

You return to the CommandShell window.

7 Press RETURN to run the command.

You can now make calls through the modem; however, the modem cannot accept incoming calls.

Removing a modem

Removing a modem from A/UX frees the serial port for other uses. If you’ve set up your modem only to make calls, you can simply disconnect the modem from your computer to free the port; skip the rest of this section. However, if you’ve set up your system to receive calls, physically disconnect the modem and use the following procedure to stop the A/UX process that has been answering the line at that port.

1 Log in to the root account.

See “Logging In to the root Account” in Chapter 1 if you need instructions.

2 Choose CommandShell from the Applications menu.

If a CommandShell window does not appear, choose New from the File menu.

3 **Type `setport` and press COMMAND-K.**

The `setport` Commando dialog box appears.

The screenshot shows the `setport` Options dialog box. It is titled "setport Options" and contains several sections:

- Logins:** Two radio buttons: "Enable logins" (selected) and "Disable logins".
- Ports:** Two checkboxes: "Modem (tty0)" (selected) and "Printer (tty1)". Below them is a text field labeled "Other ports:" with up and down arrow buttons.
- Speed (baud rate):** A list of radio buttons: "9600 (terminal)" (selected), "4800", "2400", "1200 (modem)", "300", and "19200".
- Output:** A text input field.
- Error:** A text input field.
- Command Line:** A text field containing the command `setport -r`.
- Help:** A section with the text: "Set a serial port; adds or modifies entries for serial ports in `/etc/inittab`. NOTE: This command may be executed only by a superuser."
- Buttons:** "Cancel" and "setport" buttons are located at the bottom right.

4 **Select "Disable logins" from the Logins options.**

This setting will stop the process that handled incoming calls.

5 **Select "Modem (tty0)" from the Ports options.**

Only the modem port is disabled.

If you connected the modem to the printer port, select "Printer (tty1)" instead.

6 **Click `setport`.**

7 **Press RETURN.**

This runs the command.

8 **Disconnect the modem.**

The serial port is free for other uses.

Switching from an Apple Personal Modem to a Hayes-compatible modem

If you set up an Apple Personal Modem to make and receive calls, you entered `apm_getty` into the `/etc/inittab` file to enable automatic call answering. The `apm_getty` setting has the same effect on a Hayes-compatible modem; however, most Hayes-compatible modems don't require this setting because they are preset to auto-answer mode. If you are switching from an Apple Personal Modem to a Hayes-compatible modem, leave `apm_getty` in the `/etc/inittab` file unless the Hayes-compatible modem has settings you want to keep and with which the `apm_getty` setting could interfere.

8 Adding and Removing Terminals

A terminal consists of a keyboard and a screen. A terminal might be a Macintosh Plus running a Macintosh terminal emulator program. By adding a terminal to your Macintosh computer, a second person can use your A/UX system simultaneously. Whereas user accounts let several people use an A/UX system *sequentially*, terminals extend this capability to allow people to use a system *simultaneously*. Any Macintosh computer can be used as a terminal.

In this chapter you'll learn how to

- add a Macintosh computer, such as a Macintosh Classic®, Macintosh Plus, or Macintosh SE as an A/UX terminal
- remove one of these terminals from an A/UX system

For information on adding a third-party terminal to A/UX, see *A/UX Local System Administration*.

Limitations of using a terminal

You will encounter the following restrictions if you interact with A/UX through a terminal:

- You cannot use the Finder or the mouse on the terminal; you can use only the command-line interface.
- You cannot run any Macintosh applications on your A/UX system from the terminal. (These applications run in the window environment available through the A/UX Toolbox; terminals cannot access the A/UX Toolbox.)

Usefulness of a terminal

You can run any of the standard UNIX applications that ship with A/UX, such as the `vi` editor, on a terminal. You can also perform any of the A/UX procedures described in this guide, but without the Commando dialog boxes. Instead, you may use only the command-line interface available in CommandShell.

A terminal is well suited for performing system administration tasks using the traditional command-line interface. A terminal is especially helpful when you have problems with a program you're displaying on the main console (the monitor connected to the computer running A/UX). If the program displayed on the console causes the computer to "freeze" (that is, if the computer won't respond to your commands), then you can enter a command from the terminal to stop that program (in UNIX terms, to *kill* the process running on the console).

Effect on system performance

Acceptable system performance is a matter of personal preference. You can connect multiple terminals to one A/UX computer, but system performance deteriorates with each additional terminal. Constraints on the number of terminals you can have include the amount of RAM in your A/UX system, the demand your applications make on system resources, and the level of system performance you require.

Adding a Macintosh as a terminal

To add a Macintosh as a terminal to an A/UX System, regardless of the model of Macintosh computer you selected for use as the terminal, follow this procedure. The procedure involves these steps:

- connecting the Macintosh to serve as a terminal to the Macintosh running A/UX
- running a terminal emulator program, such as MacTerminal, on the Macintosh you add as a terminal
- running a script to inform A/UX that a terminal is connected

What you need

To connect a Macintosh as a terminal, you need the following:

- an Apple serial cable, such as a Macintosh Plus system to ImageWriter II cable, with mini-8 connectors at both ends
- a terminal emulator program for the Macintosh, such as MacTerminal (MacTerminal is available from your authorized Apple dealer.)
- a Macintosh computer to serve as the terminal

Making the hardware and software connections

Follow these steps to set up your hardware and software:

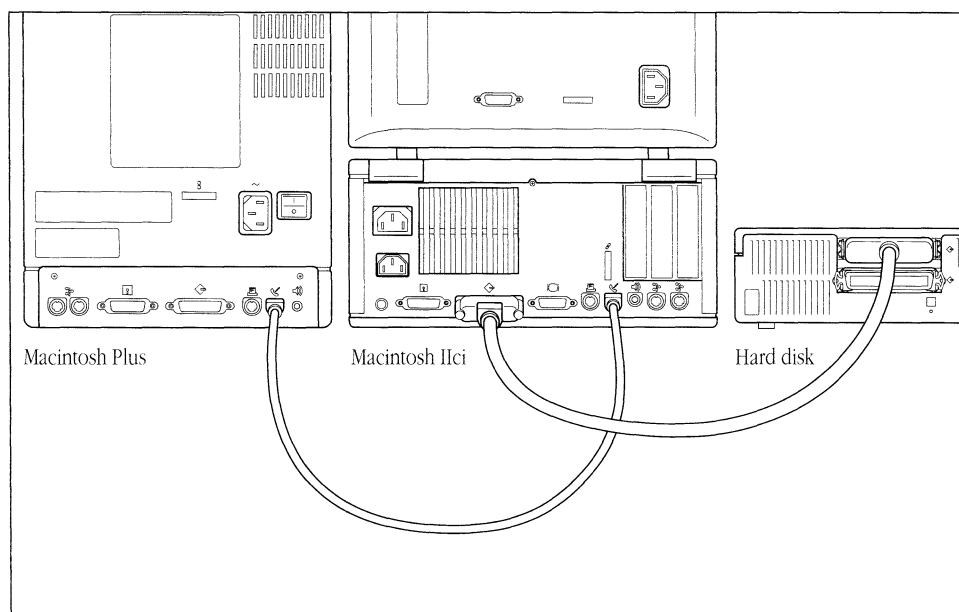
- 1 Plug one end of the cable into a serial port on the back of the Macintosh computer running A/UX.**

The serial ports are identified with icons of a modem (represented by a telephone handset) and a printer. You can use either serial port. You can use the modem port if a printer is connected to the computer running A/UX, or use the printer port if a modem is connected.

- 2 Plug the other end of the cable into the corresponding serial port on the back of the Macintosh computer.**

The icons used to identify the serial ports are the same as those on the back of the A/UX computer.

The completed hardware connection is shown here.



3 Plug the Macintosh serving as a terminal into a power source.

See your Macintosh owner's guide if you need instructions.

4 Turn on the Macintosh serving as a terminal.

The power switch is on the back panel.

5 Open MacTerminal or another terminal emulator program on the Macintosh serving as a terminal.

6 Select the following settings in the terminal emulator program.

If you're using MacTerminal, choose Terminal and Compatibility from the Settings menu and select the following settings:

- terminal type: VT100
- line width: 80 columns
- mode: ANSI
- baud: 9600
- bits per character: 8
- parity: none
- connection port: modem (Select printer instead if you'll be connecting the terminal through the printer port.)
- connection: to another computer (that is, instead of to a modem)
- handshake: XON/XOFF

7 On the Macintosh running A/UX, log in to the root.

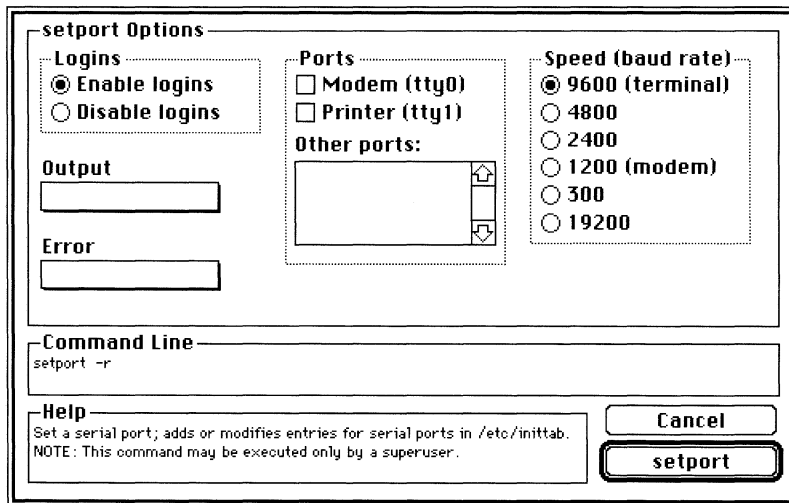
See "Logging In to the root Account" in Chapter 1 if you need instructions.

8 Open a CommandShell window by choosing CommandShell from the Applications menu.

If a CommandShell window doesn't appear, choose New from the File menu.

9 **Type `setport` and press COMMAND-K.**

The `setport` Commando dialog box appears.



In the next step, you tell A/UX through which serial port you connected the terminal.

10 **Select “Modem (tty0)” or “Printer (tty1)” from the Ports options.**

If your Macintosh running A/UX is connected at its modem port, select “Modem (tty0)”. If it’s connected at its printer port, select Printer (tty1).

11 **Select 9600 from the Speed options.**

Now you’re ready to run the command.

12 **Click `setport`.**

You return to the CommandShell window.

13 **Press RETURN to run the command.**

14 Check the screen of the Macintosh that's serving as a terminal. You should see a login prompt. Press RETURN once if you don't see the login prompt.

If you see a login prompt in your terminal emulator program, log in as the root user or log in to any user account to test the connection. After entering the password, press RETURN to accept VT100 as the type of terminal. The Macintosh that you added as a terminal is now functioning as a terminal for A/UX.

If you don't see a login prompt, check the cable connections. Check that your settings on the terminal emulator program match those listed in step 6 of this procedure. If those are correct and you still see no login prompt, check that you have configured the software for the terminal to use the port that connects it to the A/UX computer. Then check that the port through which the A/UX computer is connected to the terminal matches the one you selected in the `setport` Commando dialog box.

Removing a terminal from A/UX

To remove a Macintosh serving as a terminal to A/UX, follow these steps:

1 Log in to the root account.

See "Logging In to the root Account" in Chapter 1 if you need instructions.

2 Choose CommandShell from the Applications menu.

If a CommandShell window does not appear, choose New from the File menu.

3 Type `setport` and press COMMAND-K.

The `setport` dialog box appears.

4 Select "Disable logins" from the Logins option.

This disallows logins at the port you select in the next step.

5 Select “Modem (tty0)” or “Printer (tty1)” from the Ports option.

If your Macintosh running A/UX is connected at its modem port, select Modem (tty0). If it's connected at its printer port, select “Printer (tty1).”

6 Click setport.

7 Press RETURN.

8 Disconnect the cable between the two computers.

The serial port is free for other uses.

When you again want to use one of these computers as a terminal, follow the setup procedure in this chapter. You don't need to reenter the terminal emulator program settings if they haven't changed.

9 Adding and Removing an Apple Scanner

You can attach an Apple Scanner to your A/UX system as you would any other SCSI device.

◆ **Note** A third-party scanner will not work with A/UX. ◆

This chapter describes how to

- add an Apple scanner to your A/UX system
- remove an Apple scanner from your A/UX system

▲ **Warning** Do *not* copy any scanner or driver files into any A/UX System Folder. Under A/UX 3.0, these files are not required and can even cause unpredictable results. ▲

Connecting the scanner

You need a SCSI cable connection kit and a hard disk with a recommended storage capacity of 80 megabytes (MB) or greater to store the image files generated by the scanner.

◆ **Note** Depending on what else you have in the SCSI chain of devices, you may need to add a SCSI terminator on the device at the end of the SCSI chain. You need two terminators, one at the Macintosh and one at the other end of the chain. One SCSI terminator is already built into the Macintosh disk drive. ◆

Follow these steps to connect a scanner to an A/UX system:

1 Unpack the scanner and set it up by following the instructions in the scanner owner's guide.

2 Shut down A/UX.

Choose Shut Down from the Special menu.

3 Turn off all SCSI devices.

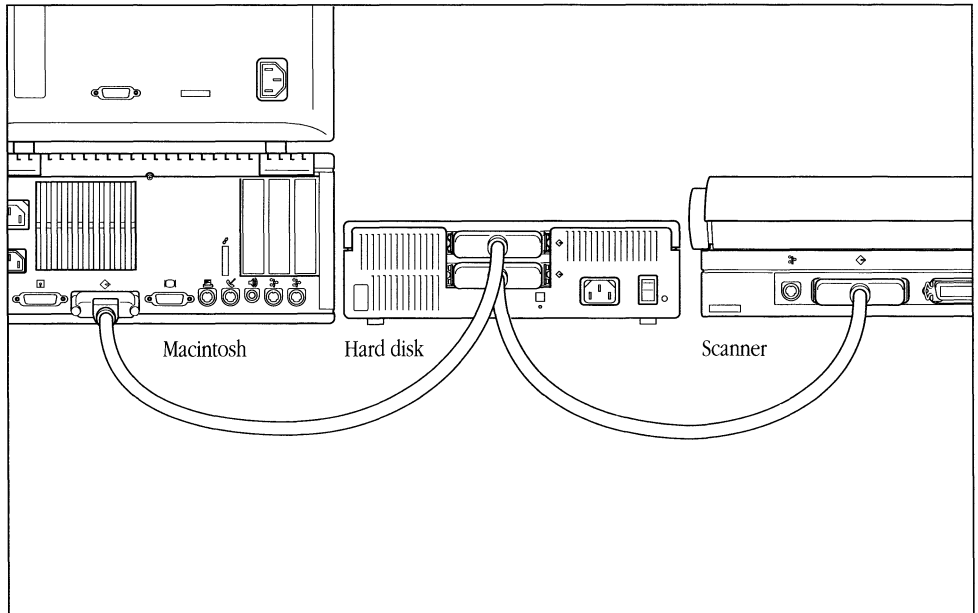
△ **Important** This prevents any possible damage to other SCSI devices while setting up the scanner. △

4 Follow the instructions in your scanner owner's guide to connect the scanner.

You can connect the scanner to your hard disk, to your Macintosh, or to another device in the SCSI chain of devices. The next figure shows a scanner connected to a hard disk.

◆ **Note** Don't connect more than one scanner to A/UX. ◆

After you connect the scanner to your system, go ahead and connect the scanner to its power source and turn on the scanner.



△ **Macintosh Quadra 900 users** Follow the instructions in this note instead of those in step 5. Start up A/UX but do *not* enter your password; then turn on your scanner. After the scanner initializes, (about 30 seconds), enter your password and complete the login process. You are now set up to use an Apple Scanner under A/UX. △

5 **Restart the Macintosh, log in to A/UX, and turn on the scanner.**

You are now set up to use an Apple Scanner under A/UX. Follow the directions that came with your scanner to begin using it.

When scanning an image, your scanner application creates a memory buffer to store the image temporarily. The location of the buffer is determined by your particular application, such as AppleScan or HyperScan. You set the location of the final scanned image when you choose to save the image. In most cases, your hard disk on which you've installed A/UX, is the primary storage area of the scanned images. However, you can drag the scanned image to any available storage area, including one using the Macintosh Operating System.

Removing a scanner from A/UX

You can remove a scanner just as easily as you connected it.

1 **Shut down A/UX.**

Choose Finder from the Applications menu and choose Shutdown from the Special menu.

2 **Disconnect the Scanner and its cables from your Macintosh computer.**

Remember, you need to have a SCSI terminator on the last device in your SCSI chain. If the scanner was the last device on your SCSI chain, move the terminator to the device that is now last on your SCSI chain.

If you're removing the scanner permanently, you may want to remove the AppleScan folder as well since the software serves no purpose without the scanner.

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The Apple Publishing System

Setting Up Accounts and Peripherals for A/UX was written, edited, and composed on a desktop publishing system using Apple Macintosh computers, an AppleTalk network system, Microsoft Word, and QuarkXPress. Line art was created with Adobe Illustrator. Proof pages were printed on Apple LaserWriter printers. Final pages were output directly to separated film on a Linotronic L300. PostScript®, the LaserWriter page-description language, was developed by Adobe Systems Incorporated.

Text and display type are Apple's corporate font, a condensed version of ITC Garamond®. Bullets are ITC Zapf Dingbats®. Some elements, such as program listings, are set in Apple Courier, a fixed-width font.

Writing Group Lead: Linda Kinnier
Developmental Editor: Paul Dreyfus
Design Director: Lisa Mirski
Art Director: Tamara Whiteside
Production Editor: Debbie McDaniel

Special thanks to Kristi Fredrickson, Craig Hext, Kelly King, John Sovereign, and Chris Wozniak

