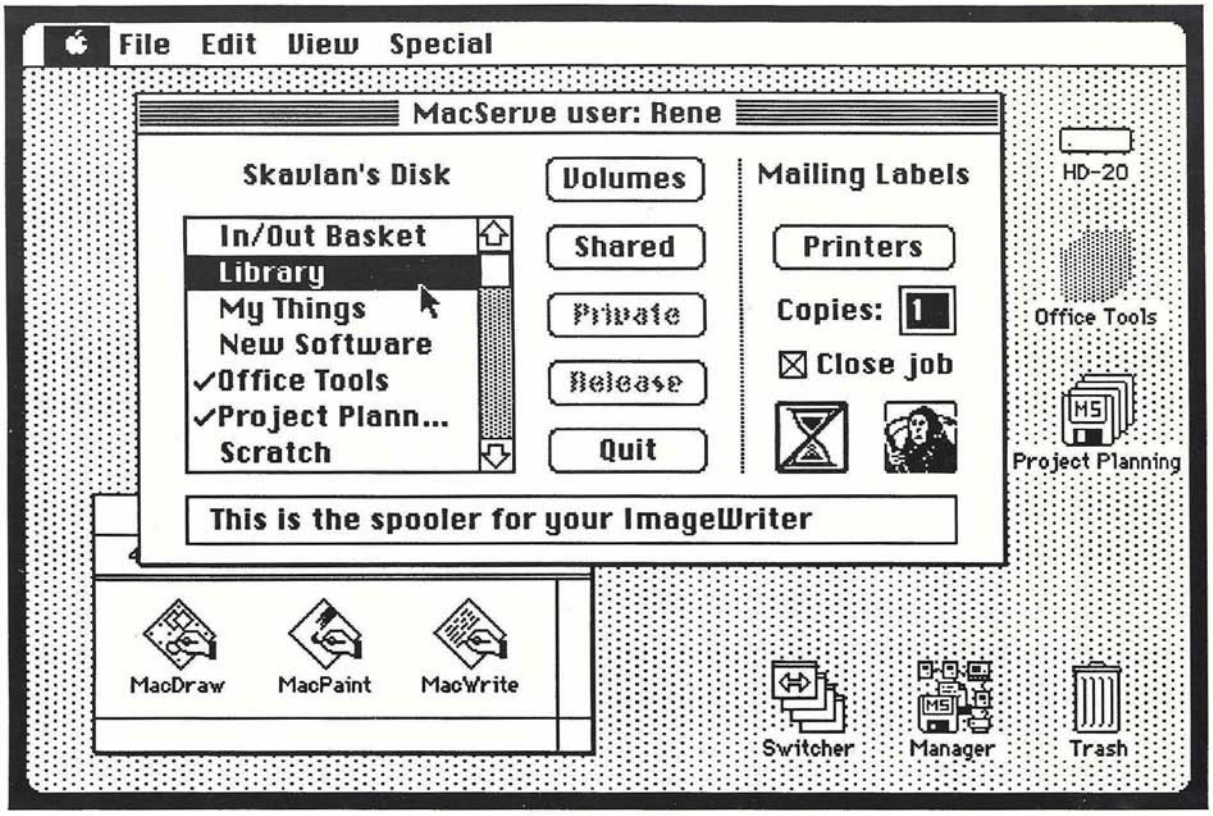
MacServe™



Sharing Resources through AppleTalk

FIRST EDITION
February 1985

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This manual was created in a Macintosh Office with Aldus PageMaker, MacPaint, and Microsoft Word and was printed on the Apple LaserWriter.

Production by Best Impressions, Inc.

Infosphere, Inc.
4730 SW Macadam Avenue
Portland, Oregon 97201
(503) 226-3620

MacServe™ 2.0 Release Notes

Disk contents

Your MacServe distribution disk is based upon Apple's 3.1 System file. This is the latest System at the time of MacServe's release. It corrects a number of problems encountered with the 3.0 System (first shipped with the Mac Plus) and bugs in the 128K ROMs. Most of the Apple fonts and desk accessories have been removed to make room for MacServe.

To make additional space available, the disk uses a Mini-Finder. This is significantly smaller than the Finder. However, it only supports a small set of capabilities, appropriate for installing MacServe and performing basic maintenance. *You will not want to transfer this "Finder" to your working disks.*

The Mini-Finder is described in your Macintosh documentation. To escape from it, either select "Shut Down" or run an application from a different disk using "Open Other".

The disk also includes the MacServe Installer, Manager, and Help file. A disk updater (described below) is useful if you have been using XL/Serve or prerelease versions of MacServe.

Before you install

The Macintosh System environment is changing significantly because of the introduction of new components:

- 128K ROMs for the Macintosh Plus
- The Heirarchical File System
- System 3.0 and 3.1
- New system utilities and printing resources

These elements may still contain bugs. There also may be incompatibilities between them (depending on versions) and existing Macintosh software.

We recommend that you make a back-up copy of your System file before you install MacServe. You might also want to do this before adding fonts or desk accessories. By doing so, you can prevent a lot of grief if anything goes awry. Just copy the System (and Finder) to a diskette before proceeding.

You will probably need to reinstall MacServe after using one of Apple's System Update procedures.

About the Updater

If you have been using XL/Serve or a prerelease version of MacServe, you will find the Updater utility on the MacServe disk useful. It is not documented in the MacServe manual.

Use the Updater to copy the contents of your MacServe disk to an XL/Serve or earlier MacServe disk. Since it preserves all serial number information, it will make your old disk functionally identical to the master disk you update from.

To use it, boot your MacServe disk on a 512K Mac, Mac Plus, or 1 Mb Mac XL. It will guide you through the update process. If you run it by mistake, just click the Quit button in the initial dialog.

The Updater is not suitable for making back-up copies. For this, you need a disk copy utility that makes full sector copies. Or, you may purchase a back-up from Infosphere by sending a check for $15.00 when you submit your registration card.

RAM HFS

Apple introduced a prototype of their new Heirarchical File System (HFS) with the Hard Disk 20 in the fall of 1985. It is used by add-on disk drive vendors to provide HFS support on 512K Macs. It is also used to support 800K diskette drives on Macs that do not have the 128K ROMs.

This prototype is found in the "Hard Disk 20" file of startup disks and can be identified by creation and modification dates of fall 1985. It is not fully compatible with HFS embodied in the 128K ROMs.

You may encounter two problems using it with MacServe:

- It fills the system heap so full that you may not be able to open many MacServe volumes.
- Volumes you have open may not be automatically released when you select Finder's "Shut Down" option.

We expect Apple to release an upgraded version of RAM HFS in the near future that is compatible with the 128K ROMs. It will alleviate these problems.

Erratta and Adenda

The following notes are organized by page number in the MacServe manual.

14: Installing MacServe

If you copy the MacServe Help file to a Mac XL that previously supported XL/Serve, the icon will be lost and double-clicking the icon fails to start the Manager. These symptoms will be corrected if you rebuild the desktop (hold down the Command and Option keys while starting the Finder).

24: Releasing volumes

Clicking the "Go-away" box in a window that represents a MacServe volume under some applications does not release the volume. Instead, doing so may place your Mac in a very confused state where it knows about a volume it can no longer access.

If you reboot a Mac that had a volume open whose contents had changed, without releasing the volume, the next time you open the volume Finder may report the volume needs "minor repairs".

35: Archiver features

Incremental copies made with the **Partial** option are not considered part of a Back-up Set. They may be restored as **Full** or **Partial Appends**.

You may use Finder to individually restore files if the files are visible, unProtected, and not split across the media of the Back-up Set.

Back-up Sets made using the **Full** and **Replace** options can only be restored by the Archiver as **Full Replace**, even if they fit on a single volume.

Files that qualify for **Append to** copies will not replace files with matching names on the destination media if the destination file is Locked, Protected, or in-use.

48: Creating volumes

Automatic is an option that only affects hosts. Remote nodes must manually open volumes using the MacServe desk accessory.

Infosphere Product Update Program

We are always looking for ways to improve our software, and we want you to be able to take advantage of our continuing efforts. You can assure your eligibility in the Infosphere Product Update Program by returning your registration card today.

As a registered MacServe user, you will be notified by mail about updates to the product. These notices will give the price of the update, a list of the added enhancements, and ordering instructions. Most updates will be available at a reduced price.

Only registered owners will receive these update notices, so send in your registration card now!

MacServe Product Support

We want you to get the most out of MacServe and we would like to help. If you have a technical question or problem, check this manual first. Most of the time you will find the asnwer right there. In fact, Appendix C has been specifically written to assist in troubleshooting. You may also want to give your dealer a call. If you still need assistance, call our Technical Support Department at (503) 226-1407. They will be happy to answer your questions, if you are a registered MacServe user.

Register now for technical support and upgrades!

Please complete and return this registration card before you use your new MacServe software for the first time. Register now so that you will be able to take advantage of the following benefits:

- Infosphere Product Update Program
- MacServe Product Support
- Advance information on new Infosphere products

Serial number M000 16054

Name _____
Company _____
Address _____
_____
Phone _____

Date purchased _____
Purchased:

☐ With my Macintosh
☐ At a later time

Purchased from _____
City _____ State _____

I learned about MacServe through:

☐ Apple salesperson
☐ Dealer
☐ Friend
☐ Ad in _____
☐ Computer show
☐ Direct Mail

My Macintosh Office includes:

☐ Mac Plus (Qty _____)
☐ Mac XL (Qty _____)
☐ LaserWriter
☐ These hard disks:_____
☐ 512K Mac (Qty _____)
☐ 128K Mac (Qty _____)
☐ Other _____

Infosphere, Inc
4730 SW Macadam Ave
Portland OR 97201
USA

Contents

Before You Begin

You have purchased a special kind of product, known as "system software", for the most powerful computer family Apple has ever sold. Perhaps, the most exciting computers ever mass produced.

System software is different from applications, such as MacPaint. It forms the environment within which you use applications. The Finder is an example. You use the Finder to manage your disks and start applications.

You use an application directly; it is the focus of your work. Over time, you want to learn as much as you can about it so you can accomplish your work more effectively.

A good piece of system software does not interfere. You quickly forget it is there, but notice its absense. You also prefer to know as little as possible about it. Like the lighting of a room, the level becomes insignificant yet strongly influences your effectiveness.

We have tried, with MacServe, to create system software that makes it easier and faster for you to do the things you bought your Macintosh to do. Simple things like printing documents, and managing your hard disk. Even sharing applications and documents with your colleagues.

Things that you want to take for granted. Things that others do easily, all the time, on large computers.

Things not possible before on personal workstations.

How to use this manual

MacServe is not a program, but rather a number of program elements. That calls for a different format than classic Macintosh software documentation. We have chosen a cookbook approach that leads you through each of these program elements as you install and learn to use MacServe.

Throughout this manual are short sections entitled *About ....* They provide background material for the specific topics described in the How To sections, like the sidebars in magazine articles. We hope they make the technical issues underlying the choices you make digestable.

Chapter 1, *Getting Started with MacServe*, shows you how to quickly set up a working MacServe network, including installation instructions. It refers you to the places in the other sections of this manual where you can learn more about using MacServe.

The largest part of this manual is Chapter 2, of interest to all MacServe uses. *Using MacServe* discusses the techniques you will use day-to-day to communicate with MacServe. (If someone has installed MacServe for you, you could start here.) Step-by-step instructions detail each task you normally do to manage disk volumes and print documents from the applications you use in your daily work.

Special material for MacServe administrators is included in Chapter 3. *Managing MacServe Hosts* has detailed instructions for setting up and changing the way MacServe manages the resources of your Macintosh. Many of the choices presented there only need to be made once.

The Appendices contain valuable information that helps you get the most out of your MacServe system. They also show you how to avoid and get out of trouble.

Lastly, if computers or networks are new to you, the Glossary explains some of the less common terminology used in this manual. An index and Problem Report Form wrap up the manual.

What MacServe can do for you

MacServe performs the following services to increase the performance, convenience, and security of your Macintosh:

- **Simultaneously runs Macintosh applications in the foreground while acting as a "server" for other Macintoshes on the network.** Your Macintosh remains your workstation, even though others share its resources.

- **Partitions your hard disk into as many as 16 logical "volumes".** Each volume appears to be a separate disk and can be any size you choose (from 100 Kbytes to 32 Mbytes). Volumes can be structured with your choice of MFS or HFS (assuming your Mac supports HFS). You can have several volumes open simultaneously, giving you access to thousands of files.

- **Shares volumes with other Macintoshes.** The same volumes you create for use on your Macintosh can also be shared by other Macs over the network, just as if they were disks directly attached to the other machines.

- **Controls access to shared network volumes.** Each volume can have a unique password which allows only those who know the password to access the data contained within the volume. You may designate volumes as read-only, allowing simultaneous access by multiple users to libraries. This prevents contention for write access by restricting write privileges to privately mounted volumes.

- **Improves disk performance by using a technique called "disk caching".** MacServe keeps a copy of the most frequently used data from its disk volumes in memory, eliminating the need to reread it from disk when called for by an application. You obtain the performance benefits of a ramdisk but gain increased data security because new data is always written directly to the disk.

- **Improves application performance by spooling printer output while the application continues.** Documents directed to an ImageWriter or similar printer are temporarily stored on your hard disk and then printed in the background. You may be able to resume your application more quickly.

- **Shares printers.** Other network users can direct their documents to the printer attached to your Macintosh, instead of requiring their own printer. Their documents are also stored on your hard disk and then printed in the order received.

- **Makes network services available conveniently from applications through a desk accessory.** The same desk accessory you use on your Mac to open and close volumes is used by all members of the network to choose hosts, select volumes, and select printers.

- **Names devices for access to multiple "hosts".** You give each MacServe system a network name; through those names, you have the ability to select which (of as many as 16) hosts you will obtain disk and print services from.

- **Names users for identification.** You give each MacServe user a network name and, through these names, have the ability to identify who is using your servers and who has created print documents.

- **Simplifies backup and restoration of important files.** An incremental backup facility keeps track of when you last saved files on MFS volumes to an archive device (today, a diskette) and copies only those files that have changed. *HFS volumes are not yet supported due to the lack of technical information about HFS.*

- **Supports virtually every hard disk drive available for the Macintosh.** With MacServe, there is no need to buy special hardware to build a network, nor to commit to a single hardware vendor. You can probably get started with the equipment you already have.

- **Offers incremental expansion to as many as 16 MacServe hosts.** As your network needs grow, you can add additional MacServe hosts for increased performance and capacity.

MacServe is NOT

- **MacServe IS NOT a file server.** The difference between a disk server, such as MacServe, and a file server is subtle. For most users, what is important is being able to run data base applications designed for multi-user access. MacServe includes a set of protocols for data base vendors who want to offer such support. These products will be available soon for use with MacServe.

  We expect to develop file server products in the future, as the technology becomes more stable. For now, MacServe is far more reliable than any Macintosh file server product. As a registered user of MacServe, we will advise you of these developments.

- **MacServe IS NOT a LaserWriter spooler.** MacServe is compatible with the LaserWriter and can share the same AppleTalk network. However, it is not able to spool print jobs for a LaserWriter (or any other AppleTalk printer). Laser printing protocols have not yet evolved to the point where laser spooling is practical.

  We are working with other companies to develop protocols for laser spooling. For now, MacServe can effectively reduce the loading on your LaserWriter by providing efficient ImageWriter sharing for document drafts.

What you need to get started

You need the following Apple products to use MacServe stand-alone (or as a network server):

- A 512K Macintosh (or Macintosh Plus) with a hard disk drive (Appendix A describes any software required for the currently supported drives), or a Macintosh XL with MacWorks XL (no earlier than version 3.0); and
- Optionally, a printer that directly attaches to your Macintosh's modem port (such as an ImageWriter), or a specialized printer required by your application.
- At least 200 Kbytes of free disk space (for the MacServe resources and Manager).
- Macintosh System 2.0 software and Finder 4.1, or
- Macintosh System 3.0 (or later) and Finder 5.1 (or later).

The Macintosh 3.0 System file and Finder 5.1 contain significant bugs. We strongly recommend that you convert to versions 3.1 and 5.2 as soon as possible if you have been using version 3.0!

Prerelease Macintosh System files and Finder 5.0 are not supported by MacServe. Using them may cause problems.

For a MacServe user node, use any of the configurations listed above. User nodes do not require a hard disk.

User nodes require approximately 80 Kbytes of free disk space for the MacServe resources that go in the System file.

To connect your Macintoshes over AppleTalk, you also need an appropriate AppleTalk Connector Kit for each Mac and AppleTalk cabling. *See "Adapting a Cable" in Appendix A if you have trouble locating the standard AppleTalk Connector Kit needed by your flavor of Mac.*

Are you ready?

We assume you are familiar with the Macintosh. If not, read *Macintosh*, the owner's guide you received with your Macintosh. You will also want to review the manual you received with your AppleTalk connectors.

Before continuing with MacServe, you should know how to:

- set up, start, and use your Macintosh
- use the Finder and desktop icons to open, copy, and delete Macintosh documents, applications, and disks
- point, select, and drag with the mouse
- pull down menus and choose commands
- use desk accessories from the Apple menu
- set up, start, and use your hard disk
- set up, start, and use your printer
- connect your Macintosh to an AppleTalk network

Getting help from MacServe

You may want more information while you are using MacServe. On-line help is available from both the MacServe Installer and the MacServe Manager.

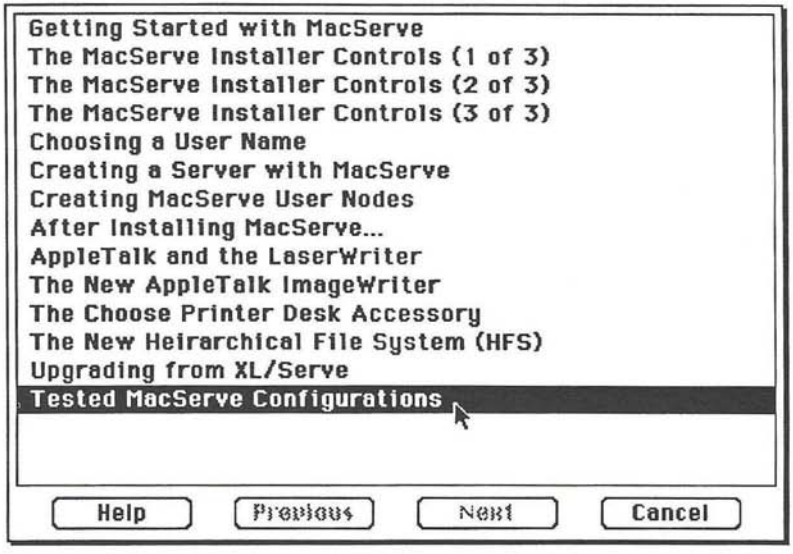
MacServe uses the same help dialog (with different topics) in both of these applications. The method for accessing the dialog differs:

- Within the Installer, click the **Help** button to invoke the dialog.
- Within the Manager, select "Help" from the Misc menu.
- From the Finder, double-click the MacServe Help file icon.

The MacServe Manager and MacServe Help file must be located in the same folder to work together.

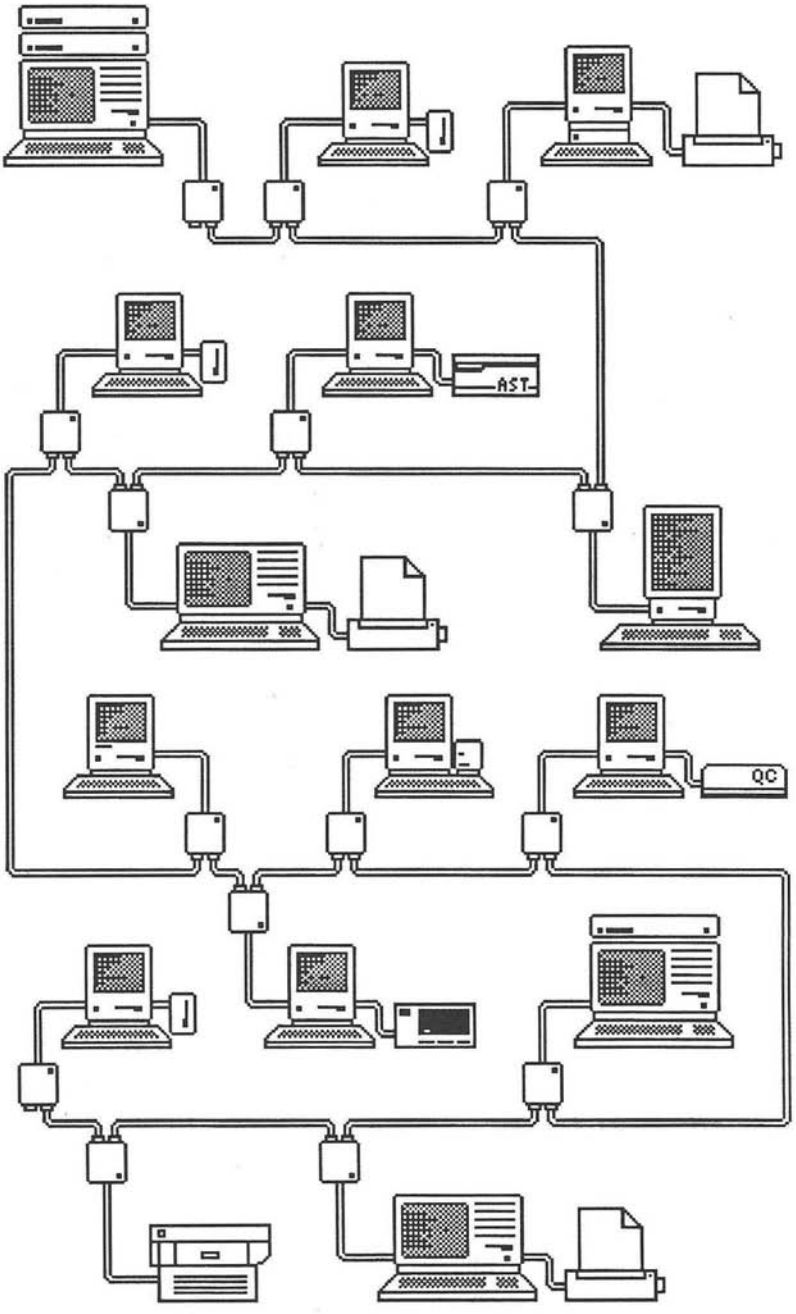
Once you select the Help dialog, it appears as shown below. The dialog lists a number of topics that it can offer more information about.

- Select a topic and click **Help** to review the information or double-click on the topic.
- Step backward or forward within the topics by clicking the **Previous** and **Next** buttons.
- Click **Topics** to return to the list of help topics.
- Click **Cancel** when you are finished with the Help dialog.



Chapter 1

Getting Started with MacServe



Preparing your equipment

Apple now offers two filing systems (disk structures) for the Macintosh:

- The original Macintosh Filing System (MFS), supported on all Macintoshes, and
- The Heirarchical Filing System (HFS), introduced with Apple's Hard Disk 20 drive and incorporated into the new 128K ROMs (on the Mac Plus).

The choice of which to use on your hard disk has implications for MacServe.

MacServe supports your choice of MFS and HFS on volumes, regardless of how your hard disk is structured. However, your Mac must support HFS if you want to access HFS volumes under MacServe.

You may find MFS desirable or necessary for the following reasons:

- MFS is universal. It is supported on all Macintoshes. With MacWorks 3.0, MFS is the only option for Macintosh XLs.
- Your disk is already structured with MFS and you don't want to reformat it.
- The MacServe Archiver only supports MFS media. If your hard disk uses MFS, the Archiver can provide full back-up and restore capabilities for it.
- Some applications only work correctly when the system files (and others used by the application) are managed by MFS.

On the other hand, HFS may be desirable or necessary for the following reasons:

- Your disk is already structured with HFS and you don't want to reformat it.
- Your disk is larger than 64 Mbytes.
- You have an alternate method for backing up the whole disk (such as a tape drive).

Rebuilding your hard disk

Most disk manufacturers provide their own disk management software. For optimal disk access, use their software to create a single partition the size of the whole disk and layer MacServe volumes on top of that partition. This reduces the space requirements in your Mac's system heap and keeps your desktop cleaner.

Use the procedure below to prepare a fresh hard disk, or to convert one from HFS to MFS. (See Chapter 2 for a complete discussion of this procedure.) If you do not want to modify the disk structure (it's not essential), proceed to the section on Installing MacServe.

The procedure used to install MacWorks XL is more effective for formatting Macintosh XLs. Follow the documentation you received with MacWorks XL.

- Copy all the files you want to save from your hard disk to some back-up media, such as diskettes.
- Use the drive manufacturer's support software to reformat the disk into a single partition the full size of the disk.
- Use "Erase Disk" in the MacServe Manager's Misc menu on your distribution diskette to place an efficient MFS structure (or HFS structure if your Mac supports this) on the hard disk (this has no effect on HyperDrives).
- Copy a System folder to the hard disk.
- Install your favorite fonts, desk accessories, and printer drivers (including LaserWriter).
- Install MacServe.
- Copy to the hard disk the applications you must always be able to access.
- Create your MacServe volumes.
- Restore your files to the MacServe volumes on the hard disk.

About AppleTalk

When you purchase AppleTalk connector kits you receive only the hardware necessary to build a network.

AppleTalk software is supplied with and installed by products that use it, such as the LaserWriter and MacServe. Unfortunately, there is no effective method to verify that an AppleTalk product installs the version needed by other AppleTalk products.

If you find that an AppleTalk product behaves erratically after you install another AppleTalk product, try reinstalling the first product.

AppleTalk requires exclusive use of your printer port. If you run MacServe as a **Net server**, you must attach your hard disk or printer to the modem port. Reconfigure applications that use the printer port (such as terminal emulators) so they use the modem port. See "Serial Ports", in Appendix A, for a more thorough discussion of this subject.

Upgrading to MacServe

If you have been using XL/Serve, you can easily upgrade to MacServe and enjoy its additional features. MacServe can use any XL/Serve volumes you have already built.

MacServe and XL/Serve can coexist on the same network. However, they cannot coexist on the same machine. When you upgrade a node to MacServe, you must upgrade every System file that node uses. You must also upgrade every node that can access these upgraded System files.

This conversion requirement also applies to upgrading earlier versions of MacServe.

Disable your XL/Serve or MacServe server and reboot before attempting to install or upgrade MacServe.

Installing MacServe

The MacServe Installer will not operate if Switcher is running. Disable it before proceeding.

If you want to install MacServe on user disks while your server is running, make sure that you have set your disk cache to allow a minimum of 256 Kbytes for applications. See Chapter 3 on Setting the Startup Features.

Once you are ready to install MacServe:

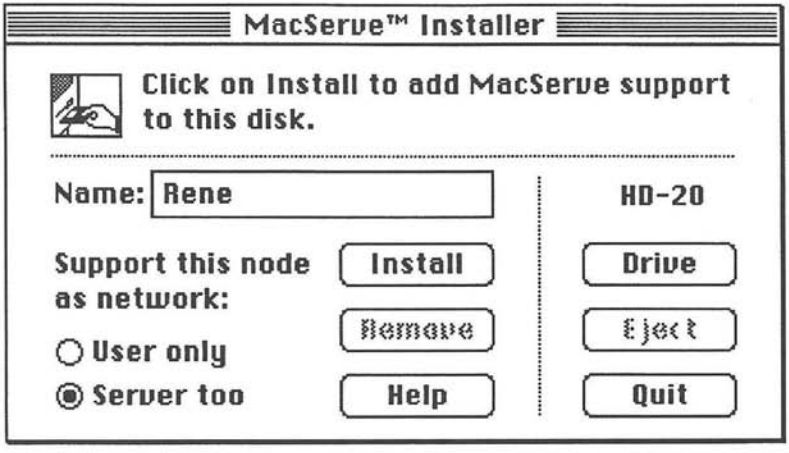
1. Insert the MacServe disk in your Mac's diskette drive.

The MacServe disk window appears on the Finder's desktop.

2. Open the MacServe Installer application by double-clicking the icon while holding down the Command and Option keys.

Holding down the Command and Option keys instructs the Finder to change the current System to the one located on the MacServe disk. This allows the Installer to modify the System on your hard disk.

The Installer dialog appears, as shown below. It issues various messages as it prepares for installation. It also advises if installation cannot proceed for some reason.



The watch icon changes to a pointer when the Installer is ready for commands. The dialog describes the MacServe characteristics of the first disk it finds.

3. Click the Help button if you would like on-line assistance from the Installer.

If this is your first time installing MacServe, review the information in the Help dialog. It highlights the topics described in this manual and may incorporate errata.

The Help dialog appears and lists a number of topics it has more information. Select a topic and click **Help** to review the information or double-click on the topic. You may step backward or forward within the topics by clicking the **Previous** or **Next** buttons. Clicking **Topics** returns you to the list of help topics.

Click **Cancel** when you are ready to return to the Installer dialog.

4. Click the Drive button until the dialog describes the disk you wish to modify.

The name of the selected disk appears above the button.

The button dims if there are less than two disks on-line.

5. Click the Eject button to release the selected disk if you want to insert another.

The button dims if the selected disk can not be ejected.

If you insert a diskette, it becomes the selected disk and the dialog describes its characteristics.

6. Enter a unique name for the user.

User names are becoming a standard method of identifying users on AppleTalk. MacServe, the LaserWriter, and some mail products use this same name resource to identify users of their services.

The dialog shows any user name present in the selected System. If no name is present, the dialog shows a default name.

When you boot a MacServe node, MacServe registers the user name on your AppleTalk network. This name identifies users for network diagnostics, the creators of print jobs, and the users of servers. If MacServe finds the name is already in use, it uniquely alters the name by adding a numeric suffix.

You may subsequently change the user name with the MacServe Manager's View Users option (described in Chapter 2). You may also use Apple's new Chooser desk accessory (supplied with System version 3.0) to change names.

Enter the same name for all the Systems a user will use. Otherwise, the LaserWriter may identify users incorrectly.

7. Select the services the node will support by clicking Net user or Net server.

The MacServe Installer adds the appropriate resources for both servers (hosts) or users. Each MacServe disk can be used to create a single host and an unlimited number of users.

If the selected disk has sufficient space (approximately 80 Kbytes) for the MacServe user resources, the **Net user** option is enabled.

If the selected disk is a hard disk with sufficient space (approximately 120 Kbytes) for the MacServe host resources, the **Net server** option is enabled. (**Net servers** have all the **Net user** features.)

Both options are disabled if the disk is write-locked or there is not enough free disk space to add MacServe.

8. Click the Install button to add the selected MacServe resources, or click Update to update existing MacServe or XL/Serve resources.

The **Install** button is disabled if you cannot install MacServe on the selected disk. A message explains the problem.

The **Install** button changes to an **Update** button if the Installer detects the presence of any MacServe or XL/Serve resources.

Clicking this button begins the process of adding AppleTalk and the special MacServe resources to the selected System file. Various messages report the progress of the installation. *Appendix B explains any error messages you might encounter.*

If you have selected **Net server**, the Installer also copies the MacServe Manager to the selected disk.

When the installation completes, the dialog updates to reflect the new state of the disk.

9. Click the Remove button if you decide to remove MacServe (or XL/Serve) from the selected disk.

The **Remove** button is disabled if there are no MacServe resources on the selected disk.

The Installer removes the special resources used by MacServe. Then the dialog updates to reflect the new state of the disk.

If, through some error, more than one set of MacServe resources became installed in the selected System, the **Remove** button will still be enabled. Click it again to remove the additional set.

The MacServe Installer never removes AppleTalk. You must replace the System file or use another procedure to accomplish this.

10. Repeat from step 4 until MacServe is installed on all your System disks.

You may install MacServe on as many user disks as you like.

You may only install MacServe host resources (**Net server**) on a single hard disk (using a single MacServe disk). You must remove them before transferring MacServe from one hard disk to another.

There is no need to install MacServe on the special diskette your disk vendor may have supplied for booting your hard disk.

11. Click Quit when you are finished.

When you click **Quit**, the Installer returns to the Finder. If the MacServe disk was not your startup disk, the MacServe disk automatically ejects.

If you selected **Net user**, you may reinsert the MacServe disk to copy the Manager and MacServe Help file (used by the Manager) by dragging their icons to your disks. *The Manager was automatically copied to your disk if you selected **Net server**. If you recopy it, your server configuration information may be lost.*

Testing your MacServe host

Once you install MacServe on your Macintosh, you may want to quickly get your MacServe system running. These pages summarize the basic steps you should follow.

Afterwards, you will have a minimal configuration which supports volumes and a spooled ImageWriter attached to the modem port. Network access to MacServe is also enabled.

The system folder on your Mac's hard disk must contain the file "ImageWriter".

This procedure is not a substitute for reading the remainder of this manual. MacServe has many features beyond those covered here. See Chapter 3 for assistance when configuring MacServe for non-network use.

You may want to alter or rebuild your system, perhaps several times, as you become more comfortable with MacServe and your needs change.

1. Open the MacServe Manager application on your hard disk by double-clicking the icon.

The manager is the tool you use for configuring and maintaining your MacServe system. Its capabilities are described in detail in the next chapters.

2. Create volumes by choosing "Create" from the Volumes menu.

You may want to create just a few volumes for initial experimentation. Later, you can remove them if you want to modify the volume structure.

For each volume you want to create, enter a name and size for the volume. Then, click the **Create** button.

Click **Quit** when you are finished creating volumes. The dialog will disappear.

3. Select "Startup Options" from the Settings menu.

Click the **Net server** radio button.

This option instructs MacServe to install AppleTalk upon startup and to provide its full services, both locally and to your AppleTalk network.

Click the **Set** button to save these settings. The dialog will disappear.

4. Select "Network Access" from the Settings menu.

Enable network access to the disk and print servers by clicking their respective icons so that the slash disappears.

Enter the names for the disk and print servers. Choose names that are meaningful to you and unique among any other MacServe hosts on your network.

Click the **Set** button to save these settings. The dialog will disappear.

5. Select "Quit" from the Misc menu to return to the Finder.

6. Attach an ImageWriter to your modem port. Attach an AppleTalk connector to your printer port. Restart your Mac.

The MacServe features you just selected load MacServe into memory (as well as the AppleTalk system software) and locate the volumes you created. You may change these features later with the manager.

At this point, MacServe is operational as a disk server and print spooler.

MacServe uses the printer port for AppleTalk and its print spooler, when acting as a network server. Therefore, you must attach your printer to the modem port. Chapter 3 describes how to configure MacServe for stand-alone use (when you won't be on a network).

Applications that directly access the printer port, such as terminal emulators, can cause serious system errors by disrupting AppleTalk. To avoid this, reconfigure these applications according to the vendor's documentation while MacServe is not loaded.

7. Enable the print spooler.

To do this, select the MacServe desk accessory from the Apple menu. Click the **Printers** button until the name you gave your spooler appears above the button. Then click the **Quit** button.

This procedure installs the ImageWriter driver in your system file (if not already installed) and selects the print spooler. Chapters 2 and 3 describe printer naming and selection. Appendix A discusses printer drivers.

After selecting a print spooler, you may print documents. They will spool to the disk and allow you to continue working while they print. *Unless you use one of the procedures described in the next chapter, you may experience some delay before documents begin to print. This is normal.*

8. Open the MacServe volumes.

To do this, select the MacServe desk accessory from the Apple menu. One at a time, select the volumes listed and click the **Private** button. Click the **Quit** button when you finish.

The first time you open each volume, the Finder adds a desktop file. Using the **Private** button ensures you have write access to the volume, needed by the Finder for this operation.

Once you quit from the desk accessory, the volumes you opened appear on your desktop as icons. You may use them as if they were diskettes. Copy some applications and documents of your choice to the volumes and verify they work correctly.

9. Release the volumes.

To do this, select the MacServe desk accessory from the Apple menu. One at a time, select the volumes you opened and click the **Release** button or double-click their names. Click the **Quit** button when you finish.

You may also release the volumes, under the Finder, by dragging their icons to the Trash.

Notice that the volume icons disappear from the Finder desktop.

This little exercise shows you how easy it is to use the basic capabilities of MacServe.

Checking your MacServe network

You may want to perform a quick check of your MacServe network before proceeding to the remainder of this manual. This will confirm that:

- MacServe is correctly installed on the disk at each node.
- Your AppleTalk network is wired correctly.
- Your server is operating correctly.

If you encounter difficulties during this exercise, consult the troubleshooting guide in Appendix C.

1. Connect each of your Macs to an AppleTalk network.

The AppleTalk connectors attach to the printer port of your Macs. Follow the directions you received with your connectors.

Appendix A shows how do build adapter cables if you have difficulty locating the correct connectors. These are not a substitute for using AppleTalk cables and connectors.

2. Boot each Mac using a disk that you installed MacServe on.

The installation procedure was previously described in this chapter.

As the Macs start up, a message appears in the Welcome to Macintosh screen saying that MacServe is loading. There is a short delay (less than a minute) while the user's name registers on the network.

3. Verify that each node can find all your MacServe hosts.

Select the MacServe desk accessory from the Apple menu on each Mac.

Once the desk accessory opens, it displays messages that it is looking for servers and printers. Shortly thereafter, the names of a MacServe disk server and print spooler appear. The scrolling volumes name box fills with the names of the available volumes for the designated server.

If you have more than one MacServe host on your network, click the **Volumes** and **Printers** buttons to confirm that each can be found.

Detailed use of the desk accessory is described in Chapter 2.

Click the **Quit** button to release the desk accessory.

4. Verify that each host can find all your network users.

Open the MacServe Manager on your host by double-clicking the icon. Select "MacServe Users" from the View menu.

A dialog appears and advises that it is checking the network. Shortly thereafter, the scrolling name box lists the names of each MacServe user located on the network. Verify that all the expected nodes appear connected to the network (your own name is not shown).

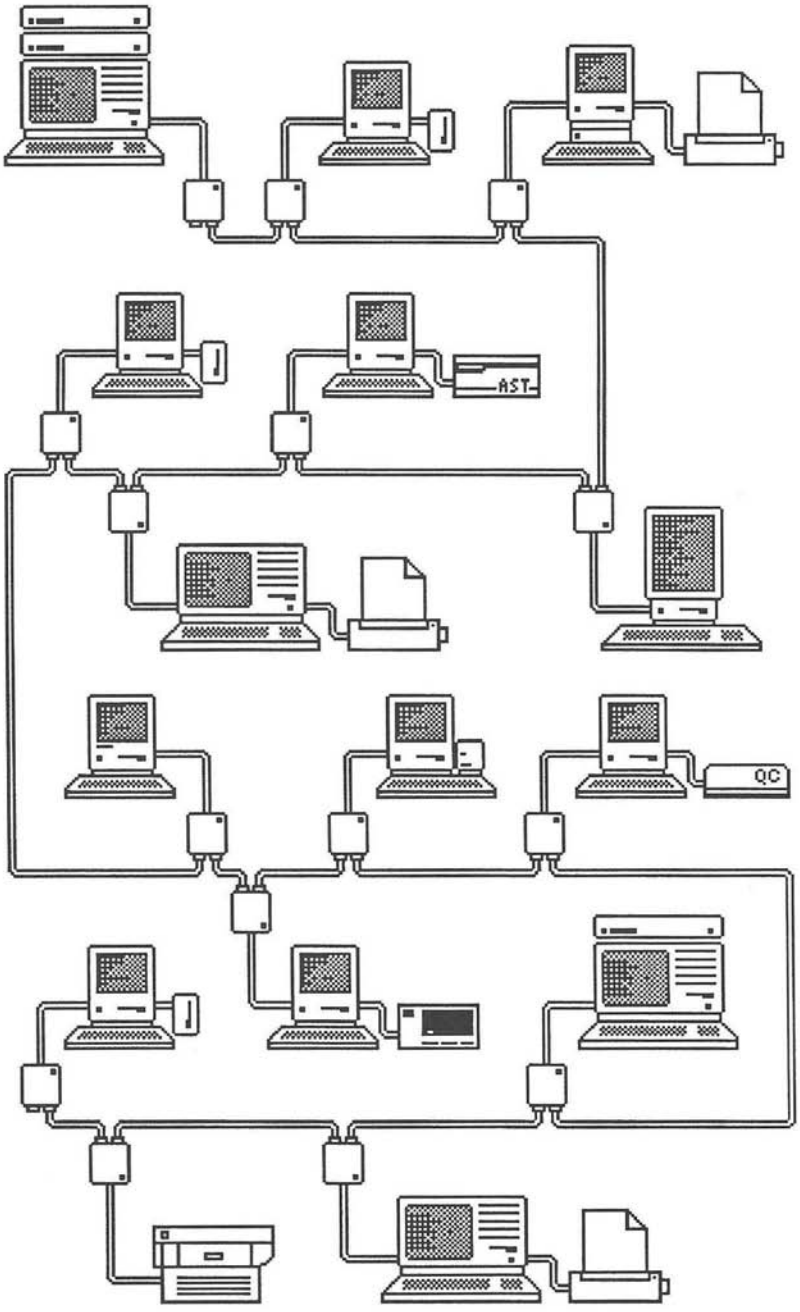
If more than one node has the same name, MacServe alters the duplicate names by adding a numeric suffix to make them unique. The next chapter explains how to change the names.

Click the **Quit** button to release the dialog. Select "Quit" from the Misc menu to return to the Finder.

This completes the basic check of your MacServe network. Proceed to the next chapter to begin learning how to use MacServe for your daily work.

Chapter 2

Using MacServe



MacServe's startup methods

The MacServe disk and print server functions exist in the background of your Macintosh. If you want to use them during a computing session, they must be loaded into memory when you start the machine.

This occurs automatically when you start a MacServe user node from a diskette that has MacServe installed. It also occurs automatically when you start a MacServe host and have selected an appropriate startup mode with Startup Options, described in Chapter 3.

MacServe loads into memory shortly after the "Welcome to Macintosh" dialog appears. Any errors that occur while loading are reported through this dialog. *Appendix B explains the messages you may receive.*

There may be occasions when you don't want MacServe loaded into your Mac's memory. This can happen if:

- You want to use an incompatible application.
- You have an application that needs ALL your Mac's memory.

You may instruct MacServe not to load when your Mac starts by holding down the **M** and **S** keys once the Happy Mac icon appears, until the Finder (or your startup application) appears. Alternately, you may start your Mac using a disk that does not have MacServe installed.

About volumes

Disk volumes provide a convenient way to structure and control access to applications and documents. Since MacServe's volumes are managed by the Macintosh file system, they are transparent to most applications. They behave just like diskettes -- without the bother.

Opening a volume from the MacServe desk accessory is equivalent to inserting a diskette. Their equivalent to ejecting a diskette is releasing them, which you can do through the desk accessory or the Finder.

When volumes are shared between users, access is restricted to read only. This is like setting the write-protect tab on a diskette. Read only access is necessary to prevent the information being shared from being inadvertently changed.

Volumes can also be assigned a password by the MacServe host administrator. Without supplying the correct password, you cannot access the volume. *Passwords are not case sensitive -- "A" is the same as "a".*

About print spooling

In addition to providing hard disk management, MacServe increases the performance and convenience of your Macintosh (and AppleTalk network) by spooling a printer, such as an ImageWriter.

To most applications, it is transparent when you chose a print spooler. When you print, your print job is captured as it is sent by your application to the printer port. MacServe sends it to the spooler, where it is temporarily stored on the host's hard disk and then printed in the background.

Since the print stream is (typically) created more quickly than it can be printed, spooling allows you to resume work on your application more quickly. *Some applications print so slowly that they do not benefit from spooling.*

A print job begins when your application begins printing. The job ends when:

- You exit the application.
- You open the desk accessory.
- Your application stops printing for 40 seconds and you have selected **Close Job** from the desk accessory.
- The spooler aborts the job, having run out of storage space.

If at least one of these conditions has not been met and you print a second time from the same application, the two documents will be combined into a single print job.

MacServe's print spooler also allows you to start another print job while prior jobs are still printing or waiting to be printed. Up to 32 print jobs may be in process, as long as disk space is available. Jobs print in the order received, unless you elect to defer them.

When you attach your MacServe host to an AppleTalk network, you may offer print spooling to all the Macs on the network. Each workstation can direct its printer output to your Mac's printer, instead of requiring a local printer. Each workstation receives the same performance advantages of being able to quickly resume work while its document is being printed.

If you are the local user of a MacServe host and your spooler is not shared on a network, your print jobs become eligible to print as they are created. If you are a remote spooler user, or a local user sharing a spooler, your print jobs become eligible to print once they are completed.

You can reduce transmission time and storage requirements by using lower quality print modes, such as "draft" or "normal" instead of "high quality".

The administrator of a MacServe spooler may elect to have each print job preceeded by a banner page that shows the document name, the user name of the creator, and other identifying information.

For a small work group, spooling provides efficient use of a common printer. Although MacServe does not spool to the LaserWriter, its spooling of printers such as the ImageWriter can reduce the load on your Laser.

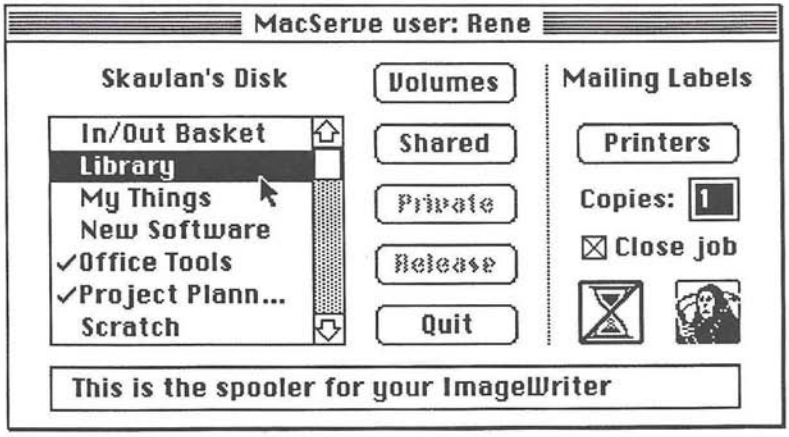
Print spooling is not possible on user nodes until you invoke the MacServe desk accessory and select a print spooler. On hosts, if the spooler is paused, direct printing is selected at startup, if unpaused, the local spooler is selected.

Desk accessory basics

For your daily work, you access the facilities of MacServe through the MacServe desk accessory (in the Apple menu). If you do not use the Finder, but instead use a substitute shell that does not support the menu bar, you may still use the MacServe desk accessory within any application that supports the Apple menu (including the MacServe Manager).

Through the desk accessory, you may:

- Open volumes on the MacServe hosts in your local network;
- Release volumes, so other network users can access them;
- Select printers, including those spooled through MacServe hosts; and
- Set options for the print jobs you submit to a MacServe spooler.



To open the desk accessory:

- **Choose "MacServe™" from the Apple Menu.**

The MacServe desk accessory dialog appears on your desktop. The dialog title shows your user name as known to the network, unless you are using MacServe stand-alone.

The desk accessory beeps and/or flashes the menu bar and does not open if there is not enough memory or a copy is already open under Switcher.

If there was a printer error on the last print spooler job you submitted, an error message appears when you open the desk accessory. The message includes a code that defines the nature of the error. These codes are listed in Appendix B.

If you open the desk accessory on a MacServe host that has users, you are advised of that fact.

If this is the first time you are using MacServe during a computing session, MacServe locates the servers on your local network. The names of the first disk and print servers it finds appear in the server name fields. If you are using MacServe on a host, the names of your servers are listed first.

A warning message advises if no server or spooler is available.

When you reselect the desk accessory during a computing session, the names of the disk and print servers you last selected appear in the server name fields, unless they cannot be located, in which case a warning appears.

The desk accessory remains on your desktop until you click its **Quit** button.

To return to your application:

- **Click the Quit button.**

This saves the selected disk server and printer names.

Quitting selects the printer whose name appears above the **Printers** button. If necessary, MacServe installs the correct driver in your system file to match the selected printer. Appendix A discusses printer drivers.

A message advises if MacServe fails to record the change of printer drivers. This can happen if you run out of system memory, perhaps from having too many volumes open. Once this occurs, further attempts to change the printer driver are blocked until you reboot.

Once you select a printer, it remains selected until:

- You select a different printer (perhaps by using one of Apple's Choosers),
- You have chosen a spooler and it becomes unavailable,
- You transfer to a new System disk that does not have the needed print driver, or
- You restart your Mac.

After recording your printer selection, the desk accessory goes away from your desktop.

To select a disk server:

- **Click the Volumes button.**

Each time you click the **Volumes** button, MacServe selects the next disk server it has identified (just like the Drive button in the standard Open menu) and shows the server's name above the volume list.

It then lists the names of that server's available volumes in the volume list. If there are more volumes than can fit in the window, use the scroll bar to scan the list. A checkmark appears next to the name of any volume you have open.

When you next click the button after sequencing through the list, MacServe updates the list. A message advises that it is seeking additional servers. The list may not be in the same order after updating.

To open a volume:

- **Select the volume name and open it by clicking the Shared or Private buttons.**

The **Shared** and **Private** buttons indicate the methods you may use to open the volume. The **Shared** button opens the volume "locked" against modification so it can be available to several users at the same time. The **Private** button opens the volume "unlocked" for write access (granting you exclusive access), if no other user has the volume open and it is not **Locked** by the administrator of the host.

The buttons disable if a method is inappropriate for any reason.

If the volume is structured with the Heirarchical File System (HFS) and your Mac does not support HFS, a message advises the volume is not available.

If the volume is password protected by the host administrator, a message asks you to supply the password. Type the correct sequence of characters and then press the Return key. Just press the Return key if you choose not to proceed. A message advises the volume is not available if you do not supply the correct password.

Passwords are not case sensitive -- "A" is the same as "a".

You may also open a volume by double-clicking its name. The volume opens in preferred order of **Private**, then **Shared**. If the volume is not available, a message advises you of that fact and double-clicking has no effect.

If MacServe is able to open the volume as you have requested, the volume list updates and a check mark appears next to the name showing that it is open. You may then access the volume like any diskette, once you exit the desk accessory.

You may have as many as six volumes open at the same time on multiple servers.

If you use the Finder while a volume is open, a special icon appears on the desktop to represent the volume.

To release a volume:

- **Select the volume, by name, and click the Release button.**
- **Or, double-click the volume name.**
- **Or, drag the volume icon to the trash when the Finder is running.**

You must currently have the volume open, as indicated by a check mark next to its name. The **Release** button disables if you do not have the volume open.

You cannot release a volume on which you have files open. A message advises you that the volume is in use. *A volume that does not appear to have open files may have the current or discarded Clipboard files.*

Any volumes you have open are automatically released when you select "Shut Down" from the Finder's Special menu.

If you are using MacServe on an AppleTalk network, it is courteous to release volumes when you no longer need access to them. Do this before you turn off or restart your machine; otherwise the server may not release them for some time. MacServe delays automatic release of volumes to accomodate disruptions of the network (up to 15 minutes long).

To select a printer:

- **Click the Printers button.**

Each time you click the **Printers** button, MacServe shows the name of the next printer it has identified.

If your system disk is write-locked, any printers that match your installed driver appear. Otherwise, all printers for which you have a driver appear.

MacServe describes the selected printer as follows (where "printer type" is the printer driver name):

- The spooler for your (printer type), if it the spooled printer at your host.
- A remotely spooled (printer type), for remote MacServe spoolers.
- An AppleTalk (printer type), for LaserWriters and and other shared printers.
- A local printer for your modem port, with the printer type in (parentheses).
- A local printer for your printer port, with the printer type in [brackets].

Local printers use your modem port when you are connected to a network. Local printers may also be available through your printer port if you are using MacServe stand-alone. On a host, you will see local printers for the MacServe spooler port only when your spooler is paused or disabled.

When you next click the button after sequencing through the list, MacServe updates the list. A message advises that it is seeking additional servers. The list may not be in the same order after updating.

To select automatic print job timeout:

Macintosh applications do not advise the print spooler when they have finished creating a print document. In addition to the automatic job closure that occurs when you exit an application, you may close a job by opening the MacServe desk accessory. You can also have MacServe close your print jobs. To do this:

- **Click the Close Job check box.**

When the box is checked, MacServe automatically closes print jobs 40 seconds after your application stops printing. This accomodates the slow printing cycles that some applications go through, especially when the application and the document are not located on a local hard disk.

Some applications print so slowly that you will want to disable this feature. Automatic job closure is disabled when the box is unchecked. *However, the spooler aborts any unclosed jobs after 15 minutes of idle time. Close the job through one of the methods described above to prevent this from happening.*

Close Job is enabled, by default. If you change it, your selection is remembered until you restart your Mac.

To defer your next print spooler job:

Normally, the MacServe spooler prints jobs in the order they are received. If the documents are short, waiting your turn is not an inconvenience, since you can continue working.

If your job will take some time to print, or you are not concerned about how soon it prints, you may elect to defer the job. The host administrator of the spooler decides when to print these "low priority" jobs.

To defer the next print job:

- **Click the Defer icon until it has no slash through it.**


Deferred


Priority

The icon is dim if the selected printer is not a MacServe spooler.

You may adjust this option any time before you print. **Defer** resets to its normal (high priority) state after each job.

After printing, use "Print Jobs" from the View menu of the MacServe Manager if you want to change this option for the job.

For multiple copies of your next job:

The standard application print dialog lets you create a number of document copies as it generates a print job. However, the MacServe print spooler sees each job as one document and normally prints a single copy.

If you want multiple copies of a document, it is more efficient for the spooler to make them as it prints than to have the application generate them. This creates and sends the job to the spooler more quickly. It also reduces the buffer storage needed.

To print multiple copies of your next print spooler job:

- **Enter the number in the Copies field.**
- **Enter one (1) in your application's print dialog.**

You may adjust the **Copies** any time before you print. **Copies** resets to one (1) after each job.

After printing, use "Print Jobs" from the View menu of the MacServe Manager if you want to change the number of copies for the job.

To delete your last print job:

If you decide, after sending a print job to a MacServe spooler, that you do not want the job to print:

- **Click the Delete Last icon.**


Delete Icon

If the last job you submitted during this computing session has not been printed, a message advises you that the job is deleted. Otherwise, you are advised that no job could be deleted.

The icon is dim if there is nothing to delete. You cannot UNDO deleting a job.

You may also use "Print Jobs" from the View menu of the MacServe Manager if you want to delete the job.

Watching your network in action

MacServe includes a wide range of functions that help you determine how your network is operating. Some of these are described in this chapter. Others are specific to the needs of a host administrator and are covered in Chapter 3. The following list summarizes the available information.

The MacServe desk accessory shows:

- All the available disk servers, and the available volumes at each server. Checkmarks identify those volumes you have open.
- All the available printers and spoolers for which you have an appropriate printer driver.
- If the host for which you are the local user has other users.
- Any print spooler errors your last job encountered.
- The user name you are known by on the network.

The Manager's View MacServe Users dialog shows:

- The names of all the other users on your network. If you are the local user of a host, checkmarks identify those using your host.
- Your user name from the current System file (which may be different from your known name).

The Manager's View AppleTalk Devices dialog shows:

- The names of all the named devices on the network, including foreign devices and other users.

The Manager's View Print Jobs dialog shows:

- The state of all your print jobs, if the selected spooler is remote.
- The state of all the print jobs at your spooler, if you are the local user of a host and have selected its spooler.

The Manager's Volumes dialogs show:

- All the volumes located on your host, with their features. Checkmarks identify those volumes in use.

To see all your AppleTalk devices:

1. Select "AppleTalk Devices" from the Manager's View menu.

The View AppleTalk Devices dialog appears, as shown below.

A message advises if AppleTalk is not available. Otherwise, the Manager initiates a lookup on your AppleTalk network for all the named devices.

Shortly thereafter, a message advises how many devices where located. The scrolling box lists their names and types, in alphabetical order. Devices resident at your own node are not shown.

If no devices are found, a message advises to check your AppleTalk cabling.

Some of the common types you will see include:

- ImageWriter, an ImageWriter II with an AppleTalk interface or a MacServe print spooler;
- LaserWriter, an Apple LaserWriter printer;
- MacUser, a MacServe user name;
- xlDisk, a MacServe disk server (for historical reasons); and
- Other printer driver names, which may be MacServe print spoolers.

If you have other third party AppleTalk devices, their names may also appear in the list.

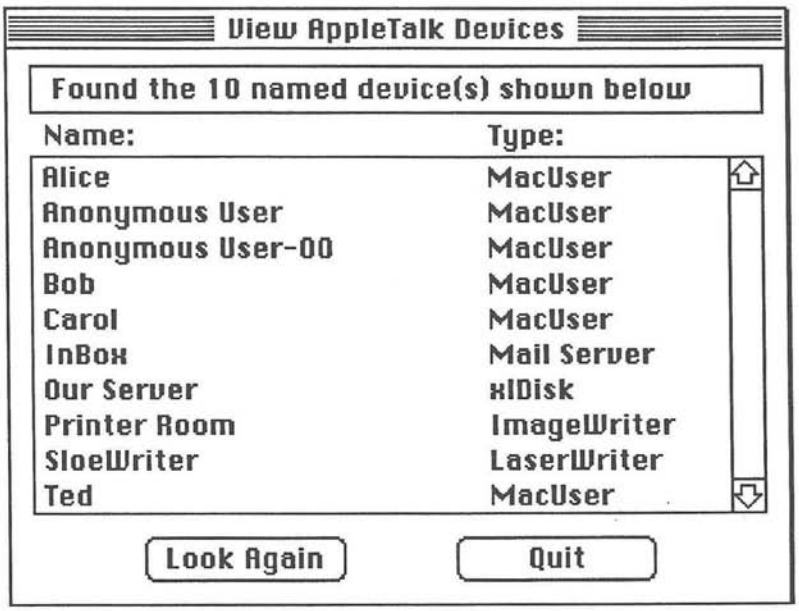
Appendix C offers some troubleshooting guidelines when you are not able to locate all the devices you expect to see.

2. Click Look Again to initiate another snapshot lookup.

The **Look Again** button is disabled if AppleTalk is not present in memory.

The list of devices may change if devices have joined or left the network.

3. Click Quit when you are finished looking at the AppleTalk devices.



To see all the MacServe users:

1. Select "MacServe Users" from the Manager's View menu.

The View MacServe Users dialog appears, as shown below. The dialog shows the user name from your current System file. This may be different from the name by which you are known to the network. The MacServe desk accessory shows your known name.

Your known user name can differ if it was altered for uniqueness, MacServe was installed in this System with a different name, or you changed the name with the Manager or a chooser.

A message advises if AppleTalk is not available. Otherwise, the Manager initiates a lookup for MacServe users.

Shortly thereafter, a message advises how many users where located. The scrolling box lists their names, in alphabetical order. *Your own name is not included in the list.* If you are the local user of a MacServe host, checkmarks appear next to the names of those using your host.

Appendix C offers some troubleshooting guidelines when you are not able to locate all the users you expect to see.

2. Click Find Users to initiate another snapshot lookup.

The **Find Users** button is disabled if AppleTalk is not present in memory.

Otherwise, the Manager initiates another lookup for MacServe users. The list of users may change if users have joined or left the network.

3. Select your user name and enter a new one to change it.

Your user name can be any character sequence up to 30 characters long.

4. Click Change to record your new name and exit.

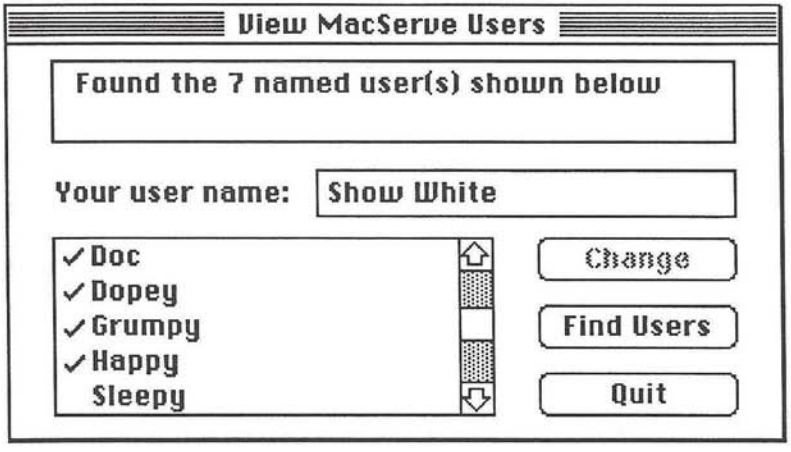
The **Change** button is disabled unless you change your user name.

Your new name will be used by MacServe the next time you start your Mac if the current System file is the one that is active during your Mac's startup sequence (its disk icon appears in the upper right cornet of your screen when Finder starts).

If you current System file is not the one you used to start your Mac, this new name may only be used by the LaserWriter.

MacServe updates your System file and the dialog disappears.

5. Click Quit when you are finished looking at the AppleTalk devices.



Altering print spooler jobs

The section on *Desk accessory basics*, earlier in this chapter, shows you how to select MacServe print spoolers. It discusses the options you may elect for a print job *prior to its creation*:

- The number of copies to print,
- The priority of the job, and
- How to decide when the job is complete.

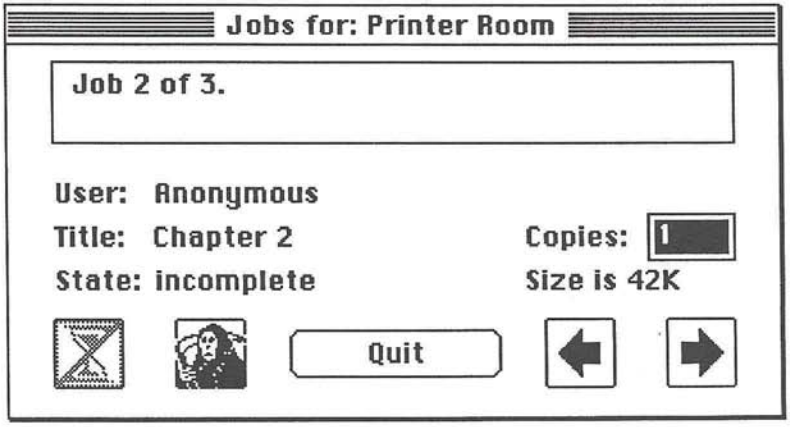
It also shows you how to delete the last print job you created.

Once a print job has been created, you may adjust its characteristics using the MacServe Manager. To do this:

1. Select "Print Jobs" from the Manager's View menu.

The Print Job dialog appears. Its title identifies the currently selected printer. If the current printer is not a spooler then dialog controls are disabled and no information can be supplied. Otherwise, the dialog sequentially identifies each job in that print spooler queue and provides information about that job.

If you view the jobs on a remote spooler, only the jobs you created are shown.



User is the name of the job creator (blank if no name is available). Title comes from the document window when you print. States are: printing, pending, deferred, or incomplete. Size is the amount of disk space used by the job.

2. Adjust the number of copies to print by entering a new number.

This is the number of print job copies requested of the spooler through the MacServe desk accessory, not the number of copies requested in the print dialog (which should always be set to one).

3. Adjust the job status.

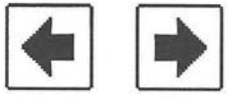
Prior to its creation, a print job may be deferred with the desk accessory. Once the print job is complete, you may adjust this option by clicking the **Defer** icon. *The icon is dim if the job is incomplete.*

If the job is printing and you defer it, the job stops printing. When the job becomes eligible to print again, it begins from the start and prints all the requested copies.

Delete Icon

Clicking the **Delete** icon permanently removes the job from the spooler queue when you click one of the arrow buttons. A message confirms the job will be deleted. *You cannot UNDO deleting a print job.*

4. Click one of the arrow buttons to step through the queue, or click Quit when you are finished.



Previous Next

The arrow buttons record any changes you made to the print job, including deleting it. Then they move you through the spooler queue in a circular manner.

Deleting a job occurs immediately. If the job is printing, it stops.

Deferring a job ocurs immediately. If the job was printing and "low priority" jobs are not being processed, the job stops printing.

Clicking the **Quit** button prevents any changes you made to this job from being recorded, including **Delete**.

Erasing volumes

Apple now offers two disk structures for the Macintosh:

- The original Macintosh Filing System (MFS), supported on all Macintoshes, and
- The Heirarchical Filing System (HFS), introduced with Apple's Hard Disk 20 drive and incorporated into the new 128K ROMs (on the Mac Plus).

MacServe supports your choice of MFS and HFS on volumes, regardless of how your hard disk is structured. However, your Mac must support HFS if you want to access HFS volumes under MacServe.

MacServe volumes are initially structured with MFS. You may voluntarily, or involuntarily, change the structure of a volume, by:

- Selecting the Finder's Erase Disk option, which rebuilds the structure of a volume using Apple's default model, or
- Dragging the volume icon for one volume to another (to copy the volume) under the Finder, which also rebuilds the structure of the destination volume, or
- Selecting the MacServe Manager's Erase Disk option.

If your volume is structured with MFS, you will **ALWAYS** want to use the Manager's Erase Disk option. It offers:

- More efficient MFS structures than the Finder uses for volumes larger than 400 Kbytes.
- The only way to maintain MFS on volumes larger than 400 Kbytes if HFS is present on your Mac.
- Faster erasing of volumes, regardless of structure.

You can prevent the Finder from restructuring your volumes by selecting files you want to remove and dragging them to the Trash and when copying files by selecting them individually or as a group and dragging them to your destination.

To erase a volume or change its structure:

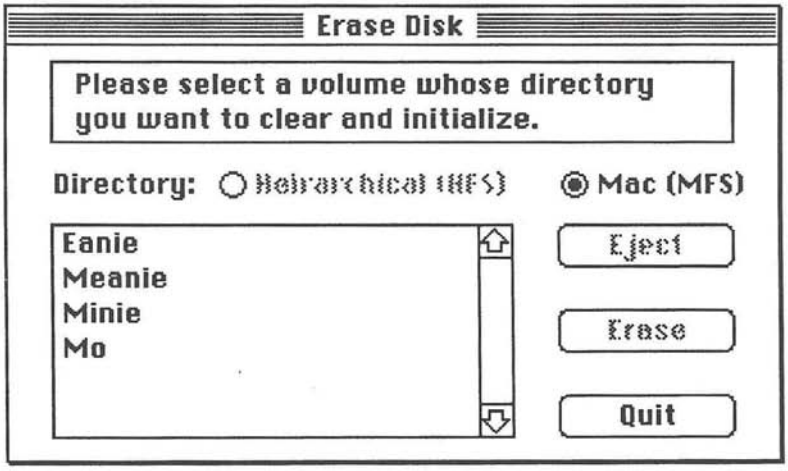
1. Select "Erase Disk" from the Manager's Misc menu.

The Erase Disk dialog appears, as shown below. The volume name box lists the on-line disks and volumes.

2. Select the volume or disk you want to manipulate.

If you insert a diskette, it becomes the selected media.

The dialog displays a message describing the selected media and buttons show the available choices. The MFS and HFS buttons show the current structure.



The **Erase** button highlights if the media is not in use. The **Eject** button highlights if the disk is ejectable and has no open files. The **HFS** button is disabled if your Mac does not support HFS.

3. Click Eject to release the selected disk.

4. Click Erase to clear the volume and rebuild its structure

The Manager erases the disk and places the designated structure on it.

Erasing the media only clears and rebuilds the directory structure. This is faster than clearing each sector.

If the selected media is a diskette, the diskette ejects. Otherwise, if the erasure is successful, the volume name reappears in the scrolling name box.

5. Click Quit when you are finished erasing and ejecting media.

Rebuilding your hard disk

Most disk manufacturers provide their own disk management software. For optimal disk access, use their software to create a single volume the size of the whole disk. Then use MacServe to create volumes on top of that partition. This reduces the requirements in your Mac's "system heap" and keeps your desktop cleaner.

1. Copy all the files you wish to save from your hard disk to some back-up media, such as diskettes.

You will probably want a special back-up disk containing the System folder you are currently using. You can then copy this System folder back to the hard disk after completing the erasure.

If your hard disk uses MFS, you may find the MacServe Archiver useful for the overall back-up function. Consult the instructions elsewhere in this chapter on using it.

The Archiver produces a single backup set from each subdivision (not folder) of your hard disk. If the disk is subdivided, their contents may map naturally to MacServe volumes. If the disk has only a single subdivision, you may find it awkward to restore the files.

2. If your hard disk is subdivided, you may want to convert it to a single subdivision.

Follow the procedure for the volume manager that came with your hard disk.

You will find MacServe's volume management more desirable than the method that came from your disk manufacturer. Each MacServe volume can be password protected and, optionally, made available to others on your AppleTalk network.

3. Run the MacServe Manager from the MacServe disk.

Hold down the Command and Option keys while double-clicking the Manager icon. This instructs the Finder to change the current System to the one located on the MacServe disk.

The Manager will not erase a disk that has open files.

4. Select "Erase Disk" from the Manager's Misc menu.

Select your hard disk by name. Then choose a disk structure and click the **Erase** button.

The buttons show the choices available for the selected disk. The **HFS** button is disabled if your Mac does not support HFS. The **Erase** button highlights and the message box describes the features of the selected disk, if it is not in use.

*If the disk has open files, a message advises the disk is in use and the **Erase** button remains disabled. This can happen if a discarded Clipboard file is on the disk or you did not open the Manager while holding down the Command and Option keys. Reboot and restart this sequence from step 3.*

The Manager erases the disk and places the designated structure on it. If the erasure is successful, the disk name reappears in the scrolling name box.

Some early support software for SCSI drives contains a bug that prevents correct reading and writing to the disk. This bug does not become visible until the name of the drive fails to reappear in the scrolling name box after erasing the disk and placing an MFS structure on it. If this happens, you have no choice but to rebuild the disk using the software provided by the vendor. Do not use MacServe on the disk until the vendor supplies corrected software.

This same effect occurs sometimes if you have RAM-based HFS support (a file called Hard Disk 20 in your System folder) and too many AppleTalk products or unusual desk accessories. Since the disk is probably erased at this point, reboot your Mac and copy a simpler System folder (with fewer drivers and accessories) to the disk. Once MacServe is installed, the problem will be reduced.

Click the **Quit** button to exit the dialog and then select "Quit" from the Misc menu to exit the Manager.

5. Copy a System folder to your hard disk.

After exiting the Manager your system disk is the MacServe disk.

Copy the System folder from the special boot disk supplied by your disk vendor or from the back-up copy of the System file previously used on the hard disk. Install any special disk support software with an installer supplied by the vendor.

6. Reboot your machine and verify that everything works correctly.

If you have a problem rebooting, you may need to rebuild the disk using the method provided by the disk vendor. Consult their documentation.

Backing-up and restoring volumes

Because disks can be damaged or erased accidentally, it's a good idea to make backup copies of your files. Using the Finder to back up (or archive) files on a hard disk can be time-consuming and error prone.

How often you back up files depends on their size, how often they are revised, the possible consequences if they are lost, and the difficulty of preserving them.

MacServe makes it easy to preserve your work by providing an incremental backup and restore function. This technique remembers when you last archived your files and offers to copy only those that have changed since then. The result is faster, easier backups and reduced storage requirements.

The MacServe Archiver only supports MFS media. We have not received sufficient information about HFS to support it in the Archiver, at this time. If your volumes are structured with HFS, you will need to use the Finder or some other method to back them up. To back-up a file too large for the Finder from and HFS volume, copy it to an MFS volume and then use the Archiver to transfer it to diskettes.

Archiver features

The MacServe Archiver offers full and incremental back-up capabilities:

- **Full** back-ups copy all the files from an MFS volume, including Protected and Invisible files (some special MacServe files are ignored, such as the files that represent MacServe volumes -- this is not a concern). The desktop file is included.

- **Partial** back-ups copy only those visible and unProtected files whose modification dates are later than the date of the last back-up. The desktop file is ignored, since it is Invisible.

The desktop file is used by the Finder. It contains the icons for all the files on a volume, as well as folder names and the contents of the Get Info display. Since it is ignored on ***Partial*** *copies, this information can be lost.*

If you copy a file to a volume and its modification date is earlier than the last back-up date, the file will be ignored in future ***Partial*** *back-ups. You can check the modification date with the Finder's Get Info option.*

Back-ups can be made from any MFS media to any other MFS media, with the following limitations:

- The destination must have enough free space for all the files that qualify, unless the destination is diskette.

- If the destination is diskette, the Archiver will prompt for additional diskettes, as required. The associated diskettes form a "Back-up Set" and are sequentially numbered for identification.

When copying files to a diskette, files that are larger than the diskette are split into smaller files. They are reassembled when you perform a restore. *These split files can only be reassembled by the Archiver. Manipulating them with any other application (including Finder) may cause errors.*

Back-up copies of all other files may be individually restored with the Finder, *unless the disk is too full for the Finder to create a desktop.*

The Archiver maintains the exact characteristics of each file, including Finder information and desktop location. Back-up copies of unsplit files may be individually restored with the Finder. *However, the icon for a document may not be available if the creating application is not present when the file is restored.*

When performing a back-up, you may have the option to:

- Copy qualifying files and **Append to** those already present on the destination, or
- **Replace all** of the contents of the destination with the qualifying files.

When replacing the contents of the destination, the Archiver first erases the destination media, discarding any files that may have been present. The Archiver maintains the existing structure of the media. It will not allow you to replace the contents of a volume that has open files. *This is the only option when backing-up or restoring a collection of files that comprise a Back-up Set..*

Append to is an option when all the qualifying files will fit on the destination media. If you select this option, qualifying files will replace any files with matching names on the destination media.

The Archiver places special, Invisible files on the media it manipulates. These files remind it:

- when a volume was backed-up,
- whether the volume is part of a Back-up Set,
- what the sequencing is for the Back-up Set, and
- how large the Back-up Set is.

Removing or modifying these files can make it impossible to restore a Back-up Set.

The Archiver also offers you the option to **Verify** the files as they are copied. Selecting this option reads each file back from the destination after being copied to ensure it was copied correctly. *This procedure is less effective when copying to a hard disk, since most hard disks do not support this function.*

Back-up strategy

We recommend using a combination of the Archiver's **Full** and **Partial** copy modes to create an effective back-up procedure:

- Start by making a **Full** back-up of a volume. This establishes a baseline.
- On an "as needed" basis, perform **Partial** back-ups to new media. This saves those files that you have changed. **Partial** back-ups should never exceed the capacity of the destination media (the Archiver will not allow them to span diskettes).
- Once the size of the **Partial** sets approaches the size of a **Full** back-up, set all the media aside and start over by making a **Full** back-up.
- Maintain a complete back-up set of all the files you might want to restore later. Otherwise, recycle your back-up media.

When restoring back-up media, use:

- The Finder to restore individual, unsplit files, and
- The Archiver to restore full Back-up Sets or large files that must be split for back-up.

If you must recover the contents of a volume, first restore the most recent **Full** back-up. Then, in order of increasing date, restore each subsequent **Partial** back-up. This should result in the last saved state of the volume.

Its a good idea to write-lock back-up media when performing any restore operation.

Performing a Full back-up and restore of a volume tends to optimize the layout of the volume by:

- Making all the files contiguous, and
- Compacting the directory for the volume.

The order in which the files are copied depends upon the nature of the operation:

- Back-ups that fit the destination are copied in order of decreasing modification date.
- Back-ups that require multiple diskettes are copied in order of "best fit", starting with the largest files. Smaller files are copied, as needed, to fit in the gaps.
- Restores are copied in increasing directory (and set sequence) order.

Back-up and restore procedures

1. Select "Archive" from the Manager's Misc menu.

The Archive dialog appears, as shown below. It lists the storage devices known to your system by volume name, including MacServe volumes and diskettes.

You may insert diskettes into an empty drive any time before you click **To**. The volume list updates immediately. If the diskette is uninitialized, you are offered the option of initializing or ejecting it.

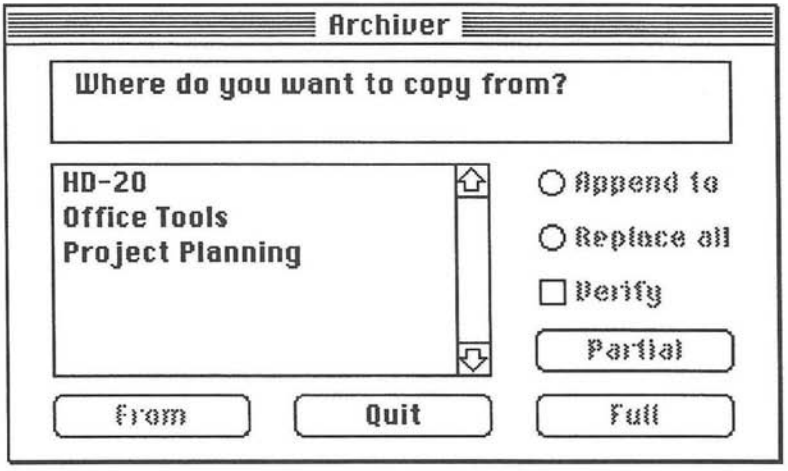
2. Select the source and destination devices.

A message asks you to select the source for the copy. The **From** button is disabled until you select a source.

Once you make a selection, the Archiver reports the back-up state of the source media you selected. If you have selected a secondary diskette of a Back-up Set, the diskette ejects and a message asks you to insert the first diskette of the set.

The Archiver needs write access to the source device in order to record the back-up date, if it is not a restore set. A message warns you if the device is write-locked, preventing the back-up date from being recorded..

The name of the **Quit** button changes to **Cancel**. Click it anytime you want to terminate the back-up dialog sequence and return to the initial dialog state.



Once a valid source is selected, the **From** button name changes to **To**. A message asks you to select the destination. The volume list updates to show the eligible selections.

The **To** button is disabled until you select the destination. Once you make a selection, the Archiver inspects the volume. The dialog updates to reflect the available choices of **Append to, Full, Partial, Replace all,** and **Verify**.

A message advises you if the destination you have selected is write-locked and ejects it if it is a diskette. The Archiver asks you to select the destination again.

3. Select how you want the destination treated.

If the source is not a Back-up Set, select **Append to** when you want to:

- Add the files that qualify to any files already present on the destination, or
- Restore files created as **Partial** backups.

When appending, new files will replace any files with matching names already on the destination media. The Archiver deletes the previous file before copying the new file. If the back-up fails, the old file cannot be recovered.

If the destination does not have open files, select **Replace all** when you want to:

- Erase all existing files on the destination, or
- Restore Back-up Sets.

Select **Verify** if you want the Archiver to read each file back as it copies them to ensure they are correctly copied.

4. Select how you want to qualify files.

Click **Partial** to copy only those files not previously archived to the destination (this is not an option if the source has never been archived or the source is a Back-up Set).

Click **Full** to copy all the files on the source to the destination.

Selecting one of these options initiates the copy sequence. If the source you selected is a Back-up Set, the Archiver begins restoring the files. Otherwise, it begins qualifying the files for copying.

Files are considered archived if their modification date is earlier than the last back-up date. For this to be effective, your clock must be correct. Also, the source device must not be write-locked.

A message advises how much space is needed for the copy. It also tells you if there is not enough space on the destination to store all the selected source files.

You may only copy files that will not fit on the destination if the destination is a diskette. The copy aborts if you selected ***Append to*** *and additional media is required.*

When the copy requires additional diskettes:

- They must be write-enabled.
- You are prompted to supply diskettes, as needed. The Archiver erases diskettes if they are the destination.
- The Archiver names destination diskettes and tells you the name so you can keep track of their order. The names derive from the name of the source. Record these names on the diskettes.
- The Archiver requests source diskettes by the names it previously supplied.

5. Click Cancel if you decide not perform the copy.

Otherwise, the copy is performed as you have requested. You may **Cancel** a copy sequence at any time. The button is checked continually until you initiate a copy sequence and then between each file that is copied.

If you allow the copy to complete, the Archiver updates its history files for the next time.

If the copy included diskettes, they are ejected after the copy completes.

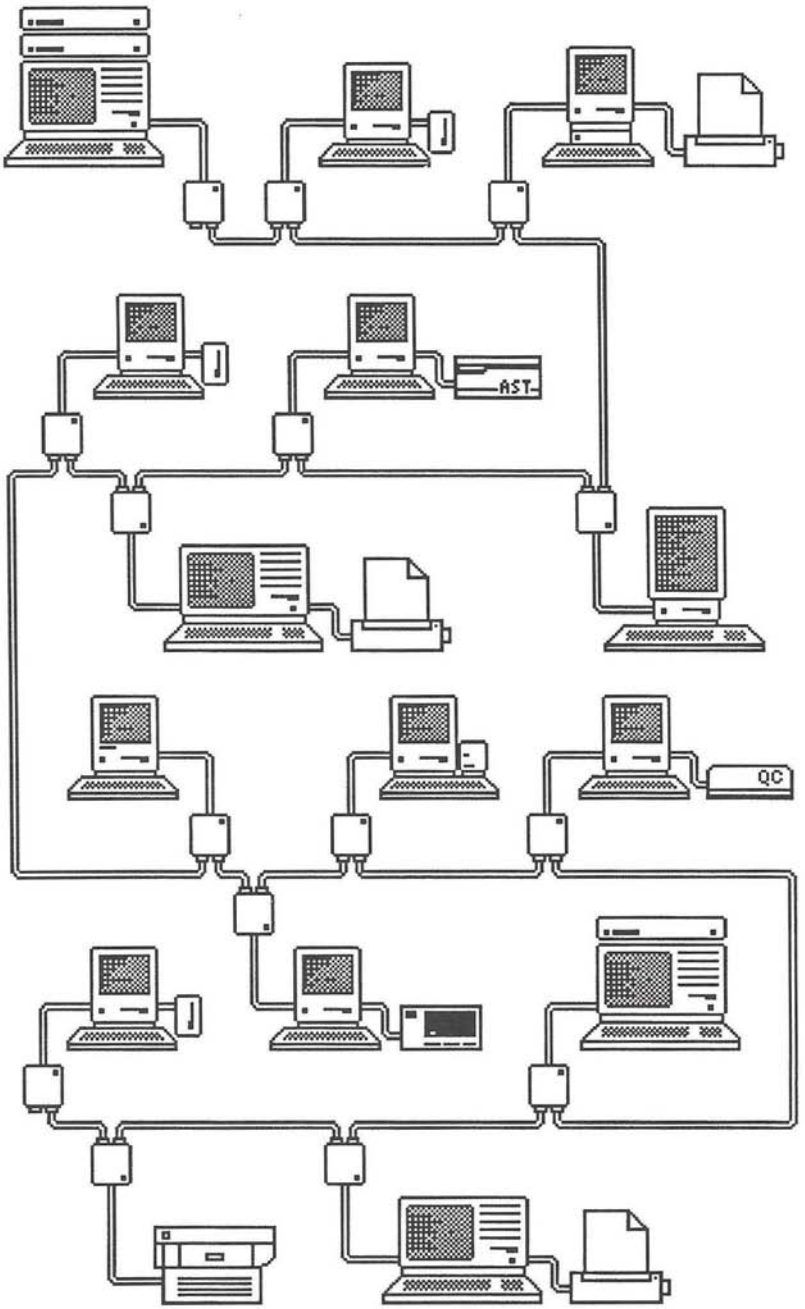
The Archiver preserves the dates of your files and tries to maintain the Finder's desktop information. You may need to adjust the desktop when you restore the files.

6. Click Quit when you are done copying files.

The dialog disappears and the Manager's main desktop returns.

Chapter 3

Managing a MacServe host



Managing your host's resources

When MacServe is installed as a server, an application called *Manager* is automatically placed in the main window of your hard disk. As described in Chapter 2, the Manager can be run from either user nodes or host nodes to:

- Manage print spooler jobs
- Backup and restore disk volumes
- Erase disks and volumes quickly
- View network configuration and use

This chapter shows you how to use additional Manager functions (available only on, and necessary for, host nodes) to:

- Create and remove volumes
- Establish and modify access control for volumes
- Set MacServe's startup characteristics
- Manage network access to your servers
- Manage your print spooler

The Manager needs to be on your root disk. (The root is the disk whose icon appears in the upper right corner of your screen when you first start your Mac). You may place it in another location. To do so, select it and drag the icon to the folder or desktop location of your choice. If your hard disk is formated with HFS, place the MacServe Help file in the same folder with the Manager.

You may place additional copies of the Manager on MacServe volumes so others can use it.

About security

The functions available from the Settings and Volumes menus of the Manager can significantly affect the security and operation of your Macintosh, its hard disk, and AppleTalk. You may limit access to these functions by assigning the Manager a password that only you (and any others you share the password with) know. See *Setting the Manager Password*, later in this chapter.

Only the Manager on your root disk has access to these menus. Managers located on MacServe volumes or at user nodes are always limited to the general purpose functions described in Chapter 2.

Starting the MacServe Manager

To activate the MacServe Manager application:

- **Double-click the Manager icon.**

If the MacServe Manager is password protected, you are asked to enter the password. Without the correct password, you may only use the Misc, Edit, and View menus. These are the same functions you can use on a MacServe user node.

Passwords in MacServe are not case sensitive -- "A" is the same as "a".

About MacServe volumes

A MacServe volume is a subdivision of your Macintosh's hard disk. Users can access the contents of each volume as if it were a separate disk, just as you access individual diskettes.

These volumes internally exist as invisible files within the Macintosh file system, complete with names. MacServe automatically assigns names for the files that contain its volumes, synthesizing them from the file numbers associated with the files. Normally, you will only see MacServe volumes by the names you give them. However, you may encounter the files that contain volumes when using disk utilities that display and manipulate invisible files.

Since each volume has its own directory structure, MacServe volumes let you manage more files with faster access than without using such a partitioning scheme. You can create and use up to 16 of these volumes as a way of organizing your files.

MacServe volumes can be password protected, shared over an AppleTalk network, and operate faster than the root disk because of MacServe's disk caching.

MacServe automatically places a traditional Macintosh file system (MFS) on volumes, as you create them. You may later convert them to the new Heirarchical File System (HFS), if you have HFS support on your Mac. This gives you the opportunity to mix and match file systems for compatability with your applications software. Select "Erase Disk" from the Misc menu to convert the volume structure.

Users without HFS support software can not access MacServe volumes that have HFS structure.

Example disk structures

Volumes let you structure your Macintosh's hard disk for performance and convenience. The number, size, and placement of volumes is application dependent. You might want to choose from the approaches described here when deciding how to allocate your volumes. Refer to the discussion in Appendix A on *Allocating Resources* if necessary.

Don't feel compelled to allocate all 16 possible volumes. For most environments, half that number is enough.

You can create MacServe volumes at any time, assuming there is sufficient disk space remaining. However, you will obtain the best performance from MacServe if you plan your volume structure and create them all at once on a freshly formatted disk. This keeps the volumes in logical order and contiguous.

Creating volumes on HFS disks will fail if there is not enough contiguous free space.

Regardless of the approach you use, we recommend that your root disk contain the following:

- The startup system folder and Manager (this is required);
- All applications you might want to use when MacServe is disabled; and
- Around 2000 Kbytes of free space for spooling (if you plan to use a spooler).

Structuring with a project approach

We favor a project approach -- volumes for all the applications and documents related to a project or type of project. The following is a model for 10 Mbyte hard disks, tuned for the needs of the host user:

- The core model described above;
- One large volume of 2000 Kbytes, which stores primary applications in a library;
- A few medium volumes of 800 Kbytes for special projects; and
- A number of 400 Kbyte (diskette size) volumes for documents and special libraries (such as languages).

The dedicated server approach

If you expect to dedicate a machine as a network server then you will want to structure your disk for flexibility. The following approach makes sense:

- The core model described above; and
- An equal mix of small and medium volumes, sufficient to allow each user one or more volumes. These can be traded off between users as their project needs dictate.

You might also want a single library volume which contains read-only copies of commonly used applications. These can be copied, as needed, to users' private work areas for execution (if they require write access to the volume they run from). *You may find this inconvenient if your applications use a complex copy protection scheme.*

Users tend to fill volumes to capacity, frequently with obsolete files that are not needed on a day to day basis. You can reduce this clutter and obtain better utilization of your hard disk if files are periodically archived and then removed from on-line storage.

The distributed services approach

For the utmost in performance from both MacServe and your AppleTalk network, we recommend that each user with intense disk requirements have their own hard disk. Equip each with MacServe and structure the volumes using the project approach described above. Then distribute your storage and information in such a way that applications and documents are located on the hard disk of their primary user.

With this approach, the role of MacServe changes from a disk substitute to a method for sharing common information. The major difference is that each server becomes a repository for one or more special libraries, maintained by the administrator of that server.

Placing your volumes

Regardless of the strategy you use to organize your hard disk space, we recommend minimizing disk fragmentation. Performance degrades when seeking information from the disk that is not physically near the last information sought, causing erratic disk accesses.

Use one of the following techniques to reduce the disk's fragmentation:

1. Reserve space at the beginning of the disk for files you will later place in the root area:

- Create a temporary "buffer" volume, large enough to allow for the future files you will add.
- Create the volumes you intend to use.
- Finally, remove the buffer volume.

This leaves a "hole" at the beginning of the disk for future files, near the heavily used System and Finder files.

2. Create contiguous volumes by working outward from the inside of your hard disk:

- Compute the amount of disk space needed for all the volumes you want.
- Subtract this amount from the free space amount reported by the Manager's Create Volume dialog.
- Create a temporary buffer volume whose size is the difference.
- Create the volumes you want.
- Remove the buffer volume.

This procedure is ideal for freshly formatted disks and all MFS disks. It will fail on fragmented HFS disks when there is not enough contiguous space for the volumes.

The Mac file systems allocate disk space working inward on the disk. The first volumes you create will be closer to the System and Finder files, which are heavily used. These volumes are prefered for heavy use.

Creating volumes

1. Select "Create" from the Manager's Volumes menu.

The Create Volume dialog appears, as shown below.

2. Click the Drive button to select a hard disk drive.

The MacServe Manager allows you to create volumes on any hard disk drive with sufficient remaining disk space. MacServe can use the volumes even if the drive is not available when your Mac starts (a HyperDrive drawer, for example). The name of the selected drive appears above the button, which is disabled if only one drive exists.

The dialog lists the previously created volumes on the selected drive in the scrolling box. A checkmark next to a volume name indicates the volume is in use.

MacServe can accomodate up to 16 volumes. When creating new volumes, the Manager scans the online drives to make sure this limit is not exceeded. If you have a drive with volumes that is not online, this check is defeated, allowing you to create more volumes than MacServe will recognize.

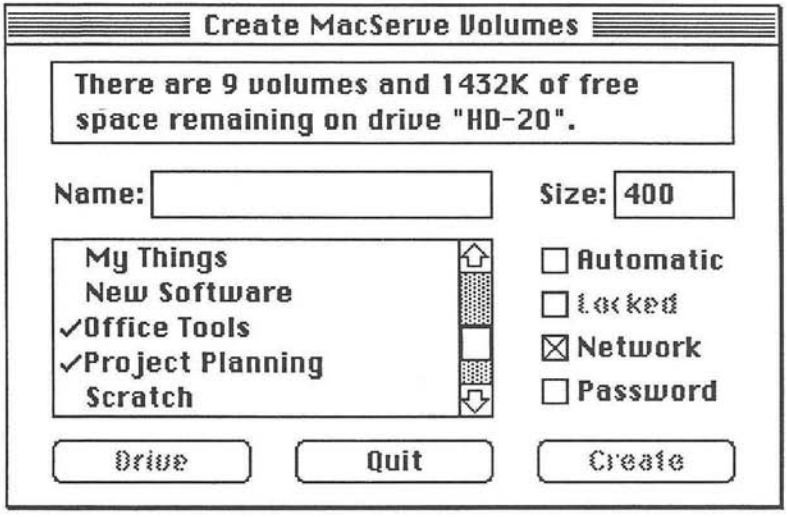
3. Enter the size for the volume (in Kbytes) or accept the preset value.

The dialog shows you how much space is available on the disk drive for new volumes. You may enter any size from 100 Kbytes to the lesser of the remaining free space or 32 Mbytes. The preset value of 400 Kbytes is the same as a diskette.

Volumes created on HFS disks use contiguous allocation. *We know of no method to determine the size of the largest contiguous space*. Therefore, the create may fail if your disk is too fragmented. If this occurs, you may want to rebuild your disk to remove fragmentation.

If you are technically inclined, the amount of space allocated on the disk is the number of clumps required to hold the volume, plus 512 bytes of system information. A clump is the increment of disk space the Mac file system allocates, and varies from 512 bytes to 32 Kbytes depending on the size of the disk and whether the disk is MFS or HFS. Commercially available disk utilities show the clump size for a disk.

Once you create a volume, its size remains constant. This is necessary to support multi-user access to volumes.



If you want to adjust the size later, use the Archiver to copy the contents of the volume. Then remove the volume and create a replacement of the size you want. Lastly, restore the contents. *This method can lead to disk fragmentation.*

4. Name the volume.

Enter a name to represent the volume. This is equivalent to the name on a diskette and appears under its icon on the desktop. You will use this name for all future references to the volume. Like a diskette, you may change the name later with the Finder.

MacServe does not prevent you from using the same name for more than one volume. However, if you do so, you will need to develop a method for distinguishing them.

5. Set the initial features for the volume.

If you check **Automatic**, MacServe will open the volume each time it starts on your Macintosh. The volume will open as **Private**, if possible. *You may not combine **Automatic** with any other option when creating volumes. The Manager does not enforce MacServe's limit of six **Automatic** volumes. MacServe will open the first six **Automatic** volumes it finds.*

The **Locked** option is disabled until at least one file exists on the volume. This is usually the desktop file, placed on the volume the first time it is opened with the Finder. You may elect to lock the volume later using the Alter Volume dialog.

If you check **Network**, other Macintoshes can access the volume over an AppleTalk network. If not, it is available only to your Macintosh. This option has no effect if you do not enable network access to your MacServe host. ***Network** is the default option. It is disabled if you elect **Automatic**.*

If you check **Password**, you will be asked to assign a password to the volume. A dialog appears when you click **Create**, asking you for the volume's new password. Type in a sequence of up to 14 characters. Then click the **OK** button. The dialog asks you to retype the sequence for confirmation. Retype the sequence and click **OK** again. *If you enter a null password or reenter it incorrectly, the effect is not electing **Password**.*

6. Click the Create button when you are ready, or click the Quit button when you no longer want to create volumes..

The **Create** button is disabled until you enter a name.

If you click the **Create** button, the Manager creates the volume you have requested. It then updates the display to reflect the current status of the drive. If MacServe is running, the volume becomes available shortly thereafter.

If the disk is write-locked, the creation fails. If the disk is structured with HFS, the creation will fail if there is not enough contiguous space for the volume.

You may repeat the sequence from step 2 to create more volumes, or click **Quit**. The volume size and features you select become the default for your next volume if you repeat the sequence.

*The first time you expose a volume to the Finder, it's desktop will be initialized. For this to work, the Finder requires write access. The Finder will reject the volume if it is unable to create the desktop. You may then reopen it as **Private**.*

Altering a volume's features

After creating volumes, you may want to change their features. This can happen when you want to:

- Lock a volume, after placing the applications and documents into a library volume.
- Revise the set of Automatic volumes, as your project needs change.

To do this, or to examine the features of a volume:

1. Select "Alter" from the Manager's Volumes menu.

The Alter Volume dialog appears, as shown below.

2. Click the Drive button to select a hard disk drive.

The name of the selected drive appears above the button, which is disabled if only one drive exists.

The dialog lists the volumes on the selected drive in the scrolling box. A checkmark next to a volume name indicates the volume is in use and cannot be altered at this time.

3. Select the volume you want to alter, or click the Quit button if you decide not to make any changes.

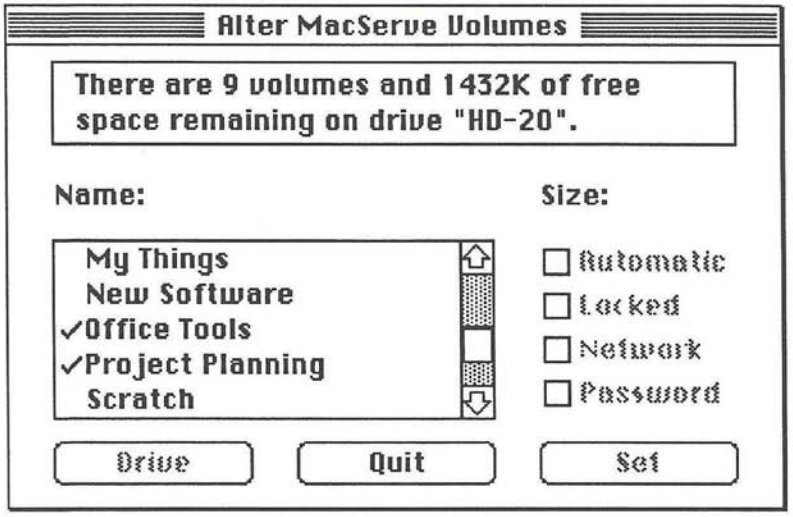
If you select a volume, the current name, size, and features for that volume are displayed.

4. Adjust the features you want the volume to have.

If you check **Automatic**, MacServe will open the volume each time it starts on your Macintosh. The volume will open as **Private**, if possible. *The Manager does not enforce MacServe's limit of six* ***Automatic*** *volumes. MacServe will open the first six* ***Automatic*** *volumes it finds.*

If you check **Locked**, the volume becomes read-only and protected against modification (just like setting the write-protect tab on a diskette). This forces the volume to be simultaneously shareable on an AppleTalk network. Otherwise, the volume's write-lock is determined at the time it is opened. *This option is disabled until at least one file exists on the volume.*

If you check **Network**, other Macintoshes can access the volume over an AppleTalk network. If not, it is available only to your Macintosh. This option has no effect if you do not enable network access.



If you check **Password**, you will be asked to assign a password to the volume. A dialog appears when you click **Set**, asking you for the volume's new password. Type in a sequence of up to 14 characters. Then click the **OK** button. The dialog asks you to retype the sequence for confirmation. Retype the sequence and click **OK** again. *If you enter a null password or reenter it incorrectly, the effect is not electing* ***Password.***

You may not elect both ***Automatic*** *and* ***Password.*** *You may not elect* ***Locked*** *until at least one file exists on the volume. You may not elect the unstable combination of* ***Automatic***, ***Network***, *and not* ***Locked.***

5. Click the Set button when you are ready to record the changes, or click the Quit button if you decide not to make any changes.

The **Set** button is disabled until you make a change. *The* ***Set*** *button remains disabled if the disk is write-locked.*

If you click the **Set** button, the Manager changes the volume's features. If the volume is open by you or anyone on your AppleTalk network, a message advises that the features can not be changed now. Retry the operation once the volume has been released.

The dialog updates to reflect the current status of the drive. You may repeat the sequence of altering volumes from step 2, or click **Quit** if you are done making changes.

Removing volumes

Follow the procedure below to remove MacServe volumes. *Using any other application to perform this function can corrupt your hard disk.*

1. Select "Remove" from the Manager's Volumes menu.

The Remove Volume dialog appears, as shown below.

2. Click the Drive button to select a hard disk drive.

The name of the selected drive appears above the button, which is disabled if only one drive exists.

The dialog lists the volumes on the selected drive in the scrolling box. A checkmark next to a volume name indicates the volume is in use and cannot be removed.

3. Select the name of the volume you want to remove and click the Remove button, or double-click on the name.

A secondary dialog appears and asks you to confirm that you want to remove the selected volume. The dialog provides summary information about the volume to assist your decision.

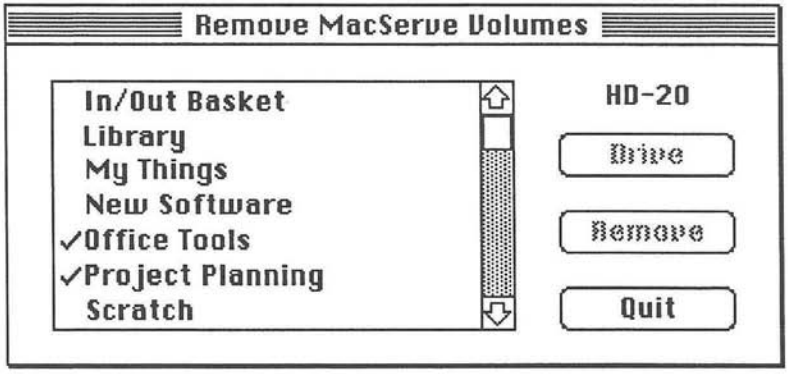
4. Click the OK button to proceed; click the Cancel button or press the Return key if you do not want to remove the volume.

If you click the OK button, the Manager permanently removes the volume. If the volume is open by you or anyone on your AppleTalk network, a message advises that the volume cannot be removed now.

The removal will fail if the disk is write-locked. However, the volume will be removed from the server's tables until you reboot your Mac.

Warning: You cannot UNDO the removal of a volume. All the files on the volume will be lost.

The dialog returns you to the Remove Volume dialog. You may repeat the sequence of selecting and removing volumes, or click Quit if you are done.



Setting the server startup features

The MacServe disk and print server functions exist in the background of your Macintosh. If you want to use them during a computing session, they must be loaded into memory when you start the machine.

Use the Manager to indicate whether you want the servers installed the next time you start your Mac and the amount of memory to use for disk caching.

Due to its placement in memory, MacServe is loaded into memory and its cache allocated only at system startup.

To adjust the startup features of MacServe:

1. Select "Startup Options" from the Manager's Settings menu.

The Server Startup Features dialog appears, as shown below. It displays the current startup settings.

2. Accept the recommended cache size or enter a value less than the free memory limit.

The dialog shows you how much memory is available in your Mac for applications and MacServe's disk cache. The minimum acceptable value for the disk cache is 10 Kbytes. The maximum value still leaves 128 Kbytes for applications.

The value you enter is used to allocate the cache the next time you start your Mac.

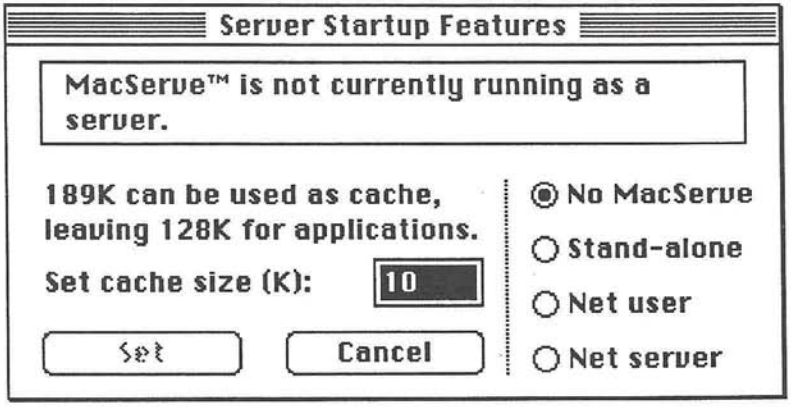
If the value you enter is too large when you restart your Mac, MacServe reduces the cache size to fit. This can happen if you remove a memory board from your machine.

3. Select the desired startup mode.

If you select **No MacServe**, MacServe will not be operational the next time you start your Mac. Choose this option to completely disable MacServe temporarily, without removing it with the MacServe Installer.

*You may also select **No MacServe** when your Mac starts by holding down the M and S keys once the Happy Mac icon appears, until the Finder (or your startup application) appears.*

If you select **No network**, MacServe will not load the AppleTalk support software. Choose this option if you want server support but do not require network access and wish to retain your printer port for direct connection of a serial printer.



*Make sure your Mac is not connected to an AppleTalk network if you start it with **No network** selected. Failing to do so will cause serious disruption to the network. When switching to this option on 512K Macs, you must perform a complete power cycling before restarting your Mac to prevent spurious printing.*

If you select **Net user**, MacServe will temporarily downgrade your capabiliites to those of a user node, without requiring a reinstallation. Choose this option to disable server functions without loosing your ability to access the network.

If you select **Net server**, MacServe will provide full local and network services on your Mac.

4. Click the Set button when you are ready to record the settings, or click Cancel if you decide not to make any changes.

The **Set** button is disabled until you make a change.

If you click the **Set** button, the Manager records the changes you made. You may adjust these settings as often as you like; they take effect only when you restart your Mac.

If you make a change to the startup mode, the Manager updates the port B configuration bits in your Mac's parameter RAM to match the selection. This is much like the action of Apple's Chooser desk accessories. *Electing **No MacServe** makes the port use undefined. Electing **No network** prevents the use of AppleTalk. Electing either network mode forces AppleTalk support.*

About disk caching

Disk caching is a performance enhancement feature of MacServe. It retains copies in memory of those segments from disk storage that were most recently used. Even though MacServe always writes data directly to the disk for security, it can frequently read data from the memory copy, avoiding the delay of a disk access.

With disk caching, you achieve many of the performance benefits of a ramdisk. However, your data is protected against power failures. And, you do not have to copy files to the cache or save them when you are done.

MacServe distributes its cache over all the open volumes. It does not provide caching for storage outside of its domain, such as your root disk or any diskettes.

The optimum size for MacServe's disk cache is application dependent. Increase the cache size as you increase the number of simultaneous users sharing your disk. A larger cache can reduce the impact you experience when others access your networked volumes.

On the other hand, too large a cache may prevent you from using very large applications or Switcher effectively.

Setting network access features

The MacServe disk server is available to your Mac at all times, if you select **No network** or **Net server** from the Startup Options dialog. You may disable the MacServe print spooler with the Printer Options dialog, below.

If you attach your Mac to an AppleTalk network, and select **Net server**, you may elect to make either or both servers available to other network users. Chapter 2 discusses how they can share your Mac's resources.

You may not remove your servers from the network or change their names while they are actively being used. It could be very disruptive to other users if you turn off your Mac, either through the power switch or the Finder's Shut Down option. *MacServe prevents the Shut Down option from completing if your server is in use. MacServe has no control over the soft power switch on the Mac XL.*

The desk accessory is the fastest way to tell when others are using your servers; it displays a message when you access it. You also receive a message if you ask the Finder to Shut Down your Mac when you have users; shortly thereafter, the Finder restarts (under Finder 5.1, Shut Down is disabled if you have users; Finder 5.0 is not supported). The Manager's View Users option will identify your current users, if they have user names.

You assign names to your servers. These names identify your servers through the MacServe desk accessory, whether you are connected to AppleTalk or not.

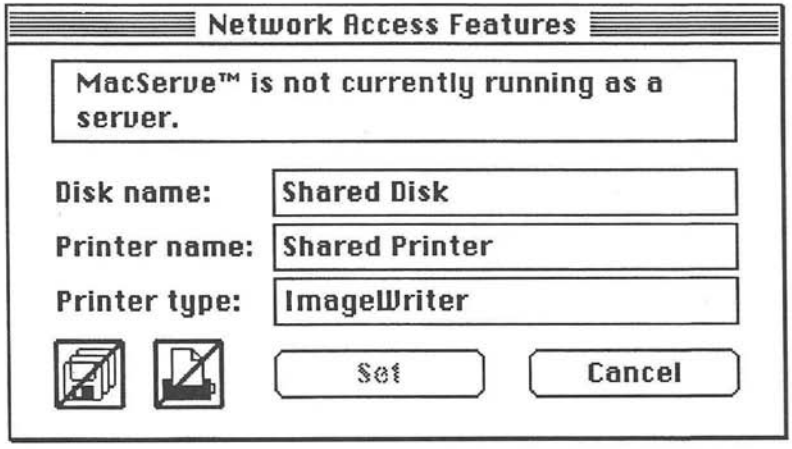
The names of your servers must be unique to avoid confusion. Connect your Mac to your network before changing their names to prevent duplicate names.

To adjust the network access features:

1. Select "Network Access" from the Manager's Settings menu.

The Network Access Features dialog appears, as shown below.

The dialog displays the current network settings. The icons indicate whether network access to your servers is enabled. The names are those used by the desk accessory to identify your servers.



The disk and print server icons are disabled if their names could not be validated at startup. The dialog is available, even if you elect not to have network support.

2. To adjust network access to your disk server, click the disk server icon.

The icon dims and does not respond if there are active network users of your disk server.

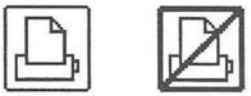
3. Accept the current disk server name or enter a new one.

The name you choose appears next to the **Volumes** button in the desk accessory when someone selects your disk server. Supply a unique, non-blank name.

You may not change the name of your disk server if it has active network users.

Keep the names of your disk and print servers under 14 characters if you have any XL/Serve nodes on your network.

4. To adjust network access to your print server, click the print server icon.



The icon dims and does not respond if there are active network users of your print server.

If you disable network access to your print spooler, your print jobs begin printing even before they are completely received. When network access is enabled, your jobs enter the queue along with those from network users.

5. Accept the current print server name and printer type or enter new ones.

The printer name you choose appears above the **Printers** button in the desk accessory when someone selects your print server. Supply a unique, non-blank name.

The printer type is the name of the printer driver that supports this printer. MacServe compares your printer type with the driver files on system disks to decide if a user can access your print spooler. *Appendix A discusses printer drivers.*

You may not change the name or type of your print server if it has active network users.

6. Click Set to record any changes you made, or click Cancel if you decide not to make any changes.

The **Set** button is disabled until you make a change.

When you change the name of a server, the Manager attempts to verify that the new name is unique. A message advises you if it finds another MacServe host on the network using the same name. You must supply unique, non-blank names.

You can find out the names of other servers by using the **Volumes** and **Printers** buttons in the desk accessory, or with the View All Devices option in the Manager.

If you click the **Set** button, the Manager records the changes you made. If you changed the name of a server, there is a short delay while the name is validated on the network. The changes go into effect immediately.

Setting the printer options

The MacServe print spooler sends documents to the printer it is spooling over a serial communications link. Because different brands of printers may use different protocols, the MacServe Manager includes a dialog to specify the protocol required for your printer.

The dialog also allows you to specify whether you have a printer available for spooling. This option controls whether your spooler can be accessed over the network and whether it appears among your printer choices in the desk accessory.

The Printer Options dialog is only enabled while spooler printing is paused or disabled (see Setting the Print Spooler Options, below).

The default settings for the printer communication protocol are appropriate for an ImageWriter. If you have a different kind of serial printer, you may need to adjust these settings. Consult the technical documentation that came with the printer to determine your exact requirements.

To change the printer communication protocol options:

1. Select "Printer Options" from the Manager's Settings Menu.

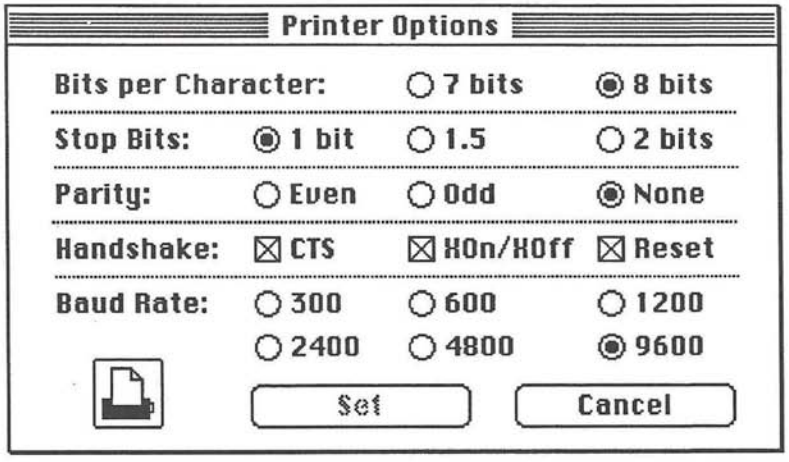
The Printer Options dialog appears, as shown below. It shows the configuration currently being used by MacServe to communicate with your spooled printer.

2. Select the protocol options required by your printer.

The options correlate with the technical specifications for your printer and include: baud rate, bits per character, number of stop bits, parity, and the handshake mode.

Some printers can operate at speeds above 9600 baud, but at these speeds the performance of your Mac is adversely affected. For this reason, MacServe limits the baud rate at 9600 baud.

Some add-on hard disk drives for the Macintosh that attach to your modem port include a serial pass through capability that allows you to attach your printer to the hard disk drive. They may not support any protocol options other than those normally used for an ImageWriter. Consult the drive manufacturer if you are in doubt about this.



3. Check the Reset box if your printer is an ImageWriter.

MacServe offers special printer reset logic for ImageWriters. This flushes the printers buffer and delays an appropriate amount for resets after job aborts. Leave this box unchecked if your printer is not an ImageWriter.

4. To adjust the availability of MacServe's print spooler, click the printer icon.


Available


No Printer

If you indicate you have no printer by clicking the icon until it has a slash through it, MacServe disables its print spooler (and automatically disables network access to it). This prevents the spooler from being unpaused (in the Print Spooler dialog) and guarantees the print spooler's port is free.

You may still access other MacServe print spoolers over the network.

5. Click Set to record any changes you made, or click Cancel if you decide not to make any changes.

The Set button is disabled until you make a change.

If you click the Set button, the Manager records the changes you made. Changes to the printer protocol options go into effect the next time spooler printing is activated (unpaused). Changes to the availability of a printer go into effect immediately.

If you make the print spooler available after MacServe is running you may want to reenable network access to it.

Setting the print spooler features

The print spooler is active whenever you choose to have MacServe loaded in memory and indicate you have a printer. Even though AppleTalk may be using your printer port, your applications act as if you have a printer there. When you select a MacServe print spooler through the desk accessory, MacServe captures all the data that normal applications direct to your printer port. It redirects printing to a spooler, which prints to your modem port (if you select **Net server**) or to your printer port (if you select **No network**).

Applications that directly access the printer port, such as terminal emulators, can cause serious system errors by disrupting AppleTalk. If such applications directly access the port MacServe is spooling to, spooler printing may be adversely affected unless the spooler is paused first. To avoid this, reconfigure these applications according to the vendor's documentation while MacServe is not loaded.

To adjust the print spooler features of your MacServe system:

1. Select "Print Spooler" from the Manager's Settings menu.

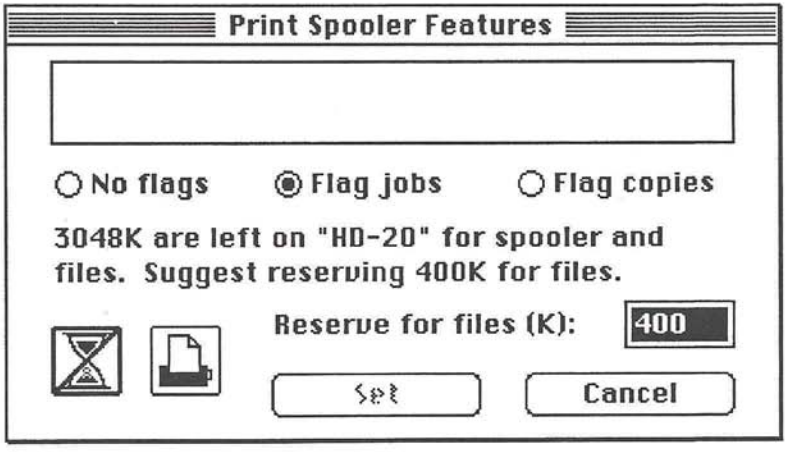
The Print Spooler Features dialog appears, as shown below. It displays the current spooler settings.

2. To adjust whether the spooler is paused or able to print, click the Printer icon.

The icon dims and does not respond if you no printer is available with the Printer Options dialog. The Printer Options dialog, in turn, is enabled while the spooler is paused.

Pause the spooler if you want to hold all jobs the spooler receives. You might want to do this so you can attach a modem to your Mac's modem port and still create printer output from your application. Reattach the printer and enable the spooler once you complete your communications.

Disconnecting and connecting printers can cause the Mac and the printer to get out of synchronization. If spooler printing does not work, try cycling the power on the printer, or try toggling its on-line button.



Pausing the spooler suspends output to the printer. The printer may not stop immediately; it will stop once it drains any data already present in its internal buffer. If the printer is attached through an external print buffer (including some hard disks), pausing the spooler may be ineffective. Once MacServe has sent the job to the printer, it has no further control over it.

3. To adjust whether the spooler prints deferred jobs, click the Defer icon.

Users may elect, when they direct printing to a spooler, to defer the job. This places an indefinite hold on the job and allows higher priority documents to print sooner. Clicking the icon until it has a slash through it blocks deferred jobs; removing the slash allows those jobs to print.

When the spooler blocks deferred jobs, other jobs may bypass them in the queue. Without deferring, printing of jobs occurs in the order they were received, regardless of whether they were submitted as deferred jobs.

Print jobs occupy slots in the print queue, which is limited to 32 pending jobs (and limited by the file reserve you specify). They also occupy disk space. You will not want to defer jobs indefinitely!

You can detect deferred jobs and adjust their state with View Print Jobs, described in Chapter 2.

4. Accept the recommended file reserve or enter a value less than the available disk space.

The dialog shows you how much disk space is available on your Mac's root disk for spooling and new files. It suggests an amount to reserve for files. The minimum value is 100 Kbytes.

The spooler will stop accepting print jobs when the free disk space declines to the value you enter, rather than using a fixed size area. Make the limit low enough so that enough space is available for all the print jobs you might want to spool. Leave room for any files you might need to create on the root disk.

If the spooler is in the middle of receiving a print job when it reaches this limit, it terminates and discards the job.

5. Choose the way you want print jobs to be identified by checking one of the Flags options.

If you select **No Flags**, the jobs will print without identification pages or intermediate page ejects. Select this option if you want to conserve paper or you are printing on special forms (including paper sizes other than 8 1/2 inches by 11).

If you select **Flag Job**, the spooler preceeds each job with a page eject and a banner that identifies the name and creator of the job and other pertinent information. This is very useful when several users share a spooled printer. The banner helps you find the beginning of each job and identify its owner.

If you select **Flag Copies**, the spooler preceeds each copy of a job with a banner page.

6. Click the Set button to record your changes, or click Cancel if you decide not to make any changes.

The **Set** button is disabled until you make a change.

If you click the **Set** button, the Manager records the changes you made. The changes go into effect immediately.

The Manager's password

The MacServe Manager performs functions that can have significant consequences for the security of your Macintosh, your hard disk, and AppleTalk. These functions include:

- the options in the Volumes menu, and
- the options in the Settings menu.

You can limit access to these menus by assigning a password that only you (and any others you share the password with) know. Without the correct password, users cannot access these menus.

Only the Manager on your root disk has access to these menus.

When you first install MacServe on your Macintosh, there is no password. This allows unrestricted access. To change this or subsequent passwords:

1. Select "Password" from the Manager's Settings menu.

A dialog asks you for a password to restrict access to the Settings and Volumes menus.

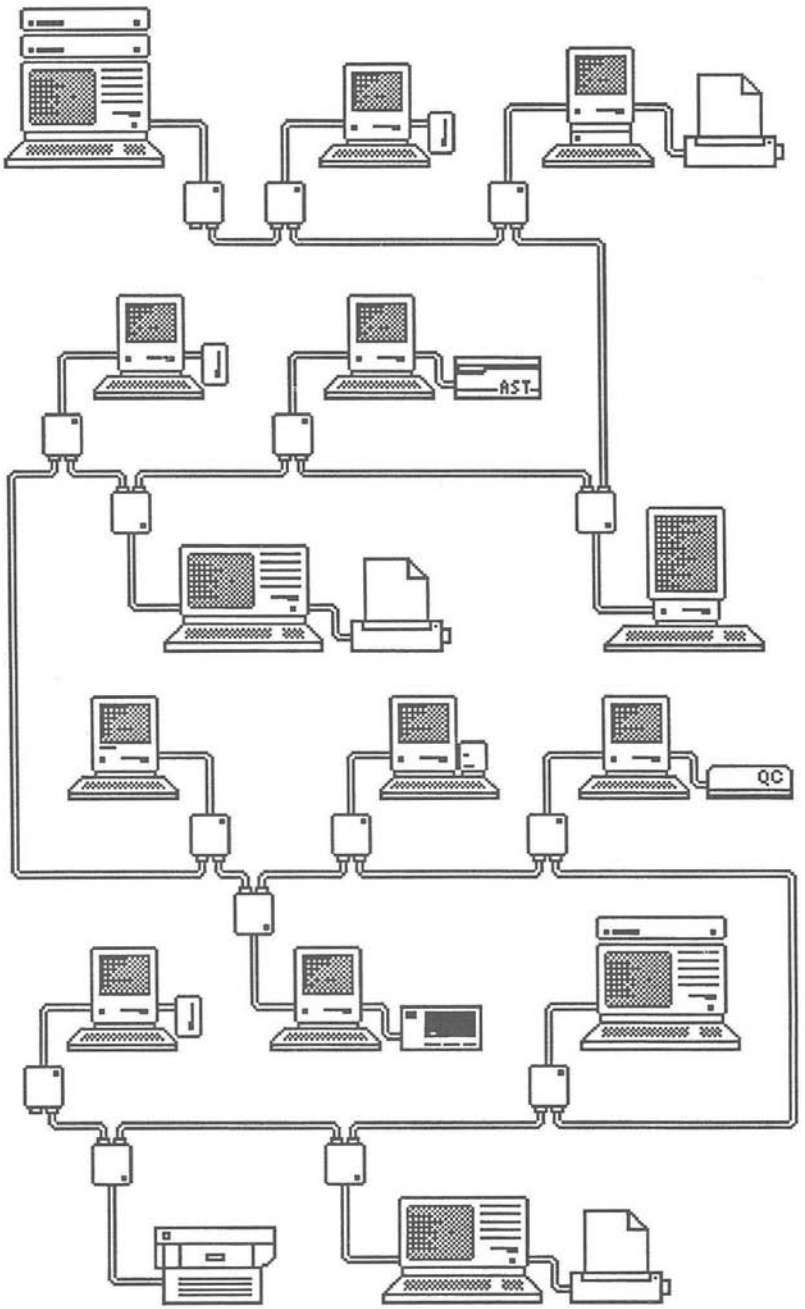
2. Type in a sequence of up to 14 characters. Click the OK button. The dialog asks you to retype the sequence for confirmation. Retype the sequence and click the OK button again.

The longer you make the password, the lower the chance someone will be able to guess it. The password may include spaces.

You can turn off the Manager's password checking by clicking OK each time without typing any characters. This same affect occurs if you retype the sequence incorrectly.

You will be asked to enter the same password each time you run the Manager. You must type the exact sequence of characters to gain access to these menus. The password is not case sensitive -- "A" is the same as "a".

Reference



Appendix A
Tips and Gotchas

The following pages are a compendium of miscellaneous notes that will help you get the most out of your MacServe system. They also will help you avoid or get out of trouble.

Use the blank space at the end to add your own notes and observations. We would appreciate your sending a copy of them to us.

Adapting a cable to a Macintosh XL

If you are unable to obtain an AppleTalk XL Connector Kit (with 25-pin connector that attaches to the Macintosh XL), you may substitute an AppleTalk Connector Kit (with 9-pin connector that attaches to a 512K Macintosh).

The chart below shows how to build an adapter cable from the 25-pin Macintosh XL printer port connector to a 9-pin Macintosh compatible AppleTalk connector. Keep the cable length short (under 6 inches).

This adapter is not a substitute for AppleTalk connectors.

Contact a qualified service technician if you need assistance.

AppleTalk ImageWriters

With an AppleTalk interface card for the ImageWriter II you can share a printer on an AppleTalk network, much like a LaserWriter -- one user at a time. If another user wants access, they must wait until the current user releases it.

On the other hand, you can attach the same ImageWriter II to a MacServe host, so it can be spooled. This allows a large number of users to share it at the same time.

If you elect to have both an AppleTalk ImageWriter and an ImageWriter spooled by MacServe, you must change the name of the ImageWriter driver at all MacServe nodes to something like "Ms ImageWriter" to avoid confusing the Chooser desk accessory. Otherwise the chooser will incorrectly match printers and printer drivers.

Type		TXD-	RXD-	GND	RXD+	TXD+
DB-25P		2	3	7	19	20
DB-9S		5	9	3	8	4

Chooser and Choose Printer

MacServe prevents the Chooser desk accessories from changing the AppleTalk connection status. This ensures they will not remove AppleTalk while MacServe is active.

Since the MacServe desk accessory allows you to select printers, whether local or networked, you will normally not need to use a chooser.

You may remove the chooser from your system to avoid confusion. To do this, use the "Font/DA Mover" supplied on your Macintosh System Disk.

Clipboard nasties

The Clipboard is where information is stored that you want to transfer from one application to another.

Unfortunately, Clipboard files are usually stored on your current default volume (normally the volume your application is located upon). This means you need write access to that volume if you want to transfer information to another application.

The Macintosh never closes Clipboard files. It simply opens new ones as the default volume changes. This becomes important when you use Switcher, since a volume with an open file cannot be released. Otherwise, Switcher would get very upset! You can release the volume with the Finder, once Switcher is completely shut down.

Databases

Very few Macintosh applications are designed to assume the special responsibilities of multi-user access to shared storage.

MacServe does not normally allow simultaneous access to a volume by multiple users while any user has write access, unless they follow a special protocol. This ensures the integrity of the data on MacServe volumes.

You will soon see applications that use MacServe's multi-user protocol. If you are a developer, specifications are available from Infosphere.

Etiquette

Sharing information and equipment on a local network requires special courtesies. The golden rule of networks applies:

- **Use shared resources as you would want others to use them.**

At a practical level, we suggest the following:

- *Release volumes when you no longer need them.*
- *Use the lowest "print quality" you need when printing to a MacServe spooler.*
- *Use deferred printing for lengthy print jobs.*
- *Do not arbitrarily break AppleTalk connections, and if you must, make it brief.*
- *Do not use buggy software on a host; it may crash, taking all the users with it.*

Hardware specifics

MacServe has been tested with the hard disk drives listed on the back of this package. Those that require special support software include:

- Paradise Mac-10 and Mac-20 requires their software version 2.0.
- PCPC MacBottom requires their software version 2.1.
- Quark Peripherals QC-10 requires their software version 2.0, available on request from Quark.
- Tecmar MacDrive requires their software version 2.3.

In general, a hard disk drive will work with MacServe if:

- It is an Apple product, or
- It is compatible with the Macintosh Plus, or
- It starts automatically, without requiring a dedicated Startup Application, and
- It does not attach to the printer port.

Some disk drive manufacturers include print spooling or disk caching capabilities. We suggest you disable these features when using MacServe.

The Heirarchical File System (HFS)

In the fall of 1985 Apple introduced its new heirarchical file system. The initial RAM-based prototype came with the Hard Disk 20. It consumes most of the Mac's system memory (heap), making it difficult to add accessory software. The Macintosh Plus incorporates an improved version in ROM, reducing memory requirements.

Using Finder 5.0 or later does not imply you have HFS. HFS is built into the 128K ROMs, or loaded from a separate file.

Developers are striving to achieve compatibility with HFS. MacServe works with HFS, given the following limitations:

- HFS volumes are only accessable to users whose Macs support HFS.
- MacServe only supports contiguous volumes on HFS disks. If your disk is fragmented, there may not be enough room for volumes unless you rebuild it.
- The MacServe archiver does not support HFS media.
- HFS is not (yet) available for Macintosh XLs.

Folders under HFS behave differently from MFS. The following guidelines will help prevent problems:

- Keep the Finder and System in the same folder with all your printer drivers. Otherwise, the disk may not be bootable.
- Keep the Manager and its Help file in same folder. Otherwise, the Manager's Help function might not work.

System heap space (memory) is so constrained with RAM-based HFS that you may experience problems trying to open more than one MFS MacServe volume.

Improving your network performance

AppleTalk is throughput limited at 230 Kbaud (about the speed of a diskette). This prevents it from being an effective disk substitute. Try using the following techniques to improve performance (by reducing the network load):

- Allocate as large a disk cache as possible on heavily used servers. Information retrieval from cache is faster than from disk.
- Keep disk-intensive work off the network. Instead, provide local hard disks for all your "power" users. Equip them as MacServe hosts for information sharing.
- Locate information where it is most heavily used. For example, a database should be located at the Mac of its primary user. Others can still access it, on an occasional basis, over the network.
- Use a local System disk, since the System and Finder are heavily used.
- On Mac Plus-based user nodes, enable the optional file cache (from the Control Panel).

Internets

When multiple AppleTalks are connected they become an internet. The connection device is called a bridge, and is available from several AppleTalk vendors.

MacServe has been tested on internets and has the following limitations:

- The MacServe desk accessory will recognize a maximum of 16 MacServe hosts.
- Each MacServe host can support a maximum of 32 MacServe users.
- Hosts and users only recognize a single zone; the one they are located on.
- Communications may not be reliable across slow half-bridges (under 9600 baud).

MacServe takes longer to perform lookups on internets. This is normal.

Library volumes

You can effectively create libraries of commonly used documents and applications that are shared on your network. These are volumes with **Network** and **Locked** features. Anyone (unless you assign a password) can read from these volumes, even if someone else is using them.

We find it helpful to assign a librarian to manage these special Library volumes. When information needs to be updated:

- Set the volume features to non-**Network**, and not-**Locked**, using the Manager's Alter Volumes option.
- Open the volume and update its contents.
- Release the volume.
- Then, reset its access capabilities to **Network** and **Locked**.

Macintosh Plus file cache

The Macintosh Plus offers an ability (through the Control Panel) to allocate some of its memory as a cache for files. This is similar to and compatible with MacServe's disk cache, described in Chapter 3.

There are some differences:

- MacServe's cache operates at the host; it supports all of the host's users. The Mac Plus cache operates at the user end; it services the local user.
- MacServe's cache is guaranteed to mirror the disk. The Mac Plus cache updates the disk when the cache needs to be released. This makes it faster. It also makes it susceptible to power failures.

Both caches enhances performance for the user of a MacServe host, for different reasons. MacServe's cache increases the responsiveness of the host. The Mac Plus cache reduces loading of MacServe hosts.

MacServe's cache is needed to improve network performance. Do not make it too small.

Multi-user support

MacServe includes a protocol for applications that want to manage multi-user access to documents. The specifications for this protocol are available to developers.

If you are using an application that uses MacServe's access protocol, remember to open the volumes that contain associated documents with the **Shared** option. This allows others to simultaneously access then. Open them **Private** if no one else needs access.

Note that the volume must not be permanently **Locked** from the MacServe Manager. This option prevents modification under any circumstances.

Network capacity

An AppleTalk network can be viewed as a form of plumbing. It has a finite flow capacity. When used effectively, it can sustain the data communication needs of a small work group. When abused, it will clog.

To estimate the capability of a network to provide shared disk support, imagine each of the nodes in use, stand-alone. If the diskette drive of at least one node is turning most of the time, while it acquires data that will be coming from the network, then the network may often be clogged. If, on the other hand, the diskette drives are mostly quiet, the network will suffice.

Applications that require continual access to data from storage should keep the data on a local storage medium.

Network friendly software

Developers might consider the following when designing applications for network friendliness:

- Will your application run from a write-locked disk? Or does it try (and fail) to create temporary files there?
- Will your application allow examination of documents on write-locked disks? This makes documents shareable.
- Does your application seek a disk (such as the System disk) that is writeable for temporary files and print documents?
- Does your application use the System disk for Clipboard files? The 128K ROMs now place the Clipboard on the System volume -- a reasonable location for scratch files.

Printer drivers

A printer driver file contains software which knows how to control the operation of a particular type of printer. Examples are the ImageWriter and LaserWriter files in your system folder.

Other vendors supply printer drivers to support printers not manufactured by Apple. We have not had an opportunity to test many of these.

When you select a printer with the MacServe desk accessory or Choose Printer, portions of the printer driver file are copied to your system file. Both of these accessories allow you to select printers from the printer files present on your system disk. *The selection is superceded when you switch Systems.*

If your system disk is write-locked, you will only be able to use a previously chosen printer resource already in your system file. Under HFS, printer drivers MUST be located in the same folder as your System and Finder.

See also the discussion of AppleTalk ImageWriters.

Serial ports

If you are not sure which serial connector to use:

- Serial port A corresponds to the Mac's modem (rightmost) port. This is where you connect a character printer, such as an Imagewriter, when you use AppleTalk.
- Serial port B corresponds to the printer port. You must attach AppleTalk here when running on a network. When you use MacServe in stand-alone mode, this is where you attach your spooled printer.

If you want to attach both a printer and a modem while attached to a network, an A-B switch box can be obtained from several vendors. The spooler will buffer your printer output while you use the modem. *You must Pause the spooler to use a modem.*

Switcher

Switcher is a system utility from Apple Computer that allows you to have more than one application resident in memory at the same time, increasing performance.

MacServe is compatible with Switcher version 4.4 (the 1st official release). *However, Switcher 4.4 has problems releasing disks and volumes under Finder 5.1.*

The MacServe desk accessory is larger than most. You might want to allow an additional 32K of memory in Switcher partitions so you can safely use the desk accessory.

Switching systems

Your "startup disk" is where the current System File and Finder are located. Its icon appears in the upper right corner of your desktop under Finder.

If this is a MacServe volume, you must change to a different startup disk before you can release the volume.

To switch systems:

- **Hold down the Option and Command keys and double-click on the icon of an application (or the Finder) on the volume you want to make your new startup disk.**

Your discoveries

Appendix B
Error Messages

This section contains a summary of the messages from MacServe that may require some explanation. The messages are listed in alphabetical order, by source.

If you encounter a problem not described by a MacServe message, consult the *Troubleshooting tips* contained in Appendix C.

Use the space on the rest of this page to record any messages you encounter that are not listed here and require explanation.

Your own observations:

Startup messages

These messages appear in the "Welcome to Macintosh" screen during your Mac's startup phase.

Warnings are not fatal conditions; MacServe will be operational with limited capabilities.

- **AppleTalk failed to load.**

  Make sure nothing but an AppleTalk cable is attached to your printer port. If that is not the problem, reinstall MacServe. If the problem persists, try removing desk accessories (especially those that might use the printer port).

- **Can't find configuration file.**

  Run the MacServe Manager and check all the options in the Settings menu. If the problem persists, try reinstalling MacServe.

- **Can't get MacServe™ resources.**

  The System is corrupt and has prevented MacServe from obtaining one of its DRVR resources. Reinstall MacServe on a fresh System.

- **Can't get port for AppleTalk.**

  The printer port is configured for asynchronous use, disallowing AppleTalk. Use Apple's Chooser (or new Control Panel) to connect and then disconnect AppleTalk.

- **Can't get system heap space.**

  The system heap (memory) is too full for MacServe to obtain the (less than) 2 Kbytes it needs. Probably caused by excessive accessory software (especially support for AppleTalk products or disk drives). Try removing products of this nature until the problem goes away; or reinstall MacServe on a fresh System.

- **Can't initialize MacServe™ driver.**

  An error occurred when opening the MacServe driver. Reinstall MacServe.

- **Can't initialize printer driver.**

  The printer port serial driver could not be opened. Use Apple's Chooser or new Control Panel to connect, then disconnect AppleTalk. Make sure no other device, such as a disk drive, expects to be connected to the printer port.

- **Can't load from a floppy.**

  You started your Mac from a diskette whose System file was copied from a MacServe host. Use the MacServe Installer to remove MacServe from the floppy.

- **Configuration file has no signature.**

  The server configuration file is corrupt. Reinstall MacServe. Then configure the Manager's settings.

- **Configuration file is bad.**

  A failure occurred trying to read the server configuration file. Try reinstalling MacServe. Then configure the Manager's settings.

- **MacServe™ already loaded.**

  The System is corrupt and has caused MacServe to try twice to load into memory. Reinstall MacServe on a fresh System.

- **MacServe™ loading... NOT LOADED.**

  If you were expecting MacServe to load, check in the startup mode in the Manager's Startup Options dialog.

- **Manager and server mismatched.**

  Reinstall MacServe after deleting any MacServe Manager(s) present on your system.

- **No serial number.**

  The MacServe disk used to install this host was tampered with. Reinstall with a valid disk.

- **Printer port not available.**

  In **No network** mode, AppleTalk has been installed and the printer port can't be used for printing. Use Apple's Chooser or new Control Panel to connect, then disconnect AppleTalk.

- **This is a renegade server.**

  Another MacServe host with the same serial number was detected on the network. Use the MacServe Installer to remove MacServe from one of the hosts. Reinstall using the correct disk. Purchase another MacServe package if you want more hosts.

- **Warning: A configuration file was deleted.**

  Multiple server configuration files were found among the drives currently on-line. All but the file which was last modified were deleted. The latest one was used for server start-up info. Use the Manager to verify these settings are correct.

- **Warning: A volume failed to automount.**

  At least one volume marked Automatic could not be opened. No more than 6 volumes can automatically open and they cannot have passwords. If the volumes are structured with HFS, your Mac must support HFS.

- **Warning: Can't find any volumes.**

  No MacServe volumes were found on the currently available disk drives. The server is running with no available volumes. Use the MacServe Manager to create volumes or connect any other hard disk drives you have.

- **Warning: Can't restore print jobs.**

  Some or all of the print jobs left in the spooler queue from your last computing session were lost. The server configuration file is probably corrupt. Reinstall MacServe as soon as any remaining print jobs have printed.

- **Warning: Duplicate disk server name.**

  Your disk server is not available to the network. Assign it a unique name using the Manager's Network Access dialog and make it network visible.

- **Warning: Duplicate print server name.**

  Your print server is not available to the network. Assign it a unique name using the Manager's Network Access dialog and make it network visible.

- **Warning: Duplicate user name.**

  The user name for this node matches one already in use on the network. The name has been modified to make it unique. Use the Manager's View MacServe Users to change the current name, or reinstall MacServe and assign a unique user name.

- **Warning: No server name.**

  Your disk and/or print server is not available to the network. Assign it a name using the Manager's Network Access dialog and make it network visible.

- **Warning: No user name.**

  No user name was found in the System file. Use the Manager's View MacServe Users to assign a unique user name, or reinstall MacServe and assign one.

- **Warning: Unable to honor cache request.**

  There is not enough memory to satisfy the amount of cache requested by the Manager's Startup Options dialog. Perhaps your have removed a memory board or allocated the memory to something else. Adjust the cache request with the Manager.

Desk accessory messages

These messages appear in the message window of the MacServe desk accessory.

- **Can't find the disk server you had selected.**

  The server has probably gone off-line. Try again to locate it. If that fails, check the host and your AppleTalk cables.

- **Can't find the printer you had selected.**

  The printer has probably gone off-line. Try again to locate it. If that fails, check the printer, its host, and your AppleTalk cables.

- **Click Printers to repeat the lookup.**

  No printers could be located, or the last printer in the list disappeared. Try looking again. If that fails, check your AppleTalk cables or use the Manager's View AppleTalk Devices option to see if any remote printers or print spoolers are on-line. Check to see that your System has an appropriate printer driver, and that the driver is in the same folder as the System and Finder. Verify that the System disk is not write-locked.

- **Click Volumes to repeat the lookup.**

  No disk servers could be located, or the last server in the list disappeared. Try looking again. If that fails, check your AppleTalk cables or use the Manager's View AppleTalk Devices option to see if any servers are on-line.

- **Failed to record your printer selection.**

  An error occured while trying to update the System file. This happens most frequently when there is not enough system heap (memory) to modify the System file. System heap is consumed by RAM-based HFS, each open volume or disk, and some desk accessories or drivers. Restart your Mac and try again with less system heap loading.

- **Sorry, MacServe is not running on this machine.**

  The best way to find out why MacServe is not running is to check the message MacServe issues during your Mac's startup sequence, after "Welcome to Macintosh" appears. These messages are detailed, under *Startup messages*. Can also occur if you copy the desk accessory with the Font/DA Mover, instead of the MacServe Installer.

- **Sorry, this volume is too large to open.**

  There is not enough memory available to successfully open the volume. If you are in an application, exit and try again while using the Finder.

- **Sorry, you can't access this HFS volume.**

  The volume is structured with HFS and your Mac only supports MFS. Try opening it on a Mac with HFS support (such as a Mac Plus).

- **Sorry, you can't open any more volumes.**

  You are allowed to have open a maximum of six MacServe volumes at once. Release one you no longer need and try again.

- **This volume is not available now.**

  Someone else is using the volume, or you entered an incorrect password.

- **Warning: can't find the local disk server!!!**

  Something has become seriously corrupt on your MacServe host. Try restarting your Mac. If the problem persists, try reinstalling MacServe.

- **Warning: this desk accessory is mismatched.**

  The desk accessory was not installed from the same MacServe kit as the other components. Reinstall MacServe.

- **You have files open on this volume!**

  You tried to **Release** a volume that has open files (frequently a discarded Clipboard). Close the files and try again. If that fails, drag the volume to the Trash with the Finder.

- **Your last print job could not be deleted.**

  The spooler you sent your last print job to is no longer selected, or the job has already printed.

- **Your last print job was unsuccessful: err -90x**

  An error occured on your last print spooler job. The code identifies the specific problem. These are described in detail, under *Spooler messages*.

Print spooler messages

There are a number of possible errors that can occur when print spooling. MacServe returns these error codes to applications in the standard location used to report print errors. The MacServe desk accessory also reports these code numbers when you next open it, in case the application did not inform you.

It is good practice to activate the desk accessory each time you print to a spooler. This closes the print job and allows you to confirm printing was successful.

-900 Printing was cancelled from the originating application.

-901 The serial driver could not locate the MacServe driver, and was unable to communicate to the print spooler. Probably caused by a resource conflict in your System or application. Restart your Mac. If the problem persists, try reinstalling MacServe.

-902 The serial driver has a version number which differs from that of the MacServe Driver. Reinstall MacServe.

-903 The printer you had selected is no longer valid. This can happen if you switch Systems and the new System does not support the selected printer. Use the desk accessory to reselect printers. Remove unnecessary System files from your volumes.

-904 A communication failure occurred while MacServe tried to send a print job to a spooler. Make sure your network is intact. Make sure the host is not overly loaded (this can happen when the host is performing a long series of diskette operations). Try restarting your Mac.

-905 The print spooler failed to accept a new print job. This can happen when there is not enough disk space on the host for another job, the queue is full, or a file error occured on the host. Wait until the spooler completes some of its jobs. Then, try printing again. If necessary, lower the spooler file reserve on the host.

-906 The print spooler could not accept part of a print job and the job was deleted. This can happen when there is not enough disk space on the host for the job, the host was restarted while receiving the job, or a file error occured on the host. Wait until the spooler completes some of its jobs. Then, try printing again. If necessary, lower the spooler file reserve on the host.

-907 The print spooler could not close a print job. This can happen when a file error occurs on the host, or the host was restarted while receiving the job. Try printing again. If the problem persists, restart the host.

Server errors

There are a number of serious errors that can occur within the host server. When these occur (which is rare), the server cannot continue and must be rebooted. They are reported by number. The codes mean:

> **MacServe™** **A serious error has occured. Please consult your MacServe manual. Error code *nn.***

0 A read error occurred accessing the hard disk on which a volume is located. Reformat the disk (after saving its contents, if possible).

1 A write error occurred accessing the hard disk on which a volume is located. Make sure the disk is not write-protected. Otherwise, reformat the disk (after saving its contents, if possible).

34 You are using a Finder earlier than version 4.1. MacServe reports a serious error so you will remove this obsolete Finder to prevent more subtle errors from occurring.

38 The version numbers for the MacServe components you are using do not match. Reinstall MacServe.

other MacServe has become corrupted in memory. Note the error code number. Call Infosphere Technical Support with as many details as you can remember.

> **MacServe™** **Lost contact with the server *disk_name* attempting to reconnect.**

There may be occasions when your network becomes disrupted. This can happen when a server crashes, a cable becomes disconnected, or a server's power is cycled. If the disruption lasts more than a few seconds, MacServe alerts you that it has lost contact with a server, by name. Once the server returns, your work will proceed, as if nothing had happened.

Manager messages

Most of the MacServe Manager's messages are self-explanatory. Those that benefit from further discussion are listed below.

- **Failed to create the volume you asked for... the file system error code is (number).**

  An unexpected error occured trying to create a volume. Perhaps the disk is write-locked. Otherwise, contact Infosphere technical support for assistance (remember the error code number).

- **Sorry, AppleTalk is not running on this Mac.**

  On a user node, boot your Mac with a MacServe disk. On a host, verify your Startup Options are set as **Net server** or **Net user**.

- **Sorry, but I can't offer any more assistance since I can't find the "help file name" file on this disk.**

  The MacServe Manager can only offer help if its Help file is located on the same disk (and in the same folder under HFS).

- **Sorry, but unable to resume printing. Perhaps the port is already in use.**

  Use the MacServe desk accessory to select a printer other than a local printer for the spooler port.

- **Sorry, couldn't alter this print job.**

  There was a communications problem between your Mac and the selected spooler. Try the operation again. If the problem persists, check your network and the host.

- **Sorry, couldn't get any information about this print job.**

  There was a communications problem between your Mac and the selected spooler. Try the operation again. If the problem persists, check your network and the host.

- **Sorry, couldn't get the print job list for your selected printer.**

  There was a communications problem between your Mac and the selected spooler. Try the operation again. If the problem persists, check your network and the host.

- **There are (quantity) print jobs in the queue and not enough disk space to add more.**

  Consider lowering the file reserve so that more space is available for spooling.

- **This is not a MacServe spooler.**

  The View Print Jobs dialog only shows jobs for MacServe print spoolers. Select the spooler whose jobs you want to view using the MacServe desk accessory.

- **Warning: Your printer is not responding.**

  Verify that your printer was not placed off-line manually, turned off, or out of paper. Cycle the printer's off-line button, if necessary.

MacServe Installer messages

Most of the MacServe Installer's messages are self-explanatory. Those that benefit from further discussion are listed below.

- **(type) (identifier) is probably protected; unable to replace it.**

  The System file is corrupt. Try installing on a fresh System.

- **Error (number) installing (type) (identifier); unable to continue.**

  An unusual system error occured. The System file is probably corrupt. Try installing on a fresh System.

- **Found a duplicate resource adding (type) (identifier); unable to continue.**

  The System file is corrupt. Try installing on a fresh System.

- **Invalid handle for (type) (identifier); unable to continue.**

  A system error occured. Try installing on a different Mac.

- **No ID is available for (type) (identifier); unable to continue.**

  Your System file is so full of resources of the (type) shown that MacServe could not be successfully installed. The System is probably corrupt and should be replaced.

- **Ran out of memory making (type) (identifier); unable to continue.**

  Click Remove to clear the partial install of MacServe. Then, try installing again after making more memory available to the Installer.

- **The serial number changed; maybe this kit belongs to another Mac.**

  Each MacServe disk is serial numbered. You probably tried to reinstall MacServe from a different disk than you first used. This can cause a collision with another host you also installed with this disk. Try removing MacServe and reinstalling with the original disk.

- **There is already a file called "name" on this disk. Please enter the name you want to use for the MacServe Manager:**

  The Installer normally copies the Manager to your hard disk, using the name found on the MacServe disk. That name is in use for another purpose on your hard disk.

- **There is not enough memory for the Installer; cannot continue.**

  Disable whatever is using so much memory (perhaps a large Mac Plus file cache, RAMdisk, MacServe, or XL/Serve).

- **There is not enough room on this disk for the MacServe Manager.**

  The Manager requires 70 Kbytes of disk space. You will also need room for volumes and print spooler files. Remove some files to make room. Then reinstall MacServe (it might help to **Remove** it first).

- **There is not enough room on this disk to install MacServe.**

  MacServe required 60 Kbytes on user node disks and 90 Kbytes on hosts. Remove some files, desk accessories, or fonts to make room.

- **There was an error copying the Manager; it has been deleted.**

  Some error occured while copying the Manager to your hard disk. The defective copy was delete from the hard disk. Try reinstalling MacServe.

- **There was an error opening the System file; unable to continue.**

  Either the System file on the selected disk has become corrupt or there is not enough system memory available to modify it. Restart your Mac and try again, or try using a different Mac.

- **There was an error retrieving a resource; installation may fail.**

  Either there is not enough memory available for the Installer or the Installer application has become corrupt. Try again, making more memory available to the Installer.

- **There was an update error. The System file may be destroyed.**

  An error occured trying to write the updated System file to the disk. The file may be corrupt. Try building a new System on a fresh disk.

- **This disk has no System file; unable to install MacServe on it.**

  The MacServe resources are installed in System files. If one is on this disk, it could not be located.

- **This MacServe distribution disk has been modified. Cannot continue.**

  Your MacServe disk has been damaged or tampered with. You may return it to Infosphere for repairs.

- **You have too many desk accessories to install MacServe.**

  MacServe requires up to 4 new desk accessory/driver identifiers. Remove some desk accessories, then try again.

- **Your MacWorks is obsolete. Please see your dealer for an update.**

  If you are installing on an XL, we suggest strongly that you use MacWorks 3.0 (or later).

Appendix C
Troubleshooting tips

Technical support is available to MacServe users once your Registration Card is received by Infosphere.

You may contact Infosphere Technical Support by telephone during normal business hours (9AM to 5PM Pacific time, Monday through Friday) at 503-226-1407. *Technical support is not available from our corporate or sales numbers.*

Before you call us, you may find that your question can be quickly answered by consulting the appropriate section in this manual. Appendix B lists the more significant messages that MacServe offers to decribe problems you might encounter.

This appendix discusses common problems that are not directly related to a MacServe message. The discussion is loosely organized by subject. While it may not solve your problem, it might direct you to an answer. *The more you know about the nature of a problem, the better we can help you solve it.*

AppleTalk

- **Are you using approved AppleTalk cables and connectors?**

  Proper network operation depends upon the electrical characteristics of the cabling. "Home-brew" or "budget" networks may not comply.

- **Are the AppleTalk connectors for your Macs attached to their printer ports?**

  Connecting AppleTalk to the modem port not only makes the node unable to access the net but can also cause disruption for other nodes.

- **Are all your AppleTalk cables tightly secured?**

  A loose connection prevents signal signal transfer over the net. Some users add rubber bands or other devices to help secure the connections.

- **Do you have too many devices or too much cable on your network?**

  AppleTalk may not operate reliably if you exceed (or sometimes even approach) its specified limits.

- **Can you locate all the named devices on your network?**

  Use the "AppleTalk Devices" dialog in the Manager's View menu. It can help you isolate the location where the net is not working.

- **Are your servers configured for Net server use?**

  Check the "Startup Options" in the Settings menu. A server set for **No network** is not visible and can disrupt the network, if connected. A host operating as **Net user** or with **No MacServe** offers no services to the net.

- **Are your servers configured for network access?**

  Check the "Network Access" dialog in the Manager's Settings menu. By default, it is set to disable network access. It may also revert if a duplicate name is found during startup.

- **Is someone using an application that is incompatible with AppleTalk?**

  Products that directly manipulate the serial ports, such as terminal emulators, can wreck havoc on networks by violating the protocols. If the product is not known to work with a LaserWriter, it may not work with MacServe.

- **Are there any 3rd party AppleTalk devices on the network?**

  These products may not fully comply with the AppleTalk protocols. Try removing the device from the net.

- **Do you have any Macintosh XLs on your network with pre-1985 I/O boards?**

  Earlier XLs and Lisas may have circuit boards with substandard support for AppleTalk. They do not operate correctly with larger networks. Contact your dealer for a replacement.

Applications

- **Are you using a standard software configuration?**

  Only the system software configurations listed in the beginning of this manual are known to work correctly. Prerelease software (of any kind) is almost guaranteed to have problems.

- **Does the problem only occur with a specific application?**

  Perhaps you have a defective copy of the application. Try a fresh copy. Try running the application with MacServe disabled. Try running the application under Switcher. *With the approaching 1000 software products for the Mac, we have not been able to test all of them for compatibility.*

- **Are you using the 128K ROMs (a Mac Plus or upgrade)?**

  Many applications were developed before the introduction of the 128K ROMs. Even those released after the Mac Plus may not have had an opportunity for adequate testing. Is the problem reproducable on a 512K Mac or an XL?

Archiver

- **Is your clock correct?**

  Partial copies may not work as expected if your clock is (or was) incorrect. Files qualify for **Partial** if their modification date is later than the date the volume was last backed-up.

- **Has your Back-up Set been modified?**

  The Archiver depends upon the contents of a Back-up Set not changing, except under its control.

Desk accessories

- **Did you install the desk accessory after MacServe?**

  Try using the Font/DA Mover to remove and reinstall the desk accessory. It avoids resource conflicts. Custom installers may not be so respectful.

- **Is the desk accessory resident in an application?**

  Resource ID conflicts are difficult to avoid between items in the System file and those in an application. Apple has reserved a group of IDs for desk accessories that reside in applications. MacServe respects this scheme.

- **Does the problem only occur after switching from your boot disk?**

  There can be resource ID conflicts between different System files. Try using the same System file you have on your boot disk.

- **Have you run out of system heap from too many accessories or RAM-based HFS?**

  Device drivers (for hard disks) and AppleTalk products typically use large amounts of system heap space (a very limited resource). Try removing some of these to see if the problem goes away.

  System heap space is so constrained with RAM-based HFS that you may experience problems trying to open more than one MFS MacServe volume.

Printing

- **Can you print with MacServe disabled?**

  If not, check to see that you have the correct cable for your printer (XLs require a null modem cable) and that is it connected to the required port (use the modem port for network environments, else the printer port). Also confirm the printer driver is correct. Printing can also fail if your application disk is write-locked or has insufficient free space for the printer scratch files.

- **Did you use one of Apple's choosers?**

  Apple's Choose Printer and Chooser desk accessories do not support MacServe print spoolers. Using them for any reason can invalidate your printer selection. We recommend removing them from your Systems.

- **Does the print spooler accept any jobs?**

  Try something simple like a screen dump (command shift 4) or a Finder Print Catalog. Remember to close the job by opening the MacServe desk accessory (check for error messages at this time). Confirm the job is in the spooler queue using "Print Jobs" from the Manager's View menu. Make sure the printer is on-line and unPaused.

- **Are you trying to use a cut sheet feeder?**

  Some cut sheet feeders do not work with the spooler (this is not the case with the ImageWriter II sheet feeder).

- **Did you switch Systems without revalidating your printer?**

  If you switch System disks, your printer selection can be invalidated. This happens when the new System has a different selection recorded in it or the driver for the selected printer is not present.

Appendix D
Technical Notes

This section describes some of the technical characteristics of MacServe. The "jargon" used here is compatible with the terminology of *Inside Macintosh.*

MacServe's files

MacServe creates and uses a number of special files for its operation. These are Invisible so they don't appear on the Finder's desktop.

MacServe files are designated by having a creator field of 'XLSV' (for compatibility with XL/Serve). Files of type:

- 'CNFG' are server files and contain startup and print spooler information. They are named 'MS-data-fork'. *Only one of these files should exist on a host system.*
- 'PJOB' are print spooler documents. Their names are 'PJOB.*nnnnn*', where *nnnnn* is the job sequence number, as displayed in the job's banner.
- 'VOLM' are MacServe (or XL/Serve) volumes. When created by MacServe, their names are 'MS Vol-*nn*', where *nn* is the file number.
- 'back' identify a single volume Archiver restore set. The file name is 'restore_set'. The Finder information field is encoded with special Archiver information.
- 'mark' identify the date a back-up of the associated volume was performed. The name is 'archive_date'. The Finder information field is encoded with special Archiver information.
- 'next' identify the successor volume of a MacServe Back-up Set. The name is the expected volume name.
- 'root' identify the predecessor volume of a MacServe Back-up Set. The name is the expected volume name.

MacServe's System resources

The MacServe Installer adds a number of resources to your System file. Together, they comprise the MacServe user interface, the network software, and the server software. These resources are:

- The MacServe desk accessory is assigned a non-conflicting ID in the range of 12 to 26. The desk accessory also uses a DLOG, DITL, CNTL, STR#, and two ICONs. Each of these is a named resource, whose ID indicates it is owned by the desk accessory.

- The MacServe loader is made up of an INIT module (ID 31), an XLSV resource, and an STR# resource (whose IDs indicate they are owned by the desk accessory). Even though the loader only needs to be present on your boot disk (or startup hard disk for a host), the Installer places it in all Systems, in case you transfer the System to a boot disk. *The loader should be the last INIT module run during startup.*

- The MacServe user node driver (.XLuser) is assigned a non-conflicting ID in the range of 12 to 26. The user node driver provides all network interfacing for non-host nodes, or hosts operating as **Net user**. The user driver also references an STR# resource(XLuser).

- The MacServe host driver (.XLhost) is assigned a non-conflicting ID in the range of 12 to 26. This driver provides all network interfacing for servers and contains the server logic. It is too large to be a single resource, so its second half is contained in XLSV resource 0. It is only installed on hosts. The host driver also references an STR# resource (XLhost).

- The MacServe printer port driver (.xlBout) is assigned an ID of 8. This replacement for the standard printer port serial driver adds all the needed logic to capture output to the printer port and redirect it to your selected printer.

- The Multi-user MacServe driver (.MuMS) is assigned a non-conflicting ID in the range of 12 to 26. MuMS offers an interface to MacServe for multi-user applications. It manages access to and arbitration of MacServe volumes for database security.

- An INIT module that is added to System files on Macintosh XLs (FixMW) is assigned a non-conflicting ID. This resource patches a bug in the I/O manager of MacWorks versions 3.0 and earlier.

- The standard AppleTalk resources (.MPP and .ATP drivers, NBPC resources, and the AppleTalk loader module, INIT 6). These are the latest versions available at the time of production.

- Apple's INIT 31 module is relocated as an XLSV resource to avoid conflict with the MacServe loader.

MacServe's startup procedure

The MacServe loader (INIT 31) executes early in your Mac's startup phase (at the time the "Welcome to Macintosh" screen appears). It determines whether it is running on a user node or a host node by the presence of the .XLhost driver and the contents of the MS-data-fork file. In either case, the MacServe startup sequence:

- Normalizes the startup environment and executes any external INIT modules (using the protocol defined by Apple's INIT 31 module). This activates any drivers not located in the System file.
- Confirms that AppleTalk is available (if needed) and opens it (if needed).
- Loads the appropriate network interface driver and the printer port driver into high memory (above the application heap). For servers, it also allocates the memory for the disk cache and other data structures in high memory.
- Opens the MacServe drivers.
- Registers the appropriate user and server names on the network.
- For servers, finds all the available volumes and opens those marked **Automatic**. It also restarts any pending print spooler jobs left from the last computing session and deletes those that were incomplete.

On a host, the loader expects the driver for the root disk to be open and for the disk to be mounted. The MacServe Installer will only install host resources on a hard disk. Hard disks that use a diskette boot sequence must transfer control to the System on the hard disk before the MacServe loader executes.

MacServe's use of memory

Your Mac's RAM memory is logically divided into three areas:

- The system heap, which contains most drivers, volume information, patches, and other non-transient resources.
- The application heap, which contains the normal resources for applications, desk accessories, a stack, and other transient resources.
- High memory, located above the application heap (actually above BufPtr), which includes the screen buffer.

MacServe uses a section from each of these areas:

- Less than 2 Kbytes from the system heap for resources that cannot be located elsewhere, due to constraints imposed by Apple's software. These are primarily data structures for AppleTalk.
- About 32 Kbytes from the application heap, when the desk accessory is active.
- About 40 Kbytes (85 Kbytes on hosts) in high memory for the MacServe drivers, data structures, and a private stack.
- A user specified amount of high memory for disk caching on hosts.

MacServe's Transport Protocol

MacServe uses a custom AppleTalk protocol and operates as a client of DDP. This protocol provides:

- A high reliability transport mechanism for communicating between clients and hosts.
- Guaranteed delivery of messages through a retry mechanism.
- Automatically adapted timing to maximize network efficiency and tolerate internet delays.
- Automatic back-off to reduce loading of servers from unnecessary retries.
- A session mechanism that makes it possible to restore the state of a client/server relationship after a catastrophic network failure (such as rebooting a server).
- Block transfer capabilities for disk and print services.
- Remote job management for print services.
- Support for a (virtually) unlimited number of clients, using a single DDP socket. (The client list is limited by table space to 32 nodes.)
- Arbitration support for multi-user access applications.

MacServe also uses NBP for named access to its clients and hosts. Each NBP entity is user specified. The NBP types used by MacServe include:

- "MacUser", for client user names.
- "xlDisk", for disk server names (for compatibility with XL/Serve).
- The user-specified printer driver name for print spoolers. This may conflict with Apple's use of "ImageWriter" for their ImageWriter II AppleTalk interface.

Glossary

application	A computer program with which the user directly interacts to accomplish a task.
archive	The process of copying files from your work disk to a safe place (such as diskettes). Also known as "back-up".
background	Describes a computer program that executes invisibly and simultaneously with other programs (such as applications).
back-up set	The end result of archiving a collection of files. A set is distinguished by spanning more than one diskette.
boot	Slang for "bootstrap". The procedure used to start, or the act of starting, a computer.
byte	The smallest directly accessable element of computer storage, comprised of 8 bits (binary options). A byte represents storage with 256 choices, sufficient to represent a full character set. Groups of bytes are also measured in "Kbytes" of 1024 bytes and "Mbytes" of 1024 Kbytes (or 1048576 bytes).
clump	The smallest amount of disk storage the Macintosh allocates; ranges from 512 bytes to 32 Kbytes, depending on disk size and file system used. Also known as a "cluster".
computing session	The period of time after you start (or restart) your computer until you stop (or restart) it. When you start ot restart a Macintosh, the screen displays "Welcome to Macintosh".
contiguous	Aligned together without gaps. Used to describe disk storage that is not fragmented.
desktop	The icons, menu bar, and windows associated with a Macintosh application, including the Finder. Also the name of the invisible file used by the Finder to remember how you left the elements of the desktop arranged.
disk caching	A procedure for keeping a copy of frequently referenced disk data in memory that eliminates the need to reread the data from the disk, thereby increasing performance.

disk server	A device that offers simultaneous read and write capabilities for multiple users of a mass storage device. Contention is prevented by requiring exclusive access to a partition when writing.
driver	A computer program segment responsible for managing or controlling a device (such as a disk drive, printer, or communications link).
file	A document or application on mass storage; specifically, any entity that appears in the storage directory.
foreground	The highest priority computer program. In an interactive computer system, such as a Macintosh, a user application.
fragmentation	Describes an undesirable state where (disk) information is scattered across the media rather than aligned together without gaps. Causes inefficiency of access and reduced performance.
HFS	The abreviated name of the Macintosh's Heirarchical Filing System.
host	A MacServe node that offers disk or printer sharing to other Macintoshes over AppleTalk. Also known as a "server".
host administrator	The person responsible for maintaining a MacServe host.
library	A repository for applications and documents which are maintained for reference and common, shared use.
local printer	A directly connected printer that is not spooled by MacServe.
MFS	The abbreviated, informal name for the traditional Macintosh Filing System. Also known as the "flat" filing system. Designed primarily for diskettes.
node	A station on a local network.
password	A secret sequence of characters known only to authorized users that acts as a key to a lock placed on a program or volume.
print spooler	A background program that simultaneously accepts documents to be printed, temporarily stores them on a disk, and prints them in the order they were received (while you continue working).

program	A task for a computer (may also be an application).
ramdisk	A segment of memory used like a disk, with the performance advantage of having negligible access delay. If the memory is not protected against power failures, a ramdisk is subject to data loss.
read-only	A term meaning protected against or unable to perform modification.
registration	The process of making a name for a device known on an AppleTalk network. Includes confirming that the name is unique.
resource	A computer program fragment or data structure.
root disk	The hard disk, or partition, that acts as the initial System disk after a Macintosh is booted. Its icon appears in the upper right corner of the Finder's desktop once the Finder starts. The place where MacServe starts from and store print jobs.
SCSI	An acronym for "Small Computer Systems Interface", an industry protocol for connecting disk drives and other devices to computers.
sector	The smallest amount of directly addressable storage on a disk; typically 512 bytes.
shell	A system program (such as the Finder) that is used to start programs and perform other "housekeeping" functions.
startup disk	The disk from which your Macintosh obtains system resources (such as desk accessories). Also known as the "System disk". The current System disk may not be the same as the disk used to boot the Macintosh.
system heap	A section of the Macintosh RAM memory that contains patches, drivers, volume information, and other non-transient system resources.
user node	A Macintosh that is using the disk or printer services of a MacServe host.
volume	A section of mass storage you can use like a diskette.
write-lock	A method that implements write protection and makes a disk read-only.

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Software problem report form

Instructions

Use this form to report software bugs, documentation errors, or suggested enhancements to MacServe. Photocopy it and mail to:

Infosphere, Inc
4730 SW Macadam Avenue
Portland, Oregon 97201

Who You Are

Name _____
Company _____
Address _____
City _____ State _____
Phone _____ Date _____

Catagory

☐ Software Problem ☐ Documentation Problem
☐ Enhancement ☐ Other _____

Environment

Serial Number _____ Revision _____

☐ Mac Plus (Qty _____) ☐ 512K Mac (Qty _____)
☐ Mac XL (Qty _____) ☐ 128K Mac (Qty _____)
☐ LaserWriter ☐ Other _____

Problem

Describe how to reproduce it, and any diagnosis or suggested correction.

M000 16054

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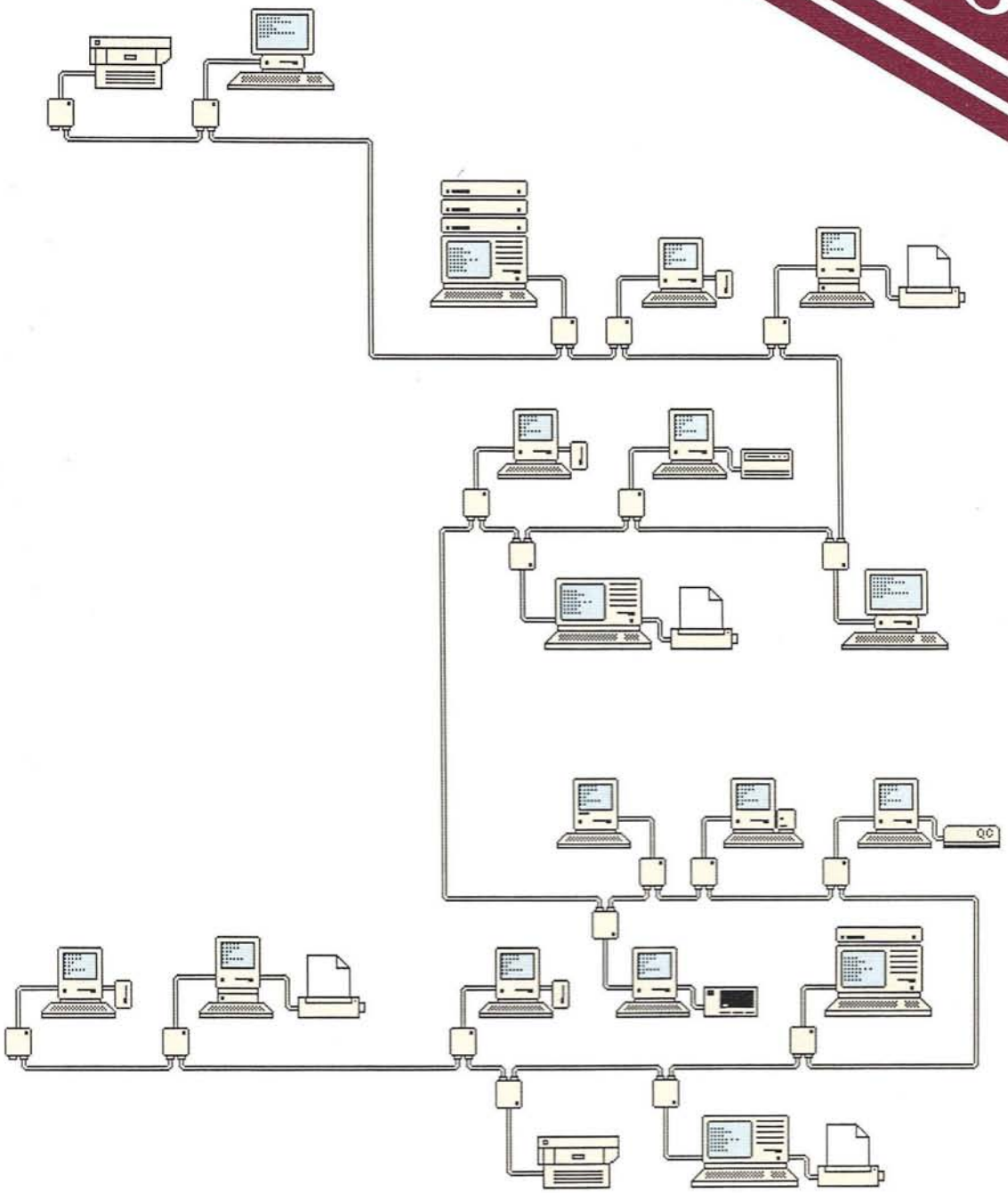

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MacServe™ Hard disk support software for
The Macintosh Office

INFOSPHERE

Infosphere, Inc
4730 SW Macadam Ave • Portland, OR 97201
503-226-3620

MacServe makes it easy and inexpensive to share your Mac's hard disk and a serial printer with your colleagues. Increase your productivity by sharing information and peripherals electronically, without investing in specialized equipment.

Manage your hard disk effectively.

Structure your hard disk for convenience and effectiveness. Divide it into as many as 16 volumes, of whatever size you choose. Then you can mix the traditional Mac file system with Apple's new Hierarchical file system for maximum software compatibility. MacServe is the only disk management software for Apple hard disks.

Secure important documents and applications.

You can designate MacServe volumes as ready-only to prevent information from inadvertently changing (this also makes them simultaneously shareable on a network). Or, make them read-write for full modification privileges. Volume-level passwords let you decide who can access sensitive data.

Share your printer to save time.

MacServe's character printer spooler captures your print jobs (and those from your colleagues across the network), as they are created, and saves them on a host's hard disk. Documents print while you resume your application or begin another.

Enjoy freedom of choice.

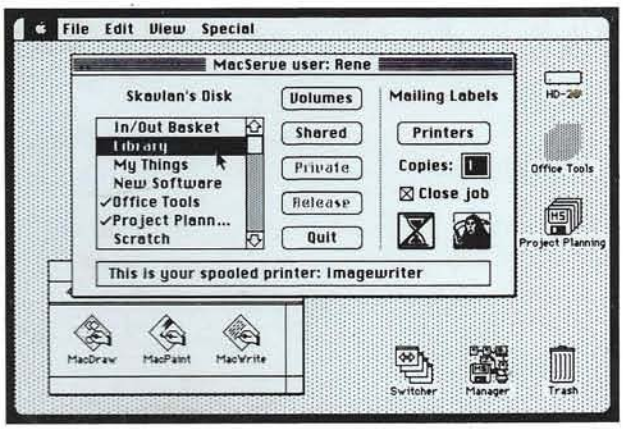
Only one user interface, MacServe, supports all the leading hard disk drives. Use hardware that matches your price and performance requirements today, without worrying about future software compatibility. Later, you can add more capacity by simply adding more servers!

Mature technology makes it reliable.

MacServe is upwardly compatible with XL/Serve,™ the first commercial AppleTalk software product. Our disk and print server technology is field-proven. Thousands of work groups depend on it, every day, to reliably share information and resources.

The magic of multi-tasking makes it efficient.

Your MacServe host remains primarily a Mac workstation. Because of MacServe's true multi-tasking, you can run your favorite applications while others share your resources.



The MacServe desk accessory shows how easy it is to use.

MacServe™

- Divide disks into as many as 16 partitions; you choose their sizes to fit your needs.
- Volume partitioning allows mixed MFS and HFS file systems for greatest software compatibility.
- Per-volume passwords secure sensitive data.
- Day-to-day operations can be performed conveniently anytime through a desk accessory.
- Disk caching improves system performance.
- Spools serial printers (such as ImageWriters) so documents print while you resume work.
- Operates in the background of your Mac while you retain its full capabilities for applications.
- Access up to 16 MacServe hosts on a network.
- Each host supports up to 32 users (however, the practical limit is very application dependent—typically 2-6 users).
- Use up to 6 volumes at once from all available hosts.
- Upward compatible superset of our field-proven, highly reliable XL/Serve network software.
- Includes all software for single users or networks—just add AppleTalk connectors and cables.
- Stand-alone use does not preempt any serial ports.

Hard Disks Supported Include:

- Apple HD-20 and Macintosh XL
- General Computer HyperDrive
- Paradise Mac-10 and Mac-20
- PCP MacBottom
- Quark QC-10
- Tecmar MacDrive
- Macintosh Plus with:
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  MD Ideas HD-20 and HD-30
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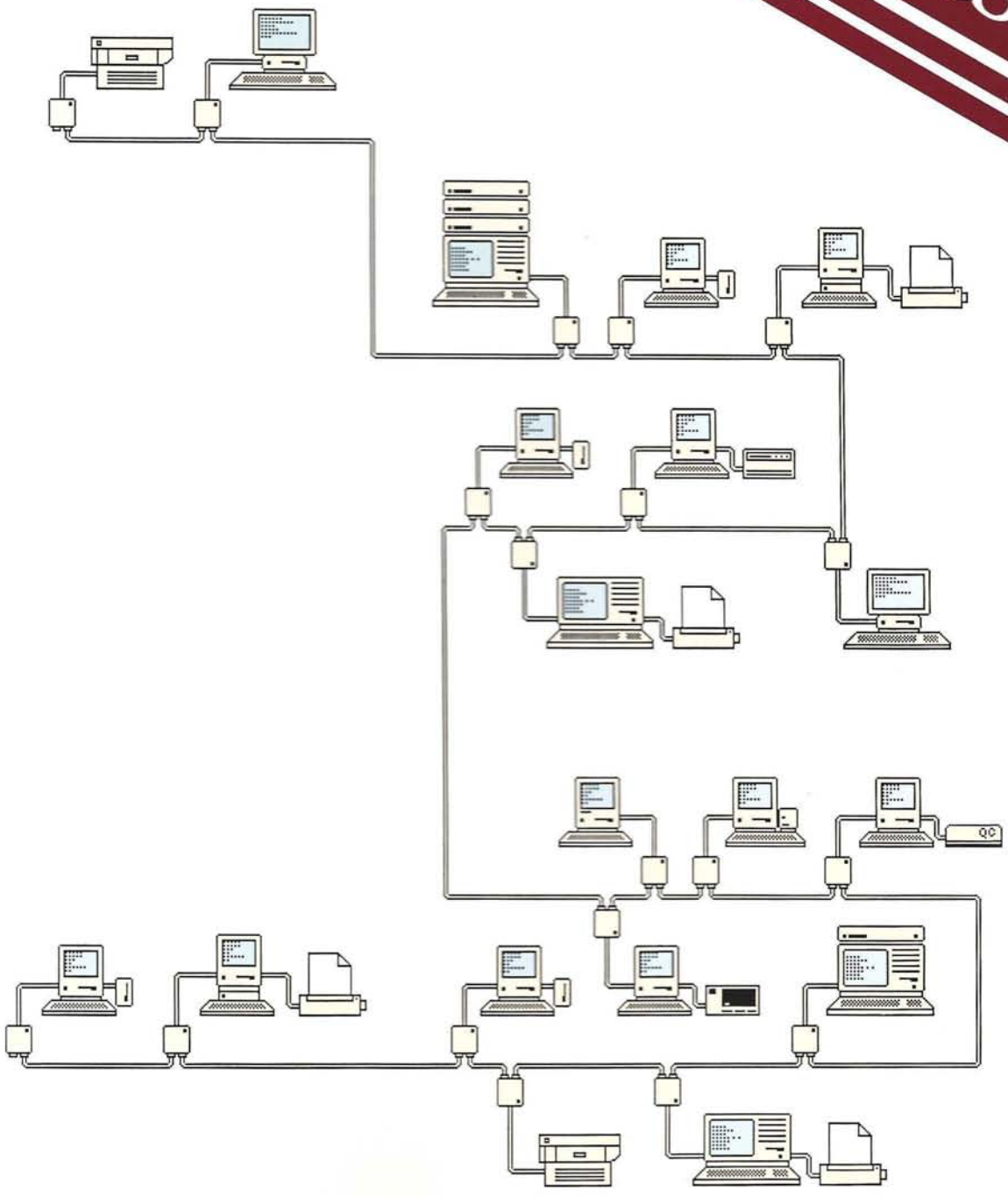

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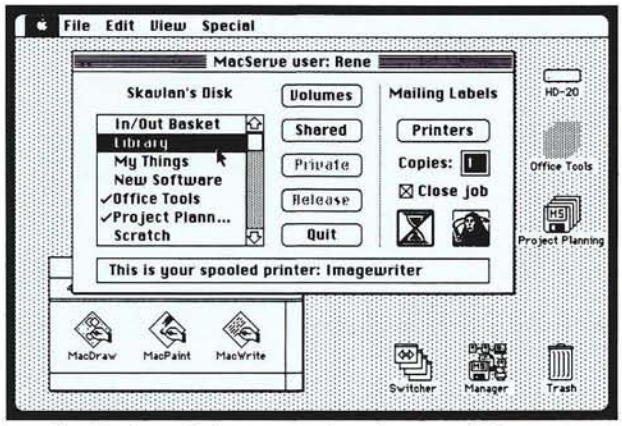

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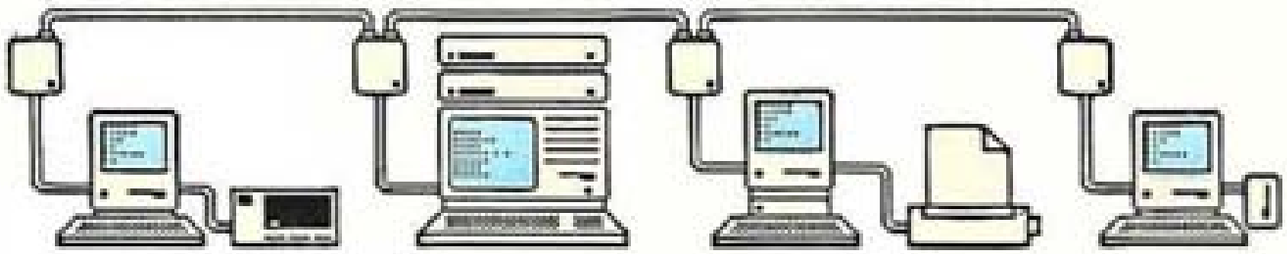

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