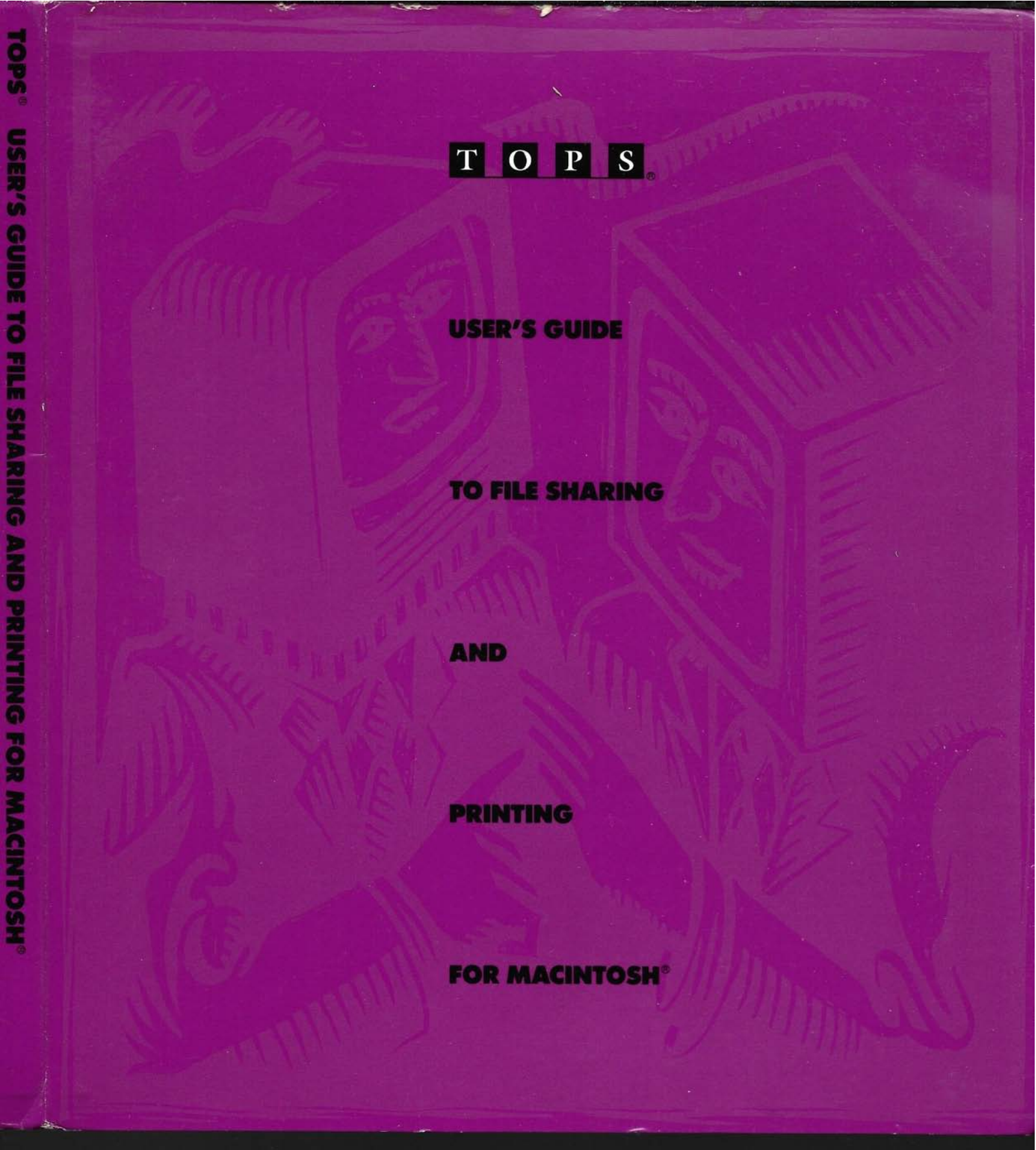
TOPS® USER'S GUIDE TO FILE SHARING AND PRINTING FOR MACINTOSH®



TOPS

USER'S GUIDE

TO FILE SHARING

AND

PRINTING

FOR MACINTOSH

Version 3.0

Sun Microsystems, 950 Marina Village Parkway, Alameda, CA 94501
Part # 800-4427-01

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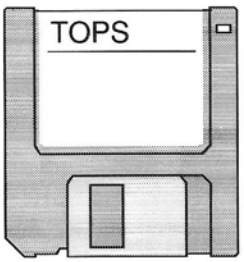
Table of Contents

Preface:

Welcome to TOPS File Sharing and Printing software for the Macintosh. With this software you can link your Macintosh to other Macintoshes, PCs, or Sun™ Workstation computers on a TOPS network.

Your TOPS File Sharing and Printing Package

- **One Disk: File Sharing and Printing for Macintosh**



- **Documentation: TOPS User's Guide to File Sharing and Printing for Macintosh.**
- **Release Notes:**
  Additional information not included in the User's Guide. Read the release notes first.

Refer to your TOPS Network Bundle for Macintosh packing list for details on other items which accompany your TOPS file sharing and printing package.

About the User's Guide

This user's guide provides you with information to help you understand your TOPS/Macintosh software and how to use it. The pages that follow assume that you know how to use your Macintosh and your LaserWriter or compatible.

How the User's Guide is Organized

The material in this user's guide begins with basic concepts and progresses through the stages of installing, connecting stations, and using your TOPS network. Reference information can be found in the appendices.

Before You Begin

Chapter 1 introduces you to TOPS/Macintosh and provides a basic explanation of TOPS file sharing and printing software. A general description of how networks function is provided with an emphasis on TOPS networks in particular. Advanced users may skim this chapter and proceed to *Chapter 2*.

Quick Start

Chapter 2 provides advanced users with a quick guide to installation and operation of TOPS file sharing and print spooling services. If you are a new user or need more details on installation, refer to *Chapter 3*.

Step–by–Step Installation

Chapter 3 provides you with a detailed guide to the installation of TOPS file sharing and print spooling services as well as information on the TOPS file sharing and print spooling software modules.

Making Connections

Chapter 4 teaches you how to use the TOPS Desk Accessory to publish and mount volumes on the network.

Working on a Network

Chapter 5 discusses aspects of working on a network, including access to remote data files, copying files over the network, using remote applications, and working on a mixed network consisting of Macintoshes, PCs, and Sun Workstation™ computers.

Print Spooling

Chapter 6 teaches you how to use TOPS Spool in order to print in the background while using your Macintosh to do other tasks.

Reference:

Troubleshooting

Appendix A: Contains troubleshooting help

Appendix B: Contains TOPS error messages.

Glossary

Index

Conventions Used in this User's Guide

Throughout this user's guide, a number of stylistic conventions are used. The typeface conventions are described below, followed by a few other interface conventions.

Typeface Conventions

Various typefaces are used to indicate the different meanings or context of certain words or phrases. The following list defines the typeface conventions that appear in this manual:

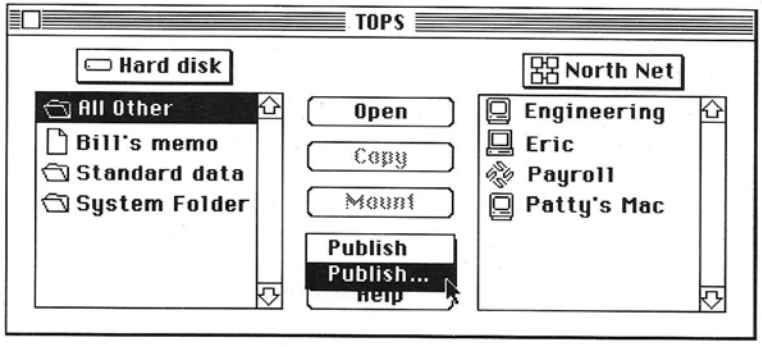
Typeface Style	How the Style is Used	An example
This typeface	Normal text.	Throughout this manual, various typefaces indicate the different...
This typeface	Special headings, indicates steps or processes which must be done in sequence.	**1. Make backup copies of your TOPS diskettes**...
This typeface	Indicates figure and table titles, book titles and chapter names, examples, and emphasis on important words.	See *Chapter 3* of the *User's Guide to File Sharing and Printing, Macintosh Version,* for information on...
This typeface	Indicates menu and menu option names, dialog boxes and window names and any other screen or keyboard option available for your use.	Choose the **Print Directory** option from the **File** menu...
`This typeface`	On–screen text or, when it is in **`boldface`**, text that you must enter on the computer.	You will see the message: `File is locked or in use`...

Interface Conventions

- The user's guide uses standard Macintosh conventions to describe operations that you perform with your mouse. For example, you can "click" on an item to select it and then "click" on, say, the open button to open the item. Or, if you wish, you can simply "double–click" on the item to both select *and* open that item.

- "Pull down the option button."
  TOPS includes drop–down optional buttons to give added versatility to the user interface. An optional button is a button which contains more than one choice.

  To use an optional button, place the cursor arrow on the button, hold down the mouse button (two options will appear), pull down the cursor to select the option of your choice (the option will become highlighted), release the mouse button to activate the selection. This action will be referred to as "Pull down the optional button." (See the Publish button in the following illustration:)



Chapter

1

Before You Begin

This chapter will explain the features of TOPS networking and provide background on how TOPS/Macintosh™ software works. The concepts presented here will be useful in your understanding of the remainder of this user's guide.

- **About Networks**
  A brief general overview of networking concepts.
- **About TOPS Network**
  A description of the features that distinguish TOPS from other networks.
- **About TOPS/Macintosh**
  A brief description of what TOPS File Sharing and Printing for Macintosh does and the special features built into it.
- **How TOPS Works**
  A general description of how TOPS file sharing software functions.
- **Other TOPS Products**
  A description of other TOPS networking products that may be used in conjunction with TOPS/Macintosh.

TOPS/Macintosh is easy to install, easy to learn and easy to use! Enjoy it!

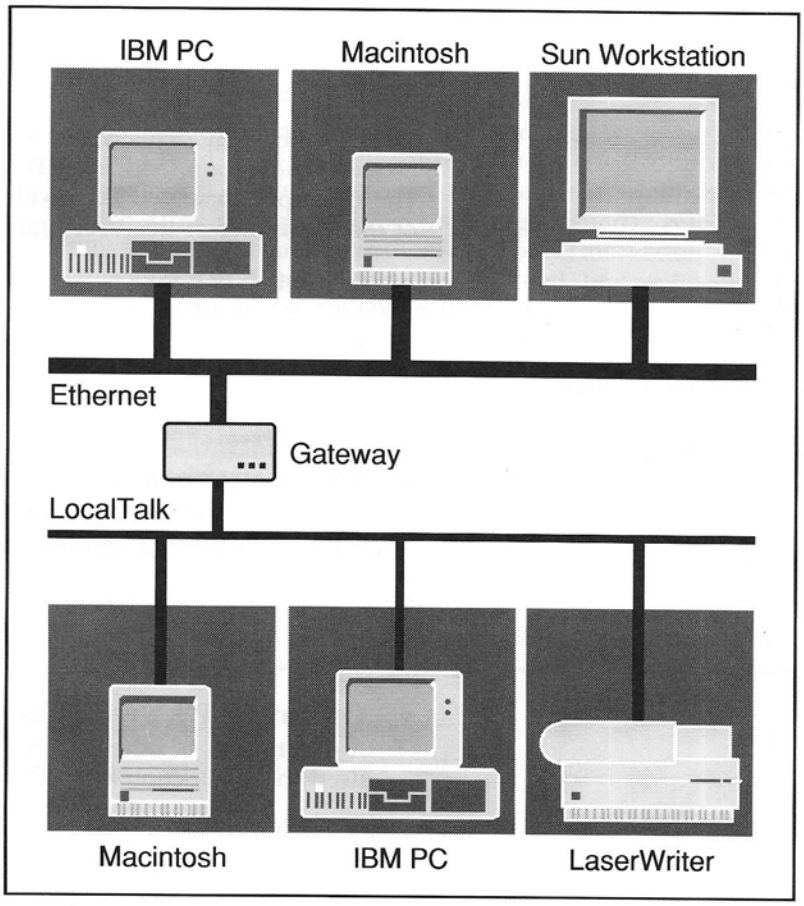


Figure 1–1. TOPS Network links different operating systems across both LocalTalk™ and Ethernet cabling systems.

About Networks

A *local area network* (LAN) is a combination of hardware and software that allows multiple computers to share resources and to communicate with each other.

Networks arose from the fact that in many work environments, computer users need to have access to the same information. They may also need to share hardware resources such as disk storage devices, printers, backup units and modems.

A network may provide a number of different services to the computer stations it links together: file service (to share files), print service (to share printers), electronic mail service (to send messages back and forth) and backup service (to help secure data). In practice, most networks offer only some of these services.

Basically, a local area network is composed of a number of computer stations linked together physically by some kind of cabling system (network hardware) and communicating with each other through software (network software).

Network Hardware

Network hardware typically consists of a cabling system, network interface cards, repeaters and other devices.

- Cabling systems, of which there are various types, are used to link stations on a network. A cable's physical characteristics set limitations on speed, network length and the number of network stations.
- Interface cards (containing a communication chip and other hardware) provide a link between the computer station and the cabling system. In some cases, the communication hardware is built directly into the computer mother board.
- Repeaters boost signal strength, increasing the overall length limit imposed on a network by the electrical characteristics of the cabling system.
- Other network hardware includes bridges and gateways. These are used to link separate networks.

The physical arrangement of stations on a network may vary, depending on the type of network On some networks, the stations are arranged along a central trunk line. On others, they may radiate out like a star from one central point or connect to branches tied into a long backbone. On yet others, each station is linked to the next in a daisy chain that is terminated at both ends.

Network Software

Network software performs all the functions needed to carry out communications over a network. It must be tailored to the type of cabling system and network interface hardware being used. The functions performed by network software are complex and provide all the different rules—or *protocols*—that govern the transmission of information over the network. There are several protocol levels:

At the lowest level these protocols govern how network stations determine an information packet's originating station, its destination station and how to ensure error–free transmission between these stations. At a higher level, the protocols determine how to break a transmission down into smaller packets for transport over the network and ensure that such packets arrive in the proper sequence.

At the next higher level, the protocols determine when a communication has been completed and when it is appropriate to respond. On the highest level, the protocols are the language used in the communication itself—similar in concept to the rules of grammar and syntax for a spoken language.

Typically the lower level network protocols don't depend on the content of the communication, just the hardware and packaging of data. The communication chip and driver, for example, are responsible for getting the communication out onto the network and to its destination, and watching for a response.

The higher level protocols interact with a computer's operating system (DOS, for example) and are often referred to as the network shell or network system software (Figure 1–2).

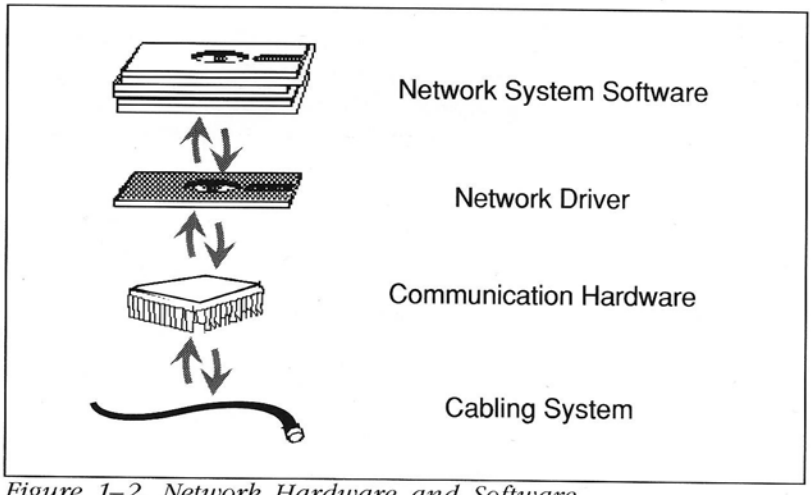


Figure 1–2. Network Hardware and Software

Network Services

An important aspect of networking is how various network services are provided. Several options are possible.

With centralized services, one or more computers on the network are designated to provide file services, print services or other services to all the other computer stations on the network. A station that provides such services is called a *server*. The stations on the network which utilize these services are called *clients*.

Centralized services, for example, typically consist of one or two servers with large hard disk drives and/or attached printers. Most often they are highly specialized, dedicated servers running only networking software. All of the clients on this network are dependent on these servers for file and printing services. If a server should fail, the entire network may well go down.

With peer–to–peer services, any station on the network may function as a client or a server or both. File and print services may be shared among all the computer stations on the network. For example, a station on the network might access files on a remote computer station while at the same time making its own files or printers available to *other* stations on the network.

About TOPS Network

TOPS networking has several distinguishing characteristics: it is geared to networks where a variety of computers running under different operating systems are being used; it is well suited to work environments where peer–to–peer services are at a premium; and it runs over either LocalTalk or Ethernet cabling systems.

Mixed Operating Systems

Until recent years, computers running one operating system were unable to communicate with computers running a different operating system This situation made it virtually impossible to link Macintosh, DOS, and UNIX™–based computers (such as Sun workstations) on a single network.

Simply stated, the computers all spoke different languages. Existing networks provided good communications between similar computers (such as IBM PCs and PC compatibles), but there was no practical way to link Macintoshes, PCs and UNIX–based computers on one network.

TOPS networks solve the problem of incompatible operating systems by providing network software that translates between different operating systems. For example, TOPS makes it possible for a PC to share information with a Macintosh; the translation

between operating systems occurs in the background and is transparent to the user.

Note

Although TOPS networking software translates between operating systems, it *does not* translate different applications' data formats. For example, you cannot edit a MacWrite™ document created on a Macintosh simply by loading it directly into WordPerfect™ on the PC. Either the program's data files must be interchangeable between systems, such as Lotus 1–2–3 and Excel, or a special application, such as MacLink Plus/TOPS™ (included in your TOPS Network Bundle for Macintosh), must perform the conversion needed to share files in this way.

LocalTalk and Ethernet

TOPS networks can run on both LocalTalk and Ethernet cabling systems. (In this user's guide, LocalTalk refers to Apple's LocalTalk cabling system as well as any LocalTalk–compatible system, such as PhoneNET Plus™ connectors and cable.)

To achieve this versatility, the TOPS system software can sit on top of and communicate with both LocalTalk and Ethernet driver software (Figure 1–3).

LocalTalk

LocalTalk is a low–cost, twisted–pair wire cabling system that can transmit data at 230 thousand bits per second, approximately 200 times faster than a 1200–baud modem. TOPS stations on LocalTalk are normally daisy–chained together, with a limit of 32 stations on a 1,000–foot length daisy–chain network. Repeaters can be used to extend the network beyond these limits.

Macintosh computers come with a built–in hardware interface to LocalTalk. The LocalTalk network driver, included in Macintosh System software, is known as AppleTalk™.

To connect a PC to LocalTalk, you must have a LocalTalk interface card and driver. UNIX–based computers are typically linked to LocalTalk by way of a LocalTalk/Ethernet gateway, explained below.

LocalTalk supports other communications besides AppleTalk. FlashTalk™, for example, transmits data at three times the AppleTalk rate. To support FlashTalk on a Macintosh computer, you need a hardware device called TOPS FlashBox™ and the TOPS FlashTalk driver for Macintosh. On a PC, you need a TOPS FlashCard and the TOPS FlashCard (FlashTalk) driver.

A number of other devices, such as Apple LaserWriter™ and compatible printers and network modems, can also be attached directly to LocalTalk.

LocalTalk networks can be joined together by a device called a *router* (formerly known as an AppleTalk *bridge*). When using a router, you can designate each side of the router as a separate logical network called a *zone*. The router software will only permit communications going from one zone to another to pass through the router.

This network traffic control is particularly useful in situations where a network consists of departments or work groups. By separating work groups with a bridge, you may contain most communications within that group, reducing overall network traffic. The more infrequent interdepartmental communications pass across the bridge. While each department is usually assigned a zone, a single zone may span several departments.

Ethernet

Ethernet is a shielded wire cabling system that transmits data at 10 million bits per second. Ethernet commonly comes in two types: thick (known as Ethernet standard) and thin. Twisted pair and fiber optic Ethernet cabling are also available. Ethernet length limits are 1,500 feet per segment for Ethernet standard cable and approximately 600 feet for Ethernet thin. Ethernet repeaters may be used to extend these length limits.

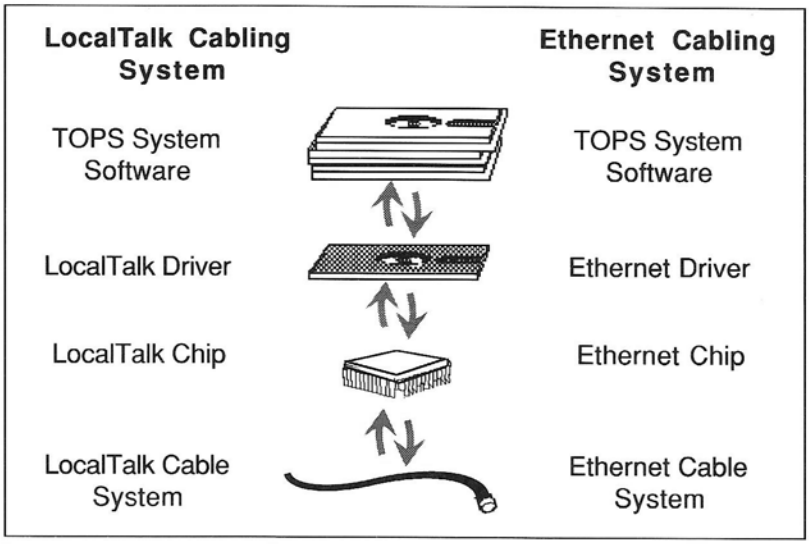


Figure 1–3. TOPS Network on LocalTalk and Ethernet

Connecting a Macintosh or a PC to Ethernet requires an Ethernet interface card and Ethernet driver (often called EtherTalk). UNIX–based computers ordinarily have a built–in hardware interface to Ethernet. A Macintosh or PC computer may be connected to a UNIX station either directly over Ethernet or via a LocalTalk/Ethernet *gateway*

LocalTalk/Ethernet Gateway

LocalTalk and Ethernet cabling systems can be linked together through a LocalTalk/Ethernet gateway. A gateway is a device that can connect two different types of cabling systems together and translate the communication protocols of one system (in this case AppleTalk) into those of the other (EtherTalk), and *vice versa.*

Using such a gateway, a TOPS network can span LocalTalk and Ethernet networking arrangements, tying together a wide variety of operating systems, computers and printers.

Peer–to–Peer Services

TOPS is a peer–to–peer network. Any station on a TOPS network can function as both a server and a client at the same time.

As a server, your computer can make its resources available to the network.. A TOPS server need not be dedicated. TOPS lets you share your computer's resources with other users on the network. while, at the same time, you use the computer for your own work.

In addition, your computer can function as a TOPS network client station. You can gain access to resources offered by servers on the network. TOPS lets you use files and printers made available on the network exactly as if the files were on your own PC or hard disk and the printers were attached directly to your station.

You can set up your network so that every Macintosh or PC attached to the network functions as both a server and client, providing file service and (in some cases) print service, or you can dedicate some of the stations to function as servers only and make the others client–only stations. The choice is up to you, depending on how you want to utilize the various resources on your network.

About TOPS/ Macintosh

TOPS File Sharing and Printing for Macintosh is a comprehensive networking package for Macintosh computers. With TOPS/Macintosh, you can link your Macintosh to other Macintoshes, PCs, or Sun workstations on a TOPS network.

File Sharing

TOPS Network bundle for Macintosh provides file server and client capability to your Macintosh.

As a file server, you can make any file or files on your Macintosh hard disk or floppy drive available to other stations on the TOPS Network.

As a client you can access files made available by any file server station on the TOPS network. This means you can transfer files from a remote server to your own disk drive, load remote data files into an application running on your own Macintosh, or run a remote application on your own Macintosh. In short, your client Macintosh can access remote files as if they were located on your own disk drive.

Print Spooling

TOPS Network bundle for Macintosh includes a LaserWriter (or compatible) print spooler, TOPS Spool™, for your Macintosh.

With TOPS Spool, you can continue to perform other tasks while your documents are printing in the background. Since TOPS Spool is a Desk Accessory, you can retain control of your print jobs from within any application. If your Macintosh crashes, TOPS Spool recovers any files that had not been printed prior to the crash. You never lose your work.

Other Features

In addition to the basic features offered by TOPS/Macintosh, a number of other attractive features are also built into TOPS file sharing and printing software.

- **Easy to use Desk Accessory** makes it easy for inexperienced TOPS users to perform networking operations. Because TOPS is a Desk Accessory, you can access the network from within any application.
- **Compatible with Ethernet cards** and cable.
- **Protection** such as passwords and read–only mode provide security to files made available to the network.

- **Remember option** lets you automatically mount and publish volumes whenever you restart your Macintosh.
- **Compatible with the TOPS FlashBox™**, which provides high–speed communication by transmitting data at up to three times the normal AppleTalk speed.
- **Support for multi–user applications** which use standard file and record locking routines.
- **File Translation**: TOPS/Macintosh is bundled with MacLink Plus/TOPS™, a data file format translation utility created by DataViz., Inc. MacLink Plus lets you translate many popular PC application data formats to common Macintosh application formats, and vice versa. Used in conjunction with TOPS/Macintosh, MacLink Plus lets you load remote PC data files into your Macintosh applications.

How TOPS Works

The following is a general description of how TOPS/Macintosh file sharing software functions.

When your Macintosh starts up, TOPS/Macintosh loads a number of software files into your computer's conventional memory (RAM). The files correspond roughly to different levels of TOPS network protocols.

The TOPS memory–resident files work in the background, letting you go about your normal work while processing communications with other stations on the network. They remain in RAM until you shut down your Macintosh.

Making Connections

Once the appropriate TOPS memory–resident files have been loaded, you are ready to establish the communication link between your Macintosh and other network stations.

Any networking operation involves a transaction between at least two TOPS network stations: a server and a client. The server station makes files available to the network through a process called *publishing*. The client station gains access to these files through a process called *mounting*.

For example, a file server can publish (make available to the network) a disk drive, folder or directory. This published *volume* (as it is called) can then be mounted on a client station. On a Macintosh client, the mounted volume appears on the desktop as a TOPS Network folder icon. The client Macintosh can access the files in the volume just as if the volume were an extra disk drive (Figure 1–4).

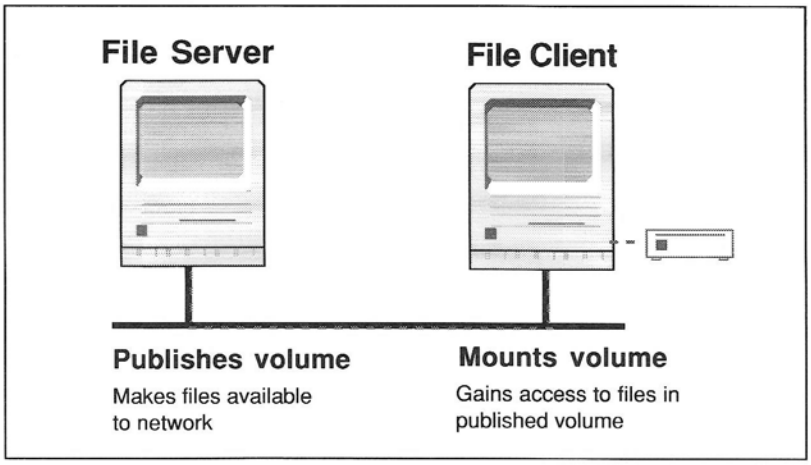


Figure 1–4. Client Mounts Volume Published by File Server.

TOPS Background Operation

Once you have established the communication link between the server and client, file access across the network is all managed by the TOPS software working in the background.

TOPS inserts itself between an application and a local operating system. When an application on a client, for example, tries to get access to a file on a remote server, TOPS intercepts the call to the local operating system and determines that it is a call to the remote server rather than to the client's operating system.

TOPS software then translates the call from a local operating system call to a TOPS network call and sends it out (by way of the driver software) over the network to the server. The TOPS server software receives the TOPS network call and translates it into a call to the server's operating system. The server opens the requested file and reads it. TOPS then transmits data in the file back over the network to the client.

It doesn't matter whether or not the server is using a different operating system than the client. TOPS client software translates all remote calls into TOPS network calls and TOPS server software translates all TOPS network calls into calls to the server's operating system. In this way, a client running a Macintosh operating system may have access to files on a PC server running DOS or a computer workstation running UNIX.

Other TOPS Products

You can use a number of TOPS products in conjunction with TOPS/Macintosh to enhance your network environment:

- **TOPS File Sharing and Printing for DOS (TOPS/DOS™)** is the TOPS networking software for PCs and compatibles. Provides file sharing and print services, plus high–speed FlashTalk communication.
- **TOPS InBox™** is electronic mail for PC and Macintosh computers.
- **TOPS/Sun™** is the TOPS networking software for Sun Workstation computers. Provides file sharing and print services.
- **TOPS FlashCard** is TOPS' LocalTalk interface card. It supports FlashTalk transmission speeds.
- **TOPS FlashBox™** lets your Macintosh communicate on a TOPS network at FlashTalk speed. Data transmission is up to three times faster than AppleTalk.
- **TOPS TeleConnector™** provides the physical link between a network station and the network cabling. Use it to connect every device, including computers and printers, to the network.
- **TOPS Repeater™** lets you extend the total length of a TOPS LocalTalk network beyond the normal limits, as well as letting you set up branches off a daisy–chain network arrangement.

Chapter

2

Quick Start

This chapter guides the experienced user through installation and use of the TOPS file sharing and print spooling software.

If you are a new user or need more details on installation, refer to *Chapter 3* for step–by–step installation procedures and to succeeding chapters on file sharing and printing operations.

This chapter is divided into two sections:

- **TOPS Quick File Sharing**
  A brief guide through the installation and use of the TOPS file sharing software modules.
- **TOPS Quick Print Spooling**
  A brief guide through the installation and use of the TOPS print spooling software modules.

Quick Start File Sharing

This section provides a brief guide to installation and use of the TOPS File Sharing software. For step–by–step installation instructions, see *Chapter 3*, and for more detailed information on how to use TOPS File Sharing software, see *Chapter 4* and *Chapter 5*.

Quick File Sharing Installation

Make a working copy of your TOPS/Macintosh disk and put your original away for safekeeping. Shut down your Macintosh. Attach your network connector to the printer port on the back of your Macintosh.

Warning

TOPS software cannot be installed with MultiFinder or Switcher active. If you are *updating* an older version of TOPS and/or have management utilities for fonts and desk accessories, please refer to the release notes which accompany this users guide before proceeding.

Insert the working copy of TOPS into one of the disk drives of your Macintosh. Restart your Macintosh, booting off of the working copy of TOPS. Make sure that AppleTalk is active in the **Chooser** or **Control Panel**.

Double–click on the **Installer** on your TOPS disk. Click on the **Drive** button until the hard disk is selected on which you want to install TOPS. Then click on **Install**. When the installation is done, click on **Quit**. Eject the TOPS disk and restart your Macintosh.

Each station requires its own serialized copy of TOPS software. In order for the TOPS network to function, TOPS file sharing software must be installed on at least two stations on your network.

Quick File Sharing Tutorial

The following is a quick tutorial on using TOPS to share files. This tutorial assumes that you've installed TOPS filesharing software on at least two stations in your network.

1. **Select ⌘TOPS from your ⌘ menu.**
   If this is the first time TOPS has been opened, a dialog box will appear, asking you to give your computer a network name.

2. **Enter a name and click** OK.
   Now the TOPS Desk Accessory window will appear with a list of your computer's volumes in the local window on the left. The TOPS command buttons will appear in the center, and a list of the network's file servers in the network window on the right. Select an entry from either list and click **Open** (or double–click the entry). The list will change to show the

contents of your selection. The heading at the top of the list will tell you what you are looking at.

3. **Publish a volume.**
Do this by selecting the name of a disk or a folder from the local window and clicking **Publish**. You may restrict access to the selected volume by entering a password or specifying other limitations here. Once you have published a volume, your station will appear on the network as a server.

Note

When you select a published volume in the TOPS Desk Accessory window, the **Publish** command button will change to **Unpublish** in order to let you unpublish the volume.

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4. **Unpublish the volume.**
Do this by selecting the published volume and clicking on **Unpublish**. You will receive a warning message if anyone else is using the volume you have published. If you want to find out who is using a published volume before you unpublish it, select the volume name and click on **Help** to list your *clients.*

5. **Create a new folder called Application.**
Place into this folder a Macintosh application of your choice. Then publish the folder.

6. **Move to another station on the network. Mount the remote volume Application.**
Do this by selecting a file server from the remote window. Click on **Open** to see the volumes that have been published on that station. When you have found the station which has published the volume application, select the volume click on **Mount**, and close the TOPS Desk Accessory. The volume will appear as an icon on your desktop as if it were a local disk. You may now open the TOPS volume icon and double–click on the application to launch it. You can mount up to six volumes at a time.

7. **Unmount the volume application.**
Quit the application. Close the window of the mounted volume icon application. Then drag the icon to the trash can on your desktop.

8. **Click on Help.**
It provides an explanation of each TOPS feature. Select **Help** alone and windows will appear that describe each of the buttons. Click for **Help** after you've selected another entry in the TOPS window and the windows will explain your selection and the options that are available to you. To delete the help tutorials, remove the TOPS Help file from your System Folder.

Quick Start Print Spooling

This section provides a brief guide to installation and use of the TOPS Print Spooling software. For step–by–step installation instructions, see *Chapter 3*, and for more detailed information on how to use TOPS Spool, see *Chapter 6*.

Quick Print Spooling Installation

After restarting your Macintosh off of its hard disk, insert your working copy of TOPS into one of the Macintosh disk drives. Open the folder called TOPS Spool Files. Copy the TOPS Spool and Spool Installer files from this folder into the System Folder of your hard disk. Open the System Folder of your hard disk and double–click on **Spool Installer.** Click on **Install**. When the installation is done, click on **OK**. Restart your Macintosh using your hard disk. TOPS Spool is now installed and running.

Quick Print Spooling Tutorial

The following is a quick tutorial on using TOPS to spool files for printing.

1. **Restart your Macintosh using your hard disk, if you have not already done so.**
2. **Select the** Chooser **from under the** ** **menu to specify the printer you wish to use.**
3. **Select** ** TOPS Spool **from the Desk Accessories menu.**
   The **TOPS Spool** menu will appear to the right of the Macintosh Finder **Edit** menu.
4. **Select** Prep Laser **from under the TOPS Spool menu to prepare (initialize) the printer for printing.**
5. **Turn on** Print spooled output while I work.
   This option is turned on when the button is darkened and turned off when the button appears popped up (white). If this option is off, Click on the button to turn it on.
6. **Close the TOPS Spool Desk Accessory window.**
7. **Open your hard disk.**
8. **Select** Print Directory... **from under the** File **menu.**
   The standard Macintosh print dialog box will appear prompting you to specify other printing options. Click on **OK**. A blinking laserprinter icon in the upper right corner of your screen indicates spooling is taking place.

Chapter

3

Step–by–Step Installation

This chapter guides you through the following steps involved in installing and loading TOPS file sharing and print spooling software on your Macintosh.

1. **Check to make sure that you have the appropriate hardware and software.**
2. **Install your network connectors.**
3. **Installation TOPS software.**

Each of these steps is covered in a separate section of this chapter:

- **What You Need to Begin**
  A description of the hardware and software requirements for TOPS/Macintosh.
- **Connecting Hardware**
  An explanation of how to install your connectors and cabling.
- **Step–by–Step File Sharing Installation**
  An explanation of how to install, remove, load, and unload your file sharing software on both hard disk and floppy disk–based systems.
- **Step–by–Step Print Spooling Installation**
  An explanation of how to install and remove your print spooling software on both hard disk and floppy disk–based systems.

Table 3–1 TOPS File Sharing Software

TOPS File	What File Does	Size on Disk	Required to run TOPS?
SoftTalk	TOPS network communication module	26K	Yes
TOPS	TOPS system software	84K	Yes
TOPS Key	Holds the serial number	1K	Yes
TOPS DA	The TOPS Desk Accessory application: This file must reside in the System Folder in order to use the TOPS Desk Accessory or, you may store it in any folder where you can double–click on it to launch the TOPS Desk Accessory as you would any Macintosh application.	67K	Yes
TOPS Prep	Automatic publishing and mounting info	1K	Yes
Start TOPS	Loads TOPS if not loaded at startup: TOPS can be loaded either automatically when you start up your Macintosh or you may double–click on the Start TOPS application to load TOPS whenever you choose.	3K	No
Interbase	Translates Macintosh file names to network names recognizable by DOS: This file is required only if you have clients who are using PCs.	24K	No
TOPS Help	Tutorial help for TOPS Desk Accessory	36K	No
PC Icon	Provides a Finder icon for PC items: This file is required if you want access to PC servers as well as Macintosh servers.	1K	No
UNIX Icon	Provides a Finder icon for UNIX items: This file is required if you want access to UNIX–based servers as well as Macintosh servers.	1K	No
VMS Icon	Provides a Finder icon for UNIX items: This file is required if you want access to VMS–based servers as well as Macintosh servers.	1K	No

What you Need to Begin

Before beginning the actual installation it is important to check to see that your system meets the minimum requirements for TOPS Macintosh and that you have all the necessary hardware and software.

In particular, it is important that you have the correct Macintosh System software. See the information in this section.

Computer

While an all Macintosh floppy disk network will work with TOPS, we recommend that you have at least one hard disk on the network. This hard disk will be the repository of data for your network. If you have more than one Macintosh with a hard disk, each of these stations may further act as servers to the network.

TOPS supports the Macintosh 512KE , Macintosh Plus, Macintosh SE as well as the Macintosh II and SE30 families. Your TOPS network may include any combination of these Macintosh models.

Interface and Cabling

- **LocalTalk**
  Since Apple includes a LocalTalk hardware interface inside every Macintosh, an additional interface board is not required for Macintosh stations on the TOPS Network using the LocalTalk cabling system.

  LocalTalk cabling links your computer stations together by means of a connector which connects to your Macintosh and cabling that links the connectors together. The connectors are generally daisy–chained together, though other arrangements are possible.

- **Ethernet**
  You can also run TOPS over an Ethernet cabling system by using any of several third–party interface cards or by using a LocalTalk/Ethernet gateway. Ethernet cabling links your computer stations together by means of a T–connector (for thin Ethernet) or a transceiver (for standard Ethernet). The stations are arranged along a long backbone or segment.

System Software

TOPS supports Apple's 6.0 system software on all Macintosh models (except the Macintosh 512KE, for which we recommend System 4.1/Finder 5.5). To determine which version of 6.0 system software to use, refer to the Apple specifications for your particular Macintosh model.

To obtain your current System and Finder version, pull down the menu and select **About the Finder**. Contact your Apple dealer for system software updates.

Warning Do not use MultiFinder 1.0 with TOPS. Use MultiFinder 6.0 or later.

Connecting Hardware

Before you can use TOPS Macintosh, you must be connected to a LocalTalk or Ethernet cabling system:

- **LocalTalk**
  To connect to LocalTalk, you need both connectors and cabling. The connector should be a LocalTalk compatible connector.

  Make sure the connector is securely attached to the AppleTalk (printer) port as shown in Figure 3–1 and that your cabling is properly terminated. Do not connect to the modem port.

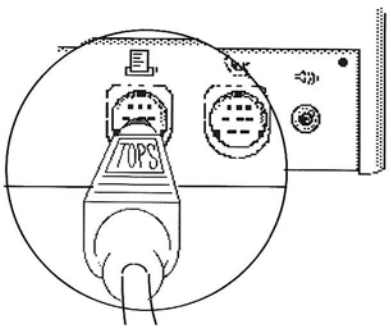


Figure 3–1. Macintosh SE AppleTalk Printer Port

Also, AppleTalk must be active (this turns on the AppleTalk driver software). To turn on AppleTalk, pull down **Chooser** from the menu and click the **Active** button.

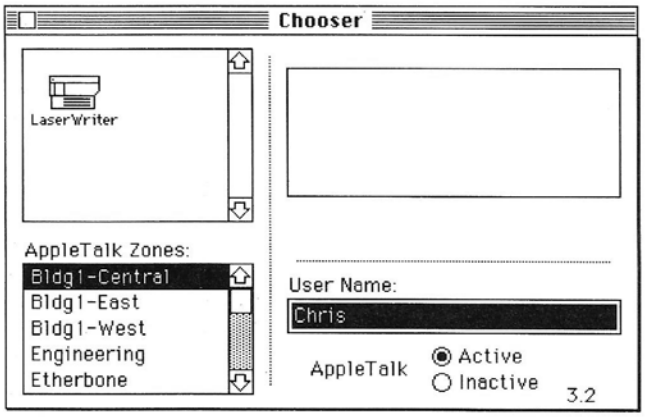


Figure 3–2. Chooser Desk Accessory

- **Ethernet**
  If you have a LocalTalk–only network, you can skip to the next section, Step–by–Step Installation of TOPS File Sharing Software.

  A Macintosh is connected to Ethernet either through a direct–connect card or through a gateway. Several third–party vendors make cards and gateways. Check with your dealer for more information on Ethernet interface hardware.

  If you are using a direct–connect Macintosh Ethernet card, install the card into the Macintosh and connect your Ethernet cabling to the card's port. Open the **Control Panel**, change the Network icon setting to **Ethertalk** and restart the Macintosh. If you are on Ethernet and wish to change back to using LocalTalk, open the **Control Panel**, select **Built–In** as the Network setting and restart your Macintosh.

Step–by–Step File Sharing Installation

This section explains how to install the TOPS File Sharing software on both hard disk and floppy disk drives.

The TOPS/Macintosh distribution disk includes an installer that makes the installation of the file sharing software simple and quick.

TOPS must be installed on at least two stations for you to be able to use your network for file sharing.

Warning

Do not install TOPS with MultiFinder or Switcher active, because the installation will fail.

Installing on Your Hard Disk

The TOPS Installer installs the TOPS Desk Accessory into the System file and copies the eleven TOPS files into the System Folder (see Table 3–1). The installation procedure changes the System Folder on your startup disk so that the TOPS file sharing software is automatically loaded into memory whenever you start up your Macintosh.

Note

If you already have a previous version of TOPS installed and wish to update TOPS or TOPS Spool, follow the instructions in the *Update and Release Notes* which accompany this users guide.

You have a choice of installing using the TOPS Installer or by using Apple's Font/DA Mover. For greatest efficiency, we recommend you use the TOPS Installer which significantly abbreviates the installation process.

1. **Make a working copy of your TOPS/Macintosh disk and put your original away for safekeeping.**
   Then, if anything damages your working copies, you have a backup. TOPS is serialized, so you need a separate copy for each network station. It is very important to write the serial number of the original disk on each copy that you make. Each Macintosh on the network must have TOPS software with a different serial number.

2. **Shut down your Macintosh.**

3. **Insert your working copy of TOPS into the Macintosh floppy disk drive and restart so that you are booting up off of your working copy of TOPS.**

4. **Open the TOPS disk.**
   Double–click on the **Installer** and in a moment you will see the following screen:

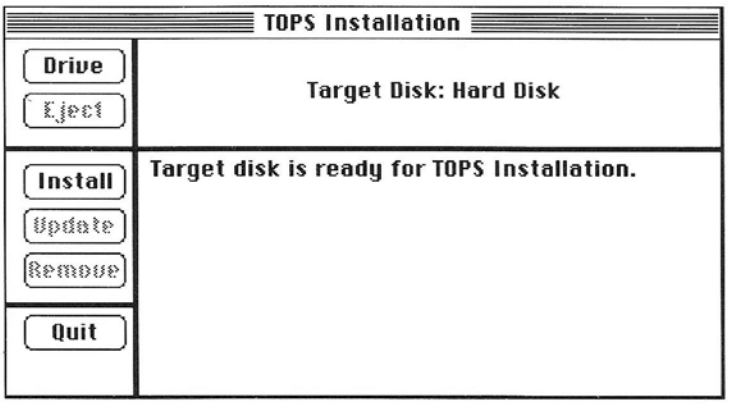


Figure 3–3. TOPS File Sharing Installation Screen

Note: If the installation button is disabled, refer to the update and release notes which accompany this users guide before going on. The disk you have attempted to use is intended only for *updating* an older version of TOPS presently installed on any Macintosh station.

5. **Click on** Drive **until you have selected the disk on which you want to install your TOPS File Sharing software.**
6. **Click on** Install.
   In a moment, the installation process will be finished.
7. **Click on** Quit, **and the following dialog box appears:**

Figure 3–4. Dialog box for completed installation

8. **Click on** OK. **Eject the TOPS disk and restart your Macintosh booting up off of your hard disk.**
   Your TOPS File Sharing installation is now complete.

Installing TOPS File Sharing Software Without Using the Installer

If you wish to install TOPS File Sharing software without using the Installer, follow these steps:

1. **Copy all the files from the TOPS Files Folder on your TOPS File Sharing and Printing For Macintosh disk into the System folder of your startup disk.**
   Insert the TOPS File Sharing and Printing For Macintosh disk into one of the Macintosh disk drives and drag all the files in Table 3–1 into the System folder on your hard disk.

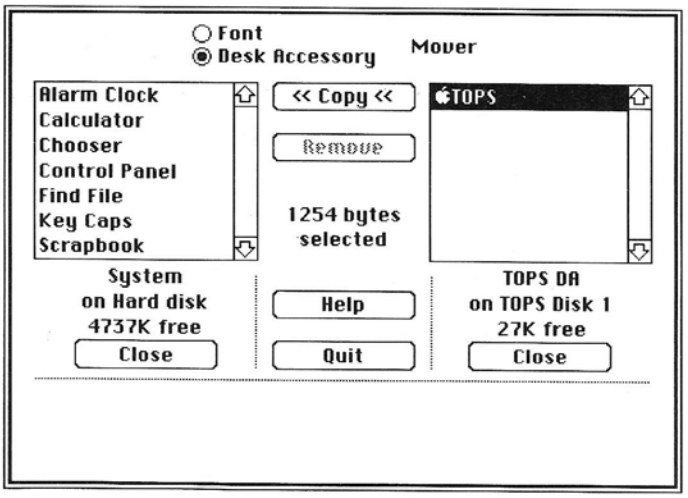


Figure 3–5. TOPS Desk Accessory in Apple's Font/DA Mover

2. **Install the TOPS Desk Accessory into your System file.**
   Run the Font/DA Mover and click on the **Desk Accessory** button. Hold down the **option** key and click **Open** on the right side of the window. Click on **Drive** to select the TOPS disk. Open the **TOPS Files** folder. Select **TOPS.**

   Next, click the <<**Copy**<< button to copy **TOPS.** This installs the TOPS Desk Accessory into your System file.

3. **When the cursor turns back into an arrow, click on** Quit.

4. **Restart your Macintosh.**
   TOPS is now installed and ready to use.

Installing onto Floppy Disks

You will be using two floppy disks to install and run TOPS File Sharing services. Disk One will be your startup disk. You will boot up your Macintosh using Disk One. Disk Two will be your program disk. You will load TOPS into memory from Disk Two, opening the TOPS application file the same way you would open any Macintosh application stored on a floppy disk. Install TOPS onto two floppy disks by following the instructions below.

You may modify your installation in order to run TOPS off of a single floppy disk or customize your installation to take into consideration specific memory or utility requirements. Contact TOPS Technical Support for further instructions. Table 3–1 provides helpful information on configuring TOPS installations where disk space is limited.

1. **Create a working copy of TOPS.**
   Copy the TOPS Files folder from your TOPS/Macintosh disk onto a blank disk. This will be Disk Two.

2. **Create a TOPS startup disk.**
   Copy the System Folder from the TOPS File Sharing and Printing For Macintosh disk onto a blank floppy disk. This will be Disk One. Put the original TOPS disk away for safekeeping.

3. **Copy the TOPS DA file from the TOPS Files folder on Disk Two (your working copy of TOPS) into the System Folder on Disk One (your TOPS startup disk).**

4. **Install the TOPS Desk Accessory into the System file on Disk One using Apple's Font/DA Mover.**

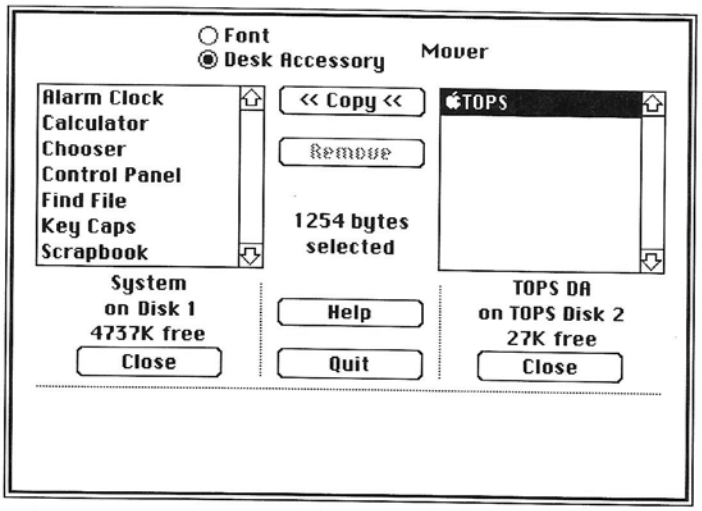


Figure 3–6. TOPS Desk Accessory in Apple's Font/DA Mover

Run the Font/DA Mover and click on the **Desk Accessory** button. Hold down the **option** key and click **Open** on the right side of the window. Click **Drive** to select Disk Two. Select **TOPS**.

Next, click the <<**Copy**<< button to copy **TOPS** DA. This installs the TOPS Desk Accessory into your System file.

5. **When the cursor turns back into an arrow, click on** Quit.

6. **Restart your Macintosh using Disk One.**

7. **Insert Disk Two into a floppy disk drive ejecting Disk One, if necessary.**

8. **Open the TOPS Files folder and double–click on the Start TOPS file. TOPS is now running.**

Loading and Unloading File Sharing Software

Once you have installed TOPS file sharing software on the hard disk of your Macintosh, the TOPS file sharing software will be automatically loaded into memory upon startup. As your Macintosh boots up, you will see an icon on the desktop consisting of three computers linked to a disk drive. This is your confirmation that TOPS has loaded.

Figure 3–7. TOPS file sharing icon

TOPS file sharing software consists primarily of two memory-resident files, SoftTalk and TOPS. SoftTalk is loaded first. It is the basic set of language protocols that TOPS uses to communicate on the network. The TOPS file is loaded next. The TOPS file intercepts calls to and from remote stations on the network and provides translation between local Macintosh operating system calls and remote network calls made using SoftTalk.

TOPS and SoftTalk are examples of initialization files, or *inits*, which are generally found in the System Folder. Init files are loaded alphabetically into memory on startup and are memory-resident until shutdown. Inits sometimes attempt to load into the same area of memory simultaneously. Such collisions often generate system errors. For this reason, we do not recommend using public domain or shareware inits on a TOPS network.

You may choose to startup your Macintosh without automatically loading TOPS into memory. If you subsequently wish to load TOPS, open your System folder and double–click on **Start TOPS.** The TOPS files will be automatically loaded

Removing File Sharing Software

If you wish to remove the TOPS File Sharing software completely, double–click on the **Installer**. Click on **Continue** when prompted by the TOPS installer to proceed with removal. Click on **Quit**. When you restart your Macintosh, the TOPS File Sharing software will no longer reside on your startup disk.

Step–by–Step Print Spooling Installation

This section explains how to install the TOPS print spooling software.

The TOPS File Sharing and Printing For Macintosh v3.0 disk includes a spool installer which makes the installation of the print spooling software simple and quick. Instructions are also included for installing the software without using the TOPS Spool installer and for installing TOPS Spool on a floppy disk based system.

Installing on Your Hard Disk

The following installation requires a hard disk.

1. **Start up your Macintosh using your hard disk.**
   If you have just completed installing your TOPS File Sharing software, make sure to restart your Macintosh so that it boots off of your hard disk.

Warning

Installing TOPS with MultiFinder or Switcher active will cause the installation to fail. If you have utilities which assist in the management of desk accessories and fonts, please refer to the release notes which accompany this manual before installing TOPS Spool.

2. **Copy the** Spool **and** Spool Installer **files from the** Spool File Folder **on the TOPS Disk into the** System Folder **on your hard disk.**
3. **Open the** System Folder **on your hard disk.**
   Double–click on **Spool Installer**. In a moment, you will see the Installer screen:

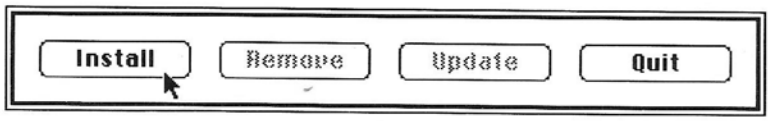


Figure 3–8. Spool Installer Screen

4. **Click on** Install.
   The Spool Installer will notify you that the installation of TOPS Spool is complete (see Figure 3–9 below).

Figure 3–9. Restart Dialog Box in Spool Installer

Click on **OK** to return to the desktop.

5. **After you have returned to the desktop, select the** Restart **option from the** Special **menu.**

When you restart your Macintosh, TOPS Spool will be installed and ready to use. See *Chapter 6* for information on using TOPS Spool.

Installing onto Floppy Disks

You will be installing TOPS Spool onto a floppy disk which you will use to startup your Macintosh. If you have installed TOPS File Sharing and Printing services onto two floppy disks as described in the previous section, install TOPS Spool onto disk one (your floppy startup disk). Install TOPS Spool onto your floppy startup disk by following the instructions below.

If you plan to spool documents onto your floppy startup disk, make sure that there is adequate disk space available. Whenever possible, we recommend spooling to a local hard disk. Documents spooled to a local hard disk are processed faster and more efficiently.

1. **If you have not already done so, create a TOPS floppy startup disk.**
   Copy the **System Folder** from the TOPS File Sharing and Printing For Macintosh v3.0 disk onto a blank floppy disk. This will be your startup disk.
2. **Restart your Macintosh booting up off of your TOPS floppy startup disk.**
3. **Copy the** TOPS Spool **and** Spool Installer **files from your File Sharing and Printing For Macintosh v3.0 disk. into the** System Folder **of your TOPS floppy startup disk.**
   Open the TOPS Spool Files folder on your File Sharing and Printing For Macintosh v3.0 disk. Drag the TOPS Spool and Spool Installer files from the TOPS Spool Files folder into the System Folder on your TOPS floppy startup disk.
4. **Restart your Macintosh using your TOPS floppy startup disk.**
5. **Open the System Folder of your TOPS floppy startup disk**
   Double–click on **Spool Installer**.
6. **Click on** Install.
7. **Click on** OK **when installation is complete.**

8. **After you have returned to the desktop, restart your Macintosh using your TOPS floppy startup disk.**
   When you restart your Macintosh, TOPS Spool will be installed and ready to use. See *Chapter 6* for information on using TOPS Spool.

Removing Print Spooling Software

If you wish to remove TOPS Spool, double–click on the **Installer**. Click on **Remove**. Click on **OK** when removal is complete. Then click on **Quit**. When you restart your Macintosh, TOPS Spool will no longer be listed as a Desk Accessory.

Chapter

4

Making Connections

Once you have installed TOPS, you are ready to establish server/client connections on your network.

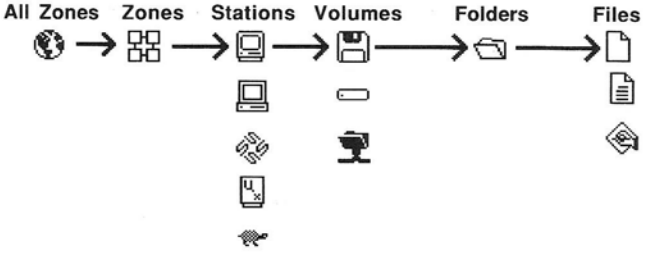
This chapter explains the different server and client operations of your TOPS filesharing software: how to publish volumes from a server and how to mount published volumes on a client:

- **The TOPS Desk Accessory**
  An explanation of how to use the TOPS Desk Accessory to do all your TOPS publishing and mounting operations.
- **Client Operations**
  A description of the TOPS client operations including viewing remote servers, mounting and auto–mounting.
- **Server Operations**
  A description of the TOPS server options including publishing, write protection, and viewing clients and volume directories.

Table 4–1. TOPS/Macintosh Icons

Icon	What it Means
	All the zones on the network
	Your zone on the network
	A Macintosh station on the network
	A PC station on the network
	A Sun Workstation server on the network
	A UNIX-based server on the network
	A station that has not yet connected to the network
	A volume or subdirectory that has been mounted or published
	A volume published from a Macintosh, PC, or UNIX hard disk
	A Macintosh, DOS, or UNIX subdirectory
	A floppy disk volume
	A Macintosh Application
	A Macintosh Data File
	A PC Data File

Hierarchical Relationship of Icons



The TOPS Desk Accessory

The TOPS Desk Accessory is your primary means of signing on to the network. Through its windows, you can:

- Find out which volumes are available to you on the network and mount them onto your Macintosh. Mounting makes files appear as if they were on an extra disk drive attached to your computer.
- Make your volumes (folders or entire disks) available to others on the network. This process is called "publishing."
- Copy files to and from other volumes.

Opening the Desk Accessory

Once TOPS has been installed, you can open the TOPS Desk Accessory by selecting **TOPS** from the Desk Accessory (apple) menu.

Figure 4–1. TOPS DA

The absence of TOPS in this menu indicates that TOPS has not been installed on your current system startup disk. You cannot use TOPS until it has been installed. Refer to Step–by–Step Installation, *Chapter 3.*

TOPS requests your station name the first time you sign on to the network. The following dialog box will appear:

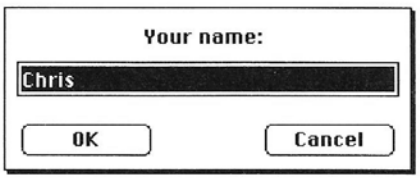


Figure 4–2. Signing on to TOPS

You may make your station name up to 31 characters long. This might be your own name (such as "Chris Stein"), the name of your computer or hard disk (such as "Room 72A Mac SE"), or a functional description such as Accounting or Manufacturing. This

name identifies your Macintosh to other stations on the network and appears as a file server in the TOPS Desk Accessory window whenever you publish a volume.

Once you have entered the name and clicked **OK**, TOPS checks the network to make sure no one else has the same station name. If TOPS detects the same name on the network, you will be asked to enter a different name (see Figure 4–3 below).

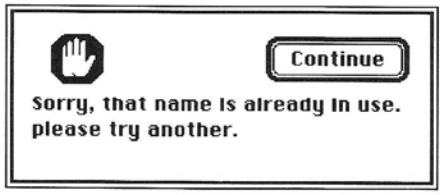


Figure 4–3. Try Another Network Name

Once you have selected a unique name, the TOPS Desk Accessory dialog box will appear and you will have full access to the network.

Changing your station name

After you have signed on the first time, TOPS remembers your name (in the TOPS Prep file) and automatically signs you on each time you turn on your Macintosh. You will not be prompted for the name again. If you want to change your name, open the TOPS Desk Accessory, select your name, and drag down the optional **Open** button. See Interface Conventions in the *Preface* for more information on using option buttons. You will see the same dialog box you saw the first time you specified your name. Just change the name and click **OK**.

Elements of the Desk Accessory

The TOPS Desk Accessory dialog box is divided into three parts:

Local Window

The left-hand (local) window of the TOPS Desk Accessory displays the floppy disks, RAM disks, or hard disks located on your computer. The next section, Server Operations, explains how you can make your files available to other stations on the network by publishing volumes. In Figure 4–4 shown below, "Chris" represents the station name. On your own Macintosh, the station name you choose will appear instead of "Chris."

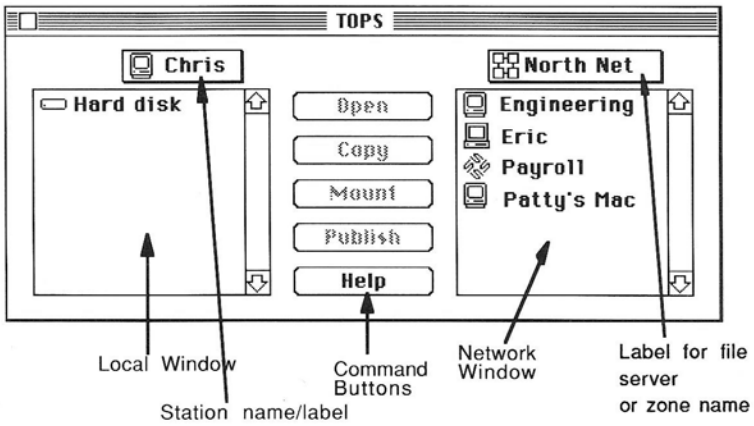


Figure 4–4. TOPS Desk Accessory

If you select one of the disks listed in the local window of the TOPS Desk Accessory and click on the **Open** button (or double–click on the selected disk drive), your station name will be replaced by the name of the disk which you chose to open. A list of files and folders on that disk will then appear in the local window.

To return to the list of local disks, click on the name of the current local disk. Your station name will be attached below the name of the current local disk. Keep the mouse button depressed and move the pointer down until your station name is highlighted. Release the mouse button to view the list of local disks once again.

Network Window

The right-hand (network) window of the TOPS Desk Accessory displays the servers active on the network. If there is only one network, this window is labeled "File Servers." If you are on a network with more than one zone, instead of "File Servers", you will see the name of your local zone (such as "North Net" in Figure 4–4).

A zone is a way of dividing large networks into smaller work groups to reduce network traffic. This is particularly useful when network communication occurs within workgroups or departments in separate physical areas of a network. TOPS can recognize up to 256 zones.

Zones are installed and configured with specialized third party hardware and software. If you have established zones on your network and want to view servers in zones on the network other than your own, click on the name of your zone at the top of the

network window and pull down with the mouse. The next level up is labelled "Zones". Move the mouse to that name and release the button The list changes to show all the zones on the network.

When you select a server and click **Open**, the list changes to show the published volumes on that server. The section, Client Operations, explains how you can get access to these remote volumes.

Command Buttons

The command buttons between the two windows are used with the selections shown on either side. TOPS commands are easy to use:

Open displays the contents of whatever item you select (such as a server, volume, or a folder) in the window. This button becomes highlighted when you select an item from either window. The heading at the top of the window indicates which item you are viewing.

The option open button is useful when viewing zones with servers that may be slow in responding on the network. TOPS will extend the length of time it takes to search for and identify servers in the specified zone. Servers that are slow in responding on the network are represented by a turtle (see Table 4–1, TOPS/Macintosh Icons).

Copy is used to copy individual files and applications from one window to another, that is, from a server station to a client station or vice–versa. This button becomes highlighted when you open both windows to where files may reside and then select a file. See Copying Files, *Chapter 5,* for more information on the **Copy** button.

Mount is used to mount published volumes to your Macintosh. This button is highlighted after selecting a published volume. If you select the name of a volume which you have already mounted, the button will change to read **Unmount**. See the section, Client Operations, for more information on the **Mount** button.

Publish is used to publish a drive or folder on your Macintosh. This button becomes highlighted when you select a local drive or folder, and changes to **Unpublish** when you select published local drives. The next section, Server Operations, explains how to use the **Publish** button.

Help provides you with a detailed explanation of any item that you select from the TOPS Desk Accessory. The Help button is always highlighted. If you click on an item in the TOPS Desk Accessory window and then select **Help**, TOPS will give you help specific to the item you have chosen.

If you select Help without specifying an item, Help will display the version of TOPS you are using as well as the serial number and provide a description of each button in the TOPS Desk Accessory window.

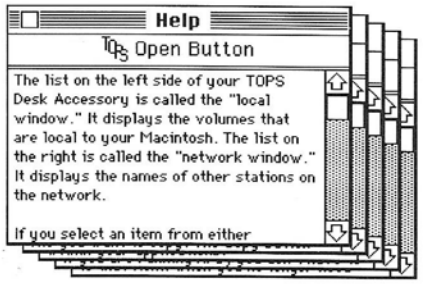


Figure 4–5. Help on the Open Button

To close all the Help windows at once, click anywhere outside the help windows.

Note Every button has options you can choose. To choose an option, move the mouse so that the cursor arrow is located on the button. Keep the mouse button depressed while dragging the cursor arrow down towards the bottom of your screen until the option button is highlighted. This is referred to in this manual as "pull down the option button." See *Preface,* Interface Conventions, for more information on using option buttons.

Client Operations

When you use volumes that are located on someone else's computer, your Macintosh is functioning as a client station. In this section, you will learn how to view and gain access to remote volumes on the network, and how to mount and unmount them.

Viewing Published Volumes

The network window of the TOPS Desk Accessory provides you with information about the volumes that are available to you from the other servers on the network.

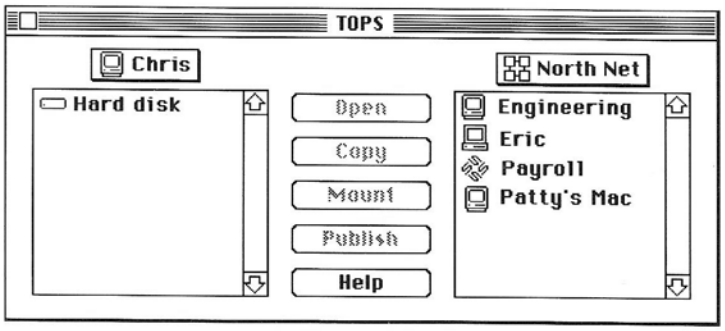


Figure 4–6. Listing Network Stations

The network window lists the stations on the network (or in your zone) that have become file servers by publishing volumes. The label above the window (which is either "File Servers" or the name of your zone) indicates which portion of the network you are viewing.

The icon preceding each station name tells you the type of computer it is. The icon for a Macintosh looks like a Macintosh, while PCs are represented by icons that resemble PCs. Stations that are Sun Workstation or UNIX–based file servers (such as "Payroll" above) are represented by a descriptive icon. See Table 4–1 for more information.

If you suspect that a new server may have signed on to the network, but it does not yet appear in the network window, you may update the server list by double–clicking on "File Servers" or the zone name.

Note

A station must have at least one volume published to appear on the network.

Listing Published Volumes

You can survey a list of a station's published volumes in much the same way that you review the contents of your own disks. Select the station and click **Open** or double–click the station name.

Open one of the station names in your TOPS Desk Accessory. The right window now displays a list of volumes published by the station you selected. The volume list might look something like Figure 4–7.

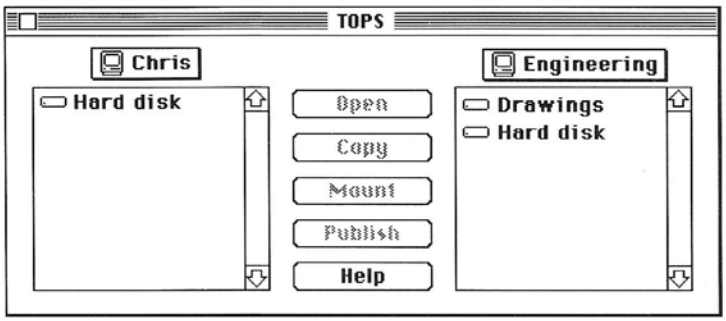


Figure 4–7. Listing Another Station's Published Volumes

Note that the network window's label has been replaced by the name of the station you selected. The icon next to it reminds you that you are viewing the contents of a station.

The icon to the left of each station indicates whether the volume has been published by an IBM, a Macintosh, or UNIX server, from a floppy disk or a hard disk. See Table 4–1.

You have now descended one level deeper in viewing information on the network. The label above this window becomes a pull–down menu. Click and hold the pointer on the station name above the window and you will notice that the levels above the current one appear. You can move to the next level up in the hierarchy by moving the mouse down to this level and releasing the button.

Viewing the Contents of a Volume

To view the contents of a published volume (which can be either a disk or a folder), select the volume name and click **Open**. The list displays the files and/or folders contained in the volume you have selected. The icons to the left of the listings show you whether the item is a data file, an application, or a folder. If no folder icons are displayed, you have reached the deepest viewing level of the selected volume.

Note

The TOPS Desk Accessory behaves like other Macintosh Desk Accessories in that only the first 14–16 characters of the file or folder name will be displayed in the lists. Knowing this, it is wise to keep your file names short, or at least have the first 14 characters adequately describe the file or folder.

The number of files displayed through the TOPS Desk Accessory window is restricted by available memory. The contents of very large volumes may therefore appear incomplete. A complete directory of mounted volumes is always available when viewed through the Finder or MultiFinder.

Mounting a Volume

To mount a remote volume, select the volume and click **Mount**. If the volume you have selected requires a password, a dialog box will appear asking you to enter the password. The characters you type in this box are not shown on the screen. Instead, a • is shown for each letter you type so that someone looking over your shoulder cannot see your password.

Once a volume has been mounted, its original icon will be replaced by an open folder marked by a network symbol. The volume's "parent" icons will be highlighted in black, as in Figure 4–8.

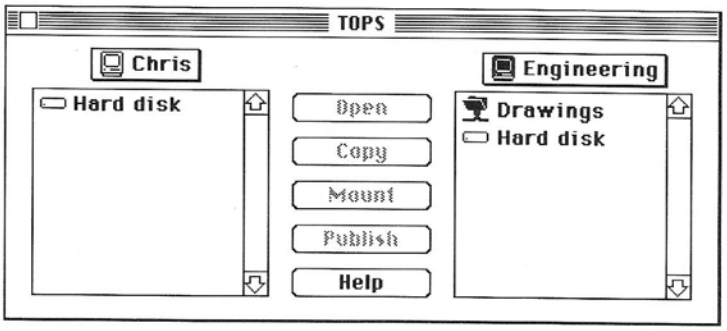


Figure 4–8. After Mounting a Volume

You can mount up to six volumes at a time. You can get a list of all your mounted volumes by selecting a blackened icon and clicking **Help**.

Opening a Mounted Volume

Every volume or folder you have mounted will appear as an icon on your desktop after you close the TOPS Desk Accessory and return to the Finder or MultiFinder window, as shown in Figure 4–9.

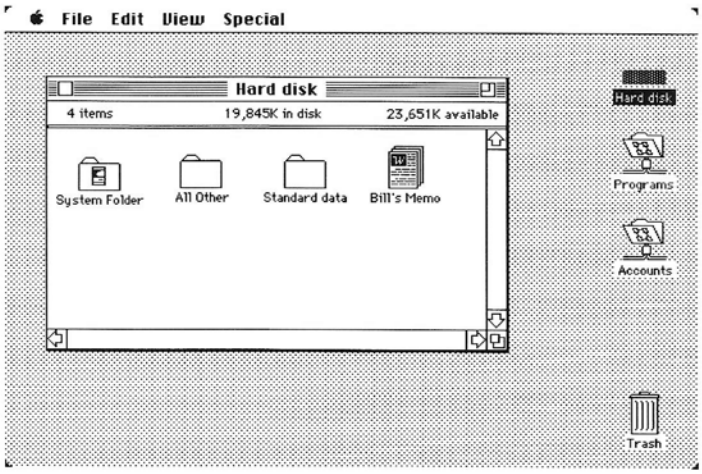


Figure 4–9. How a Mounted Volume Appears on the Desktop

Once they are mounted to your desktop, the icons behave like any other drive icon. For example, these volumes appear as disk drives in the **Open** and **Save As...** boxes in Macintosh applications.

You can open the mounted volume just as you would a floppy disk. Once you open the volume, you can double–click on an application and run it.

If you are on a network with both Macintoshes and PCs, remember that the Finder cannot open a PC document in a PC volume by double–clicking on it (it can, however, open a Macintosh document or Macintosh application that is stored on a PC disk). If you attempt to open a PC document by double–clicking on its icon in the Finder, your Macintosh will give you a dialog box saying that an application cannot be found to open the document.

Mounting with Limited Access

There may be times when you want to have access to someone else's work, but you want to make sure that you don't accidentally alter it. In such instances, you may choose to mount the volume with limited access.

To mount a volume with limited access, open the TOPS Desk Accessory, select the volume to be mounted, and drag down the option **Mount** button. The following dialog box appears:

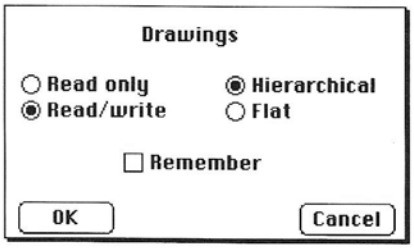


Figure 4–10. Mounting with Limited Access

Of course, your access options are still limited by the restrictions placed on the volume when it was published. For example, if a volume is published "write–protected", you cannot change this status. Access options which are not available to you are shown in gray.

The dialog box also gives you the option of mounting a volume as flat (Macintosh File System) rather than HFS (Heirarchical File System). This option, meant for old MFS software applications, is virtually of no use and should be ignored.

Auto–mounting a Volume

The Remember button in the optional Mount dialog box lets you tell TOPS to automatically mount this volume every time you start up your Macintosh. This is very convenient for volumes which you use often. After selecting the **Remember** button, TOPS will automatically mount the volume each time you start up your Macintosh.

Note The server should be running and the volume published before you startup your station.

If TOPS has a problem auto–mounting a volume, it will give you a dialog box with three choices: **Continue**, **Try Again**, and **Forget**. Click **Try Again** if you think that the volume is really on the network but may have been momentarily unavailable. Click **Continue** to proceed without mounting the volume. You can use the TOPS Desk Accessory to mount it later, as shown below. Click **Forget** to indicate that you do not want TOPS to try to auto–mount this volume in the future (for example: a folder that you know has been erased).

TOPS even lets you quickly re-mount any volumes in your auto–mount list that are not mounted. Simply hold down the **option**

key when you open the TOPS Desk Accessory. This will not affect the volumes already mounted, but will attempt to auto–mount any volumes in your auto–mount list that are not already mounted for any reason.

UNIX Volumes

TOPS fully respects all UNIX permissions and restrictions for file and directory access. Before you mount a UNIX volume, you must have an account on that workstation or server. To get an account, you must talk to that computer's owner or System Administrator.

Your account on a UNIX system consists of a user name and a password. When you first open a UNIX server, TOPS prompts you for your user name and password. Pay special attention to the use of case in issuing your UNIX password. UNIX systems are sensitive to the use of capitalized and lower case characters.

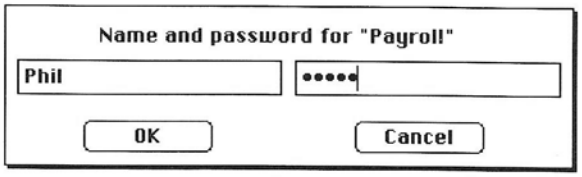


Figure 4–11. Signing on to a UNIX Server

Type in your name and your password (a • is shown for each letter you type so that someone looking over your shoulder cannot see your password). Click **OK**. You will then see a list of all published volumes from the UNIX server.

Unmounting a Volume

Once you are finished using a volume, unmount it by dragging its disk icon to the trash can. This is the same procedure you would use to remove a floppy disk inserted into your Macintosh. Note that the files are not deleted, they simply become unavailable to you. We recommend unmounting volumes by dragging them to the trash to ensure all files have been properly saved and closed.

You may also unmount volumes from within the TOPS Desk Accessory. Open the TOPS Desk Accessory and locate the volume in the network window that you wish to unmount. Select its name and then click on **Unmount**. (The **Mount** button changes to **Unmount** when you select an already–mounted volume.)

It is possible that you might attempt to unmount a volume from the TOPS Desk Accessory even though your Macintosh still has files open within that volume.

When this is the case, you will receive the following message:

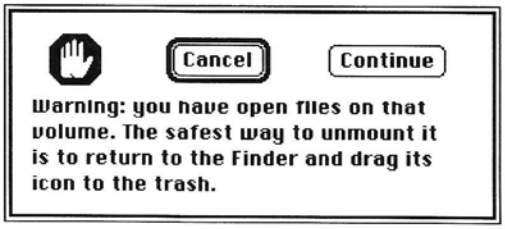


Figure 4–12. Warning about Open Files

Click on Continue to return to the TOPS Desk Accessory. After quitting the TOPS Desk Accessory, close any file that may have been opened on the volume you wish to unmount.

Make sure to unmount any volumes published by a server that is planning to shutdown, restart, or unpublish volumes. You will ordinarily be warned twenty seconds before the server disengages from the network however, a server may choose to lengthen or shorten this period as well as shutdown without warning its clients.

To save time, you may unmount all of a volume's folders at once by simply selecting the volume name and clicking **Unmount**. You can unmount all of the volumes within a server in the same way. Just select the server name and click **Unmount**. You can even unmount all of the volumes you have mounted from all of the servers by selecting the Zone icon and clicking **Unmount**.

Server Operations

When you make files and folders accessible to others on a TOPS network, your computer becomes known as a server. Only you can determine whether or not other users have access to your files. This section describes how to make your resources available to the network–or remove them from the network.

Viewing Your Disks and Folders

By now you know that the local window of the TOPS Desk Accessory provides a list of the folders and files physically located in the disk drives attached to your computer, and the icon next to each name shows you the type of item it is.

To view the contents of one of your drives or folders, select the icon in the list and then click on the **Open** button. You may also double–click on the name of the item in order to open it. Items are displayed in alphabetical order.

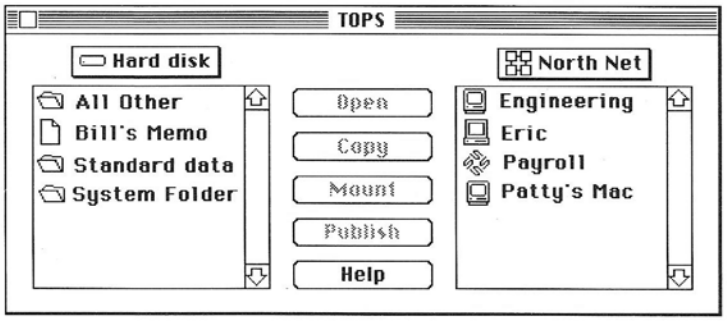


Figure 4–13. Listing the Contents of a Volume

Later Macintosh models use the heirarchical file system (HFS) which lets you place files in folders and folders within other folders. All of these folders are true subdirectories within TOPS. You may view the contents of a folder by selecting its name and then clicking on **Open** or by double–clicking on the folder's name.

Once you've elected to look at the contents of a volume or a folder, the label over the window becomes a pull–down menu. Click on the label and notice that you can return to a higher level by selecting it from the menu.

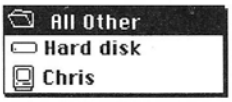


Figure 4–14. Pull–down menus

Publishing a Volume

If you wish to let others on the network have access to your files, you do so by publishing a drive or folder containing those files. When published, the drive or folder is called a volume. You may publish a maximum of 12 volumes at a time. When other stations ask for a list of your volumes, the list that appears on their screens will only show the folders or drives that are currently published. In fact, your station only appears on the network if it has one or more volumes published.

Note

You should generally avoid publishing floppy disks because when a floppy is accessed by a client station, your local activities will slow down. If you do publish a floppy disk, however, it is best to leave it in the drive until you unpublish it. If you try to eject a floppy disk that is in active use, you will get a warning. If you continue with the ejection, the floppy is unpublished, which might affect the client users.

To publish, simply select a disk or a folder in the list, and then click **Publish**. Note that the disk or folder icon changes to black to indicate that the contents have been published. The Macintosh (upper left side of the local window) icon also changes to black to indicate that at least one disk or folder on your Macintosh is published.

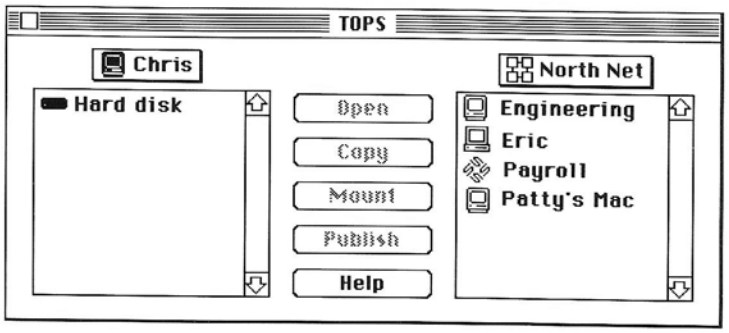


Figure 4–15. After Clicking the Publish Button

We recommend publishing folders only. If you publish at the disk level, you should be aware that all folders and files on that disk will be available to others on the network. When you open a published volume and notice that the folders are gray, it means that they are already available on the network as shown.

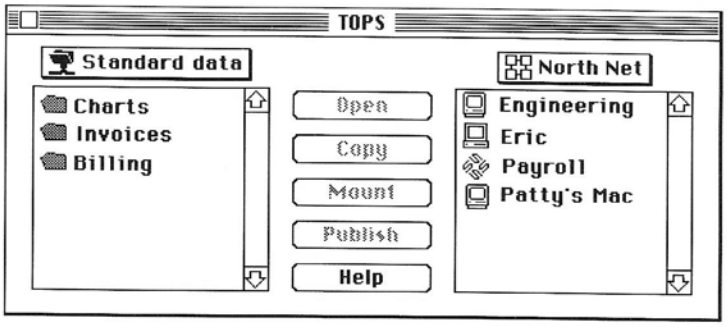


Figure 4–16. Opening a Published Volume

You may publish any folder, even if it is inside another folder. When you publish at the folder level, any files and folders within that folder will be accessible by others. The icon representing the folder that you publish will change to the open file folder, as in Figure 4–16 above. Any folders inside it will be highlighted in gray. You may publish up to 12 volumes.

Note

It is not possible to publish at the file level. Publishing can only occur at the folder or volume level. If you wish to publish an individual file, place it in an otherwise empty folder (or on a blank floppy disk) and publish that.

Restricting Access to Your Files

There may be occasions when your work must be shared with one or two key people on the network, but kept from all the others. Other times, you might need your work to be seen by others on the network, but not changed by them. In cases like these, you can publish your work but restrict the access. A server always has full access to its published volumes regardless of how those volumes are write protected when published.

Note

The best way to keep files and applications private is not to publish them.

To restrict access when you publish a volume, click **Publish** and drag down the option button as shown in Figure 4–17.

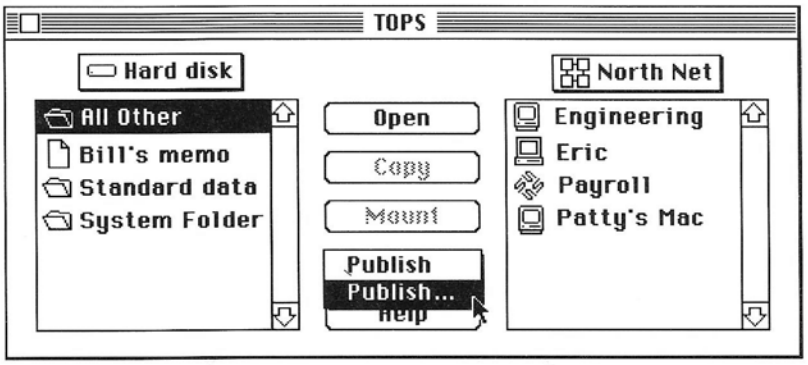


Figure 4–17. Publishing with Optional Menu

A dialog box will appear that enables you to specify a password and choose among three access modes. write–protected, one writer only, or many writers. See Figure 4–18.

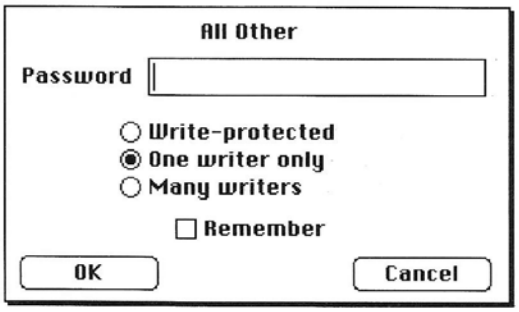


Figure 4–18. Publish dialog box

- **Passwords**
  Passwords are always optional. Second only to not publishing a volume, password protection is the best way of restricting access. If you type in a password, no client will be able to open or mount your volume unless they know the password. If you leave the password box blank, your published volume will be accessible to any client on the network.

- **Write–Protected**
  A write–protected volume is one that is "read only". A write–protected volume is indicated by a padlock icon appearing in its directory window. Other clients will be able to read files on your write–protected volume but they will not be able to make any changes to it, nor will they be able to copy files or folders into that volume.

- **One Writer Only**
  When a volume is published in this mode, the server and the first client to mount the volume can write to it. Subsequent clients can read the data but not write to it. A padlock icon in the upper left corner of the window indicates read–only access. When the first client unmounts the volume, the next client to mount the volume gets permission to write to it. All other clients retain read–only access to data on that volume. Clients may need to update the list of available volumes in order to take advantage of those volumes whose permissions have changed. This is done by either closing the volume and reopening it or by using the TOPS Desk Accessory to reopen the zone or file server.

- **Many Writers**
  This access mode places no restrictions on the number of clients who can read or write to your volume. Some applications allow multiple users to write to the same data file simultaneously. If you are using such an application over the network, make sure to publish the volume with the data file as

Many Writers. See Running Remote Applications, *Chapter 5,* for more information.

TOPS' default choice is "One writer only" with no password. This is the way your volumes will be published if you do not drag down the optional **Publish** button.

Auto–publishing a Volume

TOPS can automatically publish volumes of your choice each time you start up your Macintosh. The dialog box that you select when you pull down the option **Publish** button includes a check box labeled **Remember**. If you check this, TOPS will remember to publish the specified volume name with any password protection and access restrictions entered in the dialog box.

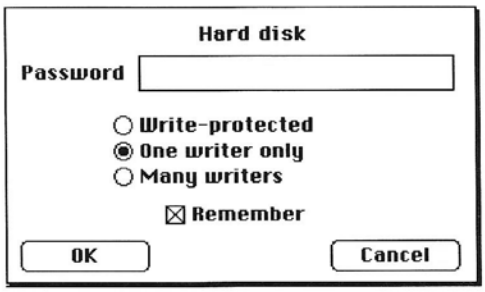


Figure 4–19. Auto–publishing

This information is stored in the file called TOPS Prep which resides in your System folder. Whenever you start up your system, all volumes you have selected in this fashion will be automatically published.

You may auto–publish up to 12 volumes. If you have auto–published a volume and want to prevent it from being auto–published each time you turn on your Macintosh, uncheck the **Remember** check box in the Publish dialog box. To do this, select the published disk or folder, click the **Unpublish** button and drag down the optional button. In the dialog box, uncheck **Remember**.

Note

If you simply unpublish a volume without unchecking **Remember**, TOPS will continue to automatically publish it in the future.

If TOPS has a problem auto–publishing a volume, it will give you a dialog box with two choices: **Continue** and **Forget**. Click **Continue** to proceed without publishing the volume. You may use the TOPS Desk Accessory to publish it later. Click the **Forget** button to indicate that you do not want TOPS to try to automatically publish this volume in the future.

TOPS even lets you quickly re-publish any volumes in your auto–publish list that have been unpublished. Pull down the option open button when you open the TOPS Desk Accessory. This will not affect the volumes already published but will attempt to automatically publish any volumes in your auto–publish list that are not currently published.

Listing Your Clients

To get a list of the clients using a volume, open the TOPS Desk Accessory, select the published volume, and click **Help**. A series of windows will appear, describing the volume's contents. The last window will give you a complete list of that volume's users. To go to that window directly, drag down the optional **Help** button. This feature applies to any volume, whether it is a folder, a floppy, or a hard disk.

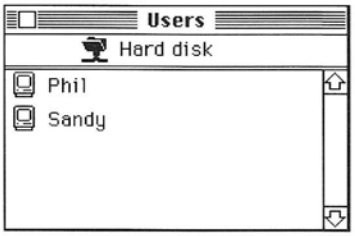


Figure 4–20. Listing Clients

Also, if you choose your station name and click **Help**, you will get a list of users for each of your published volumes.

Unpublishing a Volume

Unpublishing a volume removes its name from the list of volumes accessible by clients. Clients will no longer be able to view or mount this volue. When you select a published disk or folder, the Publish button changes to **Unpublish**.

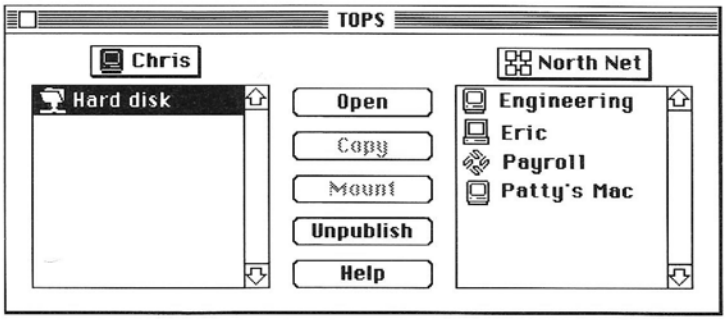


Figure 4–21. Unpublishing a Volume

Clicking the **Unpublish** button will unpublish the selected volume.

A volume represented by a highlighted disk indicates that there are individual folders within that volume which are published. If you select the highlighted disk and click on **Unpublish**, all of the published folders within that volume will be unpublished simultaneously.

If you attempt to eject or unpublish a disk or select the **Shut Down** or **Restart** option from the Finder's **Special** menu, you will receive a warning message if any of your published volumes have active clients.

You may choose one of three options: warn clients that shutdown may occur, continue to disengage from the network as requested, or cancel the request altogether.

If you click on **Warn users**, clients using your published volumes will be informed that you are planning to shut down. When you are sure that all clients have saved their work and unmounted your published volumes, you may reissue the request to shutdown, restart, or unpublish.

If you click on **Continue**, your request to shut down, restart, or unpublish a volume will take place in twenty seconds. Clients will be informed that the mounted volume has been shut down and the volume will be automatically unmounted. You may choose to shut down your station, unpublish a volume, or restart your Macintosh immediately by selecting **Shut down now**. However, for optimal communication and security on the network, we recommend against overriding the twenty second warning period. A client may be in the midst of saving a file or performing some other operation. Such an interruption may cause the operation to fail or data to be lost or damaged.

If you click on **Cancel**, your request to shudown, restart, or unpublish will be cancelled with no further messages from TOPS.

Note

If you are using a hard disk with its own "log off" or "shut down" utility, you may not be warned that your published volumes have active clients. If you shut down your Macintosh or eject the disk, your clients may lose their work. To avoid this problem, make sure to notify all your clients before you shut down.

Chapter

5

Working on a Network

This chapter discusses issues that come up in working with TOPS in all–Macintosh and mixed PC and UNIX networks. There are also many tips which will help you increase your productivity on your TOPS Network.

- **Copying Files Over a TOPS Network**
  A description of copying files to and from published volumes.
- **Macintosh Networking**
  A discussion of single–user, multi–launch, and multi–user applications and how to use them on your TOPS Network.
- **Mixed Operating System Networks**
  A discussion of the data formats, file structures, file systems and filename conventions of the Macintosh, DOS, and UNIX operating systems. There is also a description of the Macintosh Desktop file and how it is affected by mounting and multi–user access on the TOPS Network.
- **TOPS Tips**
  Tips to help you use your TOPS network most efficiently.

Copying Files Over a TOPS Network

One of the benefits of a network is the ability to transfer files from one network station to another. You can use a number of methods to copy files between your Macintosh and a remote volume.

The easiest way to copy files to or from a remote volume is to first mount that volume and use standard Macintosh copy techniques. However, using the TOPS Desk Accessory you can copy files one at a time without mounting the published volume. You can also convert formatted data files to text.

Copying Files: Mounted Volume

You can copy a file to or from a mounted volume by dragging its icon in exactly the same way you would copy it to or from a local drive. You can copy groups of files in the same way.

If you are working within an application, you can copy an open file by using the **Save As** option under the **File** menu, and when the dialog box comes up, choose the mounted volume and click on **Save**.

Copying Files: Non-Mounted Volume

TOPS provides as a way to copy files one at a time between your Macintosh and a published volume on the network: the copy option in the TOPS Desk Accessory. This is a short cut to mounting the volume and dragging the file from one volume to another. If you are copying a file to a remote volume, that volume must be published with write access.

To copy a file from your Macintosh to a remote volume:

1. **Open the TOPS Desk Accessory in the usual way.**
2. **Open the destination volume in the network window just as you have in earlier chapters.**
3. **Select the file you want to copy from the list in the local window.**
4. **Click on** Copy **as shown in Figure 5–1 and the file will be copied.**
   The file name will appear among the files in the network window.

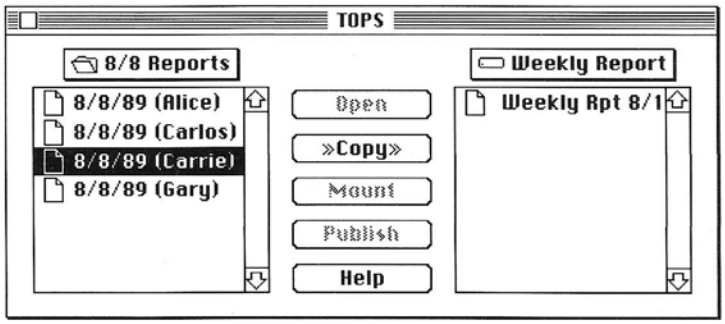


Figure 5–1. Using the TOPS Copy Button

You can copy a file from a remote station to your own in the same manner. When the **Copy** button is enabled, the arrows on either side of the word "Copy" point in the direction the selected file will travel.

Note

The destination volume must be opened and a file selected in the source folder before the **Copy** button will be enabled.

If you attempt to copy a file to a volume that already has a file with the same name, a dialog box will appear asking if you want to replace the original file or rename the copy.

The TOPS copy option can be used with any type of file: applications, data files, etc. The files can be copied from one network station to another regardless of the computer types. Because of differences in formatting between documents created on different operating systems, however, you may wish to convert a document being copied to text. This is discussed in the following section.

Converting to Text

If you use the TOPS **Copy** button in its default mode, a file is copied completely intact. However, if you drag down the option **Copy** button, a dialog box will appear asking whether you want the copy to be converted into a text–only (ASCII) file. See Figure 5–2.

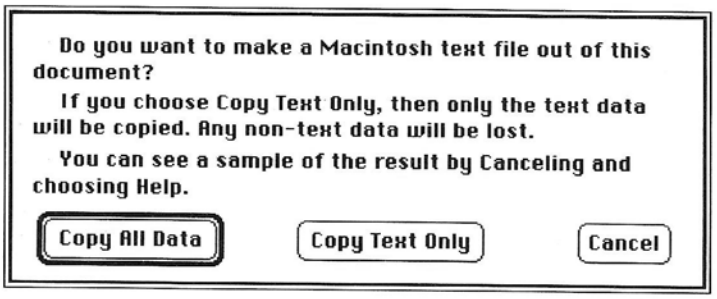


Figure 5–2. Converting a File into Text–Only Format

If you select this option, data files will be stripped of their formatting codes as they are copied. This will convert them into Macintosh text files (ASCII files with line feed and carriage return usage specific to the Macintosh operating system). PC text (ASCII) files will be converted into Macintosh text files. Macintosh document files (text which is not in ASCII format as in, for example, a MacWrite document) will be converted to Macintosh text files.

If you are copying files from a UNIX based computer and wish to convert UNIX text files to Macintosh format (or vice–versa), you can use the `tomac` and `tounix` commands on the Sun workstation (see the *TOPS/Sun System Administration Guide* for more details).

In most cases, you will want to use TOPS/MacLink Plus for converting PC files to Macintosh format. See the MacLink Plus/TOPSdocumentation for instructions.

Viewing the Content of Files

You can use the TOPS Desk Accessory to get a glimpse of a file's contents. Select a document from either window of the TOPS Desk Accessory, and click **Help**. A series of windows will appear.

The first window provides general information about the document and the TOPS commands that can be used with it. Closing this window uncovers a second window that contains facts specific to the document—its size and creation date. Close this window and the third window will be revealed, giving you a sample of the document itself. If you drag down the option **Help** button, you will get help on copying and viewing file contents.

Often the sample will consist partly or entirely of unrecognizable characters. These unrecognizable characters appear because the file is not an *ASCII* text file. Non–ASCII text files may be read correctly from within the applications used to create them.

The heading at the top of the window will either be "Sample" or "Filtered Sample":

- "Sample" indicates the document is an ASCII text file. If you decide to copy the file, the copy will contain all of the text, including the various embedded commands (carriage returns, tabs, etc.) that are invisibly used by your computer to format the text properly. These embedded commands often appear as extraneous or unrecognizable characters. When you close the Desk Accessory and open the copied document, it should appear in the exact same form as the original.
- "Filtered Sample" indicates that the document is in a format specific to the application used to create it. TOPS "filters" this text to conceal embedded formatting codes recognizable only by the application which created the document. If you copy a text file created on the PC onto a Macintosh using the **Copy All Data** button (see Figure 5–2), the file on the Macintosh will disclose many of the unrecognizable embedded formatting commands. If you use the **Copy Text Only** option to copy the PC text file onto a Macintosh, these extraneous characters will be hidden. *Character* formatting commands such as boldface, italics, underlining, overstrike, etc. will not be copied.

Macintosh Networking

A number of issues come up when using your Macintosh as a server or client on a TOPS network. If your Macintosh is functioning as a server to other stations on the network, then it is important to organize your files and folders in a way that will facilitate their use both by yourself and others on the network. This section provides a few hints.

As a client, it is important to understand how your use of a server's files may be affected by other clients' use of those same files. This section covers the issues which arise in using remote data and application files.

Organizing Files for Network Use

If you are making files available to clients on the network, you may want to give some thought to the organization of files on your disk.

Typically, you will want some files made available to all clients on the network, some files accessible by selected clients only, and some files available only for your own use.

Consider categorizing your folders in the following way:

- Those that never get published
- Those that get published with password protection
- Those that get published without password restrictions.

By arranging your placement of files in folders according to these categories it will be easy to control access other network users have to your files. Remember that all subfolders within a folder are published when you publish the parent folder.

A couple of other tips:

- Do not shut off your computer or restart it without first checking to see if other s are using your files.
- When your computer is acting as a server on the network, try to keep intensive disk access operations to a minimum.

Setting Up a Dedicated Server

You may want to set up a station as a dedicated server. The server can be either a Macintosh, PC, or Sun. You can use this server as a central place to share files, backup files, or as a home for multi–user applications. If you want to set up TOPS to run as a dedicated server:

- Group the clients' applications into separate folders with the applications each client needs.

- Publish all the volumes as "Many writers", or read/write with appropriate passwords for each client. Also, if your server is a Macintosh, click the **Remember** check box, so your volumes are published automatically on startup.
- If security is an important issue, store the dedicated server in a locked room or remove the mouse and keyboard.
- If your server is a Macintosh running under MultiFinder, leave the TOPS Desk Accessory open on the desktop.

Access to Remote Data Files

A typical file service networking situation is where several Macintosh clients are using data files located in a published volume of a network server. The data files could be word processing documents, spreadsheets, database files, etc. After mounting the published volume, access to data files by clients is provided in one of two ways:

- **By loading into a local application.**
  In this case, clients launch an application (for example, MacWrite) locally from their own disk drive and load a remote (MacWrite) document into the application (by selecting **Open** under the **File** menu).

  Two clients loading the same remote data file may or may not have the capability of writing to the same file simultaneously depending on the specifications of the application being used. Many applications provide no protection against more than one user loading and writing to the same data file however, a file may become corrupted if this happens. Some applications provide access only to the *first* user of a file. Subsequent users may or may not be able to read the file. Other applications provide multiple users simultaneous access by arbitrating access to specific parts of a file (record locking).

  If you are using an application which allows any number of users simultaneous access to a file with no record locking capabilities, data volumes should be published as one–writer only. Access will be provided to one client at a time—the first client to select and open the file. Note that this restriction is placed on clients only. There is no protection against simultaneous access by both server and client. with this type of application.
- **By double–clicking on a remote data file.**
  In this case the client Macintosh's Finder will look for a copy of the appropriate application file on the server and launch it. The data file is then automatically loaded into it. If another client double–clicks on another data file created by the same application, it will again attempt to launch the same application file.

Both clients are trying to run the same remote application. What happens at this point depends on the nature of the application itself, as described in the next section.

Running Remote Applications

It is not uncommon for clients to want to run applications stored on a network server. This is often the case where the client stations do not have hard disks and therefore want to run applications remotely. Running remote applications also takes place when clients attempt to open remote data files by double–clicking on the data file as discussed in the previous paragraph.

If only one client is running a remote application, this normally creates no problem. If more than one client is trying to run a remote application, however, the results will depend on what type of application it is. There are three types:

- **Single–user applications**
  These applications are designed to be run by only one user at a time. Once the application has been launched, a second user will find the application locked. For several clients to simultaneously run this type of application remotely, there must be one copy of the application for each client with each copy residing in a separately published volume.

  Even if clients are not attempting to run the remote application at the same time, they may each use different configuration settings when they do use it. For this reason also it is advisable to have a different copy of the application for each client using it. Check your software vendors' license agreement for information on making copies of the applications.

- **Multi–launch applications**
  Unlike single–user applications, these applications are designed to be run by more than one user at a time. However, most multi–launch applications only permit one user to *write* to a data file at a given time. The second client to open a data file will be able to read the file but make no changes to it. The second client may make changes to the file once the first client has closed it.

  Since all clients are using the same multi–launch application file, network communication may be slower due to increased demands on the server.

  Typical multi–launch applications are Microsoft Word, PageMaker and Microsoft Excel.

- **Multi–user applications**
  These applications, like multi–launch applications, are designed to be run by more than one user at a time In addition, they allow several users to work on a data file simultaneously.

  Many multi–user applications are designed to store multiple setup information so that several users may load the same application file customized according to their own individual setup needs.

  Multi–user applications permit one user to open and write to a file or record while other users write to a different file or record. For example, several users may be working in a single database file updating records, but the application will prevent any two users from writing to the same record at the same time. This is called file and record locking.

  TOPS file sharing software supports applications which take advantage of Apple's Shared Environment Extensions (SEE) to the Macintosh operating system. These extensions let multiple users simultaneously access a single file with enhanced record locking capability.

  Examples of such multi–user applications are Omnis 3 Plus™ and Omnis 5™, FoxBASE+/Mac Multi–User™, FileMaker® II, 4th DIMENSION™, Great Plains Software® and Inside Out™.

Multi–File Applications

The Macintosh operating system is configured to allow a certain number of files to be open at one time. In some cases, especially with multi–user and/or multi–file applications, the number of files allowed to be open must be increased.

The System file is always open, as is TOPS, if present. When you open an application another open file is added, and each open document adds yet another. Some applications, especially databases, maintain a large number of open files. If access is required simultaneously by multiple users, the number of open files could grow significantly, especially at the file server.

When the limit to the number of open files has been reached, the user may get an error message from the application such as "Can't find file...". Additional users may be unable to open the application or mount the server. The value for Maximum Number of Open Files resides in the boot sector of the startup disk. A resource code editing utility is required to increase this value.

Mixed Operating System Networks

A TOPS network can link Macintoshes, PCs, and Sun workstations together almost seamlessly. This task may become complicated by differences in data formats, file structures and file systems of the three different operating systems. These factors may have an impact on how you use your network.

This section explores issues of mixed operating systems on a network. If you only have Macintoshes on your network, you may skip over this section.

Macintosh and PC Data Formats

TOPS operates on mixed system networks by translating between different operating systems. This does not mean, however, that TOPS can translate between different data formats. For example, a MacWrite™ document in a Macintosh volume mounted on a PC cannot be edited simply by loading it into WordPerfect™ on the PC.

Translation of data formats is accomplished in a number of ways:

- Special translation utilities, such as MacLink Plus/TOPS, let you convert data files from many popular Macintosh applications into file formats that can be read by many popular DOS applications, and *vice versa.*
- Some applications are smart enough to recognize a remote file's data format and translate it as it loads the data file. For example, Microsoft's Excel™ (for the Macintosh) can read and write to several PC data formats including Lotus 1–2–3™. That means that Excel can open a spreadsheet that was created in Lotus 1–2–3.
- Some applications have been designed for both the Macintosh and DOS operating systems and can read the data formats of their counterparts if they have been saved in the proper formats. For example, Microsoft Word™, PageMaker™, Excel™, WordPerfect™ and others have compatible PC and Macintosh versions.

Note

Make sure that you save PC data files with the correct extension, such as ".wks" or "wk1" (for Lotus 1–2–3). Check the documentation that accompanies your PC software to determine the correct extension.

- A number of utilities are available for converting text file formats from one operating system to another. DOS, Macintosh and UNIX text files differ in their use of carriage return and line feed characters. The Macintosh Copy option (see Copying Files over a Network, in this chapter) performs such conversions as

do utilities in the TOPS Network Bundle for Macintosh (TOPS MacLink Plus) and TOPS/Sun packages.

The Macintosh File Structure

Files on the Macintosh differ considerably from those of other computers. Macintosh files consist of two parts, the *data* and *resource* fork, as illustrated in Figure 5–3:

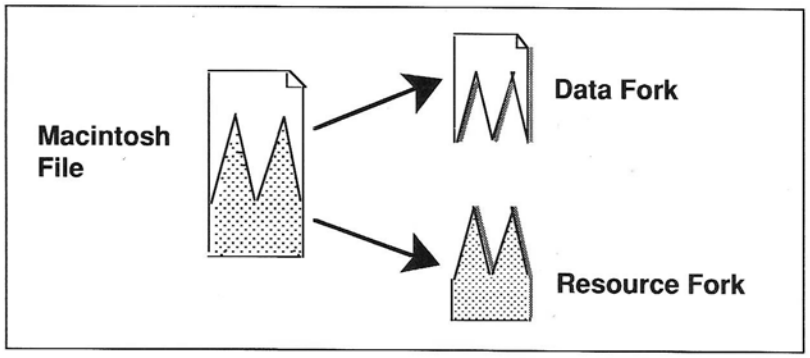


Figure 5–3. The Two Parts of Macintosh Files

All Macintosh files have both forks, although some files (such as ASCII text files) have an empty resource fork. The two–fork structure of Macintosh files is different from the file structure of the DOS and UNIX operating systems. Because of this, a number of issues may arise when copying files to these other systems, or storing them there for access from your Macintosh.

Macintosh Files on a PC

DOS files are not divided into a resource and data fork. When you copy Macintosh files to a PC, TOPS/DOS implements a procedure for storing both forks on the PC. TOPS saves Macintosh files as two files—one containing the data fork and one the resource fork. All of the Macintosh file's information is preserved, but the resource fork is kept separately, in a hidden file.

The link between the two files is maintained by a hidden database file which is in every published PC volume. TOPS creates the THFSDIR.DBE file if it does not already exist and updates it if it does, each time you publish a directory on the PC.

Warning

Your Macintosh files on a PC volume will be inaccessible. If you delete the THFSDIR.DBE file.

The best way to copy files to a PC is to publish the PC volume and use the Finder on the Macintosh to drag icons from the mounted PC volume to the local Macintosh volume. If you mount a Macintosh volume onto a PC and use the DOS Copy command to copy files, DOS will not recognize the resource fork and, therefore, will not copy the entire file. However, you may use the TOPS/DOS TCOPY command to successfully copy a Macintosh file. TCOPY copies both forks of a Macintosh file.

Macintosh files on UNIX Computers

If you work in a mixed Macintosh and UNIX environment, you may have noticed some differences in the way the two systems structure files. The UNIX file structure is very similar to the DOS file structure, and also very different from the Macintosh. TOPS/Sun also implements a procedure for storing both forks of a Macintosh file on the UNIX server.

Each UNIX directory used by TOPS contains a subdirectory named `.rsrc`. When a Macintosh file is stored on a Sun Workstation by a Macintosh TOPS user, the data fork is placed in the main directory and a file corresponding to the resource fork is placed (and created, if necessary) in the `.rsrc` subdirectory. All Macintosh files are stored in this fashion regardless of file format.

Assume that a Macintosh user on the network creates a folder (a UNIX directory) on the UNIX volume called "`chris`" and stores Macintosh files in that folder. When you are on a UNIX workstation and use UNIX commands to view the contents of the directory, you can see the files containing the Macintosh data forks in `chris`:

```
tutorial% ls -a chris
.       .rsrc    doc       notes
..      account  help
```

and the files containing the resource forks in `chris/.rsrc`:

```
tutorial% ls      -a chris/.rsrc
.            account  help
..      doc       notes
```

Copying, Moving, and Deleting Macintosh Files

The easiest way to copy, move, or delete Macintosh files stored on a UNIX computer is to publish them, mount the folders on your Macintosh, and use the Finder to drag or delete the files. If you are on a UNIX computer and want to copy, move or delete a Macintosh

file, you must remember to perform the operation on both the resource and data forks.

Thus, if you want to copy the file "account" to the directory /usr/local/chris, enter the commands:

```
tutorial% cp account /usr/local/chris
tutorial% cp .rsrc/account /usr/local/chris/.rsrc
```

To move the file doc into the directory /usr/local/chris, enter the command:

```
tutorial% mv doc /usr/local/chris
tutorial% mv .rsrc/doc /usr/local/chris/.rsrc
```

Finally, to delete the file called notes in chris, enter:

```
tutorial% rm notes
tutorial% rm .rsrc/notes
```

Storing Applications on PCs or UNIX Computers

If you copy MacDraw or another Macintosh application to a PC or UNIX computer, any Macintosh on the network may have access to MacDraw if the PC or UNIX volume is published. Once the Macintosh user mounts the volume containing MacDraw, he or she can work on existing MacDraw pictures or even create new ones—and store them back on the PC or UNIX computer's hard disk or any other available disk on the network.

Storing your Macintosh applications on a PC or UNIX computer's hard disk turns the PC or UNIX computer into a file server for the Macintosh. This method may be more convenient than using floppy disks for storage if your Macintosh does not have a hard disk.

Copying applications and files onto another computer can be an effective backup system for Macintoshes with internal hard disks.

Note

Please abide by the application vendor's license agreement when using an application on the network.

Macintosh File Systems

The Macintosh has two file system models, an older flat file system (referred to as *MFS*) which has no hierarchy and the current Hierarchical File System (called *HFS*) in which files may reside in folders nested within other folders. TOPS supports both MFS and HFS.

As the Macintosh Heirarchical File System differs from both DOS and UNIX file systems, you should be aware of issues that may affect how TOPS operates between HFS capable Macintoshes and PC and UNIX–based computers. The following sections deal with these issues.

PC–Macintosh Networking

DOS and Macintosh file systems have different ways of accessing directories. For example, HFS uses directory *numbers,* while DOS and UNIX use directory *names* (pathnames).

To account for these differences, TOPS has developed a version of DOS file server software that simulates HFS. This HFS server software maintains a database that keeps track of HFS directory numbers and their DOS pathnames.

When this file server software is used, a published DOS volume mounted on a Macintosh will behave as if it were an HFS volume. For example, if you copy nested Macintosh folders to this volume, they will retain their nested folder heirarchical structure. Be sure, when using a PC file server on a network with Macintosh clients, to configure your TOPS/DOS file server software properly. See *Chapter 2, TOPS User's Guide to File Sharing and Printing for DOS.*

Sun Workstation–Macintosh Networking

HFS is fully supported by TOPS/Sun version 2.1, and is transparent to users of the TOPS Network. When a Macintosh TOPS client wishes to gain access to a file stored on the UNIX server, a daemon (UNIX program running in the background) on the server is consulted to determine the UNIX directory name corresponding to the Macintosh directory number. This daemon, `rpc.hfsd`, maintains the directory number and pathname database.

The Macintosh directory number and UNIX pathname database is initialized by invoking the utility program `hfs_build`. This program is run automatically at start up time and whenever a new directory is published. No intervention is necessary either by the System Administrator or the clients of the UNIX server.

Desktop File Considerations

The Macintosh Finder maintain a file called the Desktop that contains information about Macintosh folders and files. The Desktop file is used to hold information relating to the size, shape, and position of windows, the type of file display (large icon, small icon, by name, etc.), and file notes. When you make a change to one of these things, the Finder records that change by writing it in the Desktop file. A new Desktop file is also written to a published volume when you mount that volume on a Macintosh client.

Whenever a volume is used by the Macintosh Finder, the Finder looks for a Desktop file. If it does not find one, it will attempt to create one. When a volume is published initially, it must be published either "One writer only" or "Many writers" for the Macintosh Finder to accept and create an icon for it. Once a Desktop file has been created for a particular volume, the volume can be published read–only. The Finder will then be able to use this mounted TOPS volume.

If possible, clients should avoid mounting a remote System Folder. The additional desktop file created in the server's System Folder by the client may confuse the Macintosh server's operating system.

The present version of the Macintosh Finder was not designed for multi–user access. Only one Finder at a time can write to the Desktop file. When two clients have mounted a volume, the first user's Finder gets write access to the Desktop File. The second user has read–only access, but his or her Macintosh gives no indication that this is the case.

Consequently, the second user will have the illusion of writing to the Desktop, but in fact, no changes (changing comments in the Get Info box of a file or rearranging a window, for example) are recorded. This confusion can be avoided by publishing a volume "One writer only" over TOPS. Then users will see a padlock icon in the upper left corner of the Desktop if someone else is writing to the volume.

It is also advisable not to publish an entire hard disk. If an entire hard disk is published, both server and client Macintosh have access to the root level desktop file. If the client modifies the server's root level desktop file, the server will find an unexpected change in the appearance of their desktop.

File Naming Conventions

Restrictions and guidelines for file names vary considerably from one operating system to another. If all computers on your network use the same operating system, file naming conventions will not be an issue. However, if more than one operating system is involved, it is helpful if you use file names that are supported by all the operating systems on your network.

If every computer on the network is a Macintosh, file naming conventions are not an issue. You can name a file anything you like and can rest assured that it will be accurately read and displayed by other Macintoshes on the network.

Mixed Networks

File and folder (directory) names for the Macintosh, DOS, and UNIX operating systems are different. Table 5–1 shows the difference between the naming conventions of these operating systems.

You can see that when dissimilar computers are involved, some thought must be given to creating file, folder, directory, application, and volume names which will be readily acceptable to all operating systems involved.

Macintosh–DOS Filename Issues

Generally, any DOS name is acceptable to the Macintosh. However, Macintosh names longer than 8 characters, or with embedded spaces, are not acceptable to DOS. The TOPS InterBase file automatically translates Macintosh names so they are compatible with DOS.

Table 5–1. Naming Conventions for Operating Systems

System	File, Directory, or Folder name
DOS	up to 8 characters, optional 3 character extension no blank spaces cannot use . " / \ [ ] : | < > + = ; , * ?
Macintosh	up to 31 characters blank spaces OK cannot use colons
UNIX	up to 256 characters blank spaces OK cannot use / avoid $ ' * ? ! # { } [ ] " ( )

The following shows how published DOS filenames would appear on a Macintosh screen after being mounted:

Table 5–2. How DOS Names are Displayed

Station	File	Application	Published volume
IBM Display	REPORTS.JAN	WORD.COM	JAN REPORTS
TOPS DA Window	REPORTS.JAN	WORD.COM	JAN REPORTS
Macintosh Finder	REPORTS.JAN	WORD.COM	JAN REPORTS

Notice that the names appear the same in both environments. This is also true in a Macintosh–UNIX environment. In comparison, the following shows how published Macintosh filenames would appear on a PC

Table 5–3. How Macintosh Names are Displayed

Station	File	Application	Published volume
Macintosh Finder	Reports for '88	Latest Version	Current Projects
TOPS DA Window	Reports for '8	Latest Version	Current Projec
IBM Display	REPORTS	LATEST_V	CURRENT_

The "TOPS DA Window" above shows the way your file names would appear in the Desk Accessory on your Macintosh. Notice that only the first 14 (or so) characters of the names appear. On a PC, names appear as shown under "IBM display". Spaces within file, folder, and application names are removed to conform to DOS name requirements.

Some Macintosh names will not make sense when viewed on the IBM screen because of the truncation of the names. Keep this in mind when naming items which will be published on the network. If you leave out spaces and keep name lengths to eight characters, the IBM will "see" the names exactly as they exist on the Macintosh.

Macintosh–UNIX File Name Conventions

File names on the Macintosh may contain characters, sometimes called graphic characters, that cannot be displayed by normal UNIX terminals. For example, the trademark symbol, ™, can occur as part of the name of a file or folder on the Macintosh.

When the name of a Macintosh file or folder contains such characters, the non-printing characters are replaced by an underscore character, _. For example, suppose that a Macintosh user moves a file named `abc™` from the local disk to a mounted UNIX volume. When a directory listing (`ls`) is performed on the UNIX directory, the output contains an entry that looks like this:

```
abc_
```

Since the actual file name is stored in the TOPS counterpart of the resource fork of a Macintosh file, the file has the correct name when opened by a Macintosh application. Generally the name mappings are transparent to the Macintosh user.

Making Macintosh Files Accessible by PC Clients

If you want to make Macintosh files on a Sun Workstation server accessible to DOS users, you should adhere to the DOS limitations in naming files—make sure you name files with an eight character file name and a three character extension. Also, many punctuation marks cannot be used in DOS file names. If a filename does not conform to DOS conventions, then TOPS/Sun retains the first seven characters of the original name and the remaining four characters are chosen in order to create a unique file name. In addition, if you have two UNIX files named `"file"` and `"FILE"`, (the file names differ only in their case) they appear the same on the DOS client. We recommend that, if your Sun Workstation server has DOS clients, you don't create two files whose names differ only in their case. See the *TOPS User's Guide to File Sharing and Printing for DOS* for more information on filename compatibility.

TOPS Tips

This section includes tips that will help you use your TOPS network more efficiently.

Verifying Network Activity

With TOPS, all network activity takes place in the background. However, if you have published volumes on your hard disk, you may, notice a small delay in your program or keyboard entry as clients read and write to your hard drive.

Whether you are on an all–Macintosh or a mixed network, you can tell if a slow down is due to network traffic by checking the network activity light in the upper left corner of the your Macintosh screen. This is a tiny one–pixel sized light that flashes intermittently when your Macintosh is sending or receiving information on the network.

Note

Some large screen monitors may require disabling the network activity light. Contact TOPS Technical Support for more information.

Finding the Version and Serial number

Open the TOPS Desk Accessory and click on the **Help** button to find the TOPS version and serial number.

Publishing Floppy Disks

Avoid publishing floppy disks as frequent access by clients will slow down local activity at the server.

If you do publish a floppy disk, it is best to leave it in the drive until you unpublish it.. You and your clients will receive a warning should you attempt to eject the disk. If you continue with the ejection, data may become lost or damaged if a file operation was interrupted.

Re–publishing Volumes

TOPS lets you quickly re-publish any volumes in your auto–publish list that have been unpublished. Simply hold down the **Option** key when you open the TOPS Desk Accessory. This will not affect the volumes already published, but will attempt to auto–publish any volumes in your auto–publish list that are not published for any reason.

Updating Desk Accessory Lists

Double–clicking the label over the network window in the TOPS Desk Accessory will update the information in the window. For example, if a new file server signs onto the network while you are using the TOPS Desk Accessory, you can double click on the label **File Servers** (or the name of the zone) and the new server's name will appear. Also, double–clicking on the open button while a volume is selected will update the window list.

Changing your TOPS Station Name

If you wish to change your station name, open the TOPS Desk Accessory, click on the name in the upper left hand window and drag down the option **Open** button. Type in a new name and click **OK.**

Viewing Hidden Files

Hidden files, such as the Desktop file or various copy protected files, are listed in the TOPS Desk Accessory window by holding down the **option** key while opening a volume.

Renaming Volumes

Do not rename published volumes. This may cause some applications to become confused.

Volume Names

Each volume to be published must be given a different name. The TOPS Desk Accessory window supports names of up to 27 characters however, the Macintosh finder will display directory names of up to 31 characters.

Publishing More than 12 Volumes

A single server may publish up to 12 volumes at a time.

Viewing Contents of Volume Through TOPS Desk Accessory Window

The number of files displayed through the TOPS desk accessory window is restricted by available memory therefore, the contents of very large volumes may appear incomplete. Files are displayed in alphabetical order. A complete list may be viewed by mounting the volume and using the Finder or MultiFinder to view its contents in a desktop directory window.

Actions that Should be Avoided on the Server

Certain utilities and activities should be avoided while clients are using a server: formatting disks, copying large numbers of files, using system utilities such as ResEdit, Font/DA Mover, or Fedit. All of these activities disrupt communication between server and client. This happens because disk or system modifications take priority over everything else including network activity. We recommend you unpublish volumes before using any utilities which modify system resources.

Network Performance under MultiFinder

Network performance under MultiFinder may be curtailed because of the way MultiFinder schedules tasks. This is evident when the desktop is in the foreground, especially at the server. An open Desk Accessory (such as the TOPS Desk Accessory) helps optimize task scheduling and thus improves performance. We recommend keeping a Desk Accessory open while running MultiFinder with the desktop in the foreground.

Mounting Large Volumes when Running MultiFinder

A Macintosh client running MultiFinder may be unable to mount a remote volume containing a large number (approximately 150) of files at the first directory level.

Mounted Volume Icon Cannot be Thrown Away

When TOPS is loaded under MultiFinder, those applications which used files from a remote volume may need to be quit before unmounting the volume.

Mounting a Remote System Folder

Clients should avoid mounting a remote System Folder. A hidden system file is always present in the System Folder of a Macintosh. It maintains information vital to the maintenance of directories and files. When a client mounts a volume, a hidden file is created by TOPS in the volume published by the server. If this hidden file is in the server's *System* Folder, the server's system may become confused between the hidden file created locally and the hidden file created remotely by the client.

Publishing Entire Disks

Whenever possible, it is recommended that TOPS servers publish folders rather than entire disks. When publishing an entire disk, both server and clients have access to the root level desktop file. Under some circumstances the client can modify the server's root level desktop file, causing a change to the server's desktop' appearance.

Generic Icons When Copying Files to Remote Volumes

When a client is viewing the directory window of a remote volume to which a file has been copied, the file's icon may appear as a generic document until the window is closed and then reopened. This will occur if the file's application does not already exist on the server.

Copying Open Files

Files selected for copying must be closed. For example, you may not copy the System file which is currently running your Macintosh. You may first need to quit an application in order to close a file and any attendant files which the application may have opened in tandem.

Access to Files on a PC

Some operations may require executing the DOS command SHARE on a PC server before publishing a volume.

Chapter

6

TOPS Spool

TOPS Spool enables you to print to a LaserWriter or compatible printer while you continue to work on other documents.

- **About TOPS Spool**
  A brief overview of spooling and the features of TOPS Spool.
- **Before You Begin**
  A description of the hardware and software requirements for TOPS Spool to run properly.
- **TOPS Spool Tutorial**
  A step–by–step explanation of how to use TOPS Spool. During the tutorial, you will spool two documents to the laser printer.
- **TOPS Spool Desk Accessory**
  A description of how to use the TOPS Spool buttons and menus, and reorder print jobs.
- **TOPS Spool and Other Products**
  Special notes on using TOPS with compatible desktop publishing products.

About TOPS Spool

Print spooling enables you to do other work on your computer while it simultaneously processes and sends a document to the printer. A program that records output for a printer and then prints it without interfering with the primary use of a computer is called a *background print spooler.*

Because a print spooler works in the background, there needs to be a way for you to see and manipulate the queue (the list of spooled print jobs to be printed). Furthermore, you need to be able to turn the spooler on and off and control other aspects of its behavior.

Overview of TOPS Spool

TOPS Spool consists of a background print spooler and a Macintosh Desk Accessory for controlling it. The Desk Accessory enables you to turn the spooler on and off, remove print jobs from the queue, change the order in which they will be printed, or save them for printing at a later time. Because it is controlled by a Desk Accessory, you can manage TOPS Spool without having to leave the application that you are using.

TOPS Spool invisibly bypasses the normal Macintosh laser printing process. It automatically redirects the output generated by your application to a temporary disk file instead of sending it directly to the laser printer. This process never takes any more time from your work than is required to actually generate the output data (also called a *PostScript print file*) for the printer and write it onto your disk.

Once this has happened, you can continue in your application, or you can quit and launch another application. At any time, you can spool additional documents to be printed. For example, you can spool your Excel spreadsheet and quit Excel. Then you can open a MacWrite document and spool it without having to wait for the Excel spreadsheet to finish printing. TOPS Spool prints while you work and is unaffected as you move from application to application.

Whenever the spooler has a job in its queue, it checks every few seconds to see whether the laser printer you selected at the time you spooled the job is available. When that laser printer is free, the spooler sends the print file from your disk to the laser printer.

The spooler is loaded automatically each time you turn on your Macintosh. Once you have installed TOPS Spool, you do not have to do anything further to use it.

TOP Spool's other features include:

- Management of TOPS Spool from within any standard Macintosh application
- Ability to work while your spooled output is being printed on an AppleTalk compatible laser printer

  You can Send spooled output to different laser printers on the same network. TOPS Spool is an effective manager of shared laser printers. TOPS Spool is fully compatible with the LaserWriter, LaserWriter Plus, LaserWriter II NT and NTX, Linotype Linotronic™ and compatible typesetter imaging devices.
- Ability to spool print jobs to any mounted TOPS volume
- Crash protection: TOPS Spool recovers any spooled print jobs that had not been printed prior to a crash. You never lose your work.
- Optional notification at the beginning and/or end of printing
- Quick installation and minimum required disk space (40K)
- use of the **Print** option from the **File** menu of your applications
- Operation without need for dedicated Macintosh or hard disk
- Compatibility with downloadable fonts
- Compatibility with InterBridges and Zones

System Requirements

TOPS Spool requires the following:

- Computer: Macintosh 512KE, Macintosh Plus, Macintosh SE, Macintosh SE/30 or Macintosh II
- System: version 4.1 (or higher) of the System file, and version 5.5 (or higher) of the Finder, (see What You Need to Begin, *Chapter 3*).

  We recommend that you use the LaserWriter and Laser Prep version 5.2 however, TOPS Spool is compatible with most LaserWriter drivers from version 3.1 on up except for version 5.1. Make sure that each station on your network has the same versions of the LaserWriter and Laser Prep files.
- 65K of memory and 40K of disk space
- A suggested minimum of 75K to 150K of disk space for temporary storage of spooled documents on any mounted disk

- One free Desk Accessory slot in your System File

  The Font/DA Mover provides for up to 15 slots. Some Desk Accessories may use more than one slot.

- Connection to an AppleTalk–compatible network and LaserWriter, LaserWriter Plus, LaserWriter II NT, LaserWriter II NTX, or a LaserWriter–compatible network printer

  TOPS Spool does not support the ImageWriter, ImageWriter II, ImageWriter LQ, or other serially–connected printers.

Note

If you have not already installed TOPS Spool, see Installing Software, *Chapter 3* and do so now.

TOPS Spool Tutorial

This tutorial assumes that you have already installed TOPS Spool by using the instructions in *Chapter 3*. If you have not done so already, make a backup copy of the Tops Disk and store the original in a safe place. You will use the copy of your Tops Disk for this tutorial.

1. **Select TOPS Spool from the Desk Accessories menu.**

Figure 6–1. TOPS Spool Desk Accessory

The TOPS Spool Desk Accessory should now appear on your Macintosh screen along with an additional menu titled **TOPS Spool** (see the next section for information on using the menu).

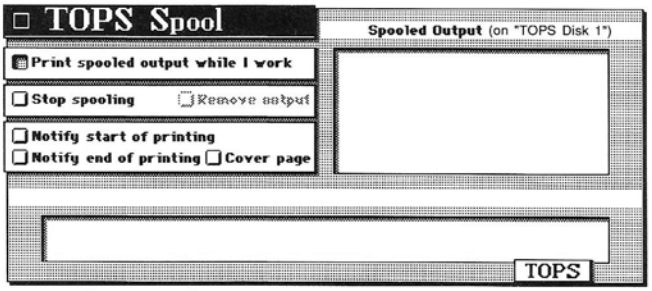


Figure 6–2. TOPS Spool window

TOPS Spool has control buttons that can be operated by moving the mouse pointer to the button and clicking once.

This button is depressed (ON)

This button is popped up (OFF)

Figure 6–3. TOPS Spool control buttons

Notice that all of the buttons are popped up except the one next to **Print spooled output while I work.**

2. **Turn off** Print spooled output while I work **by popping up its button.**
   This action turns off printing but allows spooling to continue. In this tutorial you will use TOPS Spool to spool two print jobs. Because you have just turned off background printing of the spooled output, the two print jobs will accumulate in the spooled output queue. You will generate the print jobs by using the Finder's **Print Directory** option to first print a catalog of the contents of the disk and then print a catalog of the contents of the TOPS Spool Folder.
3. **Close the TOPS Spool Desk Accessory by clicking the close box in the upper left corner.**
4. **Open the** Chooser **from the Desk Accessories menu.**
   Verify that AppleTalk is connected. Then select the LaserWriter to which you wish to print. Make sure that background printing is "off." Close the **Chooser**.
5. **Insert the Tops Disk into your Macintosh floppy drive and double–click on the icon to open the disk.**
6. **Choose** Print Directory **(or** Print Catalog **for LaserWriter driver version 5.0 or earlier) from the File menu.**

Figure 6–4. Print Directory

You are prompted with this print dialog box:

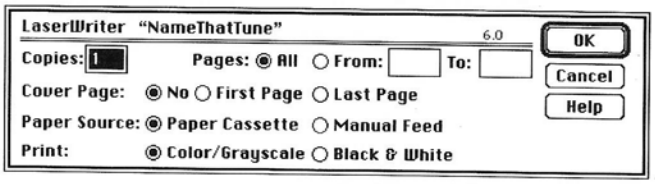


Figure 6–5. Print dialog box

7. **Click** OK.
   You will then see Figure 6–5.

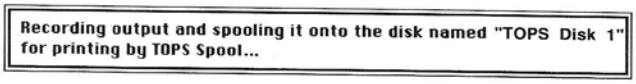


Figure 6–5. Recording output and spooling

The directory of your disk is spooled, yet printing will not begin until the **Print spooled output while I work** button is turned on.

Once some output has been spooled, TOPS Spool will display a flashing laser printer icon in the upper left corner of your screen above the .

Figure 6–6. Flashing laser printer icon

8. **Create a new folder and name it "TOPS Spool."**
9. **Double–click on the TOPS Spool folder icon.**
   Choose the **Print Directory** option from the **File** menu again. When the print dialog appears, click **OK** again.
10. **Select** TOPS Spool **from the menu.**
    This will bring the TOPS Spool Desk Accessory forward and you will see the two catalogs you spooled in the list of Spooled Output. The TOPS Spool directory is number 1 in the list which means that it will be the first item to be printed when printing is turned on.
11. **You may now print the spooled catalog for the TOPS disk.**
    Turn on **Print spooled output while I work**. This will begin the delivery of spooled output to the laser printer.

TOPS Spool Desk Accessory

The TOPS Spool Desk Accessory shows you what is being printed on the LaserWriter and how much of your job has been completed, as shown in the next figure.

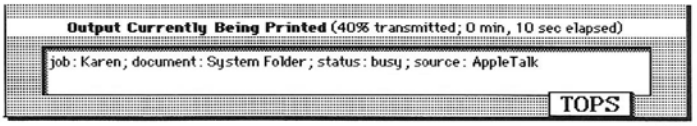


Figure 6–7. Print job progress

- The percent transmitted that is shown is the amount that has been sent to the laser printer, not the amount that has been printed.
- The time that displayed is the combination of time spent printing and time spent waiting to connect to the printer.
- The bottom portion tells you who is currently using the laser printer and what job they are printing. The name of the user printing a document is specified from within the Chooser Desk Accessory. The name of the document is the name of the file being printed Status tells you what the laser printer is doing (such as "Idle," "Busy" or "Waiting"). Status will also display information about problems encountered ("Out of paper", for example).

When status information is no longer displayed, your background printing is finished. Following this, the status of any other pending files will be displayed in the order in which they are listed.

TOPS Spool Buttons

The buttons on the TOPS Spool Desk Accessory enable you to control when your documents are printed, information on their status, and whether or not a cover page is desired.

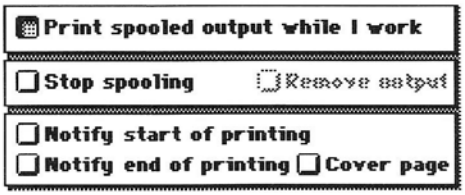


Figure 6–8. TOPS Spool buttons

- If the **Print spooled output while I work.** button is depressed, all output in the queue will be printed while you work. If the button is popped up, the files in the list are held in the queue until you click on this button.

- If the **Stop spooling** button is popped up (off), your print job will be held in TOPS Spool's queue. If this button is depressed, all printing will go directly to the printer.
- The **Remove output** button is activated when you select a file in your print queue. When you click on this button, the file is removed from the queue.
- If either of the notification buttons are down, you will be informed before and/or after the document is printed by dialog boxes that tell you: "The printing of *filename* is starting," or "The printing of *filename* is finished."
- If the **Cover page** button is depressed, TOPS Spool will include a cover page displaying your name, the file name, and the date and time when the file began printing.

TOPS Spool Menu

In addition to the controls on the Desk Accessory, there is a TOPS Spool menu. It appears to the right of any existing Macintosh or application menu you may be using.

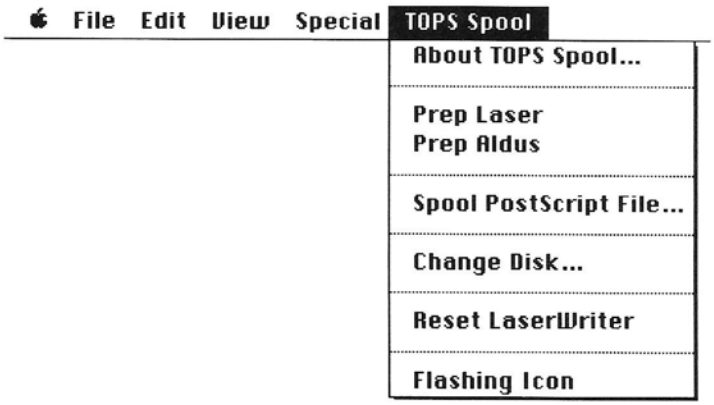


Figure 6–9. TOPS Spool menu is located to right of other menus.

- **About TOPS Spool...** shows the version number for TOPS Spool.
- **Prep Laser** initializes the laser printer. Use this if your file is the first to be printed after the laser printer is turned on. You will be notified if this is necessary.
- **Prep Aldus** also initializes the laser printer. Use this if your file is the first to be printed using PageMaker after the laser printer is turned on. You will be notified if this is necessary.
- **Spool PostScript File...** enables you to spool either a text file or a PostScript file that has been saved to disk.

- **Change Disk...** selects the disk on which your spooled output will be saved. If you are using a floppy–only Macintosh, you can mount a volume using TOPS, and then spool your output to the mounted volume. TOPS Spool always begins spooling to the System folder of the startup disk, so you will need to use the Change Disk command every time you start up your Macintosh. Keep in mind that spooling to a mounted volume increases network traffic and will slow your printing.
- **Reset LaserWriter** enables you to restart the LaserWriter remotely. This option can be handy if the LaserWriter has been initialized with a different version of the Laser Prep file. You can reset the LaserWriter and then select Prep laser to re-initialize the laser printer. Use discretion if someone else is printing to the laser printer.
- **Flashing Icon** turns on and off the flashing LaserWriter icon that appears in the upper left–hand corner of your Macintosh screen. When Flashing Icon is checked, the flashing Laser-Writer icon is turned on.

Changing the Order of Print Jobs

If you have multiple print jobs in the queue simultaneously and want to change their order, you may easily do so. For example, click on the line that reads "1. TOPS Disk 1 (Finder)" in the window titled **Spooled Output,** shown below, and drag it to the bottom of the list.

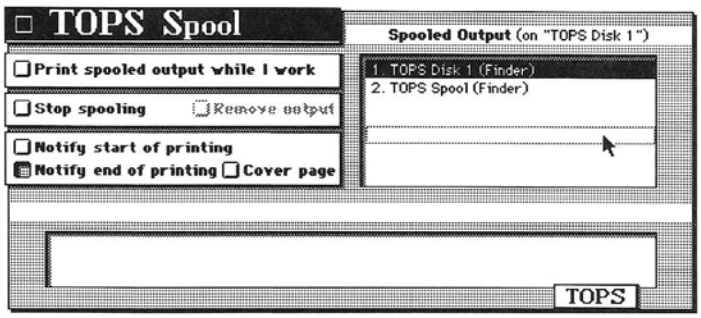


Figure 6–10. Changing print job order

(If the print job being dragged is currently printing, you will be asked if you want to cancel the printing or cancel the change in order.) Now the order of the queued print jobs is reversed.

Printing without TOPS Spool

You can print without TOPS Spool by clicking off **Print Spooled Output while I work.** Then click on the **Stop Spooling** button. Your printing will function just as it did prior to the installation of TOPS Spool.

TOPS Spool and Other Products

TOPS Spool is designed to be compatible with a wide variety of Macintosh hardware and software. The following information provides help in using TOPS Spool with certain products.

PageMaker

If you have spooled a PageMaker document, and it is the first PageMaker output to be printed since the laser printer has been turned on, TOPS Spool will ask you to choose the Prep Aldus option from the TOPS Spool menu in the TOPS Spool Desk Accessory. The Aldus Prep file must be in the System folder.

Downloadable Fonts

Downloadable fonts are special fonts (typefaces) that are purchased separately from third party vendors for laser printing. *Downloading* a font means that the font is sent to the LaserWriter where it is held in memory for use in printing. Standard fonts, such as Times and Helvetica reside in the permanent memory (ROM) of the LaserWriter and thus do not need to be downloaded. The specific procedure used to manually download a font varies from vendor to vendor. Refer to the documentation which accompanies your purchased downloadable laser fonts.

File names

Some programs do not make available the name of a file being printed. Under these circumstances, TOPS Spool will display the name of the application which created the file instead of the file name.

Appendix

A

Troubleshooting

During use or installation of TOPS/Macintosh software you may occasionally encounter difficulties. This appendix offers some guidelines on diagnosing such difficulties and provides some solutions to commonly encountered problems.

The first step is to figure out the nature of your problem. If you are getting a TOPS error message, turn to *Appendix B*, which provides information on TOPS error messages. If you are getting other error messages, or something is just not working the way you think it should, then check the first section, Diagnosing Your Problem. This will tell you which of the other sections of this appendix to consult.

If you already know which section your problem falls into, go directly to that section of this appendix to see if your problem, or a similar one, is listed.

If you are unable to resolve your problem with the help provided in this troubleshooting guide, then refer to the section on TOPS Technical Support to review the information you need to have handy when you call us for more assistance.

- **Diagnosing the Problem**
- **Getting Started**
- **Using TOPS File Sharing Operations**
- **Running Applications**
- **Using TOPS Spool**
- **TOPS Technical Support**

Diagnosing the Problem

The first step is to figure out what kind of a problem you are having. Read down through the list of questions below. If the answer to any of the following questions is "yes," then refer to the section indicated.

- Are you having trouble getting TOPS software installed on your hard drive or floppy drive Macintosh?
  See **Getting Started**
- Are you having trouble getting TOPS to load on start up?
  See **Getting Started**
- Have you encountered a System error when using TOPS or an application?
  See **Using TOPS File Sharing Operations**
- Are you having trouble publishing or mounting volumes or in seeing stations or their published volumes on the network?
  See **Using TOPS File Sharing Operations**
- Are you having trouble running single– or multi–user applications in your TOPS environment?
  See **Running Applications**
- Are you having trouble printing or spooling?
  See **Using TOPS Spool**

If an error message is displayed on your screen, refer to *Appendix B*, Error Messages.

A Few Diagnostic Tips

- If your Macintosh is unable to see other devices on the network, you may have a cabling or network configuration problem. To isolate the problem, make a small network consisting of only two Macintoshes. If the Macintoshes are able to communicate in this configuration, then your larger network has a cable or connector that is not working properly, or there is a problem with the network configuration. If all of your cabling and connectors are fine, then check to make sure your network is terminated correctly and that the network configuration is within the limits of LocalTalk cabling.
- Every time a client uses a server Macintosh on the network, the System file is used to assist with opening and closing files (including the TOPS Desk Accessory) and to perform other functions. We advise that you periodically run the Apple **Installer** (found on your Apple System Tools disk) to reinstall the System file.

  Many System errors can be solved by re–installing the System. If a System error persists, make a copy of your System file, and copy a new System and Finder file from the System Tools disk to your Macintosh System Folder. If you find that

the System error problem goes away, then use the **Font/DA Mover** to copy your fonts and Desk Accessories from the copy of the old System file to your new System file.

Getting Started

You don't see any file servers in the network window of the TOPS Desk Accessory.

Check that the LocalTalk (or compatible) cable is plugged into the printer port—not the modem port—of each Macintosh on the network (see *Chapter 2*, Figure 2–1). If your problem isn't solved, check the solutions in problem 2 in the next section, Problems Using TOPS File Service Functions.

You cannot install TOPS on a single–floppy Macintosh because of lack of disk space.

There are a number of ways this can be done. Call TOPS Technical Support for information on customizing a TOPS floppy disk based installation to suit your needs.

You get a System error when you install TOPS

Restart your Macintosh using your floppy disk based working copy of TOPS.

The install button is disabled.

You are using the wrong software to install TOPS. The software that you are attempting to install TOPS with is meant only for updating older versions of TOPS which have already been installed on a station.

There is a serial number conflict on the network.

If you see this problem, TOPS will inform you as to who is using your serial number. Find the original disk for the station with the duplicate serial number, and re–install TOPS on that station using that station's copy of TOPS.

You are unable to connect your LocalTalk cabling to a TOPS TeleConnector or PhoneNET connector.

The PhoneNET Adapter, available from Farallon Computing, makes it possible to connect a LocalTalk cable (DIN 3) to a TOPS/PhoneNET connector (DIN 8).

Using TOPS File Sharing Operations

You see a System error in any of the following cases:

- **Mounting and running an application**
- **Using the TOPS Desk Accessory**
- **Starting up your Macintosh**

For the second and third problems, restart your Macintosh, and hold down the **option** key while your Macintosh is starting up. When the dialog box comes up asking you to install TOPS, click **No**. Then see if the problem recurs without TOPS installed. If the problem doesn't occur, check Table 2–2 in *Chapter 2* and verify that you are running the correct System software.

For all three problems, use the **Find File** Desk Accessory to search for the word "System," and see if extra System folders are on your startup disks. Delete any extra System folders you may find.

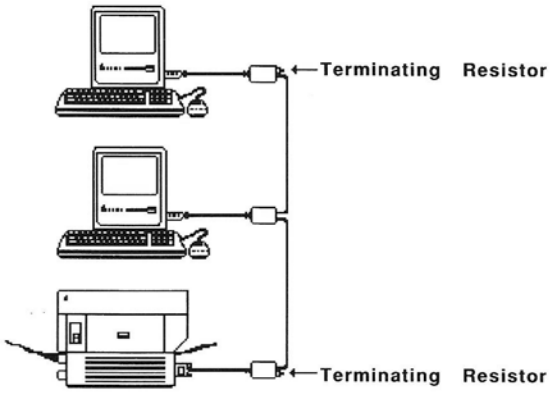
If the problem still occurs, run the Apple **Installer** (found on the Apple System Tools disk) to reinstall the System file on your Macintosh. If the System error persists, make a copy of your System file, and copy a new System and Finder file from the System Tools disk to your Macintosh System Folder. If you find that the System error problem goes away, then use the **Font/DA Mover** to copy your fonts and Desk Accessories from the copy of the old System file to your new System file.

None or only some servers show up on the network.

TOPS installs successfully on Macintoshes and/or PCs, and volumes have been published by each You may see turtles where a server icon normally appears, or you may see the message: "TOPS: Please wait a moment, the server or network is busy."

- Check that the LocalTalk (or compatible) cable is securely plugged into the printer port–not the modem port–of each Macintosh on the network.
- Make sure that all Macintoshes or PCs on your network are running TOPS version 2.0 or later. Stations running TOPS 2.0 or later cannot see or be seen over the network by stations running TOPS version 1.0. You can find out what version you are running by opening the TOPS Desk Accessory and pulling down the option **Help** button. On a PC, enter `TOPS VER` at the prompt and press return. If your stations are running TOPS version 1.0, call our upgrade line at (415) 769–8808.
- Make sure that AppleTalk is active in the Chooser of your Macintosh.

- If you are using TOPS TeleConnectors, Farallon PhoneNET, or a similar type of cabling, make sure that your network is properly terminated. For example, if you have a daisy–chain network, the terminating resistors should be at each end of the network, as in the following figure:



  If you need more help with termination, please check the manual which accompanies the cable.

- If a PC station fails to appear on your network, consult the Troubleshooting section in Users Guide to File Sharing and Printing for DOS.

You are having trouble running MultiFinder and the TOPS Desk Accessory.

Make sure that you are running MultiFinder 6.0 or later. TOPS does not support MultiFinder 1.0.

A file copied across the network appears with a generic icon instead of its correct icon.

You copied a file to a remote server while that server is running the Finder (it has its desktop open) and the generic icon appears. This is because a generic file is created before a real icon is given. Try opening and closing the folder that you copied to.

TOPS is not auto–publishing or auto–mounting correctly.

Drag the Tops Prep file into the trash and restart your computer. When you open the TOPS Desk Accessory you will be asked for your station name. Proceed to auto–publish or auto–mount again.

Running Applications

You get a System error when running a mounted application.

Use the **Find File** Desk Accessory to find extra System files on your startup disks. Delete any extra System files or System folders you may find.

If the problem recurs, run the Apple Installer (found on the Apple System Tools disk) to reinstall the System file on your Macintosh. If the System error persists, make a copy of your System file, and copy a new System and Finder file from the System Tools disk to your Macintosh System Folder. If you find that the System error problem goes away, then use the **Font/DA Mover** to copy your fonts and Desk Accessories from the copy of the old System file to your new System file.

You get the message: "Sorry, that application is missing or already in use." when you attempt to run an application.

Another client on the network may be running the application and it cannot be multi–launched. Make sure that each client's applications are grouped into separate folders on the server, and that each client mounts his or her folders only. (See *Chapter 4* for more information.)

Using TOPS Spool

You can't install TOPS Spool.

Make sure that you are not running MultiFinder when you install TOPS Spool. and make sure that you copied the TOPS Spool and Spool Installer files to the System folder before running the **Spool Installer**.

The most likely reason why you cannot install TOPS Spool is that there are not enough Desk Accessory and/or driver slots left in your System file. The System file must have at least one free Desk Accessory slot and one free driver slot (or an additional free Desk Accessory slot.) Overall there are 15 Desk Accessory slots, but some Desk Accessories require two slots.

Remove one or two of your desk accessories with the Font/DA Mover and attempt to install TOPS Spool once again. Remember to select **Restart** in the **Special** menu.

If you are using Suitcase 1.0 you will need to move it out of the System folder, restart your Macintosh, and install TOPS Spool. Then move Suitcase back into the System folder and restart your Macintosh. Suitcase 2.0 is compatible with TOPS Spool as long as

there are no more than 14 Desk Accessories installed in the System file.

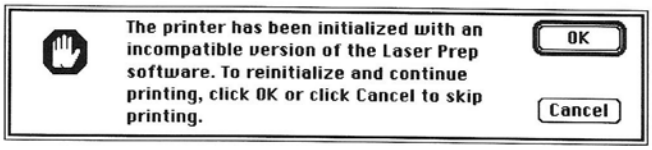
Your Macintosh is printing to the wrong laser printer on the network.

Run an application such as MacWrite or MacPaint, pull down the **Chooser**, click on the laser printer icon, and select the laser printer you wish to print to. Make sure that the laser printer appears in the list in the upper right–hand window of the Chooser.and is highlighted Then close the **Chooser** and print from within the application.

You cannot seem to redirect the printing from one laser printer to another.

TOPS Spool does not currently support redirection; you will have to remove the spooled file (using the TOPS Spool Desk Accessory), select another laser printer with the Chooser, and re-print the file.

You attempt to print and see the following message:



Make sure that everyone on your network is using the same version of the LaserWriter and Laser Prep files. You will need to select the **Prep Laser** option from the TOPS Spool menu to be able to print.

TOPS Spool does not appear on the Desk Accessory menu.

You have probably run an application (referred to as switch launching) from a published volume containing a System folder that does not have TOPS Spool installed. We do not recommend switch launching, because it degrades network performance and server response.

The laser printer icon flashes but no printing occurs.

Open the TOPS Spool Desk Accessory, and click **Stop spooling**. Then try to print again. If you still cannot print, TOPS Spool is not the problem. Here are some suggestions for solving the problem:

- Copy the LaserWriter and Laser Prep files from a System Tools disk to the System folder of your startup floppy or hard drive. Then try to print again. If you are successful, open the TOPS Spool Desk Accessory, and turn Print Spooled Output While I Work back on.
- Check that no one is printing to the laser printer, and reset the laser printer either manually or by selecting the **Reset LaserWriter** option from the TOPS Spool menu. Then try to print again. If you are successful, open the TOPS Spool Desk Accessory, and turn **Print Spooled Output While I Work** on.

TOPS Spool is not spooling.

The most likely possibilities are that you have either activated the **Stop spooling** option in the TOPS Spool Desk Accessory, or the disk which TOPS is spooling to has been ejected or unmounted. Deactivate the Stop spooling option or choose another spooling disk with the **Change Disk...** command from the TOPS Spool menu in the TOPS Spool Desk Accessory.

There are many other less likely possibilities:

- You are using an unsupported version of the LaserWriter driver (versions 6.0 and earlier are supported).
- One station on your network is using a different version of the LaserWriter driver. All stations must be using the same version.
- The TOPS Spool file is not in the System Folder.
- You started with a disk that did not have TOPS Spool installed and switch launched to one that did. Again, we do not recommend switch launching.

TOPS Spool beeps when you attempt to open the TOPS Spool Desk Accessory (DA).

There is not enough free memory to open the Desk Accessory. Reduce the amount of memory used by: reducing the size of the RAM cache in the Control Panel Desk Accessory, reducing the size of your RAM disk, or closing unnecessary DAs and windows.

TOPS Spool beeps when you choose "Spool PostScript File..." from the TOPS Spool menu in the TOPS Spool DA.

Spooling will not work if spooling is turned off. Check to see if the **Stop spooling** in the TOPS Spool DA Options window is darkened. If it is, turn off the **Stop spooling** button, turn on the **Print Spooled Output While I Work** button, and try again.

The fonts Avant Garde, N Helvetica Narrow, New Century, Schoolbook, Palatino, Zapf Chancery, and Zapf Dingbats print out in Courier.

These are LaserWriter Plus fonts. LaserWriter Plus fonts come out in Courier when spooled to a LaserWriter. There are a number of solutions: spool to a LaserWriter Plus, upgrade your LaserWriter to a LaserWriter Plus, LaserWriter IINT, IINTX, or compatible, or change to a LaserWriter font.

LaserFonts from third parties–such as Adobe, Century, and Casady–are printed in Courier when using TOPS Spool.

Check the LaserWriter driver version number by selecting **Print...** and looking in the upper right hand corner of the LaserWriter print dialog box. Automatic font downloading is not supported by drivers 3.2 and earlier. Also check to see if the downloadable font is in the System folder and has not been renamed.

TOPS Spool's "Spool PostScript File..." does not print PostScript files from Adobe Illustrator.

PostScript files generated by Illustrator do not have print commands. This is not a bug. The PostScript files created by Illustrator are designed to be included in other documents such as PageMaker documents. Therefore, these files do not include print commands. If you want to print the illustration, print it from within Illustrator.

You can't seem to print a PageMaker document with TOPS Spool.

If you are printing a document to a LaserWriter instead of a LaserWriter Plus (or an enhanced LaserWriter), you will experience problems whether you use TOPS Spool or print directly. You should consider an upgrade to a LaserWriter Plus, LaserWriter IINT, or IINTX.

Make sure that you are using the proper version of Aldus Prep and that it is placed into the System Folder. The correct version of Aldus Prep is dependent on the version of PageMaker you are using. Refer to your PageMaker manufacturer specifications.

A "4101 System Error" appears when you attempt to spool.

This means that the laser printer has not been found. Select the laser printer from the Chooser. If you can't see the LaserWriter in the Chooser, check to see that the laser printer is on and that there are no loose cable connections in the network.

When you spool to a remote volume over TOPS, spooled documents from other users are visible.

These are spooled documents from other users using the same shared spool disk. Spooling over the network increases network traffic significantly and degrades network performance. We highly recommend that, if possible, all users spool to a local disk to maintain network performance.

TOPS Technical Support

If you have persistent problems with TOPS that are not solved by any of the tips in this appendix, contact your TOPS dealer or international distributor. In the United States and Canada you can also contact TOPS Technical Support. In either case, be sure to have the following information about your system available:

Hardware Information

- Brand names, type or model of all computers involved:
- Type of connectors and cabling, used by your network:
- Model of any printers involved:
- Physical layout of the network:

Software information

- Version numbers of all TOPS software:
- Macintosh System/Finder version:
- DOS version number, if applicable:
- Sun Operating System version, if applicable:
- Any relevant applications and their version numbers:

Problem Checklist

- Reproduce the sequence of events that lead to the problem.
- Write down any error messages that appear.
- Call from near your computer station, with TOPS running.

TOPS Contacts (United States and Canada):

- **TOPS Technical Support 415–769–8711**
  You can call TOPS at the above number, between the hours of 7:00 AM to 5:00 PM Pacific Standard Time.
- **TOPS Bulletin Board Service 415–769–8774**
  You can dial in to this bulletin board service 24 hours a day. The settings are: 8 bits/1 stop bit/no parity.
- **BIX Information Service**
  TOPS maintains a "conference" on BIX.
  Enter: **JOIN TOPS**
- **CompuServe**
  Tops maintains a topic in the Apple Vendors forum and in the PC vendors forum.
  Enter: **GO APPVEN** or **GO PCVEN**
- **AppleLink**
  If you have access to AppleLink, you can send e–mail to TOPS Technical Support. Address it to **D0098**.

Appendix

B

Error Messages

This appendix lists in alphabetical order the error messages you may encounter while using TOPS or TOPS Spool. Each message is followed by an explanation of how to solve the problem.

The following messages may appear on your screen:

Can't start TOPS: other software has modified the local file system Try removing the other software.

Another application residing on the startup disk (for example, the AppleShare server module 'Desktop Manager') has modified the System file prior to the loading of TOPS. TOPS cannot be started. Remove the application in question and restart your Macintosh. If you click on the continue button, TOPS will not be loaded.

Do you want the output currently being printed to be cancelled too?

If you turn off the "Print spooled output while I work" option while one of your outputs is still being printed, this warning message will appear. You can allow the laser printer to finish by clicking on the NO button.

File is locked or in use.

This message will appear if more than one user is trying to use a single–user application simultaneously. Single–user applications are designed to be run by one user at a time. Once such an application has been opened by a client, subsequent clients will receive this message and find the application locked and unavailable until the original client quits. For more information on single–user applications, refer to the section on Running Remote Applications in *chapter 6.*

Install TOPS?

This will appear if you are holding down the option key or the mouse button while you are starting up.

No List Manager (Pack 0).

The Desk Accessory needs this system resource to run. You probably have an old System file.

Please Install TOPS First.

The Desk Accessory cannot run until the TOPS driver has been installed. You must either start up from a disk with TOPS in the System folder, or you must run the Start TOPS program.

Please start TOPS.

This often indicates that AppleTalk is turned off. Select the Chooser and click on the AppleTalk active button.

If the problem continues, check your System folder to see if there are any public domain or shareware initialization files ("inits"). Create a new folder (for example, "inits"). Move all the init files into that folder. Restart your Macintosh. Move each init file back into the one at a time restarting the Macintosh after each file has been returned. The specific init file which is causing the conflict can then be identified through this process of elimination.

Please use 27 or Fewer Characters.

This message will appear if you try to specify a volume name using more than 27 characters. Enter a new name for the volume or edit the present name. Volume names are limited to 27 characters.

Some previously spooled output was found. Do you want to start printing it?

TOPS Spool is designed to survive a system shutdown without losing any spooled output. This statement appears after you restart a Macintosh where previously spooled output remains to be printed. It may also appear after you use the **Change Disk...** option in the TOPS Spool Desk Accessory menu. If you click the **NO** button, previously spooled output is not removed; instead, the **Print spooled output while I work** option is turned off.

Sorry, can't access that server: incompatible version or serial number conflict.

This message will generally be encountered when trying to mount a volume published by a PC–only server: a PC server configured to publish volumes that are accessible by PC clients only. You may also be trying to access a server that is running a very old version of TOPS.

Sorry, can't install Tops: error -54

The TOPS Key file is probably damaged. Move it out of the System folder, copy the Key file from your backup copy of TOPS to the System folder, and restart the Macintosh. Select the damaged Key file, enter `Command-I`, and uncheck the lock box in the upper righthand corner. Then drag the damaged TOPS Key file to the trash.

Sorry, can't open that directory.

You will get this message if TOPS cannot open a particular directory and no more specific error message is available. You may also receive this message when you double click on a file icon. Files cannot be opened from the TOPS Desk Accessory.

Sorry, can't open that volume.

You will get this message if TOPS cannot open a particular volume and there is not a more specific error message available. Again, the message is probably due to the server's failure or an activity that blocks network activity.

Sorry, can't read that directory.

You will get this message if TOPS cannot read a particular directory, and no more specific error message is available.

Sorry, name registration error.

For some reason AppleTalk couldn't register your network name. Try again. If it still fails, try simplifying your environment: are you trying to run other AppleTalk programs at the same time? Or other "background" programs that use a lot of memory? Try eliminating one of these. If all else fails, try another name.

Sorry, network error.

This message is given in the rare case of a network error that isn't covered by any of the other more detailed error messages. It usually pertains to network hardware.

Sorry, no more than 6 remote volumes may be mounted at once.

When this message appears, you must unmount one of your previously mounted volumes before you can mount another. A maximum of 6 volumes may be mounted at a time.

Sorry, no more than 12 volumes may be published at once.

When this message appears, you must unpublish one of the volumes you have requested TOPS to publish. A maximum of 12 volumes may be published at a time.

Sorry, out of memory.

Try closing some files and/or unmounting some volumes to free up enough memory. Refer to the Installing on Floppies section in Chapter 2 for more help.

Sorry, that application is missing or already in use.

Another client on the network may be running the application and the program is not multi–launchable. Make sure that each client's applications are grouped into separate folders on the server, and that each client mounts his or her folder only.

Sorry, that name is already in use. Please try another.

Two different users cannot use the same network name. You'll have to use another one while the other user is logged on the network.

Sorry, that operation failed.

This message is given when the Desk Accessory is unable to read the specific error message it wants from the disk.

Sorry, that server is not responding.

You will get this message if the server does not respond within a certain amount of time – typically 30 seconds. Either the server has shut down or crashed, or the person using the server is doing something that blocks its network activity, such as running a program that doesn't support Desk Accessories.

Sorry, there is not enough space on that volume.

You will get this message if you try to copy a file to a volume that doesn't have enough room. You will have to delete some files on the destination volume, or copy to another volume.

Sorry, there are still open files on that volume. You may unmount it by dragging its icon to the trash.

This error message is encountered when running under MultiFinder and attempting to unmount a volume that has files on it which were created or altered by an application which is still running. Quit the application or close the TOPS desk accessory window and unmount the volume from the desktop by dragging its icon into the trash.

Sorry. The TOPS volume _____ has been shut down.

This message appears when a server has been shut down or unpublished a volume which you still have mounted. Click on **Continue**. The volume will be automatically unmounted from your station.

Sorry, two published volumes may not have the same name.

You will get this message if you try to publish a volume or a folder with a name that is identical to something you have previously published. Each server's volumes must have distinct names. You should return to the Finder and rename the volume you are trying to publish.

Sorry, your serial # ____ is already in use by: _____.

Each station on your network must have a different serial number. You must use a different copy of TOPS with a unique serial number in order to sign on to the network.

Spooling was cancelled because of a System Error.

An unexpected system error occurred while spooling the output. In this case the output is lost and must be spooled again. This will typically occur if your disk becomes full while spooling.

That Server is running a different version of TOPS.

Your Macintosh is running a different version of TOPS than the server, and they may or may not be compatible. Make sure that all stations are running the same version of TOPS.

That server is running an incompatible version of TOPS.

Your Macintosh is running a different version of TOPS than the server, and they are definitely not compatible. You will have to upgrade TOPS either on your Macintosh or the server. (You may also see this message if a serial number conflict is detected after sign–on.)

That volume is write protected and has no deskTop file. You can use it from an application, but the Finder will reject It.

The Desktop file is ordinarily a hidden file. however, the Macintosh Finder requires the presence of a Desktop file on every volume. If a Desktop file cannot be found on a volume, the Finder will create a new one. The creation will fail if the disk is write–protected.

To create a Desktop file on a write–protected volume, publish the volume initially as One writer only or Many writers and mount it onto a remote Macintosh station. Do not mount the volume as Write–protected. This will enable the remote Macintosh Finder to create the required Desktop file. Unmount and unpublish the volume. You may now republish the volume with write–protection.

That volume is write protected.

You will get this message if you try to copy a file to a write protected volume. The server should republish the volume as Many writers or One writer only.

The installation failed because of a Resource Manager error (disk full?).

This installation generally occurs when your disk or disk directory is full. Alternatively, this message indicates the occurrence of an unexpected system error.. Restart your Macintosh and try installing TOPS Spool again. If the problem continues, call your dealer or TOPS Technical Support.

The installer can't install the driver and/or the Desk Accessory because there aren't enough free slots available.

There are too many Desk Accessories installed in your System file. Remove an unwanted Desk Accessory with the Font DA/Mover and try installing TOPS Spool again. Some Desk Accessories require more space than others. You may need to remove two. If you have management utilities for fonts and desk accessories, please refer to the release notes which accompany this users guide before installing TOPS Spool.

The installer can't run because of a naming conflict with the TOPS Spool driver and/or Desk Accessory.

This occurs in the unlikely case that you already have a Desk Accessory or driver called TOPS Spool installed in your System file.

The LaserWriter needs to be initialized for PageMaker. You can do this by selecting Prep Aldus **from under the TOPS Spool Desk Accessory menu.**

If a spooled PageMaker document is the first one to print on the laser printer since it was turned on, you must choose the Prep Aldus option in the TOPS Spool Desk Accessory in order to initialize the laser printer for PageMaker. This installs the contents of the Aldus Prep file in the LaserWriter, which is needed for PageMaker printing. The Aldus Prep file must be in your System folder. The Print spooled output while I work option will be automatically turned off until you select Prep Aldus, then will be automatically turned back on.

The LaserWriter needs to be initialized. You can do this by selecting Prep Laser **from under the TOPS Spool Desk Accessory menu.**

If a spooled document is the first one to print on the laser printer since it was turned on, you must choose the Prep Laser option in the TOPS Spool Desk Accessory in order to initialize the laser printer. This installs the contents of the Laser Prep file in the LaserWriter, which is needed for most LaserWriter printing (the most notable exception being PageMaker printing). The Laser Prep file must be in your System folder. The Print while I work"option will be automatically turned off until you select Prep Laser, then automatically be turned back on.

The printing of FILENAME has been cancelled because AppleTalk is not connected.

In order to print to a laser printer, your Macintosh must be connected to AppleTalk. When you have connected the AppleTalk cables to the printer port of your Macintosh, start up the AppleTalk software with the Control Panel or Chooser Desk Accessory.

The printing of FILENAME has been cancelled because of a communications error.

Because of excessive network traffic, the connection to the LaserWriter has been broken and the printing of the output from "FILENAME" was cancelled. Printing will start over again with "FILENAME" as the next spooled output to print.

The printing of FILENAME has been cancelled because of a System Error.

This error message results when any unexpected system error occurs, and typically will result from an error in reading the spooled output. If it occurs, go back to your application and spool your output again.

The printing of FILENAME has been cancelled because the LaserWriter could not be found.

Check to see that an existing LaserWriter is selected in the Chooser. If spooled output is directed towards a LaserWriter that does not exist on the network, it should be removed from the queue and reprinted after selecting a new LaserWriter. There may also be a physical break somewhere on the AppleTalk network, or possibly the laser printer has failed or simply been turned off. Check your connections and/or restart your laser printer.

The TOPS volume ____ is about to shut down. Please unmount now.

You have a volume mounted from a server which is about to shut down or unpublish the volume. Click on **OK.** Quit any applications that may be running remotely from the specified volume, save your work and unmount volume.

There is a serial number conflict on the network.

A different TOPS serial number is required by each station on a TOPS network. Find the original disk for the station with the duplicate serial number and re-install TOPS on that station using its own copy of TOPS.

This output will not be spooled because there is insufficient memory to do so.

Too much spooled output has been accumulated. In this case printing proceeds directly, bypassing the spooler.

TOPS cannot be installed while running MultiFinder.

Restart your Macintosh using the TOPS disk.

TOPS: Can't Open AppleTalk.

TOPS tries to open AppleTalk as soon as it is installed. If it can't, it presents this message and then un-installs itself. The most likely cause is that the AppleTalk drivers aren't installed in your system.

TOPS isn't installed. Please start TOPS.

This often indicates that AppleTalk is not active. Select the Chooser from the Apple desk accessory menu. Make sure that the AppleTalk active button is selected.

If the problem continues, check your System folder to see if there are any public domain or shareware initialization files ("inits"). Create a new folder (for example, "inits"), and move all the inits to that folder. Restart your Macintosh and see if the problem goes away. If it does, move each init back into the System folder separately, restarting the Macintosh each time. You can then identify which init is causing the conflict.

TOPS: Please wait a moment – the "___" server or the network is busy. Only click "disconnect" if the server is not operational, otherwise files may be damaged.

This indicates that you have lost connection to the server. This may be due to a very busy network, a very busy server, a failure in network hardware, or the sudden crash of the server.

If the loss of connectivity is temporary, the message will disappear from the screen and you will be able to resume work. This is ordinarily the case. However, if the server has crashed, you will have to click "disconnect" to regain control. Before you click "disconnect,", make sure that the problem is not a temporary one.

- Check that the LocalTalk (or compatible) cable is securely plugged-into the printer port and that the cabling has not been broken elsewhere on the network.
- If you are using .TOPS TeleConnectors, Farallon PhoneNET, or a similar type of connector, make sure that your network is terminated correctly for its topology. For example, if you have a daisy–chained network, the terminating resistors should be at each end of the network,.

TOPS Spool shows the message LaserPrint Error: Limitcheck (or Typecheck); Offending Command «error message».

The most likely cause is that another user used a different version of the LaserWriter and LaserWriter Prep files. Check the LaserWriter driver versions by selecting "Print..." and looking in the upper right hand corner of the LaserWriter print dialog box. Make sure all the users on the network have the same version of the LaserWriter drivers.

Warning: "_____" has active users. If you continue, they may lose their work.

This message will appear when unpublishing a volume that someone else is currently using or when restarting your computer when you have active clients. Click on **Warn Users** to inform clients that you are shutting down your Macintosh or unpublishing a volume they have mounted.

Allow enough time for clients to save files and unmount the volume before reissuing the shutdown, restart, or unpublish command. The second time the warning message comes up, you can click on **Continue**. TOPS will then complete your request to shut down in 20 seconds.

You may override the 20 second delay by clicking on **Shut Down Now.**

Warning: Moving this output will cause printing in progress to be cancelled. Are you sure you want this to happen?

If you change the order of the outputs in the list of Spooled Output by dragging your first output after it has begun printing, its printing must be cancelled. This warning statement gives you a chance to cancel the change.

Warning: There is spooled output still not printed. Are you sure you want to do this?

This warning statement appears if you attempt to change the disk TOPS Spool is writing its spooled output on and there is spooled output remaining to be printed. If you click on the **YES** button, the spooled output is not lost, but it will not appear in the list of Spooled Output until you change back to that disk

Warning: This copy of TOPS has been damaged! Please return it from backup.

If the TOPS driver has been damaged before you start using it, this message will appear the first time you try to use your Desk Accessory. To replace the damaged driver, copy the file called "TOPS" from your original TOPS disk and replace the working copy of the "TOPS" file.

Warning: This copy of TOPS has been damaged! Please save your work and reboot as soon as possible.

If TOPS is already in use when the driver becomes damaged, this message will appear when you try to use your Desk Accessory.

Warning: TOPS has been damaged.

If the TOPS driver becomes damaged, it will present this message once as soon as the damage is detected. You should save your work and unmount any remote volumes as soon as possible. Current connections will be maintained as long as possible, but any attempt to use the TOPS Desk Accessory will present one of the messages below.

Will shut down in 20 seconds.

This message will appear after requesting TOPS to continue shutting down your macintosh or unpublishing volumes for which you have active clients. These clients will be informed that the mounted volume published by you has been shut down. In 20 seconds, the volume will be automatically unmounted.

If you choose **Shut Down Now,** clients will receive no warning of your plans. Remote operations in progress by a client may therefore fail and network performance may suffer. We recommend using this option only in cases where you are sure clients have unmounted and completed any work on volumes published by your station.

Macintosh File System Errors

Macintosh File System Errors are errors detected by the Macintosh operating system. They are distinguished by a hyphen which precedes each error number.

-33 File Directory Full

There are too many files in this folder or too many files on this disk.

-34 Insufficient Space (Disk Full)

This is a simple out–of–space error, but it could be caused by insufficient space for the Work File. This error can also be caused by exceeding partition size on a partitioned hard disk.

-36 I/O Error

The Macintosh operating system has encountered an error in data being sent/received.

-39 Logical End-of-file Reached During a Read Operation

This error could be caused by an incorrect file format, wrong version of a file, or a damaged file.

-42 Too Many Files Open

Macintosh limit of the number of files allowed to be open has been exceeded. This error could occur in MultiFinder.

-44 Volume Locked by Hardware Setting

Locked Disk error.

-45 File is Locked

Either the disk is locked OR the file has a software lock set.

-46 Volume Locked by Software Setting

Locked disk error, but the file is protected by a software lock.

-47 File is Busy

File is in use in MultiFinder, OR file was in use during a program failure and has not been reset by restarting the system.

-49 Attempt to Write to a Locked File

Unlock the file and retry.

-51 Path Reference Number Specified Nonexistent Path

Possibly caused by the operating system losing track of its position in the file system while swapping disks.

-53 Volume Not On-line

Possibly caused by the operating system losing track of its position in the file system while swapping disks.

-54 Attempt to Open a Locked File for Writing

Unlock the file and retry.

-54 Attempt to Open a Locked File

Unlock the file and retry.

-60 Bad Master Directory Block

Error in Disk Directory; Re-initialize Disk.

-61 Read/Write Permission Doesn't Allow Writing

You do not have permission to write to this file.

"4101 System Error"

This error means that the spooler could not find the laser printer. Select the laser printer from the Chooser. If you can't see the laser printer in the Chooser, make sure that the laser printer is on and that there are no loose cable connections in the network.

Glossary

Access
The ability to control a hardware device, run a software application, or manipulate a file. To access a computer, printer, or modem means to communicate with that hardware and its associated software. To access an application means to run that application. To access a file means to read, write to, or read and write to it.

AppleTalk
A set of network communication protocols for LocalTalk cabling systems. The driver that controls how the network devices address, send, receive, and read the information transmitted over the network.

Application file or application program
A file containing an executable program. The program will perform a particular task, such as word processing, data base management, networking, etc.

ASCII
American Standard Code for Information Interchange. ASCII is a standard way of representing text in microcomputer operating systems.

Background tasks
Functions performed by the computer while allowing the computer to be used for other activities. Background functions are not apparent to the user. For example, while printing a document in the background, the computer can still accept and process data intended for another document.

Back up
To copy the contents of a disk, directory, or file to another hard or floppy disk. (A backup file or disk is made in case the original becomes damaged.)

Bridge
A hardware device that connects two similar networks (zones). Bridges extend networks to expand the resource pool and control network traffic by forwarding only transmissions intended for a different zone.

Client
A station (Macintosh or PC) that uses the resources made available by servers on the network.

Daemon
A program which runs in the background, especially on a UNIX operating system. Similar to a memory–resident program like TOPS running on a Macintosh or DOS operating system.

Data file
A computer file containing information or data that can be read or processed by an application. This could be a word processing document, spreadsheet or data base file or simple text. Most data files have information formatted in a way that can be processed only by the particular application that created it. Text files have no formatting.

Data fork
One of the two parts of a Macintosh file, the data fork stores the data or text. *See also Resource fork.*

Desktop file
A file used to store the Macintosh working environment, such as window size, shape and position, file display type (large icon, small icon, etc.), and file notes.

Disk
A device used to store information processed by your computer. Hard disks and floppy diskettes are common storage devices.

DOS
The operating system (Disk Operating System) used by IBM PC and compatible computers.

Driver
The portion of network software responsible for getting communication out onto the network and for ensuring that it gets to its destination station without error.

Ethernet
A physical network cabling system (usually consisting of shielded wire) that links computers and peripheral devices on a network. Capable of transmitting data at up to 10 megabits per second.

EtherTalk
A network driver that supports AppleTalk protocols over an Ethernet cabling system using an Ethernet interface card.

File Locking
A system used by network (multi–user) applications to prevent data files from being written to by more than one user at any one time.

Filename conventions
The rules for constructing file names. These differ from one operating system to another. DOS filenames can be up to 8 characters with an optional 3–character extension. Macintosh filenames can be up to 31 characters long.

File server
A station on a network that makes files available to other stations on the network.

Finder
The application that maintains the Macintosh desktop. It keeps track of documents and applications and transfers information to and from disks.

FlashTalk
A LocalTalk network driver developed by TOPS. It is similar to AppleTalk but transmits data at up to three times the AppleTalk rate.

Folder
Macintoshes store files in folders, which can be created within other folders, forming a hierarchy of levels.

Gateway
A device used to connect two dissimilar networks. Maintains both a hardware connection and a software interface between the two systems of network protocols. For example: an LocalTalk/Ethernet gateway.

Hierarchical file system (HFS)
A filing system used by the Macintosh operating system in which files are organized according to a hierarchy of folders within folders.

Internet
A network that spans local area networks by linking them together, often over long distances.

Local
Files, software or hardware stored in or connected to a computer. *See also Remote.*

Local Area Network (LAN)
A network localized in a single workplace or institution. Compared to a wide area network, which spans long distances and usually links local area networks.

LocalTalk
A physical networking system made by Apple that links computers and peripheral devices together to permit communication and data transmission. Also refers to any LocalTalk–compatible cabling system.

Many writers
A publishing mode which allows any client to write to a published volume.

MFS
Macintosh File System: the flat file structure found on older Macintoshes.

Mount
To connect to a server so that a remote published volume or printer can be used as if it were local.

MultiFinder
System software which enables one application to process information in the background while another application is running in the foreground. *See also multitasking.*

Multitasking
The ability to process information in the background while other applications are running in the foreground.

Multi–user application
An application designed to be run by more than one user at a time.

Network
Devices (computer stations, printers, peripherals connected by cabling or phone to permit information exchange. To share or send information

to machines on a network, the information must be transmitted according to certain rules or protocols. *See also Local Area Network.*

Network name
The name which a computer, printer, or volume displays to the network.

Node
An AppleTalk term referring to a station on the network.

One writer Only
A publishing mode which enables the first client of a published volume to write to that volume; all others must mount read–only until the first client unmounts the volume.

Password
A unique character string that the user must enter to access certain files, folders, or volumes. Passwords provide network security.

PostScript
A page–description language used by certain types of printers to compose documents a whole page at a time and print them.

Protocol
A set of rules that govern the transmission of information across a network. Many kinds of rules at different levels govern data communication, just as in spoken communication.

Publish
To make a resource such as files or printers available to other stations on a network. See File Servers and Printer Servers.

RAM
RAM (random access memory) is memory used to hold application programs while they are being executed. Turning off the computer clears the memory.

Read–only access
An access mode that allows a user to read, but not change, a file's contents.

Record locking
A system used by some network application programs to allow several users on a network to access the same data file, but does not permit more than one user to make changes to a particular record in that file at any one time.

Remote
Files, hardware or software stored in or directly connected to a station on a network other than your own. *See also Local.*

Resource fork
One of two parts of a Macintosh file, the resource fork contains information about the icons, graphical interface, menus, and other information about the nature of the file. DOS cannot read or display the information in a resource fork. *See also Data fork.*

Router
A device that connects two networks and controls network traffic by passing only communication packets going from one side of the router to the other. An AppleTalk (EtherTalk) bridge is a device more properly known as a router. *See Bridge.*

Server
A station that makes its resources, such as files, printers, and other peripherals, available to other stations on a network.

Single–user application
Applications designed to be run by one user at a time.

Spooler
An application that lets printing take place in the background, that is, without interfering with your computing tasks. Print jobs are placed in a queue and printed as the printer becomes available. Local spoolers put your local print jobs in a local queue. Network spoolers put print jobs from all stations in a central queue.

Station
Each computer on the network is a station. Each station receives a name from its user when the user signs onto the network. Macintosh station names can be up to 31 characters long. (PC station names can be up to 15 characters long.)

System file
A resource file containing the fonts, Desk Accessories, and drivers necessary for applications to run.

Text file
A file containing text only (no formatting information). Several conventions exist. ASCII is most common for microcomputers. *See also Data file.*

UNIX
A widely used, multi–user, multi–tasking operating system originally developed by Bell Laboratories, and used on Sun Workstations.

Unmount
To break the connection to a remote volume, or printer.

Unpublish
To make unavailable any resource a server has made available to the network by publishing.

Volume
A folder, directory, or subdirectory that has been published (made available) to the network. (When a folder is published, all folders and files in that folder are also published.)

Write
To transfer information from the computer's RAM to a disk drive. When you write a file to a disk, you store the information on the disk.

Zone
A logical grouping of network(s) within a larger group of interconnected networks joined together through bridges. Zones are used to subdivide a very large network so as to control traffic and make networking within a work group easier.

Index

D

E

F

G

H

I

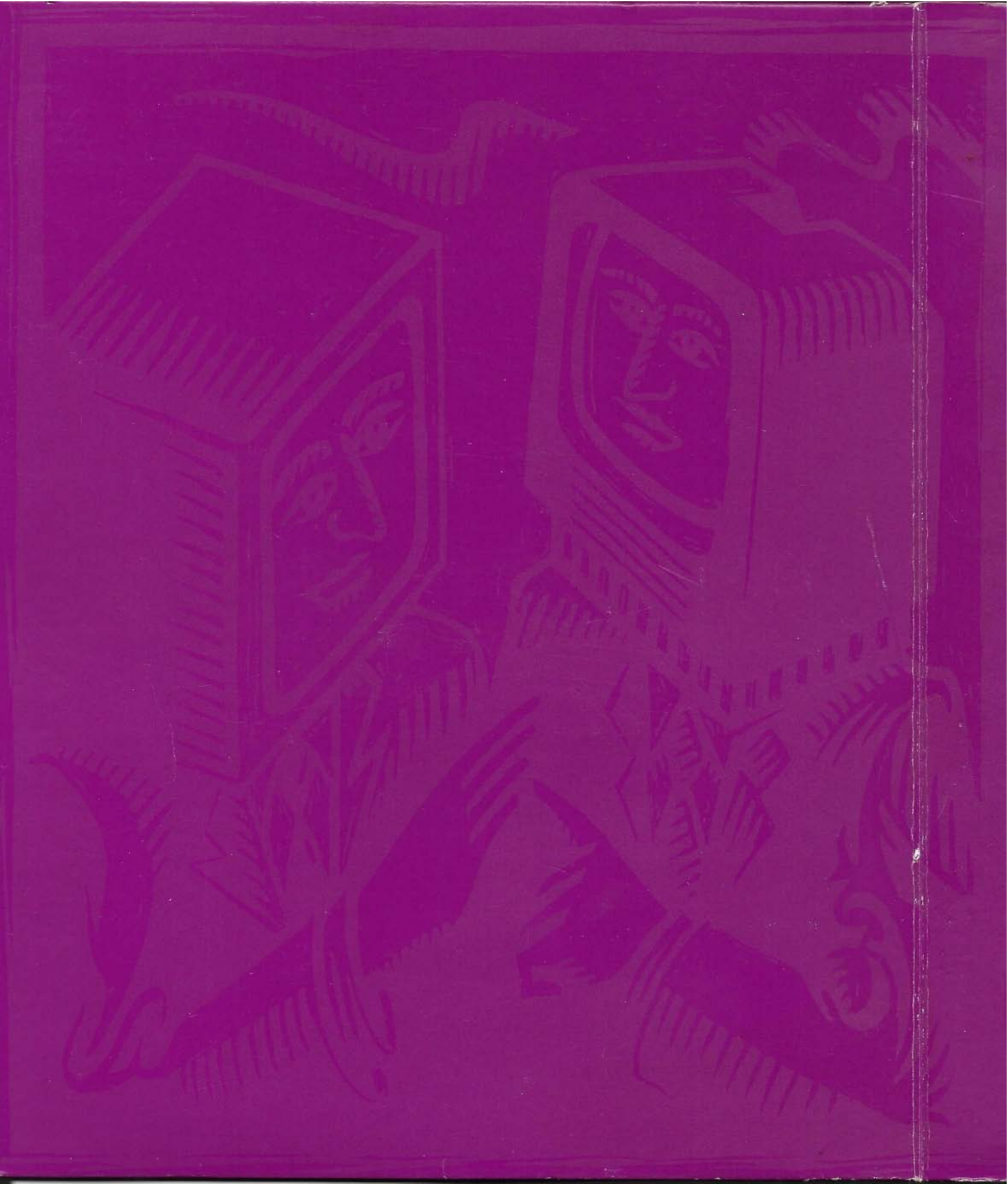
T

U

V

W

Z



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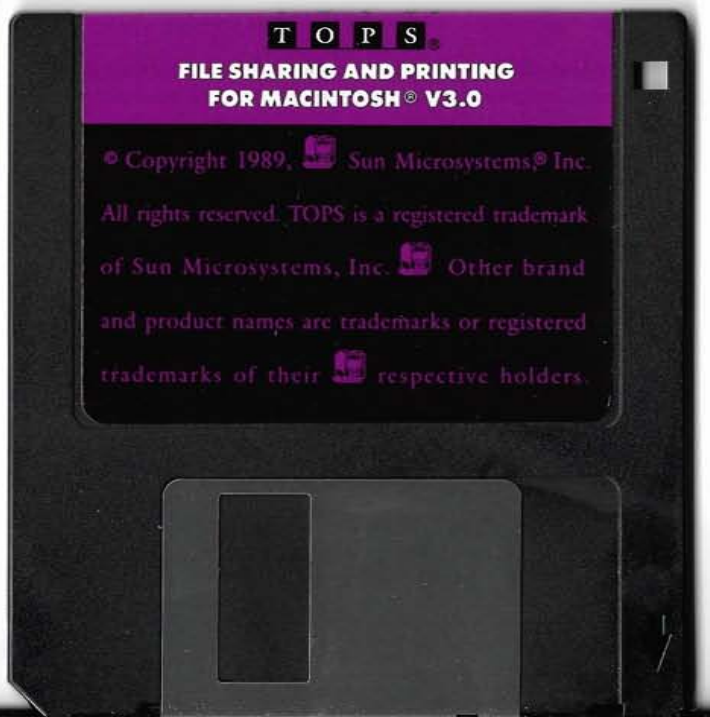

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Before you read the documentation...

TOPS/Macintosh 3.0 Release & Upgrade Notes

The following notes supplement the information provided in the TOPS *User's Guide to File Sharing and Printing for Macintosh Version 3.0.*

The notes are divided into several sections as outlined below. Be sure to read any relevant sections before using your TOPS/Macintosh 3.0 software.

- **New Features**
  Describes the new features of both TOPS networking software and TOPS Spool in TOPS/Macintosh 3.0.
- **Upgrading to Version 3.0**
  Explains how to upgrade TOPS networking software and TOPS Spool to Version 3.0.
- **Problems Fixed**
  Describes the problems in Version 2.1 that are fixed with Version 3.0.
- **Applications Compatibility**
  Specific information about TOPS/Macintosh 3.0 and other software.
- **Known Limitations**
  Important information on the limitations of TOPS networking software and TOPS Spool.

New Features

This section covers the new features of:

- TOPS/Macintosh 3.0 networking software
- TOPS Spool 3.0

TOPS Networking Software

- **Enhanced Support of Multi–User Applications**
  Applications are now supported which take advantage of Apple's shared environment extensions to the Macintosh operating system. These extensions enable multiple users simultaneous access to a single file with improved record locking capability.

  Examples of such multi–user applications are FoxBASE+/Mac Multi–User™ (Fox Software, Inc.), Omnis 3 Plus™ and Omnis 5™ (Blyth Software, Ltd.), 4th DIMENSION™ (ACIUS, Inc.), FileMaker® II (Claris™), Great Plains Accounting Series® (Great Plains Software, Inc.) and Inside Out™ (Shana Corporation).

  These operating system extensions require that file permissions be observed by the network software strictly according to specification. Certain operations, such as copying open files, that were possible without these permissions may no longer be allowed (see Known Limitations section of these notes).

- **Enhanced Zone and Server Support**
  You may now view and gain access to a maximum of 254 zones through the TOPS desk accessory window. The TOPS desk accessory window also now provides access to a maximum of 254 servers per zone.

- **Revised Upgrade Procedure**
  Apple recommends against installation into active System files. Therefore, the TOPS distribution disk is now a startup disk for purposes of installing or upgrading the TOPS networking software (TOPS Spool installation and upgrading, however, MUST be done from within the active System Folder of the target disk). Please review and follow the Upgrade procedure described later in these notes.

- **Revised TOPS Icons and User Interface Changes**
  In order to achieve a consistent design within the TOPS/Macintosh product, the design of many of the TOPS icons have been changed. The TOPS DA window and help windows are now standard windows, not the calculator DA type. Also, the TOPS cursor has been changed to the standard watch.

- **Revised Shut Down Mechanism**
  Options have been added to warn active clients when a server volume is about to be unpublished or the server Macintosh is about to be Shut Down. The clients are given an opportunity to unmount prior to Shut Down. Also, the warning message that appears at the client when the server is busy or network traffic is heavy has been revised to discourage clients from unnecessarily disconnecting from the server.

TOPS Spool

TOPS Spool 3.0 now supports LaserWriter and Laser Prep 6.0 files as well as versions 5.0 and 5.2.

Translators

The TOPS Translators have been replaced by MacLinkPlus/TOPS from DataViz. Please see the separate documentation for a complete description of this significantly enhanced new product.

With MacLinkPlus/TOPS, our customers receive a high quality product with timely application-specific upgrades and support available through DataViz.

Upgrading to Version 3.0

TOPS/Macintosh 3.0 is required for complete implementation of Apple's shared environment extensions to the Macintosh operating system, therefore it is recommended that you upgrade your entire network to this version. However, TOPS/Macintosh 3.0 is compatible with TOPS/Macintosh Version 2.1, TOPS/DOS Version 2.0 and later, and TOPS/SUN Version 2.1 and later. TOPS/Macintosh 3.0 requires approximately 150K of RAM and 240K of disk space excluding the files TOPS Spool and Spool Installer.

Only one copy of TOPS/Macintosh Version 3.0 software is needed to upgrade all existing TOPS/Macintosh Version 2.0 (or later) stations on your network. Note, however, that TOPS must be currently installed on those disks intended for upgrade. If you want to upgrade TOPS/Macintosh software versions earlier than 2.0, you must upgrade on a station–by–station basis. Call TOPS Customer Service at (415) 769–8808.

Warning

If you are UPGRADING an earlier version of TOPS/Macintosh, do not discard your original TOPS disks. They contain your node serialization and will be needed if you reinstall TOPS in the future. Upgrading does not alter the existing identity of the TOPS/Macintosh node. Instructions have been included at the end of this section (page 7) for creating serialized TOPS/Macintosh 3.0 disks from your earlier versions using copies of the upgrade disk.

The following sections cover upgrading TOPS networking software and TOPS Spool. Each uses its own installation/upgrade utility.

To Upgrade TOPS Networking Software

1. **Make a working copy of your TOPS/Macintosh 3.0 Disk, if you have not already done so.**
   Put your original away for safekeeping.
2. **Shut Down your Macintosh.**
3. **Insert the TOPS/Macintosh 3.0 working copy into your Macintosh.**
4. **Restart your machine, booting off of the working copy of your TOPS/Macintosh 3.0 disk.**
   See Figure 1.

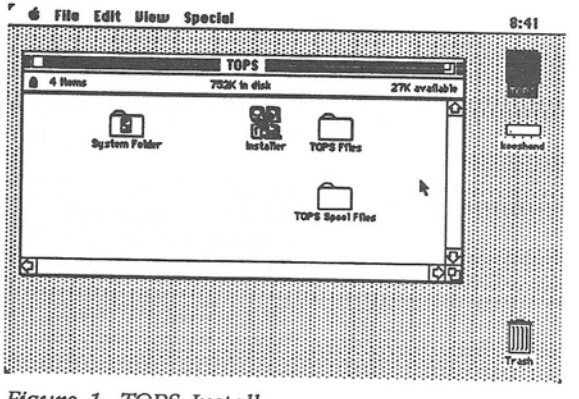

Figure 1. TOPS Installer

5. **Double-click on the** Installer.
   The TOPS installation screen (Figure 2) appears

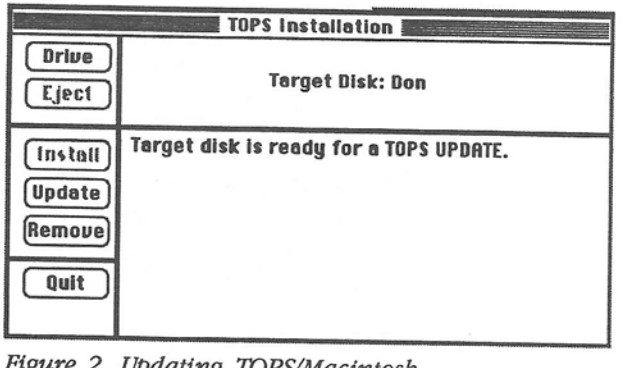

Figure 2. Updating TOPS/Macintosh

6. **Click** Update **to upgrade TOPS to Version 3.0.**
   If you are currently running a version of TOPS Spool other than Version 3.0, a dialog will appear warning that the old spooler will be deleted See Figure 3. TOPS/Macintosh 3.0 is not compatible with versions of TOPS Spool older than

Version 3.0, and therefore will not install if older versions of TOPS Spool are present.

Figure 3. TOPS Spool Dialog

7. **Click OK to delete TOPS Spool and continue TOPS/Macintosh 3.0 upgrade.**
   A dialog will appear informing you that TOPS/Macintosh 3.0 has been successfully upgraded.

   After you finish upgrading TOPS/Macintosh, turn to the section of these notes that apply to upgrading TOPS Spool and follow the instructions to upgrade to TOPS Spool 3.0.

8. **Click OK to confirm.**

9. **Quit the Installer and select** Restart **from the** Special **menu to boot from your normal startup disk.**
   The upgrade procedure is complete.

Upgrading over the Network

Since TOPS/Macintosh 3.0 must be upgraded from the active boot disk, you should not upgrade TOPS from a remote machine. You can, however, distribute the upgrade software across the network by publishing the TOPS distribution disk and copying it from the network clients as described below.

1. **Insert TOPS/Macintosh 3.0 disk into your floppy disk drive.**
2. **Publish the entire floppy disk.**
3. **Mount the published volume at each existing TOPS/Macintosh station on the network.**
4. **Insert a blank, 800K formatted disk and copy all the files and folders from the published volume to the blank disk.**

5. **Complete steps 4-9 from the preceding section, "To Upgrade TOPS Networking Software."**
   Repeat this procedure on each Macintosh until all stations are upgraded.

6. **Unpublish the TOPS/Macintosh 3.0 disk on the server and perform the upgrade procedure, as normal, on that machine.**

Creating a Serialized TOPS/Macintosh 3.0 Disk from Earlier Versions

If you are upgrading your existing network from an earlier version of TOPS/Macintosh, you may want to create separate serialized TOPS/Macintosh 3.0 disks for each of your existing nodes. These will be convenient in case you need to reinstall TOPS/Macintosh 3.0 in the future.

1. **Make a backup copy of your TOPS/Macintosh 3.0 upgrade disk.**
2. **Insert the copy into your Macintosh and open the** TOPS Files **folder.**
3. **Select the** TOPS Key **file by single clicking on it.**
4. **Select** Get Info **from the** File **menu.**
5. **Deselect the** Lock **checkbox and close the** Get Info **window.**
6. **Select** Eject **from the** File **menu.**
7. **Insert your original TOPS/Macintosh 2.0 or 2.1 disk and open the** TOPS Files **folder.**
8. **Drag the** TOPS Key **file to the** TOPS Files **folder of your TOPS/Macintosh 3.0 disk.**
9. **A dialog will appear asking you if you want to replace items with the same name. Click** OK.
10. **Swap disks as directed.**
11. **Your TOPS/Macintosh 3.0 backup disk is now serialized. We recommend that you mark it to identify the station that it belongs to.**

To Upgrade TOPS Spool

The upgrade procedure for TOPS Spool differs significantly from the upgrade procedure for TOPS/Macintosh networking software. Be sure to follow the instructions below carefully.

Warning

Do not upgrade or install TOPS Spool while running under MultiFinder. Restart under Finder before upgrading.

If you have Suitcase II™ or Master Juggler™
Before upgrading TOPS Spool, remove these applications from the System Folder of the startup disk on which you are upgrading TOPS Spool. Restart your Macintosh. Proceed to upgrade TOPS Spool. Return the applications to the System Folder after upgrade is complete and restart your Macintosh.

---

1. **Insert the TOPS/Macintosh 3.0 disk and open the TOPS Spool Files folder.**
   (Do not boot from the distribution disk for TOPS Spool upgrade.)
2. **Copy the TOPS Spool and Spool Installer files from this folder into the System folder on your startup disk or hard drive.**
   (If you did not delete the existing Spool Installer during the TOPS/Macintosh 3.0 network software upgrade, the Macintosh will ask you whether you want to replace items of the same names with the selected items. Click on **OK**.)
3. **Open the System folder on your startup disk or hard drive, and double-click on** Spool Installer.
4. **Click Update to upgrade TOPS Spool to Version 3.0.**
   See Figure 4.

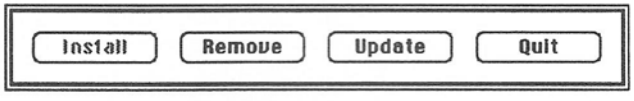

Figure 4. Updating TOPS Spool

In a moment, the upgrade process will be finished. You will then see the screen in Figure 5.

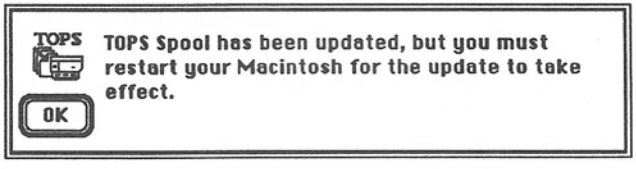

Figure 5. Update finished

5. **Click on OK to return to the desktop.**
6. **Select the Restart option from the Special menu.**

Note

Now that TOPS Spool is installed, the Spool Installer file is no longer needed and may be removed from the system folder and thrown away. We suggest that you leave the Spool Installer file in your system folder. This will be convenient in case TOPS Spool needs to be re-installed.

To Upgrade TOPS Translators

The TOPS Translators have been replaced by the MacLink-Plus/TOPS translators from DataViz. To upgrade your TOPS Translators, simply remove all of the TOPS Translators files from your Macintosh by dragging it to them trash, and refer to the MacLinkPlus/TOPS documentation for installation instructions.

While MacLinkPlus/TOPS is not serialized, it will not run unless TOPS is installed.

Problems Fixed

This section describes the problems in TOPS/Macintosh Version 2.1 that are now fixed with TOPS/Macintosh Version 3.0.

TOPS Networking Software

- **HyperCard on Write Protected Volumes**
  HyperCard now works correctly when run from a TOPS/Macintosh volume that has been published with the Write-Protected option, or from a CD-ROM.
- **MPW 3.0 Installer**
  The MPW 3.0 Installer could not be used with TOPS/Macintosh. It is now fully compatible (see Applications Compatibility section for limitations on the use of the MPW 3.0 Dumpobj tool).
- **TOPS and AppleShare 2.0 Client**
  When TOPS/Macintosh and AppleShare client software were loaded on the same Macintosh, some applications (e.g. MacProject II from Claris) would have trouble accessing data from a remote TOPS volume. This has been fixed.
- **Pathname limitations**
  Applications which use "full" pathnames could not access files in deeply nested folders on remote volumes due to a

pathname length limit in TOPS. TOPS/Macintosh 3.0 now supports full 255 character pathnames.

- **4th DIMENSION**
  Several problems with 4th DIMENSION have been fixed, and TOPS/Macintosh is now fully compatible with 4th DIMENSION.
- **FoxBASE+/Mac**
  FoxBASE+/Mac Multiuser could not be used over a TOPS network. TOPS/Macintosh is now fully compatible with FoxBASE.

TOPS Spool

- **LaserWriter and Laser Prep 6.0**
  TOPS Spool 3.0 now supports LaserWriter and Laser Prep 6.0.

Applications Compatibility

This section provides information about TOPS/Macintosh 3.0 and its compatibility with other software applications.

TOPS Networking Software

- **Interferon Version 3.0**
  Interferon, a shareware virus detection utility, mistakenly finds TOPS files infected with a "sneak" virus. This information should be disregarded. The software on the TOPS/Macintosh 3.0 disk has been certified virus–free. The author of Interferon has corrected this in the commercial virus detection program Virex® from HJC Software, Inc.
- **MPW 3.0**
  The MPW 3.0 Dumpobj tool, which dumps object code modules, does not work correctly with TOPS/Macintosh 3.0. If this tool is invoked the system may hang.
- **TOPS Terminal**
  The INIT file required for the public domain terminal emulation software TOPS Terminal must load before TOPS. Rename the file TOPS TCP/IP to TCP/IP.
- **Great Plains Accounting Software**
  Users of Great Plains Accounting Software should contact TOPS' or Great Plains' technical support for current information on compatibility with TOPS/Mac 3.0.
- **WriteNow 2.0**
  Users of WriteNow version 2.0 cannot perform a Save As... to the server when the original document is also at the server.

- **Multi-file applications**
  The Macintosh operating system is configured to allow a certain number of files to be open at one time. In some cases, especially with multi-user and/or multi-file applications, the number of files allowed to be open must be increased. The System file is always open, as is TOPS, if present. When you open an application another open file is added, and each open document adds another. Some applications, especially databases, maintain a large number of open files.

  If there are several simultaneous users the number of open files can grow significantly, especially at the datafile server. When the limit has been reached the user may get an error message from the application such as "Can't find file...", or additional users may be unable to open the application or mount the server. The value for Maximum Number of Open Files resides on the boot sector of the startup disk. To increase this number, use a disk editing utility such as Symantec Utilities for Macintosh™ (SUM) from Symantec Corporation.

- **Incremental Backup Utilities**
  Some backup utilities (those which utilize the backup date field of the PBSetCatInfo() input parameter block) will not perform incremental backups of TOPS server volumes.

TOPS Spool

- **PageMaker 3.02 and PageMaker Color Extension**
  TOPS Spool 3.0 is compatible with PageMaker 3.0.2. Make sure that you move the file Aldus Prep and the folder APDs from the PageMaker folder to the system folder of the startup disk so that TOPS Spool can find it. TOPS Spool 3.0 will support the PageMaker Color Extension if the Aldus Prep file is converted to a text file using MacLinkPlus/TOPS

- **Excel 2.2**
  Most Excel 2.2 documents will print correctly using TOPS Spool 3.0 and LaserWriter drivers 6.0. In a few cases, you may see the error "Stackunderflow: Offending Command Exch", and your document will continue to print repeatedly until you remove it from the TOPS Spool queue using the TOPS Spool desk accessory. The solution to this lies in the LaserWriter 6.0 print window (the window that appears when you select **Print...** from the **File** menu in Excel). There is an option in this window called **Print** which lets you choose between Color/Grayscale and Black&White. The default is always Color/Grayscale. You will need to change the print setting from Color/Grayscale to Black&White each time you print any document that exhibits this behavior.

Known Limitations

This section contains information on known limitations of TOPS/Macintosh 3.0 networking software and TOPS Spool.

TOPS Networking Software

- **Network performance under MultiFinder**
  Because of the way tasks are scheduled under MultiFinder, network performance is reduced when MultiFinder is active and the desktop is in the foreground, especially at the server. An open Desk Accessory (such as the Alarm Clock) helps optimize task scheduling and thus improves performance. We recommend keeping a Desk Accessory open while running MultiFinder with the desktop in the foreground.
- **Mounting large volumes when running MultiFinder**
  A Macintosh client running MultiFinder may be unable to mount a remote volume containing a large number (approximately 150) of files at the first directory level.
- **Mounting a remote System Folder**
  Clients should avoid mounting a remote System Folder. The TOPS client creates a hidden desktop file when it mounts a remote folder. The System may become confused by this file if it is in the System Folder, with unpredictable results.
- **Publishing entire disks**
  Whenever possible, it is recommended that TOPS servers publish folders rather than entire disks. When publishing an entire disk, both the server and client Macintoshes have access to the root level desktop file. Under some circumstances the client will be able to modify the root level desktop file of the server, which can change the server's view of their own disk. We recommend that all files and folders that are to be made available to the network be placed in a published folder.
- **Volume names**
  Each volume to be published must be given a different name. TOPS only recognizes names of up to 27 characters, although the Macintosh will allow directory names of up to 31 characters.
- **Maximum number of published volumes**
  A maximum of 12 volumes may be published at one time from a single server.
- **Viewing the contents of a volume through the TOPS desk accessory window**
  The number of files displayed through the TOPS desk accessory window is restricted by available memory,

therefore, the contents of very large volumes may appear incomplete. Files are displayed in alphabetical order. A complete list may be viewed by mounting the volume and using the Finder or MultiFinder to view its contents in a desktop directory window.

- **Copying open files**
  The Finder may refuse to copy certain files, particularly the current System, current Finder and any open applications, when TOPS/Macintosh 3.0 is in memory. Files can only be copied when they are not active.

- **Access to files on a PC**
  Some operations may require executing the DOS command `SHARE` on a PC server before publishing a DOS volume.

- **Mounted volume icon cannot be thrown away**
  When TOPS is loaded under MultiFinder, you will need to quit applications which used files from a remote volume before unmounting the volume.

- **Generic Icons when copying files to remote volumes**
  When a client is viewing the directory window of a remote volume to which a file has been copied, the file's icon may appear as a generic document until the window is closed and then reopened. This will occur if the file's application does not already exist at the server.

- **Network activity light and large screen monitors**
  The network activity light is a tiny one–pixel sized light in the upper left corner of your Macintosh screen that flashes intermittently when your Macintosh is sending or receiving information on the TOPS network. This feature is incompatible with some third party large screen monitors (it can cause the screen to freeze or produce system bombs). Users with large screen monitors can modify TOPS to eliminate this feature if necessary (contact TOPS Technical Support to request Tech Note #1203, *Disabling the Network Activity Light*).

- **Maximum RAM**
  TOPS/Macintosh 3.0 will not operate on machines with more than 8MB of RAM.

- **Desktop Manager**
  This INIT file, designed for use on an AppleShare file server, modifies the file system so that TOPS cannot load. The message: "Can't start TOPS: other software has modified the local file system. Try removing the other software." will appear. You may have this file in your System folder if your Macintosh was ever used as an AppleShare server. If so, remove it.

TOPS Spool

- **Black and White Printing with LaserWriter 6.0**
  If you are using the LaserWriter 6.0 drivers, but are printing to a black and white laser printer, you may notice "dots" in your output where there should be solid color. This is an indication that you need to select the Black&White print option in the LaserWriter 6.0 print window.

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