

New: Macintosh File Sharing Under System 7

Introduction



Many Macintosh users are familiar with Apple's file sharing software, AppleShare. To share information using AppleShare you dedicate one machine to act as a file server; no one can use this machine as a personal computer. The advantage to this scheme is speed and security. You can lock the file server in a closet and leave it turned on all the time. Dedicated servers are also faster than non-dedicated ones.

In August 1986 we reviewed AppleShare in the *Micro-computer Newsletter*. AppleShare, of course, has changed since that review. When Apple introduced System 7, its options for file sharing changed even further.

File Sharing Built Into System 7

System 7 lets you turn your Macintosh into a personal file-server. You can specify that selected documents be made

available to anyone on your AppleTalk network. When you do this, others can connect to your computer even if you are currently using it. You can even use a password to make your entire hard drive available from any other Macintosh on the network.

If the Macs in your work group are set up to share a laser printer, they are also set up to share documents. The hardware you must buy to set up a personal file-server or share printers is an LocalTalk or PhoneNet connector. Each machine involved in the sharing must have one of these connectors. Currently these cables cost \$38-56. Since networking capability is already built into the Mac, you do not have to buy other hardware to share printers and documents among machines connected by LocalTalk or PhoneNet connectors.

What You Don't Know Can Hurt You

The key to using these new file sharing features successfully is understanding how to properly set the access permissions you grant to other people. Granting permissions without knowing the options and limitations of whatever file

System 7 Notes

Whether or not you are using System 7.0, you need to be aware of several new features of the operating system while you read the *New: Macintosh File Sharing Under System 7* article.

Improved Utilities Handling

First, System 7 handles many utilities differently than previous Macintosh operating systems. For example, the *Control Panel* has been turned into a folder. The Control Panel and other utilities that we became used to finding under the Apple menu are handled like other Mac programs. The Apple menu has become more versatile. When you place any program or document in the new *Apple Menu* folder, it will appear in the Apple menu.

This specialization of folders for specific purposes plays a role in the new file sharing features, too.

Aliases

Another major new feature is *aliasing*. Using the *File* menu's *Make Alias* command creates a small document which "points" to another file or folder. Creating an alias is not the same as duplicating something. For one thing, all aliases are very small (about 2K), and when you double-click on the icon of the alias, you access the "original" no matter where that original is located.

This may be easier to understand if you think about how you access your favorite word processing software. One method is to locate the program icon, for example the Word or MacWrite icon, and double-click on

it. However, once you've saved a document you created with Word or MacWrite, you can double-click on the document icon and the word processing program will automatically start up and run.

How does this work? Special information is stored along with your document or letter that tells the computer to run the MacWrite or Word program in order to work with the data in the document. When you double-click on the icon of an alias, you also start up a program or open a document.



sharing software you are using can get you in serious trouble. You could suffer viral infections, lost files, and reduced file storage capacity due to "unauthorized" use of your hard disk. So if you are new to file sharing or are interested in setting up a System 7.0 file server on your own Mac, we strongly urge you to read on.

Correct usage can make it easy to exchange and update documents between Macintoshes on a network.

System 7.0 Notes

If you're unfamiliar with System 7.0, you may wish to take a look at it before or while reading this article. We've included some information about System 7 at the bottom of page 78. (The June 1991 *Microcomputer Newsletter* also has a 9-page overview of System 7.0.) You can stop in the Microcomputer HelpLine in 125 Shepherd Labs to try out System 7.0. The software itself is free. To obtain a copy bring eight blank, high-density (1.44MB) disks to any Microcomputer HelpLine.

Networks and the Chooser

The *Chooser* is the Macintosh tool you use to select various services, including accessing other Macs that have turned on file sharing. Since others will use the Chooser to connect to your Mac, it's important to understand how your choices affect what they see. If you are familiar with the AppleShare functions of the Chooser, you can skip ahead to the *Setting Up Sharing on your Mac* section.

Local and Wide-Area Connections

A Local Area Network (LAN) is a collection of closely linked computers that share resources, such as printers and documents. Several Macintoshes connected by AppleTalk constitute a LAN. A Wide Area Network (WAN), such as the University's internet, is built by connecting several Local Area Networks together. The Chooser allows you to select resources available to you via your LAN or WAN.

Chooser Options

Figure 1 shows a Chooser window with many options. You'll find Chooser under the  menu.

In the upper left of Figure 1 is a display of icons representing the various services our example Macintosh can use. In this article we are interested solely in AppleShare, so we select the *AppleShare* icon.

Many departments are connected to the University's AppleTalk internet. If your network is not connected to it, you will not see the *AppleTalk Zones* list in your Chooser window. However, if you are part of the internet, the AppleTalk Zones list shows the zones that comprise the larger internet. Our zone is called *MicroCenter*. Since the service we selected was AppleShare, you also see a list of all the AppleShare servers available in the MicroCenter zone. Many of the MicroCenter's servers listed under *Select a file server* are System 7.0 servers. For this example we selected the server called *>Mac Information*.

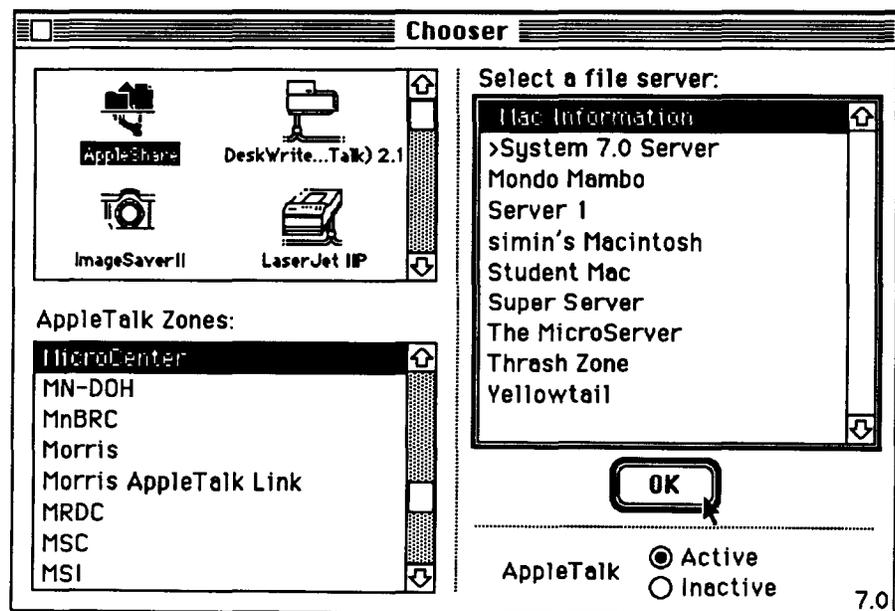
To see these zones and file server selections, you must also activate AppleTalk by selecting the *Active* button. This button is at the bottom of the Chooser window.

Accessing a File Server

Although we selected the *>Mac Information* server name, we have not actually connected to the server. To do this we must click on the Chooser's *OK* button and supply a little more information, as shown in Figure 2.

We can connect to the server as a *Guest* or as a *Registered User*. The owner of the server can grant access to anyone

Figure 1: Chooser with Many Options



by setting up guest access or to registered users by giving selected individuals private names and passwords. In Figure 2, note that the characters you type in the *Password* text box are not actually displayed on the screen. Displaying dots rather than the characters you actually type helps keep passwords secret.

Guest Access

Information on *>Mac Information* is unprotected; anyone can connect to it and copy information from it by clicking on the Guest button. When *Guest* is selected, you do not use the *Name* and *Password* text boxes.

Figure 2: Connect as Guest or Registered User

Figure 3: Sharing Setup Utility

Servers Can Share Several Resources

A server can have more than one resource available on it. When you select one of these resources, a special Apple-Share icon will appear on your desktop. You can treat the icon as if it were another hard drive.

Setting Up Sharing on Your Mac

To set up file sharing under System 7 you need to know about the four tools listed below. We'll review these utilities in the order you need to use them.

From the *File* menu:

1. *Sharing*

From the *Control Panel* in your *System Folder*:

2. *Sharing Setup*
3. *Users & Groups*
4. *File Sharing Monitor*

Sharing Setup

The first tool you'll use is *Sharing Setup*, which is divided into the three sections shown in Figure 3.

Network Identity

The *Network Identity* section requests three pieces of information: the *Owner Name*, *Owner Password*, and the *Macintosh Name* that this Mac will present to the network. You can use whatever name you desire, provided your name differs from other Mac names on your *local* network.

Be careful about selecting an owner name and password. If these names are too easy to guess, an unauthorized person could connect to your computer and do anything they like, since the "owner" has access to everything. Finally, keep in mind that since you can change the *Owner Password* without knowing what the previous password was, *anyone* can sit down at your computer and change the password.

File Sharing

After you've turned on *File Sharing* by clicking on the *Start* button, your Macintosh will appear as a server under the *Select a file server list* (as shown in Figure 1) to *other* Macs on the network.

However, you haven't specified *what* you want to share. To do this you must use the *User/Group* feature which we will discuss later.

Program Linking

Because few programs are currently set up to take advantage of the new Program Linking feature, we won't discuss it here.

Share What?

Before you can share anything, you must prepare a folder to be used for sharing. You can share documents you place in this folder.

Select a Folder

In our example we will share information in a folder called *Public* but not in a folder called *Private*. To start this process, we click once on the Public folder. When the folder is highlighted, we select *Sharing* from the *File* menu and are presented with a dialog box similar to the one shown in Figure 4. When we click on the *Share this item and its contents* check box three things happen:

- an X appears in the box,
- the folder becomes available for sharing (Figure 5),
- and the folder's icon changes (Figure 6).

The *Sharing* dialog box shown in Figure 4 has many check boxes that you can select to control access to the information stored within Public folder. Initially all the *See Folders*, *See Files*, and *Make Changes* boxes are checked, meaning that anyone who connects to your Public folder can read, alter, add to, or erase *any* information stored in that folder.

The third part of the *Sharing* dialog box has two check boxes. The *Make all currently enclosed folders like this one* is very useful, provided no subfolder requires different permissions. The *Can't be moved, renamed or deleted* control means anyone accessing Public folder over the network cannot rename or rearrange the folder.

Folder is Available for Sharing

Now that you've turned on *Share this item and its contents*, when another Mac on the network selects your Mac's name, they can also select your Public folder, as shown in Figure 5.

Figures 4: Sharing from File Menu

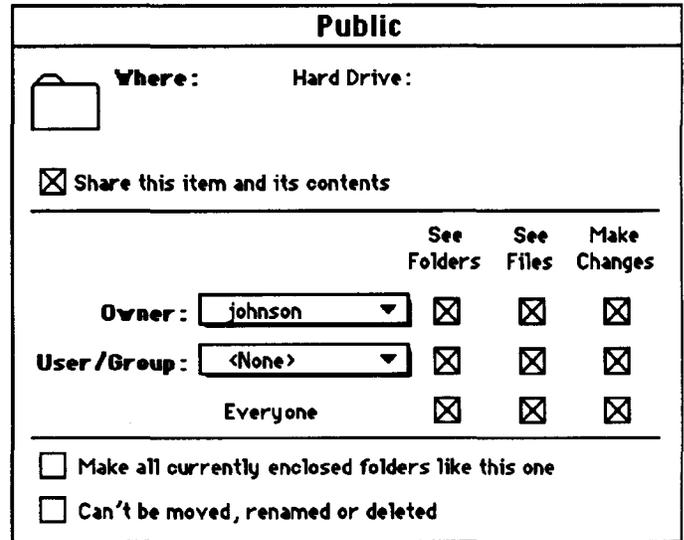


Figure 5: Select Public Folder Through the Chooser

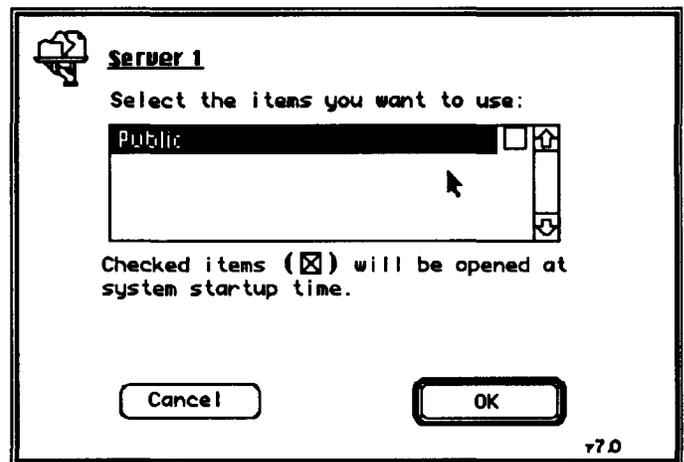
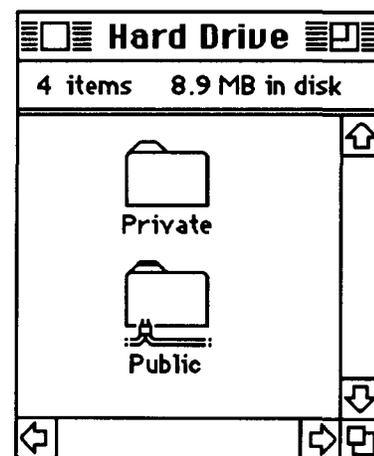


Figure 6: Shared Folders Look Different



Shared Folders Look Different

In Figure 6 if you compare the icons of the folders called Private and Public, you can see that the Public folder's icon changed in two ways. First, the network link at the base of the icon indicates that this folder is shared. Second, the darkened tab at the top of the folder indicates *ownership*, which is discussed in the *Users & Groups* section below.

Three Classes of Users

In Figure 4 you can see three different classes of users: Owner, User/Group, and Everyone. At the extremes are Owner and Everyone.

Owner

Generally an *Owner* would grant themselves full access to everything. The owner can even grant themselves network access to their entire hard disk by clicking on the hard disk's icon and selecting *Sharing* from the *File* menu. This option lets the owner access their Mac and its contents from another machine on the network, provided they remember the "owner" name and password.

Everyone (Guest)

The class of *Everyone* is also called *Guest*. To access shared information Guests simply click on the Guest button; they do not need to type in a name or password.

User/Groups

You can use the *User/Groups* class to grant limited access to selected individuals or groups. Properly setting up limited access takes thought and time.

Beware Permissive Permissions

The *See Folders*, *See Files*, and *Make Changes* options let you fine tune access to the information you want to share. In the examples below we'll use these options to set up some of the most common types of access privileges. We'll use a fictitious company to illustrate our examples.

Welcome to Heartland Software

In the following examples you are Ms. Johnson, network administrator for Heartland Software. Your staff is divided into two overlapping groups: the *Production Group* of programmers who write your software and the *Budget Group* who are dedicated to the careful allocation of your profits.

Your file server has three functions:

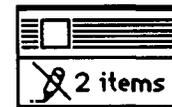
1. distribute your program (called Gopher) to customers
2. transfer proprietary information within your office
3. serve as private dropbox for your staff

Read Only

The ability to see, read, and copy information but not to make changes to it is ideal for distributing data to Guests; these permissions are shown in Figure 7. This ability lets Heartland Software distribute their program to potential customers without being concerned that someone might accidentally erase or alter the software.

Figure 7: Read Only Privileges	See Folders	See Files	Make Changes
Everyone	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

The Guest accessing the shared folder sees the Read-Only symbol at the top of the folder window, as shown in the figure on the right. Guests cannot alter files within this folder or add new files to it.



See Files Only

The settings shown in Figure 8 permit a Guest to see the files that are stored in a folder but not to see any subfolders within that folder. This ability helps Heartland Software organize its software. They set up a master software folder that contains many subfolders and grant Guests access only to the latest release of the software. Figure 9 shows both the Guest's and the Owner's view of the folder set up in Figure 8.

Figure 8: See Files But Not Subfolders	See Folders	See Files	Make Changes
Everyone	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Write Only

Write-Only privileges let you use a folder as a dropbox. Although Guests cannot open this folder, they can copy documents to it. To set up Write-Only privileges, select just the *Make Changes* button, as shown in Figure 10.

Figure 10: Write Only Privilege	See Folders	See Files	Make Changes
Everyone	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Create Individual Dropboxes



To create individual dropboxes you use the *Users & Groups* program discussed below.

Users & Groups

In order for the staff of Heartland Software to have individual dropboxes, everyone must have an "account" identifying them as someone other than a Guest. To do this use the *Users & Groups* program.

When you open *Users & Groups*, you find that it resembles a folder that contains portrait-like icons. You also find that the *File* menu has two new selections: *New User* and *New Group*. Initially, *Users & Groups* contains just two icons: one for Guest and another for Owner. In our examples the owner is *johnson*.

Create New Users

To set up individual dropboxes, select *New User* from the *File* menu. You can rename the resulting *New User* icon just like you would rename a file. For our example we'll name the new user *smith*. (The name <Guest> is special; you cannot change it.) Now we have three icons.

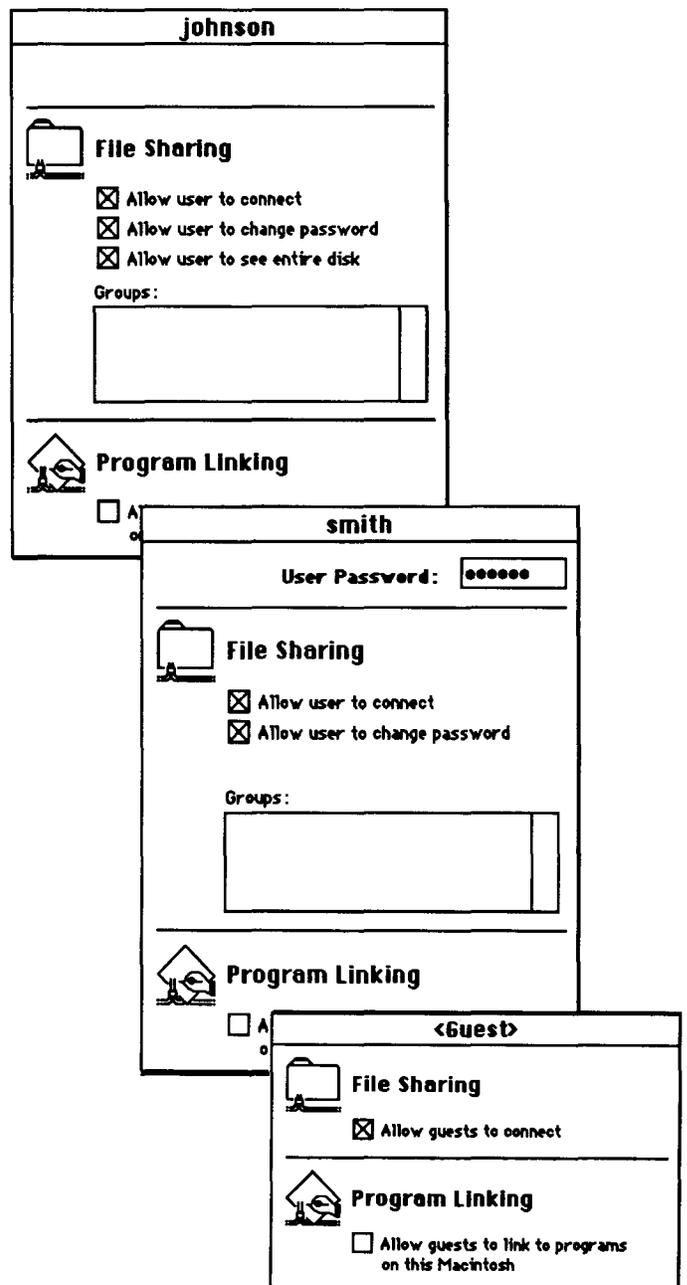
When you double-click on the *johnson*, *smith*, and <Guest> icons, you see the dialog boxes shown in Figure 11. Notice that each classification has different options. You can change the privileges, but you cannot change the options.

To temporarily prevent someone, for example smith, from connecting to your machine, you can deactivate his *Allow user to connect* option.

Groups

To complete our examples, we will create entries for the rest of the staff. We need to indicate who is in the Production Group, the Budget Group, or both. To do that we'll use the *User/Groups* feature.

Figure 11: Privileges for Our Dropboxes

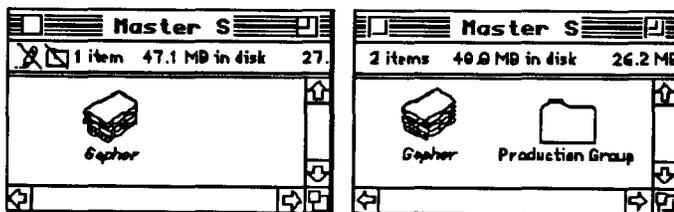


Privileges by Classification

Classification	Connect	Change Password	See Entire Hard Disk
Owner	Y	Y	Y
User/Group	Y	Y	N
<Guest>	Y	N	N

The *see entire disk* option is useful for owners who want to access their Mac from somewhere else on the University's internet.

Figure 9: Different Views of the Same Folder
Guest View Owner View



To create Budget and Production groups, we'll use the *New Groups* command in the *File* menu. Then we'll add the appropriate employees to each group. The results are shown in Figure 12.

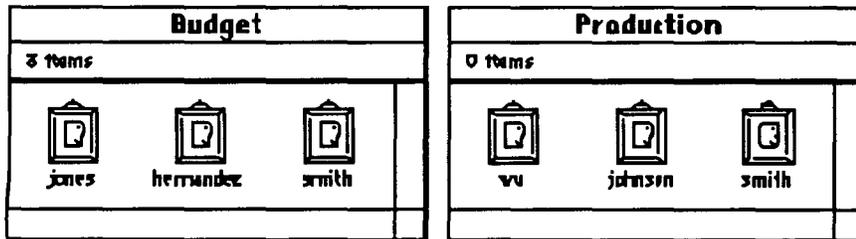
(representations of Users appear as portraits). As shown in Figure 12, Owners and Users can be members of more than one Group, but Guests cannot be Group members.

Groups behave somewhat like folders. To add a User to a Group, you drag the User's icon onto the Group icon

Sharing Can Satisfy Many Needs

At Heartland Software different groups have different needs, as shown in Figure 13. We'll satisfy these needs through file sharing. If you do not want to follow our detailed examples, skip ahead to the *Shortcuts: Aliases* section.

Figure 12: Budget and Production Groups, Opened for Inspection



We will begin by creating folders called *Production Group* and *Budget Group* and store them in our company's Public folder.

Figure 13: Different Groups Have Different Needs

The *Production Group* is developing two things
 Need 1: one software product must be available to the world at large and
 Needs 2-3: new versions of the software, which *only* the Production Group can change but which the Budget Group can access.

The *Budget Group* maintains financial information which
 Need 4: can be alterable only by the Budget Group but
 Need 5: must be available for review by anyone at Gopher Software
 Need 6: no one outside Gopher Software can see.

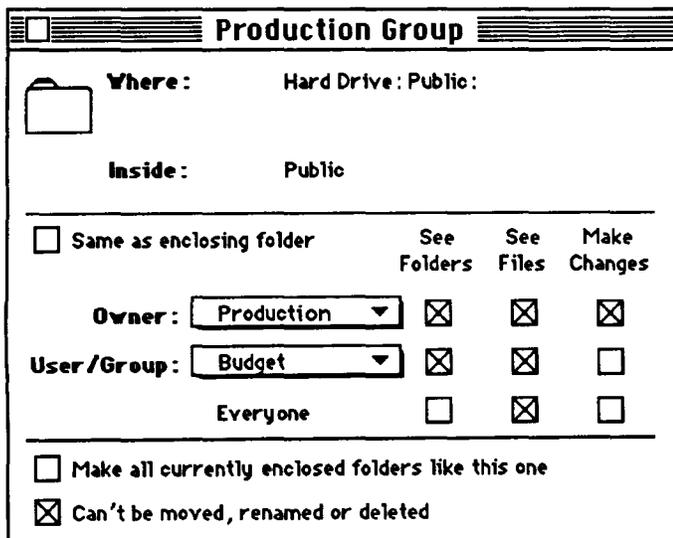
The *Owner* of the machine that is used as a file server
 Need 7: has information that cannot be shared.

Production Group Folder

To begin setting privileges, we click once on the *Production Group* folder and select *Sharing* from the *File* menu. These actions produce a window with the same name as the folder, as shown in Figure 14.

Since we have never set access privileges for this folder, the See Folders/ See Files/Make Changes buttons are grey. To activate them, we turn off the *Same as enclosing folder* button by clicking on it. Then we set up the access privileges shown in Figure 14.

Figure 14: Privileges for Production Group Folder



These permissions allow Everyone (Guests) to see files, but not folders, that are stored in the Production Group folder. Guests cannot make changes to anything. This arrangement satisfies need #1; it lets anyone see and copy the software product that the Production Group wants to distribute.

Although the Production Group owns the Production Group folder, the file server owner (johnson) retains full rights. (It is impossible to set access privileges that the owner cannot change.) However, since the Production Group "owns" the folder, they can change anything within that folder and its subfolders; satisfying need #2.

The Budget Group can see subfolders but not make changes; satisfying need #3.

Test Subfolder

We also create a folder inside the Production Group folder and call it Test. The folder contains beta software, the unfinished version of Heartland Software's program that is available for testing within the company.

Since the Budget Group has permission to access subfolders, it can obtain a copy of the beta software from this Test subfolder. Since Everyone (Guests) cannot see any folders within the Production Group folder, they never even know that the Test folder exists.

Budget Group Folder

The Budget Group is given ownership of the Budget Group folder, allowing only them to alter the financial information kept there. The Production Group can see files in this folder, but they cannot see subfolders or make changes to the folder. The Budget and Production privileges satisfy needs #4 and 5.

Guests have no access to this folder; satisfying need #6. These access privileges are shown in Figure 15.

Figure 15: Privileges for Budget Group Folder

	See Folders	See Files	Make Changes
Owner: Budget	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
User/Group: Production	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Everyone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Upcoming Budget Folder

We also create a folder inside the Budget Group folder and call it *Upcoming budget*. Since the Upcoming budget folder's access privileges are identical to those of its parent folder, the *Same as enclosing folder* button is selected, as shown in Figure 16. (Whenever the *Same as enclosing folder* button is selected, the See Folders/See Files/Make Changes buttons cannot be changed.)

Setting Up Dropboxes

Once all the accounts are in place, setting up dropboxes under System 7.0 file sharing is fairly straightforward – you just have to create a lot of folders.

Since the Public folder is the repository of everything we want to share, we'll create a folder called *Dropbox* inside our Public folder. Then, inside the Dropbox folder we will create a folder for each employee. We'll make each employee the owner of their own folder and set the User and Everyone privileges to Write-Only. Figure 17 shows different views of this dropbox set up, using employee jones as an example.

Figure 16: Upcoming Budget Folder

	See Folders	See Files	Make Changes
Owner: Budget	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
User/Group: Production	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Everyone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Each employee owns and can open their own dropbox but can only copy files into the dropboxes of others. As you can see in Figure 17, jones is locked out of all the other dropboxes.

If jones does not want people outside Heartland Software to put files into his dropbox, he can deactivate the *Make Changes* box for the *Everyone* line.

Shortcuts: Aliases

Since System 7's alias feature can span networks, jones can create an alias of his Dropbox folder to make it easier to fetch mail. Once jones creates the alias, it is stored on his machine. Now he can double-click on the alias to open his Dropbox folder, bypassing all the intervening steps that are

necessary to actually access his dropbox on johnson's machine.

Performance Issues: Bugs, Tips, Warnings

While the new file sharing features we described here are powerful and convenient, there are performance costs to the file server's owner.

File Sharing Monitor

Whenever a User or Guest accesses a shared file or folder and engages in any activity more demanding than opening folders, several things happen: programs slow down, folders open more slowly, and memory (RAM) is consumed. The File Sharing Monitor enables the Owner to see who is using the machine and observe, in a primitive

fashion, the degree to which this external usage consumes machine resources.

Figure 18 shows that jones and a Guest have connected to the Public folder. The *File Sharing Activity* monitor indicates moderate usage, probably due to large files being copied across the network. This indicator will usually fluctuate as you watch it.

Really? The Name is Permanent?

Fortunately, people rarely need to rename their computer's hard drive. It is fortunate because when file sharing is activated, you cannot rename the hard drive.

Sometimes you cannot rename your hard drive even after you turn file sharing off. Once this happens, you can rename the drive by starting up your machine with a System 6.0.7 disk or re-initializing your entire hard drive.

Figure 17: A Sample Mailbox Account

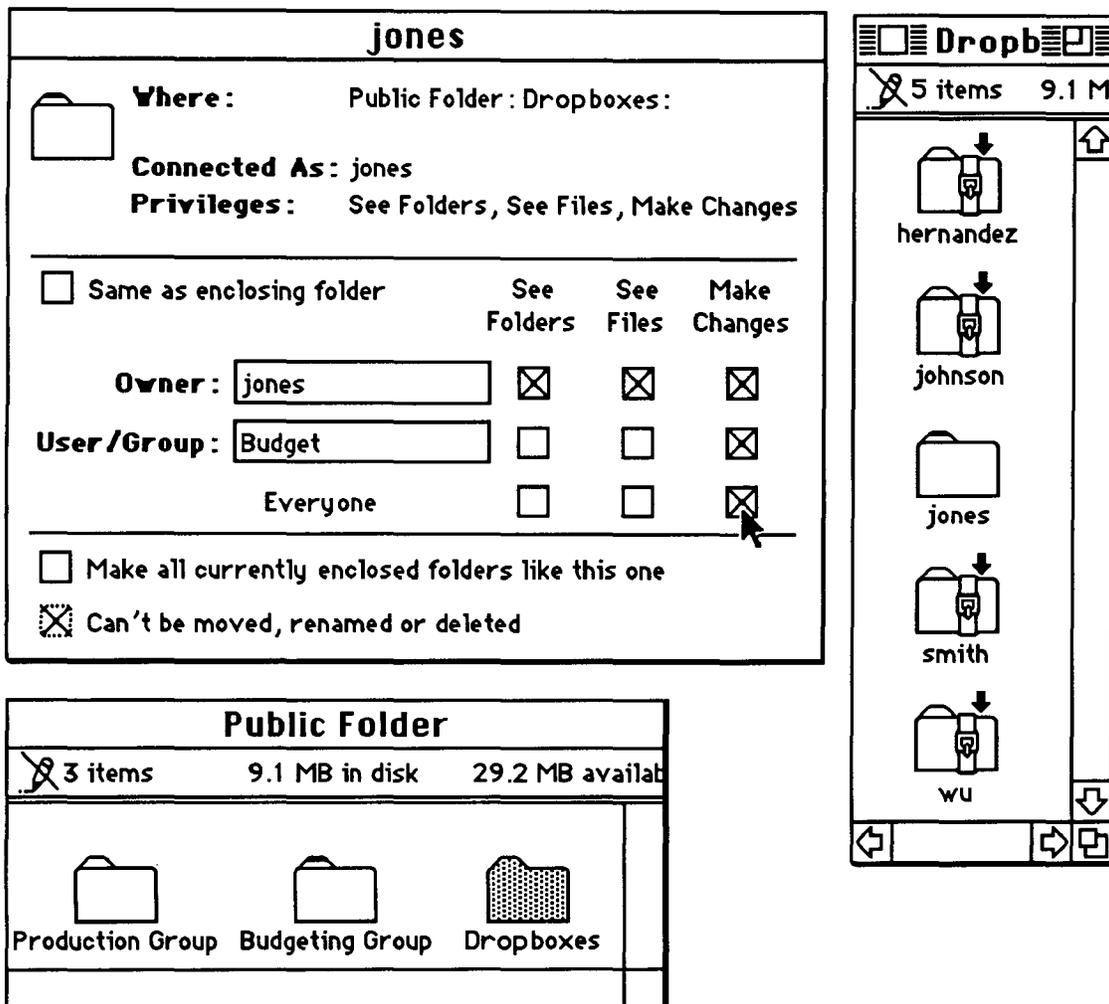
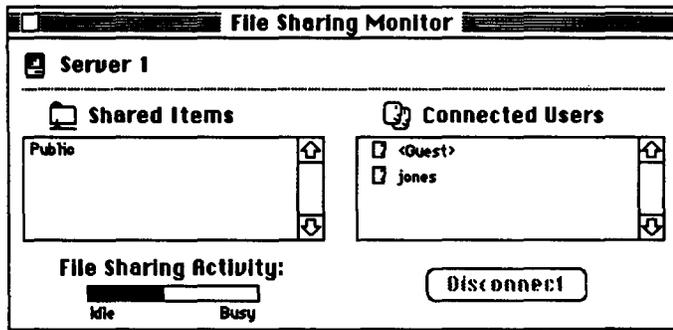


Figure 18: File Sharing Monitor



We recommend that you give your hard drive an appropriate name *before* you install System 7 – since you might begin tinkering with System 7 and forget about this name limitation.

Turn Off Guest Access

When you first select a folder or icon and turn on sharing, the folder or icon is available to *Everyone* (as shown in Figure 4). To safeguard your computer, you might want to immediately turn off *Make Changes* access for Guests.

You also need to guard against letting people make illegal copies of copyrighted software. To do this you may need to turn off the *See Folders* and *See Files* options.

Alias Limitations

Since aliases are not supported by previous versions of the operating system, aliases appear as useless documents to non-System 7 users who encounter them.

Sharing a file or document and continuing to use it yourself is awkward. You must

- set access privileges to share your private folder whenever you wish to share one file or
- duplicate the file into your public folder and
- update it as necessary.

Although the alias solution we discussed earlier might seem to solve these problems, it will not. The drawback is that *original* documents are not shared. An alias will not work because Guests and Users will not be able to access your original documents through an alias.

To use an alias to share a file with the public, you must place the *originals* into the shared folder and place the aliases into your private folder.

Surprise! Your Privileges are Lost

Finally, if you deactivate file sharing from a primary shared folder, such as the Public folder we used in our examples, you will *lose all access privilege settings* in every file and folder within that folder.

Conclusion

Which file sharing scheme you select depends on your work group's needs. When you use Sharing under System 7, you can have a maximum of ten people connected to your personal file server. If you do not have a lot of free memory (RAM), you may not want to dedicate about 300K to maintaining a personal file server. Overall, System 7's fairly simple Sharing, Sharing Setup, Users & Groups, and File Sharing Monitor utilities make setting up and maintaining a personal file server a fairly straightforward task.

However, a dedicated file server's approach may be more appropriate than System 7's personal file server approach. Consultants in the Microcomputer HelpLine can help you sort out the pros and cons of these two approaches.

Since setting up file sharing on a non-dedicated server may limit your machine's storage, security, memory and performance. We urge you to be careful when deciding to turn your *personal* machine into a file server.



➔ News from page 77

■ Gopher Consultant

Gopher Consultant allows campus network users to access a growing of information, including a database of technical information about computers. The Gopher Consultant's full-text search feature treats every word in every document as a keyword, allowing you to search for items that contain words of interest to you. We developed this service partly as an alternative to our busy helpline problem and announced it in the June 1991 *Microcomputer Newsletter*.

■ Minnesota Daily Newswire

We recently added the *Minnesota Daily Newswire* to the news and information you can access through Gopher. (In September we added the UPI newswire.)

■ Faster IBM PC Version 1.24

We've released PC Gopher version 1.24. Among the changes over version 1.00 is a five-fold increase in speed. We've also included a bookmark feature. Using Bookmark you can assign a name to a section of the gopher that you want to access again, for example *Today's Campus Events* (from the *Minnesota Daily Newswire*). Thereafter when you select that name from your personal list you, Gopher will immediately go to that section.

■ Acquiring the Software

You can get the software from several sources.

The latest IBM client software is available from the IBM Information Server. All the Microcomputer HelpLines have access to this server. Look for the software in the directory called

```
P:\INFO\PUBDOM\COMMUN\GOPHER\VERSION1.24
```

The Mac client software is available from the Mac Information Server. Look in the *Communications* folder on the *information* volume. All the Microcomputer HelpLines and many of the Public Computing Facilities have access to the Mac Information Server; look in the *MicroCenter* zone.

The gopher software is also available via anonymous ftp from `boombox.micro.umn.edu` in the directory called

```
/pub/gopher
```

The latest IBM version is in

```
/pub/gopher/PC_client.version_1.24
```

■ Telnet Access

You can access the terminal version of the gopher software by using Telnet to connect to

```
consultant.micro.umn.edu
```

and logging in as

```
gopher
```

Once you're entered your user name as *gopher*, you will not need a password.

The terminal version of the software is undergoing some revisions to add features to it that are already in the networked Mac and PC versions.

■ Other Requirements

To run this software you need a connection to the campus Ethernet backbone network (either directly or via a local area network).

Mac users will also need at least 2MB of RAM, HyperCard 2.0 or later, and the MacTCP network drivers. PC users will need at least 640K of RAM and the appropriate Clarkson Packet Driver (for their network interface card).

If you do not have a campus network connection, but have a modem and a communications program that emulates a VT100 terminal, you can call the Telecommunication department's dial-in server at 626-300, -1200, -2400, or -9600 (for 300, 1200, 2400, and 9600 bps communications respectively). When you call the dial-in server it gives you a short message and then displays the prompt

```
access>
```

At this prompt you proceed as if you were using Telnet. The access commands are listed in the *Telnet Access* section above.

■ Comments? Suggestions?

If you have questions about the software or want to report bugs, send E-mail to the gopher development team at

```
gopher@boombox.micro.umn.edu
```



Revised Manuals:

UNIX and VMS Introductions

The fifth edition of our *Introduction to UNIX Computing* (for users of the CIS ENCORE UNIX system) and the second edition of the *Introduction to VMS Computing* are now for sale in University Book Stores. The cost of the UNIX Introduction is \$3.75. The VMS Introduction manual costs \$4.75.

We've published both volumes in punched, loose-leaf editions, ready to slip into a three-ring binder. In order to keep costs down, we no longer publish the more expensive bound versions of these Introductions.

Free Instructor Desk Copy

Instructors who make either manual a required text for their courses can request a free desk copy of that manual by calling 626-1093.

Mac Contracts: Overview

All Mac service contracts include keyboard, mouse, memory (including Apple memory upgrades), internal Apple hard disks (as noted), internal floppy drives, video boards, and built-in monitors. Contracts do *not* include external Apple monitors and hard disks, most non-Apple internal hard disks, or non-Apple products unless specifically noted in the contract.

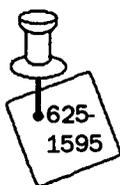
Separate contracts are available for Apple monitors and some external hard disks.

All Contracts: Overview

If you extend your protection before your warranty expires, you can avoid a gap in coverage and an inspection of your equipment.

A service contract is an insurance policy that covers almost any problem except abuse. Those who have a service contract get priority service. You can purchase three levels of post-warranty service as well as non-contract Time and Material (T&M) service.

Engineering Services Notes



Engineering Services provides warranty service to University departments, employees, and students on most equipment sold through the discount program. They also provide service on equipment such as workstations, terminals, and peripherals. If you have trouble with your

microcomputer equipment, your first call should be to the Microcomputer HelpLine at 626-4276; the consultants will help you determine if the problem is with your hardware or software. If the symptoms point to the hardware, call Engineering Services at 625-1595.

On-site

On-site response time takes an average of four working hours. This service is available to departments with offices that are within a 5-mile radius of the Twin Cities campuses. If departments purchase an on-site service contract, they also get on-site warranty service.

Carry-in

Equipment delivered to Engineering Services is usually ready for pick-up the next day. Some departments use Campus Courier service for pick-up and delivery of their equipment.

New: Macintosh LC Service Contracts

Engineering Services recently added the Mac LC to their list of available annual service contracts. The Mac LC's service contract prices are shown in the table below.

Mac LC	On-site/ with loaner	On-site/ no loaner	Carry-In
no hard drive	\$120	\$105	\$85
40MB hard drive	185	165	120

Time and Materials

Under T&M service you are charged for parts and labor. Our service charge is \$40 per hour with a one hour minimum. If you request on-site service, the additional charge is \$10 per trip.

Free Stuff

MODE32 for Macintosh



We recently acquired MODE32, a memory management utility that will interest Macintosh II, IIfx, IICx and SE/30 users. MODE32 enables the aforementioned Macs, which do not have 32-bit clean ROMs, to access more than 8MB of physical RAM when using System 7.

Once MODE32 and System 7 are installed, those who use a Mac II can access up to 72MB of RAM and users of Mac IIfx, IICx, and SE/30 systems can access up to 128MB of RAM.

MODE32 is not needed for the Macs that already have 32-bit clean ROMs, i.e., the LC, IIfx, IIsi, and IIfx. MODE32 is of no use to 16-bit Macs, i.e., the Plus, SE, Classic, and Portable.

Brought to You by Apple and Connectix

We acquired MODE32 from Apple. Apple Computer and Connectix Corporation announced a distribution agreement under which Apple has acquired the rights to distribute, at no charge, Connectix's software utility, MODE32. Connectix's other Macintosh utilities are unaffected by this agreement and continue to be sold through their normal commercial distribution channels.

Acquiring MODE32

You will find MODE32 on the *information* volume of the Mac Information Server. Look in the folder called *Mode32* in the *System Software* folder. If you are connected to the campus internet, you can access the Mac Information Server from the Mac on your desk. Otherwise you can access the server from the Microcomputer HelpLines or many Public Computing Facilities.

Documentation

The *Mode32* folder contains several text documents. The *Read Me (MODE32)* document contains installation instructions and tips on what to do before and after you install MODE32. The other documents contain a press release and some Q&A.

Refund for MODE32: Act Before 12-31-91

Those who already purchased MODE32 may qualify for a refund from Apple. To qualify:

1. the product must have been purchased *prior* to September 5, 1991 and
2. the diskette must be received by Apple or postmarked no later than December 31, 1991.

U.S. customers should contact *The Apple Customer Assistance Center* at 800/776-2333. Customers will be directed to return the original MODE32 diskette for an automatic refund of \$100. If a valid sales receipt for a larger amount is enclosed, Apple will refund the purchase up to the original list price of \$169 plus tax.

Customers outside the US must contact their local sales office for program details.

Selected Q&A

- *Are there any known compatibility issues with MODE32?*
We know of only two compatibility issues with MODE32. Neither issue is serious, and we expect that all will be addressed by the manufacturers of the individual products.
 1. Disklock: when Disklock is activated, MODE32 is disabled.
 2. MacDraw Pro: when text is selected, in certain modes, the selection is offset by a small amount.

Note: You can use more than 8MB of memory only when 32-bit addressing is turned on. Some applications may not run correctly in 32-bit mode. Therefore, applications that are not 32-bit compatible will not run properly even when MODE32 is present.

- *How does MODE32 work?*

MODE32 is a control panel that works with System 7. Like all control panels, installing MODE32 under System 7 is easy. Just drag it to the System Folder. MODE32 must be turned on from its control panel. Open the control panel and select "enable." Then, without restarting, open the Memory control panel. The 32-bit addressing capability and larger virtual memory (VM) space (except for VM in Macintosh II machines that do not have a PMMU installed) become available.

You must restart your Mac for any changes you make to the Memory control panel to take effect.

Future System 7s and 32-bit Addressing

Apple also announced that a future release of its system software would incorporate similar capabilities to MODE32. 32-bit addressing is a feature of System 7.0 that allows the Macintosh to access up to 128MB of

physical memory or up to one gigabyte (1024MB) of virtual memory. Without MODE32 or equivalent software, Mac II, IIx, IIcx and SE/30 systems do not have the internal capabilities to take advantage of 32-bit addressing.

Gambit Scheme for the Mac



Many university Computer Science departments, including those at the University of Minnesota and MIT, use Scheme in their introductory programming courses.

You can learn the formal properties of Scheme, a dialect of Lisp, in an afternoon. With the simple properties you learn, you can express powerful ideas. Instead of learning syntactic details of one programming language, you can concentrate on learning universal principles of how to express your thoughts in a well-structured program. Our Special Projects Group has experience using Scheme and Lisp; their phone number is 625-8332.

Obtaining Gambit Scheme

Gambit Scheme, a public-domain Scheme interpreter and compiler, is available for the Macintosh. This version of Scheme conforms to the IEEE-Scheme standard and the R3.99RS report. The interpreter runs on any Mac with at least 1MB of memory. The compiler needs at least 2.5MB to run; although more memory is recommended if you want to compile larger programs.

You can obtain a free copy from the Mac Information Server. Look in the *Applications* folder on the volume called *information*.

New Printer Driver for LaserJet III Family



Microsoft Windows users who have a Hewlett-Packard LaserJet III, IIID, IIIP, or IIISi may be interested in a new Windows printer driver.

The new version 3.77 driver works with PCL (HP's Printer Control Language); it does not work with PostScript.

Supports LaserJet IIISi Features

Yes, you can print to the IIISi with older versions of the printer driver, but version 3.77 allows you to take advantage of features unique to the IIISi. These features include additional internal scalable typefaces, choice of output bins,

job separation, and access to up to 17MB of memory. At the time of this writing, we did not have a LaserJet IIISi printer with which to test the new driver.

Supports HP Soft Fonts

If you have Hewlett-Packard soft fonts with file names that end in PCM, TFM, SFP, or SFL, the version 3.77 driver will enable you to install and use these fonts with Microsoft Windows 3.0 and your HP LaserJet III family printer.

When you use HP soft fonts, the new driver also speeds printing. The driver downloads *individual* characters from a symbol set to the printer as they are required rather than sending the entire symbol set at one time.

Unfortunately, since we do not have any Hewlett-Packard brand soft fonts that work with Microsoft Windows 3.0, we were unable to actually test this enhancement.

Here's a little background for those who are unfamiliar with some of the many font options. The HP LaserJet III family of printers all come with built-in fonts. If you want to use fonts that are not built into the printer, you have two choices:

- use a cartridge, which you plug into a slot in the printer, or
- use soft fonts, which are stored on a computer disk and then sent or "downloaded" to the printer.

The software that downloads the fonts usually comes with the soft fonts, and generally each vendor has their own download utility.

A symbol set is the set of all of the characters that are included in a font. For example, a typical symbol set would include all of the letters in the alphabet, the numbers 0 through 9, punctuation marks, and then some special symbols such as letters from foreign alphabets, mathematical symbols, etc.

Enhancements to Graphics Printing

Depending on what version of the printer driver you are currently using, you will see different options on the Setup screen. With older versions, you might see a Gray Scale dialog box that has two options: Graphics On or Graphics Off. Version 3.77 has three options: Photographic Images, Line Art Images, and HP ScanJet Images.

The *Photographic Images* option emulates 60 levels of gray. (The old Graphics On option that Photographic Images replaces, emulates 32 levels of gray.)

The *Line Art Images* option replaces the Graphics Off option. Although both options emulate 32 levels of gray, Line Art Images uses new patterns to emulate them. These new patterns have been fine-tuned to make the printed image look more like the image on the monitor.

The *HP ScanJet Images* option is a new option that is specially designed for printing scanned images.

We experimented with the old and new gray scale options using three images: a drawing with lots of shading (similar to a photograph), a simple line drawing, and a scanned image. We found that the prints made with the old and new drivers were subtly different: there were some improvement with the new driver, but nothing you could see at a glance. (We used CorelDraw for this experiment.)

What's Your Version Number?

You can see what version of the printer driver you are currently using by doing the following:

- start Windows
- open the Main window
- double-click on the *Control Panel* icon
- double-click on the *Printers* icon
- click on the *Configure* button
- click on the *Setup* button, and
- then click on the *About* button.

Version 3.77 includes enhancements of features found in previous drivers and also some completely new features.

Obtaining the New Printer Driver

To get a copy of this new printer driver, bring one 3.5-inch disk or two double-density (360K) 5.25-inch disks with you to one of the Microcomputer HelpLines. At the HelpLine you can log in to our IBM Information Server and copy the files from the following directory:

```
P:\INFO\DISTRI\PRNTDRV\HP\LASERJET\WINDOWS3
```

In addition to the driver itself, this subdirectory also contains a file called *README.TXT* which includes step-by-step instructions for installing the software.

PCL or PostScript?

If you are not sure whether you're using PCL or PostScript, do the following:

- start Windows
- open the Main window
- double-click on the *Control Panel* icon

- double-click on the *Printers* icon, and you will see a table called *Installed Printers*.

The table will contain the name of at least one printer. The one that is highlighted is the one you have been using. If it reads "PostScript Printer on ...", you use PostScript. If it reads "HP LaserJet III...", you use PCL.

Book Center Notes



The offers listed here are made to University departments, employees, and students. The regular Microcomputer Discount Program rules of eligibility apply. If you have questions about availability, phone the Electronics Desk at 625-3854.

Those with access to electronic mail and the University's internet and BITNET can get product and price change bulletins for the products sold through the Electronics Desk. To be added to the mailing list, E-mail a request to:

request@boombox.micro.umn.edu

Once you are on the mailing list, you will receive notification via E-mail as soon as we have new prices or products.

Handouts and Sales Tax

Individuals must add 7% sales tax to any prices listed here or in our handouts. University departments do not have to pay sales tax.

For more complete descriptions of the hardware products listed here or of those available through the discount program, pick up one of our handouts. Handouts are available at all Microcomputer HelpLines. Our current handouts are: *IBM PS/2 Computers*, *ZEOS MS-DOS Compatibles*, *Printers for IBM-Compatible Computers*, *Apple Macintosh Computers*, *Macintosh Printers and Peripherals*, *NeXT*, and *Networks*. Some specialized handouts are also available from the Microcomputer HelpLines.

Figure 1: New Book Center Prices for Macs

● Macs with built-in monochrome monitor.	Classic		Portable		
Microprocessor (CPU)	68000		68000		
CPU speed	8MHz		16MHz		
Coprocessor	none		none		
Expansion slots	none		one processor direct		
Power	50-60Hz, 120V		48-62Hz, 85-270V		
Variables					
Memory (MB of RAM)	1	2	2	4	
Hard Disk, Megabytes	none	40	40	40	
● New Discount Price	* \$795	\$1195	\$2385	\$2700	

* This Classic is a special order and requires a \$200 non-refundable deposit.

● Must purchase monitor separately.	LC▲		IISI		IICI▲			IIFX		
Microprocessor (CPU)	68020		68030		68030			68030		
CPU speed	16MHz		20MHz		25MHz			40MHz		
Coprocessor	none		optional		68882			68882		
NuBus Expansion Slots	none		1 or		3			6		
Other Expansion Slots	one 020 direct		one 030 direct		none			one fx direct		
Display Adapter	built-in & options		built-in & options		built-in & options			option		
Power	47-63Hz, 90-240V		50-60Hz, 100-240V		50-60Hz, 100-240V			50-60Hz, 100-240V		
Variables										
Memory (MB of RAM)	2	4	3	5	5	5	5	4	4	4
Hard Disk, Megabytes	40	80	40	80	none	80	160	none	80	160
● New Discount Price	\$1695	\$1980	\$2500	\$2950	\$3295	\$3700	\$4095	\$4550	\$5000	\$5350

▲ All LCs now come with 512K of video RAM (VRAM) installed.
 ▲ Every IICI now comes with the IICI cache card (M0326LL/A), which is also sold separately for \$280.

Standard Mac Equipment	Substitutions
All Macs come with a mouse, System software and utilities such as Apple File Exchange, HyperCard software, virus detection software, the standard (M0116) keyboard, and a one-year warranty.	Except for the Classic, you can substitute the enhanced keyboard (M0312) for the standard keyboard by adding \$60 to the Book Center's Price. For the Classic you must purchase the enhanced keyboard at its standard \$165 price.

Figure 2: Macintosh Fall Promotional Bundles

Mac Part #	RAM	Hard Disk	Printer	Savings	Price
Classic					
B0080LL/B	2MB	40MB	StyleWriter	\$200	\$1390
B0081LL/A	2MB	40MB	Personal LaserWriter LS	200	1805
B0692LL/A	2MB	40MB	Personal LaserWriter NT	325	2565
LC					
B0587LL/B	2MB	40MB	StyleWriter	\$400	\$1690
B0588LL/A	2MB	40MB	Personal LaserWriter LS	400	2105
B0694LL/A	2MB	40MB	Personal LaserWriter NT	525	2865
B0084LL/B	4MB	80MB	StyleWriter	425	1950
B0085LL/A	4MB	80MB	Personal LaserWriter LS	425	2365
B0695LL/A	4MB	80MB	Personal LaserWriter NT	525	3150
IISI					
B0086LL/B	3MB	40MB	Personal LaserWriter LS	\$750	\$2560
B0087LL/B	3MB	40MB	Personal LaserWriter NT	750	3445
B0088LL/B	5MB	80MB	Personal LaserWriter LS	900	2860
B0089LL/B	5MB	80MB	Personal LaserWriter NT	900	3745

● Macintosh Packaging Changes

We have several Macintosh packaging changes to report. Although many of these changes became effective in September, they were not announced in time to make the deadline for the September newsletter.

New Book Center Prices

In September the Book Center stopped including MacWrite and MacDraw with each Macintosh purchase. As a result, the prices of all Mac configurations have dropped. The current prices are listed in Figure 1 on page 93. However, at the time you purchase a Mac you can still get special discounts on software and memory. These specials are discussed in the *Memory Specials* and *Software* sections below.

Fall Promotional Bundles

Apple has a Fall Promotion; it is bundling selected Macintoshes with Apple printers, as shown in Figure 2 on page 93. A printers table is on page 95.

The promotion began in September and continues through December 28th. The Promotional Bundles include the same standard equipment and substitutions as the Macs sold at the regular price.

For Departments: Mac IIsi and IICI

Through December 31st Apple is offering a special discount to University departments on the configurations listed below. To get the special price, departments must send their Journal Vouchers to Colleen at the Minnesota Book Center's Electronics Desk.

Part #	RAM	Hard Disk	Savings	Price
Mac IIsi				
M0491LL/A	3MB	40MB	\$600	\$1900
M0364LL/A	5MB	80MB	600	2350
Mac IICI				
M5775LL/A	5MB	80MB	\$800	\$2900
M5777LL/A	5MB	160MB	800	\$3295

Memory Specials for IIsi and IICI

The Book Center offers a special price on the 4MB memory kit – if you order the memory when you order the Macintosh. The kit contains four 1MB SIMMs, and you can use it in the IIsi and IICI. The special price is \$160 and is good while supplies last. If you decide to purchase the memory later, the price of the 4MB memory kit is \$210. Regardless of which price you pay, the price includes installation costs.

This special price for memory applies to the Fall Promotional Bundles and to the standard discount price.

Software

Since a computer is useless without software and software manuals, the Book Center offers some software specials. The catch is that the special prices are only good if you order the software when you order the Macintosh. If you decide to purchase the software later, the price will be higher.

Software Specials	Recommended Minimum RAM	Price
Word Processing & Drawing		
MacWrite II and MacDraw Pro	4MB	\$110
MacWrite II and Claris CAD	4MB	145
Word Processing & Database		
MacWrite II and FileMaker Pro	4MB	120
Word Processing & Spreadsheet		
MacWrite II and Resolve	4MB	145
Microsoft Word and Excel	4MB	175

Normal Book Center Prices

Claris CAD	2MB	\$105
Claris FileMaker Pro	* 2MB	100
Claris MacDraw Pro	** 2-4MB	150
Claris MacWrite II	2MB	65
Claris Resolve	2MB	125
Microsoft Word	2MB	100
Microsoft Excel	* 2MB	125

* need 2MB if used with System 7 or MultiFinder

** use 4MB with System 7 or to get millions of colors

Printers

There have been no changes in the Apple printer prices. We've included this section and Figure 3 so you can compare the printers that are included in the Fall Promotional Bundles. All the Apple printers come with the appropriate ink or toner cartridge. The StyleWriter and Personal LaserWriter LS also come an accessory kit that contains a cable (M0197) to connect the printer to the Mac. To use the AppleTalk interface on the Personal LaserWriter NT, you must purchase *at least* one LocalTalk M2068 cable for \$56 or PhoneNet PN308 cable for \$38.

Monitors

There have been no changes in the monitor prices. We've included this section and Figure 4 because the Mac LC, IIsi, IICI, and IIfx do not come with monitors.

Figure 3: Printers Included in Fall Promotional Bundle

	StyleWriter	Personal LaserWriter LS	Personal LaserWriter NT
Pages per minute			
draft	1	4	4
letter quality	1/2	4	4
Dots per inch (letter quality)	360	300	300
Interface			
network	no	no	AppleTalk
single user	8-pin serial	8-pin serial	25-pin serial
PostScript	no	no	yes
Standard Paper Handling	50 single sheets	50 single sheets	50 single sheets
Print Mechanism	inkjet	laser	laser
Normal Discount Price	\$395	\$810	\$1695

Figure 4: Monitors for Current Mac IIs

Monitor	Color		Monochrome		
	Hi Res	12"	Monochrome	Portrait	Two-Page
Resolution	640x480	512x384	640x480	640x480	1152x870
Dots per inch	69	64	76	80	77
Size (in inches)	13	12	12	15	21
Mac and Video Adapter	Colors or Shades of Gray Supported				
LC: built-in adapter*	256	32,000	256	na	na
lisi: built-in adapter	256	256	256	16	na
8•24 adapter**	16.7 million	16.7 million	256	256	256
llici: built-in adapter	256	256	256	16	na
8•24 adapter**	16.7 million	16.7 million	256	256	256
lifix: 8•24 adapter**	16.7 million	16.7 million	256	256	256
Price	\$650	\$390	\$195	\$720	\$1070

* On the LC to get 256 or 32,000 shades you need more video RAM; 512K VRAM is installed on all the LCs currently sold through the discount program.

** The Book Center's price for the 8•24 adapter is \$520.

● **Enhancements for Apple StyleWriter and Personal LaserWriter LS**

Apple is shipping the Personal LaserWriter LS and StyleWriter with:

- a new software printer driver,
- four more TrueType font families: Chicago, Geneva, Monaco, and New York,
- and a new part number but the same old price.

The enhanced LaserWriter LS also comes with a 70-sheet paper tray (the built-in paper tray on the original LS held 50 sheets of paper).

Free Software Upgrade

If you already own a StyleWriter or a Personal LaserWriter LS, you can get a free copy of the new printer driver and TrueType fonts from the *information* volume the Mac Information Server. Look for the *Printers* folder inside the *System Software* folder. Inside the Printers folder you'll find a *StyleWriter* and *Personal LaserWriter LS* folder. Both folders have their own *v.1.1 update* folder.

If you're connected to the campus internet, you can access the information server from the Mac on your desk by selecting the *Chooser* from the Apple menu. Look for the server in the *MicroCenter* zone. You will also find campus internet connections at all the Microcomputer HelpLines

and at most of the Public Microcomputer Facilities. If you're unfamiliar with using the server, a consultant can help you access it.

The software changes are discussed in a little more detail below. We suggest that you read the documentation that comes with this software. The README document contains tips on working with popular software, such as MacWrite II and Microsoft Word.

New Printer Driver

Apple reports that the improved software can double the printers' speed. The new printer driver also supports background printing on both printers, which means you can continue to work on your computer while the document you sent to the printer is being printed. Previously this feature was available for the LS and StyleWriter only from third parties. The software is System 7 and System 6.0.7 or later compatible.

Once the new driver is installed, select *Chooser* from the Apple menu. Then select the StyleWriter and/or Personal LaserWriter LS icons and turn on *Background Printing*, as shown in Figure 1.

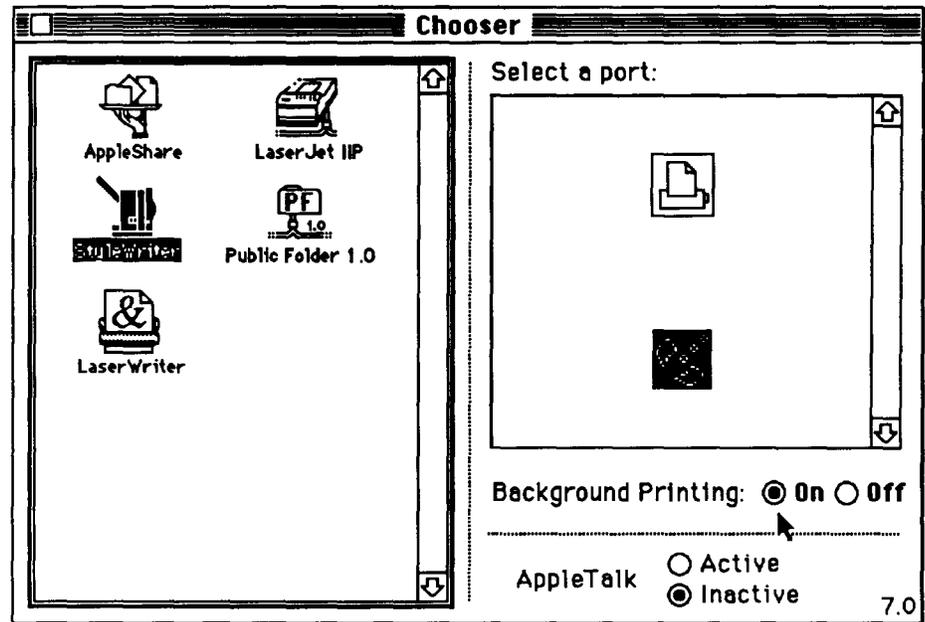
The README document that comes with the printer drivers has helpful hints for working with popular software, such as Adobe Type Manager.

Although the README document instructs you to use the Installer utility, we had no problems updating from version 1.0 to version 1.1 by dragging the printer's icon to our System Folder. Follow the installation instructions if you are installing the printer driver for the first time.

Additional TrueType Fonts

The new fonts are TrueType versions of the original Macintosh screen fonts. Now you can see and print the Chicago, Geneva, Monaco, and New York fonts in a wide range of sizes. For example, you can print a tiny 5 point footnote or a large 127 point headline, and your printed output will look much smoother than your previous attempts to print these fonts. For high quality text printing, TrueType fonts compete with the PostScript fonts built into Apple's PostScript laser printers.

Figure 1: Turn On Background Printing



To use TrueType fonts you need a minimum of 1MB of RAM and System 6.0.7 or later installed on your Mac.

During the normal printer installation procedure, each font is automatically installed in your System Folder.

● ZEOS Changes

ZEOS recently announced several changes in their line of computers and in the prices of their Math Coprocessors.

New Upgradable Processor Line

ZEOS added four lines of computers with upgradable microprocessors (CPUs). If you purchase a configuration with an upgradable microprocessor, you can exchange it. If you make the exchange within the first 30 days, you can exchange the CPU for a higher one (for an extra charge) or a lower one (and get a refund). After the first 30 days, you can exchange only for a higher CPU.

The Microcomputer HelpLine has a table showing the exchange prices. The upgradable processor packages are shown in Figure 1.

ZEOS 386SX Notebooks

ZEOS lowered prices on their 16MHz 386SX Notebooks and added a 20MHz 386SX Notebook. The latest prices are listed in the Notebook Packages table.

The 7 pound 386SX Notebooks come with the following built-in features: 1.44MB 3.5-inch floppy drive, 20MB hard drive, 640x480 VGA backlit LCD display (supports 32 shades of gray), serial port, parallel port, 15-pin video port for external monitor, and 82-key keyboard. Both Notebooks support an optional 80387SX math co-processor, and you can power them with an AC Adapter/Charger or battery. Packages #1-3 differ as shown in the table below.

386SX Notebook Packages

Standard Features	#1	#2	#3
• Memory (RAM)	1MB	3MB	5MB
• MS-DOS 5.0 or DOS 4.01/GW Basic	no	yes	yes
• Carrying case	no	yes	yes
• Battery charging stand and extra battery	no	yes	yes
• Internal 2400 baud modem	no	no	yes

80386SX Configurations	Old Price	New Price
16MHz		
Package #1	\$ 2180.25	\$ 1895.25
Package #2	2655.25	2465.25
Package #3	3035.25	2940.25
20MHz		
Package #1	na	\$ 2180.25
Package #2	na	2750.25
Package #3	na	3225.25

Figure 1: ZEOS Upgradable Processor Line

The upgradable processor line comes with: • a desktop case with 7 drive bays and 2 cooling fans • seven 16-bit and one 8-bit expansion slots (one slot is used for the display adapter) • 1 parallel, 2 serial, and 1 game port integrated on the mainboard • a 300 watt power supply • and an RS keyboard. You may upgrade packages #1-4 to an 8 bay vertical system for an additional \$142.50.

#1: Base Package		#2: Base Package		#3: Base Package		#4: Base Package	
386-25	\$1325.25	386-25	\$1895.25	386-25	\$2370.25	386-25	\$2845.25
386-33	1420.25	386-33	1990.25	386-33	2465.25	386-33	2940.25
486SX-20	1515.25	486SX-20	2085.25	486SX-20	2560.25	486SX-20	3035.25
486-33	1705.25	486-33	2275.25	486-33	2750.25	486-33	3225.25

53ns RAM 1MB 2MB 4MB 8MB
 (You can add a 128K RAM cache for \$190.)

Drive:
 • Hard (IDE) 42MB 85MB 130MB 210MB
 • 3.5" Floppy Teac 1.44MB or Teac 1.44MB and Teac 1.44MB and Teac 1.44MB and
 • 5.25" Floppy 1.2MB 1.2MB 1.2MB 1.2MB

Software:
 • MS-DOS 5.0 or no yes yes yes
 DOS 4.01/GW Basic
 • Windows 3.0 no yes yes yes

ZEOS 14-inch Monitors:
 • Color - - 1024x768 VGA 1024x768 VGA
 • Mono flat screen VGA - -
 hi-resolution amber

Microsoft Mouse no yes yes yes

Display Adapter:
 • Diamond SpeedStar Plus, 1024 VGA, 16-bit: Packages #2, #3, and #4
 • Hercules graphics: Package #1

Math Coprocessor Price Reductions

Math coprocessor prices have come down dramatically.

Math Coprocessor	Old Price	New Price
80387SX-16 (for 386SX-16 and 386SX notebooks)	\$ 312.55	\$ 132.05
80387SX-20	331.55	141.55
80387-16	331.55	217.55
80387-20	379.05	217.55
80387-25	474.05	217.55
Weitek 3167-25	1420.25	755.25
80387-33	569.05	217.55
Weitek 3167-33	1895.25	945.25
Weitek 4167-25 (for 486-25E)	na	945.25
Weitek 4167-33 (for 486-33E)	na	1135.25

ZEOS Enhancements

The Diamond SpeedStar Plus VGA card now comes with 1MB of memory.

Discontinued Items

The ZEOS Notebook 286 and all ZEOS 386/25 systems previously listed have been discontinued.

The 486-25C configurations are discontinued and have been replaced with the 486-25E systems. The 486-33C configurations are discontinued and have been replaced with the 486-33E systems. Both new systems are listed in the revised ZEOS handout.

● WordPerfect Corp. Price Changes

WordPerfect Corp. recently lowered their educational price for the software listed below.

Software	New Single User Price
WordPerfect for IBM/MS-DOS	\$ 135
DrawPerfect for IBM/MS-DOS	135
DataPerfect for IBM/MS-DOS	135
LetterPerfect for IBM/MS-DOS	99
WordPerfect for Windows*	135
WordPerfect for the Macintosh	135
WordPerfect for NeXT	135

* the Windows product will be available soon

The only difference between this educational product and their regular product is the color of the packaging.

Departments that want to purchase several copies of WordPerfect or DrawPerfect can also get a lower price by

purchasing the software at a higher price and sending in a form that entitles them to seven free licenses for the same software. Here are the prices:

Buy one, send for seven free licenses

WordPerfect for IBM/MS-DOS	\$ 260
WordPerfect for Mac	285
DrawPerfect IBM/MS-DOS	285

● DeskWriter and DeskJet: \$399

Hewlett-Packard recently reduced the price of their 300 dots-per-inch DeskWriter and DeskJet inkjet printers. The Book Center's discount price for both of these machines is now \$399. (Formerly the DeskWriter and the DeskJet were \$445.) Both printers come with an input paper tray that can handle 100 sheets and a one-year warranty. To connect these printers to your computer, you must purchase a cable. The DeskWriter is packaged specifically for the Macintosh. The DeskJet is one of HP's offerings for the IBM-compatible market.

	DeskWriter	DeskJet
Draft Mode*	4 ppm	240 cps
Letter Quality Mode*	2 ppm	120 cps
Interfaces		
Serial	yes	yes
Parallel	no	yes
AppleTalk	yes	no

* ppm = pages per minute and cps = characters per second

● System 7 Upgrade Coupon

On May 13th Apple officially released System 7. For quite a few months thereafter, those who bought a Mac continued to get packages that contained System 6.0.7. They also got a coupon that they could send in to Apple to get a free set of System 7 disks and documentation. Apple has begun to ship System 7 upgrades to those who sent in their coupon.

Inquiring minds want to know: what do you get when you turn in the card/coupon? Here is what we saw in a recent upgrade package:

- One 800K disk that contains *How to Install System 7 and Before You Install System 7*
- Six 1.44MB System 7 diskettes: Install 1, Install 2, Printing, Disk Tools, Fonts, and Tidbits

- ❑ One 1.44MB diskette that contains: HyperCard 2.1, a HyperCard Fonts suitcase, and three stacks: Appointments With Audio, Addresses With Audio, Audio Help
- ❑ Booklets: *What's New In System 7* and *System 7: Compatibility With Selected Hardware and Software*
- ❑ Macintosh Reference - a 400 page book
- ❑ A letter from Apple that mentions the automated upgrade answer line at 1-408-257-7700 and the System and Support Upgrade Answerline at 1-900-535-APPL (which costs \$2 a minute)

What you do not get:

- ❑ 90 days of technical support from an 800 phone line. You must buy System 7.0 to have access to this line.
- ❑ *Macintosh Networking Reference* book and Macintosh Networking basics tutorial diskette.

Information Service



Do you want to know what's happening on campus in the Twin Cities? Do you wonder what major issues are facing the University this week? Are you looking for departments that offer a specific service? These are a few of the ways that our Info service can help you. Available 'round the clock, seven days a week, you can access Info on and off campus via a modem or the University network.

Info is easy to use, with on-line help and a simple, menu-oriented interface. Assuming you have the necessary equipment, Info is easy to access.

If you need help with any of the details discussed below, you can call the Central System HELP-Line at 626-5592.

Featuring The Calendar

A major feature of Info is the most complete and up-to-date events calendar available anywhere for the Twin Cities campuses. During spring quarter, it was not unusual to find over 40 events listed for a single weekday. The Calendar is updated at least once each weekday, so corrections, cancellations, and new events are posted as they become available.

Your Message Here

Do you want to describe your services? Do you have events to promote? Do you publish a newsletter or other serial? We can show you how to get your message across to students, faculty, and staff.

For more information, contact Peter Chandy at 612/626-1527. We seek to improve and expand Info. If it does not meet your needs, please let us know.

Accessing Info

You don't need a password or special account to access *INFO*. At present, to use Info your terminal (or terminal emulator on your personal computer or workstation) must be VT100-compatible. This is perhaps the most commonly available terminal, so most likely it will not be a problem for you.

Regardless of whether you access Info via a modem or the University's internet, in response to the prompt for a user name, just type

INFO

and press the **Return** key

From the University Internet

If you have an account on nearly any of the University mainframe systems or you have the Telnet software and a personal computer or workstation connected to the University network, you can use the following command

TELNET VX.ACS.UMN.EDU

(or its variation on your system) to reach the Info system.

From a Modem

If you have a terminal or personal computer with a modem, you can access Info by dialing 612/626-300-1200-2400 or -9600. Which phone number you use depends on the speed of your modem. When the connection is made and you get a prompt, type

VX.ACS.UMN.EDU

and press the **Return** key

And Books, Too



If you cannot find the computer books you want in the Book Center's Reference section, tell us what books you want to buy. Send specific titles or areas of interest to: Maureen O'Brien, 160 Williamson Hall, Minnesota Book Center, 231 Pillsbury Drive SE, Minneapolis, MN 55455.

Here's what is new in the Reference section:

- ✓ *DOS 5 - Self Teaching Guide*, an Ashley-Wiley publication for \$19.95.
- ✓ *DOS 5.0 at Work* by Campbell, an Ashley-Wiley publication for \$22.95.
- ✓ *Introduction to Macintosh System 7* by Bryan, a Sybex publication for \$19.95.
- ✓ *Mastering Harvard Graphics 3* by Larsen, a Sybex publication for \$27.95.

Tips, Tricks, Tutorials

● Stolen Equipment Recovered

A computer owner of our acquaintance recently had a relatively happy ending to an unhappy event. His computer was stolen and, against great odds, the police recovered it. The recovery was possible partly because the computer's owner wisely recorded his serial number. The police asked that he pass on this tip to other computer owners.

Do you know the serial numbers of your computer equipment?

● Excel Wish Line: 206/936-WISH

Microsoft Corp. has set up a hot-line for all Excel users who wish to express their frustrations, complaints, and needs related to their Excel spreadsheet product. Microsoft will use this information to decide on features for new versions of Excel.

So if you have a hot feature idea, wish list, or gripe, call the Excel Wish Line at (206) 936-9474.

● WordPerfect and the University Wordmark

You can import EPS (Encapsulated PostScript) files into WordPerfect 5.1 on an IBM-compatible. Although incorporating graphics is not hard to do, there are a couple of tricky parts.

- Your output device, for example laser printer, must be able to interpret PostScript code.
- You must create a figure box to hold the graphic.
- There is no screen representation of the EPS document for IBMs (the Mac has a MacPaint version), so you just see a box on the screen.

Incorporating graphics is relatively easy.

1. Select **[Alt] [F9]** (the GRAPHICS menu).
2. Select FIGURE from the resulting menu.
3. Select CREATE from the resulting menu.
4. Type in the name of the EPS document (or use the **[F5]** LIST FILES function to select the document's name from the files on your disk).

Follow these steps for a screen view of what you have done:

5. Select **[Shift] [F7]** (the PRINT menu).
6. Select VIEW DOC from the resulting menu.

Editing the Figure

Each figure is automatically assigned a number. You can use this number to edit the figure, for example to resize it.

To edit the size of the figure box:

- Select **[Alt] [F9]** again.
- Select EDIT from the resulting menu.
- Type in the figure number, for example 1.

Page 272 of the *Reference* manual covers scaling pictures. You might have to review this section to get the size you want. Originally the EPS files take up a lot of space on the page.

An Easy Test

You can test these steps by using one of the pictures that comes with WordPerfect, for example BALLOONS.WPG.

What is the University Wordmark?

The wordmark is the primary means of communicating the University of Minnesota name on all publications. It consists of the words "University of Minnesota" in all capital letters in a modified Times Roman typeface.

Public Computing Facilities

The wordmark must be reproduced from master artwork or from a computerized EPS version. Master artwork and the computerized version are available from University Relations.

Don't try to create the University wordmark in unmodified Times Roman. Differences in space between characters, character thickness, and size will occur. The graphic is made available in the EPS format because this provides the clearest image when printed on PostScript printers.

Acquiring the Wordmark Documents

The wordmark documents are on the IBM Information Server in the following directory:

P:\INFO\DISTRI\WORDMARK

There are separate documents for all the campuses, e.g. Twin Cities and Duluth, and the documents are available in several formats, such as center and reverse.

The University Relations' *Graphics Standard* publication is also on the IBM Information Server. This publication has instructions on using the wordmark, determining the space surrounding the wordmark, allowable sizes of the wordmark, using colors with wordmark, and where to get more information and master artwork.

Overview

Over the past decade the University has developed a network of public computer facilities to support and enhance the teaching and research mission of the University. "Public" in this context means public to the University of Minnesota community. These computer facilities are listed on pages 105-106.

Those who have used the microcomputer facilities in the past will find minor changes in the access cards and departmental agreement forms.

Free or Fee?

To use the microcomputer facilities, current students, faculty, and staff must present an access card or be listed on a departmental agreement form. At press time the University supported 18 public microcomputer facilities.

To use the computer terminal facilities, current students, faculty, and staff do *not* need an access card. You do, however, need an account on the system you wish to access. At press time the University supported six public terminal facilities.

Usage Priorities

Computer facility usage priorities are based on our mission of supporting and enhancing the teaching and research mission of the University. The priorities are as follows:

- 1st Classes and group reservations for instructional purposes.
- 2nd Individual students working on course assignments.

- 3rd Faculty or staff doing research-related work or work supporting instructional use of the facilities.
- 4th Faculty or staff doing departmental work.

Copyrights

You must not use the computer facilities' equipment to violate any copyright agreements.

Overview: Public Microcomputer Facilities

Individual computer facilities are managed by different departments, although Computer and Information Services manages most of the facilities. The department responsible for the computer facility sets the hours and selects its own hardware and software.

The computer facilities have equipment such as IBM or IBM-compatible personal computers, Apple Macintoshes, and impact printers. Some computer facilities have special equipment, such as Apple IIs, scanners, laser printers, and equipment for people with disabilities.

Each computer facility has a wide variety of software, and generally the facilities have the current versions of software. The software in individual facilities varies but generally includes software in the following categories: spreadsheet, database, statistics, graphics, desktop publishing, and word processing.

The facilities' attendants provide limited software consulting.

You can use your own software on the computer facilities' equipment as long as you follow the policies.

For detailed information about the availability of hardware and software, you must contact individual computer facilities.

Access Policies

Students, faculty, and staff must have a *Computer Facility Access Card*, an *IT Computer Facility Access Card*, a *Single Use Computer Facility Access Card*, or be listed on a *departmental agreement* to use the public microcomputer facilities. These requirements apply for individual and for instructional purposes. Individuals do not need an access card to use terminals. The access cards are non-transferable. Once a card has been used it is not eligible for a refund.

Facility users who wish to use a laser printer must have a *Printer Access Card* in addition to one of the other access cards.

Users must present proper identification and log-in at the front desk (except when attendants do mass logins for classes) each time they use a computer facility.

When you are finished using the public facility, you must sign out.

Access to computer facilities may be restricted or denied. The reasons for these actions are detailed in the *Public Computer Facilities Handbook*. Copies of the handbook are available at all public computer facilities.

Time Limit

Use of the facility may be limited to two hours per session per day. However, if there is no waiting list for equipment, users will be allowed more time. Students, faculty, and staff are expected to complete their work or end their session, including printing, before the facility's scheduled closing time.

Plotters

Two computer facilities have color output devices. To pay for this output use the Printer Access Card.

- *455 Blegen Hall* has two HP color printers: a PaintWriter XL for Macintoshes and a PaintWriter for IBM and compatibles. Costs: \$1 per page for both color printers.
- *305 McNeal* has a PaintWriter XL connected to a Mac and two HP plotters connected to IBM microcomputers. The HP 7475 plotter is compatible with many business and technical applications. The HP 7570 plotter has been designed for CAD systems. Costs: the 7475 is 30¢ per page; the 7570 is 70¢ per page; the PaintWriter XL is \$1 per page.

Scanners

The computer facilities in 305 McNeal, 455 Blegen Hall, 26 Lind Hall, and 121 Elliott Hall have Macintoshes that are connected to Apple's 300 dots-per-inch flatbed scanner. You can use this scanner to capture pictures and text onto Mac disks. Since each facility has only one scanner, the time limit is based on demand.

You can capture pictures in MacPaint, TIFF, or PICT formats using AppleScan. You can use OmniPage to capture text and save it in several formats, including ASCII (plain text), Excel, MacWrite, Microsoft RTF,

Word, and WordPerfect. OmniPage can read many fonts and point sizes above 6 points; it recognizes some foreign characters and attempts to keep multiple column documents in proper order.

File Transfers and Conversions

All the microcomputer facilities have Macintosh and IBM microcomputers connected directly or via modem to ACSnet or another campus network. These connections provide high-speed access to campus central systems from a microcomputer.

Although you can use any microcomputer facility to transfer IBM/MS-DOS documents from one size disk to another, each facility has different combinations of floppy disk drives. Contact the facility you plan to use to see exactly which combination of floppy drives they have.

All the Macintoshes have Apple File Exchange, which lets you transfer some kinds of documents between IBM and Macs. Contact the facility you plan to use for more specific transfer information.

Adapted Technology

The computer facilities in 9 Walter Library, 170 Anderson Hall, and 4-204 EE/CSci have large print and audio hardware and software connected to microcomputers; these machines are also connected to ACSnet. The 4-204 EE/CSci facility has additional input devices.

The B50 St. Paul Central Library facility has large print hardware and software. 121 Elliott has Computer Keyguard.

Access Cards for Microcomputers

Four different cards are available: Computer Facility Access Card, Single Use Computer Facility Access Card, IT Computer Facility Access Card, and Printer Access Card. Most of the computer facilities are printed on the back of all the access cards, except the IT Computer Facility Access Card.

All the cards are non-transferable and require the purchaser's signature and ID imprint, except the Printer Access Card.

Computer Facility Access Card: \$35/quarter

This card's use is not limited strictly by the beginning and ending of the Fall, Winter, Spring, and Summer sessions. The cards are usually available 1-2 weeks before the start of the quarter for which they are valid, and you can use the card up until (but not through) the first day of the next quarter.

Single Use Computer Facility Access Card: \$5

You can use this new \$5 card once. It entitles you to a maximum of two hours of microcomputer time.

IT Computer Facility Access Card

The IT computer facilities are EE/CSci 4-204, EE/CSci 3-166, and Physics 130. IT access cards are distributed to students who are registered in qualified courses. The IT cards are available only from the facility attendants in EE/CSci 4-204.

Although the IT facilities are available to other card holders, those with an IT card get priority access. For \$10 the facilities *manager* can upgrade the IT card for access to other public computer facilities.

Printer Access Card: \$1

You use the printer card to pay for special printing services, such as laser print. Your cost to use a laser printer is 10¢ per page.

These \$1 printer cards do not have an expiration date. To use the printer card you must also have a Computer Facility Access Card, a Single Use Computer Facility Access Card, an IT Computer Facility Access Card, or a departmental agreement.

Departmental Agreement Forms

Departments may arrange to use the microcomputer facilities for departmental business. The fee for departmental usage is \$20 per quarter per staff member. Application forms are available at the computer facilities and from Jerry Larson, a Computer Facility Manager.

To use special printing services, such as laser printers, those with departmental agreements must also use a Printer Access Card.

Purchasing Access Cards

You can purchase access cards at any Bursars office. If the Bursars are closed, you can purchase Computer Facility Access Cards, Single Use Cards, and Printer Access Cards at the West Bank Periodical Shop. You can also purchase the aforementioned access cards at the computer facilities listed below.

Please note:

these locations do not accept cash.

East Bank:	9 Walter Library
St. Paul:	135 Class. Ofc. Bldg.
West Bank:	170 Anderson Hall

Public Computer Facilities Handbook

Detailed information about access and usage policies is available in the *Public Computer Facilities Handbook*. Handbooks are available in the computer facilities and from the Computer and Information Services office in 132 Shepherd Labs.

Private Computer Facilities

Some departments and dormitories have set up private computer facilities that do not honor the *Computer Facility Access Card*. The access policies for these private computer facilities is determined by whoever provides funding for the private facilities.

Classroom Facilities

Some microcomputer facilities can be reserved for instructional use. Look under the *Classes* heading in the table shown on pages 105-106 to learn which microcomputer facilities these are.

We also have set up several classrooms for demonstrations using an IBM computer.

Microcomputer Facilities

You can reserve all or a portion of many microcomputer facilities for classroom instruction for up to two hours per quarter at no charge.

You can reserve many microcomputer facilities for 2-10 hours per quarter by using one of the options listed below. (You must, of course, negotiate days and time with the person responsible for the microcomputer facility you wish to reserve.)

- Requiring that all students in the class obtain a Computer Facility Access Card. (This card would still allow the students unlimited access to the microcomputer facilities outside the reserved class time.)
- Submitting a Journal Voucher that reimburses the microcomputer facilities \$20 for each student enrolled in the course. Under this option students who wish to use the microcomputer facilities outside of reserved class hours must obtain a Computer Facility Access Card.

We will negotiate reservations for longer periods of time on a case by case basis. Reserved time must be devoted to classroom/instructional activities. Individuals may not use this time for personal work or for assignments for other classes.

Faculty or instructors who use the public facilities for instructional purposes must inform their students of the pertinent policies, including the need to pay to use the public microcomputer facilities.

Demo Facilities

We have equipped several classrooms with an IBM-compatible microcomputer and a projector system. These classrooms have telephone equipment for high-speed connection to campus central system computers and are available for faculty to use in their classroom instructions: 15 Architecture, 105 Folwell Hall, and 6 Biological Sciences.

For more information regarding these facilities, contact Jerry Stearns at phone 625-1543 or e-mail jstearns@vx.acs.umn.edu.

To reserve the classrooms, contact Room Scheduling at 5-6030.

Overhead Projection Pads

University departments and faculty can borrow some overhead projection pads for computer presentations for 48 hours.

To reserve these overheads, call the Computer and Information Services office at 625-0073.

In Focus for Mac or IBM

You can borrow an In Focus Systems black and white projection palette from us for 48 hours. You lay this palette on a common overhead projector, which you must supply.

The In Focus palette has auto-recognition, multi-scan circuitry so you can use it with an IBM-compatible or a Mac II. You do not need any special software to use it. You can just plug it into your computer.

To use it with a Mac II you get a 9- to 15-pin cable, and you can use the Mac II's monitor and the palette at the same time. It works with IBM CGA, EGA, and VGA adapters and comes with a 15-pin D-style connector.

Kodak Data Show for IBMs

The Kodak Data Show System works with IBM-compatibles that have these video adapters: CGA, EGA, or 100% CGA-compatible. It does not work with the newer VGA or the older IBM monochrome display adapter (MDA). Although you can plug the pad into an Enhanced Graphics Adapter (EGA), the Data Show's display works only in CGA resolution.

The pad's cabling allows the image to appear in two places: on your system's monitor and on the Data Show pad.

Public Computer Facilities: Fall Quarter Schedule

Building Room Phone Classes Laser Printing ♦ Hours: Weekday Hours: Weekend

East Bank



Access to these microcomputer facilities requires an access card.

Microcomputer facilities managed by Computer and Information Services: contact Jerry Larson at 625-7850.

EE/CSci ♣ - ACSnet	3-166 4-204	624-7588 625-9081		3 LaserJets 2 LaserWriters	M-Th Fri	8 am-midnight 8 am-8 pm	Sat Sun	8 am-midnight 10 am-midnight
Elliott Hall - ACSnet	121	624-0866	†	1 LaserJet 2 LaserWriters	MTTh Wed Fri	9 am-8 pm 10 am-8 pm 9 am-5 pm		
Folwell Hall - ACSnet	14	625-4896	†	2 LaserJets 3 LaserWriters	M-Th Fri	8 am-10 pm 8 am-6 pm	Sat Sun	noon-6 pm 4 pm-10 pm
Lind Hall	26 ♣	626-0856	†	1 LaserJet 2 LaserWriters	M-Th Fri	8 am-midnight 8 am-6 pm	Sat Sun	10 am-6 pm noon-midnight
Physics ♣ - ACSnet	130	625-6820	†	1 LaserJet 1 LaserWriter	M-Th Fri	9 am-9 pm 9 am-5 pm		
Walter Library - ACSnet	9	626-1899	†	1 LaserJet 3 LaserWriters	M-Th Fri	8 am-midnight 8 am-10 pm	Sat Sun	10 am-6 pm noon-midnight

Microcomputer facilities managed by other departments.

Architecture	148	624-9583			M-Th Fri	9 am-8 pm 9 am-5 pm		
Contact: Lee Anderson, 624-5201								
Eddy Hall Annex	54	625-0314		1 LaserWriter	M-Th Fri	8 am-10 pm 8 am-4 pm	Sat	10 am-2 pm
Contact: Dennis Kern, 625-4350								
Moos Tower	8-425	625-1477		1 LaserWriter	M-Th Fri	7:45 am-6:00 pm 7:45 am-4:30 pm		
Contact: Marge Tillery, 625-1477								



ACSnet terminal facilities: access to these facilities does not require an access card.

Diehl Hall	278	624-3128	♦		M-F	7 am-midnight	Sat	8 am-8 pm
Contact: Philip Army, 626-3375 (Access to Diehl Hall microcomputer facilities is limited)								
Lind Hall	1	625-0801	♦		M-Th Fri	8 am-9:45 pm 8 am-5 pm	Sat Sun	noon-5 pm 6 pm-10 pm
Contact: Charles McCarthy, 624-4001								
Mech. Eng.	308	625-7352	♦		M-Th Fri	8 am-midnight 8 am-7 pm	Sat Sun	9 am-7 pm 6 pm-midnight
Contact: Don Riley, 625-0591								
Nicholson	1	625-5082	♦		M-F	8 am-7 pm		
Contact: Jerry Larson, 625-7850								

ACSnet

ACSnet facilities have terminals that can access LUMINA and other Central System Computers, e.g., Computer and Information Services' CA, EP/IX, IBM CMS, MEDLINE, NOS, NOS/VE, UX, VX, and VZ and the School of Management's IBM mainframe

♦ Laser printing notations apply only to microcomputer facilities. HP LaserJets available for printing from IBMs and IBM-compatibles. Apple LaserWriters available for printing from Macs.

Printing from mainframes is charged against your mainframe account.

† Instructors can reserve all or part of these labs for instructional use by contacting the department responsible for the lab.

♣ These labs are frequently scheduled for classroom use. Call before making plans to use these facilities.

♣ IT Students have priority use of the EE/CSci and 130 Physics labs.

Building Room Phone Classes Laser Printing Hours: Weekday Hours: Weekend

St. Paul



Access to these microcomputer facilities requires an access card.

Microcomputer facilities managed by Computer and Information Services: contact Jamil Jabr at 624-7766.

Cla Office Bldg.	135	624-9226	†	1 IBM Per PgPrntr 1 LaserWriter	M-Th 8 am-10 pm Fri 8 am-6 pm	Sat 10 am-6 pm Sun 4 pm-10 pm
McNeal Hall	305 ▲	624-5367	†	1 LaserJet III 2 LaserWriters	M-Th 8 am-10 pm Fri 8 am-6 pm	Sat 10 am-6 pm Sun 1 pm-7 pm

Microcomputer facilities managed by other departments.

Central Library	B50	624-3269	†	2 LaserWriters	M-Th 8 am-10 pm Fri 8 am-6 pm	Sat 10:30-4:30 pm Sun 4 pm-10 pm
Contact: Dick Rignell, 624-1248						
Vet. Science	450	624-4281		1 IBM 4019	M-Th 8 am-9:30 pm Fri 8 am-5 pm	Sat 9 am-5 pm Sun 1 pm-5 pm
Contact: Livija Carlson, 624-3078						



ACSnet terminal facilities: access to these facilities does not require an access card.

Central Library	B40	—	◆		M-Th 8 am-10 pm Fri 8 am-6 pm	Sat 10:30-4:30 pm Sun 4 pm-10 pm
Contact Jamil Jabr, 624-7766						

West Bank



Access to these microcomputer facilities requires an access card.

Microcomputer facilities managed by Computer and Information Services: contact Shu-Fan DeJarlais at 624-0877.

Anderson Hall	170	624-6526		1 LaserJets 3 LaserWriters	M-Th 8 am-midnight Fri 8 am-10 pm	Sat 10 am-8 pm Sun noon-11:30 pm
Blegen	90		†		classroom only	
Blegen*	10, 125, 130		†		classroom only	
Wilson Library	B2	626-2205		1 LaserJet 1 LaserWriter	M-Th 8 am-11:30 pm Fri 8 am-10 pm	Sat 10 am-8 pm Sun noon-11:30 pm

Microcomputer facilities managed by Computer and Information Services: contact Jamil Jabr at 624-7766.

Blegen	455 ▲	626-7778	†	1 LaserWriter	M-Th 8 am-10 pm Fri 8 am-6 pm	Sat 10 am-6 pm
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ACSnet terminal facilities: access to these facilities does not require an access card.

Blegen	140	—	◆		M-Th 8 am-11:30 pm Fri 8 am-9:30 pm	Sat 10 am-7:30 pm Sun noon-11 pm
Contact S. DeJarlais, 624-0877						

* Blegen 10, 125, and 130 are lecture-only classrooms that are set up with an IBM-compatible micro-computer. The computer is connected to a ceiling-mounted color

projector and can access the campus central systems as well as the Blegen 90 microcomputer network and its IBM software.

Call the Scheduling office at 5-6030 to reserve these Blegen classrooms. Computer and Information Services can help you set up the classroom's computer equipment; call 624-0877 for assistance.



Help: Computer and Information Services

Consulting Service

Phone

Help Line Hours

Computer Services Information Line *New* 625-1555

If you do not know which computer service phone number to call, dial the Computer Services Information Line.

Central System Computers

To use these systems, you need a user name and password, which you get when you establish an account. Qualified users can apply for grants to handle some computing related costs. To talk to a consultant in person, call for exact location.

- UX, VX, VZ, CA accounts on VAX, ENCORE, and CYBER 626-5592 Monday-Friday 8:30 am to 4:30 pm
1 Nicholson Hall Walk-in Consulting Monday-Friday 10 am to 4 pm
- NOS/VE, NOS, EP/IX, MEDLINE accounts on CYBER 626-8366 Monday-Friday 7:45 am to 4:30 pm
- CMS accounts on IBM. 624-6235 Monday-Friday 9 am to 4 pm

LUMINA

If you have trouble connecting to LUMINA call 626-2272 Monday-Friday 8:30 am to 4:30 pm

Microcomputers and Workstations

- Software, hardware, peripherals, local area networks 626-4276 Monday-Friday 9 am to 4 pm
- East Bank: 125 Shepherd Labs above Monday-Friday 9 am to 4 pm
- West Bank: 93 Blegen above Tuesday and Friday 1-4, Thursday 9-noon
- St. Paul: 307 McNeal above Monday and Friday 9-noon, Wednesday 1-4 pm

Central System, Microcomputer, and Workstation Consultants: B. Alberti, F. Anklesaria, R. Baird, J. Bergman, T. Bonfiglio, S. Brehe, S. Collins, S. DeJarlais, M. Dunham, P. Goblirsch, G. Gonzalez, C. Griesel, S. Hail, S. Hakomaki, C. Haugan, S. Hickman, R. Hotchkiss, M. Hu, J. Jabr, J. Jannett, D. Johnson, P. Kachelmyer, M. Kelleher, D. Larsen, J. Larson, J. Larson, P. Lindner, M. McCahill, P. Oberg, K. Olson, N. Ostrom, J. Pearson, K. Pearson, C. Plaisance, E. Schleske, C. Squires, J. Stearns, K. Teder, E. Thayer, A. Thomas, H. Tonsky, D. Torrey, S. Traxler, L. von Munkwitz-Smith



General Information

The *Student/Staff Directory* has a more complete listing of our department's resources. For more information about computing and information services at the University, departments may request a copy of our *Handbook of University Computing Services* by calling 625-1300. Information about public computing facilities is published quarterly in this newsletter and is available from the *Public Computing Facilities* handbook.

- Adaptive Technology Services (voice) 626-0365
- (TDD) 624-4037
- Artificial Intelligence, Humanities,
Text Analysis (Mon, Wed, Fri 3-4 pm) 625-8332
- Central System Accounts:
UX, VX, VZ, CA 626-5592
- NOS/VE, NOS, EP/IX, MEDLINE 626-8344
- IBM 624-7788
- Electronics Desk, Williamson Hall Book Center ... 625-3854
- Equipment Repair and Warranties 625-1595
- Faculty Resource Center 626-1090
- Instructional Computing on Central Systems 626-0200
- Tape Librarian at Lauderdale Facility 626-1838
- Telecommunications, Networking Services:
Information 626-7800
- Repair 625-0006
- Training Resources, Course Registration 625-1300



Central Systems Dial-up Access

The terminal settings for dial-up access to the University's mainframes are 8-1-N (that is, 8 data bits, 1 stop bit, and no parity) unless otherwise noted. Some phones work at 7-1-even (that is, 7 data bits, 1 stop bit, and even parity).

- LUMINA:
300/1200/2400 bps 625-6009
- UX, VX, VZ, CA:
300 bps 626-0300
- 1200 bps 626-1200
- 2400 bps 626-2400
- 9600 bps 626-9600
- 300/1200/2400 bps at 7-1-even 626-1630
- NOS, NOS/VE, EP/IX, MEDLINE:
300/1200/2400 bps 625-1445
- up to 19.2 bps campus data phone line 3-2400
- IBM CMS:
300/1200/2400/9600 bps at 7-1-even 624-4220

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