

Computer and Information Services Newsletter

Information Services

Volume 1, Number 9

March 1992

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News and Announcements

● Computer and Information Services

*Don Riley, Acting Associate Provost
with Special Responsibilities for
Computing and Information Systems*

I am writing because I felt the need to communicate some of my concerns and thoughts to you, the community of users of Computer and Information Services' services. I have recently been given responsibility for the organization and am still sorting out the issues and opportunities.

I was asked to assume this "acting" position in an attempt to provide some stability and a focal point for leadership and problem resolving. I got involved in the fall in chairing the *Advisory Users Committee for Twin Cities Computing Infrastructure* (AUC). Even though I was on sabbatical, I agreed to assume this position, terminating my sabbatical, because of my concern for the importance of the campus computing infrastructure.

So where are we going? That's the job of the AUC. They're charged with developing a vision and a plan, with lots of input from staff and the user community.

I think it is safe to categorize the future of campus computing as "distributed," with many points of access and many points of "service delivery" — what some have referred to as the "democratization" of access to computing and information resources.



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➔ **News continued on 206**

In this environment, there are many roles to play, and none of them are static. Each individual and organization must adapt and change in response to the evolving needs of the users, that is, administration, faculty, staff, and students.

In my definition of distributed computing, I see the role of traditional mainframes evolving rather than going away. The "centrality" of central computing is changing (perhaps disappearing). Both the definition and the function of mainframes is changing: they are becoming another node on the network.

All computing services have come through a difficult period of time, weathering such upsets as lots of turmoil and staff reductions. Additional changes certainly await us. They're unavoidable as we go through the planning exercise of further developing a vision for our computing infrastructure and possible recommendations for combining Administrative Information Services (AIS) and Computer and Information Services (CIS) into one organizational structure.

However, I view these exercises as an opportunity to let the users of our services help determine the future of our organization. Quality service can only be defined by the users of that service.

So we have begun the planning process and are working hard to include all stake-holders in the process. I will be working hard to communicate and to provide channels for two-way communication.

In the next issue of this newsletter, I will try to expand on some of these issues and communicate more of what we are considering. I will also use Electronic mail to communicate regularly on the progress of the planning process. This is a big, overwhelming job. I need your help.

● Introducing D. R. Riley, Acting Associate Provost

Computer and Information Services has a new chief administrator.

In February, E. F. Infante announced that Professor Donald R. Riley of the Department of Mechanical Engineering was offered the position of Acting Associate Provost with Special Responsibilities for Computing and Information Systems on the Twin Cities Campus. Professor Riley was offered this position as a result of an internal search and with the advice of the members of the Senate Committee on Computing.

This acting academic administrative position, which Professor Riley accepted, will terminate once the permanent position of Chief Information Officer has been filled. It's anticipated that the Chief Information Officer position will be filled in the Fall of 1992.

The Acting Associate Provost reports directly to E. F. Infante, Provost. Professor Riley's new responsibilities include:

- Direct responsibility for coordination of all Twin Cities campus academic computing, from microcomputer labs to mainframe computing and the campus local area networks.
 - Work with the Advisory Users Committee for Twin Cities Computing Infrastructure as it develops short- and long-range plans for the organization of the computational infrastructure of the Twin Cities Campus, including academic and administrative functions, to bring about effectiveness, efficiencies, and economics.
 - Play a leadership role in establishing policies and procedures that will improve electronic access by Twin Cities students, faculty, and staff.
 - Coordinate relations with hardware and software vendors as appropriate.
 - Maintain an advisory relationship to the Director of the University Library Automated Systems and to the directors of computing organizations on the coordinate campuses.
 - Maintain an advisory relationship to the directors of Administrative Information Services (AIS) and Telecommunications. (The direct reporting lines for AIS and Telecommunications are within the Office of Robert Erickson, Senior Vice President for Finance and Operations.)
-

● Newsletter Available on Gopher

We're making the *Computer and Information Services Newsletter* available via the *News* and the *Computer Information* sections of Gopher Consultant. By the time you receive this issue of the newsletter in your mailbox, Gopher will have the January, February, and March issues.

Since Gopher Consultant offers guest access, you do not need a password or special account to use it. You only need the client software or general purpose software, such as Telnet. For more information about accessing and using the Gopher Consultant, see *Free Stuff: Public Information Available Electronically* in our January 1992 newsletter.

Every Word is a Keyword

The Gopher Consultant is a service we developed to store information electronically and retrieve it using keywords. Because Gopher treats all words as keywords, it is relatively easy to search for items of interest in large databases.

Text Only

The version of the newsletter that is stored on Gopher is not a replacement for the paper copy. Since the information on Gopher is stored only as text, most figures will not show up. To see the figures and illustrations, you must obtain a copy of the "original" newsletter.

Saving and Printing

When you use the Gopher clients we have developed, you get features that are not available in the terminal (Telnet) version of the software. The Telnet version of Gopher is more limited. It is designed to provide easy public viewing rather than saving or printing functions.

A drawback to the client programs is that to use them you must have a connection to the University's campus Ethernet backbone, either directly or via a local area network.

Mac

Figure 1 shows the Mac client. To print or save the *About Gopher* information we've retrieved, you must click on the ▼ next to *Start the Gopher*. When you do this you will see a Gopher menu that includes *Print* and *Save Document* options.

IBM-PC

The *File* menu in the IBM-PC Gopher client has a *Save File* option. Once you've saved your selection to a disk, you can use your word processing software to print it.

NeXT

When you use the NeXT Gopher client you can use standard NeXT print and save commands.

UX and EPX

The Gopher client software is also installed on the UX and EPX (UNIX) central systems. When you use these systems, you can use their standard print and save commands.

Acquiring the Software

The Gopher client and server software is available via anonymous ftp from

boombox.micro.umn.edu

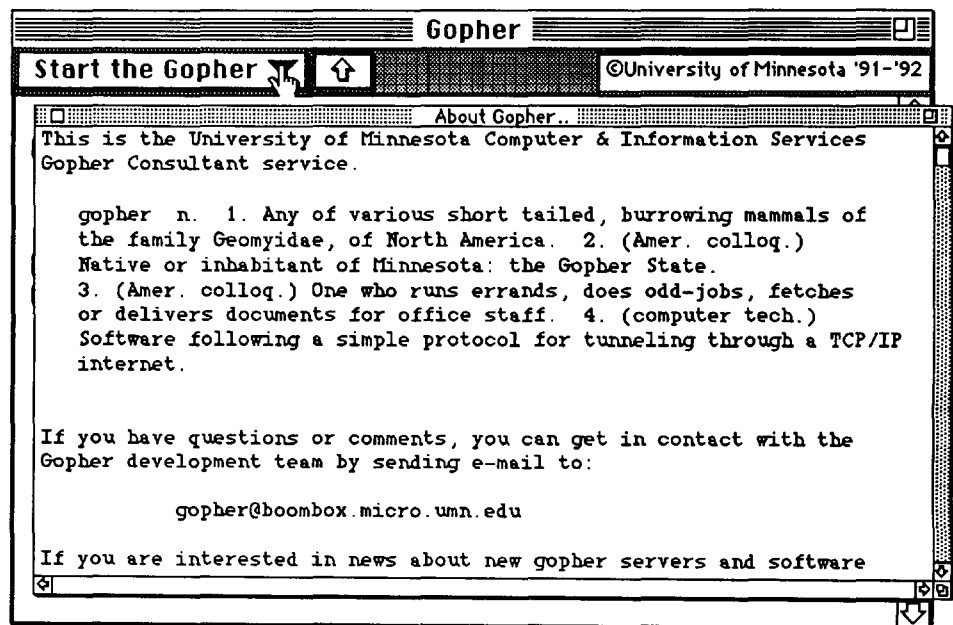
in the directory called

/pub/gopher

You will find separate directories for the different machine versions.

Macintosh client software is also available on our Mac Information Server, which is in the *MicroCenter* AppleTalk Zone. Look in the *Communications* folder on the *information* volume.

Figure 1: Mac Client - Click on the ▼ to Select the *Print* and *Save Document* Options



The IBM PC client software is available from the IBM Information Server. Look for the software in the directory called

P:\INFO\PUBDOM\COMMUN\GOPHER

All the Microcomputer HelpLines have access to the IBM and Macintosh Information Servers.

● Mac 16-inch Color Monitor: \$1120

Apple recently added a 16-inch color monitor to their product line; its 70 dots-per-inch resolution is 832 horizontal by 624 vertical pixels. The Book Center's price for this monitor is \$1120.

You can plug microphones, headphones, external speakers and ADB (Apple Desktop Bus) devices, such as keyboards and mice, directly into this monitor.

The Shepherd Labs Microcomputer HelpLine has a display model of this color monitor.

Ergonomic Features

This monitor meets Swedish MPR recommendations for low-frequency magnetic emissions. You can tilt and swivel this anti-glare, anti-static screen to adjust your viewing angle.

Compatibility

The monitor does not work with the built-in video circuitry of the Mac LC, IIsi, and IICI. To use it with the IIsi and IICI, you can add Apple's 8•24 NuBus video card; this setup lets you display 256 colors. (NuBus cards do not work with the Mac LC's 020 Direct Slot.)

When you use this color monitor with the built-in circuitry on the Quadras you can get 256 colors. To get the millions of colors option, the Quadras need 2MB of VRAM. Currently the Quadra 700 comes with 512 VRAM and the Quadra 900 comes with 1MB.

● Spring Short Courses

The descriptions, dates, and times of our Spring Short Courses will be mailed as a separate bulletin.



The first day of registration for Spring Short Courses is March 19, 1992.

This bulletin will be mailed automatically to everyone on our newsletter mailing list who has a Minnesota mailing address.

Those who do not have a Minnesota mailing address will also get the bulletin *if* they identified themselves as a University of Minnesota student, staff, or faculty member.

● EtherJack:

No Nonsense Network Connection

The Telecommunications department (Telecomm) has a new product: EtherJack, which is available in some buildings.

EtherJack is designed for connecting a single desktop system – such as a Mac, PC, workstation, or printer – to the campus network. Telecomm's new EtherJack service will put a twisted pair Ethernet jack in a University office for a one-time charge of \$20 and a monthly charge of \$15. These are similar to the fees you are charged for a telephone.

Like new phone installations, you pay for wiring if it needs to be installed. New wiring installation is typically about \$180-200.

Setting Up EtherJack

Departments that want to order EtherJack service can do so through their departmental phone coordinator.

To use the EtherJack option, your personal computer needs a 10BaseT/Twisted Pair Ethernet connection. Some appropriate Asante Ethernet products are featured on page 202 of our February newsletter. Those with IBM and IBM-compatible computers can order appropriate

Standard Microsystems products from AmeriData for under \$250. (Standard Microsystems was formerly part of Western Digital.) To place an order with AmeriData, call 290-4304.

You will find more details on network setups in our latest *Networks* handout, including information on the products mentioned here. Handouts are available at all Micro-computer HelpLines.

Also see *Tales from the Network Woods*

This month's *Tales from the Network Woods* column has more information about EtherJack connections.

Central System News



TROLL, an Econometric Modeling Package

After February 27, 1992 the TROLL econometric package became *unavailable* on the IBM CMS system.

Other Econometric Modeling Packages

The University central systems and some microcomputers have access to other econometric modeling packages. These packages are shown in the table below.

Econometric Package	Computer				
	CMS	EP/IX	VMS	NOS	Micro
SAS/ETS	Y	Y	Y	N	IBM-PC*
SPSS Trends	Y	Y	Y	N	IBM-PC, Mac*
SCA	Y	N	N	N	IBM-PC**
RATS	N	N	Y	N	N
Shazam	N	N	Y	Y	N
TSP	N	N	(future)	Y	N

* University site licenses are available to departments, not to individuals. Departments interested in leasing this software can call our Shepherd Labs office at 625-1300.
 ** The IBM/MS-DOS version is available from SCA Inc.

Technical Coordinators' Forum



A New Forum

In order to increase the overall dissemination of information among the University's computer support people and to provide better technical support on campus, we are pleased to announce a forum to discuss problems and provide solutions.

Our First Meeting

Computer and Information Services held the first meeting for departmental Technical Coordinators on February 20. Departmental Technical Coordinators are people who computer users often turn to for help in solving their computer problems. Because they are often called upon to solve problems, a Technical Coordinator's knowledge base is very broad. We organized this forum for departments so the people who provide computer help can expand their knowledge in an efficient and effective manner.

Philip Kachelmyer is Computer and Information Services' facilitator for the Technical Coordinators forum. Philip is our Manager of Distributed Systems.

At the February meeting, the participants defined the six special interest groups listed below. Each group has at least one chairperson whose internet E-mail address is also listed below.

UNIX Administrators

Chairpersons: Will Murray and John Easton

murray@cs.umn.edu
 easton@atlas.socsci.umn.edu

People who joined this group are responsible for the day-to-day operations of UNIX-based computers. Because many of the problems encountered by UNIX System Administrators are similar, even across different hardware platforms, the people in this group will be able to query others who may already have solved the problems that they are experiencing and to find solutions quickly.

Site License Software

Chairperson: Dale Swanson

swanson@ee.umn.edu

Departments can often save money on software purchases if they can guarantee a certain number of purchases from the software distributor. The Site License Software group will actively seek out companies that may be willing to offer reduced pricing for purchasing large quantities of specific software. It will also compile, publish, and maintain a list of site license software available at the University.

Workstation Hardware and Software Purchasing

Chairperson: Ray Muno

muno@aem.umn.edu

The Workstation Hardware and Software Purchasing group will look at ways of obtaining attractive prices from hardware vendors. It will also work closely with Computer and Information Services in developing programs whereby University departments can combine their purchasing power to obtain the best possible pricing.

Microcomputers and LAN Hardware and Networking Software

Chairperson: Joe Stone

stone@math.umn.edu

This is the largest of the six groups. Because microcomputers are such an integral part of most departments at the University, this is an area where there are more questions raised and problems to be solved than any other.

In many cases departments are finding that it is no longer enough to have a standalone microcomputer to do word processing. You may need to communicate with other members of your department to send Electronic mail or exchange files. You may need to use one of the mainframe computers, or send E-mail to someone at a University halfway around the world. Networking is the best means to accomplish this.

This group will help locate information about the best ways of integrating computers into departments.

Public Domain Software

Chairperson: Bob Hain

bob@ht2.me.umn.edu

Most computer users are familiar with software that can be purchased from the Book Center or from other computer stores. This software is usually advertised and well-known. However, there is a great wealth of public domain, or free, software that is available from a variety of sources.

The quality of some public domain software has advanced to the point that it equals or surpasses some commercial products, but there are often problems finding and installing the software. We hope this forum can help to overcome these problems.

An example of public domain software is the pair of POPmail electronic mail applications developed by Computer and Information Services for use on Apple Macintosh and IBM/MS-DOS systems.

Many other institutions provide such software in the interest of promoting effective and efficient use of computers. This group will seek out sources of new and interesting public domain software. This could be a valuable source of software for students who cannot afford commercial versions.

Administrative Computing Connectivity

Chairperson: Ray Voelker

rvoelker@ux.acs.umn.edu

Most departments must communicate with the CUFS system in one way or another. CUFS users have very special needs and desires. This group will seek to make communications and information transfer smoother and more effective.

Tools for Coordinators

We set up the Technical Coordinators forum is to facilitate knowledge transfer among departmental computer support people and to provide better technical support on campus. In order to accomplish this goal, the coordinators must have special tools. Computer and Information Services is providing the tools listed below.

Gopher Consultant

This is a database containing a wide variety of information. We continually add more information, and the Technical Coordinators forum will help us provide even more and better information.

UseNET News

UseNET News provides many forums for discussion. We will provide tools for accessing UseNET News and information about news groups that may be particularly informative.

Local News Groups

As they are needed we will set up news groups that can be used by Technical Coordinators. News groups are often an effective means of posting questions and receiving answers. Many people can read the information and use it, and Technical Coordinators who can do so can answer questions that are posed.

Newsletter Articles

Each special interest group will publish articles in the *Computer and Information Services Newsletter* on a regular basis to inform the University community about what is available and what they are doing.

Conclusion

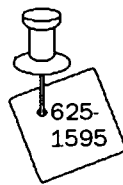
Nearly 200 people responded to our invitation and attended the initial meeting of the Technical Coordinators. Most of the 200 signed up to join one or more of the six special interest groups described above.

Contact the Facilitator

We are actively seeking additional Technical Coordinators to be members of these groups. If you are interested in learning more about the program or wish to join one of the groups, please contact Philip Kachelmyer, the Computer and Information Services' facilitator for the Technical Coordinators forum. You can call him at 625-6821 or reach him via E-mail at

phk@boombbox.micro.umn.edu

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.

Hard Drives for Macs

Engineering Services has installed hundreds of the Quantum drives listed in Table 1 and are impressed with their reliability and performance. The drives' effective access times are listed in milliseconds (ms). All drives have 17 ms nominal access time and 50,000 hours MTBF (mean time between failure).

Table 1: Quantum Hard Disk Drive

Drive	Unformatted Capacity	Access Time With Cache	Price	
			Internal*	External
LP	52	11.7	\$ 359	\$ 429
LP	105	11.7	479	569
Pro	210	10.7	799	849

* On-site installation available for departments for a \$15 fee.

Internal Quantum Drives

We can install a Quantum drive in your Macintosh as

1. a replacement for a defective hard disk or
2. as an upgrade to a higher capacity drive.

Please note, however, that installation could void the one year Apple warranty on your Macintosh.

Our internal drive price includes the drive, internal cables and bracket, in-shop installation, a driver utility, and our one-year warranty. In addition, on-site installation is available for departments for a \$15 fee.

External Drives

Our external drive price includes the drive, SCSI cable, power cord, terminator, external cabinet with power supply and fan, external SCSI ID select switch, driver utility, and our one-year warranty.

Trade-in Allowance

We even offer the trade-in allowances listed below for Apple-brand 3-1/2 inch hard drives.

Defective Apple hard drive	\$ 5
20MB Apple drive in good condition	80
40MB Apple drive in good condition	100

Data Recovery/Transfer

For a \$15 fee we will attempt to transfer information from your old hard drive to your new drive.

Tales from the Network Woods: A Quick Listing of Costs

Lawrence Liddiard liddiard@unet.umn.edu



People often request a way to estimate the costs associated with upgrading or installing new networks at the University of Minnesota. The Telecommunications department (Telecomm) can help. They will prepare complete network plans for any University department. When the estimate involves unusual requirements or reworking an older network, Telecomm calls on us, Networking Services.

Below we'll start with on-campus costs and end with off-campus costs.

Costs: Connecting One Device

If you want to connect a personal computer to the campus network, Telecomm has two services that should interest you: *EtherJack* and *AppleJack*.

The installation costs for EtherJack and AppleJack are the same, but the costs per location vary as shown below.

- \$20 if only the walljack must be changed
- \$180-200 (approximately) if new twisted pair building wiring is required

You also need to pay a monthly fee, similar to the fee you pay for telephone lines. Leased Ethernet (EtherJack) or LocalTalk (AppleJack) walljack services cost \$15 a month for each device, such as a personal computer, that is connected to the network.

AppleJacks, EtherJacks, Routers, and Other Things

Radiating from the main building wiring closet up through the risers and out onto each floor are the star devices, routers, and wiring that are required to connect your department's local area network (LAN) and computing devices to the campus network.

The new LAN wiring that Telecomm installs has twisted pair LocalTalk or 10BaseT Ethernet (EtherJack) walljack locations (wire, walljacks, connecting blocks, jumpers, and labor). The installation costs *average* \$180-200 per location. Both services include *maintenance* and *upgrades* to future networking capability.

For LocalTalk (AppleJack) configurations, active star-controllers and a router are used to connect the building walljack to a Telecomm center.

For Ethernet (EtherJack) configurations (such as Apple EtherTalk, Novell LAN, or SUN TCP/IP networks), twisted pair hubs with SNMP (Simple Network Monitoring Protocol) are used to connect the walljack with the University's Ethernet backbone and provide maintainability.

Caveats

The installation costs we quoted assume several things:

- the building already has router connected optical fiber
- any previous sections of the departmental network were installed to code (e.g., by not breaching fire walls or running across floors).

The one-time wiring estimates listed above can double or quadruple if the building requires a new wiring closet or if conduit must be installed.

For the Long Term

LocalTalk has a much slower network speed than Ethernet. Whenever possible, we recommend Ethernet connections, such as the EtherJack setup discussed above, rather than LocalTalk connections.

Costs: Connecting One LAN

Connecting an Ethernet LAN to the campus network costs as little as \$50 per month per network – with a \$226 one time installation charge.

If your building is connected with optical fiber, a full Ethernet connection is made. If the building is not connected with optical fiber, a phone system LANMark Ethernet connection is made.

LANMark is not our first choice because it transmits at one tenth normal Ethernet speed.

Costs: Add a Building to the Network

Adding a building to the backbone optical fiber network costs \$25-45,000. The terminating fiber optic modems and cost of pulling optical fiber to a campus building from a Telecomm center are about \$12,000. Wiring closet construction averages \$6,000, and a simple closet router is \$3,500.

Larger buildings require more capable \$21,000 routers with an uninterruptible power supply. The connection at the Telecomm end is an additional \$2,000.

Buildings with Optical Fiber Connections

Currently on the Twin Cities campus, 43 of the 120 buildings that could use fiber have optical fiber connections. The University routinely connects newly constructed buildings with optical fiber.

Next year we will add the seven buildings that have fiber pulled, but not connected, to the network. With our current funding we can pull and connect fiber to five additional buildings each year.

Costs: Off-Campus

Connecting off-campus locations to the campus network is more expensive. Off-campus locations must lease a 'T1' circuit from U.S. West or another carrier. On a five-year contract this is approximately:

- \$350 per month for a location close to a University Telecomm center
- \$1,200 for installation

- \$6,000 for a router at the off-campus location, connecting devices, and a connection to the University backbone.

An off-campus location in outstate Minnesota has the same installation charges, but would average \$2,000 per month.

Free Stuff

System 7 Tune-Up



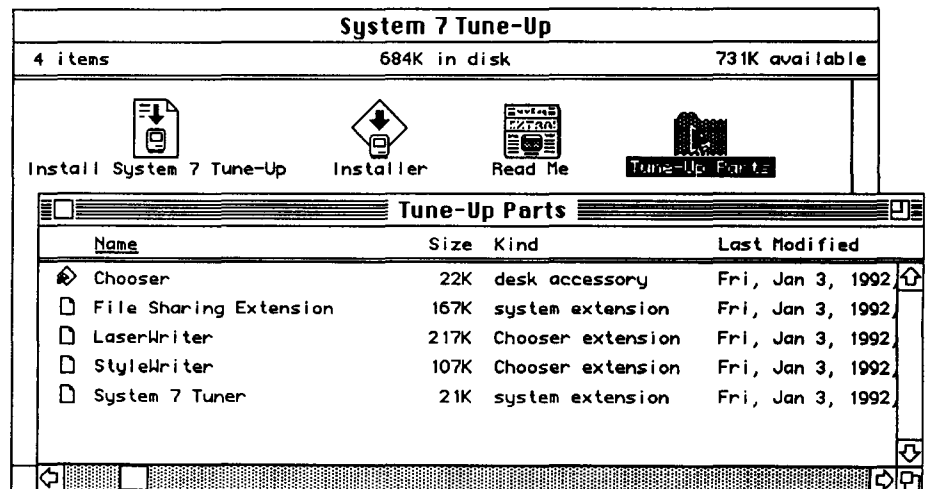
Apple recently released software enhancements that refine the performance of Macs that are using System 7.0 or 7.0.1. Free copies of this "tune-up" are available from the Mac Information Server.

Obtaining the Software

To obtain the enhancements look for the *System 7 Tune-Up* folder inside the *System Software* folder on the *information* volume.

Use the "image" documents you find inside the tune-up folder to make exact copies of the tune-up. Double-click on the image that matches your floppy disk, that is, 800K or 1.44MB. When you get the message that the image is loaded into memory, click on the *Make A Copy* button to copy the information to your floppy disk. Figure 1 shows you the contents of the tune-up "kit" after you've successfully copied it.

Figure 1: Contents of the Macintosh Tune-Up "Kit"



Some of the tune-up's highlights are listed below.

- ❑ Improved memory management, resulting in (1) fewer "out of memory" messages and (2) more memory available for applications on computers that are not connected to a network, such as PowerBooks that are used on the road.
- ❑ Faster, more reliable printing on the StyleWriter and most LaserWriters.

Improved Memory Management

When you run out of memory, the Mac will automatically offer to free up memory, as shown in Figure 2.

Macintoshes that are not connected to a network could have 100-125K more memory available. To free up this memory, turn off AppleTalk and restart the Mac. (The AppleTalk button is in the *Chooser*. Chooser version 7.1 will not load unactivated AppleTalk code into system memory.) When AppleTalk is turned on again, you must restart the Mac to use networking services.

Printing Tune-Up

The tune-up includes new versions of the StyleWriter and LaserWriter printer drivers. The StyleWriter 7.2.2 and LaserWriter 7.1 drivers speed up printing with TrueType fonts. The drivers are reported to be 40-73% faster, depending on the situation. The tune-up does not speed up printing bit-mapped fonts.

The tune-up includes these TrueType fonts: Times, Helvetica, Courier, Symbol, Avant Garde, Bookman, Helvetica Narrow, New Century Schoolbook, Palantino, Zapf Chancery, Zapf Dingbats, Chicago, Geneva, Monaco, and New York.

Since the LaserWriter driver does not download fonts to the LaserWriters NT, NTX, IIf, or IIg if the fonts are already in the printer's ROM (read only memory), printing with Type 1 PostScript fonts is also faster.

In addition, the *Print Monitor* utility is more stable and less prone to crashes.

New Printer Incompatibilities

Under some circumstances you should reinstall the older StyleWriter and LaserWriter drivers. To do this drag the new drivers out of System 7's *Extension* folder and into the trash; drag the new drivers *onto* System 7's *System* folder.

Figure 2: The Finder Automatically Offers to Free Up Memory

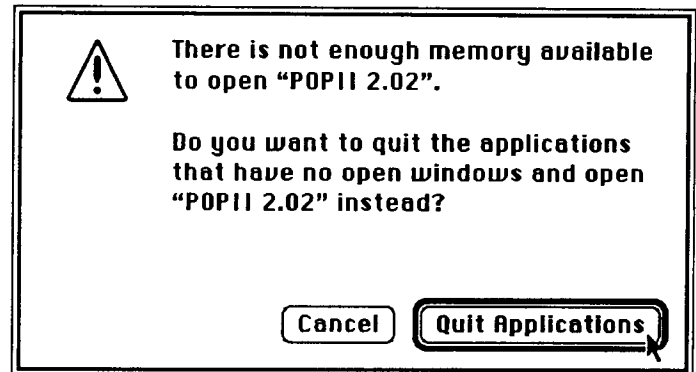
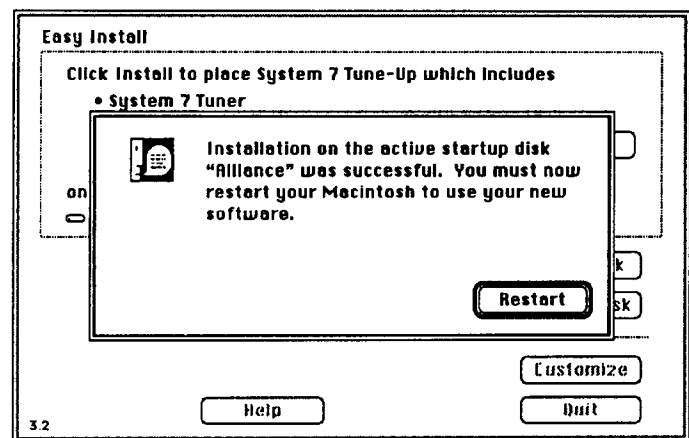


Figure 3: Tune-Up Successfully Installed



StyleWriter 7.2.2 and System 6.0.7

The new StyleWriter 7.2.2 driver also works with System 6.0.7. Although background printing is supported under System 7 with the new driver, it is not supported under System 6.0.7.

We've also heard that Mac LC owners who've installed the Apple IIe card have problems with the StyleWriter 7.2.2 driver.

LaserWriter 7.1 and Old LaserWriter Printers

If you print to the original LaserWriter or the LaserWriter Plus printers, you should not use the new LaserWriter 7.1 driver. Instead you should reinstall the 7.0 driver.

The good news is: the new LaserWriter 7.1 driver can happily co-exist with the LaserWriter 7.0 driver. (Previous LaserWriter drivers required that *everyone* who is on the same AppleTalk network use the same version in order to avoid the dreaded reinitialize message.)

Improved File Sharing

Previous to *File Sharing Extension 7.0.2* if the *File* menu's *File Sharing* option was turned on and two or more people tried to access a file simultaneously, the data could become corrupted.

Another file sharing problem sometimes occurred because of a clash with the SCSI manager. If a serial communications device, such as a modem, were used when there was also a lot of file sharing activity, the SCSI bus could become confused and cause the computer to lock up. This problem has been corrected.

Other Improvements

Keyboards that failed to wake up when the Mac started up should work now.

People on large networks or with many devices attached to their computer should notice that the Mac responds faster to selections they make in the *Chooser*.

Finder move and duplicate operations on files over 250K should be about 20% faster.

The tune-up also fixes occasional strange behavior of aliases that were put in the Trash.

Installing the Tune-Up

Overall, for the best performance, System 7 users should also use the System 7 Tune-Up.

If you can select the *Installer* icon, installing the tune-up is easy. Those who want more detailed installation instructions will find them in the *READ ME* document that accompanies the tune-up.

Figure 3 shows the kind of message you receive when the tune-up is successfully installed.

Upgrade: POPmail II 2.02a



We recently released version 2.02a of POPmail II, which is an easy-to-use Electronic mail program. POPmail II supports System 6.0.7 or later and runs on all Macs that have at least one megabyte of RAM.

The POPmail client application that you use on your personal computer includes many features, such as background operation under System 7 (or MultiFinder under System 6). For more detailed information, see the POPmail II 2.01 announcement in our February newsletter.

New to Version 2.02a

The features listed below were not present in POPmail II 2.01.

Messages you are composing in the Sender window are saved even if you close that window or quit POPmail. When you attempt to reply to a message, POPmail II will ask you if you really wish to throw away the text that is already in the Sender window.

You have two options for appending your signature to the end of a message:

- 1) the signature is always appended or
- 2) it is never appended.

To override whichever option you've set as your default, hold down the **Shift** key while clicking on the *Post* button.

Thanks to Your Feedback...

We've also improved POPmail II's behavior.

If you create a group with no members and exit the *Edit Groups* section, you will no longer get the "Sorry out of memory" message.

If you hit the **Tab** key in the Message Browser or Archive window, POPmail will no longer lock up.

Those running an international version of the Mac's system software will get the correct date when they save a copy of their message. The date/times displayed in the status window will also be correct.

Please send POPmail II comments and bugs reports to:

popmail@boombox.micro.umn.edu

Obtaining POPmail II 2.02a

You can get the POPmail software, documentation, and MacTCP drivers from the Mac Information Server. Look on the *information* volume for the *Communications* folder. The folder labeled *POPmail II* contains the latest release.

If you prefer, you may obtain POPmail II via anonymous ftp from

`boombox.micro.umn.edu`

Look in the directory named

`/pub/POPmail/macintosh/2.0.2a`

Future Upgrades

We're setting up an electronic mailing list (a POPmail group) to notify people about POPmail updates and upgrades. To add your name to this group, send E-mail to

`popmail-news-request`

Borland Customer Support



Borland, a software vendor, recently set up the internet address listed below for customer-support.

`customer-support@borland.com`

You can use this address to send E-mail to Borland for such things as requests for product and price information, upgrade information, requests for replacement of defective disks, maintenance upgrades, and other customer service requests. This internet address does not provide technical support nor does it cover commercial transactions, i.e., you cannot purchase things.

Technical Support

Borland offers technical phone support at 408/438-5300 and supports forums on CompuServe (GO BORLAND), BIX (join borland) and GENie.

Borland Software at the Book Center

The Minnesota Book Center handles many Borland products for IBM and IBM-compatible computers. The products the Electronics Desk routinely carries are shown Table 1.

Table 1: Borland Software at the Electronics Desk

Type	IBM Product	Price
Languages	Borland C++ *	\$ 99
	Turbo C	50
	Turbo C++	50
	Turbo C++ for Windows	60
	Turbo Pascal	50
	Turbo Pascal for Windows	60
	Object Vision	72
Other	Paradox	\$ 220
	Quattro Pro	70
	Sidekick	40
	Superkey	36

* Borland C++ currently comes with Turbo C++, Turbo Assembler, Debugger and Tools, Profilers, and it works with Windows. If you want the package that includes Application Frameworks, you can special order it for about \$200.

If you don't find the Borland items you need on this list, the people at the Electronics Desk may be able to order the items for you. When placing a special order you may be required to pay a 10% deposit.

More Printer Drivers For Macs



Besides the new StyleWriter and LaserWriter printer drivers announced in the *System 7 Tune-Up*, Apple recently released a new driver for the Personal LaserWriter LS. The Micro-computer HelpLine also has updated drivers for many Hewlett-Packard printers.

All of these drivers are on the Mac Information Server. Look on the *information* volume for the *System Software* folder; it contains a folder called *Apple & HP Peripherals*. You will find all the printer drivers in that folder.

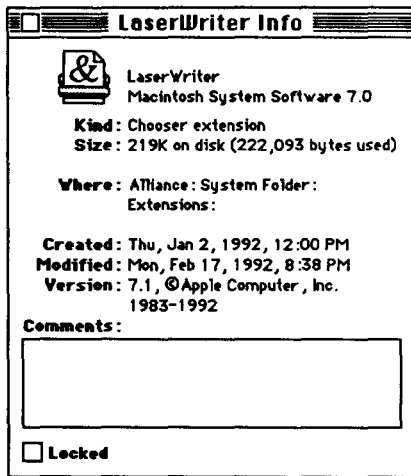
Locating Version Numbers

To find out which version of a printer driver you are using, click once on the printer's icon. (Printer icons are stored inside the *System* folder.) When the icon is highlighted, select *Get Info* from the *File* menu. As shown in Figure 4, the resulting dialog box contains the version number.

Personal LaserWriter LS

If you use Apple's Personal LaserWriter LS printer, you may find version 1.2 of that printer's driver useful. Version 1.2 began shipping with the LS in January 1992.

Figure 4: Select Get Info from the File Menu



HP DeskWriter 2.2 Driver

Our most recent HP addition is the DeskWriter 2.2 driver. Besides printing faster, this version works with EtherTalk networks and does not conflict with System 7's virtual memory feature. Previous versions would not print when virtual memory was turned on. Version 2.2 does not support background printing.

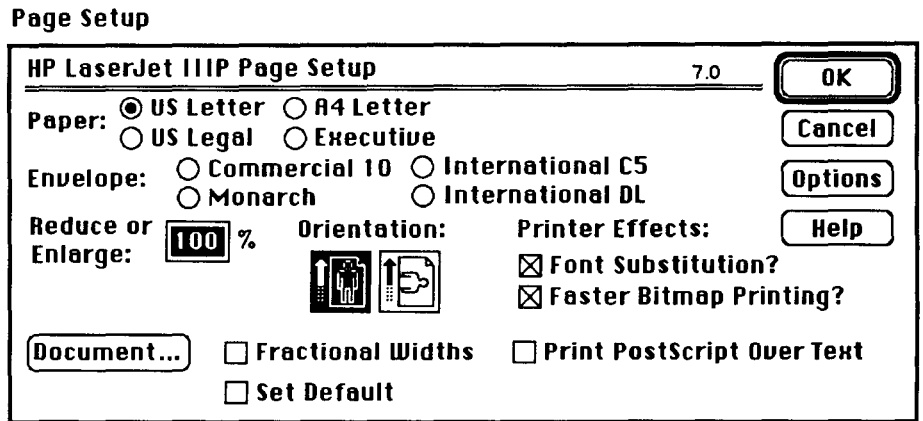
HP LaserJet Drivers

Our most recent versions of the LaserJet drivers are listed in Table 2. Versions 2.0-2.11 of the LaserJet drivers support background printing. The different drivers support specific features, such as the IIIP's alternate paper sources, as shown in Figure 5. The LaserJet 2.X drivers are compatible with the Apple LaserWriter 7.1 driver included in the System 7 Tune-Up and with System 6.X.

Background Printing

Background printing allows you to continue to use your computer while a document prints; this function is handled by the *Print Monitor*, which is stored in your System folder. Figure 6 shows the background printing option turned on.

Figure 5: Options for IIIP Printer Driver 2.0



Print

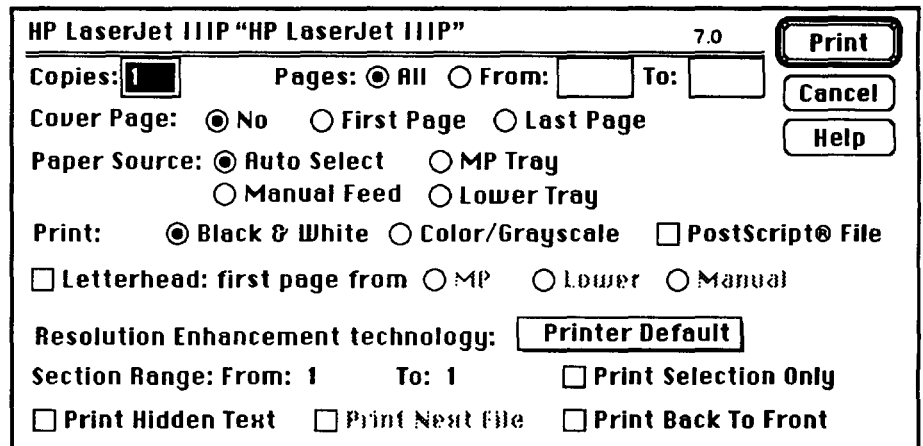


Figure 6: Background Printing Turned On

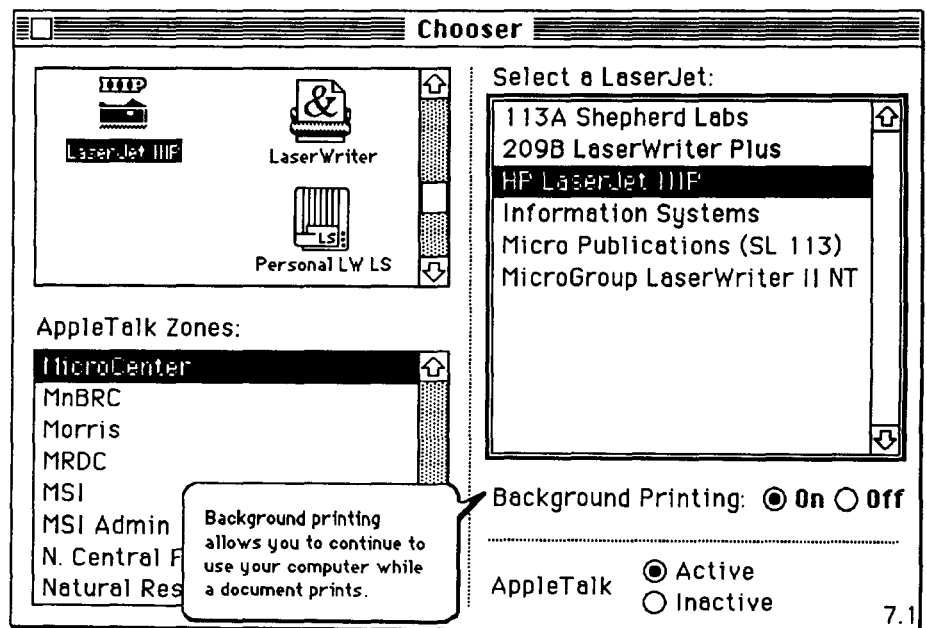
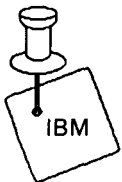


Table 2: HP LaserJet Printer Drivers for Mac

LaserJet	Size	Version
IID	259K	2.0
IIP	256K	2.0
III	256K	2.0
IIID	263K	2.0
IIIP	259K	2.0
IIISi	238K	2.11

Tips, Tricks, Tutorials

Low Cost IBM-Compatibles



Question

I've noticed some PC-clones on sale that cost less than at the University Book Center. What are the differences, and how can I make an informed decision about what to buy?

Many Factors Influence Prices

Many factors influence PC-clone prices. If you want to buy a computer that you will be able to use for your work, for a good price the best thing to do is to *test the software you will use* on the machines you are considering buying. By doing so, you can determine if the differences in features and performance between the various machines are important for the work you will be doing.

In no particular order, what follows is a list of possibilities for the low-lower-lowest prices that are being advertised.

- ✓ Many manufacturers of PC-compatible microcomputers cut their labor costs by producing their product offshore.
- ✓ Some vendors of PC-clones have been hit hard by the recession and many have excess inventory that they're liquidating at deep discounts. High-volume electronics stores are taking advantage of this situation by buying the inventories and then reselling them.

If you are uncomfortable about buying a computer from a vendor that is on shaky financial ground, you might want to do a little research before making the plunge. This doesn't necessarily mean that the product is inferior, but it may make getting future service and repairs challenging.

✓ Some high-volume electronics stores will have manufacturers build models to a certain specification, like a 42.3 megabyte (MB) hard disk. Then, the store offers this computer and its 42.3MB hard disk with a guarantee of a full refund if you find the system sold for less anywhere else. The catch is, you will not find a computer with a 42.3MB hard disk anywhere else. The hardware vendor only builds that particular computer for this specific store. This situation can make it difficult to do direct comparisons among systems, but direct comparisons are the best way to ensure that you get the most for your money.

✓ Some manufacturers shave costs by combining new and old technology. For instance, the central processing unit (CPU) might be an Intel 386 running at 33 megahertz (MHz), but the hard drive access time, memory speed, and peripheral bus might be older, and, therefore, slower, technology. The supporting electronics aren't able to keep up with the CPU, which slows the total performance of the computer.

Other Components To Check Out

Other components to check out include the power supply, expansion slots, RAM (random access memory), video circuitry, and available ports.

- ✓ The power supply might not have enough wattage to support expansion slots or extra drives.
- ✓ Upgrading RAM might not be an option or may require chips rather than standard SIMMs (Single Inline Memory Modules). An inexpensive model may not have a RAM cache, which can greatly improve system performance but typically adds a couple hundred dollars to the price.
- ✓ Check for the resolution and number of colors supported by the video circuitry. Some VGAs (video graphics adapters) will only support 256 colors, while other VGAs can support more colors and higher resolutions. If you look at how quickly the screen is updated, significant performance differences can be readily apparent between different vendors' video cards.
- ✓ Only one serial port may be provided. If you're planning to use a serial mouse and modem at the same time, you would have to purchase a serial expansion card.

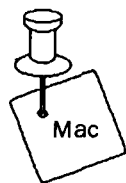
✓ Keyboards with a squishy touch or cases that are made of plastic rather than metal are other things to evaluate.

Buying computers requires research and comparison shopping. Remember, the best way to determine if a computer will fit your needs is to test drive the software you plan on using on the computers you're thinking about purchasing. Bringing along an example of the work you will be doing also helps in making the final decision.

To reinstall the hard drive SC driver:

1. Use the on/off button to shut off the stalled PowerBook.
2. Use the *Disk Tools* disk to restart the PowerBook.
3. Double-click on *HD SC Setup*.
4. Select *Update* from the resulting menu. (This will update the HD SC driver on the PowerBook's hard drive but will not affect applications that are already installed on the hard drive.)
5. Restart the PowerBook in the normal manner.

PowerBook Tips



Here are two PowerBook tips.

❶ Don't Move Sleeping PowerBooks

PowerBooks have three power states: on, sleep, and off. You should not move a sleeping PowerBook. Instead you should use the *File* menu's *Shut Down* command to turn the PowerBook off. (Doubters can read *Turning the Macintosh On and Off* in their User's Guide.)

❷ Stalled PowerBook 140 and 170 Hard Drives

Macintosh PowerBook Models 140 and 170 with serial numbers in the range F2140-F2141 who regularly experience the symptom described below will want to reinstall Apple's hard disk setup software. (For example, serial number F2140KY0706 is in the range but CF1450BF703 is not.) PowerBook 140 and 170 serial numbers are on the inside of the back panel, where you will also find the power button.

Symptom

After the drive goes to sleep, it will not properly start up when it is accessed again. (During normal operation, if the hard drive is not being accessed, it will spin down to conserve power.) The result will be a system error or a system hang.

Solution

Installing the version 7.0.1 HD SC driver from the *Disk Tools* diskette should resolve the problem. Why? The hard drives of machines in the range F2140-F2141 may have been set up with the wrong version of the HD SC driver.

Book Center Notes



The offers listed here are made to University departments, employees, and students, and are subject to the eligibility rules of the Micro-computer Discount Program. If you have questions about availability, phone the Electronics Desk in Williamson Hall at 625-3854. The Electronics Desk is open Monday-Friday from 8:30 am to 5:30 pm.

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 all 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.

Table 1: ZEOS Upgradable Value Systems

Features	Package 1	Package 2	Package 3	Package 4
CPU and Prices				
• 386-25	\$ 1230.25	1705.25	2085.25	2465.25
• 386-33	\$ 1325.25	1800.25	2180.25	2560.25
• 486SX-20	\$ 1420.25	1895.25	2275.25	2655.25
• 486-33	\$ 1610.25	2085.25	2465.25	2845.25
Memory: 80 ns DRAM	1MB	2MB	4MB	8MB
Mouse: Microsoft	no	yes	yes	yes
ZEOS Monitor				
• 14" Monochrome	flat screen, Hi Res Amber	VGA	na	na
• VGA Color: non-interlaced 1024x768 res	na	na	yes	yes
Video Card				
• Graphics	Hercules	na	na	na
• Diamond SpeedStar Plus	na	yes	yes	yes
Drives				
• IDE hard drive	42MB	107MB	130MB	210MB
• Teac 1.2MB floppy	1.2MB <i>or</i>	yes	yes	yes
• Teac 1.44MB floppy	1.44MB	yes	yes	yes
Software				
• Choice of DOS 4.01 with GW/Basic or DOS 5.0 with Q Basic	no	yes	yes	yes
• Windows 3	no	yes	yes	yes
• AmiPro	no	yes	yes	yes
• Lotus for Window	no	yes	yes	yes

● ZEOS Upgradable Value Systems

The ZEOS line of upgradable value systems is available from the Book Center. At press time the Microcomputer HelpLine did not have display models of any of these systems.

Integrated onto the motherboard on these systems is one parallel, two serial, and one game port. The case and slots for all the "value" systems are also the same: 2 cooling fans and 7 drive bays, as well as seven 16-bit and one 8-bit expansion slot. (One slot is used for the video card.) These systems include 80 nanosecond system memory, a 200 watt power supply switchable between 115/230V, a video card capable of displaying 256 colors, and a reduced size keyboard that has the function keys across the top.

Upgradable Options

The upgradable part of these systems refers to the processor. If you want a different processor within 30 days of making your purchase, the cost (or refund) is the difference in the original prices of the packages. In addition, you may

upgrade to an 8 bay vertical case with a 300 watt TurboCool power supply for \$142.50. You can add a 128K cache for \$190.

Other ZEOS Upgradable Systems

The other line of ZEOS upgradable systems offers the same upgradable options at the same prices as those listed above. However, these other upgradable systems come with faster 53 nanosecond system memory, a 300 watt power supply switchable between 115/230V, a Super VGA card capable of displaying 32,000 colors, and an F12 keyboard with function keys down the side.

How much money you save by purchasing the *value* system is listed below. The savings is based on the package not on the microprocessor.

	Savings
Packages 1 and 2	\$ 95
Package 3	190
Package 4	285



Table 2: New Macintosh Prices and Configurations

Mac Part #	CPU / Speed	Megabytes		Price		
		RAM	Hard Disk	Old	New	
Macs with built-in monitors						
🍏 Classic M1560LL/B	68000 / 8MHz	4*	40	\$1195	\$995	
🍏 Classic II M1540LL/A	68030 / 16MHz	2	40	\$1399	\$1020	
M1543LL/A		4	40	na	1135	
M1542LL/A		4	80	1775	1245	
🍏 PowerBook 100 with 1.44 Superdrive	68HC000 / 16MHz	M1045LL/A	2	20	\$1825	\$1475
M4159LL/A		4	40	na	1900	
with no floppy drive M4144LL/A		4	40	na	1755	
Macs requiring external monitors						
🍏 LC M1218LL/A **	68020 / 16MHz	4*	40	\$1690	\$1250	
M1201LL/B (with VRAM)		4	80	1980	1445	
🍏 Ilisi M0491LL/A	68030 / 20MHz	3	40	\$2500	\$1900	
M0364LL/A		5	80	2950	2350	
🍏 Ilci M5728LL/A	63030 / 25MHz	5	none	\$3295	\$2450	
M5718LL/A		5	80	3700	2900	
M5722LL/A		5	160	4095	3295	

* These Macs previously came with 2MB of RAM.
 ** Previously this LC came with VRAM. The part number for the 40MB configuration also changed.

● Apple Price and Product Changes

Apple Computer recently announced price reductions and configuration changes to some of their products. Table 2 lists the changes.

Discontinued

The Apple Tape Backup 40SC, the LaserWriter II SC, and many LaserWriter upgrades are no longer available.

Mac LC and VRAM

Under the new configurations only one of the Mac LC's comes with extra video RAM (VRAM). When you use the Mac LC's built-in video card with the 512K VRAM option, you can view more colors or shades of gray, as shown in the Table 3. You can purchase the 512K VRAM separately at the Book Center for \$175.

The Mac LC's built-in video circuitry does not support Apple's Portrait, Two-Page, 16-inch Color, and 21-inch Color monitors. (You can use these monitors with other machines in the Mac II family if you install Apple's 8•24 or 8•24GC card in a NuBus slot. These cards do not work with the Mac LC's 020 Direct Slot.)

● New ZEOS Equipment in the HelpLine

The Microcomputer HelpLine in 125 Shepherd Labs recently acquired the ZEOS equipment listed below; it is available for test drives.

- 386SX-20 without cache, 4MB RAM, 130MB hard disk
- 386DX-33, 4MB RAM, 130MB hard disk
- 486DX-33, 8MB RAM, 210MB hard disk
- Diamond SpeedSTAR HiColor VGA adapter
- 14-inch color SuperVGA monitor

With compatible software, such as special drivers, you can display 32,000 colors at 800x600 resolution or 256 colors at 1024x768 resolution on the video equipment that's on display.

Table 3: Mac LC Monitor

Apple Monitor	Price	Res	Colors or Shades of Gray	
			Built-in	With VRAM
12" Monochrome	\$195	640x480	16	256
12" RGB color	390	512x384	256	32,000
13" HiRes color	650	640x480	16	256

LaserWriter Upgrades

LaserWriter upgrades are available directly from Engineering Services. To order an upgrade call them at 625-1595. Table 4 lists the only Apple upgrades available; the discount prices include the cost of installation.

Table 4: List of all LaserWriter Upgrades

Upgrade From	Upgrade To	Discount Price
IISC	IIf	\$ 1070
IISC	Ilg	1740
IINT	IIf	750
IINT	Ilg	1420
IINTX	IIf	640
IINTX	Ilg	1310

● Word 5.0 for Mac Upgrade

Microsoft Word for the Mac has changed a lot since it was introduced in 1985. Some highlights of version 5's new features are described below.

To run Word 5.0 you need at least a Mac Plus with one megabyte of RAM and System 6.02 or higher. We recommend that you have at least 2MB of RAM. Some features, such as the grammar checker, require at least 2MB of memory.

Version 5.0 Free or Fee?

Those who bought the Academic version of Word 4.X on or after September 1, 1991 can get a free upgrade. Otherwise you must buy the upgrade.

To obtain the free upgrade, bring dated purchase information and your original Microsoft disks to the Electronics Desk. At press time, free upgrades were in stock. Although the Electronics Desk can order free upgrades, they involve different paperwork than normal purchases. So before you stop in to pick up a free upgrade, it is wise to call to be sure the Electronics Desk has them in stock.

Although the Book Center does not get discounts on Microsoft upgrades, their everyday \$100 price is lower than Word 5.0's \$129 upgrade cost - and you don't have to pay shipping and handling.

For more information on upgrades, contact Microsoft at 800/426-9400. Identify yourself as an end user.

Drag, Drop, and Ribbon

The Drag and Drop feature lets you move words, sentences, and paragraphs just by clicking on highlighted text and dragging it to its new location. This grab and move feature is quicker than cutting and pasting.

The Ribbon simplifies text formatting by letting you change fonts, format text, create columns, or create a drawing by clicking the mouse on icons. The icons sit in a ribbon at the top of your screen.

Print Merge Helper and Equations Editor

The new Print Merge Helper guides you step-by-step through a form letter. The Print Merge Helper also graphically helps you create a data document, link it to your form letter, and insert information.

Word's graphical equation editor makes it easier to create complex formulas. The Equation Editor is accessible from Excel and other applications that support some AppleEvents (discussed under *Full Support for System 7.*)

Find Documents by Keywords

Now Word lets you locate files even if you cannot remember the file name. You can search documents using keywords, title, author, date, or any word in the document.

Conversion Utilities

Word 5.0 includes conversion utilities for word processing applications such as Microsoft Word for Windows, Microsoft Word for DOS, WordPerfect for DOS, and MacWrite II as well as conversions for some graphics files. These graphics conversions enable you to open PICT, Paint, and EPS (Encapsulated PostScript) files in Word.

Full Support for System 7.0

Word 5.0 offers full support for System 7.0, including Balloon Help, TrueType fonts, and Publish and Subscribe. In addition, Word supports a suite of Object Linking and Embedding (OLE) AppleEvents that are defined by Microsoft. This technology lets you integrate information in more ways. For example, to access the Equation Editor's full features, you can double-click on an equation that is embedded in a Word document.

Plug-in Modules

With Word 5.0, Microsoft introduces plug-in modules, a new modular architecture. This design enables you to choose the specific features they want to install. Many of Word 5.0's features, such as Find File, Drawing, and voice annotations, are actually plug-in modules.

Help: Computer and Information Services

Consulting Service *Phone* *Help Line Hours*

Computer Services Information Line 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.

<i>Machine</i>	<i>ID</i>		
<input type="checkbox"/> CYBER	NOS/VE, NOS, EP/IX, MEDLINE...	626-8366	Monday-Friday 9 am to 4 pm
<input type="checkbox"/> IBM	CMS	624-6235	Monday-Friday 9 am to 4 pm
<input type="checkbox"/> VAX, ENCORE, CYBER ..	UX, VX, VZ (CA goes June '92)	626-5592	Monday-Friday 8:30 am to 4:30 pm
1 Nicholson Hall Walk-in Consulting			Monday-Friday 10 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 99B Coffey Hall 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. Hakomaki, S. Hickman, M. Hu, J. Jabr, J. Jannett, D. Johnson, P. Kachelmyer, M. Kelleher, D. Larsen, J. Larsen, J. Larson, P. Lindner, M. McCahill, P. Oberg, K. Olson, N. Ostrom, J. Pearson, K. Pearson, C. Plaisance, E. Schleske, C. Squires, K. Teder, E. Thayer, A. Thomas, H. Tonsky, D. Torrey, S. Traxler, L. von Munkwitz-Smith

General Information

Acting Associate Provost with Special Responsibility for Computing & Information Systems on the Twin Cities Campus
 Donald R. Riley 626-9816

Computer and Information Services
 Computing Services Operations, Mike Skow; Distributed Services and Planning, Shih-Pau Yen; Software Services, Lee Croatt; St. Paul Services, Mel Sauve; Networking Services, Lawrence Liddiard

Adaptive Technology Services (voice) 6-0365
 (TDD) 4-4037



Central System Accounts:
 UX, VX, VZ (the CA goes in June 1992) 6-5592
 NOS/VE, NOS, EP/IX, MEDLINE 6-8344
 IBM CMS 4-7788



Data Entry Services, Minneapolis 6-8351
 St. Paul 4-7297





Equipment Repair and Warranties, Lauderdale 5-1595
 Faculty Resource Center 6-1090
 Instructional Computing on Central Systems 6-0200
 Networking Services, Network Addresses, 130 Lind .. 5-8888
 Software Services 5-2303
 Tape Librarian at Lauderdale Computer Facility 6-1838
 Training, Course Registration, 132 ShepLab 5-1300




Other Departments
 Electronics Desk, Williamson Hall Book Center 625-3854
 Telecommunications, Networking Services:
 Information 6-7800
 Repair 5-0006




Access Information




 Internet addresses.
 The terminal settings for dial-up access to the University's central systems are 8-1-N (8 data bits, 1 stop bit, no parity) unless otherwise noted. Some phones work at 7-1-even (7 data bits, 1 stop bit, even parity). Which phone number you use may depend on the modem's bps (bits per second) or baud rate.

LUMINA
 300/1200/2400 625-6009 
 _____ LUMINA.LIB.UMN.EDU 

UX, VX, VZ, CA, INFO (VX)
 300, 1200 626-0300-1200 
 2400, 9600 626-2400-9600 
 300/1200/2400 at 7-1-even 626-1630 
 _____ UX or VX or VZ or CA.ACS.UMN.EDU 

NOS, NOS/VE, EP/IX, MEDLINE (NOS/VE)
 300/1200/2400 625-1445 
 up to 19.2 campus data phone line 3-2400 
 _____ NOS or NVE or EPX.HSCS.UMN.EDU 

IBM CMS at 7-1-even
 1200/2400 624-4220 
 up to 19.2 campus data phone line _____ 4-4220 
 _____ VM1.SPCS.UMN.EDU 

Computer Consultant (log in as gopher)
 300, 1200 626-0300-1200 
 2400, 9600 626-2400-9600 
 _____ CONSULTANT.MICRO.UMN.EDU 

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Staff

Student

Alumni

Other

Electronic-Mail and FAX Options

You can also send us your subscription requests by fax or E-mail. Fax a subscription request "coupon" to 612/625-6817 or E-mail your request to this internet address:

newsletter-subscription@boombox.micro.umn.edu

Electronic-mail Notification Service

- We receive notices of software and hardware fixes, seminars, helpful hints, and various computer related items from many sources. This information may be of immediate importance or interest to the University community. To make this information available in a timely manner, we offer an E-mail news notification service that periodically sends out "news" bulletins. To subscribe to this free service, send E-mail to:

news-request@boombox.micro.umn.edu

Computer and Information Services

The University of Minnesota is committed to the policy that all persons should have equal access to its programs, facilities, and employment without regard to race, color, creed, religion, national origin, sex, age, marital status, disability, public assistance status, veteran status, or sexual orientation.

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Computer and Information Services Newsletter

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Minneapolis, MN 55455-0421

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10

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Published Monthly By

Computer and Information Services
Distributed Services and Planning
Managing Editor, M. Kelleher

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