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Fax Service via E-mail

Did you know that our E-mail system's fax gateway enables you to send faxes directly from your desktop computer? This centralized gateway allows you to use your preferred mail system, for example POPmail or PINE, to directly send faxes to University and non-University local phone numbers.

Since some of the people you need to communicate with may not use E-mail regularly, this option allows you to send them the same faxed message you're sending to others via E-mail.

Messages may contain plain text or PostScript files. The fax gateway converts these mail messages to fax format, generates a cover sheet, dials the phone number, and transmits the fax message. It even sends you a message confirming that it delivered the fax.

To Send a Fax

Using your regular E-mail system, send your message to the fax gateway using the 3-part command format shown in Figure 1.

In most cases, this command goes in the "Send to" field. VMS Mail, CMS Mail, and PROFS mail are a little different. See the *Examples* section and Figure 2 for the E-mail system you'll be using.

➥ continued on next page

After entering the first part of the command,

```
/pn=
```

replace *First.M.Last* with the name of the person to whom you're sending the fax, for example *John.Doe*, using periods instead of spaces to separate parts of the name. This name will be printed in the "To" field on the fax cover page.

After entering the next part of the command,

```
/dd.fax=
```

replace the *9-9999* with the fax number. Use 5 digits for on campus fax numbers, for example 5-4321. Use 7 for non-campus local fax numbers, for example 123-4567. (Long distance faxing is not allowed at this time but will be available in the future).

Generally you will enter the last section of the command

```
/@fax.tc.umn.edu
```

just as it appears—it directs your message to the centralized fax gateway.

Examples

For specific examples of the E-mail system you'll be using, see Figure 2. These E-mail systems provide the "to," and "send to" messages. We'll call those messages system prompts. You enter the fax gateway commands after those system prompts.

In Figure 2 the name and fax number, which are italicized, are the parts of the command you must change.

Figure 1: Fax Command Format

```
/pn=First.M.Last/dd.fax=9-9999/@fax.tc.umn.edu
```

Figure 2: Examples

POPMail, all mail systems on staff.tc.umn.edu and student.tc.umn.edu, other UNIX mail, and NVE
In the "To:" field enter

```
/pn=john.doe/dd.fax=9-9999/@fax.tc.umn.edu
```

VMS Mail on VX or VZ
When prompted for "To:" enter

```
in%"/pn=john.doe/dd.fax=9-9999/@fax.tc.umn.edu"
```

CMS Mail on VM1
After you receive the "Ready;. T=..." system prompt, enter the following command on the CMS command line

```
mail  /pn=john.doe/dd.fax=9-9999/@fax.tc.umn.edu
```

PROFS on VM1
At the "send to:" prompt enter

```
smtp
```

Respond to the "From:" and "Subject:" fields as usual. Then add the following line in your *message*, with the period beginning in the *first column*

```
.ddn  fax.tc.umn.edu(/pn=john.doe/dd.fax=9-9999/)
```

The PROFS system differs from the other mail systems in that it requires that the fax gateway information be entered on the first line of the *text* section, rather than in the "send to" section.

E-mail Enclosures Part 1: Using POPmail

Overview

Whether you are using PINE or POPmail to send and receive messages, you can use E-mail to send more than just simple text messages. You can also use E-mail to send files created with software such as spreadsheet, database, graphics, or word processing programs. For example, you can send a message asking for feedback on a report you've created with your word processor and include the report along with the message.

In this article, we'll discuss sending these types of files using POPmail's enclosure feature. In a future newsletter article, we'll discuss sending these files using PINE.

It's Automatic with POPmail

Most E-mail systems are designed to handle *plain text* files only. These files are sometimes called ASCII (American Standard Code for Information Interchange) files. Plain text files contain text without any extra frills, such as graphics or formatting codes (e.g. codes to change the margins or the font).

Files that are not plain text files are called *binary* files. Binary files contain computer code. To send binary files through E-mail, the files must first be encoded or converted to a plain text format.

The Enclosure feature of the Mac and PC versions of POPmail uses an encoding method called BinHex. BinHex works on any type of file, including formatted word processing and spreadsheet files, graphics files, and even executable files (i.e. programs or applications). In other words, POPmail allows you to send any type of file through E-mail by enclosing the file with an outgoing message.

When you choose to enclose a file, POPmail *automatically* encodes the file in a plain text format. The encoded file can be passed from machine to machine in its encoded form. The encoding will remain intact, and it will be equally meaningless on all the machines. To be usable or readable it must be converted back to its original format and be "run" on a compatible computer.

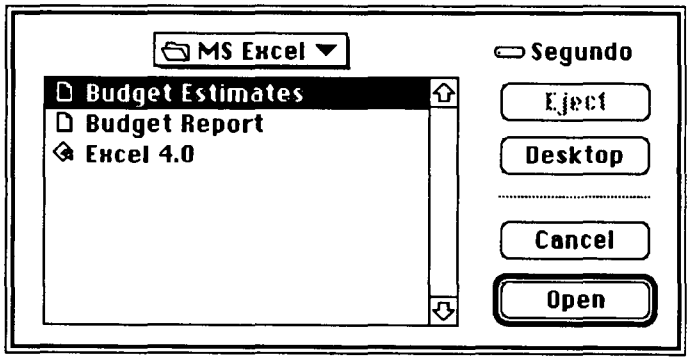
If you send the file as an enclosure to someone who uses POPmail, the unencoding is performed automatically. However, if you send the file to someone who doesn't use POPmail, they must unencode the enclosure themselves using a BinHex program. Both situations will be discussed in detail below.

Sending a POPmail Enclosure

Using the Mac or PC version of POPmail to enclose a file with an E-mail message is very easy. Although the instructions below refer to using a mouse, PC POPmail users without a mouse can use PC POPmail's manual or on-line help to find instructions on how to do these same things using the keyboard.

To enclose a file with an outgoing message, simply click on POPmail's *Enclose* button, and you will be presented with a dialog box that allows you to find and select the file you wish to enclose. Figure 1 shows a Mac dialog box; the PC dialog box is similar. To select a file, click on the name of that file, and then click on the *Open* (Mac) or *OK* (PC) button. In Figure 1 we've selected the file named "Budget Estimates."

Figure 1: Select a File to Enclose



To confirm that you have selected an enclosure, PC POPmail displays the name of the file at the bottom of the window. Mac POPmail displays the name of the file in the upper right corner of the window, as shown in Figure 2.

When you're ready to send the message and its enclosed file, click on the *Post* (Mac) or *Send* (PC) button.

Figure 2: Message Confirms Enclosure is Attached

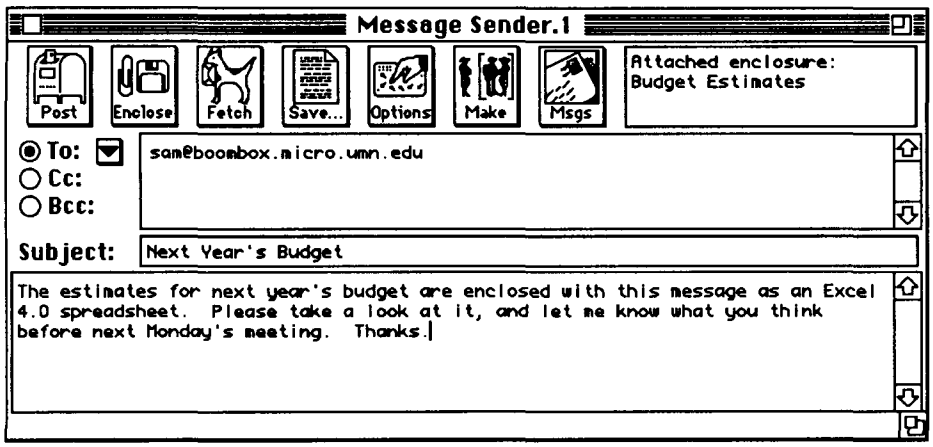
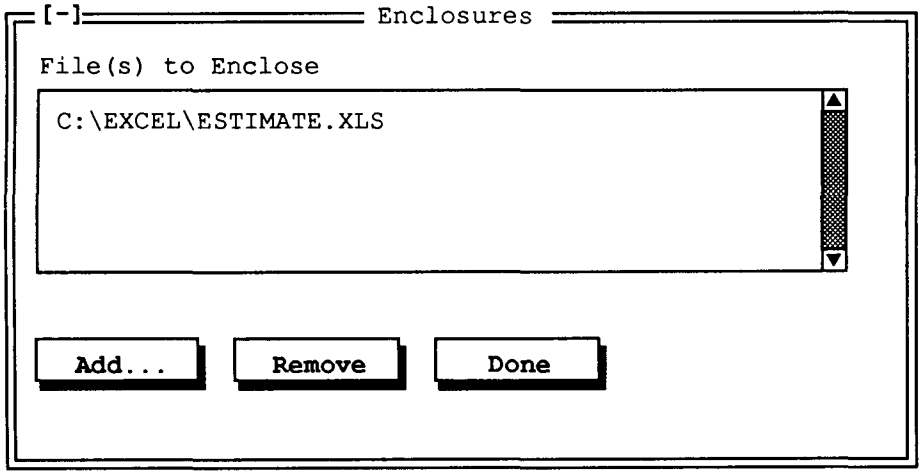


Figure 3: List of Attached Enclosures



Multiple Enclosures

Mac POPmail allows you to enclose only one file with each message.

After enclosing a file in PC POPmail, however, you can enclose another file by clicking on the *Enclose* button again. As shown in Figure 3, the resulting dialog box displays a list of files already enclosed with the message. When you click on the *Add* button, PC POPmail will again present the dialog box that allows you to find and select a file to enclose.

Caution

When enclosing files, keep in mind that each enclosure adds to the overall size of the message.

Since some E-mail systems cannot handle large messages, enclosing too many files can prevent your message from reaching its destination. As a rule-of-thumb, when sending an enclosure to someone who doesn't use POPmail, limit the combined size of the enclosed files to less than 32K.

Canceling Enclosures

Canceling an enclosure is much like selecting an enclosure in the first place. You begin by clicking on POPmail's *Enclose* button.

Mac POPmail will display the dialog box shown in Figure 1, whereas PC POPmail will display the dialog box shown in Figure 3. In either case, select the enclosure you wish to cancel by clicking on the name of the file, and then click on the *Cancel* (Mac) or *Remove* (PC) button.

Receiving a POPmail Enclosure

How you handle incoming POPmail enclosures depends on whether or not you are also a POPmail user.

POPmail Users

POPmail enclosures can, of course, be sent to people who are using POPmail to read incoming E-mail messages.

If you are a POPmail user and you receive a message with an enclosed file, a line at the end of the message notifies you that an enclosure has been received. The enclosed file is ***automatically*** unencoded and saved on your disk. In other words, you automatically have a copy of the file just as if you copied it using a diskette.

When you set up or configure POPmail for the first time, you are asked to specify a subdirectory or folder for storing incoming messages. Many people use a common name such as "Incoming."

Mac POPmail saves incoming enclosures in the same folder as incoming messages. PC POPmail saves incoming enclosures in a subdirectory called *ENCL*. This subdirec-

tory is located inside the subdirectory where incoming messages are stored.

Non-POPmail Users

POPmail enclosures can also be sent to people who are using an E-mail program other than POPmail to read incoming messages.

When a non-POPmail user receives a message with an enclosed file, a lot of nonsense text will be appended to the message, similar to the gibberish shown in Figure 4. This gibberish is actually the enclosed file encoded in a BinHexed format. You must use a BinHex program to unencode (convert) this text back into the original file. We'll discuss using Mac and IBM-PC versions of BinHex below.

Preparing BinHexed Text

Before using BinHex to convert the enclosure, you must save the BinHexed text in a separate file using whatever steps are appropriate for your E-mail program.

Typically this is done by saving the entire message in a file and then editing the file so that it only includes the BinHexed text. In our example from Figure 4 you would delete the "From susan@mudhoney" etc. part of the message. The final edited file:

1. must start with the line that says *(This file must be converted using BinHex 4.0)*

2. must be saved as a plain text file.

And if multiple enclosures were received, each must be saved in a separate file.

Unencoding the BinHexed Text

We've included separate instructions for those who use IBM-PCs and Macs. Both BinHex programs mentioned below are available from all our Microcomputer HelpLines. To obtain a copy you must supply your own formatted disk.

IBM-PC: use PC BinHex

If you are using an IBM-PC, we recommend *PC BinHex* for unencoding BinHexed text files. Our department wrote PC BinHex and put it in the public domain. You can get a copy from our IBM Information Server in the following location:

```
p:\app&util\binhex
```

After starting PC BinHex, click on the

```
Hex2Bin
```

button or press the F3 key. You will be presented with a dialog box that allows you to find and select the file you want to unencode. To select a file, simply click on the name of the file, and then click on the *Open* button.

Once you click on the Open button, the BinHexed text file is converted back to the original file it represents. The unencoded file is saved in the same subdirectory where the PC BinHex program is stored.

Mac: Use BinHex v4.0

If you are using a Mac, we recommend BinHex v4.0 for unencoding BinHexed text files. BinHex v4.0 was written by Yves Lempereur of Mainstay and is in the public domain. You can get a copy from our Mac Information Server in the following location:

File Server: *Mac Information, information*
Folders: *Utilities, Binhex Etc.*

Figure 4: Encoded Enclosure

```
From susan@mudhoney Fri May 22 09:04:53 1992
...
To: sam@boombox.micro.umn.edu
Subject: Next Year's Budget
...

The estimates for next year's budget are enclosed
with this message as an Excel spreadsheet. Please
take a look at it and let me know what you think
before next Monday.

(This file must be converted with BinHex 4.0)

:$d*eFfPZCA0c)%aPG(4PFJ"A4%*1690A4!J!N!1X!*!&5"(q
3#!%!N!-'B!!!UQS!N!B&B!#3'UJ!!0!!!+J!!0!!!+M3!*!%
ShJ!5!!#Sm!#3"+M`!*!%U2!!N!5Sm!!+!!#SqJ!+!!#T"!#3
...
bD`#3!a3&9'PYCA-!N!-9#8KPE(CPG'PMBB!"!3#3"(S!N!0k
&+!!#!G8"r!!S!!)!qJ(m!$%23R9cD@jPFh-J6'9dG'9b&&G[
[Bh9YC@jd!*!$!P*R!P*R!*$r!*#BEL-!!!%#!`:
```

Note: Although a newer version of BinHex exists, we recommend version 4.0. Version 4.0 is more stable and is still considered the standard program.

After starting BinHex v4.0, select

Upload → Application

from the *File* menu. You will be presented with a dialog box that allows you to find and select the file you want to unencode. To select a file, click on the name of that file, and then click on the *Open* button.

After clicking on the Open button, you will be presented with a dialog box that allows you to choose where you want to save the unencoded file.

Encoding (BinHexing) a File

Should you need to manually encode a file yourself (the Enclosure feature of POPmail does this automatically for you), both of the BinHex programs discussed above have options for encoding a file as a BinHexed text file.

Both programs will automatically append

`.HQX`

to the name of the file you select to be BinHexed. For example, if you select a file called "TEST," the BinHexed version of the file will be called "TEST.HQX."

To BinHex a file with PC BinHex, click on the

`Bin2Hex`

button or press the F2 key.

To BinHex a file with BinHex v4.0 on the Mac, select

Application → Upload

from the *File* menu.

In both cases, you will be presented with a dialog box that allows you to find and select the file you want to encode.

Considerations

Whether you send files via floppy disks or via POPmail enclosures, there are several things to consider to ensure that the recipient can successfully use the file. The less you know about the recipient's hardware and software, the more likely you are to run into unforeseen problems.

Appropriate Software and Printer

Before sending a POPmail enclosure, you should consider the following questions to ensure that the recipient will be able to look at and print the enclosed file. Does the recipient have:

- ❑ a program that can open the file? If not, do they have software capable of converting the file?
- ❑ the supplemental files needed to successfully manipulate the file, including such files as style sheets, glossaries, or user dictionaries?
- ❑ the appropriate printer and printer fonts to print the file as you intended it to look?

File Names

Before sending a POPmail enclosure, you may also want to consider renaming the enclosed file because inappropriate file names can sometimes cause trouble for the recipient.

As shown in Table 1, Mac file names can contain spaces and can be fairly long. PC file names cannot contain spaces and can only contain up to 8 characters. A PC file name may also be followed by a period and an optional extension that can contain up to 3 characters.

Table 1: Acceptable File Name Examples

Mac	PC
Weekly Report	WKREPORT.DOC
Budget Estimate	ESTIMATE.XLS
1992 Spider Lake Loon Data	LOONDATA

Mac to PC

If someone using PC POPmail receives an enclosure with an unacceptable file name, the name is simply truncated to the first eleven acceptable characters. For example, "1992SPID.ERL" is the truncated result of "1992 Spider Lake Loon Data."

This strange file name may confuse the PC user because it does not clearly describe the contents of the file. Worse, the strange extension may make it difficult for the PC user to open the file since some PC programs only recognize files with certain extensions. For example, Word for Windows normally only recognizes files with a .DOC extension. Although it is not difficult to force Word for Windows to recognize files with other extensions, the PC user may not know how to do it.

PC to Mac

If someone using Mac POPmail receives an enclosure with an improper extension, the enclosed file will not arrive with the proper icon. All files on a Mac are represented by icons, or small pictures, that indicate the application used to create the file. Without the proper icon, the Mac user will not be able to double-click on the file to open it.

For example, if a Mac user receives a Word for Windows file with a `.WK1` extension, the file will actually arrive with an Excel icon. If they double-click on the file to open it, the Mac will unsuccessfully attempt to open the file with Excel instead of Word. Although the Mac user can solve this problem by using Word's *Open* command to open the file, they may not be familiar with all the steps involved.

Table 2 lists the appropriate extensions to use for some common Mac applications.

Ethics

Although it is possible to enclose an executable file (i.e. a program or application) with a message, it may not be legal to do so. After all, sending someone software via a POP-mail enclosure is just like giving them a copy of the software on a diskette. Therefore, you should only send software that is in the public domain or whose license agreement allows it to be freely copied.

For additional information on when it is illegal to copy software, refer to the article called *Copying Software* in our February 1993 newsletter.

Etiquette

As mentioned before, enclosing a file with a message adds to the overall size of the message. Enclosing a large file or multiple files can result in an extremely large message that may be difficult or impossible for some E-mail systems to handle. The message may bog down the entire E-mail system, or the message may never reach its destination.

To avoid these problems, consider the strategies listed below.

1. Enclose only one file per message.
2. Break up large files into smaller files.
3. Send enclosures to one person at a time or to small groups only.
4. Send enclosures during off-peak hours.

Although large messages pose less of a problem when one University of Minnesota POPmail user sends something to another POPmail user, we still urge you to be courteous and use common sense. Consider whether all of your recipients want to wait while their E-mail program fetches and unencodes a large enclosure.

Table 2: How Macs Interpret PC Extensions

Use this PC Extension	For this Mac Application	And this Mac Document Type
.XLS	MS Excel	Excel spreadsheet
.WKS	MS Excel	Excel spreadsheet
.WK1	MS Excel	Excel spreadsheet
.TXT	MacWrite II	ASCII text
.BAT	MacWrite II	ASCII text
.C	MS Word	ASCII text
.CPP	MS Word	ASCII text
.DOC	MS Word	Word document
.RTF	MS Word	RTF

Gopher™ News

▼ Board Your Info in Our Gopher™ Hotel

If your department or organization has information you'd like to share with the rest of campus—or the world—you may be interested in checking out our Gopher Setup Service.

This new service enables departments, student organizations and individuals to make their information available to others through Internet Gopher. For very affordable rates, your organization can have its own Gopher server. Any information you place on the server will be accessible throughout the worldwide Internet or access to it can be limited.

In the past, organizations that wished to make their information available to others needed to purchase their own computer to use as a server, install the required software, and maintain the service. Now, however, you can simply "rent space" on one of our central system computers, place your information on it, and we'll maintain the hardware, manage software upgrades, and perform backups so that your information can be accessed 24 hours a day, 7 days a week.

The Service

Your group will be allocated a Gopher server on one of our central system computers and provided with written instructions for placing documents and special items in your server. These documents are text files, which can be created using practically any word processor on a Macintosh, PC, or central system.

Daily backups of all data and re-indexing of Gopher search items will be done automatically. In addition, special tools are available exclusively through this service for easy editing of menus, and creation of search items and external links. Search items allow users to search your entire server for documents containing a specified set of words. Links allow you to provide seamless access to information on another Gopher server.

Figure 1: *University of Minnesota Campus Information* Section

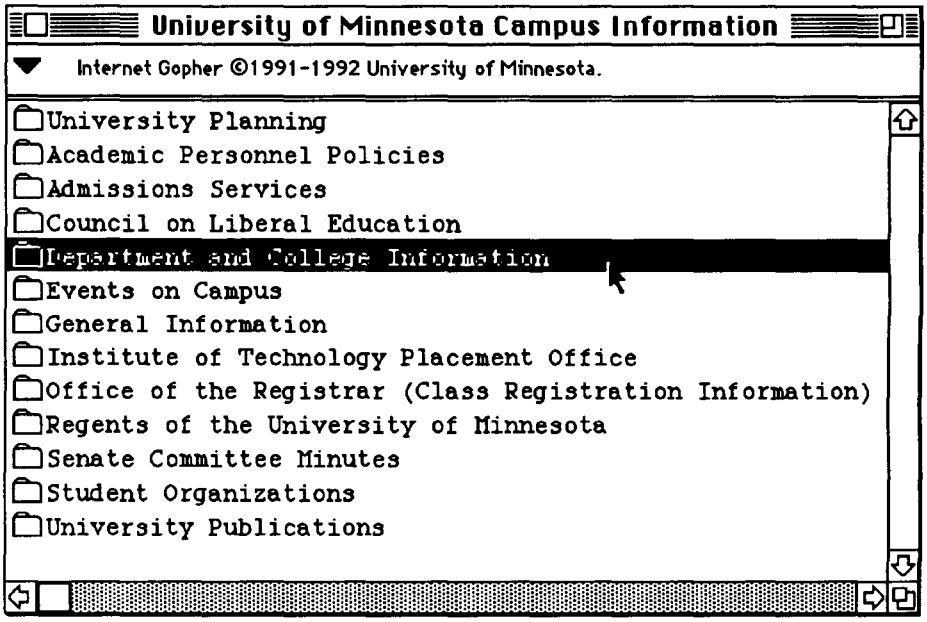
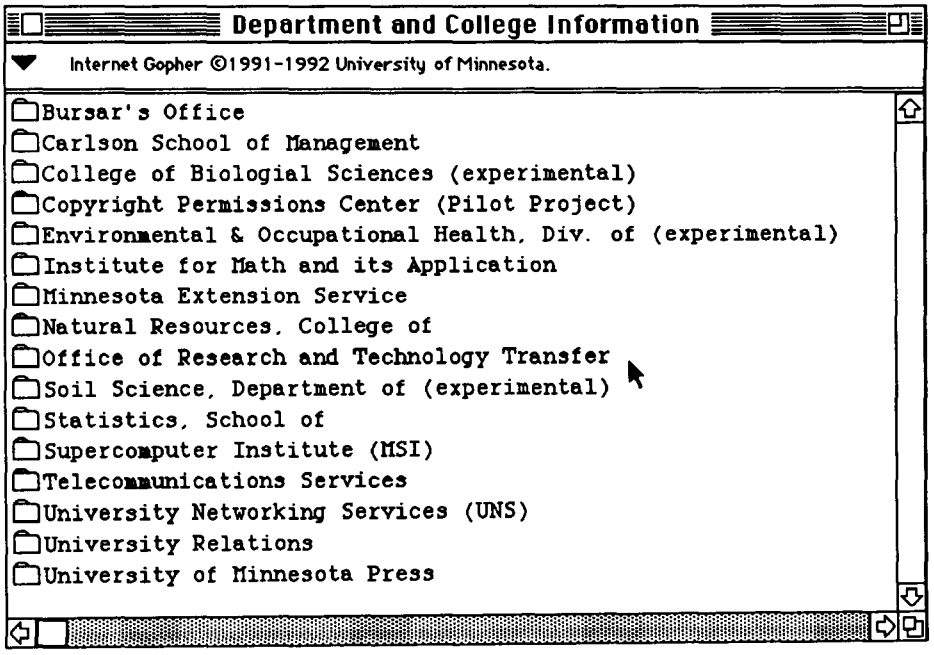


Figure 2: *Department and College Information* Section



When the data is set up, your organization's Gopher server can be made accessible through the University of Minnesota's main Gopher entry point, making your information accessible to a wide audience.

Rates

This service is available for a flat monthly rate of $15, plus a one-time fee of $100 for the initial setup. This rate covers all the above services, plus 10 megabytes of disk space for storing Gopher documents. Special arrangements can be made for groups with significantly greater space needs. Additional consulting or more specialized training will also be available at standard consulting rates.

For More Information...

For practical information about this service contact Cheryl Vollhaber by phone at 625-2303 or by E-mail at

clv@vx.cis.umn.edu

For a technical description of this service, send E-mail to Benjamin Littman at

bjl@staff.tc.umn.edu

▼ Department and College Information on Gopher™

Figure 1 shows the University of Minnesota Campus Information that is currently available on Gopher.

One of the most recent additions to Gopher is from ORTTA, the Office of Research and Technology Transfer Administration. You'll find them listed in the *Department and College Information* section, as shown in Figure 2. ORTTA's server, which is in the experimental stage, will supply research information, deadlines, telephone numbers, and links to other useful information systems.

Software Services

▼ Automatic MEDLINE Search Updates

If you're a MinnesotaMEDLINE user who regularly updates your searches to include the most recently added citations, you'll be interested to know that MinnesotaMEDLINE can now execute those searches automatically.

Your automated searches can be scheduled to rerun on a weekly, monthly, or quarterly basis, after the appropriate update has been applied. The convenience of having your search automatically performed immediately after the specified update has been applied ensures that you receive the most up-to-date information available. In most cases, your search will be restricted to include only those articles which have been added to the database since the last search.

After your automated search has been performed, the results can be sent on-line to your E-mail address or computer file, or they can be printed and sent to your CIS output bin or campus mail address.

Since these searches will run during "off hours" and since no typing time will be required, the connect time charge for each MEDLINE search can be significantly lower than if you'd performed the searches on-line during regular hours (8 am - 8 pm).

Costs

The cost to have your searches automatically processed include a one time set-up fee of $20, and minimal charges for storage of the search script. Savings from running the search during "off hours" should recover these charges over a short period of time.

To use this service, you'll need a validated username and account on NVE and a tested search strategy which has been saved as a permanent file using the *SAVE* command. You must also specify how the format results should be printed (COMPLETE, LONG, or SHORT format), and the output destination, for example, filename, E-mail address, output bin, or Campus Mail address. (For more information on the save and print commands, see the MinnesotaMEDLINE manual).

For information, phone Kevin O'Rourke at 626-8354.

▼ Software Services Reminder

Here's a reminder of some of the various services that are currently offered through Software Services.

Customizing Applications

The Software Services group customizes a variety of applications for faculty, staff, and departments. The services include programming on multiple platforms (both microcomputer and central systems.)

We can assist you with:

- Installing software and developing applications using University-supported software packages such as 4th Dimension, FileMaker Pro, Paradox, and Excel
- Designing database systems using the relational database INGRES on our VAX system for multi-user access
- Fixing software related problems on microcomputers (IBM-PC and Macintosh)

Charges for technical services are on an hourly basis. To obtain more information about rates and types of projects, call Software Services at 625-2303 or send E-mail to

clv@vx.cis.umn.edu

Data Entry

Are you bombarded with surveys from your latest research study? The Software Services group provides data entry services for those hundreds (or even a couple) of survey forms you've received for your data analysis.

The data entry services can change data into machine-readable files on our central systems accounts for use with SPSS or SAS. Data can also be transferred to floppy disks (IBM-PC or Macintosh, 3.5-inch or 5.25-inch) for use with a microcomputer.

For assistance with data entry and rates, call:

626-8351 at Lauderdale or
624-7297 at St. Paul Computing Services

Reading Tapes and Cartridges

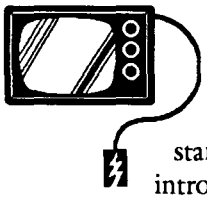
You don't have to struggle to read those strange tapes or cartridges you obtained from another computer site for your statistical analysis. The programmers within Software Services can help you with a variety of data transfers, including:

- Downloading data from 9-track tapes to either a central systems account or floppy disks (IBM-PC or Macintosh, 3.5-inch or 5.25-inch)
- Transferring data from TK50, TK70, and TA90 data cartridges to any central systems account
- Uploading data from floppy disks (IBM-PC or Macintosh, 3.5-inch or 5.25-inch) to central systems or tapes
- FTPing files from tapes to other accounts on the Internet
- Backing up data to tape for storage purposes

Technical assistance is provided at standard consulting rates. For assistance with tape reading or other types of data transfers, call Software Services at 625-2303 or send E-mail to

clv@vx.cis.umn.edu

Computer Basics: Buying a Monitor, Part 1



This article is the first in a three-part series about monitors. The technology involved in producing an image on the screen is constantly changing, new standards are being established, new jargon introduced, and more decisions have to be made in selecting a monitor. The issues are no longer simply "How big?" and "Do I want color or not?"

This first article deals with some of the specifications you should know about in considering which monitor to buy: size, resolution, dots per inch, refresh rate, bandwidth, interlacing, and multisyncing.

The next article will include information on dot pitch, video memory, and color. Finally, we will list the monitors currently available under the University's discount program and their characteristics.

What Do These Numbers Mean?

The three main specifications to consider are physical size of the screen, resolution, and dots per inch. Size and resolution are independent of each other, and dots per inch is a function of both.

Size

Size is one of the hardest measurements to describe, because vendors are neither consistent nor in agreement as to how the screen size of a monitor is to be measured. Some use the diagonal size of the tube, others measure the diagonal size of the actual viewing area, which is usually one inch smaller. Put Company X's 13-inch monitor next to Company Y's 14-inch monitor, and they may well be the same "size."

Picture tubes (also called cathode ray tubes or CRTs) are molded as a continuous surface of glass. The actual shape of the tube is subject to the limits of what you can do with glass. An ideal picture tube would have a perfectly flat front surface because curves cause distortions, but it is prohibitively difficult to mold sharp right-angle corners. Consequently, the edges of picture tubes are curved. This is true of both CRTs used in televisions and CRTs used in computer monitors.

Viewing Area

In televisions, you usually don't care if what appears at the very edges of the screen is somewhat distorted, and so television CRTs "over-scan," that is, the picture extends beyond the region of distortion-free viewing, all the way out to the case. In computer monitors, characters on the edge of the screen must be as legible as those in the center. This requirement keeps the scanning area within the relatively flat region of the screen. The black border you see around the viewing area is where the monitor is too curved to be free of distortion. This is why, on a monitor, the viewing area is smaller than the size of the tube.

Resolution vs. Dots per Inch

In describing or comparing monitors, people often talk about resolution as though it were a measure of sharpness or clarity, and assume that a high resolution monitor will "look better" than one that is not labeled that way. This is not necessarily the case.

Pixels

Before we can continue talking about resolution we must define pixel. A pixel (short for picture element) is the smallest dot that a monitor can display. Pixels are displayed in a grid of horizontal rows and vertical columns.

Resolution

Resolution is the number of pixels displayed horizontally and vertically across the screen. A typical resolution is 640 x 480. This means that the screen displays 640 pixels from side to side and 480 pixels from top to bottom (the first number always refers to the horizontal dimension).

Dots per Inch

Dots per inch or dpi (also called dot density) refers to how many pixels fit in one inch in one direction on the screen. You can calculate the dpi by dividing the number of pixels of resolution (either horizontal or vertical) by the actual size of the image on the screen.

It is important to realize that two monitors with the same resolution may differ in dots per inch, as shown in Table 1. The higher the dpi, the more fine-grained the image will appear.

Table 1: Resolution + Screen Size

Screen	Horizontal Resolution	DPI	Formula
9.5-inches	640	67.35	640 + 9.5
10-inches	640	60.95	640 + 10.5

Maximum Resolution

The resolution displayed on a screen is a function of two things:

- the capabilities of the monitor and
- the video board that controls the monitor.

The electronics of the monitor determine the maximum resolution it can display. For example, the IBM Color Display 8515 has a maximum resolution of 1024 x 768; that is physically the best that it can do. If it is controlled by an XGA video board, the monitor will display at the 1024 x 768 resolution. If, however, the same 8515 monitor is connected to a VGA board, it will display at a resolution of 640 x 480.

Vertical Resolution

Vertical resolution is a measure of how many lines are drawn in the raster scan (see *Raster Scan* below).

Horizontal Resolution

Horizontal resolution is a measure of how many dots can be individually turned on or off in a single scanned line, which is a function of bandwidth (see *Bandwidth* below).

Raster Scan

The image we see on the screen is actually produced by a single beam from an electron gun that moves extremely quickly around the screen. The beam starts at the upper left corner and scans across to the right edge, then jumps back to the beginning of the next line and scans across, and so continues down the screen. When the beam reaches the bottom, it starts all over again at the top. This pattern of scanning is called a raster scan.

Glowing Dots

The electron gun shoots a magnetically-directed stream of electrons. The gun is turned on whenever a dot is to be shown on the screen. The impact of the electrons on the phosphor on the inner surface of the screen causes a momentary fluorescence to take place at the point of impact.

Refresh Rate

Since the light emitted by the phosphor fades very rapidly, some method is needed to maintain the screen picture. One way to keep the phosphor glowing is to redraw the picture repeatedly by quickly directing the electron beam back over the same points. The rate at which this scan is repeated is called the refresh rate.

Scan Frequency

Scan frequency is the speed at which the electron beam can scan across one horizontal line of the monitor. This speed is measured in kilohertz. If a monitor has a scan frequency of 31.52 kHZ, it can scan 31,520 lines in one second.

Refresh Rate Measurements

In order for the image to appear stable, a complete raster scan must occur at least 60 times a second, that is, the beam scans every line on the screen in 1/60 of a second or less.

The speed of the beam is measured in kilohertz; the higher the number, the greater the speed, and the more lines that can be scanned in the required 1/60 of a second, as shown in Table 2.

Table 2: Faster Beams Scan More Lines

Monitor Type	Speed (KHz)	Vertical Scan Lines
CGA	15.8	200
EGA	21.8	350
VGA	30.5	400
XGA1	35.52	768

Vertical Resolution and Horizontal Scan Lines

Vertical resolution is how many horizontal scan lines the beam can trace before it has to start over, measured in thousands of lines per second. Vertical resolution is a function of the time it takes to draw each line (scan frequency) and how often it redraws the entire screen (refresh rate).

An Example

Putting all these numbers together, the IBM 8515 monitor, for example, lists a scan frequency of 35.52 kHZ, a refresh rate of 43Hz, and a resolution of 1024 x 768.

vertical resolution	→	scan frequency + refresh rate
Monitor #8515 at 768	→	35520 + 43

Actually 35520 + 43 = 826. The extra lines extend beyond the viewing area onto the monitor's black band and are not used.

Bandwidth

Bandwidth is the measure of the number (in millions) of on/off changes per second that the system can display.

For one pixel not to blur into the next, the individual pixels must be bright, then totally off, then bright again. A system with a very low bandwidth cannot turn the beam on and off fast enough, resulting in characters with fuzzy edges. Typical bandwidths range from 12 to 150MHz (megahertz). The higher the bandwidth, the cleaner the image but also the higher the cost.

Multisync

Multisync monitors can adapt to the characteristics of different video control cards.

Interlaced vs. Non-Interlaced

In early monitors, some viewers could perceive the raster scan as a flicker. To avoid flicker, designers introduced interlaced monitors. In an interlaced monitor, the first time through only the even numbered lines are displayed; the second pass displays the odd lines.

Advances in electronics now make it possible to produce non-interlaced monitors without flicker. These monitors produce an image which is very crisp and less fatiguing on the eyes and meet ISO (International Standards Organization) requirements.

Conclusion

These are some of the features you will encounter when you look at the specification sheets describing monitors. Our next installment will cover other technical aspects like memory and color.

Central System News

▼ Low Cost File Storage on NVE

Want to reduce your NVE file storage costs? NVE's off-line storage system has a file storage alternative designed to reduce storage costs for infrequently accessed files. This allows you to choose criteria for determining whether a file will reside on mass storage (disk) or off-line storage (tape). Files kept off-line incur no storage charges at present; they are reloaded to disk when you access them, and remain on disk (accumulating storage charges) until the next system backup takes place.

Think about how you use the files on your NVE account. Do you have large data files that you use infrequently? Has an unneeded output file been collecting storage charges while you were on vacation? Are there early versions of data files, programs, or command libraries that you don't need right now, but don't dare get rid of? Using off-line storage wisely can reduce your storage costs in these situations.

Remember that retrieving off-line files requires that one of our operators must mount the tapes. Thus, files that you may want on weekends or holidays are NOT good candidates for off-line storage.

For More Information...

For more information about using off-line storage on NVE, see our free Brief *Off-line Storage on NVE* in the Computing Information Center in 1 Nicholson Hall, or call the Central Systems Help Line at 626-5592.

Figure 1: EPX Cost Message

```
CPU time 25.473 secs  Cost: $3.06 (Internal Normal Rate)
Connect time 11:18    Cost: $0.28 (Internal Rate)
```

▼ Cost Command for EPX

Users of our EPX (UNIX) system who want to track their computer time costs on staff.tc.umn.edu will find our new *cost* command helpful. Just type

```
cost
```

at the system prompt (no parameters are needed), and a message like Figure 1 will appear.

CPU and Connect Time

The first line gives the CPU (central processing unit) time in seconds. The cost of the CPU time is based on the current rate for the job: internal or external to the University, low or normal (8 am - 8 pm weekdays). The second line gives the connect time in hours:minutes:seconds, and its cost is based on the internal or external rate.

Other Considerations

The times and costs include the current shell (normally the login shell) plus all processes executed by that shell.

Note that the low rate for CPU time is a 40% savings off the normal rate. See the next article, *Save Money After Hours*, for information on how to take advantage of the low rate.

Restrictions

The cost command uses the output from the *time* command, which is built into the C-shell. Because of this, the cost command might not work from within other shells or if the shell variable 'time' is modified to change the form of the output.

Note: the time command prints the system CPU time and the user CPU time. The CPU time printed by cost is the sum of the two since the cost of your job is based upon it.

Documentation

For information about the cost or the time command, type `man cost` or `man time` at the system prompt.

▼ Save Money After Hours

All of our central systems run 24 hours a day, 7 days a week. After the peak usage hours there are far fewer users, so the system uses fewer resources and we can provide less expensive computing. The IBM central system VM/CMS offers a 25% reduction in rates from 5 pm to 6:45 am, Monday through Friday, and all day Saturday and Sunday. The low rate for the machines EPX, VX, VZ, and NVE is 40% off the normal rate; this reduction applies to all jobs or login sessions that run after 8 pm and finish before 8 am on weekdays and all day on weekends.

For those of you who aren't night owls, there's a way to build a job file during that can keep your job in a queue until the low-rates start.

CMS, Delayed Jobs

For the IBM/CMS machine, use the *VMBATCH SUBMIT* command with the *SHIFT BASIC* option to submit a program to run at the first available time after the beginning of the lower (Basic) rate. To set an exact time for the job to be run, use the *VMSCHEDULE* command. For example, to submit a VMBATCH job on file *TEST EXEC* to run after 5 pm, enter the following:

```
VMBATCH SUBMIT TEST EXEC (SHIFT BASIC
```

If you have submitted a job to run after hours but want to change that and have it run immediately, you can change the submission option by entering:

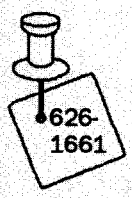
```
VMBATCH CHANGE id (SHIFT PRIORITY
```

where *id* is the job identifier for the job.

The default time limit for a VMBATCH job is 5 CPU minutes. You may add the *TIME hh:mm:ss* option to the VMBATCH SUBMIT command to increase this limit for your job.

(Continued on page 215)

Printing on Our Kodak Printer from Your Macintosh



The *High Speed, High Quality Printing Service* article in our February *Computer and Information Services Newsletter* summarized some of our Kodak printer's capabilities. The Kodak EktaPrint 1392, our Central printer, can print up to 92 duplex images per minute, using 300 dots per inch technology that prints with darker, more uniform blacks than most laser printers.

This month, we'll describe the basic process of preparing your department's networked Macintoshes so your department can use the Kodak.

Working from your Macintosh, you can use all the capabilities of the Kodak. For example, you can select paper stocks in a number of colors, weights, and sizes, staple up to 50 sheets in any of six positions, insert covers and slip sheets, and separate and stack multiple sets. You can also merge several files, text and graphics, into a single print job.

Space won't permit us to describe how to use these options here, but we can provide you with complete documentation. In this article we'll discuss these three steps:

1. Setting up an account and getting the Lionheart print driver software.
2. Installing the Lionheart software on your Macintosh.
3. Printing your files on the Kodak printer.

Set up an Account

Printing on the Kodak printer is not free, and the charges you incur for printing will vary according to the number of pages you print and the types of paper you print on. Therefore you must set up a printing account with us before you begin printing on the Kodak.

Get the Software and a Charge Number

Phone Peter Bartz at 626-1661 to make an appointment. He will arrange for someone on our staff to meet with you to discuss your printing needs, set up your account, and give you a free copy of the Lionheart software for the Macintosh, along with a copy of the documentation you'll need to use the software and the Kodak printer. In this meeting you'll also let us know where to deliver your printed output.

If you'd like help installing the software and setting up your printing jobs, one of our staff can come to your office.

Finally, we will give you a charge number that you'll need when you print on the Kodak, as we'll see later in this article.

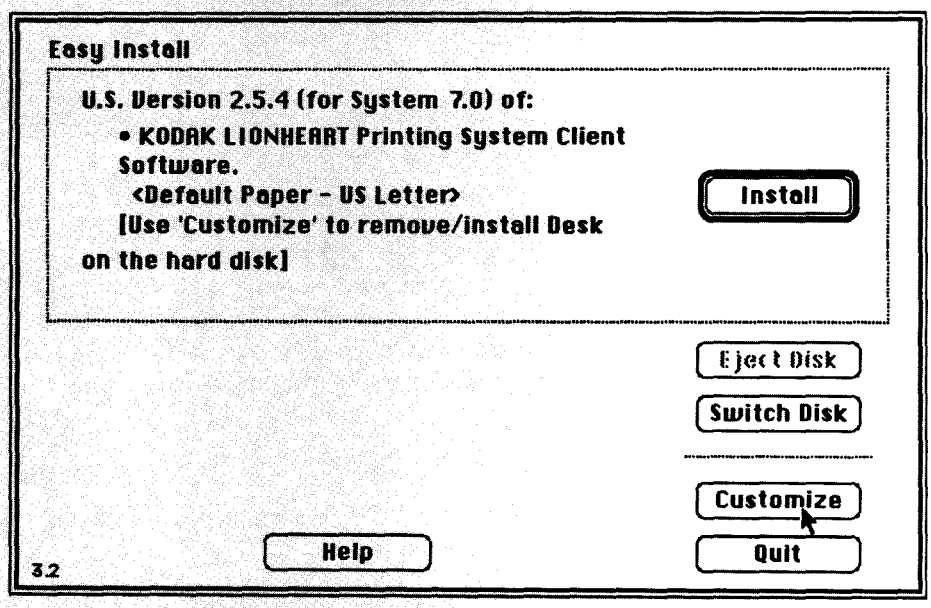
Install the Lionheart Software

To use the Lionheart print driver, you'll need a Macintosh with a hard drive, one (preferably two) megabytes of memory, and an AppleTalk or Ethernet connection to the University internet. Your Macintosh should be running System 6.0.4 or later, and we recommend that you have your LaserWriter and LaserPrep icons in your *System* folder.

To run the Installer software, you'll also need a minimum of 600K of memory available.

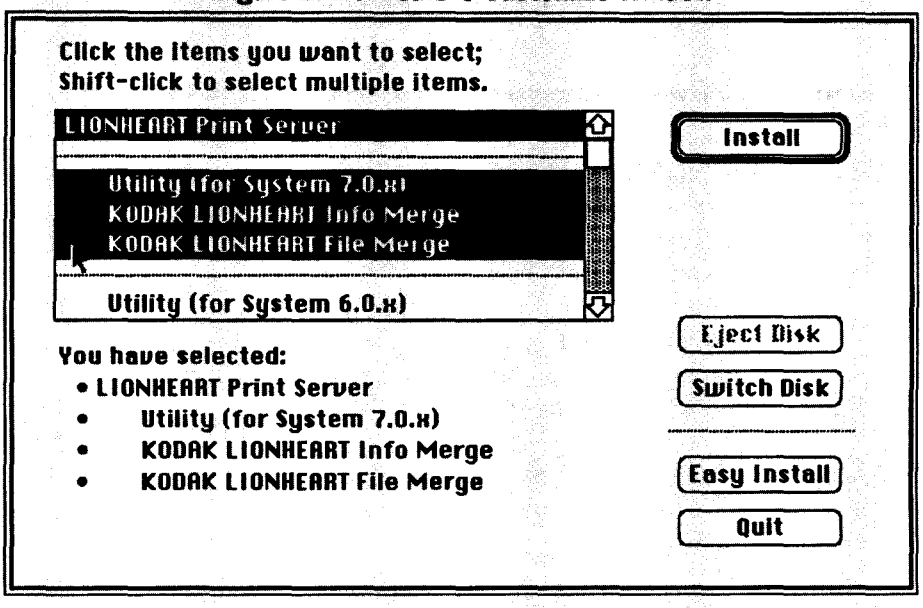
After you've inserted your Lionheart disk into your Macintosh, double-click the Installer icon. After the Installer opens, click the *Customize* button, as shown in Figure 1.

Figure 1: Customize Lionheart Software



After the Customize window opens (Figure 2), you will select five options. Some of your selections will depend on whether you are running System 6 or System 7 on your Macintosh.

Figure 2: Lionheart 's Customize Window



System 7 Users

Hold your Shift key down and click the option at the top of the list, the *Lionheart Print Server*. Then — still holding your Shift key down — click the three items immediately below the Print Server:

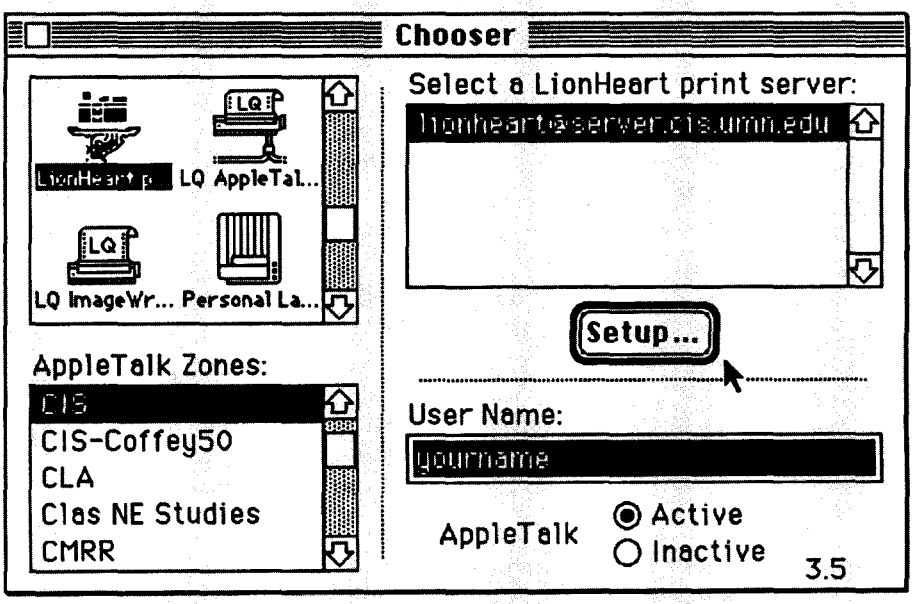
Utility (for System 7)
Kodak Lionheart Info Merge
Kodak Lionheart File Merge

Scroll to the end of the list of items and click the *Lionheart Information* option. Finally, release the Shift key.

System 6 Users

Begin by holding your Shift key down and clicking the *Lionheart Print Server* option. Then — still holding your Shift key down — scroll past the Utility (for System 7), Info Merge, and File Merge to the System 6 versions of these same three options. Select those options: *Utility (for System 6)*, *Info Merge*, and *File Merge*. Then select the *Lionheart Information* option, and, finally, release the Shift key.

Figure 3: Lionheart Print Server Installed



All Users

After you've selected the necessary five items, click the *Install* button. Installation will take a few minutes. When the installation is completed, the system will tell you if the installation was successful. If it was, it will also tell you to restart your Macintosh. Click the *Restart* button that the system displays at this point.

After you've restarted your Macintosh, open the ♦ menu. You'll notice that three new desk accessories, *Info Merge*, *File Merge*, and *Utility*, have been added to that menu. The documentation you get with the Lionheart software will tell you more about those.

For now, open the *Chooser* from the ♦ menu. You'll notice that a new icon, the *LionHeart print server* has been added to the icons in the Chooser's upper left window, as shown in Figure 3. Click that icon. In the list of AppleTalk Zones, find and click the *CIS* zone, and the LionHeart print server's name will be displayed on the right:

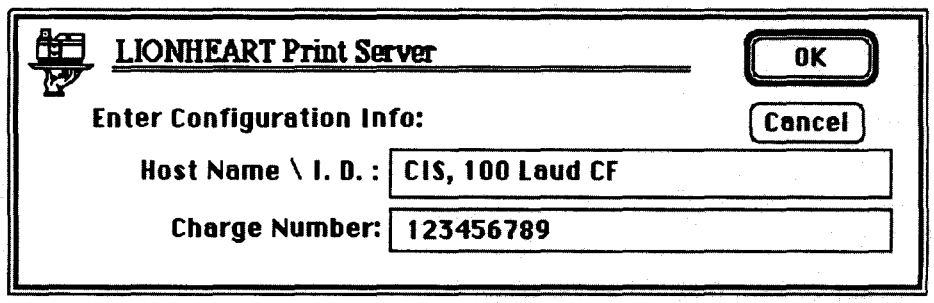
`lionheart@server.cis.umn.edu`

Select that print server and then click the *Setup* button.

Tell Us Where to Deliver the Printed Output

A Setup window will now open, as shown in Figure 4. First type in the configuration information. For our Kodak printer, this is simply the name of your department or other identifying information for your output. This will tell our staff where to deliver the printed output.

Figure 4: Enter Setup, Configuration Info



Type in Your Charge Number

Then type in your charge number. (You will receive this number when you pick up your Lionheart software.) Then click *OK* and close the Chooser. You're ready to print.

Printing Your File on the Kodak Printer

Open any file that you'd like to print — it can be text, graphics, or any other kind of file that you can print. Before you print, go into the *File* menu and select *Page Setup*. The Lionheart software will display page setup options.

Page Setup Options

In Figure 5, we have opened a Microsoft Word document and are preparing a page setup that includes stapling, paper color and weight, and other options. (The Lionheart documentation will explain more about all these options.) After you've completed your page setup, click the *OK* button.

These options will be saved when you save your file, so you will not have to select them again every time you print.

Figure 5: Prepare the Page Setup Options

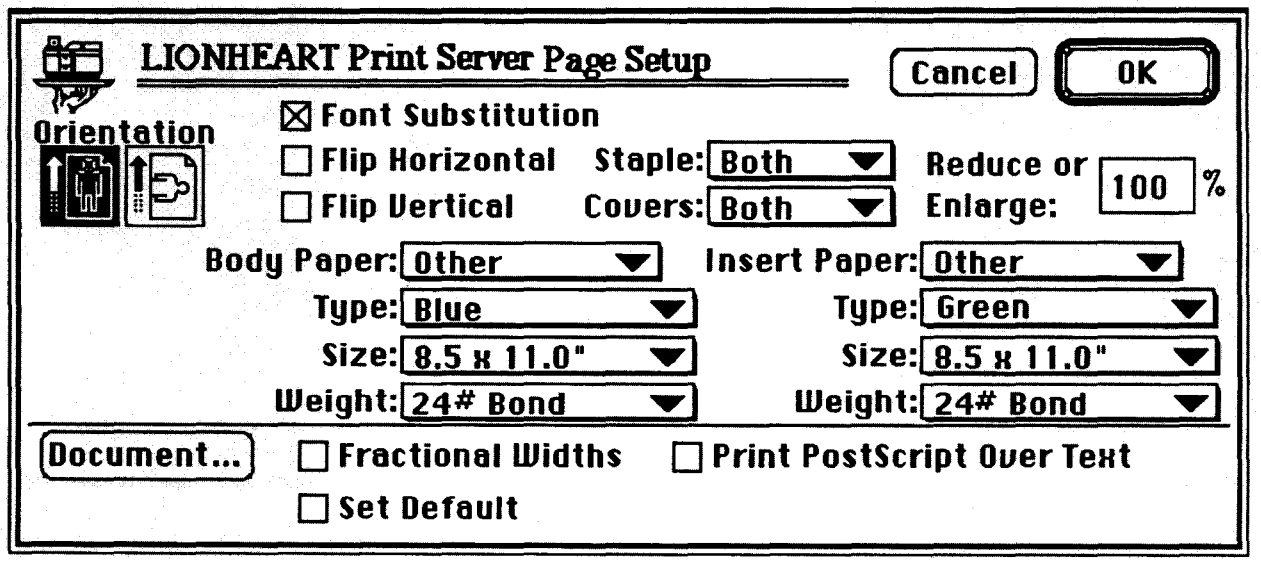
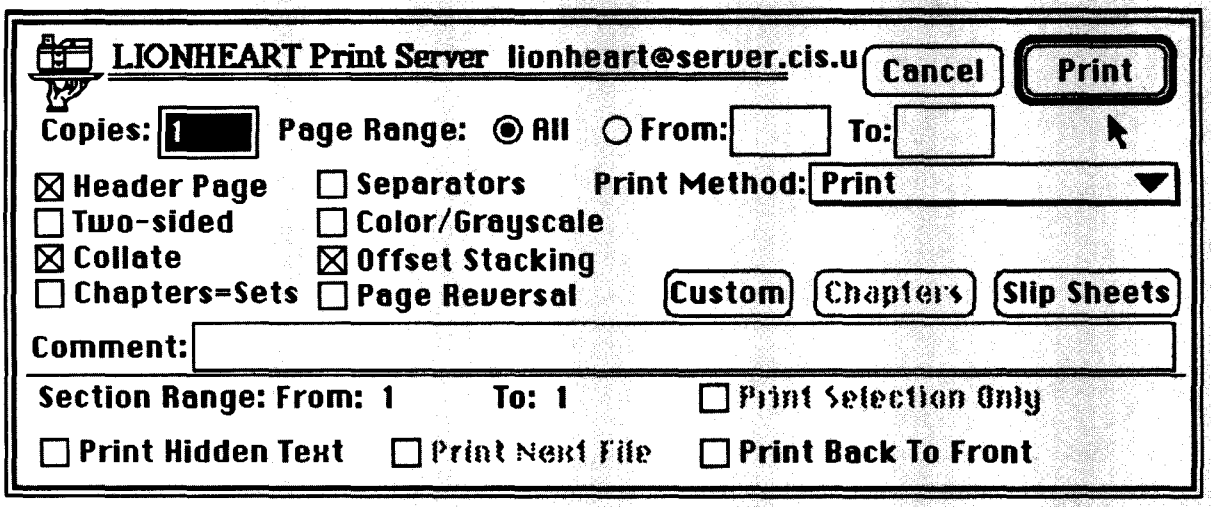


Figure 6: Additional Print Options



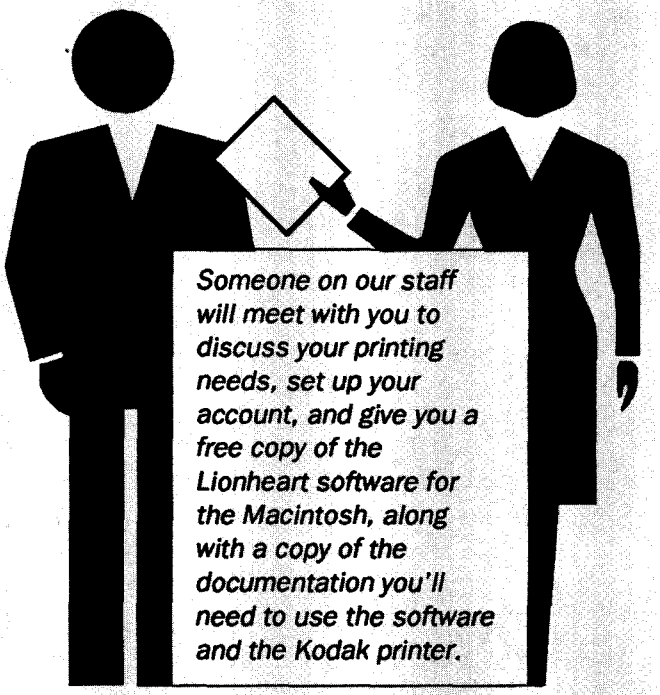
Additional Print Options

At this point, you can select the *Print* option from the *File* menu, just as you would when you are printing on your own printer. The Print window will appear on your screen. As you can see in Figure 6, there are additional options in this window. These are also explained in the Lionheart documentation.

To print using the default options, simply click the *Print* button. The Lionheart software will send your file to the Kodak printer and your output will be delivered to the location you specified when you set up your printing account.

For More Information

For information about printing charges on the Kodak Central printer, or to set up an account to use the printer, call Peter Bartz, Software Services and Operations, at 626-1661.



Print *Sample* Available

You can also request a print sample from our Kodak printer. A duplex print sample, featuring many of the 35 standard LaserWriter fonts, will be available at all our computer help lines or by calling 626-1661.

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To raise the limit to 90 minutes, submit the command shown in Figure 1. To schedule your job to run at a specified time or on a regular basis, enter:

```
VMBATCH SUBMIT
```

You will see a fill-in-the-blank screen on which you need to enter the exec file-id. Tab to the *VMSCHED* line and type

```
ON
```

and press *PF11*. You will see another fill-in-the-blank screen, where you may enter the details of the scheduling of your job.

On-line help is available by entering *HELP VMBATCH* or *HELP VMSCHED*. The Brief *VMBATCH* is available free from the help desk in Nicholson and in St. Paul, and the VMBATCH and VMSCHEDULE User Guides are available for reference at the St. Paul help desk.

VMS, Delayed Jobs

For the machines called VX and VZ running the VMS operating system, you use the

```
SUBMIT
```

command to run the job at a later time. First you create a file containing a series of system commands. You will typically give this file the file type

```
.COM
```

because that's the default for the *SUBMIT* command. Each command line in this file will begin with a $.

When you submit this file to run during low rate time on weekdays, use this qualifier in the *SUBMIT* command:

```
/AFTER=20:00:00
```

The default CPU time limit for submitted jobs is 3 minutes so you may also need to add this qualifier to set the maximum CPU time for the job:

```
/CPU=hrs:min:secs
```

As an example, a very simple file you could submit called *SAMVMS.COM* is just

```
$DIRECTORY
```

The command for running this file for up to 1.5 hours of CPU time is

```
$SUBMIT /AFTER=20:00:00 /CPU=01:30:00 SAMVMS
```

After you type the *SUBMIT* command, the system displays a message showing the queue where your job is being held. For more information on the *SUBMIT* command, see the chapter on "Submitting Jobs" in our ***Introduction to VMS Computing***, available in campus bookstores.

NOS/VE, Delayed Jobs

For the machine called NVE running NOS/VE, you use either of these commands

```
INCLUDE_FILE
INCF
```

to run the job in the overnight queue. The first line of your delayed job will be:

```
JOB JC=OVERNIGHT ODI=logname
```

where ***logname*** is the name of the file containing printable output and the dayfile for the job. The next lines are whatever NOS/VE commands you want the job to include. The last line of the file is *JOBEND*.

For example, a corresponding simple file that we'll call *SAMNVE* on NVE is

```
JOB JC=OVERNIGHT ODI=LOGFILE
DISPLAY_CATALOG
JOBEND
```

To run this job, type the interactive command:

```
INCF SAMNVE
```

Unlike VMS, there's no default time limit for jobs run by the *INCF* command, so you don't have to worry about resetting a time limit.

Figure 1: CMS Example - Raise Time Limit to 90 Minutes

```
VMBATCH SUBMIT TEST EXEC (TIME 90:00 SHIFT BASIC
```

UNIX, Delayed Jobs

For the machine called EPX running UNIX, you use the

```
at
```

command to run the job at a later time. Unfortunately, the *script* command can't be used to make a log file for the job because it only works with interactive jobs.

So we recommend that you make two files. One file to be run with *at* that calls another file that does the real work while saving the output on a log file. As an example, the first file called *samepx* would be

```
#!/bin/csh -f
joe >& logfile
```

where *joe* is the name of the second file and *logfile* will contain the output. The file *joe* is

```
#!/bin/csh -f -x
ls
```

where *-x* causes the commands (like *ls*) to be echoed on the output. After creating file *joe*, you need to type

```
chmod 755 joe
```

in order to make file *joe* an executable file. Now you can type

```
at 2000 samepx
```

to run the job at 8 pm (2000 on a 24 hour clock). The command

```
atq
```

displays a list of the jobs in the delay queue. To remove a job from the queue, enter

```
atrm jobnumber
```

where *jobnumber* is the number of the job from the *atq* command listing. You may also find the *date* command useful with these commands.

In UNIX, there's no default time limit for jobs run by the *at* command.

For more information about these commands, see the following on-line documents: ***man at***, ***man atq***, ***man atrm***, ***man date***.

Bargains

▼ SLIP for DOS Computers

We recently announced a new SLIP package for IBM and compatible microcomputers. Since the latest SLIP enables a broader range of modems to dial into an authorized University account and maintain a connection, we urge all IBM-compatible SLIP users to use at least SLIP version 1.4.

We've also set up SLIP so it is easier to move from one network application to another, for example POPmail and Gopher. With the new SLIP package, the phone is dialed only if needed. Therefore, you can go from one application to another without losing your SLIP connection. Those unfamiliar with SLIP can read *What is SLIP?* at the end of this announcement.

The New SLIP Package

The new SLIP package replaces the old SLIPDIAL package — that is, it replaces slipdial.exe, all of its script files, the SLIP8250 packet driver, and the X00.SYS device driver.

The new SLIP package includes:

- phone.exe — phone dialer program
- umslip.com — new University of Minnesota SLIP packet driver
- termin.com — utility program to remove a packet driver from memory (RAM)
- slip.bat — batch file interface to all SLIP software

Printable documentation is also included with the package.

Your access to SLIP is accomplished with the SLIP batch file. Whenever you type

```
slip
```

at your system prompt you are presented with the screen of options shown in Figure 1.

Running a TCP/IP Network Program

Once you have set up SLIP you are ready to use a TCP/IP network program like POPmail/PC or Gopher/PC. For example, to start up POPmail/PC, you would type

```
slip popmail
```

Using or Disconnecting SLIP

The SLIP batch file automates the whole process. It loads the SLIP packet driver (umslip.com), dials the phone, establishes the SLIP connection (with the phone.exe program), and starts a specific TCP/IP network program. It also automates hanging up the phone and unloading the packet driver from RAM. This is done by typing

```
slip quit
```

Obtaining SLIP

The new SLIP software is set up for easy copying in the Microcomputer HelpLine in 152 Shepherd Labs. You will need one 3 1/2-inch HD (high density) disk, two 3 1/2-inch DD (double density) disks, one 5.25-inch HD disks, or three 5-25-inch 360K DD disks. A consultant can show which machines are connected to the IBM Information Server. When you sit down at an appropriate machine, at the P:\> prompt you can just type

```
slipdisk
```

and follow the onscreen menus. The slipdisk batch file will copy our installer program as well as our SLIP package, POPmail/PC, Gopher/PC, NCSA Telnet, FTP, and printable documentation onto your floppy diskettes.

When you get back to your computer, use the installer to set up the applications on your hard disk. Put the diskette into the a or b disk drive on your computer and type

```
a:install
b:install
```

as appropriate.

You can also use anonymous ftp to obtain the software from boombox.micro.umn.edu. Look for it in /pub/slip.

Questions

You can address any SLIP questions via E-mail to

```
slip@boombox.micro.umn.edu
```

What is SLIP?

SLIP turns your phone jack into a network connection. SLIP (Serial Line Internet Protocol) makes it possible to run TCP/IP networking software like POPmail, Telnet, FTP, and Gopher from an IBM or compatible microcomputer that is equipped with a high speed modem, just as if it were directly wired into the campus network.

SLIP access to the University's network is limited. The University has a security system called TACACS (Terminal Access Control and Authority Control System) controlling who can connect.

Networking software has a tendency to transmit more information than terminal-based programs, such as ProComm and TinCan. Because you are transferring more information across the telephone line, you need at least a 2400 baud modem to use SLIP. We recommend a 9600 baud V.42 compatible modem, such as those sold at the Computer Desk in the Minnesota Book Center.

Figure 1: SLIP Options

```
Please enter one of the following in LOWER case:
================================================
slip setup      to change phone number, modem settings, etc.

slip            to get help
slip popmail
slip gopher
slip telnet
slip ftp

slip quit       to hang up the phone and unload the packet driver
```

▼ PKZIP Version 2.04e

Our April 1992 newsletter contained an article about PKZIP, an IBM/MS-DOS shareware program that allows you to compress one or more files into a single file and then restore the original file(s) as needed. Recently, a new version of PKZIP has been released. It is version 2.04e, and it is available on our IBM Information Server in

```
p:\app&util\archive\pkzip
```

Improvements In Version 2.04e

Below are some of the enhancements that have been made:

- Faster
- Compresses files more
- Can span a .zip file over more than one diskette if the .zip file is too big for a single diskette
- Uses expanded (EMS) and extended (XMS) memory as well as the upper memory block (UMB) and high memory area (HMA)
- Detects the kind of CPU and whether or not 32-bit protected mode is available and then optimizes itself accordingly
- Allows password protection of zipped files

Version 2.04e also fixes some of the problems that kept version 2.0 from becoming popular.

Caution

When you get PKZIP, it is accompanied by several other programs, one of which is PKUNZIP. PKUNZIP is used to decompress or "unzip" files that have been created using PKZIP. Some versions of PKUNZIP will not unzip files created with some versions of PKZIP.

Version 2.04e versus 1.1

Version 2.04e of PKZIP works faster and also compresses files more than previous versions of PKZIP because version 2.04e uses a new compression algorithm called "Deflating." However, because 2.04e uses a different compression algorithm than earlier versions of PKZIP, older versions of PKUNZIP will not be able to unzip files created with version 2.04e. Because of this, we will continue to use version 1.1 of PKZIP to create the .zip files on our IBM Information Server.

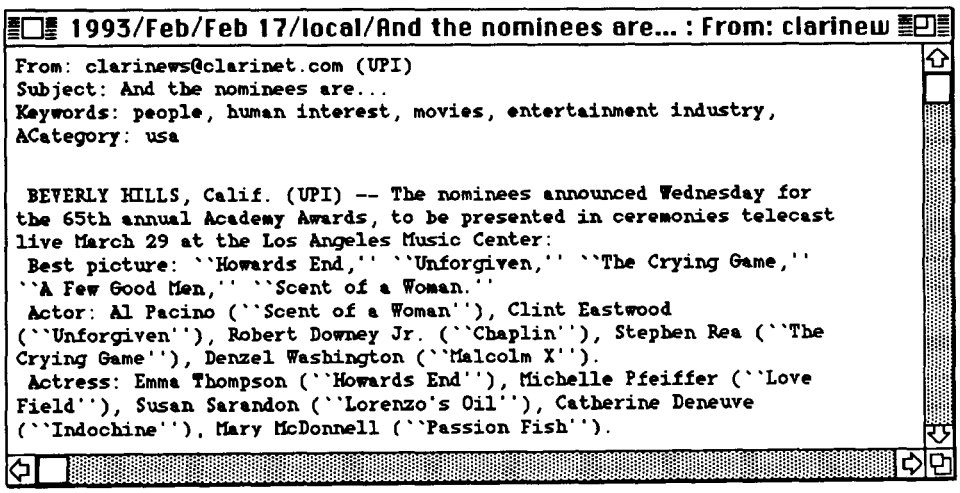
▼ Mac Word 5.1a Patch

A patch (update) for Word 5.1 is on the Mac Information Server. This patch fixes a problem that can occur when fast saving a document where the Footers or Headers feature was used. (*Fast Save* is an option in the *Save As* menu.) The problem is that the footer or header can disappear in the last (or only) section of a document. In November Microsoft announced they were correcting the problem for all new releases of Word and were sending a patch and a letter to all registered Word users. We received a patch that we are able to distribute free of charge.

Look in the Applications/Updates Folders

The Word 5.1a Patcher and installation instructions (a ReadMe document) are in the *Updates* folder within the *Applications* folder on the *information* volume. Once the patch is installed, Word's version number changes to 5.1a.

Keep Up-to-Date: Search UPI News on Gopher™



Book Center News: 625-3854

The offers listed here are made to University departments, employees, and students, and are subject to the eligibility rules of the Computer Discount Program. If you have questions about availability, phone the Computer Desk in Williamson Hall at 625-3854. The Computer Desk is open Monday–Friday from 8:30 am to 5:30 pm during the Fall, Winter, and Spring quarters and for reduced hours at other times.

▼ Sign Up for E-Mail Notification

You can get product and price change bulletins for the products sold through the Computer Desk via E-mail. 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.

▼ Sales Tax and Handouts

You can charge your purchases on your *MasterCard* and *Visa* accounts.

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, consult our handouts. Paper handouts are available at all Microcomputer HelpLines. Electronic versions are available from the Computer Consultant (gopher). 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 Network Connections. Some specialized handouts are also available.

▼ *New* Apple Products

In February Apple introduced several new products. The new microcomputers are: Color Classic, Mac LC III, PowerBook 165c, Quadra 800, and Centris 610 and 650. Other new products are the LaserWriter Select 300 and Select 310 printers. These products are described briefly below, and many of their features are compared in Tables 3 and 4. The *Computer Information* section of Gopher™ has more information about these products:

- Apple's complete descriptions, which provide additional information such as size and sound generation capabilities.
- Macintosh computers and printers discount price lists.
- *Computer Basics: Macintosh CPUs* in our July 1992 newsletter.

At press time the Microcomputer HelpLine in 152 Shepherd Labs had an LC III available for test drives.

Memory: 72-pin SIMMs

The Macs shown in Table 1 require 72-pin SIMMs. How many memory expansion slots these machines have is also shown in Table 1. The Book Center's price for these 72-pin SIMMs is shown in Table 2. All other Apple desktop machines use 30-pin SIMMs – except for the IIfx, which uses 64-pin SIMMs.

With the new 72-pin SIMMs you no longer have to add RAM to the Mac two or four SIMMs at a time. You can also mix SIMMs, e.g. a 4MB and a 16MB.

Table 1: 72-pin SIMM Slots

Macintosh	RAM (MB) on Logic Board	No. of Slots 72-pins
LC III	4	1
Centris 610	4	2
Centris 650	4	4
Quadra 800	8	4

Table 2: 72-pin SIMM Prices

Single 72-pin SIMM (MB)	Book Center Price
4	$148
8	290
16	560
32	call for price

Built-in Video Support

The Mac LC III, Quadra 800, and Centris 610 and 650 have built-in video support for a wide range of monitors, including Apple's 16-inch color. The *Monitors* table in our *Apple Macintosh Computer* handout has been revised to show which monitors and what colors are supported when you use these new machine's built-in video support.

Color Classic

Apple added another all-in-one design to their Mac line: the Color Classic. This entry level computer adds a 10-inch 512 x 384 pixel color Trinitron display to the familiar Classic. This display meets the Swedish requirements for low emissions. At 256K VRAM (video RAM) you can see 256 colors. When you add a 256K upgrade and expand VRAM to 512K, you can see 32,768 colors. At press time we did not have the price for this upgrade.

When you aren't using the Color Classic, you can conserve power by putting it in a standby mode.

Expansion

The new Color Classic is more expandable than previous Classics. It includes a socket for a math coprocessor, one expansion slot, and its logic board is accessible. The expansion slot lets you add standard Mac LC processor-direct cards, such as the Apple IIe Card and Apple LC networking cards. Like the Classic and Classic II, you can expand memory up to 10 megabytes. The Color Classic comes with 4MB of RAM on the logic board, and it has one dual (30-pin) SIMM expansion slot.

Mac LC III

The new Mac LC III is almost twice as fast as the LC II, and it comes with built-in support for a wider range of monitors and a socket for an optional math coprocessor.

Centris 610 and 650

The Centris 610 and 650 are similar. Both can accommodate one internal 5.25-inch half-height device, such as the Apple CD 300i internal CD-ROM drive. Their other expansion capabilities are also similar, although the 650 has more expansion slots and more SIMM slots.

Apple says the Centris 610 is up to 2 times as fast as the Mac IIvx and IIci, and the Centris 650 is 2.5 times as fast.

Quadra 800

The Quadra 800 is much more expandable than the Quadra 700 but less expandable than the 950. The 800 comes with one internal hard disk and has room for three more internal storage devices, including the AppleCD 300i CD-ROM.

PowerBook 165c

The PowerBook 165c is Apple's first color notebook; without a modem it weighs 7 pounds. The 165c has one HDI-30 SCSI port, and its NiCad battery provides 1.5-2 hours of use before it needs recharging.

Display

The 165c's built-in LCD display is backlit, passive matrix, 640 by 400 pixels, and shows 256 colors from a palette of 4,096 choices. The screen's diagonal measurement is 9 inches.

The PowerBook 165c has one video-out port and two video-out modes. The video mirroring mode lets you display the same image on two screens. The dual mode gives you full use of both screens (so you can display different windows on each screen).

The Book Center carries *The Whole Internet* for under $25.

1993/Feb/Feb 16/nb/Join the Internet, Get a Book 02-16-93 :

```
From: newsbytes@clarinet.com
Subject: Join the Internet, Get a Book 02/16/93
Keywords: Bureau-SFO

SEBASTOPOL, CALIFORNIA, U.S.A., 1993 FEB 16 (NB) -- If you sign
up to the Internet through a service provider, don't be surprised
if you get offered a book from O'Reilly & Associates.

The Californian publisher has struck a number of deals with the
various Internet IPs, allowing it to market the books on a wide
scale. As with many other marketing deals of this type, the
publisher wins by being able to target his or her customers
accurately, while the customer wins by (usually) gaining access
to a discount on the book concerned.

Under the deal, ANS, CICnet, NEARnet, and MRnet will be bundling
Ed Krol's book "The Whole Internet" to new and potential new
customers. NEARnet has gone a step further and is planning on
distributing copies of the book as part of its 1993 information
and training services offerings.
```

Table 3: Color Monitor Built-in

Distinguishing Features	Color Classic	PowerBook 165c	
Fixed			
CPU	68030	68030	
• MHz	16	33	
• Data Bus	16-bit	32-bit	
Memory (MB)			
• Standard	4	4	
• Maximum	10	14	
Coprocessor	opt.	68882	
VRAM	256K, 8-bit	–	
Expansion slots	1 LC PDS	1 video out 1 slot for modem	
Variable			
Part No. M.../LLA	1602	4900	4920
Price	$1215	$2770	$3064
Hard Disk (MB)	80	80	120

Table 5: Selected Apple Parts

Part No.	Description	Discount Price
M1242LL/A	Adjustable Keyboard	$ 179
M1402LL/A	Mac Centris 610 NuBus Adapter Card	79
M1386LL/A	*Upgrade:* Mac LC III Logic Board — available through Engineering Services	540

LaserWriters Select 300 and 310

Underneath the "hood" of the LaserWriter Select 300 and 310 is a Fuji Xerox laser engine. This engine uses micro-fine toner. For pages with 5% density, a toner cartridge will print 4,000 pages.

To use all the printers' features, both require at least System software version 6.0.7 (with TrueType INIT) or

Table 4: No Monitor Built-in

Distinguishing Features	LC III		Centris 610			Centris 650				Quadra 800		
Fixed												
CPU	68030		68LC40 (no integrated FPU)			68040				68040		
• MHz	25		20			25				33		
• 32-bit Data Bus	Y		Y			Y				Y		
• 8K Cache	N		Y			Y				Y		
Expansion Slots	1		1			4				4		
• PDS	LC-type		Y or			1				1		
• NuBus	none		Y or			3				3		
Memory												
• Maximum	36		68			132				136		
• 72-pin SIMM slots	1		2			4				4		
Variables												
Part No. M.../LLA	1312	1313	1345	1397	1398	1276	1388	1279	1209	1287	1329	1291
Price	$1100	1225	$1545*	2060	2360	$2205*	2880	3180	3525	$3560	4415*	4840
Installed Memory (MB)	4	4	4	8	8	4	8	8	8	8	8	8
Hard Disk	80	160	80	230	230	80	230	230	500	230	500	1000
Video Ram												
• Amount	512K	512K	512K	512K	1MB	512K	512K	1MB	1MB	512K	1MB	1MB
• N-bit	16	16	16	16	32	16	16	32	32	16	32	32
Coprocessor (FPU)	opt	opt	opt	opt	Y	Y	Y	Y	Y	Y	Y	Y
Ethernet	opt	opt	opt	Y	Y	opt	Y	Y	Y	Y	Y	Y
AppleCD 300i Installed	na	na	opt	opt	Y	opt	opt	Y	opt	opt	opt	opt

* Centris 610 — identical configuration with Ethernet, as well as AppleTalk, is $1630, Part No. M1392LL/A.
* Centris 650 — identical configuration with Ethernet, as well as AppleTalk, is $2590, Part No. M1613LL/A.
* Quadra 800 — identical configuration with 512K VRAM is $4120, Part No. M1288/LLA.

later. The printers' features are shown in Table 6 and are discussed individually below.

Select 300

The LaserWriter Select 300 comes with Apple's FinePrint technology, and PhotoGrade is optional if you add a 4MB upgrade. The 300 supports background printing through the GrayShare software that is packaged with it. (Background printing lets you continue working on your computer when it sends a document to the printer.)

The Select 300 comes with 39 scalable TrueType fonts from the following font families: Avant Garde, Bookman, Chicago, Courier, Geneva, Helvetica, Helvetica Narrow, Monaco, New Century Schoolbook, New York, Palatino, Symbol, Times, Zapf Chancery, and Zapf Dingbats.

Select 310

The LaserWriter Select 310 comes with 13 scalable Adobe Type 1 fonts in ROM including Times, Helvetica, Courier, and Symbol. A note of caution: although the 310 comes with 1.5MB of RAM, to print some complex images and pages you may need more memory.

The Select 310's serial and parallel interfaces are not active simultaneously. To switch from one port to the other, you must shut down the printer.

Table 6: LaserWriter Select 300 and 310

Printer	**300**	**310**
Part No.	B1028LL/A	B1027LL/A
Printers come with one toner cartridge and a cable.		
Price	**$685**	**$900**
Dots per Inch	300	300
Pages per Minute	5	5
PostScript	opt.	Y
Memory (RAM)		
• Installed	512K	1.5MB
• Optional: 1MB and 4MB	Y	Y
Interfaces		
• Serial: 8-pin DIN	Y	Y
• Parallel	N	Y
• AppleTalk	N	N
Paper Handling		
—Standard		
• 250 Sheet Feeder	Y	Y
• Manual Paper Feed	Y	Y
—Options	Y	Y

Selected Parts for 300 and 310		**Discount Price**
M2031G/A	30 Envelope Cassette	$67
M2042G/A	500 Sheet Feeder w/Cassette	225
M2028LL/A	PostScript Option for 300 (available April)	285

▼ Apple Price and Product Changes

In February Apple also discontinued some products. In the descriptions below the first number refers to RAM, the second to hard disk size, i.e., 4/40 means 4MB of RAM and a 40MB hard disk.

- ❑ The Mac IIsi and IIci are no longer available.
- ❑ The Classic II 4/40 was discontinued.
- ❑ The only available LC II is the 4/80 with 512 VRAM. Its price is $955.
- ❑ The Quadra 950 8/400 was discontinued, but four other 950 configurations are available.
- ❑ The IIci logic board upgrade is no longer available.

Sample Price Changes

Prices on some other Apple products changed. Sample prices are shown in Table 7.

Table 7: Sample Apple Price Changes

Apple Part No.				**Discount Price**
Apple Ethernet				
M0437LL/A	Twisted Pair (10BaseT) Transceiver			$75
M0432LL/A	AUI Adapter			75
		Memory (MB)	Hard Disk (MB)	
Classic II				
M1542LL/A		4	80	$880
Mac IIvx with 512K VRAM				
M1355LL/A		4	80	$1,575
M1358LL/A		8	230	2,015
Quadra 950				
M6710LL/A		8	none	$4,250
M6720LL/A		8	230	4,615

Comparing Prices

When comparing the prices listed here and in our handouts with prices advertised elsewhere, be aware that all the Book Center's Macintosh prices include a standard keyboard. If you buy a Mac somewhere else, you may need to purchase a keyboard separately, thereby adding approximately $90–160 to the cost of the Mac.

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.

A 10% Discount

The prices listed below are suggested retail prices. The amount you actually pay will be less because you will receive a 10% discount at the cash register.

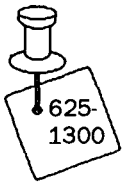
Here's what is new in the Reference section:

- ✔ *Using Excel 4 for the Mac, Special Edition*, a Que publication for $27.95.
- ✔ *How Computers Work* by White, a Ziff Davis publication for $22.95.
- ✔ *Virtual Reality: Through the New Looking Glass* by Pimentel, a McGraw Hill publication for $22.95.

An Old Favorite

- ✔ *The Whole Internet: User's Guide and Catalog* by Ed Krol, an O'Reilly & Associates, Inc. publication for $24.95.

Training Resources



We own training packages for many popular software products. These training packages are available to University of Minnesota departments and current employees and students. There is no fee for using these packages, and you may check them out for 48 hours. However, before you can check them out, you must sign a *Usage Agreement* and leave your University of Minnesota ID with us. We will return your ID when you return the training materials.

Generally the IBM/MS-DOS disks are available on 5.25-inch 360K and 3.5-inch 720K disks; the Macintosh disks are 800K.

▼ Reservations Required

To reserve or check out these materials, phone 625-1300 or stop in our Shepherd Labs office in room 190 (formerly 132), Monday-Friday, 8 am to 4 pm. Unless you use our Self-Paced Training Centers, you must supply your own software and equipment, such as computer and cassette player, to use these training materials.

Training Center Hours

Location	Monday-Friday
1 Nicholson Hall	8 am to 7 pm
99 Coffey Hall	9 am to 4 pm

Microsoft Word 5.1

Below are the key topics in the audio tapes from *Personal Training Systems.* Each module has nine lessons. To use this material you need at least System 6.0.2. In addition, System 6 users need a Mac with at least 2MB of RAM; System 7 users need one with at least 4MB.

Module 1, Beginning Word

#1 Entering and editing – insert, delete, and replace text; save document under new name; move paragraph; save document without changing name. #2 Use spelling checker – check spelling; remove words from custom dictionary. #3 Printing – change line spacing and margins; print document. #4 Change appearance of text – change alignment and font size; change text to bold, to underline, and to italics; change indentation; create bulleted list, numbered list; and handing indent. #5 Use styles – change existing style; define style; apply a style. #6 Change defaults – change default font. #7 Use tabs – create, delete, and move tabs; assign leader to tab; use a style to assign tabs. #8 Enter headers and footers – create header and footer; create different header or footer on first page; insert and delete page breaks. #9 Find files – locate and view contents of documents.

Module 2, Intermediate Word

#1 Create tables – create table; enter information; add new row; highlight entire column or row; change appearance of row or column; change column and table width; change column width but not table width; turn gridlines off or on. #2 Create form letters – a form letter requires two files; merge form letter with main document. #3 Sort records – create new field while in main document; insert and delete

columns; sort alphabetically by first and last name; sort records. #4 Select records – split screen; remove split screen; highlight records without dragging; keep records from being merged. #5 Customize form letters – use IF statement to change contents of letter. #6 Convert text files – convert text files; avoid blank lines. #7 Create borders – insert row; add decimal tab to numbers in table; add border and shading. #8 Add finishing touches – add blank text line above row; paste or move rows; calculate totals; center tables. #9 Number lines – add line separating columns of text; add border to paragraph; number lines; turn off line numbering in section.

Module 3, Advanced Word

#1 Use styles – create and change new style; use built-in style; redefine style; make space appear before or after paragraph; two lines of text may be combined. #2 Find and replace text. #3 Import styles – replace and import styles; replace extra paragraph marks; if styles with same name have already been defined. #4 Formatting characters – insert special symbol; change text to superscript or subscript; enlarge font size; format text. #5 Use the glossary – use glossaries to store items; glossary items; add item to glossary; delete item from glossary; items entered in standard glossary; create additional glossary. #6 Create headers and footers – include summary information in document; format text as hidden; mark inside margin wider than outside margin; create different headers on even and odd pages. #7 Insert footnotes – create and delete footnotes; locate footnote markers in document. #8 Create an index – connect files in series; create index; modify index manually; make index start on new page. #9 Create a table of contents – create table of contents automatically; print series of files.

Module 4, Additional Features

#1 Check grammar – when checking grammar; using grammar checker. #2 Use Thesaurus and word count – use Thesaurus; count words; insert text annotation. #3 Create newspaper-style columns – create new section; change number of columns in section; automatically balance columns; make section start on a new page or in a new column; all text in same section; text in neighboring sections. #4 Add graphics – drawing tools; create new graphic; insert or modify existing graphics file; crop or resize graphic. #5 Use frames – insert text or graphics into a frame; insert item into frame; position frame precisely; paragraph settings of framed items; change paragraph settings of framed items; create drop cap. #6 Use hyphenation. #7 Create side-by-side paragraphs – create side-by-side paragraphs; add borders; increase amount of space between paragraphs; create reverse heading. #8 Use the outliner – customize Toolbar; enter information into outline; expand, collapse, or number outline; move section of outline; remove numbers; change appearance of headings. #9 Link documents – transform data from table to graph; links can be created; create automatically updated link; the text of automatically updated links; update source document.

❖ Quattro Pro for Windows

Below are the key topics in the audio tapes from *Personal Training Systems.* Each module has 8-9 lessons. To use this material you need at least Windows 3.0 and a 386 PC with at least 2MB of RAM.

ZQP1, Beginning Spreadsheets

#1 What is a spreadsheet? – change a number. #2 Create a spreadsheet – make border appear around a cell; make more row or columns visible; create new spreadsheet; maximize spreadsheet window; save under new name. #3 Enter labels – label rows and columns; adjust column width; enter non-calculated numbers; fix mistake while typing; change previously entered item; save your work frequently. #4 Enter formulas – copy, paste, and create a formula. #5 Create function formulas – use help menu; copy and paste formula; type in function formula by hand; use SpeedSum button. #6 Improve the appearance – change appearance of item; change height of row; make column labels align to right; change format of numbers. #7 Print – check printer setup; preview file; zoom preview page; change page setup and margins; print spreadsheet. #8 Make changes – insert empty row; delete row; formulas will be adjusted automatically. #9 Absolute reference – use buttons to copy and paste; change reference; changes can be made quickly; drag and drop cells.

ZQP2, Using Quattro Pro

#1 Change properties – use SpeedSum button; improve spreadsheet's appearance; use object inspector; change numeric format; save file with different name. #2 Sort – use menu or button to sort cells. #3 Name pages – assign name to page; move page; enter TODAY formula; type in date; use built-in date formats; copy and paste formula; drag and drop cells; drag and copy cells. #4 Edit groups – define group; turn group mode on or off; drill entry through pages in group; view more than one page at a time; insert file as block. #5 Print – check printer setup; preview spreadsheet; zoom preview page; change print

options; add header and footer; change margins; print spreadsheet. #6 Create 3D formulas. #7 Use styles – apply, create, and modify style; changes made to a cell manually; use SpeedFill button; keyboard shortcuts; turn off gridlines. #8 Graphing – use SpeedFormat button; great graph on spreadsheet; add titles; change graph type; make graph appear in own window; change font size and colors.

ZQP3, Presentation Graphics

#1 Overview – graphs created from numbers; a slide show consists of; run slide show using button; go to graphs page; view graph on screen. #2 Create graphs – create graph on spreadsheet; make graph appear in its own window; change graph type, pattern, and font size; add titles; change legend position; make and resize floating graph; add drop shadow to floating graph; change name assigned to graph. #3 Change the appearance – create, move, and resize text box; change appearance of text box and of text; change style color and style of background; explode pie piece; create graph in its own window; view graph on screen. #4 Print – print graph on own page or on same page as numbers; add graph to spreadsheet page; copy style from another graph. #5 Graph stock prices – change appearance of numbers on Y axis; graph stock prices and volume. #6 Edit series – change 3D graph view; add series; swap rows and columns. #7 Create text graphs – create text box; enter bullet codes; import graphic; create blank text graph; change aspect ratio; turn grid options on. #8 Create a slide show – create new slide show; add slide to slide show; rearrange slides; remove slide from slide show; run slide show; use graphs page icons; use bitmap graphic as fill style. #9 Automatic slide shows – create button to run slide show; create graph button; change transition effects for slides; change default effect for slide show.

ZQP4, Advanced Features

#1 Create number formats to enter non-numeric characters. #2 Work with large notebooks – return to cell A1 on current page or on first page; go to cell coordinate; name a cell; go to a named cell; select same cell on more than one page; scroll quickly; create or clear locked titles. #3 Print large notebooks – preview printed file; format header or footer; add space between print blocks; change page break; make headings print on every page; select non-contiguous or 3D print block; save print settings; view file using a named print setting. #4 Protect your spreadsheet – before protecting a spreadsheet; turn protection on; create password for opening file. #5 Use the database desktop – open database desktop; view database table; run query on database table; use database information in spreadsheet. #6 Goal seeking – create a what-if table; use solve-for command to solve formula; use optimizer to solve formula. #7 Create macros – run a macro; before recording a macro; macros that use relative record or absolute record; record a macro; text macro. #8 Customize the user interface – create a dialog box; enter command to display dialog box; assign a name to a macro; test macro; make changes to dialog box; save dialog box.

❖ PowerPoint 3.0 for Windows

Below are the key topics in the video training from *Anderson Soft-Teach*. Each volume has five lessons, and each lesson is approximately 10 minutes long. Anderson Soft-Teach recommends that you allow 10-25 minutes to complete the hands-on exercises in the training guide. You should allow approximately 2-3 hours to complete the training material in each volume.

Volume 1, PowerPoint

#1 Getting started – examine the PowerPoint window; exit PowerPoint. #2 Work in slide view – enter a title or body text; add a new slide; format text; use the slide changer; change font size; save a presentation; print slides. #3 Work in outline view – open a presentation; switch to outline view; change the view scale; add a slide in outline view; promote and demote paragraphs; rearrange paragraphs; print an outline. #4 Add clip art – change to slide view; delete the body object; open a clip art file; copy and paste clip art; ungroup and regroup objects; modify clip art. #5 Work with a slide presentation – use the slide show tool; switch to slide sorter view; delete slides; add slides in slide sorter view; rearrange slides.

Volume 2, PowerPoint

#6 Draw in PowerPoint – draw an object; use the constraint key; use the shape tool; resize and move objects. #7 Enhance objects – fill or shade an object; change text color; adjust the shape of an object; group or stack objects. #8 Working with masters – view the slide master; add background items to a master; format the master title; ignore the master format. #9 Change the color scheme – understanding the color scheme; change the color scheme; change title text color. #10 Apply templates – understanding templates; apply a template follow the master; change template.

Volume 3, PowerPoint
#11 Work with text objects – use a ruler; change paragraph and line spacing; align text; add text objects; designate text as the body object. #12 Create a graph – create a graph; examine the graph window; delete rows and columns; enter data; delete the legend; place the graph into PowerPoint. #13 Customize a graph – edit a graph; change the graph type; add titles to a graph; work with graph colors; return the graph to PowerPoint. #14 Create notes pages and handouts – use notes view; use the home scale tool; create a notes page; view the notes master; format the notes master; print notes; view the handout master; print handouts; view the outline master. Extras for experts.

Tips, Tricks, Tutorials

▼ Surge Suppressors

To buy or not to buy a surge suppressor — is that your question? In our October 1992 newsletter we ran some information about surge suppressors. This tip includes additional information that may help you decide.

Expanded Voltage Range
Not many years ago computers were labeled 120/240 Volts, meaning that you could flip a switch and the power supply would run around 100 or around 240 Volts (but not both at the same time).

Most new computers have power supplies that are labeled 100-240V. The "-" means they can accept anything from 100 through 240 Volts without flipping any switches. The newer power supplies have enough extra adjustment range so they can efficiently use any voltage in the 100 through 240 range.

What does this have to do with surge suppressors? Quite a bit. A typical surge on a 120 Volt line might be 180 Volts for a fraction of a second. A 100-240V power supply can probably swallow this kind of surge with no ill effects — after all, it can routinely run on 240 volts.

Network Issues
When you attach a surge suppressor to your equipment, it takes noise and surges from the power line and tries to short those surges to "ground." Sorta like taking a washing machine that is wobbling around the laundry room and gluing it to the floor. A kludgy but acceptable solution if the floor is steady. But what if the floor is a bit wobbly and your grandfather clock is sitting on the same floor? If the washer shakes the floor, the clock could start skipping beats – same thing with your computer. If you are hooked up to a network, your machine's ground is hooked to other computer's ground through the power cord ground, and worse yet, with Ethernet, through the coax's outer conductor, which is grounded.

A surge suppressor attached to a computer can redirect 10-50 Volts of surges and noise from the power line (where the surges are mostly harmless) through the surge suppressor to the network (through the coax grounding shield). Unfortunately, it doesn't take much surge or noise to drown out the network signals — network signals are 1-2 Volts. This surge redirection can cause considerable network disruption.

▼ Modem Tip: Touch Tone Dialing

Most communications software comes preset to work with touch tone phone service, and it automatically implements the Hayes *ATDT* (attention dial tone) command.

Just because your phone has buttons rather than a rotary dial does not mean you have touch tone service. U. S. West, for example, has a separate monthly *Touch Tone Service* charge. If you are not paying this charge, you do not have touch tone service and must use a different Hayes command - *ATDP* (attention dial pulse).

Currently all University phones have touch tone service.

Help: Computer and Information Services

Distributed Services and Planning	*Phone*	*Help Line Hours*

Computer Services Information Line 625-1555 anytime
If you do not know which computer service phone number to call, dial the Computer Services Information Line.

Central Systems Help Lines
To use these systems, you need a user name and password, which you get when you open an account.
Qualified users can apply for grants to handle some computing-related costs.

Machine ID		
☐ EPX (UNIX), NVE (NOS/VE), UZ (Ultrix), VX and VZ (VMS)	626-5592	Monday–Friday ..... 9 am to 4 pm
1 Nicholson Hall Walk-in Consulting		Monday–Friday ..... 10 am to 4 pm
☐ VM1 (IBM/CMS), 99B Coffey Hall Walk-in Consulting	624-6235	Monday–Friday ..... 9 am to 4 pm
☐ MEDLINE (MinnesotaMEDLINE on NVE)	626-8366	Monday–Friday ..... 9 am to 4 pm

Microcomputers and Workstations HelpLine

Software, hardware, peripherals, local area networks	626-4276	Monday–Friday ..... 9 am to 4 pm
☐ East Bank ..... 152 Shepherd Labs	above	above
☐ West Bank ..... 93 Blegen	above	Tue. and Fri. 1-4, Thur. 9-noon
☐ St. Paul ..... 99B Coffey Hall	above	Mon. and Fri. 9-12, Wed. 1-4 pm

E-Mail (Electronic Mail) and LUMINA Help Lines

☐ E-mail: call for help using your University account.	626-7676	Monday–Friday ..... 9 am to 10 pm
Walk-in help available in most campus Public Computer Facilities.		
☐ LUMINA: call if you have trouble connecting.	626-2272	Monday–Friday ..... 9 am to 4 pm

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

Distributed Services and Planning	Shih-Pau Yen
Engineering Services	Don Clark
Networking Services	Lawrence Liddiard
Software Services and Operations	Lee Croatt
St. Paul Services	Mel Sauve
Central System Accounts, IBM CMS	624-7788
EPX, NVE (includes MEDLINE), UZ, VX, VZ	6-8366
Disability and Computing Services, voice	6-0365
TDD	6-0569
Equipment Repair and Warranties (Engr. Serv.)	5-1595
Faculty Resource Center (to make an appointment)	5-1300
Kodak Printer Service	6-1661
Network Addresses (130 Lind)	5-8888
Public Computer Facilities (obtaining access)	5-1300
Software Services (includes contract programming)	5-2303
Data Entry Services, Minneapolis	6-8351
Data Entry Services, St. Paul	4-7297
Gopher Setup Service	5-2303
Tape Librarians (Central Systems)	
EPX, NVE, UZ, VX, VZ (Lauderdale Comp. Facility)	6-1838
VM1 (IBM/CMS in St. Paul)	4-3482
Training, Course Registration (190 ShepLab)	5-1300

Other Departments

Computer Desk, Williamson Hall Book Center	625-3854
AIS (Admin. Info. Services) Customer Assistance	4-0555
LUMINA to U (University Libraries)	6-2260
Supercomputer Center Help (3030 SCC)	6-0808
Telecommunications, Networking Services	
Information	6-7800
Repair	5-0006

Access Information

SLIP: 2400/9600 ——— 626-1920
SLIP: ADI-100 and ITE only ——— 3-0291

☎ Terminal settings for these systems are 8-1-N (8 data bits, 1 stop bit, no parity) unless otherwise noted. The number you dial may depend on the modem's bps or baud rate.

✉ Internet addresses.

➢ Dial-in Server: 626-**0300**, -**1200**, -**2400**, -**9600**

☐ At 9600 Telecomm supports V.32 and MNP level 5 error correction.

☐ On campus ADI-100 and ITE setups use 626-2400.

LUMINA: 300/1200/2400 ..... 625-6009 ☎
LUMINA.LIB.UMN.EDU ✉

E-mail and Internet Interactive Sessions, Twin Cities
Students GOLD.TC.UMN.EDU ✉
Faculty and Staff MAROON.TC.UMN.EDU ✉

Gopher or Computer Consultant (log in as `gopher`)
300, 1200, 2400, 9600 ..... see *Dial-in Server* ☎
CONSULTANT.MICRO.UMN.EDU ✉

PUBINFO (tn3270 only) PUBINFO.AIS.UMN.EDU ✉

EPX, NVE (includes MEDLINE), UZ, VX, VZ
300, 1200, 2400, 9600 ..... see *Dial-in Server* ☎
300/1200/2400 at 7-1-even ..... 626-1630 ☎
EPX or UZ or VX or VZ or NVE.CIS.UMN.EDU ✉

EPX, NVE (includes MEDLINE)
300/1200/2400 ..... 625-1445 ☎
up to 19.2 campus data phone ..... 6-2400 ☎
EPX or NVE.HSCS.UMN.EDU ✉

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

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❑ POPmail users can receive notices about updates and upgrades by sending E-mail to: `popmail-news-request@boombox.micro.umn.edu`

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Computer and Information Services

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