UNIVERSITY OF MINNESOTA

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News and Announcements

▼ IBM LaserPrinter 4029 Series

IBM recently expanded their LaserPrinter 4029 series. It now includes machines that have PostScript built into them and support IBM's Print Quality Enhancement Technology (PQET). These new printers are also capable of printing 600 dots per inch (dpi).

Lexmark, a former unit of IBM and the new distributor of IBM personal printers, is offering these new printers, which are listed in Table 1.

The 4029 series printers are compatible with the supplies, options, and features used in the other printers in the IBM laser printer family – with two exceptions: memory upgrades and optional software emulation. You can upgrade the 6P and 6A to a 10P and 10A, respectively.

4029P for IBMs and 4029A for Macs

The 4029 P series printers have standard PC parallel and serial interfaces. You buy the appropriate cable and connect it to your IBM or IBM-compatible. The downloadable fonts that come with the P series are supported by DOS 3.3 to 5.0 and most OS/2 editions. Currently the P series printers are packaged with an Adobe Type Manager (ATM) manual and software, a software driver/application book, 3.5-inch disks with screen fonts, and utilities.

➥ **IBM Printers continued on page 30**

Computer Basics: Buying a Modem

Connections

There are two commonly used ways for a microcomputer to communicate with another computer: through a network or by means of a modem.

If you have a network connection, your microcomputer and the other computer are connected via cable; these cables come in different forms. Many computers can be connected to the same network cable. At the University, many computers are connected to the network through Ethernet cable. (However, AIS's, Administrative Information Services, network is *not* Ethernet; it's SNA.)

Any computer on the network can potentially communicate with any other computer with connections to the same network.

Modems allow computers to exchange information across telephone lines. The modem (**MO**dulate/**DEM**odulate) takes characters from your microcomputer's serial port and converts them to signals that can be transmitted over telephone lines. Then it sends these transformed characters to another modem. The receiving modem transfers the characters it receives to the computer to which it is connected.

Modems always talk to other modems. All of this intermediate conversion is automatic, so you need not worry about how it works.

Since network connections are impractical or impossible in many situations, we get questions from folks who want to buy a modem to allow their microcomputer to talk to other computers - or to people who are using those computers. This article discusses some of the factors you should think about when buying a modem.

Modem Compatibility

Years ago a company called D.C. Hayes built a better modem. This modem had the ability to dial the phone and configure itself based on a set of commands you could send the modem from your communication program. So many companies adopted the Hayes command language that it became an industry standard.

Hayes Commands

Although very few modems do *not* use the Hayes command set, you should make sure that the modem you buy does. Almost all communications software will use Hayes commands, such as

```
ATDT 56009
ATDP 6269600
```

The ATD portion of the command alerts your modem that you're telling it to dial a phone number (attention dial). The T and P portions modify the dial command for tone dial or pulse dial. The numbers are the telephone numbers you want to dial.

The Speed Issue

Modems are designated by their data transfer rate. The data transfer rate, or baud rate, is the number of bits per second (bps) that characters are transmitted from modem to modem. Since it takes about 10 bits to send one byte (character) of information, you can divide the baud rate by 10 to get the number of characters that are sent each second. For example, 9600 baud/10 bits bps equals 960 characters per second.

Go For 2400 or 9600

Today most modems on the market are 2400 or 9600 baud. Generally we'd recommend that you buy modems that are at least 2400 baud. At today's prices, the faster transfer rate you get from a 2400 baud modem (as opposed to a 1200 or 300 baud modem) is worth the price difference. While some very fast 14,400 baud modems are available, we don't recommend them either. Besides being very expensive, they're currently not supported by the University's modem pool.

If you are interested in stable communications and future compatibility, we suggest that you consider buying a 9600 baud modem. 9600 baud is the highest speed modem commonly used at the University.

If you are using a standard terminal emulation package, such as ProComm for IBMs or TinCan for Macs, the speed of your modem is less critical. Nevertheless, we still recommend that you buy at least a 2400 baud modem.

Whatever modem you buy, make sure you get the appropriate modem serial cable.

You Can Slow Down

The baud rate specified for a modem is the highest rate at which it will communicate. A 9600 baud modem will usually also operate at 4800, 2400, 1200, and 300 baud. It is rare to see a modem that will not communicate at all of the lower rates.

Buying for the Future

As microcomputers increase in performance and capabilities, our need for better performing communications equipment also increases. An exciting recent development is that networking software has become available for use via a modem at home or other remote locations. This new software includes SLIP (see *SLIP...into the Future* on page 24 for more information), AppleTalk Remote Access, and Dial-in Novell.

In the not too distant past, modems ranged in speed from 110 baud up to 2400 baud. The newer generation 9600 baud modems give you at least a fourfold increase in performance. To be usable from a remote location, such as your home, networking packages need faster communications. High performance 9600 baud modems are the key to getting the performance necessary to use this new wave of software.

9600 Baud Performance Issues

In this section we will discuss the three main performance issues that relate to 9600 baud modems: the speed of data transfer, data compression, and error correction.

Fortunately, a set of standards addresses these issues for high speed modems. The University's Telecommunications Department uses modems that comply with the CCITT V.42 standard (Consultative Committee of International Telephone and Telegraph). This world-wide standard provides for data compression and error correction.

Data Transfer

There can be two different transmission rates:
1. one from the computer to the modem and
2. one from your modem to the other modem.

In the past, these two rates were always the same.

Data compression becomes important as the modem's speed increases and as the amount of information to be transferred increases. To obtain successful data compression, the computer *must* send characters to the modem at least twice as fast as they can be transmitted from modem to modem.

Data Compression

Data compression is a way of removing some of the bits that are transferred without removing any of the information the bits represent. The V.42 standard provides for two types of data compression: MNP5 and LAP-M.

When two modems start to communicate with each other, they decide which of these two compression methods is better for this session. MNP5, which is more common, will give you about a 2:1 compression ratio.

Remember, the fastest throughput relies on a transfer rate from computer to modem that is twice as fast as the modem-to-modem transfer rate. If you have a 9600 baud modem (and use data compression), your computer will send characters to the modem at 19.2K bps. Your modem will then compress two characters into one and transfer it to the other modem at 9600 baud. The other modem will decompress this character into the original two and pass the characters to the receiving computer at 19.2K.

Error Correction

Generally people can interpret the garbled speech they occasionally hear during telephone conversations. Likewise, when transferring data over phone line, transmission "noise" can occur. Error correction is an attempt to detect and correct such transmissions errors.

There are two basic types of error correction: software and hardware. Software error correction protocols include: X.PC, SDLC, and HDLC. These error correction protocols are usually written into your terminal emulation program. Generally they're used only when you transfer files, not when you communicate interactively with a host computer, such as LUMINA.

In the appropriately equipped modem, error correction is built into the V.42 hardware. The V.42 error correction protocol transmits two things:
1. blocks of characters and
2. some characters (check sum) that represent the information in the block of characters.

The main advantage of the V.42 protocol is speed.

When a modem receives characters, it rechecks the block of characters and compares its check sum to the check sum that was sent. If the results do not match, the sending

modem is asked to re-send the block, starting from the erroneous part.

Telecommunication Software

There are two categories of software you can use with your microcomputer and modem: Terminal Emulation and Networking.

Terminal Emulation

Many of you are used to using your microcomputer and modem to emulate a terminal with software such as ProComm or TinCan. ProComm and TinCan work reliably with most modems, enabling you to communicate with most of the University's central systems.

Many modems even come with communications software that will work well at the University. Like ProComm and TinCan, these software packages turn your microcomputer into a computer terminal. These packages generally also allow you to transfer files between your microcomputer and the University's central systems.

We administer site licenses for ProComm for IBM/MS-DOS and TinCan for the Mac. These licenses enable members of the University community to copy the software at no charge. You can bring a formatted disk to any Microcomputer HelpLine to copy the software and documentation, which is also on the computer disk.

SLIP...into the Future

SLIP turns your phone jack into a network connection.

Can't Function Without Your Network Connection?

Microcomputer networks have become widespread at the University. Those of us who use them quickly find them indispensable. These networks allow us access to high speed file transfer, electronic mail, database search and retrieval, and to cruise general information exchanges. Previously this network of information was available only when we were sitting at our desks, at the University, wired into the internet.

SLIP allows us to connect to the University's network from home, from University locations that don't have network connections, or even from a hotel room.

What is SLIP?

SLIP's the de-facto standard for connecting computers, via modem, to the University's TCP/IP backbone network.

SLIP (Serial Line Internet Protocol) is communications software; it's available for Macintoshes and IBMs. When you run SLIP, your computer is connected to a central computer just as if it were physically attached to a network wire. SLIP provides only the connection. You must still run "network" software to actually do anything on the central computer you're connected to.

SLIP May Change Your Life

SLIP makes it possible to run TCP/IP network software such as POPmail, Gopher, FTP, Telnet, NetNews readers, and HyperFTP from a microcomputer and a telephone line just as if you were directly connected to the campus network. So, finally you can fetch electronic mail from home using POPmail.

The Modem Pool: 626-1920

In order for this to work, the network you want to access must have a SLIP terminal server. The server monitors a modem (or pool of modems) for incoming SLIP connections. Then it translates the modem signals it receives into standard TCP/IP network signals.

The Telecommunications Department has installed many modems and other hardware to handle SLIP traffic. To reach the SLIP modem pool, call 626-1920.

Authentication Required

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 to a SLIP server. TACACS restricts access to University students, staff, and faculty.

If you don't have a valid account on a computer connected ***directly*** to the University's network, TACACS won't let you connect. And that computer must be running UNIX and TACACS. EPX is such a system, a UNIX machine running TACACS. So if you have an E-mail account on epx.cis.umn.edu, you're positioned to

Networking

We'll briefly discuss some network software that is popular at the University.

SLIP

SLIP (Serial Line Internet Protocol) is software that turns modems into a connection to the University's Ethernet network. SLIP is installed on a computer supported by the Telecommunications Department. This computer controls a group of 9600 baud V.42 modems that can be accessed by dialing 626-1920.

You can run companion programs on Macintosh and IBM/MS-DOS microcomputers that work in conjunction with SLIP. (To learn more about SLIP, see *SLIP into the Future* below.)

Gopher

Gopher is client/server software for a distributed information delivery system. While providing a way to deliver information to a local audience, it also facilitates access to other Gopher and information servers throughout the world, such as WWW (World Wide Web). Gopher servers are used to distribute all kinds of text-based information. Access to other kinds of information depends on specific client/server software setups. To access gopher you need a "client" program. To distribute gopher information you use a server program to set up a server.

Several Gopher servers are maintained at the University of Minnesota, such as the Minnesota Daily and UPI news, which is updated hourly. Gopher can also provide for limited access rather than general access. For example, use SLIP to read your E-mail from home.

For TACACS installation information, UNIX administrators can call the Microcomputer HelpLine or send E-mail to

`slip@boombox.micro.umn.edu`

Go For 9600 Baud

Typical networks will transfer information at speeds up to tens of millions of bits per second (bps). Even the fastest modems will transfer only about a thousand bps. The networking software mentioned above (along with most software in this class) has a tendency to transmit more information than terminal based programs. Because you are transferring more information across the telephone line, the time it takes to get all that information can be long, very long. The result is that you wait for the computer. At slow transmission speeds, some software gives up before a response can be obtained.

Because of the large quantity of information transferred, you need at least a 2400 baud modem. We highly recommend that you use a 9600 baud modem.

If you already own a 2400 baud modem, don't throw it out. Try it and see if you get acceptable performance.

Obtaining SLIP Software

We've made arrangements to make SLIP software available to you for no charge. We purchased a site license for MacSLIP for the Macintosh from Hyde Park Software. Those who obtain MacSLIP must sign a usage agreement. We're also distributing SLIP utilities for the IBM thanks to the University of Illinois, Urbana-Champaigne.

All the files and documentation you need to install and run SLIP will fit on one disk. To get your copy, bring a formatted disk into any Microcomputer HelpLine. Bring in extra disks if you also need a copy of other networking software, e.g., POPmail, Gopher, FTP, and Telnet.

Basic Hardware

You need a modem that has a baud rate of at least 2400. We recommend a 9600 baud V.42 compatible modem, such as the MultiTech 9600 sold at the Computer Desk. The documentation we provide with SLIP goes into more detail about modems. Along with the document we also provide Generic Hayes and Semi-Generic Hayes modem scripts that you can use with your modem.

IBM Compatibles

IBM SLIP will use any of the first four COM ports on your IBM or compatible, that is COM1 through COM4. It's compatible with IBM/MS-DOS 3.3 or later.

Macintoshes

System 7 is recommended and is required for certain Macintoshes, such as the Mac Plus, SE, Classic, and Classic II. You can use System 6.0.7 on Mac II class machines. You also need MacTCP 1.1 or later, unless you are using a Mac Plus.

Mac Plus users must run MacTCP 1.1+, a special version of MacTCP for the Mac Plus.

All of this software is free and is available at any Microcomputer HelpLine.

access to UPI news is limited because the University's site license does not allow us to provide free public access to the newswire.

POPmail for Macs and IBMs
POPmail is electronic mail software that you use over a network. Like most E-mail software you can use it to exchange messages with other E-mail users, providing you know how to address E-mail to them and your network has access to their network.

FTP
FTP is part of Telnet. NCSA Telnet software lets a computer interactively access a host computer on a TCP/IP network, such as the University's network. A computer running Telnet accesses the host computer as a VT102 or VT100 terminal, a type of terminal supported by many workstations and central system computers. You use FTP (file transfer protocol) to transfer files between a host computer and another computer running Telnet.

Telephone Lines

We've one caveat to using high speed communications: your telephone line. Information that is sent at faster speeds is much more likely to be corrupted by any electronic noise that may be present on your telephone line. This noise can range from no problem; can force some retransmissions; or it can even prevent you from running at 9600 baud. There is no real way to detect if you will have problems with noise on your phone.

We called U.S. West to find out what their current policy is in relation to computing by phone. They gave us a detailed set of solutions to possible problems. The impression we got was that they go to extreme lengths to correct problems with telephone lines that are plagued by noise.

Internal versus External Modems

Modems can be divided into two categories: internal and external. Both types do exactly the same thing.

An internal modem plugs into a slot inside your computer where it uses the computer's electric power. This means manufacturers don't have to provide a case or power supply for internal modems. And you don't have to use a cable to connect the modem to your computer. As a result, internal modems tend to be a bit cheaper than external modems.

Despite this, we generally recommend that you get an external modem. External modems have activity lights that you can use to help you see if things are working as they should. When things go wrong, you don't have to reopen your computer and poke around inside it – increasing the risk that other internal parts will get messed up. Occasionally, an internal modem will be incompatible with other components inside your computer.

External modems are also easier to reuse. Just buy the proper cables and plug them into different computers. Sometimes an internal modem bought for one computer will not fit inside another.

Conclusion

Which modem you buy depends on what you want to use it for. If you just want to access LUMINA (Libraries of the University of Minnesota Integrated Network Access), your old 1200 baud modem should be adequate. The best choice for at-home computer communication to the University's network is a 9600 baud modem with MNP5 data compression and error correction.

Graphics Software

Featuring SAS/GRAPH and PicSure

Overview

People use pictures to communicate. Graphical representations of data can be an efficient way to describe data relationships, and they can be used as an alternative method to analyze data. So even if your project does not require graphs, you might want to include some in your presentation. Graphs let you present your data to your audience in a simplified and easily understood format.

Computer users can choose from a variety of graphics packages. Some packages run on microcomputers, some on central systems (mainframes), some on both. Graphics packages differ in their versatility and in how easy they are to use and learn.

Creating graphs can be a computing and memory intensive process. Our central system help lines talk to people switching from a microcomputer to a central system when they are dealing with a large amount of data and/or calling for memory intensive procedures. A large data set might have 5000+ observations with over 20 variables. Depend-

ing on what you plan to do with the data, even a smaller amount can demand more memory than a typical microcomputer has. This aspect of creating a graph can be hard to pin down until you try doing something and get an error message about needing more memory. A memory intensive procedure might involve using map data sets, complicated macro code for customized plots, etc.

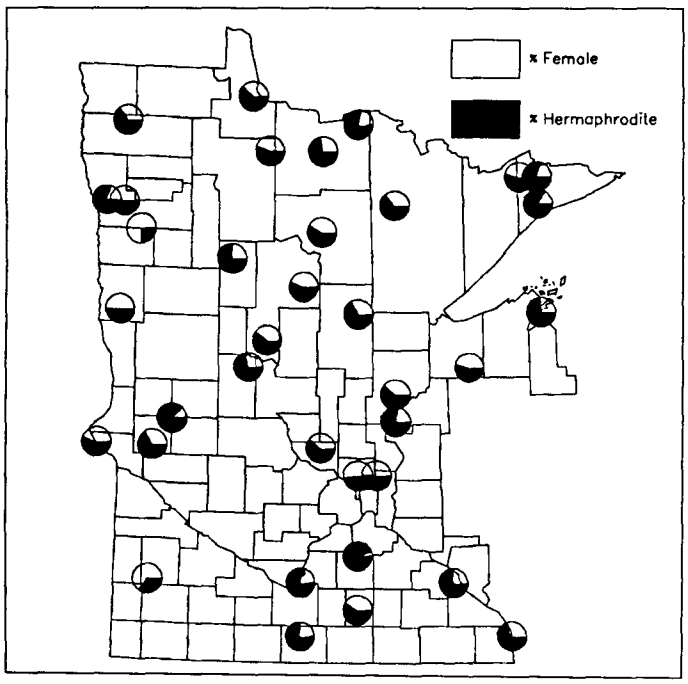
Since central systems have more computing power and memory than a typical microcomputer, one of our central systems might be the most efficient choice for your project. If you are unsure about your needs, talk to one of our consultants.

In this article we will look at two of the most used graphics packages on central systems: SAS/GRAPH and PicSure.

SAS/GRAPH

SAS/GRAPH is part of SAS, an integrated program for all phases of data access, management, analysis, and presentation. (For more information about SAS, see *Statistical Packages for Research Analysis* in our January 1992 newsletter.)

Figure 1: Created with SAS/GRAPH
Wild Strawberry Collection



SAS Is Widely Available

SAS is available on many platforms. There are versions on the IBM/CMS, EP/IX, NOS/VE, and VMS/VAX central systems. The University also has a site license for PC SAS for IBM/MS-DOS and OS/2 microcomputers.

SAS programs are portable. For example, if you spend time developing and running an exploratory analysis of your data on a personal computer and want to share it with a colleague running SAS on a SUN workstation, the SAS code works the same on both systems.

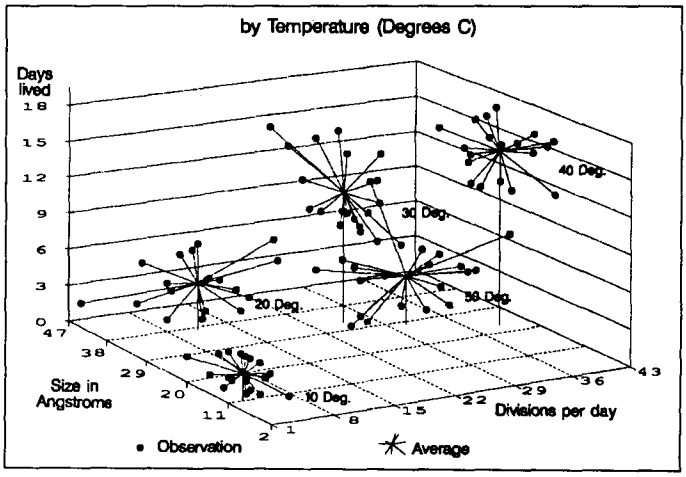
SAS on the EPX System

The EPX central system features additional SAS products and capabilities, most notably SAS/Access, a series of transparent interfaces that link SAS systems with other popular database management systems, such as ORACLE, dBASE2, and DEC's Rdb for VMS. In addition to SAS/GRAPH, other SAS products on EPX also have graphics capabilities: SAS/OR for operations research and project management and SAS/QC for quality control applications.

SAS Syntax is Consistent

Many researchers who have used SAS to analyze data find it convenient to use SAS/GRAPH to produce the final graphs (plots, charts, etc.). Since the SAS syntax applies to all SAS products, these researchers don't have to learn another software package. In addition, they don't need to be concerned about reformatting or reading in data, since SAS/GRAPH will use the data sets created for previous SAS analysis.

Figure 2: Created with SAS/GRAPH
Bacteria Growth Rate



SAS/GRAPH is Versatile

SAS/GRAPH has procedures for 2D and 3D plots, charts, contour plotting, text, and mapping. Its mapping ability is extensive. SAS has digitized map data boundaries for the world (except Antarctica) and countries (which may or may not have internal political divisions). Figures 1 and 2 were created with SAS/GRAPH. (The data for Figure 1 was collected throughout Minnesota in 1986. It shows the ratio of wild strawberry plants that were female or hermaphrodite for each collection site.)

SAS/GRAPH also has utilities for enhancing graphs and a mechanism for storing and replaying graphs. It allows extensive control over text features and has the ability to overlay plots and display multiple pictures on a page.

SAS is used for research in many departments within the University. It is also widely used in business, so familiarity with SAS may be helpful after graduation. The local SAS users' group includes representatives from Blue Cross Blue Shield, Burlington Northern, Norwest, Land O' Lakes, Medtronic, West Publishing, and 3M.

PicSure

PicSure is an interactive graphics system for generating charts and graphs using a simple sequence of English-like commands. No knowledge of computer languages or graphics is required to use PicSure. A sample PicSure graph is shown in Figure 4.

Novices as well as experienced programmers can create text charts, line graphs, scattergrams, bar charts, pie charts, and multi-charts. PicSure has a set of 20 publication-quality text fonts for use in charts and is available on our NOS/VE and VMS/VAX central systems.

Graphics Input and Output

The input to graphics software can be data that is suitable for plotting. You can also issue chart creation commands.

Output from graphics software is sent to a graphics device. A graphics device is a plotter, printer, or terminal. To see your graphs on a video screen you cannot sit down at just any terminal. You need to use a graphics terminal, such as a Tektronix graphics terminal.

PC SAS Site License

We administer several site licenses, including a license for PC SAS. Altogether there are six SAS PC products for IBM/MS-DOS and two for OS/2: Base SAS, SAS/STAT, SAS/GRAPH, SAS/ETS, SAS/FSP, SAS/IML, OS2/SAS Base, and OS2/SAS STAT. Here's what you need to know to license PC SAS.

- Fill out a PC SAS Application form. You may obtain this form at any of our offices on campus or by calling our St. Paul Services office at 624-7788.
- Bring the completed form to the front desk in 50 Coffey Hall. If you prefer to have the software mailed to you, you will be billed an additional $10 per product.
- Only University of Minnesota faculty and staff may *obtain* PC SAS software. Faculty, staff, and registered students may *use* PC SAS software. Use of this software is limited to academic studies and/or research and does not include any profit-making or commercial use.
- The software is licensed on an annual basis (December 1 through November 30) and the charge is $75 per product per year. (Prorated licenses are also available.)
- The license must be paid for by a University of Minnesota CUFS number.
- The licensee cannot make multiple copies of the software.
- To use the SAS products with IBM/MS-DOS, your computer must have a minimum of 640K memory and at least a 10MB hard disk (20 if you want to run SAS/GRAPH).
- The license covers diskettes, an installation packet, and free upgrades. You must purchase manuals separately.
- You can purchase manuals from the St. Paul Books Underground store or directly from SAS Institute. Manuals are available for reference at the Help Desk in 99 Coffey Hall.

Figure 3: PicSure Command File

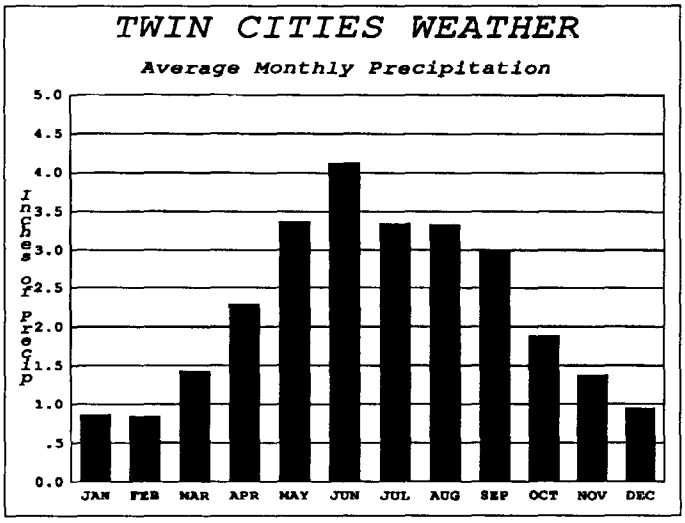
```
USE LAYOUT 'VBARM01'
/*
/* THIS PICSURE COMMAND FILE CREATES A
/* VERTICAL BAR CHART WHICH SHOWS THE
/* AVERAGE MONTHLY PRECIPITATION (IN INCHES)
/*  IN THE TWIN CITIES METRO AREA.

/*  (THIS VERTICAL BAR CHART WAS OUTPUT
/* ON THE NEC POSTSCRIPT PRINTER.)
/*
ENABLE PICTURE BACKGROUND
PICTURE BACKGROUND COLOR NORMAL
/*
ENABLE CHART BACKGROUND
CHART BACKGROUND COLOR COMPLEMENT
CHART WINDOW 1.99, 1.99
/*
ENTER DEPENDENT DATASET 'AVG MONTHLY PRECIP'
0.86  0.84  1.43  2.29  3.37  4.12
3.34  3.33  3.00  1.88  1.37  0.94
END
/*
TITLE 'TWIN CITIES WEATHER'
/*
SUBTITLE 'Average Monthly Precipitation'
/*
DISABLE LEGEND
/*
CURRENT AXIS LEFT
AXIS LABEL 'Inches of Precip"
AXIS RANGE 0.00,5.00
ENABLE LEFT GRID LINES
GRID PLACEMENT 0.00,5.00,0.50
/*
CURRENT DATASET 'AVG MONTHLY PRECIP'
FILL COLOR RED
FILL PATTERN SOLID
/*
DISABLE SOFTWARE TEXT
/*
DRAW
```

When graphics software is invoked, it creates a special type of file that can be sent to a graphics device that will display it (if it is a terminal) or plot/print it.

SAS/GRAPH and PicSure are usually run in a "semi-interactive" mode. In this interactive mode the user edits a program, submits it, and studies its display on the terminal. The user repeats this process until they're satisfied with the final display at the terminal. Finally, the program is sent to a plotter or printer.

Figure 4: Chart Created with PicSure Command File in Figure 3.



Using SAS/GRAPH

You can run SAS/GRAPH in two ways: write SAS programs or use SAS/ASSIST software, an easy, menu-driven interface to SAS features.

Using PicSure

The PicSure user builds a chart by entering a sequence of commands, as shown in Figure 3. Then the user displays the chart on a graphics display device. Data can be entered from the keyboard or a data file on disk. The resulting chart, shown in Figure 4, can be modified and may be redrawn as often as required to achieve the desired result. Instead of printing the chart, you can save it as a binary disk file or write a sequence of PicSure commands into a file that can be edited and reused later.

Ease of Use, Training, and Help

Unless you create a customized graph, you generally can turn out a graph with about a half an hour or two of training. Creating a customized graph takes more time. To master the options you want to employ can take 2-6 hours.

Each quarter we offer short courses designed to introduce the new user to PicSure and SAS/GRAPH. Fees for these courses are $5 to University students, faculty, and staff.

PicSure has an on-line tutorial and HELP facility for first time users on the VAX and NOS/VE. SAS has an on-line tutorial on CMS and a video on using SAS/GRAPH.

If you have questions about specific printers, locations, etc., call our central system help line at 626-5592 for details. SAS/GRAPH questions can also be directed to our St. Paul Services help line at 624-6235.

Costs

To use our central 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.

➥ News continued

The 4029 A series printers are packaged specifically for the Macintosh and are System 6 and 7 compatible. You can share these printers by connecting AppleTalk cables and selecting their names from the menu's *Chooser*. Currently the A series printers are packaged with an Adobe Type Manager (ATM) guide for Mac and disks with screen fonts and printer utilities for System 6 and 7.

Paper Handling

You can set up these printers to handle three paper sources, for example: tray 1 for plain paper, tray 2 for letterhead, and an envelope feeder. Some kinds of envelopes should not be used with the envelope feeder, such as those with windows or deep embossing.

The printers come with one 200-sheet input tray. You can add a second input tray. To add a 500-sheet paper tray, you install a drawer under the printer. This drawer holds the paper tray. You can purchase optional accessories, such as those shown in Table 2.

The 10P and 10A support additional features: "envelope conditioning" that helps keep envelopes from wrinkling and automatic notification when the output tray is full.

Fonts

Some fonts reside permanently in the printer, such as Courier, Times Roman, and Symbol. Others must be downloaded using the utilities provided with the printers. The 4029 Series 6A, 10A, and 10P printers come with the fonts shown in Table 3. The 6P comes with 17 Adobe PostScript Type 1 fonts, including Courier, Helvetica Narrow, Symbol, Times Roman, and some of the Helvetica fonts shown in Table 3.

Table 1: IBM 300-600 DPI LaserPrinters

	6P	10P	6A	10A
4029 Model	022	042	021	041
Price	$1606	$2656	$1886	$2796
Features				
Speed: Pages per Minute				
• 300 DPI	6	10	6	10
• 600 DPI	*	8	*	8
Memory (MB)				
• Standard	2	5	2	5
• Maximum	9	9	9	9
Usage: Pages per Month				
• 14,000	Y		Y	
• 20,000		Y		Y
Interfaces (you must order cables separately)				
• AppleTalk (DIN-8)			Y	Y
• Serial (25-pin)	Y	Y		
• Parallel	Y	Y		
Printer Language				
• PostScript	Y	Y	Y	Y
• PCL4 (HP)**	Y	Y		
• PPDS (IBM)	Y	Y		
• IBM Graphics Printer	Y	Y		
Motorola Controller Card				
• 10MHz 68000	Y		Y	
• 16.7MHz 68020		Y		Y

* 600 dpi requires additional memory on the 6P and 6A
** PCL5 (Feature #3339) is available for $139

Table 2: Some Paper Handling Options

Part	Description	Discount Price
3276	200 sheet paper tray: legal size	$55
3365	2nd input drawer for letter paper tray, includes 500 sheet paper tray	314
3151	envelope and feeder: capacity = 75	265

Toner Cartridge

The LaserPrinters 4029 10A and 10P ship with IBM's *High Yield+* toner cartridge (Part No. 1380520) which costs about $250. At 2.8% page coverage this cartridge will print about 15,000 pages, that is 30 reams of paper. (The 4029 series uses different toner cartridges than the Hewlett-Packard or Apple laser printers.) The 6A and 6P ship with a starter toner cartridge.

300 Versus 600 DPI

IBM's Print Quality Enhancement Technology (PQET), which smooths text and lines, is available at 300 dpi (dots-per-inch) but not at 600 dpi.

A surprise for those unaccustomed to 600 dpi print is that the differences between 600 and 300 dpi can be subtle. The improvements from the smaller dot size of 600 dpi are most noticeable in very small type sizes, such as 5 point, or in poster sizes, such as 250 point. You can also see the difference when you enlarge the image. The smaller dot size can give you more subtle shadings of gray. At other times the smaller dot size will make pictures appear darker.

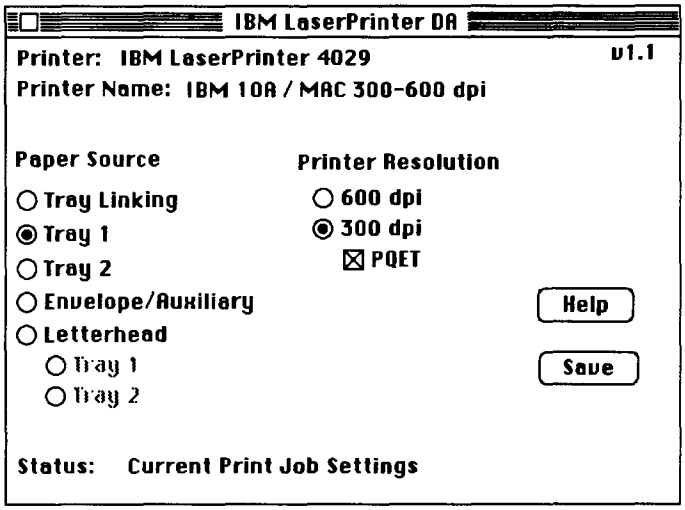
Test Drive 10A with a Macintosh

This summer the 4029 10A with the envelope accessory is available for test drives in the Shepherd Labs Microcomputer HelpLine.

Envelope Accessory

Activating the envelope accessory is easy once you've installed the *IBM LaserPrinter DA*. Figure 1 shows the print options offered by this desk accessory.

Figure 1: Macintosh Desk Accessory for 10A



We tested the envelope accessory from Microsoft Word and experimented with settings to get the address positioned correctly on the envelope. A setting that worked used the following page margins: 6-inch left and 6-inch top. We selected the wide (landscape) orientation from the *Page Setup* menu.

To activate the envelope accessory, you must make your selections from the *IBM LaserPrinter DA* and click on the *Save* button before selecting your software's Print command.

Table 3: 6A, 10A, and 10P with These PostScript Level 2 Typefaces

39 Typefaces	Roman	Medium	Oblique	Bold	Bold Oblique	Demi	Demi Oblique	Other	Other
Courier	y		y	y	y				
Helvetica	y		y	y	y			Black	Black Oblique
								Light	Light Oblique
Helvetica Narrow	y		y	y	y				
New Century Schoolbook	y		Italic	y	Bold Italic				
Palatino	y		Italic	y	Bold Italic				
Symbol								y	
Times Roman	y		Italic	y	Bold Italic				
Registered trademarks of International Typeface Corporation									
ITC Avant Garde Gothic						y	y	Book	Book Oblique
ITC Bookman						y	Demi Italic	Light	Light Italic
ITC Zapf Chancery	y								
ITC Zapf Dingbats								y	

▼ HP PaintJet XL300: Color 300 DPI

Hewlett-Packard recently introduced a new member of their color PaintJet family, the PaintJet XL300. Like the other PaintJets the XL300 is a plain-paper inkjet printer. The XL300 is designed to be compatible with the font cartridges and printer drivers available for HP's LaserJet series of laser printers. Like the LaserJets the PaintJet XL300 prints text and graphics at 300-dots-per inch.

You can also use the PaintJet XL300 with Macintoshes if the printer is equipped with PostScript.

Two distinguishing features of the XL300 are:

- PCL5, a color version of HP's printer control language, level 5 (PCL5 is used in HP's LaserJet III family and includes HP-GL/2, HP's vector graphics language) and
- optional PostScript compatibility.

At press time we did not have an XL300 available in the Microcomputer HelpLine in Shepherd Labs, but we hope to get one when demonstration models become available. The Book Center's prices for the XL300 and selected options are shown in Table 4. The XL300's features are discussed in more detail below.

Table 4: HP PaintJet XL300

Part No.	Description	Discount Price
C1645A	Standard Unit	$1985
C1656A	Unit with PostScript*	2835
Misc. Parts		
C1653A	Paper Tray: B	$105
C1651A	PostScript upgrade (with 4MB RAM) kit for XL300 (price includes installation costs)	1135
Memory Expansion Boards		
C1650A	2 SIMM slots, 0MB installed	$90
C1652A	2 SIMM slots, 4MB installed	355
Printer Cables		
For IBM compatibles		
C304-9	shielded parallel (6 foot)	$14
C-1A-10	shielded parallel (10 foot)	18
HP C2923A	RS-422 serial	not available yet
LocalTalk for Macintosh: DIN-8 connectors		
PN308	PhoneNet	$38
M2068	Apple	56

* To use the XL300 with a Macintosh, you need the unit that comes with PostScript; we expect the PostScript unit to be available in late August.

Speed

The printer's speed depends on the paper size, page complexity, and print mode, for example PCL5 or PostScript. Hewlett-Packard measures the XL300's print speed in minutes per page (mpp). Text print speed is 1 to 2 mpp. Graphics print speed varies from 1.5 to 6 mpp.

Color

You can use the XL300 to produce Pantone proofs. HP's technical data sheet states that the XL300 features "screen-to-printer color matching, Pantone-approved colors, and a 'More Vivid than Screen' choice that maximizes color saturation."

The XL300 comes with four ink cartridges: a black, a cyan (blue), a magenta, and a yellow cartridge. Color replacement cartridges cost about $20; black cartridges cost $2-3 less.

Software and Hardware Setup

The XL300 includes printer drivers (software) for Windows 3.0 and 3.1. The Windows driver supports Intellifont for Windows, Adobe Type Manager for Windows, TrueType (Windows 3.1 only), Bitstream Facelift, and HP Type Director. Drivers are also available for WordPerfect, Harvard Graphics, and other software.

On Macintoshes the XL300's drivers support System 6.0.5 through System 7. To use the XL300 with a Mac, the Mac must have a minimum of 2MB of RAM and a hard disk with 2MB of unused disk space.

The XL300 is packaged with a power cable, but you must purchase a cable to connect it to your computer or network.

Memory

The XL300 comes with 2MB of memory, has two slots for memory expansion boards, and supports up to 18MB of memory. Of the 2MB of installed memory, 800K is available to the user.

Like the LaserJet IIISI, the XL300 uses standard 1-, 4-, and 8MB SIMMs. HP's memory expansion boards have slots for these SIMMs.

Paper and Paper Trays

You can use a variety of paper in the XL300, such as letterhead or, for more brilliant color, HP's jet series paper.

The XL300's standard input tray holds up to -
- ❑ 200 sheets of standard cut-sheet paper or
- ❑ 100 sheets of film or glossy paper.

The standard input tray can accommodate several sizes of paper, including
- ❑ letter (8.5 x 11-inches),
- ❑ legal (8.5 x 14-inches), and
- ❑ A4 (210 x 297 mm).

You can also purchase optional trays that hold tabloid B (11 x 17-inches), A3 (297 x 420 mm), and B4 (257 x 386 mm for Japanese market) paper.

Table 5: Built-in XL300 Support for Non-PostScript Fonts

13 scalable typefaces	Roman	Italic	Bold	Bold Italic
CG Times	y	y	y	y
Univers	y	y	y	y
Univers Condensed	y	y	y	y
ITC Zapf Dingbats				

14 fixed-width fonts	Portrait	Landscape
Courier Medium	10 and 12 point	10 and 12 point
Courier Bold	"	"
Courier Italic	"	"
Line Printer	8.5 point	8.5 point

Fonts

The XL300 uses the same font cartridges as the LaserJet printers. It also supports Intellifont, font scaling technology that works with Windows-compatible software and permits scaling fonts from .25 to 999.75 points in quarter-point increments.

The XL300 has built-in support for the scalable and fixed-width fonts shown in Table 5.

PostScript

If you get the XL300 preconfigured with PostScript Level 2 or purchase the PostScript Level 2 upgrade, you get the fonts shown in Table 6.

Interfaces

The PaintJet XL300 comes with one parallel port for easy connections to IBM-compatible computers. It also comes with a second port that you can configure to be AppleTalk or RS-422.

The optional JetDirect cards let you connect the XL300 to a variety of networks, such as EtherTalk, and Novell NetWare Ethernet. (If you install the HP JetDirect card for EtherTalk, you cannot use the built-in AppleTalk option.) Selected interface cards are shown in Table 7. LAN Manager, HP-IB, and UNIX (TCP/IP Ethernet) cards are also available by special order.

All the ports remain active, including the ports on the JetDirect cards. The printer automatically switches to the correct port depending on the incoming data.

Table 6: XL300s with PostScript Level 2 Include These Typefaces

35 Typefaces	Roman	Medium	Oblique	Bold	Bold Oblique	Demi	Demi Oblique	Other	Other
Courier	y		y	y	y				
Helvetica Narrow	y		y	y	y				
New Century Schoolbook	y		Italic	y	Bold Italic				
Symbol								y	
Trademarks of Linotype AG									
Helvetica	y		y	y	y				
Palatino	y		Italic	y	Bold Italic				
Times	y		Italic	y	Bold Italic				
Registered trademarks of International Typeface Corporation									
ITC Avant Garde Gothic						y	y	Book	Book Oblique
ITC Bookman						y	Demi Italic	Light	Light Italic
ITC Zapf Chancery	y								
ITC Zapf Dingbats								y	

Table 7: JetDirect Network Interface Cards
compatible with LaserJet IIISi and PaintJet XL300

Part	Description	Discount Price
C2509A	Novell NetWare: Ethernet **	$435
C2059C	Novell NetWare: Token Ring	560
C2059B	3Com 3+Open: Ethernet **	435
C2059D	3Com 3+Open: Token Ring	560
C2059E	EtherTalk **	435
C1647A	10BaseT adapter kit (includes EtherTwist transceiver, HP 28685B)	95

** for 10BaseT connections, purchase C1647A adapter kit

▼ Portables and the Discount Program

The University's Microcomputer Discount Program has purchasing restrictions that apply to students, faculty, and staff who buy their own equipment. In a two-year period individuals who are eligible to participate in the program may purchase one desktop computer, one portable computer, and one of each kind of peripheral, for example a modem and a printer, from one participating vendor. Departmental purchases have no such restrictions.

▼ ZEOS: Notebook and Pocket PC

ZEOS recently announced two portable computers: a Color Notebook and a Pocket PC. Both machines come with a built-in liquid crystal display (LCD). Table 8 lists the computers' prices and some features.

At press time the Microcomputer HelpLine in Shepherd Labs did not have demonstration models of these machines, but we expect to have them soon.

Ordering ZEOS Items

To assure that you obtain the additional discount ZEOS gives to the University, place your orders through the Computer Desk in the Williamson Hall Book Center.

Color Notebook: 6.7 Pounds

The ZEOS Color Notebook can support up to 20MB of RAM (random access memory).

Video

The Color Notebook's screen is a 640 x 480 passive matrix LCD that measures 9.5-inches diagonally. The VGA video setup can display 256 colors simultaneously at 320 x 200 resolution. At 640 x 480 (VGA) resolution it can display 16 colors. You can select from a palette of 262,144 colors.

If you plug in an external monitor, you can use the built-in and the external screens simultaneously.

Power

An AC adapter/charger is built into the Color Notebook, so you have the option of plugging it into a power source rather than using batteries. The portable is also packaged with a removable quick charge NiCad battery.

To extend battery life you can use customizable power-saving utilities that are packaged with the Color Notebook.

Pocket PC: 1.3 Pounds

At 9-5/8-inch by 4-1/2-inch, the Pocket PC is smaller than this page, and it weights only 1.3 pounds. It is packaged with an adapter, cables, batteries, and an AC/DC converter. The keyboard is designed for touch typing.

The Pocket PC has two compartments available for expanding memory. You can add 128K, 512K, 1MB, 2MB, 4MB, or 8MB PCMCIA 1.0 memory cards. The cards can accommodate software or data storage.

Video

The Pocket PC has a built-in, adjustable, non-glare, monochrome screen. The resolution of this supertwist LCD screen is 640 by 200. The screen displays 80 columns of information (horizontal) and 25 lines (vertical). You can control the screen's contrast with a rotary dial. The video setup displays 16 levels of gray and provides CGA emulation.

Power

You power the Pocket PC with two AA alkaline batteries that give you 10 hours of continuous use. If you use the suspend mode, the batteries may last 30 days. The backup is a 2032 Lithium battery (CR 2032). You can also plug the Pocket PC into an A/C power source by using its 110/220 VAC AC/DC converter.

Transferring Information

You can order a *Special Travel Kit* for $236.55 that includes a pocket send/receive fax/modem and communications software.

Table 8: ZEOS Pocket PC and Color Notebook

Features	**Color Notebooks**			**Pocket PC**
System				
• CPU	80386SL			NEC V30 (80C86 compatible)
• speed (MHz)	25			4.77/7.15
• cache	64K			–
• weight	6.7 pounds			1.3 pounds
• case size	12.3" x 10.2"			9.7" x 4.5"
• internal floppy drive	1.44MB 3.5"			none
• built-in LCD video screen	9.5" diagnoally			7" x 2/34"
External Input/Output Ports				
• serial	1			9-pin
• parallel	1			1
• keyboard	1			–
• VGA video	15-pin			–
• PCMCIA memory card connectors	–			y
Keyboard				
• keys	85			81
• dedicated function keys (F1—F12)	12			12
• numeric keypad	embedded			embedded
• other	–			function hot keys
Variables	**Color Notebook Packages**			
Package	#1	#2	#3	Pocket PC
Price	$3130.25	$3700.25	$4270.25	$565.25
Memory (MB) *	2	4	8	RAM@1, ROM@1.5
Hard Drive (MB)	60	60	130	none
Misc.				
• carrying case	–	custom	custom	y
• Microsoft mouse	–	y	y	–
• internal 2400 modem**	–	y	y	–
• extra battery	***	***	y	–
Software				
• MS-DOS 5	–	y	y	y
• QBasic	–	y	y	–
• Windows 3.1	–	y	y	–
• Microsoft Works	–	–	–	y
• Choose two	–	y	y	–

a) Ami Pro 2.0; b) Lotus for Windows; or c) Freelance Graphics for Windows

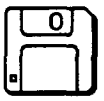
* Memory: ZEOS sells this additional memory for the Color Notebook: 2MB for $156.75; 6MB for $470.25; 10MB for $707.74, and 18MB for $1135.25.

** Modem: MNP class 5 with send/receive FAX capability.

*** Battery: You can purchase an extra battery separately for $84.55.

Bargains

Upgrade: POPmail II 2.0.5 for Mac



POPmail is electronic mail software. In July we released version 2.0.5. POPmail II runs on all Macs that have at least one megabyte of RAM and System 6.0.7 or later. If you use System 7 you need at least 2MB of RAM.

New Features

The latest version of POPmail II includes the following features.

❑ *Bullet marks the spot.* Unread mail is marked with a bullet (•) to show at a glance which messages remain unread. The bullet is removed after you view a message or initiate a fetch from the mail server.

❑ *Folder selection is easier.* The *Set Folder* dialog box now has a *Choose* button that shows the name of the selected folder on the button. Now you know exactly which folder you are selecting!

❑ *Decoding enclosures moved to background.* When binhex enclosures are received, you can continue to manage your mail in POPmail or even work in other applications.

❑ *Index files improved.* Both message and archive files have a permanent index file present in their respective folders.

❑ *Multiple message selection available.* In the *Message Browser* you can select scattered messages or a block of messages and delete or archive them. To select scattered messages, hold down the ⌘ key while clicking on each message in the message list. To select a block of messages, use the shift-click selection method.

❑ *Append Text File feature.* You can append any file in *text only* format to the end of your message by making a menu selection or holding down the Option key while clicking once on the *Enclose* button.

❑ *Support for IMAP2 protocol.* A limited subset of IMAP2 commands that emulate POP2 and POP3 command sets are implemented.

❑ *Preview feature.* Now you can look at messages on your mail server without copying them to the *Incoming Mail* folder on your hard disk. Hold down the Option key while clicking once on the *Fetch* button or select the *Preview* command from the *Mail* menu. To use this feature you must have POPmail configured for either POP3 (under *Set Username & Server*) or IMAP2 protocol.

Obtaining POPmail

You can get the POPmail software, documentation, and MacTCP drivers from the Mac Information Server. They're free. Look on the *information* volume for the Communications folder. Then look in the *Network Software* Folder. The folder labeled *POPmail* contains the latest release.

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

```
boombox.micro.umn.edu
```

Look in the directory named

```
/pub/POPmail/macintosh/2.0.5
```

Book Center Notes

The offers listed here are made to University departments, employees, and students, and are subject to the eligibility rules of the Micro-computer Discount Program. If you have questions about availability, phone the Computer Desk in Williamson Hall at 625-3854. During the summer the Computer Desk is open Monday to Friday from 8:00 am to 4:30 pm.

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

```
request@boombox.micro.umn.edu
```

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

▼ Handouts, Sales Tax, Credit Cards

Individuals must add 7% sales tax to all prices listed here or in our handouts. University departments do not have to pay sales tax. You can charge your purchases on your MasterCard and Visa accounts.

For more complete descriptions of the products listed here or of those available through the discount program, pick up one of 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 *Networks*. Some specialized handouts are also available.

▼ IBM PS/2 Academic Solutions

At press time we received information on new IBM academic solution packages for models of these Personal System 2s: 35SX, 56SX, 56SLC, 57SLC, and L40SX laptop. The prices and features of most of the desktop packages are listed in Table 1. The laptop is listed separately. Configurations of Model 8535 are also available with IBM's 8511 monitor for $80 less. (The PS/2 56SX, 56SLC, and 57SLC are fairly new models; we announced them in our June 1992 newsletter.)

At press time the Microcomputer HelpLine did not have copies of all the software included in the various academic solution bundles.

Available Through December 31

These academic promotions are available through December 31, 1992.

Laptop: $1849

Model L40 SX is a 7.7 pound laptop with an 80386SX microprocessor running at 20MHz. The 3T4 Academic Solution package comes with 4MB of RAM and an 80MB hard disk. Its discount price is $1849 (order number 2252701).

The 3T4 package also includes: IBM mouse, DOS 5.0, Windows 3.1, Asymetrix ToolBook 1.5 (runtime version), Math Expressions Editor, Exceller 3-D Keyboard, Norton Anti-Virus, METZ File F/X, Microsoft Entertainment Pack, and Fanfare Software Magic Cursor.

Table 1: Desktop Academic Solution Packages

PS/2 Model	**8535 (35SX)**		**8556 (56SX and 56SLC)**			**8557 (57SLC)***	
• Bundle	Academic Solution		Academic Solution			Advanced Academic Solution	
• Configurations	3T2	3T3	3T1	3T2	3S2	3S1	3A2
• Order Number	2261655	2261656	2251959	2252733	2252743	2261628	2261631
Price	**$1629**	**$1779**	**$2099**	**$2399**	**$2399**	**$2799**	**$3099**
System (CPU)	386SX	386SX	386SX	386SLC	386SLC	386SLC	386SLC
• Speed (MHZ)	20			20		20	
• Floppy Drive (MB)	1.44			2.88		2.88	
• Video adapter	VGA			VGA		VGA	
Variables							
• Color Monitor	8518	8518	8518	8515	8515	8515	8515
• IBM Mouse	Y	Y	Y	Y	Y	Y	Y
• Hard Drive (MB)	40	80	80	80	80	160	160
• Memory, installed (MB)	4	4	4	4	6	8	8
Software							
• Operating System	DOS 5	DOS 5	DOS 5	DOS 5	OS/2	OS/2	OS/2
• Windows 3.1	Y	Y	Y	Y	N	N	N
• Asymetrix ToolBook 1.5**	Y	Y	Y	Y	Y	Y	Y
• Math Expressions Editor	Y	Y	Y	Y	Y	Y	Y
• Exceller 3-D Keyboard	Y	Y	Y	Y	Y	Y	Y
• Norton Anti-Virus	Y	Y	Y	Y	N	N	Y
• METZ File F/X	Y	Y	Y	Y	N	N	N
• Microsoft Entertain. Pack	Y	Y	Y	Y	N	N	N
• Corel Draw	N	N	N	N	N	N	Y
• MS Multimedia Extensions	N	N	N	N	N	N	Y
• Video/Audio Clipmakers	N	N	N	N	N	N	Y

* An Ultimedia (multimedia) configuration is also available for $4199.

** Asymetrix ToolBook 1.5 that comes with the *Academic Solutions* bundles is a runtime version.

▼ Apple Back-to-School Promotions

Apple's offering selected machines at reduced prices as part of their back-to-school promotion. The products and their special prices are shown in Table 2.

Available August 15 to October 15

These promotions run from August 15 to October 15.

PowerBook 145

The PowerBook 145 offered with this promotion is a new Mac. Since the promotion was announced at press time, we have only limited information about the PowerBook 145 (look for a more complete description in the September newsletter). With a 25MHz CPU, the 145 is 30% faster than the 140, which has a 16MHz CPU. The PowerBook 145 has the same monitor as the 140. It's also compatible with the accessories and parts used in the 140 and 170, such as memory cards, rechargeable battery, AC adapter, battery recharger, and data/fax modem.

More Preinstalled Software

These Macintoshes come with this additional software preinstalled on their hard disks: American Heritage Dictionary with Roget's Thesaurus; Correct Grammar; The Random House Encyclopedia; ResumeWriter, and Calendar Creator. On-line documentation for the software is also installed on the hard disk. However, these promotional packages do not include manuals or floppy disk for this extra software. At press time the Microcomputer HelpLine did not have copies of all this software.

Table 2: Back-to-School Promotions

Mac Part	Memory/Hard Disk	Price
With built-in monitors		
Classic II		
K0129LL/A	4/40	$895
K0130LL/A	4/80	1005
PowerBook 145		
K0135LL/A	4/40	$1695
Without monitors		
For the LC and IIsi bundles, you can substitute the extended keyboard for the standard keyboard for an additional $60.		
Mac LC II		
K0132LL/A	4/80	$1195
Mac IIsi		
K0133LL/A	3/40	$1305
K0134LL/A	5/80	1520

Apple Parts	Description	Price
Monitors		
M0298LL/A	Monochrome: 12-inch	$190
M0297LL/A	Color: 12-inch RGB	385
M0401LL/B	Color: 13-inch Hi-Resolution	550
Printer	Note: the LS has no AppleTalk interface	
B0454LL/E	Personal LaserWriter LS (includes toner and printer cable)	$700

▼ Recent Price and Package Changes

IBM

IBM lowered their educational prices for some computers that are not part of a bundle. The decreases range from 11 to 31% for selected models of the computers listed here: N51SX, N51SLC, CL57, P70, P75, 56SX, 56SLC, 57, 57SX, 57SLC, 70, 90XP, and 95XP. Sample prices are shown below.

Part	Memory/Hard Disk	New Price
Desktop 56SLC and 57SLC (20MHz 80386SLC)		
8556-055	4/80	$1590
8557-055	4/80	1789
8557-059	4/160	2138
Portable N51SX, N51SLC, and CL57SX		
8551-025	2/80	$1698
8551-033	2/40	1293
8554-045	2/80	4001

ZEOS

ZEOS lowered the prices on some packages in their *Upgradable* and *Upgradable Value* systems lines. Sample prices are shown below.

Package	Memory/Hard Disk	New Price
486DX-33: Upgradable System		
#1	1/42	$1515.25
#2	2/107	1990.25
#3	4/130	2465.25
#4	8/210	2845.25
486DX-33: Upgradable Value System		
#1	1/42	$1420.25
#2	2/107	1895.25
#3	4/130	2275.25
#4	8/210	2560.25

MacDraw and Claris CAD Bargains: While supplies last you can purchase MacDraw Pro for $75 (normally $150 at the Book Center) and Claris CAD for $65 (normally $105 at the Book Center).

Help: Computer and Information Services

Consulting Service	*Phone*	*Help Line Hours*

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

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

Machine ID			
☐ EPX (UNIX), NVE (NOS/VE), VX (VMS), VZ (VMS)	626-5592	Monday–Friday	8:30 am to 4:30 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 (Minnesota MEDLINE on NVE)	626-8366	Monday–Friday	8 am to 4 pm

LUMINA

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

Microcomputers and Workstations

Software, hardware, peripherals, local area networks	626-4276	Monday–Friday	9 am to 4 pm
☐ East Bank — 152 Shepherd Labs	above	above	
☐ West Bank — 93 Blegen	above	Tuesday and Friday 1-4, Thursday 9-noon	
☐ St. Paul — 99B Coffey Hall	above	Monday and Friday 9-noon, Wednesday 1-4 pm	

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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

Adaptive Technology Services, voice	626-0365
TDD	4-4037
Central System Accounts, IBM CMS	4-7788
EPX, VX, VZ, NVE (includes MEDLINE)	6-8366
Data Entry Services, Minneapolis	6-8351
St. Paul	4-7297
Equipment Repair and Warranties (Engr. Serv.)	5-1595
Faculty Resource Center	6-1090
Network Addresses (130 Lind)	5-8888
Public Computer Facilities (obtaining access)	5-1300
Software Services (includes contract programming)	5-2303
Tape Librarians (Central Systems)	
EPX, NVE, VX, VZ (Lauderdale Computer 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	6-0505
Supercomputer Center Help (3030 SCC)	6-0808
Telecommunications, Networking Services:	
Information	6-7800
Repair	5-0006

Access Information

Internet addresses.

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

Dial-in Server: 626-**0300**, -**1200**, -**2400**, -**9600** (at 9600 V.32 standard and MNP level 5 error correction). Telecomm supports 8-1-N serial access to the TCP/IP network at 300, 1200, 2400, and 9600 bps.

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

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

EPX, VX (includes INFO), VZ, NVE (includes MEDLINE)
300, 1200, 2400, 9600 ..... see *Dial-in Server*
300/1200/2400 at 7-1-even 626-1630
EPX *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 line 3-2400
EPX *or* NVE.HSCS.UMN.EDU

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

Consulting via E-mail: *low-priority Central Systems questions*
☐ Format _____ CONSULT@MACHINE.NAME.UMN.EDU
☐ Example _____ CONSULT@EPX.CIS.UMN.EDU

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Computer and Information Services Newsletter

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Computer and Information Services

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