Microcomputer Newsletter

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News and Announcements

● NeXT Computer

Qualified buyers (full-time faculty, staff, students, and departments) can purchase the NeXT computer through the Microcomputer Discount Program. The NeXT machine includes a Motorola 68882 math co-processor to augment the Motorola 68030 CPU (Central Processing Unit); the 68030 CPU runs at 25 MHz.

UNIX

The NeXT computer runs a version of the UNIX operating system that has a graphics-oriented windowing user interface. NeXT's intent is to broaden the appeal of workstation class machines by melding an intuitive Macintosh-like user interface with the UNIX operating system and very powerful hardware. The NeXT machine has several unique features including a removable optical disk, extensive sound capabilities, and an object-oriented programming environment called NextStep.

Optical Disk Storage and Hardware Configurations

The optical disk drive on the NeXT machine uses removable disks which hold 256MB. Although the removable optical disks hold a massive amount of information, they are not as fast as more traditional hard disk drives (especially when writing information to disk). While NeXT offers configurations that include only the optical disk drive, if you plan to use the NeXT machine as a standalone system, you should consider a configuration that includes a hard disk drive; this addition noticeably improves the machine's performance.

When considering NeXT hardware configurations, you may want to consider getting more than the standard 8MB of RAM. The UNIX operating system is very flexible and powerful, but UNIX also uses more resources than today's microcomputer operating systems. (Considering that the UNIX operating system is used on some of the campus mainframe computers, it shouldn't be surprising to find that UNIX requires fairly powerful hardware.)

If you put together a networked cluster of NeXT machines with a file server, the optical-disk-only configuration may be appropriate. All NeXT machines come with an Ethernet interface, so building a networked cluster of machines requires only Ethernet cable. In this networked scenario, a NeXT machine with a large hard disk

Claris CAD

Overview

Claris CAD from Claris Corporation is a 2-dimensional drawing, drafting, and design program for the Apple Macintosh (it is not suitable for 3-D renderings). Claris CAD is similar to MacDraft and MacDraw II (another Claris product), but because it is a CAD (computer aided design) program, it has many more tools and controls than either of the other products. CAD programs are more suitable than drawing programs for designing complex constructions, such as houses or complicated machinery. With Claris CAD you can work with greater precision in positioning, drawing, and dimensioning than you can with MacDraw II. While Claris CAD may also be used to create such items as hand-bills and posters, you may wish to use a program that is easier to learn, such as MacDraw II, for these purposes.

With Claris CAD (hereafter called CAD) you can create scaled drawings, schematic diagrams, and a multitude of other drawings. When you draw a line or shape, CAD treats it as a single element called an object. CAD stores an object as a set of characteristics, such as location, length, line width, fill pattern, and so on. This allows the objects to be moved, rotated, or resized with ease.

Drawings are made up of objects, and you create simple and complex drawings by arranging objects on the screen. Objects can be modified by lengthening a line, turning a rectangle into a square, enlarging a circle, and shrinking or reshaping a triangle. You can change a line's width, fill objects with patterns, reposition, rotate, or flip objects, add an arrow point to the beginning or end of a line, or change text font and size.

Working with objects, rather than with the bit maps created by paint software, means that CAD can print at the highest possible resolution that a LaserWriter, ImageWriter, or color plotter is capable of. If you have a Mac II, IIx, or IIcx and a color monitor, you can also produce color screen drawings. (Although color may be used on monochrome systems, the colors will appear on the screen in black and white.) When you print the document, CAD allows you to print colors and color patterns, to print all patterns in black and white, or to print separated color layers for professional printing.

If you've used MacDraw II, you will find that you can do all the drawing tasks with CAD that you could do with MacDraw II as well as many more. CAD has special tools and features required for professional drawing.

System Requirements

To use CAD, you need a Macintosh Plus, SE, SE/30, II, IIx, or IIcx with 1 megabyte of RAM or more, and System 6.0 and Finder 6.1 or later. Optional equipment includes an Apple LaserWriter or ImageWriter printer, color video monitor, color plotter (up to "E" size), a videotape player (for the optional training tape), and additional memory for use with large documents, special purpose monitors, or MultiFinder.

Claris CAD is a very large program. The package comes on three 800K diskettes entitled *Program*, *Utilities*, and *Tutorial*. The program itself must be installed with the installer program from the first disk and the installer data from the second. Once installed the program uses more than 1MB of disk space. If your Mac only has two 800K floppy drives, you will not be able to run CAD. Even if you have a Mac with 1.4MB floppy drives, we strongly recommend that you use CAD with a hard disk.

Drawing Tools

While MacDraw II has nine tools in its tool palette, CAD has 25 tools and each tool has one or more modifiers. In addition, CAD has one or more drawing methods for each tool/modifier combination. CAD's combination of tools and drawing methods make it easy to draw things that are very tricky to draw in packages such as MacDraw II and MacDraft.

You will find tools for drawing fillets and chamfers, regular polygons, concentric circles, spline curves, and parallel lines, as well as others. There are also tools for dimensioning with or without tolerance information and in a variety of styles. Figure 1 shows a blank CAD drawing window.

Figure 1: Claris CAD Window
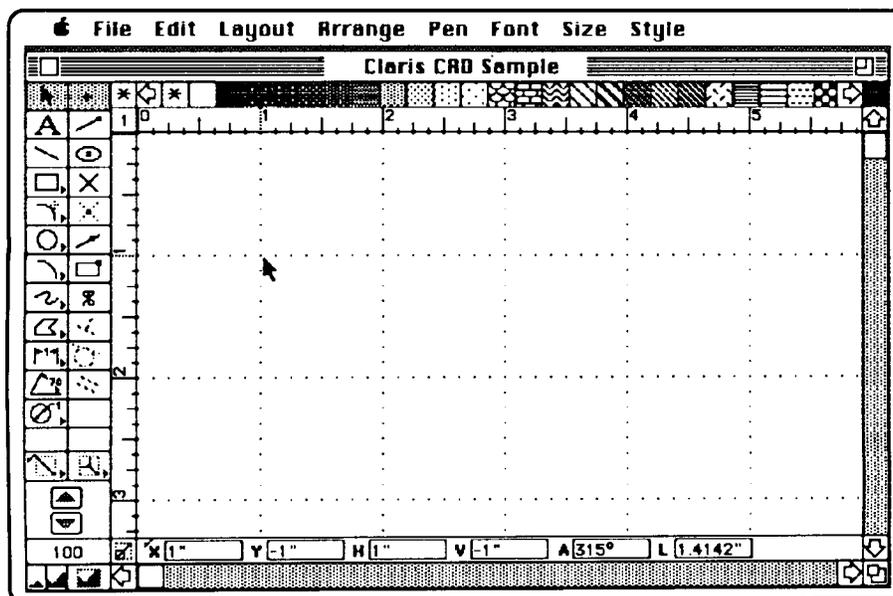
In Figure 1, tools are in the left-most column of the window; modifiers are in the right column. The tools palette is packed with useful gadgets and controls.

There are tools for entering text, drawing lines, boxes with square or rounded corners, circles, concentric circles, ellipses, circular and elliptical arcs, freehand shapes, spline curves, and irregular or regular polygons. There are also three linear dimension tools, two for dimensioning circles, one for drawing circle center lines, and one for labeling angles.

Each of these tools has one or more drawing methods available. For instance, for drawing lines you can draw a line from one point to another, draw equal lengths either side of a point, or draw a construction line across the entire drawing. To draw a circle you might specify the center point of the circle and its radius, one point on the circumference and the circle's diameter, three points on the circumference, or specify the radius length plus two points on the circle's circumference. Tools with small arrows in the lower right-hand corner provide access to one or more different, but related, tools. We will look at the tool selectors in descending order.

The first tool is the selection arrow. You use it to open menus, select tools, use the pattern palette, and use CAD controls, scroll bars, icons, and dialog boxes; you also use the arrow to select objects and resize, reshape, or move them.

Next is the text tool; you use it when you want to type or change text in a drawing. Text entered with the text tool becomes an object that can be selected, repositioned, filled with a pattern and edited.

The line tool draws straight lines at any angle, or you can choose to draw dashed lines and lines with a variety of arrowheads. You can draw a line using three methods: (1) dragging from one end to the other end of the line, (2) dragging from the middle of the line to an end point or, (3) by creating a construction line that crosses the entire document.

You use the rectangle tool to draw rectangles and squares. This tool has a small arrow in the lower right hand corner; if you hold the mouse button-down on the rectangle, you can select the square tool rather than the rectangle tool.

Use the fillet tool to gain access to the chamfer and rounded rectangle tools. The fillet tool draws rounds, or fillets, between lines, circular arcs, and circles. The chamfer tool creates bevels or chamfers between two lines. The rounded rectangle creates rectangles and squares with rounded corners. You can specify the radius for fillets and rounded rectangles, and the length of the chamfers.

The circle tool draws circles and provides access to the concentric circle and ellipse tools. Use the concentric circle tool to draw a series of concentric circles; you do this by specifying a center point and one point on the circumference of each circle.

Use the circular arc tool to draw arcs and to select the elliptical arc tool.

The freehand shape tool also provides access to the spline curve tool. You use both tools to draw irregular or curving lines. The freehand shape tool lets you draw a line with the mouse as you would with a pen or pencil. As long as you hold the mouse button down, the "pen" stays on the paper while you move the mouse. CAD automatically smooths the shape after drawing so that the shape always has smooth curves. The spline curve tool lets you draw curves that pass through exact points. After specifying the points on the curve, CAD draws the precise curves to fit the locations.

The polygon tool also provides access to the double lines and regular polygon tools. Use the polygon tool to draw polygons with different length sides and varying angles. The double lines tool is useful for drawing walls or sides of objects; it allows you to draw two parallel lines at one time. Use the regular polygon tool to draw polygons with 3 to 16 sides of equal length.

Next on the tools pallet are three linear dimension tools. You can use these tools in more ways than we'll mention here. Use these tools to create dimension lines that appear with witness lines (or extension lines) with the correct dimension or measurement value. You can make dimension lines that measure lines, distances between objects, and the sides of objects. With the chain dimension tool you create dimensions that are aligned in a series, and with the datum dimension tool, dimensions are measured from a common baseline.

Use the angular dimension tool to create angular dimensions that appear with the correct degree, minute, and second dimension values.

The last set of tools is the diametral dimension, radial dimension, and circle center tools. Use them to work with circles and arcs. The first creates a dimension line showing the diameter of a circle or arc. The second creates one showing the radius, and the third tool draws center lines.

Next you'll find the drawing method selector; this box changes for each tool and many tools have several methods.
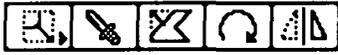
Selection tools are to the right of the drawing method selector. Use these tools to resize, trim, reshape, rotate, and make a mirror image of an object.

Arrows represent the layer controls. CAD allows you to put information in separate overlays or layers that act like overhead transparencies. The layer controls allow you to move up or down between the layers.

Finally, the four boxes in the lower left corner of Figure 1 are zoom controls. These controls allow you to quickly reduce or enlarge your view of a drawing. By c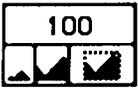licking on the percentage box (shown here with "100" as the setting), you can change the percentage of zoom; 100 is the normal setting. If you click on the left-most box, the distant view, the percentage of zoom is halved. That is, you are zoomed away from the drawing. If you click on the middle box, the close-up view, the percentage of zoom is doubled and you are zoomed into the drawing. If you click on the right-most box, you are given a tool to box the area of the drawing that you wish to fill the screen. If you double-click on the percentage box, you can specify the percentage of zoom. Clicking on the percentage box once returns to the 100% view.

Drawing Modifiers

By themselves, these tools provide a great deal of flexibility and capability. When you add the capabilities of the positional modifiers, the tools become even more powerful. The right-hand column of Figure 1 shows the drawing modifiers.

If you need to draw a circle that is tangent to a rectangle at a specific point, the modifiers enable you to do that; an example is shown in Figure 2. While some MacDraw users might argue that they can fiddle with a circle and rectangle

until the circle is tangent to the rectangle on the screen, CAD's positioning modifier is precise. When those MacDraw users print their image on the laser printer, they're likely to find that what they saw as tangent on the screen is imprecise when printed (because the LaserWriter's resolution is 300 dots per inch, while the screen's resolution is 72 dpi).

You can draw dimension lines on an object in several ways, as shown in Figure 3. Figure 4 shows five bolts spaced evenly around a circular widget.

Not all modifiers are available to all tools. Only those modifiers that are appropriate are darkened when you select a tool; the others appear in a shaded state.

The drawing modifiers are:

Use any point. The drawing begins exactly where the cursor is located.

Use the end point of another object. You need only position the pointer near the end point and CAD automatically begins drawing from that end point.

Use the center of another object. Drawing starts from the center point of the object you select.

Use the intersection point of two objects. This starts drawing from the point where the two specified objects intersect.

Use the invisible intersection point of two non-intersecting, non-parallel lines. Selects the point at which the two lines would meet if they were extended and joined.

Use any point on an object. Position the pointer near the object and CAD starts drawing from the point nearest the pointer that is on the object.

Use the corner of an object. The drawing starts at the corner of the object nearest the pointer.

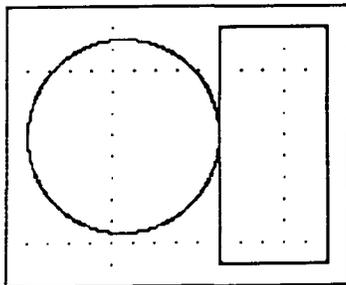**Figure 2: Circle Tangent to Rectangle**

Figure 3: Two Forms of Dimensioning
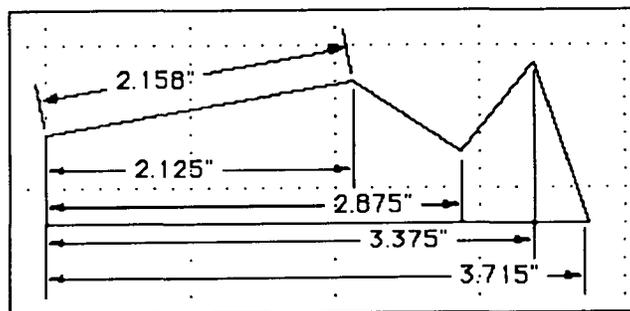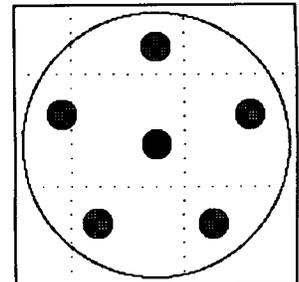
2.158"
2.125"
2.875"
3.375"
3.715"

Figure 4: Objects Rotated Around a Circle

Use a point on a line or arc that is a specified percentage of the length from the start. The exact percentage may be specified. You might start drawing from a point that is 30% of the way from the end of a line.

CAD has three geometric constraint modifiers.

The perpendicular modifier forces lines to be perpendicular to other objects.

To draw lines tangent to arcs, ellipses, and circles, use the tangent modifier. You can also draw circular arcs and circles tangent to other objects.

To create parallel lines and concentric objects, use the offset modifier.

Fill Patterns

You can fill hollow objects with a pattern or color from the pattern palette. In addition, you can hatch objects and areas of a drawing. CAD provides seven hatch patterns; you can change the patterns in the pattern palette and the set of hatch patterns as needed.

Rulers

You get six preset rulers with CAD; you use these rulers to establish the grid divisions. However, you are not limited to six rulers; you can change the rulers to represent the scales, measuring units, and ruler divisions you need.

Layers

The layering feature of CAD allows you to add information to a document in separate overlays or layers. The layers are similar to overhead transparencies. You might use the layers to display different aspects of a drawing, with each layer displaying different information. For example, you may wish to draw your objects on one layer and their dimensions on another, or put structural, electrical, and plumbing layouts on separate layers.

Other Features

Claris CAD comes with several useful additions. By default the program works in black and white mode. Although color is available only for the Macintosh II family, you may select color and use it on other Macs. When you select color on a monochrome system, colors appear as black and white on the screen but may be printed in color on a plotter or printer that prints colors.

CAD contains a library of objects along with folders containing stationery documents for black and white, 8 colors, full color, and MacDraw II settings. You can set CAD to use any of the five drawing standards (DIN, ISO, BS-308, ANSI, and JIS) used in professional drawing environments. In addition, you can choose U.S. Drafting Standards for Architectural and Engineering drawings.

Exchanging Data

You can create three kinds of documents with CAD: *drawing documents, CAD stationery*, and *PICT* files. Normally drawings are saved as drawing documents. CAD stationery is a convenient means of setting the CAD environment for a new drawing. You use PICT files to transfer CAD documents to other applications, such as desktop publishing or presentation software. In the future, Claris will add filters to let you use Claris CAD with other CAD software.

Documentation

The documentation provided with Claris CAD is very good. Included with the basic package is a *User's Guide* and *Tutorial*. You can also check out a videotape that does a nice job of describing CAD's tools; see our *Training Resources* article for our check out procedures. The *Tutorial* is a combination book and sample drawings which uses each of the tools in its various combinations. The *User's Guide* is written in three sections plus six appendices. The first section duplicates the information provided on the video tape. The second is a command reference, providing detailed information about all of the commands and menus. The third section is titled *Using Claris CAD;* it describes everything you need to set up a document and provides step-by-step instructions for using each tool.

The appendices provide information on using a plotter, printing color documents, creating and using PICT files, the default preset options, Claris CAD standards, and using CAD on a file server. We found the documentation very readable and easy to understand.

Conclusions and Recommendations

We found CAD to be a flexible, fast, fairly easy to learn program with a rich command set. In virtually all respects CAD supersedes MacDraw II and MacDraft. A possible drawback is that CAD requires more RAM and disk space than either of the other programs; CAD requires at least 1MB of RAM and a hard disk, and it will not run under versions of the operating system before 6.0.

Due to space constraints we could not cover all of the features and functions of Claris CAD; therefore, we did not tell you all there is to know about CAD. If you would like to learn more, we recommend that you come to our HelpLine in 125 Shepherd Labs and use CAD on one of our systems. Here are the current Book Center prices for the three products we've mentioned:

Software	Book Center Price
Claris CAD (Claris Corp.)	$ 155
MacDraw II (Claris Corp.)	150
MacDraft (Innovative Data Design, Inc.)	151

acts as a network file server for the optical-disk-only machines. Accessing the file server's disk across Ethernet is considerably faster than accessing the local optical disk. Since NeXT machines can be configured to boot from the network file server, each user in the networked cluster can use the optical disk drive to store their personal files.

A Built-in Digital Signal Processor

In addition to the optical disk drive, much has been made of the NeXT machine's sound capabilities. The NeXT machine is capable of playing audio CD-quality stereo sound. Part of the NeXT's sound capabilities is due to the DSP (Digital Signal Processor) chip that is standard in the NeXT machine. The DSP chip is to sound processing as a math co-processor is to number crunching; the DSP is used to remove some of the computational load from the CPU.

NextStep

Perhaps the most important feature of the NeXT machine is the NextStep programming environment. NextStep is an excellent example of the object-oriented programming philosophy. In object-oriented programming, code and data are packaged together into objects. Programs are built using collections of objects that send messages to each other. A programmer can create new objects by modifying the behavior of existing objects rather than writing everything from scratch. This modular philosophy of programming is becoming popular as a way of speeding program development.

In addition to the Objective C language, NextStep includes a program called Interface Builder (IB). You use IB to design or modify the user interface for your programs. To design a user interface with IB, you drag graphic representations of program objects onto a workspace and then connect the objects together to specify the action to be taken when a given object receives a specific message. After you have created the user interface for your program, you can write the computational part of the program in Objective C and compile the program. Because writing the user interface accounts for much of the complexity in developing graphics oriented windowing software, NeXT's object oriented programming approach is potentially very powerful.

The NextStep programming environment will be important to NeXT's success because there is not much software currently available for the NeXT machine. Much has been made of NeXT's unique hardware, and while hardware is interesting, computer systems live and die based on the quality of the software that they run.

Software

Each NeXT system includes the following software:

- NextStep
- Mach Operating System (BSD 4.3 Compatible)
- Digital Library which includes:
  - Webster's *Ninth New Collegiate Dictionary* and *Collegiate Thesaurus*
  - *William Shakespeare: The Complete Works*
  - *The Oxford Dictionary of Quotations*
- SoundKit and MusicKit
- WriteNow, word processing software
- Mathematica, software for mathematical computations
- NeXT SQL Database Server from Sybase, Inc.
- Objective C and GNU C-Compiler and Debugger
- Allegro CL Common Lisp
- Mail

Although the NeXT machine comes with quite a bit of software, it is important to recognize two things. NeXT has not finished their operating system software, and many of the applications bundled with the NeXT machine are not yet completed.

Currently NeXT machines ship with version 0.9 of the operating system; version 1.0 is not expected to ship until late in the second quarter of 1989. Although NeXT will ship all NeXT owners free upgrades to version 1.0, not all of the machine's functions are supported in version 0.9, and there are almost certainly bugs in the 0.9 release. NeXT positions release 0.9 as appropriate for "aggressive end users".

Although several third party vendors have announced their intention to produce software for the NeXT machine, this software is currently unavailable. In other words, the NeXT is a brand new machine, and there is not a lot of software to choose from. It may be some time before there is a wide selection of software available.

Test Drive It

If you want to examine a NeXT machine, visit the Microcomputer HelpLine during regular HelpLine hours.

Configurations	Prices
NeXT Computer with 8MB RAM, MegaPixel Display, keyboard, mouse, 256MB optical drive, NeXT bundled software	$ 6880
Scholar's System: NeXT computer, 8MB RAM, MegaPixel Display, keyboard, mouse, 256MB optical drive, 400 dpi laser printer, NeXT bundled software	$ 8995
Advanced System: NeXT computer, 8MB RAM, MegaPixel Display, keyboard, mouse, 256MB optical drive, 330MB hard disk drive, NeXT bundled software	$ 8995

Developer's System: NeXT computer, 8MB RAM, MegaPixel Display, keyboard, mouse, 256MB optical drive, 660MB hard disk drive, 400 dpi laser printer, NeXT bundled software .... $ 13,230

Server System: NeXT computer, 16MB RAM, MegaPixel Display, keyboard, mouse, 256MB optical drive, 660MB hard disk drive, NeXT bundled software .... $ 14,285

| Other Configurations | | RAM | |
Description	8MB	12MB	16MB
NeXT computer	$ 6880	$ 8465	$ 10,050
+ 330MB hard disk	8995	10,580	12,170
+ 660MB hard disk	11,115	12,700	14,285

Mass Storage Options

330MB hard disk drive .... $ 2120
660MB hard disk drive 4235
256MB optical disk cartridge (blank) 62

Other NeXT Options

400 DPI laser printer .... $ 2120
4MB memory expansion kit 1590

● IBM Specials

Through *June 23, 1989* IBM is offering special prices on the three PS/2 configurations listed below. During the special the wait for a PS/2 Model 70 is much shorter than usual. The wait is shorter because during the special the Book Center does not have to order Model 70-E61s in pallet quantities of 12. (Ordinarily the IBM contract requires that the Bookstore order 12 of the Model 70-E61s at one time. If after 90 days the Bookstore has not accumulated enough orders to fill a pallet, they contact customers and ask if they want to cancel their order.)

All the specials differ from the Book Center's everyday discounts in that the configurations come with a mouse, additional software, and IBM's 12-inch 8513 color monitor. Although all computers sold through the Microcomputer Discount Program come with the operating system, the IBM specials also come with the following software: Microsoft Word, Microsoft Windows, and hDC Windows Express; the Models 50-031 and 70-E61 also come with Excel. This software is already loaded onto the machine's hard disk.

For more information on the machines listed below and on other IBM products sold through the Microcomputer Discount Program, see our *IBM and Zenith Microcomputers* handout. Handouts are available at the Microcomputer HelpLine and from the Mac Information Server.

All three PS/2s come with one internal 3.5-inch, 1.44MB floppy drive, one hard disk, one 25-pin serial port, one parallel printer port, and one mouse port. The individual machines are described in more detail below.

The *PS/2 Model 30 286* uses an 80286 microprocessor running at 10 MHz with one wait state and has a socket for an 80287 numeric co-processor. The 30 286 that is on special comes with a 20MB hard disk with 80-millisecond (ms) average access time and 1MB of RAM. You can use existing IBM PC/XT/AT cards in the 30 286's three full-size expansion slots.

The *PS/2 Model 50Z* uses an 80286 microprocessor running at 10 MHz with 0 wait states and has a socket for an 80287 numeric co-processor. The 50Z that is on special comes with a 30MB hard disk with 39 ms average access time and 1MB of RAM. The 50Z has three 16-bit MicroChannel expansion slots.

The *PS/2 Model 70 386* uses an 80386 microprocessor running at 16 MHz with 0-2 wait states and has a socket for an 80387 numeric co-processor. The Model 70 that is on special comes with a 60M hard disk with 27 ms average access time and 2MB of RAM. The Model 70s have one 16-bit and two 32-bit MicroChannel expansion slots.

Model	IBM PS/2	Special
8530-E21	30 286 with 20MB hard disk	$ 2399
8550-031	50Z with 30MB hard disk	2799
8570-E61	70 386 with 60MB hard disk	4449

● Zenith Price Changes

In early May prices on some Zenith configurations offered through the Microcomputer Discount Program changed; those changes are described below. By the time you read this we expect to have prices on two new Zeniths: the Z-386 running at 33 MHz and the Z-286 LP running at 12 MHz with 0 wait states.

For more information on the machines listed below and other Zenith products, see our *IBM and Zenith Microcomputers* handout. Handouts are available at the Microcomputer HelpLine and from the Mac Information Server.

Portables

All the Zenith portables have a socket for a numeric co-processor chip as well as a 9-pin serial port, a parallel printer port, a built-in video display, a port for an external display, and 3.5-inch disk drives. The machines come with MS-DOS and Microsoft Windows software.

The *SupersPort* uses the CMOS 80C88 microprocessor running at 4.77 or 8 MHz and comes with 640K of RAM but no expansion slots; it also has a 110 to 220 VAC (50/60 Hz) autosensing adapter/charger. You can plug an optional external 5.25-inch, 360K floppy drive into the SupersPort. The Model 2 comes with two 720K floppy

drives. The Model 20 comes with one 720K floppy drive and one 20MB hard disk.

The *SupersPort 286* uses the CMOS 80C288 microprocessor running at 6 or 12 MHz and comes with 1MB of RAM but no expansion slots; it also has a 110 to 220 VAC (50/60 Hz) autosensing adapter/charger. You can plug an optional external 5.25-inch, 360K floppy drive into the SupersPort 286. The Model 20 comes with a 20MB hard drive. The Model 40 comes with a 40MB hard disk. Both models come with one 1.44MB floppy drive. The HelpLine has a SupersPort 286 for your inspection.

The *TurbosPort 386* uses the 80386 32-bit microprocessor running at 12 or 16 MHz with 0 wait states; it comes with 2MB of RAM, expandable to 3MB and is EMS and extended memory addressable. (See *Ma Micro Notes* in our April 1989 newsletter for more information about memory.) This 386 portable has one internal expansion slot for a modem and one for memory; the power supply works with 110 VAC, 60 Hz only. (You need a separate power supply to use the 386 in a country that uses 220 VAC and 50 Hz.) This 386 portable comes with a 1.44MB floppy drive and a 40MB hard drive. For a limited time, the HelpLine has a TurbosPort 386 for your inspection.

DeskTops
The price of three Zenith desktop configurations that come with the Zenith ZCM-1490 FTM (flat tension mask) color monitor has been reduced. The three machines listed below come with a VGA video display adapter, 1MB of RAM, one 1.44MB 3.5-inch floppy disk drive, MS-DOS, Microsoft Windows, and a power supply that is switchable between 110/220 VAC, 50/60 Hz. The three machines are described in more detail below.

Z-286 LP
This IBM-AT compatible uses an Intel 80286 microprocessor running at 8 MHz with 0 wait states. The LP/20 comes with a 20MB hard disk with 65 millisecond (ms) average access time; the LP/40 has a 40MB hard disk with 28 ms average access time. Both models come with two 9-pin serial ports, one parallel printer port, two full length expansion slots, and a socket for a 80287 numeric co-processor. The HelpLine has a Z-286 LP/40 for your inspection.

Z-386
The Z-386 uses an Intel 80386 microprocessor running at 16 MHz with 0 wait states; it has a socket for an 80387 numeric co-processor, one 9-pin serial port, one parallel printer port, and three expansion slots. The Z-386 is unusual in that it can support an additional internal 5.25-inch floppy drive. Currently, only the price of the configuration with the 80MB hard disk has been reduced; that model's hard disk has a 40 ms average access time. The HelpLine has a Z-386 for your inspection.

Zenith Models	Prices*	
	Old	New
SupersPort Portable		
Model 2	$ 1335	$ 1199
Model 20	2085	1889
SupersPort 286 Portable		
Model 20	$ 2920	$ 2599
Model 40	3230	2889
TurbosPort 386 Portable	$ 4575	$3899
Desktop with ZCM-1490 FTM Color Monitor		
Z-286 LP/20	$ 2240	$ 1965
Z-286 LP/40	2660	2345
Z-386, 80MB hard disk	4065	3785

* Shipping costs are not included in the Zenith prices. Contact the Book Center at 625-6681 for shipping charges when you prepare your order.

Connections

◎ Telnet 2.2 Upgrade for PC Compatibles
The HelpLine recently obtained the new version of NCSA Telnet, version 2.2 for MS/PC-DOS machines. Version 2.2 has several enhancements over the previous version; most notably it now supports the 3COM 3C523 Ethernet adapter for MicroChannel machines, and it has 3270 support.

Listed features of NCSA Telnet 2.2 are:
- VT102 emulation
- simultaneous logon to a number of computers
- ability to capture text to the PC disk or printer
- file transfer server (standard FTP)
- remote copy server (rcp) for use with UNIX hosts
- ability to take full advantage of PC colors
- Topview/Windows compatible mode
- Tektronix 4014 emulation
- domain name lookup
- optional use of RARP for determining PC's IP address
- optional use of BOOTP for determining PC's IP address, netmask, gateway, and name servers
- scrollback
- 43/35 line mode when used with an EGA capable video card and Hi-res monitor
- TN3270 support which allows a single 3270 type session concurrent with other regular Telnet sessions
- now includes a screen saver
- supports the Terminal Type and NAWS Telnet options
- packet driver now supports SLIP

To get a copy of this public domain software, bring a formatted 360K, 5.25-inch disk or a 720K, 3.5-inch disk to the Microcomputer HelpLine. Version 2.2 documentation is included on the disk.

Engineering Services Notes

Don Clark, ACSS Engineering Services
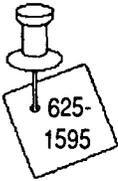
Engineering Services (ES) provides warranty service to University departments, employees, and students on most equipment sold through the discount program. We also provide service on equipment such as workstations, terminals, and peripherals. If you have trouble with your microcomputer equipment, your first call should be to the Micro HelpLine. They will help you determine if the problem is with your hardware or software. If the symptoms point to the hardware, call us.

New Service Contracts

Recently Engineering Services added several products to our service contract list, including:
- NeXT
- Macintosh SE/30, all models
- Macintosh IIx, all models
- Macintosh IIcx, all models
- Zenith, Z-286-LP/20 and LP/40
- Zenith, Z-248/12 models 1, 2, 40, and 80
- Zenith, Z-386 models 2, 40, and 80
- Zenith SupersPort models 2 and 20
- Zenith SupersPort 286 models 20 and 40
- Sun 4/110
- Sun 4/260
- IBM PS/2 Model 25, all models

We're finalizing our price lists now for distribution. Call 625-1595 for quotes on other new products.

Price Changes Effective 7-1-89

We're reducing *service contract prices* on a variety of products on a selective basis. We are looking at spare part prices, assembly repair prices, labor costs, and other factors in searching for prices to reduce. Most decreases will be for on-site service on computers with hard disks. New prices will be mailed to all contract customers who have July 1989 renewal dates. Prices will be effective July 1, 1989 for renewals and new contracts.

We're increasing the *basic labor rate* for in-shop Time and Materials (T&M) repair from $35/hour to $38/hour effective July 1, 1989. The on-site rate will be increased from $40/hour to $43/hour. (It has been many years since ES has raised the labor rate.)

Price Increases From Vendors

We are seeing price increases from several vendors. IBM has announced price increases for service contracts (ES is not increasing contract prices). Several vendors, including Apple, have been increasing prices on some replacement parts. Increases on spare parts are passed on to T&M customers as incurred, but increases are absorbed by ES on service contracts.

IT Week Special, a Reminder

If you missed our *IT Week 1/3 Off Maintenance Specials*, it's still not too late to act. Computer products sold through the Book Center during May's IT week promotions were packed with an envelope marked *Warranty and Maintenance Information from ES*. If you cannot find the envelope or want more information, give us a call.

Book Center Notes

These offers are made to University departments, employees, and students; the regular rules of eligibility apply. If you have questions about availability, phone the Electronics Desk at 625-6681.

● MS Word for Mac Version 4.0

The Minnesota Book Center has the new version of Microsoft Word (version 4.0) for the Macintosh in stock. If you have Word on back order, you can bring your order form to the Electronics Desk and pick up your copy.

Upgrading to Version 4.0

Registered owners of older versions of Word can upgrade to version 4.0. If you acquired Word through the University's Micro Discount Program, you can place your upgrade order with the Electronics Desk. Qualified people who acquired or updated to any version of Word *before August 1, 1988,* can update to version 4.0 at the Book Center for $40. Qualified people who acquired or updated to any version of Word on or *after August 1, 1988,* can get a free update at the Book Center.

If you did not acquire Word through an educational source or are no longer associated with that educational source, you can order the upgrade through normal Microsoft channels. (Many Word owners got an *Update* letter that states that the update offer is "not valid for users who acquired Word from an educational source." Our Microsoft representative assured us that all registered owners can upgrade through normal Microsoft channels.) The eligibility dates for non-educational upgrades are different; call Microsoft at 800-426-9400 for more information.

Before the Book Center can order updates they need your help; they must place specific orders for *free* or for *fee*

upgrades. Here is what you need to do:

1. Put your update request in writing. State whether you must pay for the update or are requesting a free update. Include your address and phone number as well as university affiliation (student, employee, or department).
2. Verify your purchase date. To do this include a *copy* of your receipt. Bring your *original* receipt with you when you pick up your update.
3. Wait for notification from the Book Center that your update has arrived.
4. Verify your ownership of Word. To do this bring your original Word disks to the Electronics Desk when you pick up your update.
5. If your update is not free, have your payment ready to turn over to the Electronics Desk when they give you the update.

The update includes three disks and new documentation, such as a new *User's Guide* and a *Getting Started and Learning* book. For a limited time the Word update also includes an old version of Silicon Beach's SuperPaint with a *Upgrade Coupon* for SuperPaint 2.0. (The SuperPaint upgrade costs $50 plus shipping; the University's normal discount price for SuperPaint is $70.) Microsoft Word version 4.0's update offer expires December 31, 1990.

In order to purchase Word or the update from the Book Center, you must be a University department or a full-time student, staff, or faculty member. Full-time students carry at least 12 undergraduate credits or 8 graduate credits; your ID card and paid fee statement will verify your full-time student status. Full-time staff and faculty must work at least 75% time and be eligible for the University's benefits package; your ID card and paycheck stub will verify your full-time status. If you want to try out Word version 4.0 before ordering the update, stop in the Micro HelpLine in 125 Shepherd Labs. The HelpLine has the Word update.

And Books, Too

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

Here's what is new in the Reference section.
➤ *The ABCs of Excel on the Mac* (versions through 1.5), by Hergert, a Sybex publication for $18.95.
➤ *Stretching Turbo C,* by Porter, a Prentice-Hall publication for $24.95.

Training Resources
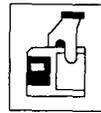
The Microcomputer Group owns training packages for many popular software programs. These training packages are available to University of Minnesota departments and current employees and students. There is no fee for using these packages, and you may check them out for 48 hours. However, before you can 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. To use these materials you must supply your own equipment, such as computer and cassette player. To reserve or check out materials, talk to Margaret Stefansky in room 118 Shepherd Labs at phone 625-1300.

Generally the PC/MS-DOS (IBM personal computer and compatible) disks are available on 5.25-inch 360K and 3.5-inch 720K disks; the Macintosh disks are 800K. We recently added the following training materials to our library.

New Material

 Learn Word Version 4 – Module 4, Additional Features. This Macintosh package from Personal Training Systems is for experienced Version 3 users who want to learn to use Version 4 to set up tables, access the thesaurus, customize menus, create and use macros, and integrate graphics and text. *System Requirements:* your own copy of Word 4.0 and a Mac Plus, SE, SE/30, II, IIx, or IIcx with two 800K floppy drives or one floppy drive and a hard disk.

Training Objectives. Lesson 1: *Using the New Menu* – Commands and Ruler. Lesson 2: *Customizing Menus* – Add Commands to Menus, Delete Commands from Menus, Change Keyboard Shortcuts, Create Work Menu, Save Menu Settings in a File, and Restore Customized Menus. Lesson 3: *Beginning Tables* – Before Creating a Table, Insert a Table, Advance from Square to Square, Expand a Table, Stop Entering Items in a Table, Format Headings, Select a Column, Change Column Width, Change Column Alignment, Set Decimal Tabs, and Stop Viewing Table Gridlines. Lesson 4: *Using Tables* – Convert Data File into Table, Merge Several Columns into One, Sort Table in Regular Order, Sort Table in Descending Order, Total Columns, and Apply Borders. Lesson 5: *Using Macros* – Macros, Record a Macro, Perform Tasks Using a Macro, and Save Macros in Macro File. Lesson 6: *Using Thesaurus and Word Count* – Count Words and Locate Alternative Words. Lesson 7: *Positioning* – See Columns, Place MacPaint Illustration, Resize Illustration, Position Illustration, and Put Border Around Illustration. Lesson 8: *Using Styles* – Create a Style, Assign a Style, and Re-define a Style.

Summer Short Courses Descriptions and Dates
Registration begins Monday, June 12, 1989

Registration ➤ *Fees and Registration are not handled by the Microcomputer HelpLine.* Registration for summer session 1989 does not begin until Monday, June 12th. You can register in person at the ACSS Computing Information Center in 128A Lind Hall, Monday-Friday, 8 am to 4:30 pm or by mail. Classes are filled in the order registration is received. The deadline for registration is 4:15 pm on the working day before the class begins. Fees must accompany your registration. You can pay fees by cash, check, or Journal Voucher. Fees are shown in ascending order and apply to the following three groups: University students, University faculty and staff, and others.

For additional registration information, call the ACSS Computing Information Center in Lind Hall at 625-7397.

Cancellations ➤ If you cannot attend a class, call the Information Center at 625-7397 to arrange a refund and *to enable us to contact people on our waiting lists.*

Refunds ➤ No refunds will be made if you cancel your registration *within 48 hours of the beginning of a class.* However, if we must cancel a class, we will refund your registration fee in full.

Other Training Resources ➤ See the *Training Resources* column in this newsletter.

● IBM Classes
Hands-on Classes. Enrollment Limited to 10.

Introduction to Microcomputers – DOS: This is a 6-hour course for new users of DOS. The course includes background information on microcomputer hardware as well as a practical (hands-on) introduction to the MS-DOS and PC-DOS operating system commands. ➤ Introduction to Microcomputers is taught over three days. Section 1: June 20, 21, and 22 from 10 am to noon; Section 2: July 18, 19, and 20 from 1:30 to 3:30 pm. Fees: $40/50/80.

Mastery of ➤ *Introduction to Microcomputers or equivalent is required for the WordPerfect class.*

Introduction to WordPerfect 5.0: This 5-hour course is for new WordPerfect users. You will learn to: edit and create files; use simple formatting commands, such as set margins and tabs; enhance text, i.e., use center, bold, and underline commands; manipulate blocks of text; and use search and replace and the speller. ➤ Introduction to WordPerfect 5.0 is taught over two days: August 1 and 3 from 9:30 am to noon. Fees: $35/45/85. *Important Notice: A workbook is required for this class.* You must buy this approximately $20 workbook at the Electronics Desk (625-6681) in the Williamson Book Center before you come to the first day of class.

● Mac Classes
Hands-on Classes. Enrollment Limited to 10.

Changed ➤ **Macintosh Fundamentals:** In this 2-hour class you will learn how to use the mouse, keyboard, pull-down menus, window environment, cut/copy/paste commands, clipboard, ⬥ scrapbook, how to start up and quit applications, as well as learn basic word processing. ➤ Macintosh Fundamentals is offered June 27 from 2 to 4 pm and July 31 from 10 am to noon. Fees: $10/10/10.

Mastery of ➤ *Macintosh Fundamentals or equivalent is required for the classes listed below.*

Introduction to Word: This 5-hour class is for new Macintosh Word users. You will use character and paragraph formatting and move blocks of text. In addition, you will learn how to: move quickly through your document; set margins, tabs, indents, page numbers, headers and footers; insert footnotes; use the spelling checker; and preview your work. ➤ Introduction to Word for the Mac is taught over two days. Section 1: July 12 and 13 from 9:30 to noon. Section 2: August 8 and 10 from 1:30 to 4 pm. Fees: $35/45/85.

New ➤ **Introduction to MacWrite II:** This 2.5-hour class is for new Macintosh MacWrite II users. You will learn to use character and paragraph formatting and move blocks of text. In addition you will learn how to: move quickly through your document; set margins, tabs, indents, use the spelling checker; and preview your work on the screen. ➤ Introduction to MacWrite II is offered August 2 from 1:30 to 4 pm. Fees: $25/35/60.

Introduction to Excel: In this 5-hour course you will set up several spreadsheets and use Excel's format and paste functions as well as absolute and relative addressing. You will move data between Excel and MacWrite and create charts. ➤ Introduction to Excel is taught over two days and is offered July 25 and 26 from 1:30 to 4 pm. Fees: $35/45/85.

Please be legible. Help us keep our costs down by using a campus mailing address whenever possible; thanks.

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Microcomputer and Workstation Networks Group

phone-in First Aid for computer users since 1980

➡ Call our HelpLine
626-4276
(dial MA MICRO)

➡ Visit our HelpLine
Room 125, Shepherd Labs
East Bank Campus

➡ We're Available
9 am - 12 and 1:30 - 4 pm
Monday
Tuesday
Friday

9 am through 4 pm
Wednesday
Thursday

➡ Newsletter Staff

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Microcomputer Newsletter
Microcomputer and Workstation Networks Group
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University of Minnesota
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100 Union Street SE
Minneapolis, MN 55455-0421

➡ Newsletter Reprints
If you want back issues of volumes 3 to the present issue, Kinkos will make them for you for a nominal fee. The master copies are downstairs at the Kinkos shop at 306 15th Avenue SE. This shop is open Sunday-Saturday. The Information server, accessable from Macintoshes that are directly connect to the University's internet, has the twelve most recent issues of the newsletter.   June 1989 {M/3.17}