

# REMark<sup>®</sup>

June 1992

The Official Zenith Data Systems Computer Users' Magazine







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The Official Zenith Data Systems Computer Users Magazine

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# Software

## OPERATING

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ACTION GAMES	885-1220-[37]	CPM	GAME	20.00
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## An Inside Look at the Show and the ZDS Show Stoppers

Nathan E. Baker  
Technical Specialist  
Zenith Data Systems

This article is for those of you who have never been to a COMDEX convention, and don't feel like spending upwards of \$75 for a ticket. It beats me why anyone who isn't intimately connected with the computer industry would go to one of these things, but they do. All kinds of people show up here, from a traditionally dressed Sheik to a nice man camped up in a dress who winked at one of my co-workers.

The spring COMDEX show in Chicago happened at McCormick Place. I went to it with a group of my co-workers, who shall remain nameless. (I'll refer to them collectively as, say, Tony X). Imagine multiple floors of vast rooms filled with kiosks and major displays ranging from the sublime to the basic, filled with a seemingly haphazard arrangement of hardware and peripherals spanning the technology of two years ago to stuff I couldn't begin to afford, with few things truly memorable (one of them a ZDS product that I'll get to in due time). I'm sure there was some kind of logic to the arrangement (like the Windows World exhibit in a building by itself), but there was mostly a mix of hardware and software contenders that were tossed together to fight it out, until those with the biggest budgets ended up with the most prominent and pretentious real estate. So, after arming myself with a coffee, a donut, a beer, and my Walkman, I plugged myself into Suixsee and the Banshees and plunged into the morass. (Note: if you want to avoid being attacked by over-zealous sales things, I strongly recommend wearing a Walkman.)

I have to admit, what I was looking for might seem pretty limited. For what I do — writing test procedures and “controlling” documentation — I was mostly concerned with things that could help me in the writing process. Since I use a lot of scanned images, one of the first things that caught my eye was a display of scanners.

This display, which featured several different companies' peripherals, also had a knowledgeable (though somewhat arrogant) salesman who showed me how I could convert grey-scale scanned images into true-color images (don't ever say “colorized” around these geeks — jeez!). They were using a Logitech ScanMan Plus handheld scanner, mounted in a 12" x 10.2" x 1" metal framed scanning bed with a built-in light source.

This product, the CAT Color Converter, is made by Computer Aided Technology, Inc. A combination of software and hardware, this contraption uses three images, scanned in succession through blue, green, and red filters, to create a composite image that it then transforms into a true-color (!) picture. You still have to use your hand to move the scanner, but their software makes up for the variations you can't avoid making when you perform the multiple scans this thing requires. It's compatible with ColorRIX, CorelDRAW, DeluxePaint II Enhanced, PC Paintbrush Plus (and IV Plus), WordPerfect, and more, according to their marketing blurb. The package requires a VGA graphics adapter, 640K of RAM with a hard disk drive, and PC-DOS or MS-DOS 3.1 or higher. It will work with a mess of

different scanners, including the GeniScan GS-2000 Plus, the Logitech ScanMan Plus (model 32 and model 256), the Marstek Mars 105 (and 105 Plus, and 800), MouseSystems PageBrush/32, among many more. The best part about this exhibit was the price, only \$169. That's great price for a color scanner.

I had just lately ran into a problem scanning penciled charts, so I was interested in finding something that would enhance illustrations with particularly poor contrast. This same display had some other software that I thought would do the trick, so after writing a sentence with the salesman's pencil I had him try to scan it, using their enhanced scanning software (which was also running on a Logitech ScanMan Plus). He was using the CAT Image Enhancer, also by the aforementioned company.

His results were less than promising. I could have done the same thing with my present scanning software, but maybe he wasn't trying very hard. Or maybe he objected to scanning and displaying “ZDS RULES”. However, that's not the forte of this unit. What's really cool is the fact that you can make an image up to 72" wide with your 4" wide hand scanner. This is done by making multiple scans and then “stitching” them together. The output can be manipulated to a great extent just by using the scanner software, which goes a lot further than the bare bones software that's supplied with most scanning units. And the price was great, only \$129.00. Once again, this thing also supports a wide variety of

scanners.

This display also had a neat little peripheral (basically a black box) that could hook up a hand-held scanner to a portable computer via the LPT port. (The CAT Hand ScanAdapter LPT.) The black box replaces the scanner interface card that would normally go into the backplane of your desktop computer. The only problem I noted with this was the fact that you had to use an external AC power source to run the adapter. Possibly a problem when you're in a fast moving portable environment. But I guess you can't be all things to all people.

Leaving these helpful folks, I plugged myself back into my Walkman and continued my exploration.

On and on I went, through milling 1950's haircuts mounted on blue and brown suits, with an eye open for the unique, the different, the unusual, the — dare I say it? — bizarre. But on this level of COMDEX I would be disappointed. There were only two other things I found noteworthy, one for its possible usefulness, and the other for its strong stroke at the absurd.

There was strong showing of rodentia. Since I use a mouse regularly, I gravitated to those displays whenever I saw them. Optical mice were in several places in the show, but the first one I happened upon was in a Chic Technology Corp. display. Freed from a cord, using this light-weight little thing was a little disconcerting at first, but I think I could get used to it fast. Using an inexpensive infrared LED mounted in the "head" of the mouse (like a little red pimple), its battery is kept recharged by keeping the mouse in a recharging cradle (can you say cage?) when it's not in use. As mice go, the CCM-400 cordless mouse wasn't a show-stopper, but for the price and performance, I'd pick this one if I was going to spend any money today (like usual, it had a special COMDEX price). The marketing blurb, in somewhat broken English, states that it can operate at up to 2 meters from the receiver unit. Poor marketing blurb aside, I'm not going to hold it against Chic Technology when they can offer this kind of unit for a little over a hundred bucks.

Walking away from the Chic booth, and trying to figure out how I could get some spending green from my section manager, I found myself gazing upon a sub-miniature laptop computer by ABC computer company. It was smaller than my MinisPort and looked like it had all the same functions (and then some). One look told me what I wanted to know, but I couldn't resist trying it out anyway. Putting my fingers gently on its nimble little keyboard, I started typing.

All I could type was garbage (well, gibberish might be a better word). The keys were so small I'd have to shave down my fingertips with a straight-razor in order to

touch-type on it. Even the space bar was hopelessly tiny and recessed. Typing the sentence "This is a test." came out "tissats" — unusual, and unfortunately unusable. Thinking back on the experience, maybe they designed this computer to be used by hunt-and-peck typists. Hunt-and-peck? Give me a break. I casually sneered at their lack of sagacity and ambled away.

Leaving this floor, I wandered up to the +42 floor, where the ZDS display was bivouacked. For an idea of the size and complexity of the this floor of the show (which was basically like the other floor and the Windows World in the next building), refer to Figure 1.

Most prominently displayed was the Zenith Data Systems booth, visible as soon as you got off the escalator. "Booth" doesn't quite do it justice. *How much did this thing cost*, I wondered as I sized it up. *Where's my raise?* was the next thought, quite logically.

The ZDS construction dominated its surroundings, whose displays looked almost pitiful in comparison. The next closest was the OS/2 display, which looked small until I got closer, then its twisted immensity almost impressed me. Almost. But enough talk of silly operating systems, and back to the real star of the show (besides, the man in the dress kept eyeing Tony X and didn't show any sign of letting up).

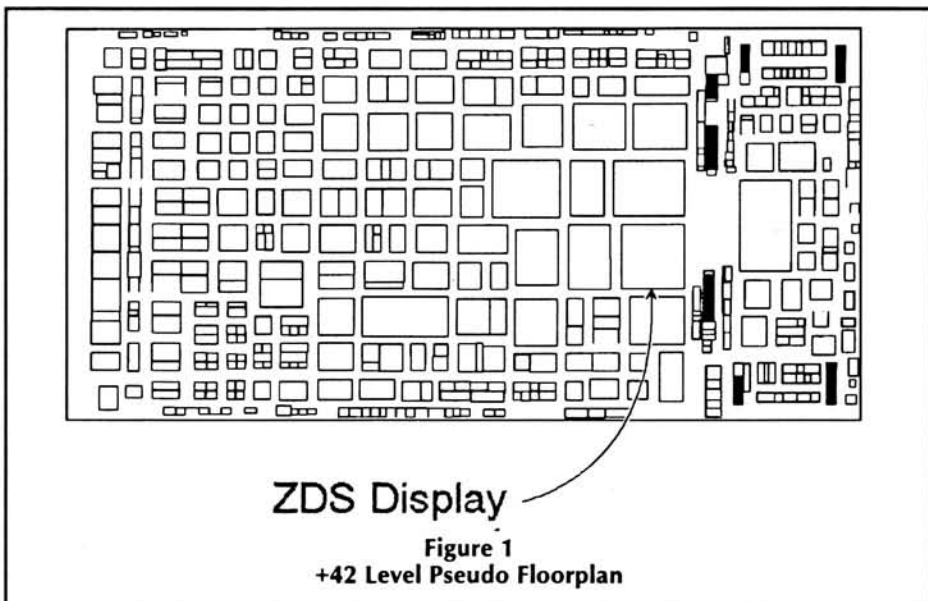
The Z-NOTE portable computers swept away their competition. What the heck is going on here, I thought; did the competitors go to sleep? Are the vendors' coma-

What computer show wouldn't be complete without an IBM manifestation? The IBM display was a vast desert populated by strange creatures working clunky portable computers with new software and old mice. The area was billed as the "Test Drive" center, so I sat in front of one of the stodgy machines and started to make it smoke. Just when I thought the boredom would overcome me, some curious George came over and asked me if the machine could do Unix. Obviously he had me confused for a salesperson. Ever helpful, I replied "Of course, everything but the disk drive functions, and then there's that pesky virus, but we found the guy at the factory who's been dosing the floppies, and we've got an upgrade for that I/O bug . . ."

The helpful security guards were closing in so I beat a hasty retreat, losing myself in the crowd. What's life without humor? Oh well, some people just can't take a joke.

Pointing devices there were aplenty at this show. Light pens, touch-screens, and touch-the-screen devices (an electric pen with an opto-mechanical tip you click on the face of the CRT — they wouldn't talk about eroding the glass after repeated touch-and-clicks. I wonder why?). However, this company is notable for some nice products, so I'll give the some attention in the following paragraphs. Their salespeople were probably the most friendly of the show.

HEI Inc. is responsible for my sudden interest in light pens, which I normally



tose? Are the buyers bewareing? But upon closer inspection, even I was impressed by these little monsters — especially the color unit. I'd rant on about it, but for the moment I'll go to some of the other contenders in this years' show. If you want to skip all of this, then go to the end of this article.

would never look at. But for some reason I tried out the pen they had on display, and discovered how easy it was to use. I could be two or three feet away from the screen and it would still react to the movements of my hand. The only problem was the fact that you had to touch the screen to enter



something (the point of the device depresses about a tenth of an inch when you push it against the CRT). This company also makes a cordless light pen called the Feather (or Model 90). This one has a side switch and a nose-tip switch so you don't have to be within arm's reach of the radioactive menace on your desktop (it's bad enough you have to stare into until your mind turns into glowing jelly). It's too bad I didn't see one of the Feathers on display (maybe they were afraid it would fly off), since I would have wanted to compare them to the remote-mice. With a nod to HEI and a click of my Walkman, I continued the odyssey.

It was kind of interesting that some vendors were still displaying 80286-based computers (mostly just system boards). I kept looking for something unique about them, but I couldn't find anything really extraordinary. Maybe it was their price? I didn't linger long enough to check. Looking for something more interesting, I stumbled into the best wireless mouse I saw in the show.

The AirMouse was a little heavier than the Chic remote-mouse, but I discovered I could walk a few feet away from the "receiver" end of the mouse and it still picked up the opto-signal. Actually, I managed to take the AirMouse (by AirMouse Remote Controls) a few yards away from the receiver. With this kind of range it would be well suited to a multimedia-style presentation. With a price tag over \$500, it should be impressive, I guess.

It gave me an interesting feeling of power to be able to point this wireless thing around like some kind of nerd-magic wand and watch the arrow zip around on the screen. I kept walking farther and farther away from the booth, and the mouse kept working. I never reached the range limit; those wonderful security people showed up again and made sure I didn't give it a real test.

After getting away, I decided it would be prudent to check out the Windows World exhibit in the neighboring building.

Ever since corporate America started mainlining Microsoft Windows like a software junkie, Windows applications have been appearing as fast as Unrecoverable Application Error messages. The dirth of new programs is exceeded only by the convolutions these software companies will go through to convince you that their ware is "easier to use" and "more productive". So, whispering a mantra of "intuitive greater productivity", I ventured forth among the sea of software displays.

If the size and complexity of the displays are any indication, Windows-hype shows little signs of abating. The mindlessness of it all was shown in rather embarrassing detail by one callow vendor who was using a pair of "Wayne's World" clones, yucking it up as part of a sideshow-style

display. I won't identify the manufacturer since I don't want to embarrass the marketing genius who thought this up. Needless to say, I didn't bother to take off my Walkman, and passed their display as quickly as possible, for fear of humiliating the participants even more than they were already doing to themselves.

All of the standard companies were on display; Adobe Systems, Ad Lib, Corel Systems, Dell, Digital Equipment Corp., Hewlett-Packard, Intel, Logitech, Lotus, Microsoft (was there any doubt?), Primus Technology, Tektronix, Texas Instruments, Ventura, Weitek, WordPerfect (gag me), and Xerox, to name but a few.

There was an awful lot of hardware in this "Windows world" section. Some of it—as far as I could tell—had little or no direct connection with Windows. But it was in this section that I found something I really wanted (my mind was literally smoking trying to think up some way to pry open my department budget).

This hand-held piece o' hardware, by NewQuest Technologies, Inc., took the form of a pocket computer that didn't have a keyboard. This was particularly interesting (at least it got me to take off my headphones long enough to talk with a salesperson). This little thing, with a 4-line by 20-character display and measuring only 6.9" x 3.35" x .79", was much too small for a normal keyboard. NewQuest, however, was a little wiser than their competitors at ABC. Instead of crafting an unusable keyboard, they took a risk and invested in a new kind of typing called Microwriting. Perhaps this is the wave of the future, perhaps not, but it is one of the most innovative word-entry methods I've seen.

Microwriting is basically one-handed typing. It doesn't employ any "new" technology, so it's not going to make a splash with the gadget-freaks, but it does free one hand for eating or holding text. The surface of the diminutive little computer has five plastic pads (buttons), ergonomically fitted to the shape of a relaxed human hand. To input a letter, you press one of the pads, or (for the majority of characters) a combination of pads. The brochure calls this "striking chords".

According to the salesperson, all of the characters available on a standard QWERTY keyboard can be typed by using Microwriting techniques. There are additional buttons on the unit, which are used for the necessary punctuation symbols, which give it everything it needs for basic writing. The salesperson assured me that Microwriting could be learned in a half-hour, but I doubt it. Still, I'm certain that like any skill, a little practice would make it easy. The little thing looks interesting, especially for a writer, and if I had money to blow on it I probably would have. By the way, it does connect (via an RS232C serial

cable) to a "real" computer, where you can do all your printing, long term storing, organizing, etc. This company sells their own software for this, but once again the helpful salesperson assured me that you didn't really need it since you can use DOS functions. Their specialized software is Windows-based. Imagine that?

I want one of these things. Even though it only has a maximum of 128K (expandable to 256K), and has an off-beat Hitachi CPU running at 4.9K, it still looks promising. It has two slots for 128K RAM cards, which have internal lithium batteries for backing up their data. The power supply is provided by a NiCad rechargeable battery and—with another slash of great insight—you can connect a 9V battery to it when your in one of those tight situations with a dead battery pack. There are even ROM cards that can be used for writing in French, Spanish, German, and other specialized functions.

Leaving the NewQuest booth, I journeyed to the Digital Vision booth, which had an eye catching video going. Computer Eyes/RT, Computer Eyes B/W, and Computer Eyes/Pro products provided a very interesting display. Even though my job has nothing to do with video capture, I couldn't help but take a long look at this piece of really cool hardware. These three video capture units offer different levels of video-digitizing capabilities, with different price tags, of course.

The /RT unit, no doubt the most costly of the three, allows you to capture moving video images in real time, with a 1/30th of a second frame snapper. It can also grab images from running video tape or from a television broadcast. All of these sources can be digitized in 24-bit color (16.7 million possible colors) in GIF, TIFF, PCX, and Targa TGA file formats, among others.

The /Pro unit is a cheaper alternative, and operates in color and black and white modes. The image is captured in an electronic scanning method that requires the person (or image) to be still for a few seconds in order to capture a clear image.

The B/W unit is (you guessed it) the cheapest of the three. It works in black-and-white only (64 levels of grey). Like the /Pro unit, this one also requires the subject to sit still for a few seconds in order to make a complete scan.

Well, I've delayed it as long as I can. With aching feet (and after making another trip to the lounge for one of those great three-dollar beers) I went back to the ZDS display.

The desktop computers were up to their usual high standards (actually, a very high standard, which was recognized when the spring COMDEX people awarded the ZDS desktop series with their coveted "Best Series" award), so I went to check out the portables. They're a little more interest-

ing to me these days, especially with the new series ZDS has just introduced.

People were hovering around the Z-Note series like flies on road-kill. And the color Z-Note . . . describing the crisp-color screen in mono-text and abstract terms of "contrast ratio" is impossible. You have to see the striking color of this LCD screen to appreciate it. (By the way, all of the Z-Notes have fully functioning, fully usable keyboards.)

After gushing over NewQuest I feel kind of spent, so without much further ado I'll present the Z-Note specifications with little unneeded fanfare. Besides, these products almost speak for themselves.

The portable Z-Notes (L series), which received the "Best of Show" COMDEX award, can be purchased in the following four flavors:

- \* The Z-NOTE 320L (Model 60)
- \* The Z-NOTE 325L (Model 85)
- \* The Z-NOTE 325L (Model 120)
- \* The Z-NOTE 325Lc

All of these portable computers have an Ethernet LAN port built-in (with adapters for thin cable and twisted pair available), a 3.5-inch 1.4M floppy disk drive (with an upgrade to a 2.8M floppy disk drive available), a hard disk drive, on-board VGA video (on an anti-glare LCD display) with an aspect ratio equivalent to a CRT. Other goodies include the famous ZDS monitor ROM (upgradable flash-BIOS, no less), dual-level password protection, a 14-icon LCD status panel, and the standard serial, parallel, and external video ports that are standard on almost all ZDS portables. And they're all wrapped around an Intel 80386SL microprocessor. Although the Z-NOTE 325Lc is the only one that comes with a VGA color screen, all of the other Z-NOTES can be upgraded to the same type of screen with some additional expense (and a trip to the ZDS service center). Of course, these four little powerhouses do have their differences.

The Z-NOTE 325L (Model 60) runs at 20MHz, 5MHz, or 0MHz (depending on how it's configured). It comes with a basic 2M of RAM (expandable to 12M), and a 60M hard disk drive (expandable to 120M). This model has a 20MHz numeric coprocessor available as an option.

The Z-NOTE 325L (Model 80) runs at 25MHz, 6.25MHz, or 0MHz (depending on how it's configured). It comes with a basic 4M of RAM (expandable to 12M) and a 64K cache module, and an 85M hard disk drive (expandable to 120M). This model has a 25MHz numeric coprocessor available as an option.

The Z-NOTE 325L (Model 120) runs at 25MHz, 6.25MHz, or 0MHz (depending on how it's configured). It comes with a basic 4M of RAM (expandable to 12M) and a 64K cache module, and a 120M hard disk drive. This model has a 25MHz numeric

coprocessor available as an option.

The Z-NOTE 325Lc runs at runs at 25MHz, 6.25MHz, or 0MHz (depending on how it's configured). It also comes with a basic 4M of RAM (expandable to 12M) and a 64K cache module, and a 120M hard disk drive. This model has a 25MHz numeric coprocessor available as an option.

Speaking of options, there's a ton of them available for these beauties. And then there's the port replicator, which offers a fast and dirty method of connecting your portable work environment to your desktop location with a minimum of difficulties. But I'm getting tired walking around this place, and if I here one more geek getting excited over GUIs or MIPS or OOPs I'm gonna puke. Seeing the door out of this techno-haven, I realize that there's still a real world out there, and I have had no luck whatsoever in prying any spending money out of my department manager. But before I go, here are the addresses of the companies I've discussed in this article (except ZDS—you know how to get a hold of them, I trust). Contact these addresses if you'd like some more information about their products.

AirMouse Remote Controls

30 Mountain View Dr.  
Colchester, VT 05446  
(802) 655-9600

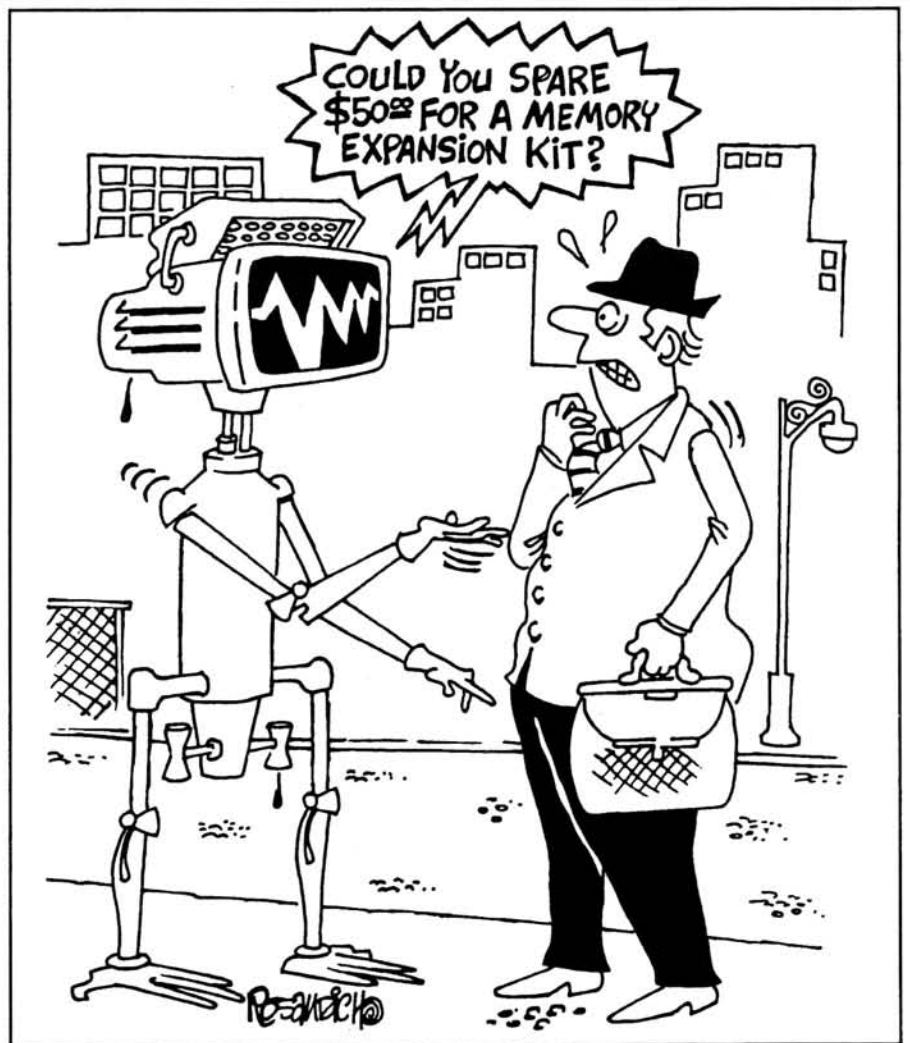
NewQuest Technologies, Inc.  
2550 S. Decker Lake Blvd.  
Salt Lake City, UT 84119  
(801) 975-9992

HEI, Inc.  
1495 Steiger Lake Ln., Box 5000  
Victoria, MN 55386  
(612) 443-2500

Chic Technology Corp.  
1004 K St. NE  
Auburn, WA 98002  
(206) 833-4836

Digital Vision, Inc.  
270 Bridge Street  
Dedham, MA 02026  
(617) 329-5400

Computer Aided Technology, Inc.  
10132 Monroe Drive  
Dallas, Texas 75229  
(214) 350-0888  
FAX — (214) 904-0888 ✱





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# Practical

# Tips

## Introduction

I would like to pass on to you some practical tips that I have learned about personal computer systems that you may find useful. I have included directory, CONFIG.SYS, AUTOEXEC.BAT, troubleshooting, and general tips. Some of these tips I have seen in past REMark articles.

## Directory

- Make a directory called C:\ACROOT on your hard drive. Copy all the files in your root directory to C:\ACROOT. If you ever trash your root directory, you can easily copy it back. If you have two hard drives, place the \ACROOT directory on the D drive instead of the C drive for additional protection.
- Make a directory called C:\BAT on your hard drive. Create all batch files here for execution of all programs you use. For instance, if you use WordPerfect, Lotus, and DBASE, create batch files called WP.BAT, LOTUS.BAT, and DBASE.BAT. A sample WordPerfect batch file (WP.BAT) would be:

```
c:                ;in case you are on different drive
cd\wp\data       ;go to your data directory
c:\wp51\wp       ;does not search down your path to execute
c:                ;go back to C drive
cd\aempty        ;place you in an empty directory
```

- Do not use the "Set" command in your AUTOEXEC.BAT file unless absolutely necessary. This uses up environment space. Place "Set" commands in your batch files in the C:\BAT directory. For instance, a fastback batch file (FB.BAT) could be as follows:

```
c:
cd\fb
set fastback=c:\fb ;sets fastback equal to where files are
c:\fb\fb           ;execute fastback ;use full path name
set fastback=      ;deletes fastback from environment
c:
cd\aempty
```

- Make a directory called C:\AEMPTY on your hard drive. Anytime you exit a program, through the use of a batch file, ensure that it goes to this empty directory. This will prevent inadvertent deletions. For example, you think you are on drive A: and issue the command "del \*.\*", followed thoughtlessly with a "Y". If you are in an empty directory on the hard drive,

you use in your path. These files in your directory and not in the C:\DOS directory. When you update DOS you will not have to remember which programs are not a part of the old DOS and need to be saved. Some examples of programs that would go here are:

MARK.COM — mark memory for a temporary TSR program  
RELEASE.COM -- release TSR program from memory  
LIST.COM — list the contents of an ASCII file  
ASC2.COM — a TSR ascii table list  
WHEREIS.COM — find a file  
STACKY.COM — a sequence of keystrokes to execute

## CONFIG.SYS

A sample CONFIG.SYS file would be:

```
files=40
buffers=20
rem
rem
device=c:\dos\himem.sys
rem    Manage extended memory & enable DOS to load @ 1MB
rem
rem
dos=high,umb
rem    high - Load DOS at 1MB vice conventional memory
rem    umb - Enable Devicehigh and Loadhigh commands
rem
rem
devicehigh=c:\dos\emm386.exe noems
rem    emm386 - Manage UMB area for Devicehigh & Loadhigh
rem    noems - No expanded memory services
rem
rem
devicehigh=c:\dos\ramdrive.sys 1024 /e
rem    A RAM driver loaded in UMB
```

no harm done.

- Make a directory called C:\AUTIL on your hard drive. Place all utility programs that you have gathered from various sources here. These are programs that often and need to have are placed in their own

```

rem
rem
shell=c:\dos\command.com c:\dos\ /e:256 /p
rem   c:\dos\ Command.com is located in \DOS directory
rem       vice in root directory
rem   /e Environment space set at 256Bytes
rem   /p makes command.com permanent

```

### AUTOEXEC.BAT

- Make your path statement in your autoexec.bat file very small. For example path=c:\bat;c:\util;c:\dos; This will use up less space in your environment and the search for a program will be much quicker. Also, if you type in a bad command, you will get the DOS prompt back faster. A sample AUTOEXEC.BAT file would be:

```

set path=
set comspec=
rem   Empty the environment
rem
rem
loadhigh c:\mouse\mouse.com 2
rem   TSR'S loaded here with complete path name
rem   Environment for each TSR is small
rem   Sample TSR - Load mouse in UMB and use COM2 port
rem
rem
prompt $p$g
path c:\bat;c:\bin;c:\dos;
rem   Put Prompt first because this is at the beginning of
rem   environment. Prompt is used most often.
rem   Path is next (most often path first).
rem
rem
set comspec=c:\dos\command.com
rem   Place command.com at last position in environment

```

### Troubleshooting

More and more users are switching to Windows 3.0 as their interface of choice. If you experience a problem that reoccurs using a DOS base program executed under windows, try running the DOS base program from DOS. This may clear up the problem. I have had trouble with Prodigy and WordPerfect when executed under Windows 3.0.

If I execute Prodigy under Windows 3.0, my computer's modem loses synchronization with Prodigy's modem. My modem stops responding to transmissions from Prodigy and finally the Prodigy program on my computer aborts. I have to do a warm boot to restart my computer. This does not occur if I execute Prodigy from DOS without Windows 3.0 in memory.

I have had problems with the spell check and merge functions when executing WordPerfect from Windows 3.0. A friend of mine has had problems with soft fonts when using WordPerfect executed from Windows 3.0. These problems do not occur when WordPerfect is executed directly under DOS.

### General

When executing a program from the AUTOEXEC.BAT or a batch file, use the full path name. This will enable DOS to go directly to the program without searching the current directory or going through your path.

If you break a power-on switch on a computer, you may have to buy the whole power supply. Power supplies are expensive. By buying a surge protected power strip, you will not need to use the power switches on your computer, monitor, etc. The surge protector will also protect against power spikes and surges. Ensure the surge protector has a connection for your modem.

When buying hardware, usually a higher number indicates bigger, better, or faster. For instance, 33 MHz is faster than 25 MHz. A 120MB hard disk has more capacity than an 80MB hard disk. However, there are times when the lower number means better or faster. Some examples are:

### Monitor (Dot pitch in millimeters-mm)

- .28mm is better than .39mm
- Dots are closer together (less grainy)

### Hard Disk (Access time in milliseconds-ms)

- 17ms is better than 25ms
- less time to access information

### Memory Speed (RAM in nanoseconds-ns)

- 70ns is faster than 80ns
- RAM stores and retrieves in less time
- Match RAM to computer speed (it does no good to place 70ns RAM in an 8MHz CPU)

Join a computer bulletin board to get your computer questions answered. Someone has probably already run into the same problem. You may even be able to answer someone else's problem. I just responded to a question about how to make labels using File Express data base software. I have also asked questions and received responses.

Make a copy of your setup that is stored on CMOS. This is where information about what hard drives you have, monitor, floppy drives, amount of memory and other information is stored. If your battery ever dies, this information will be lost.

### Conclusion

Hopefully some of these practical tips will be of use to you. I know I have enjoyed reading past REMark articles that have given helpful tips.

I also recommend that you buy backup and virus protection software. I am constantly amazed at the number of businesses that do not have a backup of their hard disks. They assume they can recreate everything from all the program disks that they have stored away. Reinstalling all my software with specific defaults set is not my idea of a fun time.

Don't use someone else's floppy disk. If you must use someone's disk, check it first. Viruses are becoming more prevalent. Buy some virus protection software today. ✱





# It's Super VGA



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Zenith Data Systems has an established leadership role in the production of high quality video display technology. In the past, ZDS became the first personal computer manufacturer to offer high resolution color text and graphics modes, smooth-scroll, flicker free video displays and video displays that would support both analog and digital signals. Additionally, ZDS has set industry standards with its backlit liquid crystal displays and supertwist liquid crystal displays for their laptop and notebook microcomputers.

Today, ZDS offers a variety of microcomputer displays that range from laptop displays and monochrome V.G.A. displays to color VGA monitors. In addition, Zenith Data Systems offers graphics adapters that match the quality of the monitor to the power of the microcomputer.

## The Differences Between VGA and Super VGA

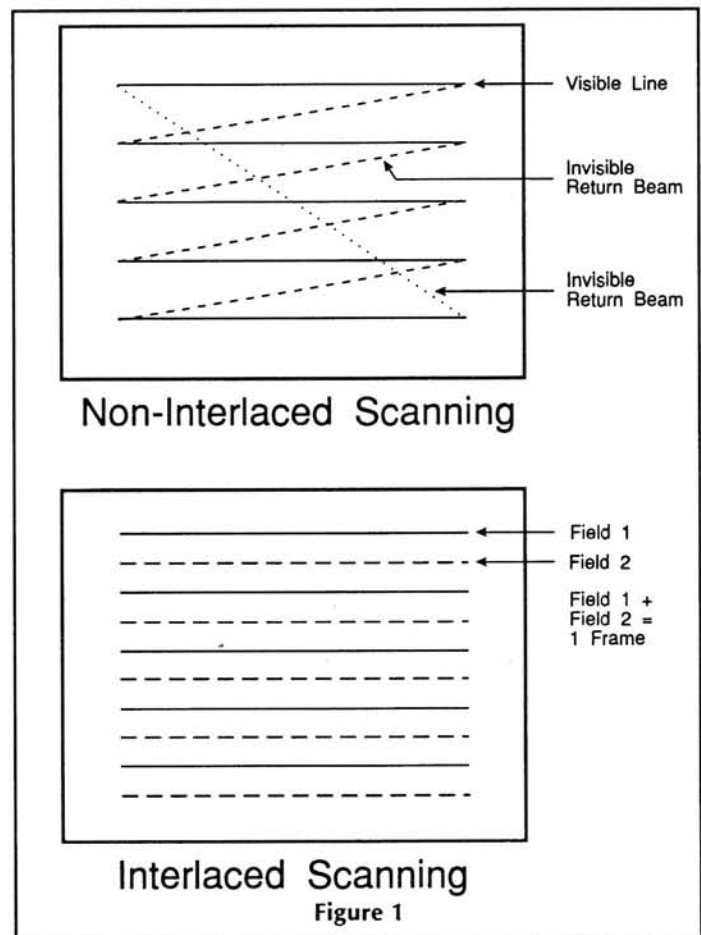
Recently, Zenith Data Systems bolstered their product line with a new video adapter and a new monitor. Both additions give the ZDS microcomputer user the option of utilizing Super VGA resolution for graphic design, desktop publishing, computer-aided drafting and desktop presentations. Not surprisingly, many new ZDS microcomputer systems incorporate Super VGA as a standard feature. Before we look at the new Zenith Data Systems video adapter and monitor, let's examine the

differences between VGA and Super VGA.

Although many advertisements list Super VGA monitors at bargain prices, the sales pitches rarely give consumers the information they need to intelligently purchase a quality video display. Not all Super VGA monitors are created equally. Before purchasing a Super VGA display, you should consider several key characteristics. Those features are image quality, the range of scanning frequencies, video mode compatibility, the number of displayable colors and the location of the customer controls.

### Image Quality

Small dots, produced by the elec-



**Table 1**  
Horizontal and Vertical Scan Frequencies

Display Type	Input Signal	Horizontal Scan Frequency	Vertical Scan Frequency
MDA	Digital	18,432 Hz	50 Hz
Hercules	Digital	18,432 Hz	50 Hz
CGA	Digital	15,750 Hz	60 Hz
EGA	Digital	21,600 Hz	60 Hz
VGA	Analog	31,500 Hz	60-70 Hz

tron guns inside the CRT, make up the total display seen on the face of your video monitor. For color video displays, three individual dots—red, blue and green—make up one pixel of video information. Dot pitch is the distance between the center points of adjacent horizontal pixels on the CRT screen. Advertisements for video display monitors list the dot pitch measurement in millimeters. Importantly, a monitor that has a smaller distance between pixels will have a higher possible resolution.

Like television receivers, microcomputer displays rely on vertical and horizontal scanning frequencies. Each line that results from the deflection scanning yields a set number of pixels. The longer horizontal lines will have more pixels than the shorter vertical lines. If the specifications for a Super VGA monitor list a resolution of 800 x 600 pixels, the horizontal scan lines show 800 pixels while the vertical line shows 600 pixels. Multiplying the two figures gives us the total amount of pixels that the raster will display. In this case, the total number of pixels is 480,000.

The image quality of a Super VGA monitor also depends on the type of phosphors used to coat the inside of the cathode ray tube. Much of the image quality due to phosphor type is a product of the type of Super VGA monitor used and the displayed image. Phosphors that glow longer after being struck by the CRT electron beam reduce flicker, but also leave "smears" during image scrolling. Other phosphors have a shorter persistence and will not exhibit the smearing. However, a monitor that has an interlaced display and short persistence phosphors will have a disturbing amount of flicker.

Because Super VGA monitors have higher resolutions, any flicker caused by screen phosphor decay is noticeable and distracting. With all the individual dots displayed, some will dim as others become illuminated. To counter the flicker problem, most video displays use non-interlaced refresh scanning. That is, the deflection circuitry of the monitor will draw all the lines during one pass. Interlaced scanning requires two passes. One pass draws

**Table 3**  
What the Z-550 Video Display Adapter Supports

Mode	Resolution Colors/Mapping
Mono Text	80 col x 25 row -Monochrome
Color Text	80 col x 25 row 16 Color
	40 col x 25 row 16 Color
132 Column Text	132 col x 25 row 16 Color
	132 col x 28 row 16 Color
	132 col x 44 row 16 Color
	132 col x 25 row -Monochrome
CGA Graphics	132 col x 43 row -Monochrome
	320 horiz x 200 vert, 4 Color
Hercules Graphics	640 h x 200 v <sub>2</sub> 2 Color
EGA Graphics	720 h x 348 v <sub>2</sub> -Monochrome
	320 h x 200 v <sub>2</sub> 16 Color
	640 h x 200 v <sub>2</sub> 16 Color
	640 h x 350 v <sub>1</sub> 16 Color
	640 h x 350 v -Monochrome
VGA Graphics (including MCGA)	320 h x 200 v <sub>2</sub> 256 Color
	640 h x 480 v <sub>2</sub> Color
	640 h x 480 v <sub>1</sub> 16 Color
Extended Graphics	640 h x 400 v 256 Color
	640 h x 480 v <sub>5</sub> 256 Color
	800 h x 600 v <sub>1</sub> 16 Color
	800 h x 600 v <sub>4,5</sub> 256 Color
	1024 h x 768 v <sub>4,2</sub> Monochrome
	1024 h x 768 v <sub>4,5</sub> 16 Color
	1024 h x 768 v <sub>4,6</sub> 256 Color

<sup>1</sup>Number of colors or shades that can be displayed at one time from 262,144 possible colors on color displays or 4 shades of gray on monochrome displays.

<sup>2</sup>200 line vertical resolution modes are double-scanned to display 400 lines on screen.

<sup>3</sup>Hercules and hardware compatible CGA and MDA modes require the use of the VGAMODE.EXE utility. 4800 x 600 graphics mode requires a multi-frequency monitor. 1024 x 768 Interlaced graphics mode requires an 8514 or compatible monitor. 1024 x 768 non-interlaced graphics mode requires a monitor capable of 49 kHz horizontal scan at 60 hz or 56 kHz at 70 hz.

<sup>5</sup>Requires 512K bytes of video display memory.

<sup>6</sup>Requires 1 M byte of video display memory.

**Table 2**

Video Mode	Graphics Type	Color/Monochrome	Char X Scan Lines	Char Box Size	Resolution
0	Alpha/Num	C 16/256	40 x 25	9 x 16	720 x 400
1	Alpha/Num	C 16/256	40 x 25	9 x 16	720 x 400
2	Alpha/Num	C 16/256	80 x 25	9 x 16	720 x 400
3	Alpha/Num	C 16/256	80 x 25	9 x 16	720 x 400
4	Graphics	C 4 /256	40 x 25	8 x 8	320 x 200
5	Graphics	C 4 /256	40 x 25	8 x 8	320 x 200
6	Graphics	C 2 /256	80 x 25	8 x 8	640 x 200
7	Alpha/Num	Monochrome	80 x 25	9 x 16	720 x 400
D	Graphics	C 16/256	40 x 25	8 x 8	320 x 200
E	Graphics	C 16/256	80 x 25	8 x 8	640 x 200
F	Graphics	Monochrome	80 x 25	8 x 14	640 x 200
10	Graphics	C 16/256	80 x 25	8 x 14	640 x 350
11	Graphics	C 2/256	80 x 30	8 x 16	640 x 480
12	Graphics	C 16/256	80 x 30	8 x 16	640 x 480
13	Graphics	C256/256	40 x 25	8 x 8	320 x 200

every other line while the second fills in the blank spaces. Figure 1 shows how non-interlaced scanning works and compares it with the interlaced scanning that some Super VGA monitors employ.

#### Scanning Frequencies

Since the number of pixels depends on the deflection signals, varying the horizontal scan frequency changes the number of displayable pixels. The horizontal scan frequency defines the speed at which the monitor draws individual scan lines. In the past, monitor designs had horizontal frequencies that ranged from 15.75 to 31.5 kHz. Table 1 lists the horizontal and vertical scan frequency for Hercules, MDA, CGA, EGA and VGA displays. Super video graphics adapters can produce horizontal sync frequencies of 35.20 khz, 37.80 khz or 48.0 khz. An increased number of horizon-



**Table 4  
The Z-550 and the Competition**

	VGA	Z-550 Super VGA	IBM 8514/A	XGA
Maximum Resolution	640 x 480	1024 x 768	1024 x 768	1024 x 768
Graphics Max Colors at Max Resolution	16	16 (512K) 256 (1 MB)	256	256
Non-interlace at Maximum Resolution	Yes	Yes	No	No
Host Interface	8-bit ISA	8/16-bit ISA	16-bit MCA	16/32-bit BusMaster
Subsystem Design	8-bit controller	8-bit controller	16-bit hardware engine	16/32-bit hardware engine
Memory Based	DRAM	DRAM	VRAM	VRAM
Maximum Text Mode	80 x 25	132 x 43	Graph. Only	132 x 25
Hardware Cursor	No	Yes	No	Yes
VGA Hardware Compatible	Yes	Yes	Pass-thru	Yes
Screen Video	Host Only	Host Only	Host Only	Host & Video Hardware
Memory Addressed Software Drivers	None	Each Res & Color	Each Res & Color	Each Res & Color
Required Color Palette to pick from	256 KB	256 KB	256 KB	64 KB

tal lines improves the clarity produced by the video monitor.

One look at the chart tells us that the vertical scan frequencies remain virtually the same while the horizontal scan frequencies increase. The vertical scan frequencies defines the number of times that the monitor updates its screen. Keeping the 60 Hz vertical scan rate and increasing the horizontal scan rate squeezes more horizontal lines into one vertical cycle. Along with the higher horizontal scan frequencies, Super VGA monitors also have vertical scan frequencies that, depending on the manufacturer, may vary from 56 Hz to 87 Hz. Each horizontal scanning frequency matches with a vertical scan frequency. For example, the lowest 56 Hz vertical scan frequency corresponds with the lowest horizontal scan frequency. The higher 72 Hz vertical refresh rate not only eases eye strain but also matches with the highest horizontal scan frequency.

**Video Mode Compatibility**

Even though VGA monitors utilize analog RGB signals, they work only with VGA input signals from a VGA adapter card. This may seem as a problem since some software packages will only produce CGA or EGA signals. Nevertheless, most VGA adapter cards can change the CGA and EGA signals into a form easily displayed by the monitor. Table 2 lists the different VGA video modes of operation.

On the other hand, Super VGA offers true backward compatibility with older video display adapters. Although Super VGA monitors use analog input signals, the newer monitors also support the digital signals used by older MDA, CGA and EGA monitors. This support translates into handling either a sixteen color CGA digital input signal or a sixty-four color EGA digital input signal. Analog color signals have an almost infinite number of voltage levels that produce an almost infinite number of colors. Digital color signals have a limited number of voltage levels and a limited number of colors.

**Number of Displayable Colors**

At a resolution of 320 x 200, VGA monitors will show 256 colors out of a choice of 256,000 colors. Only 16

**Table 5  
The ZCM-1420 and the Competition**

	Zenith Data Systems ZCM-1420	AST Super VGA	Compaq Color	Dell Super VGA Color	Epson Extended VGA	Everex Eversion 300 Eversync	IBM 8514-A	NEC MultiSync 3D
Diagonal Size (Inches)	14"	14"	14"	14"	14"	14"	16"	14"
Max. Resolution (HxV, pixels)	1024x768	1024x768	640x480	1024x768	1024x768	1024x768	1024x768	1024x768
Interlaced/Noninterlaced	I	I	N	I	N	I	I	I
Dot Pitch (millimeters)	0.28	0.31	0.31	0.28	0.28	0.28	0.31	0.28
Horizontal Scan Rate (kHz)	31.49	21.8	21.8 38.5	30.-	31.5	15.5- 35	31.5	15.5- 38
Vertical Scan Rate (Hz)	50-70	60-70	60-70	40-90	56-87	50-70	60-70	50-90 Hz
Physical Features:								
Height Inches	14"	12.2"	14.1"	15"	14.8"	13.3"	14.2"	14.3"
Width Inches	13"	14.1"	13.8"	14"	13.9"	14.5"	15.7"	14"
Depth Inches	16"	14.2"	14.6"	15"	14"	15.2"	16.3"	16"
Power Supply	110/220VAC	110/220VAC	N/Av	N/Av	110VAC	110/220VAC	110VAC	110VAC

Continued on Page 36

# QUIKDATA - 16 YEARS OF H/Z SUPPORT!

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For your **H/Z241, 248 and 386/16** we have the direct replacement **WESTERN IMAGING Z-33 ZUNI MOTHERBOARD** that's just loaded with features. Super fast 33Mhz 80386 main board with ten expansion slots and built in are two serial ports, one parallel port, floppy disk controller and an IDE hard disk controller! Add video (and your old MFM controller if you desire) and you still have plenty (9 slots) of expansion left! Support to 32 meg on-board RAM using SIMMs. **Z-33** - \$795 with 0K RAM **80387-33** - \$195 Coprocessor **SIM1X9-8** \$45 1 meg X 1 70ns SIMM DRAM **SIM256-8** - \$13 256K X 1 70ns SIMM DRAM

From Sota Technologies, Inc., the fastest and most proven way to speed up your **H/Z150/160/150/158/159** series of computers. In many cases it will run faster than a standard IBM AT type computer! The **EXP12 286i** is a 12Mhz 80286 accelerator board with 16K on-board CACHE. **EXP-12** - \$229

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**Z100MP** - \$55 Similar to ZMF100 above, but for new motherboards with p/n 181-4918 or greater.

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**Z505 1MB Z386/16 MEMORY BOARD** - \$150

**Z248/12, Z286LP RAM UPGRADE, Z605-1** consists of 2 1 meg 80ns SIMMs to upgrade your H/Z systems. **Z605-1** - \$110

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We also have memory upgrades for just about every H/Z desktop and laptop unit except the 181, 183, and 184 series. Tell us what you need and we can quote you a price.

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**ST-251-1** - \$269 Bare drive only  
**PCW80** - \$410 80 meg with Segate ST-4096 full size drive.  
**ST-4096** - \$350 Bare drive only - Special!

**DTCOM** - \$59 PC/XT hard drive controller board  
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**NCLIDE** - \$69 AT bus IDE/floppy controller for placing an IDE hard drive in any AT compatible.

**TAPE BACKUP UNITS** that work off the floppy controller in any PC/XT/AT computer from CMS, the DJ-10 (120MB unit) and DJ-20 (250MB) units. Low cost and impressive. Uses DC2000 series cartridges.

**DJ-10** - \$239 **DJ-20** - \$295

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**MF501** - \$71 5" 360K DS/DD drive  
**MF504** - \$75 96 TPI 1.2 meg AT/Z100 drive  
**MF353** - \$71 720K 3.5" drive in 5" frame  
**MF355** - \$75 1.4 meg 3.5" AT drive in 5" frame  
**TM100-2R** - \$59 40tk DS refurb (H8/89/Z100 PC type)

## ANY TYPE FLOPPY IN YOUR PC/XT/AT

With the **CompatiCard**, you can install up to four additional drives in your PC/XT/AT computer. Add a 1.2 meg, a 1.44 meg, or any other drive, including 8" to any PC with an expansion slot. The CompatiCard (CCARD) will handle up to four drives, and the CompatiCard II (CCARD2) will handle up to 2 drives. CCARD4 has boot ROM to allow it to be used as primary boot controller in systems that allow you to remove floppy controller. CCARD4 also supports 2.8MB 3.5" floppy drives. Additional cables and external enclosures may be required.

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**BPACK2.8** - \$275 **BPACK1.4** - \$225  
**BPACK1.2** - \$225 **BPACK360** - \$225

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**ADD AN EXTERNAL HARD DRIVE** - Just like above, but these units are completely portable hard drives. Think of the uses, including the security! 40 and 100MB units available by Microsolutions.

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Quikdata also stocks BIOS ROM upgrades and batteries for most H/Z PC/XT/AT computers, spike protection filters, backup power supplies, modems, printers, cables and ribbons, disk drives and diskettes of all types, external hard drive and floppy drive enclosures, cables and connectors, video monitors and cards, memory chips and cards, ICs, accessory cards, mice, software and much more! **Need a PC/AT computer?** Tell us what you want and we will quote you a price on one of our custom assembled QD computers made up to meet your demands.

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# QuikMenu III

## Part 2

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### Last Time

In the last article, I showed you some of the features of QuikMenu III. I led you through setting up QuikMenu's defaults and creating a basic menu with software icons. In this article, I will show you how to add other icons to the menu and enhance existing icons by using different graphics, styles, colors, fonts, and alignments. I will also cover adding page titles to personalize your menu.

### Getting Started

After reading Part 1 of this article, you should have a handle on the basics of

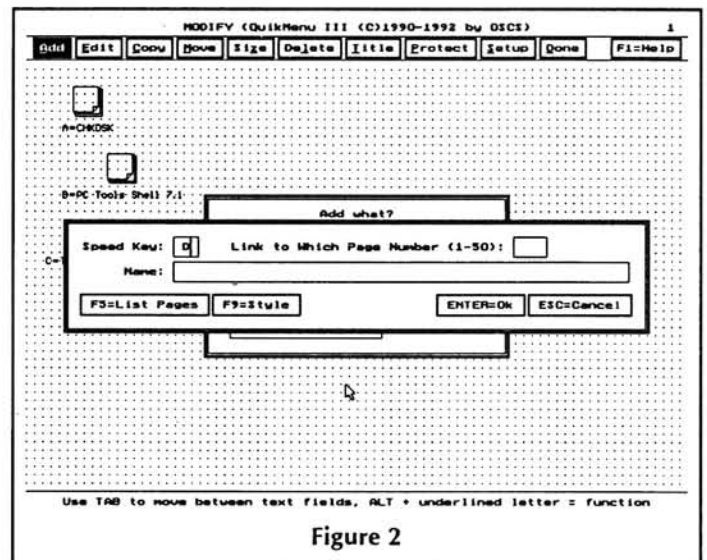
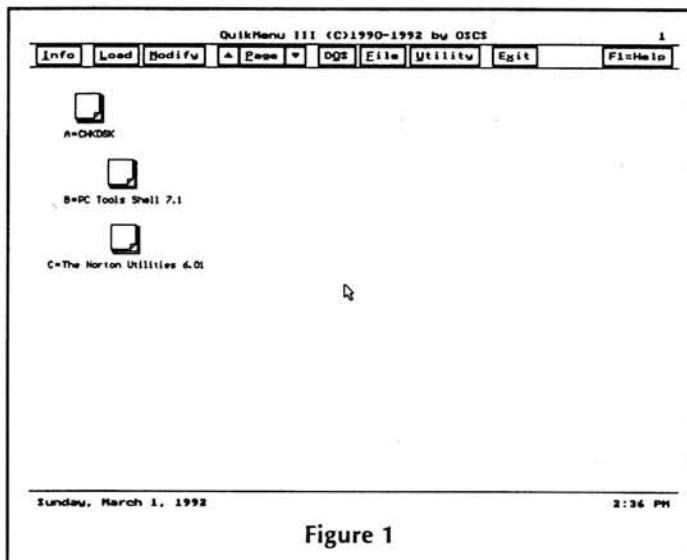
QuikMenu III. This article is meant as a follow-up to Part 1. You must understand the principles introduced in Part 1 to fully comprehend some areas of Part 2. If you forgot some of the basics, go back and review Part 1 now.

Invoke QuikMenu as you did in Part 1. Remember that non-network users must type "QM" and press [ENTER], while network users must type "QNET USERNAME" and press [ENTER]. QuikMenu will execute using the menu you created last time, which should look like Figure 1.

### Adding A Page Icon

After adding several software icons to the first menu page, you may begin running out of room. You will need to expand the menu by adding another page. A page icon is used to quickly transfer you to a different menu page. Page icons are similar to hypertext links, linking a specific menu page to it's own icon. This allows rapid movement between pages, without having to move through intermediate menu pages.

Click on {Modify} [ALT-M], and select {Add} [ALT-A]. When prompted what type of icon to add, select "Page Icon" [ALT-P]. You will see the editing dialog box for page icons, as shown in Figure 2.



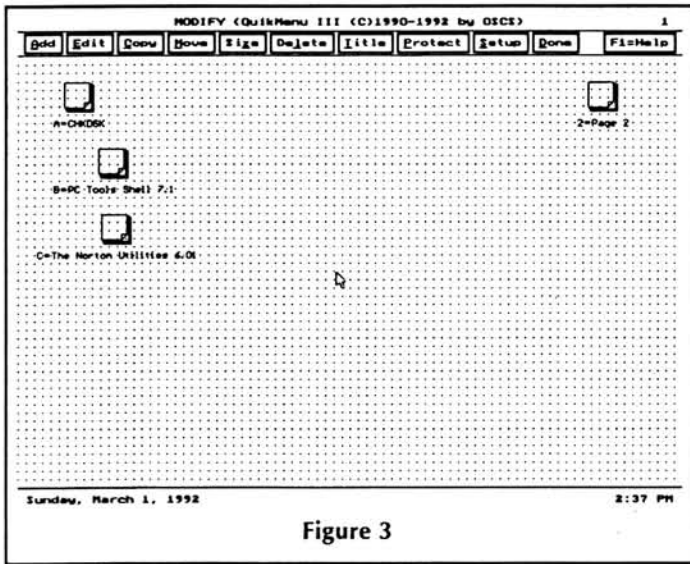


Figure 3

As with any icon, you must select a speed key or use the pre-defined one given by QuikMenu. This icon will be used to go to page 2, so press [BACKSPACE], and type "2" in the (Speed Key:) field. Press [TAB] to move to the (Name:) field, and type "Page 2". Press [TAB] to move to the third field. You are prompted, "Link to Which Page Number (1- 50):". Type "2", and click on [ENTER=Ok][ENTER] to save your changes. Your mouse pointer should now appear as a hand holding the icon, just as it did after creating a software icon in Part 1. (Some monitors may only show an outline box.) Use the mouse or the arrow keys to move this icon to the upper right corner of the menu page. Leave a margin between the icon and the edge of the menu background. Click the mouse button or press [ENTER], and the icon will remain in that position. Your screen should look like Figure 3.

**Copying A Page Icon**

In Part 1, we covered the basics of copying a software icon. This copying procedure is the same for each type of icon. Click on [Copy] [ALT-C]. When prompted, "Which item do you want to Copy:", select the icon labeled {2=Page 2}, or press [2]. Place the new icon below the original, and complete the copying procedure using what you learned from Part 1. If you have problems, go back and review Part 1 of this series.

**Editing A Page Icon**

Click on [Edit] [ALT-E] to modify the copied icon. QuikMenu will prompt, "Which item do you want to Edit:". Click on the copied icon or press [D], which is the speed key QuikMenu assigned to it. The editing dialog box for page icons will reappear. Alter the speed key, name, and page linking to correspond to page 1. (Hint: The speed key should be 1, the name should be "Page 1", and the icon should be linked to page 1.) When you have finished, click on

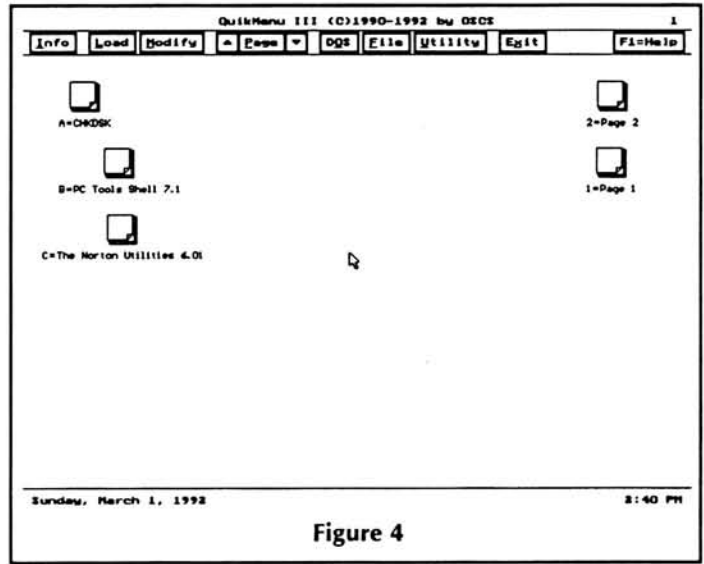


Figure 4

[ENTER=Ok] [ENTER] to save the changes to the icon, and select [Done] [ALT-D], to save the changes to the menu. Your screen should look like Figure 4.

**Moving An Icon**

The method of moving icons is also consistent within QuikMenu. The moving procedure remains the same whether you are moving a software, page, macro, or dialer icon. Since you edited the bottom page icon to read {1=Page 1}, the icons are not in chronological order. Put them in order using QuikMenu's Move command. Click on [Modify] [ALT-M], and select [Move] [ALT-M]. QuikMenu prompts, "Which item do you want to Move:". Click on the icon labeled {2=Page 2}, or press [2]. Your mouse pointer again turns into a hand holding the icon. Using the arrow keys or the mouse, position it directly to the left of the {1=Page 1} icon. Click the mouse button or press [ENTER] and the {2=Page 2} icon will remain in that position.

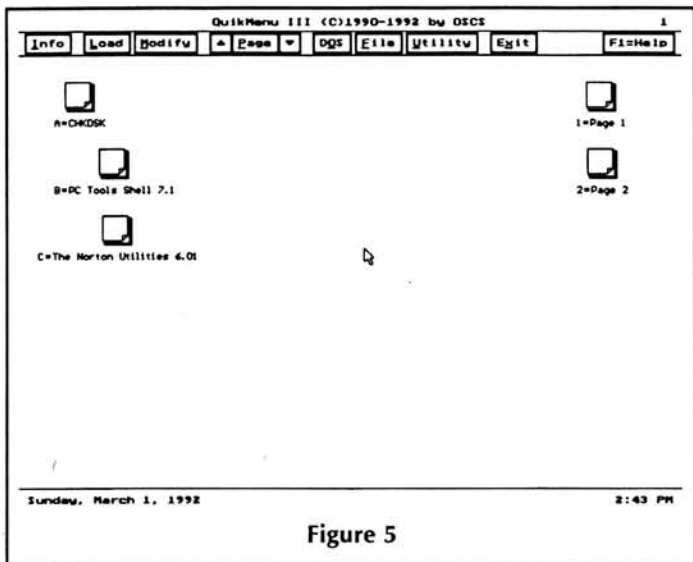


Figure 5

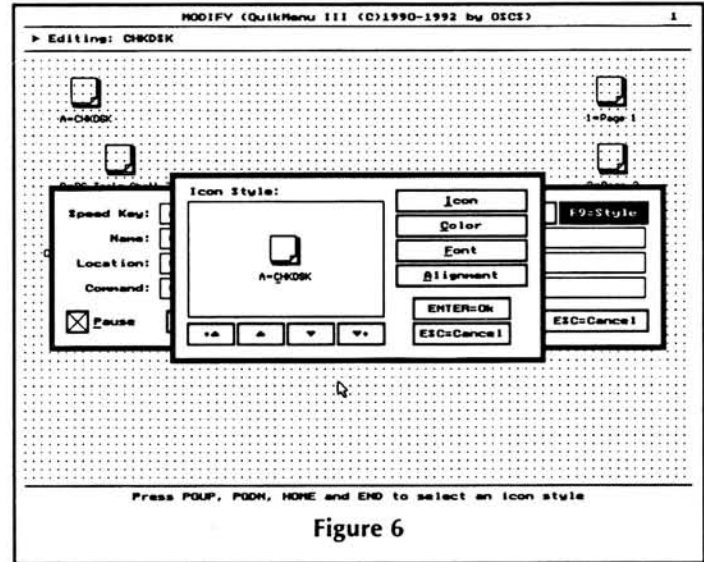


Figure 6



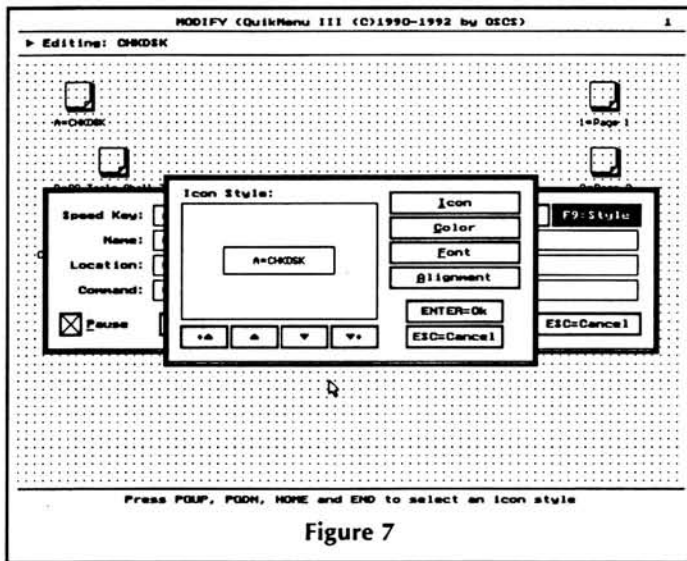


Figure 7

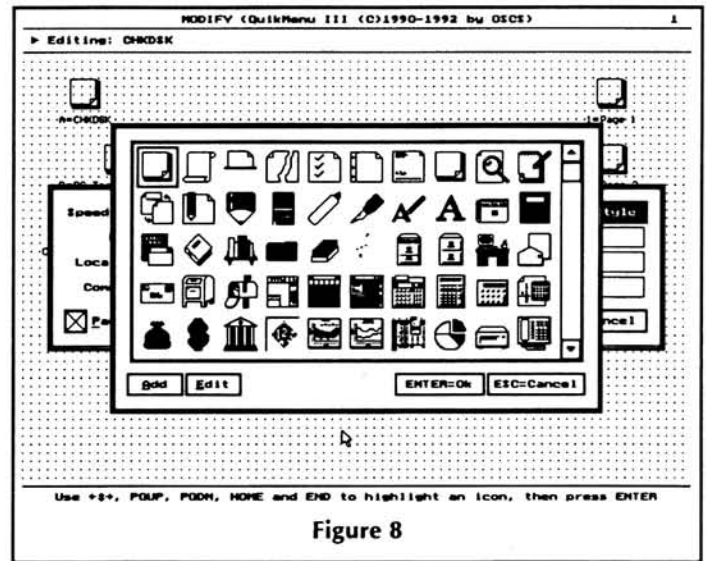


Figure 8

There is a simpler way to move icons than the way I've just shown you. As long as you are in modify mode, click directly on the icon labeled {1=Page 1}, or press [1]. The icon automatically transfers to the moving position, saving you a step. Use the mouse or the arrow keys to move it to the upper right corner of the page, again leaving a margin. Click the mouse button or press [ENTER] so it remains in that position. Use this technique to move the {2=Page 2} icon directly below the {1=Page 1} icon. When you are finished, click on {Done} [ALT-D]. Your menu should look like Figure 5.

### Macro & Dialer Icons

Advanced QuikMenu III users may find the use of Macro and Dialer icons beneficial. Macro icons may be used to automate repetitive keystrokes or mouse actions. It is possible to execute several programs in succession by selecting a single macro icon. QuikMenu does not require

that you learn a macro programming language in order to utilize macro icons. It uses a macro recorder to record keystrokes or mouse actions, allowing you to play them back when you execute the macro icon.

Dialer icons allow you to use a Hayes compatible modem as a telephone dialer. You could set up a page of your most frequently used telephone numbers and dial them by selecting the corresponding dialer icon.

### Enhancing Icons

In Part 1, I showed you a picture of an actual page from my menu. I used QuikMenu's special enhancements to modify the box style, graphic, color, font, and alignment of each icon to make the menu more organized and functional.

*Note:* The QuikMenu III users' manual refers to the picture on each icon as an "icon". To avoid confusion, I will be referring to this picture as a "graphic".

Click on {Modify} [ALT-M], and select {Edit} [ALT-E]. When QuikMenu prompts, "Which item do you want to Edit:", click on {A=CHKDSK} or press [A]. Click on the option in the upper right corner of the editing dialog box labeled {F9=Style} [F9]. Your screen should look like Figure 6.

### The Preview Window

On the left is a preview window containing an image of the current icon. It displays the shape, graphic, current colors, text, and box style. The preview window shows what the icon will look like when it is placed on the menu background. Beneath the preview window are four directional buttons. From left to right, they represent the keys [HOME], [PGUP], [PGDN], and [END]. You can click on each button with the mouse or press the corresponding keys on the keyboard to activate each button. Click on the {HOME} button [HOME] on the far left side. Your screen should look like Figure 7.

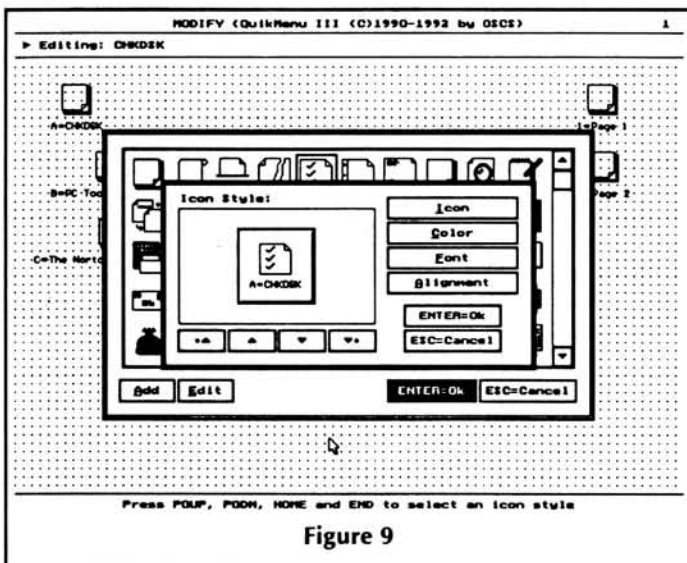


Figure 9

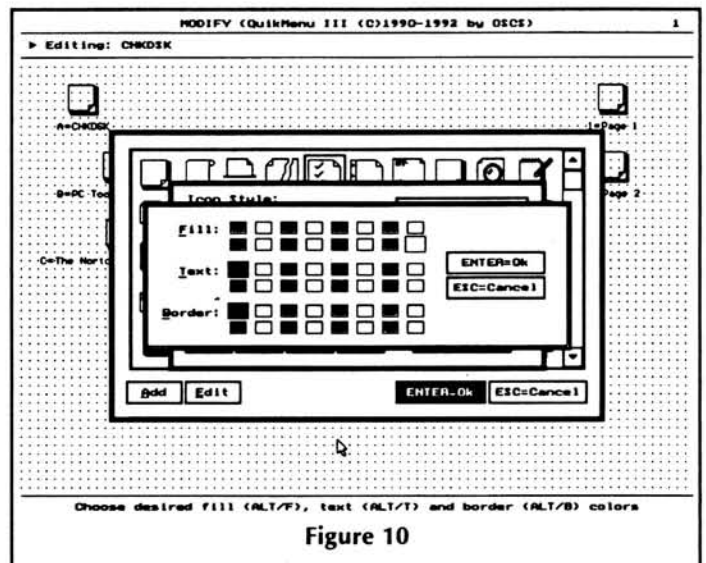


Figure 10

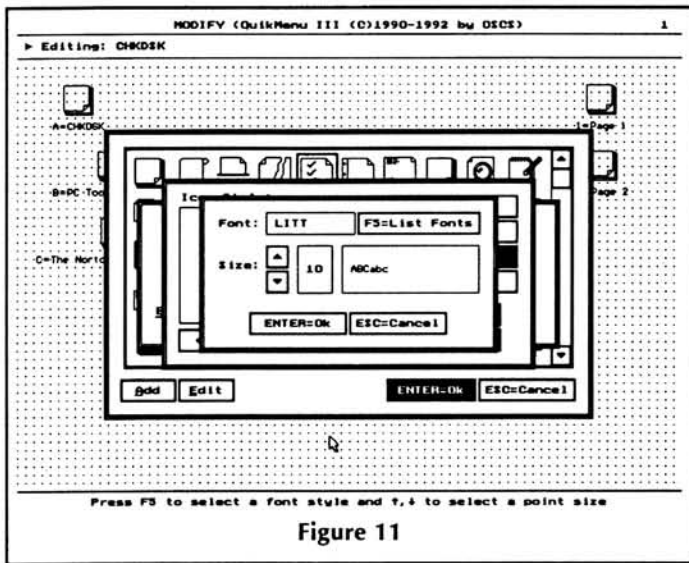


Figure 11

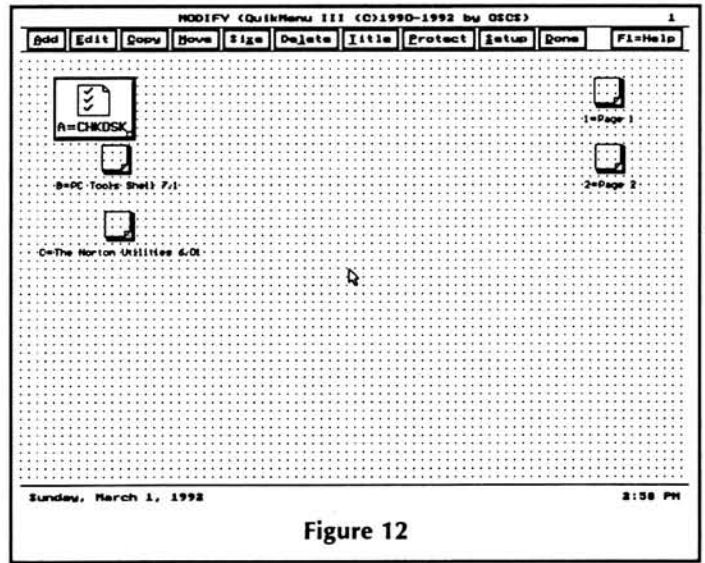


Figure 12

Notice that the icon changed shape. Instead of displaying a graphic with the text beneath it, only the text is displayed. You can use the four directional buttons to look at the different styles available for each icon. There are a total of 19 styles available. HOME will select style 1 of 19, and END will select style 19 of 19. PGUP and PGDN will move you up and down one style respectively. There are many options to choose from, including standard boxes, rounded boxes, shadowed boxes, 3-dimensional, and more. Use [PGUP] [PGUP] and [PGDN] [PGDN] to move through the list of available options. Click on [END] [END] to select the last style, which is a three-dimensional icon containing a graphic.

### The Icon Selector

To the right of the preview window are four options used to enhance the icon. They are Icon, Color, Font, and Alignment. Icon allows you to select the graphic displayed with the text. Color allows you to

customize the color for the Fill Area, Text, and Border of each icon. Font lets you change the appearance and size of the text, and Alignment allows you to Left Justify, Center, or Right Justify the icon and/or text. Click on [Icon] [ALT-I], and your screen should look like Figure 8.

This dialog box is called the Icon Selector. The Icon Selector displays 50 different graphics images at a time. QuikMenu III comes complete with 150 graphics images. Notice that the graphic in the upper left corner has a black box around it, indicating that it is currently selected. Use the scroll bar on the right side to find other images located within the Icon Selector. Click the up and down arrows located at the top and bottom of the scroll bar, or use the keyboard arrow keys to move the selector up or down one line, respectively. To move down a full page, mouse users should click within the scroll bar, but below the scroll button. Likewise, click above the scroll button to move up a full page. Keyboard

users, press [PGUP] and [PGDN].

To select a graphic to represent CHKDSK, click on the scroll button and drag it to the top of the scroll bar, or press [HOME]. Click once on the 5th graphic from the left of the top row, or press the right arrow key 4 times. The item should now have a black box around it, showing that it is selected. Click on it one more time, or press [ENTER], and QuikMenu will return to the preview window and display the graphic you selected. Your screen should look like Figure 9.

### Icon Colors

From the "Icon Style:" dialog box, click on [Color] [ALT-C], and your screen should look like Figure 10.

This screen shows the three areas of color that you may change. They are the fill area, the text, and the border. The fill area is the area of an icon that surrounds the graphic and/or text. The text consists of words typed into the (Name:) field, and the

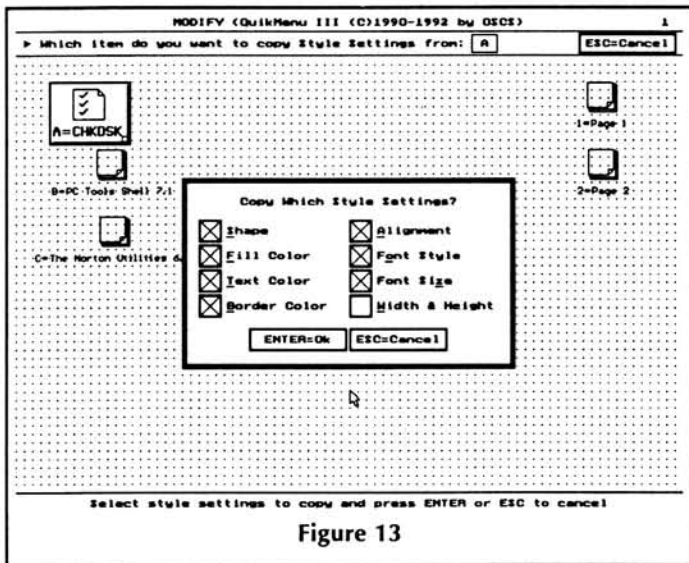


Figure 13

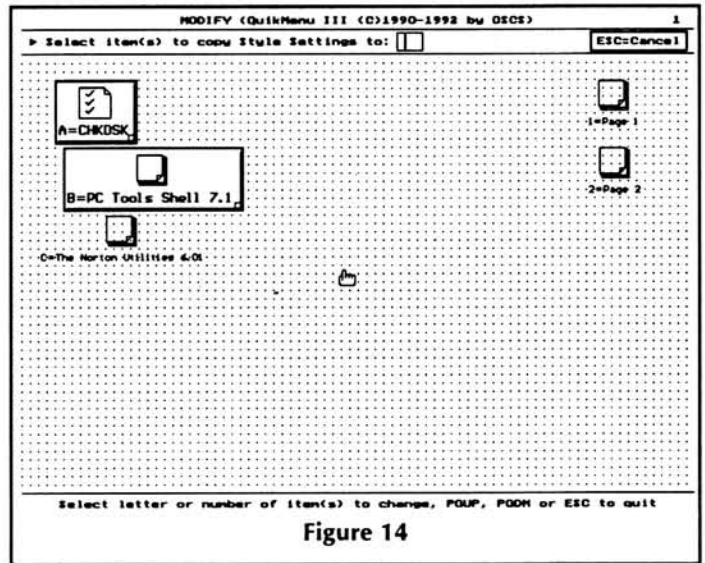


Figure 14



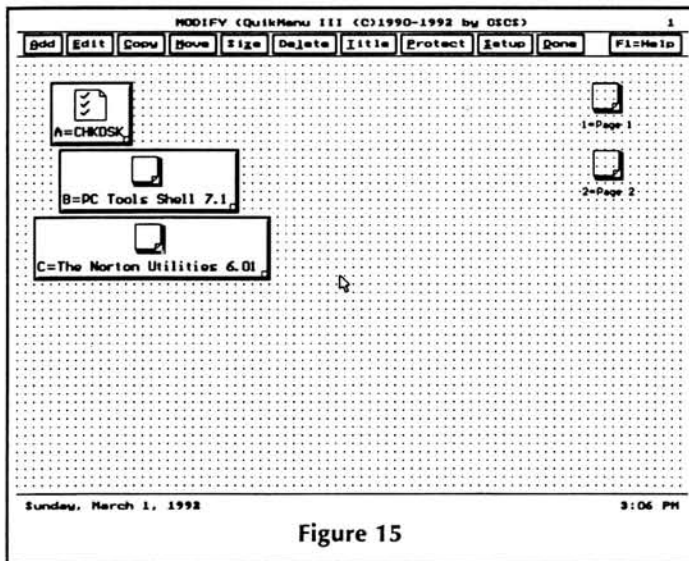


Figure 15

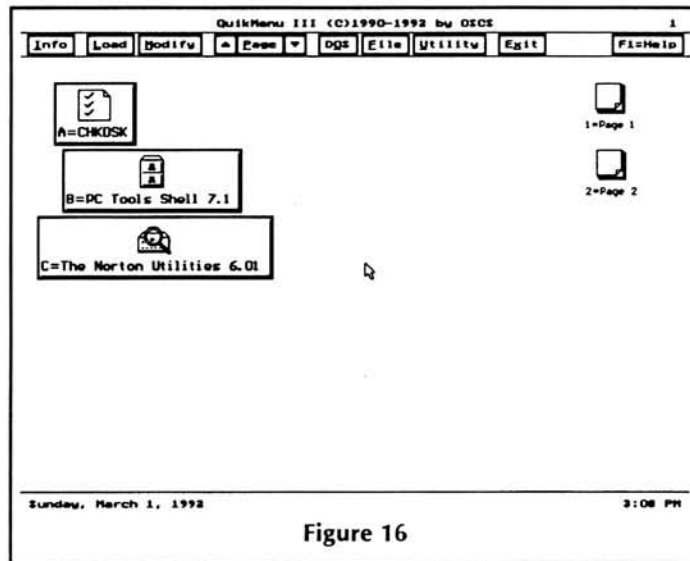


Figure 16

border is the four sides of the fill area. A larger, colored box denotes the currently selected color for each area. Choose a color for each option that will look good on the menu background color you are using. Click on a color with the mouse to select it, or press [ALT-F] to change the fill color, [ALT-T] to change the text color, or [ALT-B] to change the border color. (Although QuikMenu makes extensive use of color, it will not show up on the black and white screen captures.) When you are finished selecting icon colors, click on [ENTER=Ok] [ENTER] to save your changes, and QuikMenu will return to the preview window.

### Icon Fonts

Click on [Font] [ALT-F], and your screen should look like Figure 11.

Click on [F5=List Fonts] [F5]. QuikMenu prompts, "Select Font", and presents you with a list of 12 different font choices. Move the item selector through the choices

as you did in Part 1, using the scroll bar or the arrow keys. Click on [LIT], or highlight it with the item selector, and press [ENTER]. QuikMenu will return and allow you to pick a point size for this font. To make this font more readable, change the point size to 14. Click on the [UP ARROW] command button or press the [UP ARROW] key or four times. You may also hold down the mouse button or the arrow key, and QuikMenu will speed up the process by increasing the numbers rapidly until you release the mouse button or the arrow key. If you accidentally go too far, click on the [DOWN ARROW] command button, or press the [DOWN ARROW] key until it rests at 14. Click on [ENTER=Ok] [ENTER] to save your changes.

### Icon Alignment

Click on [Alignment] [ALT-A], and QuikMenu prompts, "Set Alignment". Alignment allows you to select whether the icon text will be centered, left justified, or right justified. If the icon style includes a graphic,

QuikMenu includes the graphic in the justification process. If you select "Center", QuikMenu will place the graphic in the center of the icon, and center the text below it. If you select "Left", QuikMenu will place the graphic on the left side of the icon, and left-justify the text directly to the right of the graphic. If you select "Right", QuikMenu will place the graphic on the right side of the icon, and right-justify the text directly to the left of the graphic. Click on [Center] [ALT-C], and select [ENTER=Ok] [ENTER] to save your changes.

QuikMenu returns to the preview window one more time to show you the changes made. Click on [ENTER=Ok] [ENTER] to save your changes, and select [ENTER=Ok] [ENTER] to return to the modify menu. Your screen should look like Figure 12.

### Copying Icon Settings

Notice that QuikMenu changed the icon's style to reflect the changes you

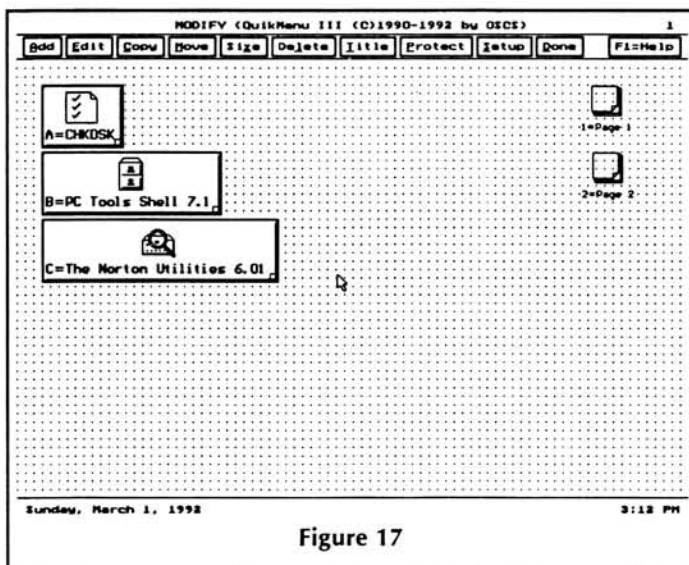


Figure 17

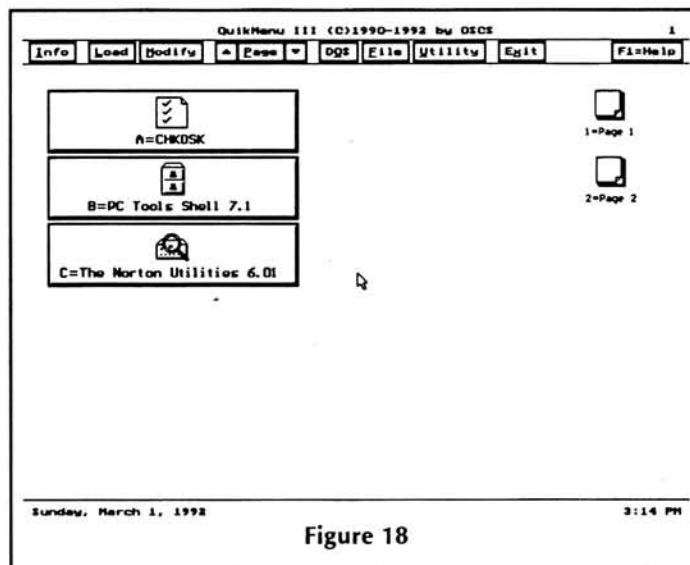


Figure 18

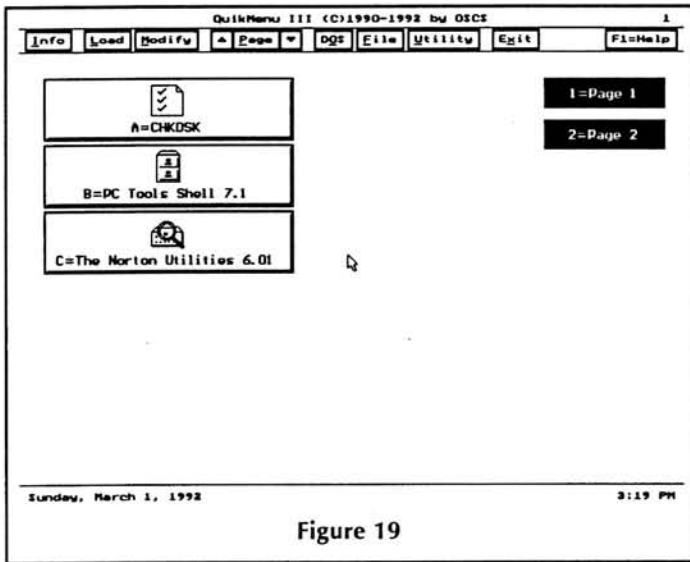


Figure 19

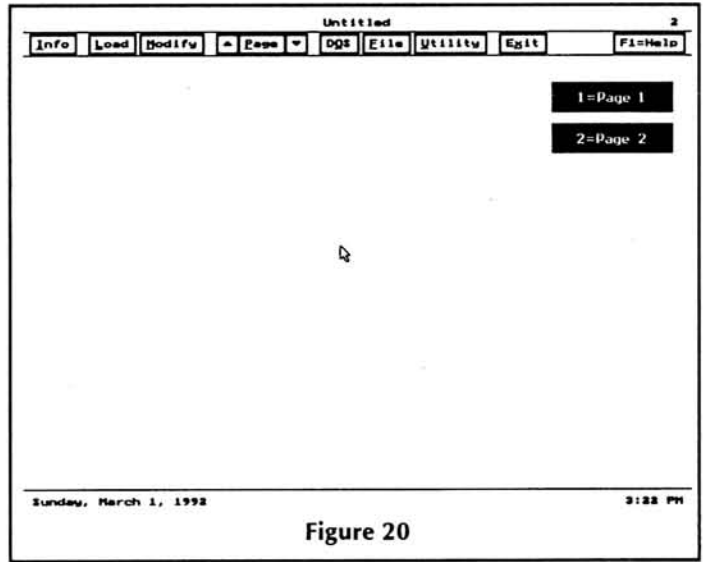


Figure 20

made. Instead of repeating the entire procedure to modify the next two icons, QuikMenu allows you to copy style settings between icons.

Hold down the [SHIFT] key and click on [Copy]. If you are using the keyboard, hold down the [SHIFT] key and press [ALT-C]. When QuikMenu prompts, "Which item do you want to copy Style Settings from:", select [A=CHKDSK][A]. Your screen should look like Figure 13.

This dialog box allows you to copy any or all of the style settings shown from one icon to another. The default shows all items selected, except for "Width & Height". Select [ENTER=Ok][ENTER] to copy these style settings from the [A=CHKDSK] icon. QuikMenu prompts, "Select item(s) to copy Style Settings to:". Click on [B=PC Tools Shell 7.1], or press [B]. Your screen should look like Figure 14.

QuikMenu copied all of the selected style settings to the second icon. The "Select item(s) to copy Style Settings to:"

prompt is still active at the top of the screen, allowing you to copy the settings to additional icons. Click on [C=The Norton Utilities 6.01], or press [C], to copy the settings to the third icon. Click on [ESC=Cancel][ESC] in the upper right corner of the menu bar to end the Copy Style Settings procedure. This will return QuikMenu to modify mode, leaving the settings you copied. Your screen should look like Figure 15.

Use the procedure you learned earlier to change the graphic for icons B and C. For [B=PC Tools Shell 7.1], select the closed filing cabinet on the first screen of the Icon Selector (row 3, column 8). For [C=The Norton Utilities 6.01], press [PGDN] once, and select the graphic showing a magnifying glass in front of a hard drive (row 2, column 7). When you have finished making changes, click on [Done][ALT-D] to return to the main menu. Your screen should look like Figure 16.

#### Sizing Things Up

Perhaps you have noticed that the menu appears disorganized due to the various sizes and positions of the icons. Click on [Modify][ALT-M]. Align the icons so they line up on the left side. You can do this by implementing QuikMenu's Move command, as you learned earlier in this article. Click on [A=CHKDSK][A], and the icon will transfer to the moving position. Move it so that its left border is four grid lines from the left of the screen, and its top border is three grid lines from the top of the screen. Click the mouse button, or press [ENTER] to leave it in that position. Use the same procedure to align icons B and C. Make sure that their left edges are even with the left edge of icon A. Leave one blank line between the bottom of each icon, and the top of its adjacent icon. When completed, your screen should look like Figure 17.

To size the icons, click on [Size][ALT-Z]. You are prompted, "Which item do you want to Size:". Since icon C is the longest,

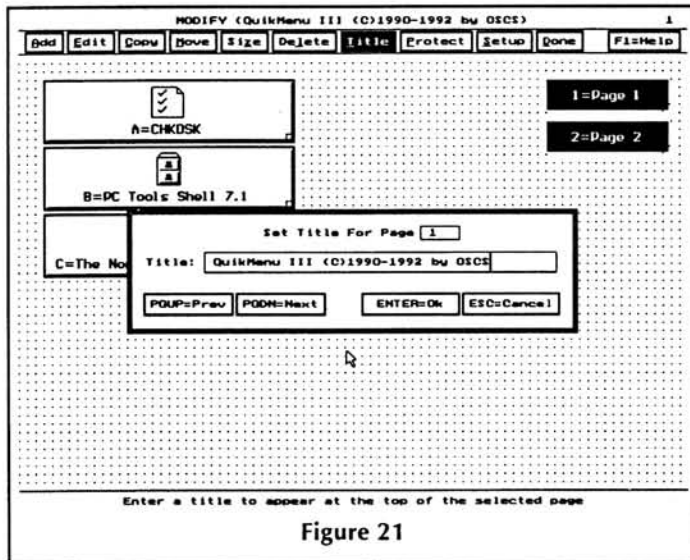


Figure 21

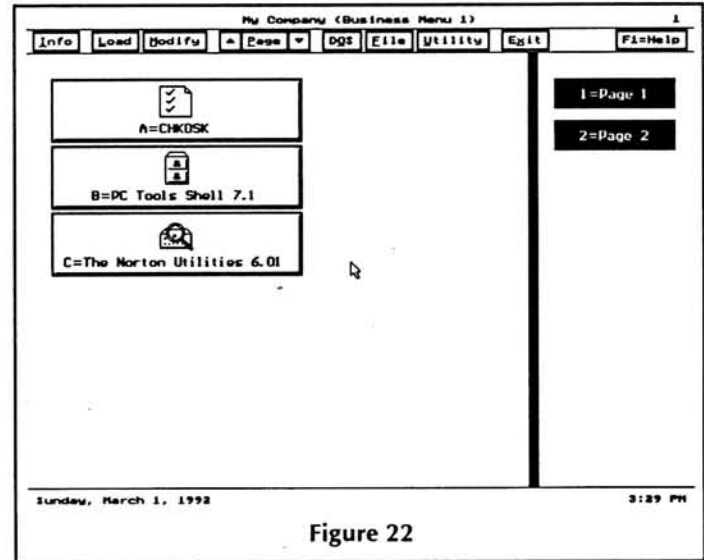


Figure 22



it should be sized first. Click on the icon labeled [C=The Norton Utilities 6.01], or press [C]. Two things happen; your mouse pointer turns into a pointing finger holding an outline box, and you are prompted, "How do you want to size this item?" The outline box can be enlarged or reduced to the size you want the icon to be. Move the mouse (or use the arrow keys) to increase the length of the outline box by 2 dots. Click the mouse button, or press [ENTER], and the icon will resize to the correct length. There is a shortcut QuikMenu allows you to use when sizing an icon, but it requires a mouse. If you look closely, you will notice a small box located on the icon's lower right corner. This is called a size handle. It is only displayed in modify mode as a shortcut to size the icons. Click on the size handle for the icon [B=PC Tools Shell 7.1]. Notice that you are immediately prompted how to size the icon. This saves a mouse click or keystroke each time you size an icon. Using the mouse or the arrow keys, increase the size of the outline box until it is the same length as the icon below it. Click the mouse button, or press [ENTER], and QuikMenu will resize the icon to the new length. Use the same procedure to increase the size of the [A=CHKDSK] icon, making it the same length as the other two. Click on [Done] [ALT-D], and you will notice that the menu looks much more organized, as shown in Figure 18.

Now that the styles of the software icons are complete, it is time to spruce up the page icons. Apply what you've learned to modify the style settings for the page icons. Use the keys given below to customize them.

Icon Shape	- Style 4 of 19
Graphic	- None Needed
Color	- Black Fill, White Text, Light Gray Border
Font	- LIT
Font Size	- 14
Alignment	- Center

Size both icons to be 15 dots long and 4 dots high. The margins should be similar to what you used for the software icons. The top page icon should be 3 grid lines from the top and 2 grid lines from the right side of the menu background. The second page icon should be directly below the first, with one blank line between them. Click on [Done] [ALT-D] when you have completed all of these tasks. Your menu should look like Figure 19.

### Copying Icons Between Menu Pages

Click on the icon labeled [2=Page 2], or press [2]. You are transferred to a blank menu page. In the upper right corner of the title bar is the number 2, indicating that you are on page 2 of the menu. Rather than adding new page icons to this menu page, QuikMenu allows you to copy them between pages. Click on the [UP ARROW]

command button located to the left of the [Page] command button, or press [PGUP], to move back to page 1. Click on [Modify] [ALT-M], and select [Copy] [ALT-C]. When QuikMenu prompts you, "Which item do you want to Copy:", click on the icon labeled [1=Page 1], or press [1]. When QuikMenu prompts, "Where do you want to place this item?", press [PGDN]. You are now on page 2, in the same relative position you were in on page 1. Click the left mouse button, or press [ENTER], to leave the icon in that position. Press [PGUP] to return to page 1. Use the same commands to copy the [2=Page 2] icon to page 2. When finished, click on [Done] [ALT-D]. Page 2 should now look like Figure 20.

### Page Titles

Return to page 1 by clicking on the [1=Page 1] [1] icon. If you look at the first line of the screen, you will notice that the page title contains the name and copyright information for QuikMenu III. All pages following page 1 are labeled "Untitled". In this space, you can display the title of each menu page. You may use your own name, the name of your company, or whatever you choose.

Click on [Modify] [ALT-M], and select [Title] [ALT-T] from the Modify menu. Your screen should look like Figure 21.

Notice that this is the exact information that was displayed on the main menu title bar. Press [BACKSPACE] until all the information concerning QuikMenu is removed from the [Title] dialog box, and type "My Company (Business Menu 1)". Instead of moving to page 2 to edit the title for that page, click on [PGDN=Next] [PGDN], which allows you to modify the title for page 2. Press [BACKSPACE] to erase the word "Untitled" and type "My Company (Business Menu 2)". Click on [ENTER=Ok] [ENTER] when you are finished. If you accidentally select [ESC=Cancel] [ESC] during editing, all of your changes will be lost. Click on [Done] [ALT-D]. The top line of the screen should now display the company name and menu title you entered.

### Finishing Touches

It is time to add some finishing touches. A page divider will spruce up the looks of the menu by separating the page icons from the software icons. This allows you to easily identify the separate portions of the menu page. Click on [Modify] [ALT-M], and add a software icon. When you are prompted for the speed key to use, enter a character you are not likely to use elsewhere, such as the exclamation point [!]. A page divider will not be executed, so leave the name, path, and command lines blank. Click on [F9=Style] [F9], and choose style 1 of 19 for the icon shape. Click on [Font] [ALT-F], and reduce the point size down to

1, which is the smallest size available. Select [ENTER=Ok] [ENTER] to save the changes to the font size. Click on [Color] [ALT-C], and select black as the fill color, text color, and border color. Select [ENTER=Ok] [ENTER] to save your color changes. Click on [ENTER=Ok] [ENTER] again to save the style setting changes, and then select [ENTER=Ok] [ENTER] to return to the modify menu. Position the divider icon between the columns of software icons and page icons. Size the button to extend the full height of the page. When complete, select [Done] [ALT-D], and your screen should look like Figure 22.

As you can see, QuikMenu III is an extremely flexible menuing system. Use what you have learned to organize your menu the way that you want it to look. Choose your own color scheme to match your preferences, and choose the icons that match the programs you use.

### Next Time

In Part 3 of QuikMenu III, you will learn about QuikMenu's File Management System. I will also show you how to use QuikMenu's built-in calculator, calendar, phonebook, and time log. ✻

# FBE

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**SmartWatch:** No-slot calendar/clock module. Software included. For all H/Z PC's, \$32

**H/Z-148:** ZEX-148 1-1/2 Card Expansion Bus, \$79.95; ZP-148 704K Memory PAL, \$19.95

**H/Z-151:** VCE-150 removes existing video card, allows use of EG A/VGA card, \$49.95; ZP640+ PAL modifies existing memory card to 640/704K using 256K RAM chips, \$19.95; ULTRA-PAL modifies existing RAM card to 640/704K plus 512K EMS/RAM disk, \$39.95; COM3 kit changes existing COM2 to COM3, allows internal COM2 modem, \$29.95

**H/Z-100:** ZMF100a modifies old motherboard for 768K memory, \$75; ZRAM-205 converts Z-205 card into 768K RAM disk, \$39

**H89:** H89PIP two port parallel printer interface card, \$50; Printer cable \$24; SLOT4 adds extra expansion slot to right-side bus, \$39.95

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# The Care and Feeding of Hard Drives

## A Look at Spinrite II

Sanford Shapiro  
654 Gravilla Street  
La Jolla, CA 92037

Not so very long ago, hard drives — fixed disks they were called then — came in two sizes: five megabytes and ten megabytes. Prices were well over \$1000. Now, a modern word processing program alone can take up five megabytes of hard drive space. Fortunately, hard drives have grown both bigger and cheaper.

But what hard drives now provide in size, speed and flexibility, they take away in security. Hard drives, you see, crash. It is not a question of *if* your hard drive will crash, but *when* it will crash. "Backup, backup and backup" is the first rule of safe computing. The second rule of safety is hard drive maintenance to protect your data and prolong your hard drive's longevity.

### Physical Life of a Drive

Can you extend the physical life of a hard drive? Yes, a clean environment, for instance, adds years to the life of a hard drive. Hard drives belonging to non-smokers, for example, will last longer than those belonging to smokers. Although hard drives have built-in air filters, the filters become clogged from smoke and dirt — restricting the air flow. That causes overheating, and the drive wears out sooner. And parking the drive's heads each time you power down also prolongs its life. (Many drives now park the heads automatically — but it doesn't hurt to do it manually.) Computer users ask if defragmenting a hard drive helps. Regularly defragmenting your drive will not prolong its life, but it will prevent a major cause of performance deterioration.

### Losing Data

A drive will appear to be dead if it

cannot read its data. It doesn't help to store large amounts of data if you lose it. How can you lose data? Over time, the precise alignment of the drive heads over the drive tracks can drift. Information telling the computer where to find data becomes unreadable, giving the dreaded error message: "SECTOR NOT FOUND." Or a microscopic defect that was harmlessly between tracks, can — with drifting — end up in the middle of a track containing data. A whole industry has developed providing utilities to maintain hard drive integrity and reliability.

The best known and most popular of these utility programs is SpinRite (the most recent version is SpinRite II). With an outstanding reputation for safety, SpinRite can read and repair data marked "unreadable" by DOS. It performs thorough drive surface testing, safely relocates data found in vulnerable areas, locks out dangerous areas, and restores and returns to service repairable areas. On drives using MFM, RLL, and ERLC encoding formats, SpinRite can — while leaving all data intact — renew the low level format that allows the drive to find its data. And while renewing the low level format, SpinRite can determine and optimize your drive's sector interleave factor. Loosening up an interleave that is too tight, for instance, will speed the data transfer rate dramatically.

### How Hard Drives Work

You don't need technical knowledge to use SpinRite — it runs from clear, easy to understand menus. But understanding how SpinRite works requires discussion of hard drive technology. Data, on a hard drive, is laid down in circular tracks on the drive's surface. Poised over a track, the disk's

read/write head waits for the data to spin by. Each track is divided into sectors, and the head has only a certain amount of time to read each sector. After a sector is processed, the head begins searching for the next sector.

Before using a new hard drive, the sectors must be defined and created with a low level format. This can be done with the Zenith PREP command, or with a format program built into the hard drive's controller. The low level format also writes the SECTOR ID HEADERS, areas that store address information telling your computer where to look for its data. Some newer types of hard drives have this process done at the factory, and it cannot be redone by the user.

The low level formatting also sets the drive's interleave factor. Because a hard drive's controller can only operate on a single sector at a time, the next numbered sector must be delayed until the current one is processed. The location of each sector around a track is noted in the sector's ID header, and by spacing successively numbered sectors, the controller has time to finish processing one sector before starting the next one. In some computers, spacing sectors too closely wastes time because the controller can't process them quickly enough and has to wait for the disk to spin around again. SpinRite will test your controller-hard drive combination with different amounts of spacing (the interleave ratio) and pick the one best for you. (Figure 1).

Every time you rewrite your data, the magnetic image of the data in that sector is strengthened. But the sector's ID header is never rewritten and it can fade. Other

factors affecting the strength of the sector's ID header are magnetic impulses generated from the head when the drive is turned off and the slight "jump" the heads make when the drive is turned on. Many hard drives go to the scrap heap because their data can no longer be found.

Interleave Setting	Transfer Revs	Avg. Data Throughput
1:1	17	30,719
2:1	18	29,002
3:1	17	30,719
4:1	4	130,560
5:1	5	104,448
6:1	6	87,040
7:1	7	74,596
8:1	8	65,280

Figure 1

Periodically renewing the low level format can prevent this disaster. Normally, a low level format means backing up your data, renewing the low level format, redoing the regular format, and then restoring your data. SpinRite does this automatically. Slowly, and painstakingly, it goes over your drive — track by track — lifting the data, holding it in RAM, thoroughly testing the surface, placing the Sector ID back underneath the drive's heads, setting the interleave, and then safely restoring your data. Using a batch file, you can start SpinRite at night before you go to bed and, when you get up the next morning, your hard drive will be completely tuned. SpinRite also provides a log and detailed report of its activities showing what was found and what, if any, actions were taken. (Figure 2)

SpinRite has some limitations. It cannot operate on large drives unless they are divided into partitions of 1024 cylinders or less in size. And drives using "sector translation" cannot be low level formatted. Fortunately, these drives are less vulnerable to their alignment drifting. SpinRite will detect the presence of "sector translation" and not redo the low level format. The newer, ultra high density drives, however, with their high data storage density, are more vulnerable to drive surface defects. SpinRite subjects the drive's surface to extreme Write/Read pattern test-

ing, finds defects before they damage data, and safely relocates the data before it is lost.

SpinRite is unique in the way it detects defects and recovers data. It disables your controller's Error Correction Coding (ECC) and — using its own error correction — avoids the DOS error message: "Abort, Retry, Ignore, Fail?" Previously unreadable areas are now made readable, and bad areas are more precisely defined. This allows lost data to be recovered, allows previously unused space to be returned to service, and allows drives thought to be dead to be brought back to life.

One exception to data relocation is the position-sensitive copy-protected file. Because relocating such a cluster could interfere with a copy-protection scheme, SpinRite points out in the log that the sector is unstable, but it does not relocate the data.

### Using SpinRite

The easiest way to run SpinRite is from a batch file where it can work unattended. But first time users may want to watch this fascinating process. SpinRite starts with a "Performance Evaluation" measuring your hard drive's speed. (Figure 3).

Following this it checks and reports how many disk revolutions are required to transfer data at interleave settings of 1:1 through 8:1. (See Figure 1). You can quickly see which setting is optimum for your system, and you can accept SpinRite's recommendation or you can tell it which interleave to use.

SpinRite then begins the low level format — a track map is displayed showing

the pattern testing and reformatting. (Figure 5)

```

-----
* Performance Evaluation *
-----
* Track-to-track: 8.74 *
* Full Stroke: 120.22 *
* Random Seek: 49.92 *
-----
* (average milliseconds per) *
-----

```

Figure 3

Elapsed time is noted and completion time is estimated. SpinRite can be interrupted at any time, and its operation resumed later. What if you interrupt SpinRite when one part of your drive is set at a different interleave from the rest of your drive? No problem — a drive can operate trouble free if its interleave is mixed. That portion of the drive that has been reset will

```

----- System Parameters -----
*
* Actual Disk Drive RPM: 3602.42 |
* Measured Inter-sector Angle: 20.12' |
* Approx Data Bits Per Track: 69,632 |
* Data Encoding Technology: MFM |
* Controller BIOS Location: C800H |
*
* Current Sector Interleave: 4 *
*
* Revs to Transfer One Track: 4 *
*
* Maximum Data Rate: 130,560 *
-----

```

Figure 4

operate more efficiently. When you are ready to resume operation, SpinRite will pick up where it left off, and when finished, a summary will be placed in the log. (Figure 6)

```

-----
SpinRite II Technical Log Entry Feb 28, 1992. Produced by Gibson
Research Corporation SpinRite II Software. Serial #: C0073721
-----
Beginning a Low-level Format on Logical Partition C:
-----
* * * * * A SURFACE DEFECT HAS BEEN DETECTED!! * * * * *
on physical sector: 7 of surface: 4 and cylinder: 399 that
is DOS sector: 40,755 in cluster: 10,162 in file WIN30.ZIP
of directory:\MIRROR\ZIP
The data in this sector's cluster will be relocated to safety.
-----
It is necessary to relocate cluster: 10,162 in file WIN30.ZIP
so the cluster's data has been placed into cluster: 63 and
cluster: 10,162 has been marked bad to prevent its future use.
-----
* * * * * A SURFACE DEFECT HAS BEEN DETECTED!! * * * * *
on physical sector: 5 of surface: 4 and cylinder: 409 that
is DOS sector: 41,773 in cluster: 10,416 that is marked bad.
-----
DOS cluster: 10,416 was marked bad in the FAT, and one or more
of its sectors was flawed; therefore, it shall remain unusable.
-----
SpinRite has successfully completed all operations.
-----

```

Figure 2

I have two Z-151 computers, one with a 20 megabyte Seagate drive — now in its seventh year of operation, and one with a 40 megabyte Seagate drive — now in its third year of operation. Each drive gets a full SpinRite analysis every three months, which I believe helps maintain reliability. My experience is not unique — the other members of the San Diego Heath/Zenith Users' Group are equally impressed with its safety and — like the sunrise - its dependability. At a list price of \$89.00 (I noted a recent street price of \$59.00), it is no wonder that Byte Magazine wrote: "SpinRite is what the word MUST was invented for."

The days of floppy drive only computers are over — a



Track Map	
Low-level Format	0
C: 4:1 Depth:4	160
	320
	480
	640
Track Status:	800
	960
Reading/Writing	1120
* Formatting	1280
.oO Patt Testing	1440
< Relocating	1600
. Format Okay	1760
cC Correctable	1920
uU Uncorrectable	2080
123 Defect Count	2240
B Marked as Bad	2400
	1 2458
Complete: 2459(100%)	Remaining: 0 (0%)

Figure 5

Low-level Format Summary			
DOS Partition Status	Clusters	Sectors	Bytes
Marked Bad in the FAT Initially	1	4	2,048
Returned to Active Use	None	None	None
Removed from Active Use	1	4	2,048
Marked Bad in the FAT Afterward	2	8	4,096
Partition's Total Defective Sector Count:		2 Sectors	
Data Relocated to Safety:		1 Cluster	
Net Partition Storage Gain (or Loss):		(2,048) Bytes	

Pre-existing Data Integrity Summary		
Error Implication and Nature:	Corrct	UnCorr
Sectors Containing Valid Data	None	None
Sectors Not Currently in Use	None	None

Figure 6

hard drive is now essential. Safeguard your data — do regular backups. Keep your hard drive spinning — use SpinRite.

SPINRITE II  
 Gibson Research Corp.  
 22991 La Cadena  
 Laguna Hills, CA 92653  
 (714)830-2200  
 FAX:(714)830-0300  
 BBS:(714)830-3300 \*



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# Printers

and

# Letterheads

# Videos

and

# Logos

Kevin Steffen  
319 Sycamore  
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All the small business magazines agree that appearances are vital to the success of a business. If the quality of the letters and other correspondence is not professional, you won't even get the opportunity to prove your competence.

Upgrading from an old 9-pin Okidata microline 83A was necessary to obtain letter quality print. This should have been a straightforward project, but Murphy strikes when you least expect him to. Selecting a state of the art, 24-pin printer in a \$300 price range is not difficult if you don't need 14-inch paper capability. The emulation capabilities of the Panasonic KX-P1124i meant it would work with my software, and the paper handling features made it my selection.

I hooked up the new printer to the Z-286 and tried printing some letters. Every paragraph had misspelled words where the printer dropped letters from words. The file being printed was correct. The same problem occurred whether I used the print command from the DOS prompt, used the print screen function, used WordStar, or used First Publisher.

I carried the printer to the shop and tried it on several computers where it

worked fine. The manual said the maximum cable length for the printer is six feet, the Okidata was using a twelve foot cable, so I replaced the cable without solving the problem. That left the parallel/serial card and the motherboard as possible causes. Replacing the parallel/serial card solved the problem.

The parallel/serial card worked fine with the nine year old Okidata printer over longer cables due to the printer not being very sensitive to having a weaker signal at times. The Panasonic prints faster, and is much more sensitive to signal strength and proper timing of transmitted information.

It soon became apparent that even with fine output from the printer on the letters, business was suffering for not having an official looking letterhead on the correspondence. The local business printing firm wanted \$60 for 500 sheets for a normal letterhead of name and address. A print shop quoted \$20 for the same job if I supplied a camera ready copy. Twenty minutes with First Publisher to select my fonts and a stop at the copy shop on the way to the print shop saved me \$40.

A laser printer normally runs around 300 dots per inch (dpi), and most printers

between 180 and 240 dpi. A hint from an article in Personal Publishing was applicable to the situation. To make a camera ready copy without a laser printer or offset press, make a print with the dot matrix printer slightly larger than you want the output to be. Use top grade paper for the print, take it to a copy center with a machine which has reduction capability and make a reduced copy. A printer with 240 dpi needs 15% reduction to make it 300 dpi, but this is not necessary. The copier will be performing two functions for you, first it will increase the dpi of the output, and secondly, it will even out the tone of the print in the larger letters. A 5% reduction gave me satisfactory results.

That would have been the end of the story, and this article would never have been written if I did not want a logo for my business cards. None of the standard designs were appealing so I played around with the idea for a while and decided to use the Bonsai tree from my birthday for my logo.

PC Paintbrush made creating the logo a snap, less than an hour to have what I wanted. First Publisher accepts PC Paintbrush's PCX format as a valid art file for



## NIGHT WINDS

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Figure 1



# NIGHT WINDS

**Kevin Steffen**  
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Figure 2



# NIGHT WINDS

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Figure 3

inclusion in publications. However, when I tried to access the logo I created, I got a blank screen; when I tried to print the logo from PC Paintbrush all I got was a black box. Something was wrong, and the manuals were no help.

None of the manuals covered this situation, every one seems to think the other will take care of covering transferring the design in their manual. Did I get bit by buying cheap bundled software through the mail, or did I overlook something obvious? Three days of research and much testing gave me the answer I was looking for; even the desktop publishing maga-

zines were no help.

David Veit's article on the Z-649 video board in December's REMARK provided the clue I needed to direct my search. Since I have a VGA color monitor and board, all of my software is installed to take advantage of the eye resting color capability. This means that every pixel in my display is using an 8-bit descriptor. When I used my monochrome monitor, each pixel only needed one bit to tell whether it was on or off.

The obvious hit me. The programs were not compensating for this color/monochrome dichotomy. Like the documentation, each thought the other would take

care of it, and that included the printer problem. A closer examination of the PC Paintbrush manual uncovered a grey to black and white conversion program. When I tested the program there was a function not documented in the manual, conversion of color to grey scale descriptor.

The answer is a two pass conversion of the logo through the program, first to convert from color to grey scale, then to convert from grey scale to black and white so the desktop publisher and the printer could use the file I saved the logo to. The only remaining question was which dithering formula to use in the conversion, Bayer or Spiral. Testing showed it made no difference in my output as to which way we converted the color pixels to black or white pixels.

After fixing the logo for my business cards, I created another letterhead with the logo. Closer examination of the letterhead with the logo showed a flaw in the 5% reduction solution on the curves and angles of the letters where it is still more jagged than a laser printer. Trials of 5%, 10%, and 15% reduction are Figures 1 through 3.

The software used in the discussion of this article are:

Wordstar Professional Release 5.0  
MicroPro International Corporation  
33 San Pablo Avenue  
San Rafael, California 94903

PFS: First Publisher Version 3.0  
Software Publishing Corporation  
1901 Landings Drive  
Mountain View, California 94039

PC Paintbrush +  
ZSoft Corporation  
450 Franklin Road  
Suite 100  
Marietta, Georgia 30067 ✻





# Budget Desktop Publishing

## Part II - Adobe Type Manager and DeScribe Bold Gold

Pat Swayne  
ZUG Software Engineer

Those of you who read my first "Budget Desktop Publishing" article (REMark, December 1991) may have wondered if I would be able to top the \$14.90 desktop publishing program I used to produce that article. Well, believe it or not, this article was typeset entirely using a FREE program, DeScribe Bold Gold Word Processor for Windows. I also used Adobe Type Manager (which I mentioned last time) to provide the fonts, and, as with the last article, I printed this article on my Hewlett Packard DeskJet 500 printer. But before I tell you about DeScribe and Adobe Type Manager, I need to make a correction to the last article and update you on some things I mentioned.

### The DeskJet 500

In my last Budget article, I stated that I had read somewhere in the manual that the DeskJet 500 was supposed to come with a font cartridge, even though mine came with none. Actually I misread the manual. In a packing list, I saw "print cartridge" and somehow that registered as "font cartridge" rather than "ink cartridge". The DeskJet 500 does not come with a font cartridge, but, like I said last time, you really don't need one with most programs.

### A Color DeskJet

Hewlett Packard has recently announced a color version of the DeskJet, called the DeskJet 500C. With a proper Windows driver, this printer would be perfect for use with a program like Corel Draw (a Windows drawing program). Also, Byte Magazine said in the December 1991 issue that Hewlett

Packard has an upgrade that changes black-only Deskjets to color. The price of the upgrade is \$450, which makes it more expensive than my entire printer. If you have an older model (the DeskJet or DeskJet Plus), the upgrade is \$550. The DeskJet 500C retails for a little over \$1000. It uses an ink cartridge that contains three primary colors, and mixes them to produce other colors. It can also use the same single color cartridges as the other DeskJet models.

Hewlett Packard has also introduced

a new high capacity black ink cartridge (part no. 51626A) that is supposed to last 1000 pages in the quality mode or 2000 pages in the draft mode.

### Canon Inkjet Printers

In the last article, I mentioned that I had considered getting a Canon inkjet printer such as the BJ-10e when I was shopping around for a budget alternative to a laser. I was wrong in one speculation I made about Canon inkjet printers. I thought that because they can

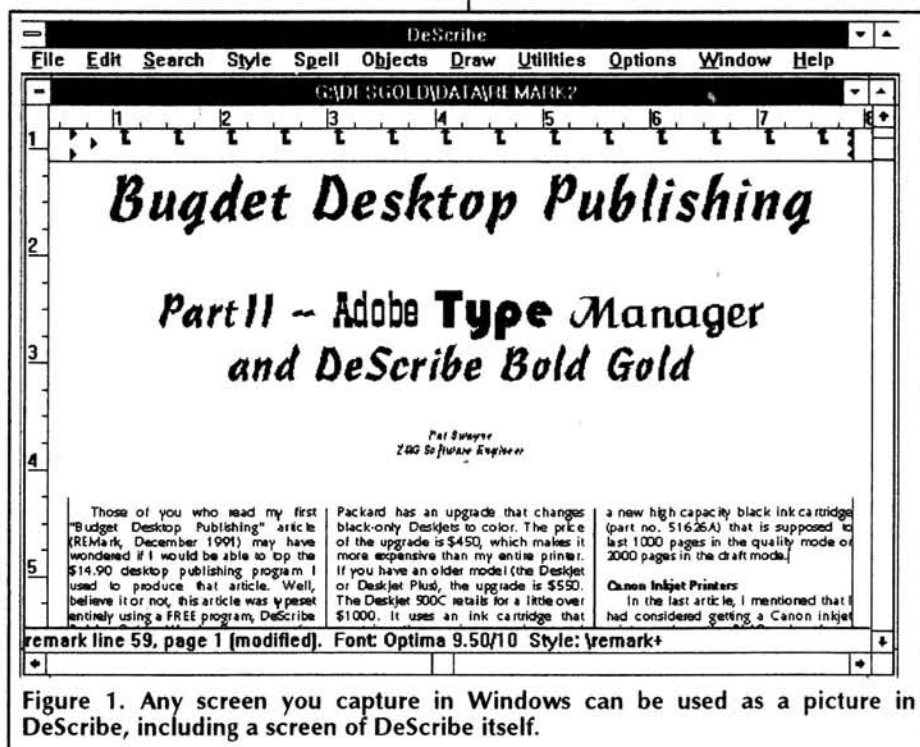


Figure 1. Any screen you capture in Windows can be used as a picture in DeScribe, including a screen of DeScribe itself.

emulate an IBM Proprinter, which is a 24-pin dot matrix printer, that they were inkjet versions of 24-pin printers. I assumed that since 24-pin printers do 360 dpi graphics by printing in double passes, that the Canon printers must do that also. However I was informed that they do not have to make double passes to do 360 dpi.

I also invited readers to send me some print samples from Canon inkjet printers so I could compare their output with my DeskJet. Two readers responded. One sample was of the printers native fonts, and it looked virtually identical to my DeskJet's native output, except that the DeskJet has more native fonts built in. The other sample is apparently from a desktop publishing program of some sort (but there was no letter with the sample saying which one). This sample was done on the BJ-10e, the lowest cost model, and it looks quite good. It seems a little sharper than the output of my DeskJet. The solid black areas are not quite as heavy, but that can be an advantage with an inkjet printer. One of the sample pages was black with white text. If I tried that with my DeskJet, I would wind up with a very wrinkled piece of paper (the wet ink would wrinkle the paper before it had a chance to dry). The black sample page was only slightly wrinkled. So although it is not supported by as many programs as the DeskJet (Key Publisher, reviewed last time, does not support it), the Canon BJ-10e seems to be an acceptable low cost substitute for a laser printer. The main drawback is that its ink is not waterproof like the DeskJet 500's. When I gave one of the sample pages the wet finger test, I was rewarded with a nice smear. Also, the list price of its ink cartridges is higher (I have not checked into the "street price"), and I have not seen any cartridge refill kits advertised for it. A reader reported that there is a company called Computer Friends, Inc., that sells refill kits for Bubble Jets (800-547-3303).

### Adobe Type Manager

Adobe Type Manager is a Windows program that allows you to use Adobe Type One scalable fonts as your printer and screen fonts with most Windows applications. There are other programs of this type, such as Bitstream FaceLift, and Windows version 3.1 will reportedly have scalable font technology built in. But Adobe Type Manager (often called ATM) is, and will probably remain, the most popular font utility because the Adobe format is the most popular font format. Many bulletin boards offer Adobe fonts for the downloading (more on that later).

Adobe Type Manager installs like most other Windows programs — you run an install program from within Windows. The installation procedure places a program called ATM Control Panel in your Windows Main Group, and runs this program to install the fonts supplied with ATM. Later, as you collect more fonts, you can add them to ATM by running the Control Panel. You can also use the Control Panel to make changes to ATM such as the amount of memory it uses to store fonts, etc., and you can turn it off (in case it conflicts with a particular program). After you have installed ATM, added more fonts, or made some other change with the Control Panel, you have to exit from Windows and restart it in order for the new fonts or changes to be recognized by the Windows system.

When you run a Windows application with ATM active, it works as before except that you have more fonts to choose from in whatever font selection menu the program might have, and you will have a truer WYSIWYG (What You See Is What You Get) display of the fonts on your screen. Some programs have to be adjusted slightly to allow the fonts to display properly. For example, Aldus PageMaker has settings that determine when very small fonts will be "greeked" and when very large fonts will be displayed as outlines. These settings have to be modified after you install ATM, or else you will not get a true WYSIWYG display of both headlines and small text.

Screen changes with ATM installed are a bit slower than without it, but on a fast '386, it does not make that much difference. When you print a file, it may print quite a bit slower than you are used to, depending on what kind of printer you have, and what kinds of fonts you used before you installed ATM. All printers except PostScript are operated in a graphic mode to produce the Adobe fonts. With PostScript printers, the Adobe fonts are downloaded directly into the printer, since the Adobe format is what those printers use normally.

The result on any high resolution printer is usually quite pleasing. The quality will sometimes depend on the font used. Real Adobe fonts give excellent results, but a font from another source may not look quite so good. The font I originally used in the text of this article was a clone of the Optima font we normally use in REMark. It was produced by the WFNBOSS program that comes with Corel Draw, which can convert Corel fonts to Adobe fonts.

If you inspect the characters in this paragraph (which is done in the clone font) closely, you will see that they are

not formed as well as they should be. Some of the vertical strokes are too thick, and there are other problems. Fortunately, I was able to get real Adobe Optima at a discount when I upgraded my ATM from version 1 to version 2.

For most of your work, you will probably find that the Adobe fonts supplied with ATM are sufficient for regular "body text" like this, and they give excellent results. If you use fonts that were not produced by Adobe only in larger type sizes, you will find that they usually give excellent results also.

Probably the best thing about Adobe Type Manager is the number and variety of fonts available for it. There are hundreds, maybe thousands, of type styles available. As I said before, many bulletin boards offer Adobe fonts that you can download for use with ATM. These come from various sources, and some are actually illegal. For example, some were produced by the WFNBOSS program that I mentioned. This program can make an Adobe font out of any of the 150 fonts that come with Corel Draw. However, they should be used by registered Corel Draw users only. The current version of WFNBOSS places a message within the font files themselves indicating the source of the fonts, but early versions did not. I should mention that it is possible to create your own font with Corel Draw, and then make an Adobe version of it. If you do this, then you can distribute the font as you please.

Some of the fonts you can download were produced by companies that sell font generating software. These fonts are provided as a means to advertise their software, and usually come with some kind of text file describing the program that produced the font. The quality of these fonts is quite good, and you are free to use them as you choose.

If you would like to download fonts, and be sure of their quality and legality, there is a bulletin board called Publisher's Paradise (205-882-6886) that offers hundreds of fonts for downloading. You have to pay a \$35 dollar annual fee in order to have access to their fonts, but that is still much cheaper (even with the long distance charges to Huntsville, Alabama, where they are located) than buying fonts on disk. They have some sample fonts that you can download without paying the annual fee, so you can check the quality.

### Bitstream FaceLift

As I said before, Bitstream FaceLift is a program that is similar to Adobe Type Manager. I had a chance to try it out for comparison because a free copy of it was included with WordStar for

Windows, which we ordered here at ZUG headquarters to check out. FaceLift works very much like ATM, and it seems to provide a bit better print quality, but it is slower at screen updates, especially when you change fonts. It also uses the Bitstream font format, which is not nearly as popular as the Adobe format. I have not seen any Bitstream format fonts on any bulletin boards yet, and Corel's WFNBOSS cannot make Bitstream fonts. One nice thing about FaceLift is that both it and ATM can be installed at the same time. According to the FaceLift manual, they can even both be active at the same time. However, I did not test that. Another nice thing about FaceLift is that Adobe versions of the Bitstream fonts are provided on the disk, so that FaceLift can provide the same support for PostScript printers that ATM provides. So after I had finished testing FaceLift, I just installed its Adobe fonts into ATM and then removed FaceLift from my disk. The fonts that came with FaceLift are of good quality, and the Adobe versions work fine with ATM. FaceLift takes up more disk space than ATM because its program files are larger, and the Bitstream versions of the fonts are larger files than the Adobe versions.

### DeScribe Bold Gold

DeScribe Bold Gold is a free demonstration version of DeScribe Word Processor for Windows version 3.0. I received an offer in the mail a while back to try DeScribe Bold Gold free. It sounded like a good deal to me so I filled out DeScribe's post card and sent it in. Besides, I still hadn't gotten over the disappointment of WordStar for Windows (more on that later).

The actual word processor part of DeScribe Bold Gold is the same as the full version that lists for \$495. However, the full version also contains a spelling checker, thesaurus, definitions dictionary, file conversion (60 formats), graphics import (20 formats), and a printed manual. Bold Gold comes with the same built-in help as the full version, and it can import text in ASCII format, and graphics from the Windows Clipboard.

The full version of DeScribe is available for both Windows and OS2, and both versions are provided on the distribution disks. DeScribe may have been produced for OS2 first and then adapted to Windows, because the "feel" of it is different from other Windows word processors. The help facility, for example, is not based on Windows' universal help support, but is proprietary to DeScribe.

The installation procedure for

DeScribe Bold Gold is like the procedure for most other Windows programs. You use the File Manager to run an installation program (SETUPWIN.EXE in this case) on the distribution diskette. As with most big Windows programs, a hard disk is a must. The Bold Gold version takes up about 1.5 megabytes, and if you install of the options of the full version, you will wind up using close to 10 megabytes. The installation program does not seem to be choosy about which of your Windows groups it places the DeScribe icon into, and it does not give you a choice. To ensure that it winds up where you want it, close all group windows except the one you want before you run SETUPWIN.

### Operation and Features of DeScribe

The screen display of DeScribe is "cleaner" than that of most recent Windows word processors. Frankly, I feel that the screens of programs like Microsoft Word (version 2) and WordStar for Windows are "cluttered" with too many icons. The text tool icons that you would find around the screen edges of those programs are in a floating box in DeScribe, and you can make the box appear or disappear as needed by pressing the right mouse button. You can also set up DeScribe so that it starts up with the box present or absent from the screen. If you are like me, and prefer the written word to cute little pictures, you'll appreciate the fact that all of the features of the text tool box are also available in the pull down menus at the top of the screen.

The pull down menus themselves are a unique feature of DeScribe. They are fully configurable, so if you do not like what is supplied, you can change it. There is also a powerful macro language, and the macros you write can be added to pull down menus or assigned to hot keys, or "soft keys", as they call them. DeScribe Bold Gold comes with a pull down menu item called "Try Me", which contains nothing but macros designed to simplify certain operations, such as setting up a two-column page or changing font size. There is also a macro in the Try Me menu that is a complete self-running demo. Macros are edited using DeScribe, and then they must be compiled before you can use them. The compiler is built into DeScribe.

DeScribe has one of the best zoom features I have seen on a Windows program. It has a continuously variable zoom that covers a wide range. You can select a zoom value from a slider bar, by typing in a percentage, or by selecting one of several preset percentages from a menu. The default screen size is set so that you can see the

full width of a standard 8 1/2 by 11 inch page with 1/2 inch or larger margins.

DeScribe is billed as a word processor, not a desktop publishing program, but it is similar to some desktop publishing programs in operation. For example, before you can put any text or graphics on a page, you must place a box to hold the text or graphics. In Key Publisher or Ventura Publisher, these boxes are called "frames". In DeScribe, they are called "objects" — text objects or graphic objects depending on what they will contain. DeScribe is smart enough to know which is which. If you click on to a text object, the program will automatically switch to the text mode, and the text tool box will appear (if you have it set up to appear when you are in the text mode). If you click on to a graphic object, the program will switch to the graphic mode, and the graphic tool boxes (there are three of them!) will appear (if that is how you have things set up). In Ventura and Key Publisher, you have to select a mode of operation before you can work with text, graphics, frames, etc. In PageMaker, you have to click the text tool to work with text or click the arrow to move boxes, etc.

While I was learning to work with objects in DeScribe, I discovered one of its deficiencies. Some of its features are not "intuitive". What I mean is that you cannot figure out some things by just "looking at" the program. With Ventura and Key Publisher, I was able to figure out what I had to do to draw frames without reading the manual or help screens. With DeScribe, I was able to figure out how to make objects by filling in a dialog box, but I had to search the help screens for a while before I learned how to draw them with a mouse, or move and size them with a mouse. For those of you who are reading this looking for hints, here is how to do it. Hold down one of the Ctrl and Shift keys, and drag the mouse to draw an object box. As soon as you start dragging, release the Ctrl and Shift keys unless you want the box to be constrained to be square. When you finish dragging the mouse (release the mouse button), a "Create Object" dialog box will appear in which you can specify what kind of object you are making, how text will flow around it, etc. To change the size of an object box, move the mouse pointer to the side you want to move. Then hold down a Ctrl key and drag the mouse to move the side. To move an object box, place the mouse pointer within it, hold down a Ctrl key, and drag the mouse.

To make your work easier, DeScribe lets you design "layouts" and "styles". A layout is what a PageMaker user would



call a template. It is a document with the objects controlling where the text will go already defined, but without the text itself. To create a document with a layout, all you have to do is load the layout and fill in the text. A style is a predefined setup for text format. It defines the font for the text, paragraph indenting, justification, columns, etc. A layout can contain any number of styles, for example, one for the title, one for the body text, and one for headers. DeScribe is as versatile as most desktop publishing programs in its style control.

When you start DeScribe, it automatically loads a default layout. As supplied, the default layout is called Document, and it has one text object on it with its borders 1 inch from the edges of the page, to make 1-inch margins. There are other predefined layouts supplied, and you can change the default layout to one of these or to one of your own design. Regardless of which default layout you use, one thing you will need to do right away is to bring up the Printer Setup box in the Files menu, and make sure the printer is set up the way you want it. For some reason, DeScribe does not necessarily come up with the printer set up the way it is before you start the program. For example, with a DeskJet or LaserJet, the resolution is set to 75 DPI even though you may have had it set to 300 DPI. After you set up your printer the way you want it, select Save As from the Files menu, and save the layout under its original name in the LAYOUTS directory (which is in the DESGOLD directory where DeScribe resides). The next time you try to load or save a file, you will have to change directories again, to the DATA directory, which is where documents are normally stored. Be careful not to use the LAYOUTS directory for storing documents, because you might over-write one with a document having the same name.

DeScribe can do automatic page numbering, and it can have separate positions for left and right pages, as in this article. However, this was another area where I had to search the help facility to figure out how to do it. For your benefit, here is how. If you are going to have separate left and right pages, import or type in enough text to make two pages. Draw a box on the first page where you want your page numbers to go (usually at the bottom). When the Create Object dialog box appears, click on Template, and also click on Left/Right Pages if you want different left and right positioning. Select other parameters as required, then select OK to close the Create Object box, and select OK again to close the Define Objects box. If you

want to have text on one side of the page and a number on the other side, as this article has, you will need to define a style for that text that has a right-aligned tab positioned at the right edge of the box. Next, click inside the box to put the cursor there, make sure it is at the left edge of the box, and enter your text, a tab, and a page number (usually a 1). Now, here is the magic part. Select the number you have just typed (drag the mouse pointer across it). Select Attributes in the Styles menu, and click on Page Number. This changes the number you have just typed into an automatically incrementing page number. If you have separate left and right pages, go to page two and enter text and a page number on that page (you will probably want the number on the left this time). As before, select the number and set the Page Number attribute.

When you set the Page Number attribute on a character, DeScribe not only knows to make that character an incrementing page number, but it also automatically knows what kind of number to use. For example, if you select "I" and make it a page number, the second page will be numbered "II", the third "III", the fourth "IV", etc. If you select "a" and make it a page number, the next page will be "b", the next "c", etc.

DeScribe has a unique dual search-and-replace capability. For example, if you want to change all occurrences of "down town" to "in the country" in a document, and also all occurrences of

"in the street" to "on the road", you can make both of those changes with one operation. This dual search-and-replace feature helps make up for a deficiency in DeScribe, in that it does not automatically convert typed quotes (") into printer's quotes (" and "), which is something that most desktop publishing programs can do. You can set up a search-and-replace that changes (") (space quote) to ("), and (") to (") , and this will take care of most of the quotes. If you turn on DeScribe's Macro recorder while you set up the search-and-replace, then you will have a macro that you can use the next time you need to fix quotes. You can assign that macro to a soft key, or put it in one of the menus, or both. As you can see in Figure 2, I put the macro in the Search menu, and also assigned Alt-Q to run it. I also added a macro to fix single quotes, and removed the Try Me menu so that all menu items would fit on one line.

One problem I found with DeScribe's menu modification system is that the on-screen changes you make to the menu take place automatically and permanently until you change something, but names of the macros that the new menu items execute, and the soft keys you have assigned are forgotten the next time you load DeScribe. What you have to do to fix this is to select "Save menus and soft keys" from the options menu after you make your changes. Then the next time you start DeScribe, you have to select "Load menus and soft keys" in the Options menu. There did

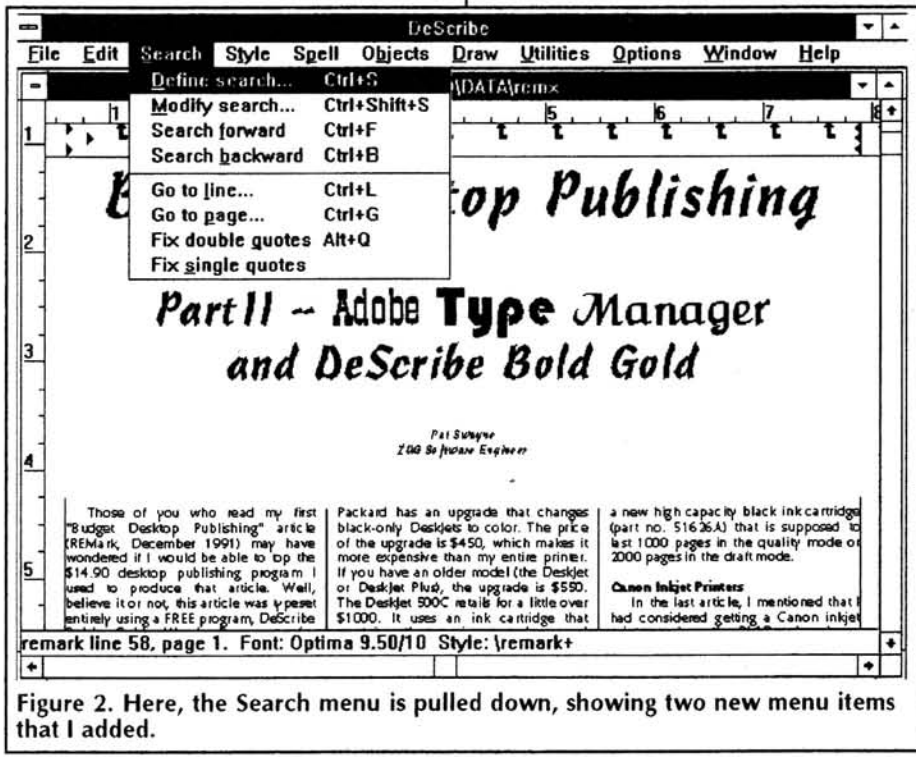


Figure 2. Here, the Search menu is pulled down, showing two new menu items that I added.

not seem to be any way to automate the loading of user-defined menus and soft keys. But by snooping around in the DESCRIBE.EXE program, I found that a macro can be loaded at startup by placing /m and the path to the macro on the command line that starts DeScribe. So I created a macro that loads my saved menu and soft keys file, and then, back in the Windows program manager, I selected the DeScribe icon and selected Properties in the File menu. Then I added /m and the path to my new macro file to the command line. So now my copy of DeScribe starts up with my new menu items loaded. If you wanted to, you could create a complex macro that would perform many operations automatically each time you started DeScribe.

### DeScribe As A DTP Program

I have yet to find a Windows word processing program that is as good as a character based DOS program for preparing the text of articles or writing program code. They are just not fast enough. But a good Windows word processor with desktop publishing capabilities can be used to import text prepared in a DOS program and format it for printing. DeScribe Bold Gold is excellent for this task, and the price is right!

DeScribe Bold Gold can only import ASCII text, but it can import it in three formats. One format is the "word processing" format, which contains carriage return-line feed characters between paragraphs only. Another is the "electronic mail" format, which contains a CR-LF at the end of each line, and two or more between paragraphs. DeScribe will remove the CR-LF's within paragraphs when it is set up to import this format, so that the text in paragraphs can be justified. The third format is the "program and configuration" format, which contains a CR-LF at the end of each line. DeScribe will keep this text as individual lines.

Because the Bold Gold version of DeScribe does not come with any spelling or other dictionaries, it does not do automatic hyphenation. If you see a line with a lot of "white space" in it, and a long word at the beginning of the next line, you can manually hyphenate the long word by typing a hyphen and a space at the point where it should be hyphenated. You should, of course, check the spelling in your text while you are still working with it in your DOS word processor.

DeScribe Bold Gold can import graphics from the Windows Clipboard in either bit mapped or vector format. To import a graphic, run your bit-mapped (such as Windows Paintbrush)

or vector (such as Corel Draw) program and load the graphic you want to use. Select the graphic or portion of it that you need, and then use the Copy command in the Edit menu to copy it to the clipboard. In Paintbrush, you can also use the View Picture command and then press the Print Screen key to copy the picture to the clipboard. Then you can exit from your drawing or paint program, run DeScribe, create a graphics object, and paste the graphic from the clipboard into it. This procedure works fairly well, except that some resolution is lost from imported vector drawings, and for some reason DeScribe Bold Gold will import but not print a dot image larger than 640 x 480 pixels (the VGA screen size). This limit may vary if you have a different video system.

DeScribe has enough graphics editing capability built in that you can create pictures within it, if you have such talent. Most of us will have to rely on what we can import, however.

### WordStar for Windows

I was thinking of doing a "Budget Desktop Publishing" article featuring WordStar for Windows, because if you are a registered user of the DOS version of WordStar, you could get the Windows version for a while for less than \$100, and even now I think you can get it for about \$130. However, I ran into some problems. At first, there was a problem with ATM. That went away with ATM version 2, but I got that only recently — not in time for this article.

Another problem with WordStar for Windows is that, at least the version I have, needs some more work. The program would halt occasionally with an "Internal error no. xxx" message popping up on the screen, with a number instead of xxx. Since this is not the usual Windows "Unrecoverable Application Error" message, the problem must be with the WordStar for Windows program, and not with Windows itself. I should point out that WordStar for Windows is not real WordStar, but a program called Legacy that WordStar bought and altered a little.

I had quite a time trying to find out how to number pages with different positioning on left and right pages in WordStar for Windows — even more-difficulty than with DeScribe. I searched the help screens and the reference manual, and could find nothing. Finally, I found the answer while doing the lessons in the on-line tutorial. In some areas, WordStar for Windows is less intuitive than DeScribe, and you may have quite a search to find answers to some of your questions.

Actually, WordStar for Windows is

not that bad a program, as Windows word processors go. It is faster than DeScribe in scrolling and some other operations, it comes with all of the extras you may need including a grammar checker, and it can import and export several other word processor formats. It also has a "draft display" mode, which is good for fast typists. For use as a desktop publisher, the layout tools are superb. About the only gripe I have in that area is that if you place several frames (the same thing as "objects" in DeScribe) on a page, with some overlapping, it's hard to tell precisely where they all are. With a little polishing, WordStar for Windows could be an excellent desktop publishing tool.

### Products Mentioned

The following products were mentioned in this article.

HP DeskJet 500C upgrade.....\$450  
(\$550 if you have an older model)  
Package your printer for shipping and include \$450 or \$550 or your Visa or Mastercard number, your return address, daytime and evening phone numbers, and the serial number from the bottom of your printer. Ship postage prepaid and fully insured to:  
HP Corvallis Service Center  
1030 NE Circle Blvd.  
Corvallis, OR 97330  
For more information, call 208-323-2551. If you would like a copy of the "official" order blank for this service, send me (c/o ZUG) a self-addressed stamped envelope, or your fax number.

Adobe Type Manager.....\$58  
Order number 08259  
Multiple Zones International  
18005 NE 68th Street, Suite A110  
Redmond, WA 98052-9904  
800-528-2088

DeScribe Bold Gold.....Free  
If you would like a copy, send me (c/o ZUG) 4 360k disks, or 2 720k disks, or 1 1.2 meg disk, or 1 1.44 meg disk, and a disk mailer containing sufficient postage. Or you may download it from my BBS at 616-982-5926. Press Enter when prompted for a password.

DeScribe version 3.....\$495  
DeScribe, Inc.  
4047 N. Freeway Blvd.  
Sacramento, CA 95843  
800-448-1586



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# On the Leading Edge

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## Windows 3.0, Windows 3.1, Word for Windows, WordPerfect for Windows, OS/2, What's Waiting?, Hard Drives

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Grand Prairie, TX 75053-1655  
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There's a lot of hype that you find in the market today. Depending on what you read, you'll find that: (1) Windows is the best thing since sliced bread; (2) Microsoft Word for Windows is the best word processor you can find; (3) OS/2 is the best operating system ever; and (4) Intel has an i486SX upgrade that's the greatest. And I'll bet you thought there were only three big lies, including the check's in the mail.

Well, part of the objective of this column is to help blow away myths and separate fact from fiction. Things like that are difficult to separate in today's market, but let's take a shot at it.

### Windows

From what I can tell, many people have discovered that Windows 3.0 isn't as easy as everyone thought it would be. It can be tricky to configure, and many people have found that it's quite easy to lose data because of the infamous Unrecoverable Application Errors (UAEs). From what I've seen, many large companies have not yet "converted" to Windows because it's expensive. That includes the cost of new hardware, such as memory and larger hard drives, new or upgraded software that is Windows-specific, training time for users, and a lot of extra time required by the technical support groups.

While it's true that Windows 3.0 will run on an 8088-based system with 640 K of memory and a CGA display, I don't recommend it. Windows will also run on an 80286-based system in standard mode, but I don't recommend that either. Even if you have a fast hard drive, bringing up DOS and

Windows (not to mention the speed of an application) is quite slow on those systems, plus you can't really take advantage of many Windows' features like multitasking. Although an 80286-based system does allow multitasking for Windows applications, that CPU is still too slow. If you want to run Windows, I still recommend a fast 80386DX system, such as a Z-386/33. Although you can get the advantage of running the 386 enhanced mode on an 80386SX system, they are generally too slow because their bus width is 16 bits and their clock speeds are not as fast as the DX systems. I've found that even my Z-386/16 with 5 MB of memory is too slow for my taste when running Windows and Windows applications, such as Word Perfect 5.1 for Windows.

It's interesting to note that over eight million copies of Windows 3.0 have been sold, but I haven't seen too many people use Windows much because it's too slow. And, if you really want to take full advantage of Windows, you also need to spend some additional money for Windows applications. I've also observed that Windows doesn't run very well in the recommended minimum of 2 MB of memory on a 386 system, and I recommend an absolute minimum of 4 MB.

If you use Windows, you probably know that Microsoft released Windows 3.1 on April 6. This release was supposed to have a considerable number of enhancements, including improved response speed, but I've found Windows 3.1 is a major disappointment.

### Windows 3.1

Microsoft has publicly stated that a major goal was for all Windows 3.0 applications to run under Windows 3.1 with no changes. There weren't even close so far as I'm concerned! I mentioned in my last column that I bought the Word Perfect 5.1 upgrade for Windows, but that is listed in the Windows 3.1 help system as having problems with this new version. Would you believe that even Microsoft's own Word for Windows 1.1 is also listed as having problems running under this new Windows version?

From what I can tell, Microsoft didn't come close to their goal because there are a number of applications that are on the "hit" list. Word processors include Lotus Ami Pro, Word Perfect 5.1 for Windows, and Word for Windows 1.1 as previously mentioned. Aside from Word, Microsoft has three other products with problems: Bookshelf for Windows, PowerPoint 2.0e, and the MS Productivity Pack 1.0. There must have been some REAL major changes in Windows 3.1 because four of Microsoft's relatively current applications apparently have problems with this new version. Other applications with problems include: Central Point Software PCTOOLS, Harvard Graphics for Windows, and WordStar for Windows; and these are just a few of the 30 applications listed on the new Windows 3.1 help screen. My guess is that this is just the tip of the iceberg, and there will be lots of fallout from this new Windows version.

This kind of problem also makes it difficult for software vendors, not to mention us poor users. Just when we thought



that Windows was relatively stable, at least in terms of the new software that we had to buy, Microsoft changed the rules and renegotiated. As a user, I don't appreciate that even though I have some understanding of the technical difficulties involved. From a business perspective, I suspect that a number of the software vendors are at least a little exasperated with Microsoft since they must now figure out a way to get their existing software to work under this new Windows version. That's going to add some costs that will inevitably be passed on to users in some way, and that's Microsoft's fault so far as I'm concerned. But there is one point about this new version of Windows that is not obvious.

Regardless of the fact that version 3.x of Windows has sold something like ten million copies, Windows is still in its infancy. So are the software programs that run under it. Microsoft is trying desperately to stabilize Windows which is certainly difficult to do given the varied types and configurations of hardware that it must run on. Software vendors have focused considerable resources on trying to develop reliable applications, but Windows is still so new that many of the rules keep changing as I mentioned earlier. Does this sound familiar? Of course it does.

In the early days of DOS-based microcomputers, application software frequently locked up the computers which occasionally required a power-off reset. CTRL-ALT-DEL wouldn't touch recover from a hard freeze. I remember working with an old version of MultiMate on an original IBM PC (before the XT's were released) that locked up on me at least once a day while I was trying to work. That's frustrating, and Windows has maintained that tradition, even though the new version has recovery features that version 3.0 didn't have. More on that in another article when I've had a chance to more fully check out this latest version.

As it happens though, there is one other problem with 3.1 that I really haven't seen much written about yet, probably because it's not something that at least a few people want to hear. Simply stated, Windows 3.1 will not run in the Real mode on any system, which means that it won't run on an 8088 system period. If you are planning on using Windows, it will not run on a Z-151 series or an eaZy PC, although you may find some kind of an upgrade CPU board for a Z-151. However, I will continue to recommend at least a 33 MHz 80386 if you plan to use a lot of Windows-based programs. Of course Windows 3.1 will continue to run on an 80286 CPU in the Standard mode. If you have at least an 80386, you can run Windows in the 386 Enhanced mode as well as the Standard mode. But there is one other point if you are considering buying a new computer to

use with Windows.

Perhaps you've heard about the new 32-bit Windows, which is also called Windows NT (New Technology). If you like Windows, don't even consider buying any computer with less than an 80386 CPU, and an 80486 is better. The whole reason for that is that Windows NT will not even run on an 80286 because this new Windows will require at least an 80386.

As a final note, the Powering Up for Windows series will begin in a couple of months as soon as I have been able to compile the appropriate information about Windows 3.1.

### Windows — An Operating System?

There are a lot of people who refer to Windows generally as an operating system. Whether or not Windows is an operating system depends on your point of view. DOS, OS/2, and DR DOS are clearly operating systems, and some kind of operating system is clearly required to "start" or boot a computer. However, the distinction between the operating system and the Windows environment becomes kind of blurred and indistinct because of some of the capabilities that Windows has. Let's take a look at some of the features that make it difficult to tell where the "real" operating system stops and the Windows environment begins.

Consider what Windows does. When you boot DOS (that may also include device drivers), the operating system basically handles all of the hardware functions such as the CPU, memory, serial/parallel ports (including a mouse), CRT/video board, accessing disk drives and files, other I/O ports (e.g., the keyboard), and working with application software. But, when Windows is running in protected mode (for either Standard mode or 386 Enhanced mode), it takes over many of the DOS functions and many other functions that were previously performed by applications. That includes the CPU and memory management, video display (Windows has device drivers for that), device drivers for special functions (e.g., SmartDrive), and all I/O ports, including standard serial and parallel ports. About the only thing DOS does at this point is when Windows sends "requests" for disk/file access, although DOS will still run the non-Windows device drivers. In other words, Windows basically takes over the system hardware, so there really isn't much left for DOS to do. So it's not too far off the mark to think of Windows as an operating system, even though it really isn't just now.

I don't think it will be too long before Windows will be directly bootable from a disk to the point you won't even see a DOS command prompt. In fact, I wouldn't be surprised to see the DOS command prompt disappear entirely, which is another reason

I recommend at least a fast 80386 system.

Windows is a large, complex program that is still not quite as stable as one might expect given the number of years it has been available. And it's only been recently—in the last year or so—that popular applications have begun to be available for Windows. Sure, some Windows applications have been around for years, but I'm talking about popular applications like Word Perfect and Harvard Graphics. Despite the length of time that Windows has been available in some version or other, it's only been since the release of version 3.0 that it has really been popular with most users. And users are just now beginning to buy these applications for their systems. Word Perfect and Harvard Graphics are now available, and of course Word for Windows has been available for some time. And speaking of Word for Windows...

### Word for Windows

The battle lines are drawn, the artillery is poised and ready, and the bombers are ready for combat. If you think that seems a little out of place in an article about computers, perhaps you haven't seen the latest advertisements for Microsoft Word 2.0 and Word Perfect 5.1 for Windows. The battle has been joined, and both companies have managed to do more than just fire shots across the bow of the competitor. Even though Microsoft fired the first salvo, Word Perfect has come back with some multi-megaton bombs. At this point, it looks like this battle will be even better than the Dell Computer versus Compaq version. Here's what's going on.

Although I've seen these advertisements before, the one I'm looking at right now is in the March 30, 1992, InfoWorld on pages 76-77. It starts out with the bold declaration that: "No wonder WordPerfect users prefer Word for Windows. It has easy written all over it." It goes on to mention that nearly eight out of ten WordPerfect for DOS users preferred Microsoft Word for Windows 2.0 over WordPerfect for Windows. The whole gist of the copy is that Word for Windows is much easier to use than WordPerfect for Windows.

Not to be outdone, the usually mild-mannered WordPerfect Corporation has fired back with a two-page advertisement that I found in the March 30, 1992, issue of PC Week on pages 106-107. Underneath a yellow, diamond-shaped traffic sign in "FOG", you'll find the statement: "If You're Moving To Windows, Beware Of Advertising." This advertisement suggests that if you're moving to Windows, proceed with caution, which I've always thought was true of any advertising. The major gist of the copy is that a competitor confined a test to just eight text-formatting functions and limited the test to a "national sample" (according to the copy) of just 24 people. This

advertisement further mentions that: "Which Windows word processor do eight out of ten people—or four out of five dentists—recommend? It all depends on which eight people you ask, and how you phrase the questions." I thought this advertisement was particularly interesting because nowhere were either Microsoft or Word for Windows mentioned. Perhaps this is a gentle hint that name-calling should not be allowed in an election year.

I am not often amused by advertising, but I'm looking forward to seeing the next installment in the battle of the word processing giants. Microsoft has tried for years to unseat the number one selling WordPerfect, and this is a new campaign that really calls it out. WordPerfect has been number one in the sales of word processors for so many years that I think it will be interesting to see how successful Microsoft will be.

## OS/2

IBM is apparently really going to push OS/2 version 2.0, at least according to what I've read. Depending on what you read, IBM is going to give it away, at least on their own computers. They apparently tried to get other computer manufacturers to bundle OS/2 with microcomputers, but the story seems to be that most manufacturers have an agreement with Microsoft to pay a royalty on each computer that rolls off the assembly line. And if these manufacturers are paying a royalty for DOS anyway, it's difficult to believe that they will add an additional cost by including OS/2.

But there are those who will tell you that OS/2 is the best operating system ever invented. But keep in mind that OS/2 is now pretty much an IBM product that Microsoft has forsaken in favor of Windows. What that really means is the latest version of OS/2 has been developed by IBM without any help from Microsoft. I should also note that OS/2 was originally released in 1987, and you can judge for yourself how popular it is. Basically OS/2 has been available for something like five years. How many people do you know who use OS/2?

There may be another reason for that. Now that IBM has essentially taken over the OS/2 development, it's not difficult to predict that users will be especially wary of that operating system, no matter how good it is. From a user perspective, I would suggest that their future in software will be consistent with their past software. What happened to TopView and OfficeVision? What about the buggy versions of DOS 2.0 and 4.0, not to mention previous versions of OS/2? Unless something has drastically changed, I think it's really difficult to see how OS/2 can possibly be a success.

But there is one other factor. How many applications do you know of that will run under OS/2? Although there are cer-

tainly some, you'll have considerable difficulty finding a complete set of popular applications that include word processing, graphics, spreadsheet, and data base. For example, I don't know of any version of a popular word processor (e.g., Word Perfect, Word, or WordStar) that is available in a version that runs under OS/2's Presentation Manager. That's a real killer because word processing is the most common application by far. What about a spreadsheet? Does Quattro Pro or 1-2-3 run under Presentation Manager? What about an OS/2 version of a popular data base or a graphics program? Sure you can find one or two, but what about something like Harvard Graphics that runs in OS/2 native mode? If you don't have OS/2-specific applications, you really lose much of the advantage of that operating system.

There is one other major point about OS/2 2.0 that I've found interesting. Initial reports are that it will run "native" OS/2 applications as well as Windows and DOS programs too. Given the amount of disk space that OS/2 2.0 requires (on the order of 18 MB or so), it is likely that any Windows applications will be noticeably slower under Presentation Manager than in Windows if for no other reason than because OS/2 is a much bigger "program." To be fair to IBM, it is still a remarkable technical achievement to get all of that working in OS/2, but I still have reservations about it.

OS/2 still has a major advantage over Windows. Windows can do multitasking, but it is kind of a kludge because DOS was never designed for multitasking, and Windows has not been able to overcome some of the DOS limitations in that area. On the other hand, OS/2 was designed as a multitasking operating system from the beginning, and one could reasonably expect that OS/2 does a much better job of memory management, among other things, than Windows. Even with its technical advantages in some areas, I still don't think OS/2 will be that popular.

Until, and unless, there is more popular software that runs under OS/2 in the native mode, I don't think it will go anywhere. It's big and slow, and it's not likely to overtake Windows, at least not now. It's going to be real difficult for any product to compete with Windows, which has at least eight million copies out, and that's before version 3.1. There's no telling how many copies that version 3.1 will sell, but I think it will be not quite so many as I originally thought given the number of existing applications that will run successfully under it, not to mention the fact that it won't run on 8088-based systems. But a successful OS/2 will require the so-called "killer app", which is kind of what Lotus 1-2-3 did for the IBM Personal Computer. Is that likely today? Possibly, but I don't think we'll see it in our lifetimes.

In summary, I don't think OS/2 is going to make it in a big way, and I personally don't plan to spend any time looking at it for now. If anything is current, Windows 3.1 with all its shortcomings is still the latest and greatest, and that's one thing you'll be seeing more about in my future articles.

## What's Waiting?

A friend once told me about the definition of boat: a boat is a hole in the water that you pour money into. A computer system is similar in many ways. Software upgrades and hardware upgrades seem to be an almost constant fact of life today. If you want to use the latest software, it seems almost certain that you will also need to upgrade your hardware too. Gone are the days when one could simply fork over the money for a software upgrade and be done with it. Sometimes you'll need more memory, other times you'll need a larger hard drive, and you may even find that you need a higher resolution CRT because some of today's software doesn't work very well, if at all, on anything less than an EGA video system. But now there is a real twist in the hardware.

Every once in a while I see an advertisement that really bothers me. Perhaps you've seen the Intel version: "Something's waiting inside the 486SX computer." Something's waiting all right—a chance to spend a few hundred dollars for an upgrade. Ah, yes, a computer IS a black hole that seemingly absorbs endless amounts of money. What's this all about?

Well, one of the major differences between the 80386 CPU and the 80486 CPU is the fact that the 80486 has a "built-in" numeric coprocessor. And perhaps you know the 80386 CPU uses a 32-bit bus while the 80386SX CPU uses a 16-bit bus. As the story goes, the "SX" designation for the 386 was taken from the word SiXteen. So far as the 80486 and i486SX CPUs are concerned, the bus width of both chips is the same: 32 bits.

Despite its origins, one of the major differences between the 80486 CPU (sometimes called the 80486DX) and the 80486SX is that the i486SX does NOT have the built-in numeric coprocessor. And if you check out the Intel advertisement, you'll usually see a "Vacancy" arrow pointing to an empty socket next to an i486SX CPU. According to Intel, that socket is for an "upgrade processor" which will double basic CPU performance with an overall system performance increase of up to 70%. This additional chip will also include a numeric coprocessor, and Intel plans to make it available this year. Although there's no hint of how much this will cost, you can bet it will be at least as pricey as a numeric coprocessor.

That probably means that a system with the i486SX and the upgrade processor



will end up costing more than a standard 80486DX (with all the capabilities) does now. It will be interesting to see how this turns out, but there is one point you should consider if you are thinking of buying a new computer.

Keep in mind that many of the current i486SX systems have a 20 MHz clock speed while the 80486DX systems generally have at least a 33 MHz clock speed, and a 50 MHz 80486DX chip is available on some systems. All other things being equal, such as the chip architecture in this case, an increase in clock speed will proportionately increase the speed of the CPU, and that will of course increase the speed of the system. For example, a 33 MHz 80386DX is already 65% faster than a 20 MHz i486SX, and a 50 MHz DX is 250% faster than a 20 MHz i486SX.

Even though systems with an i486SX are less expensive in the short term, it is quite likely that the addition of the upgrade processor will cause the system to be more expensive in the long run than a standard DX-based system. For that reason, I don't believe that a slower system with an SX CPU is a good investment, in terms of either cost or overall performance.

If you really need a fast system for graphics, CAD or heavy-duty math (e.g., a monster spreadsheet), a DX is a far better investment even though its initial cost is higher. Also, remember that CPU speed isn't the fix for everything, such as improving the speed of Windows. Although a faster CPU will help, you will also need to have a high-performance video card with lots of video memory for best response.

As you can probably tell, the Intel advertisement for the i486SX bothers me because it only tells a small part of the story. While it is true that the SX configuration is quite sufficient to improve performance for a lot of software, I recommend a considerable amount of skepticism on these things because the a DX version is already available that is two and a half times faster than the most common 20 MHz i486SX.

### Hard Drives

Choosing the right hard drive has become more difficult these days. With five different interfaces and capacities ranging from 20 to 2,000 megabytes (2 gigabytes), it's become more difficult to figure out what to buy, especially if one is considering a new and faster drive for an existing system.

Perhaps the most important factor to consider is capacity. Because of the size of today's applications, which may range from four to 10 megabytes or more, I recommend no less than an 80 MB drive. For example, Windows 3.0 takes about 6 MB on my system, and WordPerfect for Windows takes just over 10 MB of space with everything installed. By the time I add the

space required for DOS plus at least one utility (e.g., Norton or PCTOOLS), it's easy to use up more than 25 MB with just a basic word processing capability. And if you need a spreadsheet or a graphics program, that may easily take at least another 5 MB per application, not to mention the data files that are created by each application. You also may need considerable disk space if you are using softfonts for one or more applications. Fonts can easily use up a couple of megabytes, or more, depending on the number of different typefaces and sizes you need. I'm still trying to figure out how much disk space I'm really going to need for Windows 3.1 with the TrueType fonts, and that will take considerable space if I decide to implement it with all the fonts I use most often. If you are thinking of using a lot of Windows programs, I'd suggest you consider a hard drive with a capacity of 200 MB or more.

To keep up with today's software (and disk access requirements), the next factor to consider is the speed of the hard drive. A high-capacity hard drive isn't enough because a slow hard drive may have a considerable impact on the overall performance of your system, depending on what you're doing. If a program (e.g., Windows) requires a lot of disk access (reads and/or writes), a slow hard drive will really have a major impact on system performance. Performance of a hard drive is measured by access time, which may be on the order of 15 to 80 milliseconds (ms.), depending on the drive and the type of interface to the system. Some of today's hard drives have access times in the 15 ms. range which is generally fast enough for most applications. Older hard drives, such as the MFM drives in my Z-386/16, have access times of about 28 ms., which is usually fast enough for my needs. Although you probably won't be able to measure or see a minor difference in performance between a 15 and a 17 ms. hard drive, you definitely will see a difference between a 15 ms. and a 60 ms. hard drive. Even the difference between a 15 and a 28 ms. hard drive isn't usually noticeable unless you are doing something that requires a LOT of disk access, such as starting Windows or a Windows application.

Reliability is also an important factor to consider. If you buy a brand-name hard drive today, that's usually not a problem. As a personal choice, I like Seagate drives because I've had less trouble with them than other brands I've used, but most of the hard drives available today are quite good. Manufacturers generally rate their hard drives in terms of "mean time between failure", commonly abbreviated MTBF. Ratings between 40,000 and 100,000 hours are common today, and the higher MTBF is better of course. You can generally expect to pay more for a drive, all other things

being equal, with a higher MTBF. It's important to remember that MTBF is not an absolute guarantee, but it's just an indication of the overall drive reliability. Even though it's unlikely, it's possible that a drive with a 65,000 MTBF could fail after 12 hours. After all, a hard drive has a lot of mechanical components which are usually the first to fail. Electronics generally tend to have a longer life than mechanical parts.

One other thing that I've noticed about hard drives is noise. Although it's generally not a noticeable problem in an office due to other types of equipment such as air conditioners, copiers, printers, telephones, and general office noise, the same hard drive can be REAL noisy in a quiet office or home. All hard drives make various kinds of noises, but I've found over the years that the Seagate drives are quiet enough for me to use with no problem in my study. No doubt there are many other drives that are just as quiet or quieter.

Perhaps the most confusing part of choosing a hard drive is to decide what kind of interface, or controller card, you should use. There are five general drive types available today: MFM, RLL, IDE, ESDI, and SCSI.

The MFM hard drives were the original units installed in most early computers such as the IBM XT and Z-151. MFM is an acronym for Modified Frequency Modulation, which is just a way of recording data. MFM drives have been commonly used on a variety of systems, and an MFM hard drive controller was part of the Z-386/16 system I am using. Then, RLL (Run Length Limited) drives became popular because one could get up to 50% more disk space in the same physical drive (with an RLL hard drive controller). Even though it's theoretically possible to use an MFM drive with an RLL controller, I don't recommend it because it tends not to be reliable. One should only use an RLL-certified drive with an RLL controller.

IDE drives first seem to have been used commonly in laptops, such as my SupersPort 286 and SupersPort 386SX. IDE is an acronym for "Integrated Drive Electronics" which is sometimes called an "AT-standard" drive. That's probably because the drive controller, technically called an IDE host adapter or interface, will only work on a 16-bit bus, which is not available on an 8088-based system such as the Z-151. The advantage of the IDE drive is that the drive controller electronics are part of the hard drive, so the host adapter is less complex (and less expensive) than any other hard drive interface. IDE drives are generally faster and have more capacity than MFM or RLL drives. IDE drives, including the host adapters, also are generally less expensive than MFM and RLL drives. In fact, IDE drives tend to be the least expensive of all other drives and interfaces. Al-



though you can buy an IDE host adapter just for the hard drive, you can also buy a "combo" adapter that includes a floppy drive controller as well as the IDE host interface. Even combo IDE adapters are available for less than \$50, and you can find IDE adapters for \$20-25 if you already have a separate floppy disk controller. In terms of price versus performance, IDE drives are probably the best buy of all. They are generally quite fast, and the cost per megabyte is quite low, usually under four dollars a megabyte or less, depending on the capacity and drive manufacturer.

You'll also find ESDI drives have been quite popular on ZDS systems. ESDI is an acronym for "Enhanced Small Device Interface". ESDI drives, as a class, provide high capacity as well as high performance, usually in excess of 100 MB with access times of less than 20 ms. Unfortunately, ESDI drives and their controllers tend to be quite expensive, which is one reason that I don't use one. But, they may be the best solution for some applications.

Last, but not least, you may find SCSI (pronounced "scuzzy") drive available on some systems. SCSI is an acronym for "Small Computer Systems Interface." Although these drives have been used in Macintosh computers for years, they are just beginning to find a place in the PC-compatible market. Aside from being expensive like the ESDI drives and controllers, the SCSI standard is not quite as well established in the PC-compatible market, so they are not as popular as other drives. Perhaps the biggest single advantage of the SCSI interface is that you can connect up to eight devices on one port in a "daisy-chain"

arrangement.

If you're thinking of buying a new hard drive, look at capacity, performance, and reliability. The interface is not quite as important, but if you expect to add a second hard drive to an existing system, you'll want to be sure to get one that is compatible with your existing drive controller, unless you want to spend the money for a new interface as well as a drive. That may or may not be cost effective, depending on what kind of system you have.

#### Powering Down

Although I have two hard drives with a total of 120 MB capacity, I'm finding that isn't enough, especially with Windows programs. For example, WordPerfect for Windows takes over 10 MB while the DOS version takes just over five. As a result, I'm looking at some compression programs that will help improve storage capacity by compressing files on the fly. If I find anything reliable and useful from that, I'll be writing about it in the future.

For help in solving specific computer problems, be sure to include the exact model number of your system (from the back of the unit or series from the Owner's Manual), the ROM version you are using (use CTRL-ALT-INS to find it, except for the eaZy PC), the DOS version you are using (including both version and BIOS numbers from the VER command), and a list of ALL hardware add-ons (including brand and model number) installed in your computer. The list of hardware add-ons should specifically include memory capacity (either added to an existing board or on any add-on board), all other internal add-on boards

(e.g., modem, bus mouse or video card), the brand and model of the CRT monitor you have, and the brand and model of the printer with the type of interface (i.e., serial or parallel) you are using. Also be sure to include a listing of the contents of the AUTOEXEC.BAT and CONFIG.SYS files unless you have thoroughly checked them out for potential problems (e.g., TSR conflicts). If the problem involves any application software, be sure to include the name and version number of the program you are running when the problem appears.

If you have questions about anything in this column, or about Zenith Data Systems or Heath computers in general, be sure to include a self-addressed, stamped envelope (business size preferred) if you would like a personal reply to your question, suggestion, comment or request.

#### Products Discussed

##### Software

*Powering Up* (885-4604) \$12.00

Zenith Users' Group

P.O. Box 217

Benton Harbor, MI 49022-0217

(616) 982-3463 (ZUG Software only)

Word for Windows 2.0 (upgrade)

\$129.00

Microsoft

(800) 323-3577, Dept. Y73 (until 6/30/92)

WordPerfect for Windows Call for information

WordPerfect Corporation

(800) 526-5019 ✻

#### Continued from Page 13

colors are displayable at the 640 x 480 resolution. Super VGA adapters offer choices of 256 colors at resolutions of 640 x 480 and 800 x 600 plus 16 colors at a resolution of 1024 x 768. In most cases, a video adapter card memory increase allows a Super VGA monitor to display 256 colors at a resolution of 1024 x 768.

#### The Z-550 Super Video Graphics Adapter

High resolution video begins with the graphics adapter card. With the installation of the Z-550 video display adapter, a user can choose from 256,000 colors in 256 color modes. Also, the new video adapter card provides resolutions of 1024 x 768 and 800 x 600. Out of the box, the Z-550 arrives configured with 512 kilobytes of video RAM and an upgrade option of one megabyte of video memory. Upgrading the video memory of the adapter allows you to access more colors at a higher resolution. As an example, the upgraded Z-550 supports the 1024 x 768 resolution

with 256 colors. Table 3 lists the various modes and resolutions available on the Z-550 display adapter.

#### The ZCM-1420 Super VGA Monitor

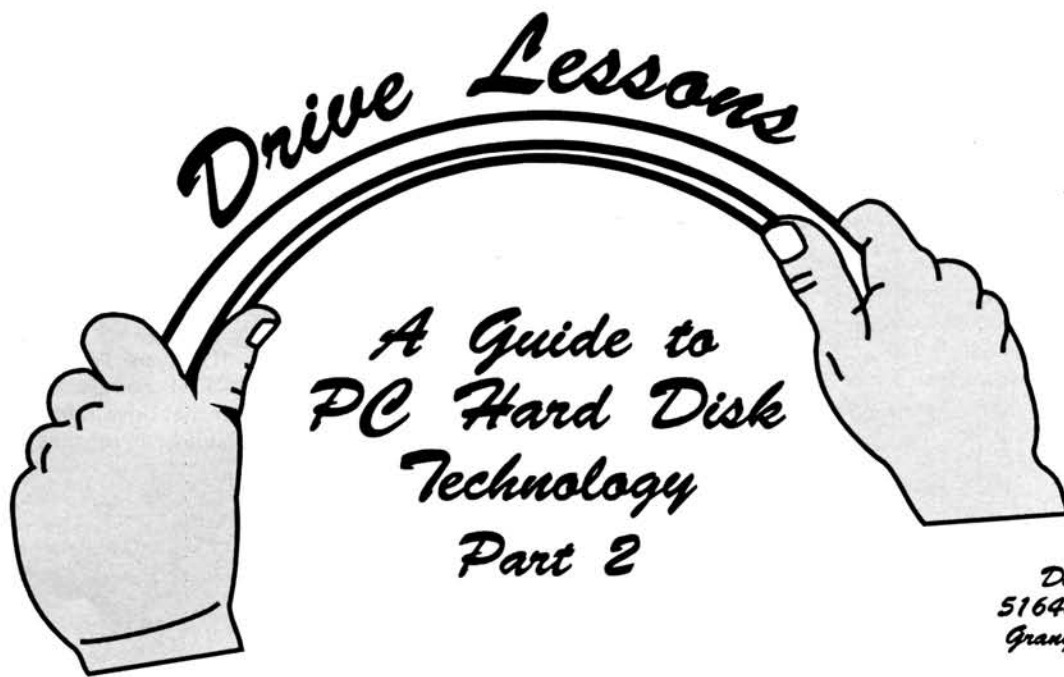
Zenith Data Systems' entry into the Super VGA market physically resembles the earlier ZCM-1490 and ZCM-1492 VGA monitors. Like its predecessors, the ZCM-1420 has a 14" diagonal, anti-glare screen and a tilt-swivel base. In addition, the ZCM-1420 includes the usual complement of size, position and video controls—horizontal phase, vertical size, brightness and contrast. One look at the quality of the ZCM-1420 display discloses the real differences. The Super VGA ZCM-1420 offers an unlimited number of colors at a higher resolution.

Considering image quality, scanning frequencies and backward compatibility, the ZCM-1420 measures well against the criteria. Specifically, image quality begins with a 0.28 mm dot pitch. Horizontal scan frequencies cover a range of 31.49 kHz,

35.2 kHz and 35.5 kHz. Vertical scan frequencies include 56, 60, 70 and 87 Hz. As with all Super VGA monitors, the ZCM-1420 has a RGB analog display. It offers full support for the 640 x 480 graphics and the 720 x 400 text resolutions. In addition, the ZCM-1420 supports the 800 x 600 graphics and text and the 1024 x 768 graphics and text resolutions.

#### Credits

All tables, except for Table 1, courtesy of Zenith Data Systems. ✻



# Drive Lessons

## A Guide to PC Hard Disk Technology Part 2

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As you sit hunched over in front of your computer furiously pecking away at the keyboard writing articles for REMark magazine, you feel compelled to periodically save your work to a file on your hard disk. Smart thing to do. You just never know when those Windows gremlins will get you, locking up your computer, and leaving you muttering unmentionables because you just lost all the work you did during the last hour. Like virtually everyone else, you just take for granted that your application software or DOS will save your work to a disk file, simply at your command. Nothing wrong with blind acceptance, here. But what is really happening?

### BIOS

In the world of disk drives, there are numerous drive types, controller types, media types, and recording methods. The process of saving a file to disk is so transparent to the user that we tend to forget that there has to be some sort of "glue" to bring DOS or application software together with the hardware. Of course, this is the function of the system's BIOS (for Basic Input/Output System). The BIOS is a collection of ROM-resident software service routines that are accessible to DOS and application software and provide a means to "talk" to the hardware. The BIOS does not talk directly to the drive, instead it communicates with a disk controller, an intelligent electrical interface between the mechanical disk drive and the host CPU. The type of BIOS disk services available and the means to invoke these services were defined by the original IBM PC/XT/AT architecture and remains "standard" for compatibility

reasons, but the actual coding and implementation of the BIOS is machine dependent.

Every BIOS has a set of standard services for hard disk operations which are

available to programmers by invoking INT 13H. I will not attempt to explain the intricacies of programming at the BIOS level; this is better left to the programmers. However, I will outline some of the AT disk

Code	Function	Description
00H	Reset all drives	Resets all drives and controllers (floppy and hard) and programs drive controllers with parameters stored in their respective parameter tables.
01H	Read drive status	Returns drive status related to last disk operation.
02H	Read sectors	Read sectors from disk and write them to a memory buffer.
03H	Write sectors	Write data from a buffer to specified drive sector.
04H	Verify sectors	Tests data in designated sectors and checks for errors.
05H	Format cylinder	Format specified disk cylinders.
08H	Return drive parameters	Returns drive parameter information.
09H	Set drive parameters	Programs hard drive controller with parameters from table pointed to by INT 41H or INT 46H.
0AH	Read sectors and ECC bytes	Reads data and ECC bytes from specified sectors to memory.
0BH	Write sectors and ECC bytes	Writes data and ECC bytes from memory to specified sectors.
0CH	Seek Cylinder	Moves read/write head to specified track or cylinder.
0DH	Reset hard drive	Reset hard drive and controller only
10H	Test	Tests status of drive ready line.
11H	Recalibrate drive	Moves read/write head to cylinder 0.
14H	Controller Internal Diagnostic	Runs self-test on hard drive controller.
15H	Return drive type	Returns number of 512-byte sectors on drive.

Table 1  
INTerrupt 13H Functions

Offset	Size	Parameter
00H	2 bytes	Maximum number of cylinders.
02H	1 byte	Maximum number of heads.
03H	2 bytes	Reserved
05H	2 bytes	Write Precompensation 0000H - Precomp starts on first cylinder FFFFH - No precompensation
07H	1 byte	Maximum number of bytes correctable with ECC.
08H	1 byte	Head options: 00H - 8 or fewer heads 08H - More than 8 heads
09H	3 bytes	Reserved
0CH	2 bytes	Landing zone cylinder
0EH	1 byte	Sectors per track
0FH	1 byte	Drive options: 01H - Removable cartridge 02H - Servo stepper drive 03H - Removable cartridge and servo stepper drive

**Table 2**  
**Hard Drive Parameter Table Entries**

BIOS services provided by Interrupt 13H in Table 1. Keep in mind that the list is not necessarily complete as it does not include services peculiar to XT-compatible or PS/2 BIOS.

Every system BIOS, regardless of who wrote it, has code written to handle disk operations. The disk code is part of the main BIOS program and physically resides in the same ROM chip with all other system BIOS code. This system BIOS always re-

parameters, the system SETUP program must write the address of the desired drive table entry into a reserved part of the interrupt vector table area in low memory (0-3FFh), based on the drive type selected in the SETUP program.

PC/XT systems are slightly different since they generally do not have a SETUP program. Instead, drive parameters are usually found on the hard disk controller in its built-in disk BIOS ROM. Disk controllers

and for the BIOS to perform its INT 13H disk service routines properly, it needs to know these physical attributes. The BIOS in AT-type computers will support a large variety of hard drive types, and the attribute (or parameter) information regarding these drive types is stored in a permanent, drive data table in ROM BIOS. Just browse through the choices found in your SETUP program and you will see on order of 40 to 50 choices. But, in order for the BIOS to reference the correct set of drive pa-

of each drive parameter table pointed to by INTs 41H and 46H.

### Hard Drive Math

So with all of this confusing jargon of tracks, cylinders, sectors, platters, and heads, how does this all relate to the drive capacity? As you'll see, it's easy to determine the capacity of a drive by inspecting its parameters. Knowing that most hard drives formatted by PC-DOS or MS-DOS contain 512 bytes of data per sector we can determine the rest using the parameter tables. As an example, ZDS uses a 60MB Conner CP2064 IDE-type drive in their MastersPORT SL computer. The parameter table for that drive is in Table 3.

From this we can see that the drive has 0397h (=919 decimal) cylinders (same as tracks), 8 recording heads (same as number of recording surfaces), and 11h (=17 decimal) sectors per track. What follows is:

512 bytes/sector x 17 sectors/cylinder x 919 cylinders/surface x 8 surfaces = 61MB unformatted capacity. This agrees with Conner's technical specification for the drive.

### System RAM Data

Besides storing drive parameter data in ROM BIOS, the system's data RAM area also contains valuable information relating to hard disk drives. Table 4 outlines the data locations related to hard drive operations.

### CMOS RAM Data

Another area within the PC's resources where drive information is stored is the CMOS data RAM. Table 5 outlines data related to installed hard drive(s).

Offset into Table	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
Parameter Value	97	03	08	00	00	FF	00	00	00	00	00	97	03	11	00	

**Table 3**  
**Parameter Table for the Zenith Data Systems' MastersPort SL**

sides in a portion of high memory, usually the F000:0 block for 8088-based PC/XT systems and FF000:0 for 80286 or better AT-class systems. On older PC/XT and AT systems with separate (usually ST-506 or ST-412 type) disk controller cards, a separate disk BIOS resides in a ROM chip on the disk controller card. This auxiliary, disk-only ROM BIOS is seen by the CPU as a 32K block of code starting at memory location C800:0 and it replaces the hard disk BIOS code found in the main system BIOS. This is accomplished by having the system BIOS code replace the INT 13H vector in the low memory vector table (0:40H) with the address of the auxiliary ROM on the controller when a disk BIOS is detected at the C800:0 memory location during the boot process.

### Disk Parameter Table

Every disk drive has the capability to have different physical attributes, such as number of cylinders, heads, and platters,

for XT-type machines often have support for only 4 drive types and the user must select a particular drive type by moving jumpers on the controller card.

In either case, interrupts INT 41H and INT 46H point to the hard drive parameter tables for the first two installed hard drives. And since these interrupts are only address pointers (there is no service routine or code stored at these locations), they are not true interrupts. Most users will never need this parameter information, it simply is not useful to most application programmers. However, it is useful to those that for some reason must bypass DOS and BIOS services to get to the disk drive hardware.

Table 2 describes the contents

### Hard Drive Interfaces

After packing your 20MB or 40MB drive full of everything imaginable, you will sooner or later want to upgrade to a faster, larger capacity hard drive. Besides, you want to run some of those fancy Microsoft Windows applications. It all sounds easy enough, but what type of drive should you get? What type of controller do you need? Browsing through the Computer Shopper or PC Sources magazine to get an idea of hard drive prices and types only makes the situation more bewil-

Location	Size	Description
40:74H	1 word	Status from last fixed disk operation
40:75h	1 byte	Number of hard drives installed
40:76h	1 byte	XT hard disk control byte
40:77h	1 byte	XT hard disk controller port offset
40:8Ch	1 byte	Hard disk controller status
40:8Dh	1 byte	Hard disk error status
40:8Eh	1 byte	Fixed disk interrupt control

**Table 4**  
**System Data RAM**



**CMOS****RAM**

Size	Description
12h 1 byte	Hard disk drive type: Bits 7-4: drive 0 type Bits 3-0: drive 1 type where: 0 = drive not present 1-E = drive type 1-15 F = use contents of byte 19h or 1Ah
19h 1 byte	Extended hard disk type for drive 0 Bits 7-0: drive type
1Ah 1 byte	Extended hard disk type for drive 1 Bits 7-0: drive type

**Table 5**  
**CMOS Data RAM**

dering. You are bombarded with ST-506/412, FM, MFM, RLL, ESDI, SCSI, IDE, XT, AT, 8-bit, 16-bit, and the list goes on. Suddenly, it's not so easy!

**ST-506/412**

Historically, the first hard drives available in PCs were 5MB (yes, five megabyte), 5.25" models offered by Shugart Technology (now Seagate) in 1980. The electrical interface between this drive and the host CPU was designated as ST-506. A follow-on drive made by Shugart and offered by IBM in their early XT models was a 10MB, 5.25" drive using a modified ST-506 interface called ST-412. These ST-412 controllers differed from their ST-506 cousins by adding a feature called *buffered seek*. The buffered seek was actually a method where the disk controller read more information than was necessary from the disk and stored it into a memory buffer. When the next piece of information required from the drive was requested, it was likely to be in memory already. In a way, it was a crude drive caching system that effectively improved disk performance.

Drives employing ST-506/412 interfaces are relatively unsophisticated by today's standards and are generally of older design. Their primary feature is price, and with a modest 5 - 7.5 Mbit/second maximum transfer rate and high average access times, these are the slowest drives available. As a rule, these drive and controller combinations are well-suited for use in XT-class machines. But, since they were universally adopted by other drive vendors wishing to get in the PC business, they persist in the market and are still widely used today in the PC industry.

**MFM Encoding**

Both of these early drive interfaces utilized a technique for encoding data on the drive platters called modified frequency modulation, or more commonly MFM. This method is simply a scheme defining how the magnetic pulses are stored on the disk surface which can then be read by the drive head as it passes overhead the spinning

platter. Combined with ST-506, the MFM scheme encodes data at 512 bytes per sector and 17 sectors per track.

**RLL Encoding**

In an effort to pack more data onto the drive plattersurfaces, another popular encoding scheme was born. A technique called run-length-limited, or RLL, is able to

encode 50% more data than MFM onto a disk platter. Consequently, RLL can squeeze up to 26 512-byte sectors onto each track, up from 17 as seen in MFM. The benefit to this increased data density is overall increase in storage capacity but also an increased data transfer rate because the read/write head now has more data available to read as the platter rotates underneath. Virtually every drive today uses either MFM or RLL encoding techniques, and most drives of recent design use RLL.

**ESDI**

Another popular drive and controller combination is the ESDI (Enhanced Small Drive Interface) type. It is very similar to the ST-506 interface with the primary difference in that it was designed to accommodate a greater maximum data transfer rate, plus it has more intelligence associated with it. One of these "intelligent" features that makes ESDI unique from earlier ST-506 drives is that its controller accepts commands that will allow it to read the drive's physical parameters off of the drive itself, and to also read the drive's defect map, a list of physically bad or unusable sectors. From the computer manufacturer's point of view, the beauty to storing drive parameters on the disk itself is that the system BIOS ROM no longer needs to maintain parameters for an extensive list of different ESDI drive types.

While ESDI is smart, its real strength is performance. ESDI drive systems use RLL data encoding and generally format the drive at 32 sectors per track, but in some cases as many as 60 or more sectors per track are utilized. The controller electronics and signal interface is more sophisticated than ST-506, and with data densities much higher than ST-506 it is no surprise that the data transfer rate is also much higher. Another result of the tight data packing on ESDI drives is that ESDI drives invariably are of much larger capacity. Most drives are larger than 100MB, and a least one vendor is offering a 1GB (giga-byte, or 1024 MB) drive. Now, that is some serious storage space for a PC!

**SCSI**

Still another interface is SCSI, affectionately known as "scuzzy", for Small Computer System Interface. More appropriately, SCSI is not really a drive interface standard or controller but rather a system level bus standard. Think of SCSI as a versatile means to connect up to seven additional SCSI-compatible devices to a single SCSI host adapter card where the adapter card provides a means for the PC to communicate with the individual SCSI devices. In the case of SCSI hard drive devices, remember that SCSI is not a drive controller. Instead, SCSI drives have a dedicated disk controller imbedded onto the drive assembly, plus a special SCSI interface allowing the disk controller to talk to the SCSI host adapter. From the users or programmer's point of view, the type of drive controller is irrelevant because it isn't accessible anyway. All communication with the drive and controller is through the drive's embedded SCSI interface using special SCSI software protocols.

As a rule, SCSI hard drives have very large capacities and as such are very popular in the PC network server arena. In these situations, up to seven SCSI-type hard drives can be connected to a single host adapter, providing several Giga-bytes of hard disk storage. Other types of SCSI hard drives are available, most common are optical hard drives, or CD-ROM drives. These drives are read-only devices and usually contain archival information such as on-line encyclopedias, and newspaper and magazine article databases.

**IDE**

The most common drive interface in recent years is the IDE interface, known by some as Intelligent Drive Electronics, to others as Imbedded Drive Electronics. Most newer desktop computers and all of the current generation laptop and notebook computers use IDE drives. One of the unique features of the IDE drives is that they contain their disk controller interface on a circuit board as part of the drive assembly. These type of drives probably evolved from the hardcards, a technology from the mid-1980's where drives were piggybacked onto a drive controller card and then plugged into the computer's bus slot. This method simplified installation because there were no separate power cables or signal cables to be routed to the hardcard.

Another feature of IDE drives is that they all have a single interface cable routing power and bus signals to the drive. Generally, the IDE drive is connected to the computer's motherboard using a 40-conductor flat cable. However, just because it connects to the motherboard, don't be confused into thinking that is where the disk controller is located, too!

PC systems with disk controllers already built into their motherboards do not currently exist, and as long as IDE drives remain popular, they never will, either.

While most newer machines have a dedicated 40-pin header connector for an IDE drive, usually on a motherboard, some computers do not. If you have a computer that does not have one of these IDE connectors, there is still hope to upgrade your machine with an IDE drive. To do so, special adapter cards are available that you can plug into an available bus slot. These cards adapt the standard bus slot configuration to the standard 40-pin IDE connector configuration. There are 8-bit bus cards used for XT machines and 16-bit cards for AT machines.

### Installation, Configuration, Cabling

Installing one or more hard drives into your desktop computer is a fairly simple task, but only as long as one knows where all of the cables are routed, and how to configure applicable jumpers in multiple drive setups.

As for cables, flat ribbon cables are usually used to connect the disk drive units to their respective controllers or to a system interface. ST-506/412 and ESDI drives each use two cables: a 34-conductor control cable, and a 20-conductor data cable. The control cable routes control signals between the drive and the disk controller card. This control cable is used to daisy-chain a path for the control signals between two drives and a single controller. The data cable, which carries data between the drive and drive controller, is not daisy-chained and it routes only data between the controller and the specific drive to which it is attached. Most systems are set up to accommodate up to a maximum of two hard drives, so when two drives are installed, there is a single control cable linking the controller and drives, and two data cables, one each between controller and drive.

SCSI and IDE drives are different in that they each use only one cable to rout all control and data signals. SCSI drives require a large, 50-conductor cable to connect signals between the drive and SCSI host adapter. Since SCSI allows up to seven additional SCSI-compatible devices to be strung out in a daisy-chain fashion, these are often specialized cables manufactured specifically for SCSI devices.

IDE devices probably have the simplest cabling configuration. A single 40-conductor ribbon cable is used to rout control and data signals from the drive assembly to the 40-pin IDE interface header connector located on the system motherboard, or on the IDE interface adapter card.

Certainly one of the sources of confusion involving drive cabling is when a computer is to be configured with two hard

drives. In dual drive setups, there is a "primary" drive and a "secondary" drive. The primary drive is the first physical drive seen by DOS, the secondary drive is the second physical drive seen. This is not the same as your logical drive designation because each physical drive can be partitioned so that DOS sees it as multiple drives, such as C:, D:, E:, and so on. In dual drive setups involving ST-506/412 or ESDI interfaces, the control cable may or may not have a "twist" in one of the sections. Generally, XT-class machines will not have a twist in the control cable while AT-class machines do have a twist. If your drive cable DOES have a twist in it, then put the primary drive at the end of the cable and the secondary drive on the middle connector. Both drives should be set for Drive Select 1. If your drive cable does NOT have a twist in it, then each drive must be differentiated from the other through use of the drive select settings. Set your primary drive to Drive Select 1 and your secondary drive to Drive Select 2. Position of these drives on the cable is not important. The primary drive can be at either the end connector or the middle connector. However, regardless of cabling configuration, the cable must be terminated, and this is done by ensuring that the last drive on the cable has resistor termination installed. In dual drive setups, the drive on the middle connector should have its cable termination removed.

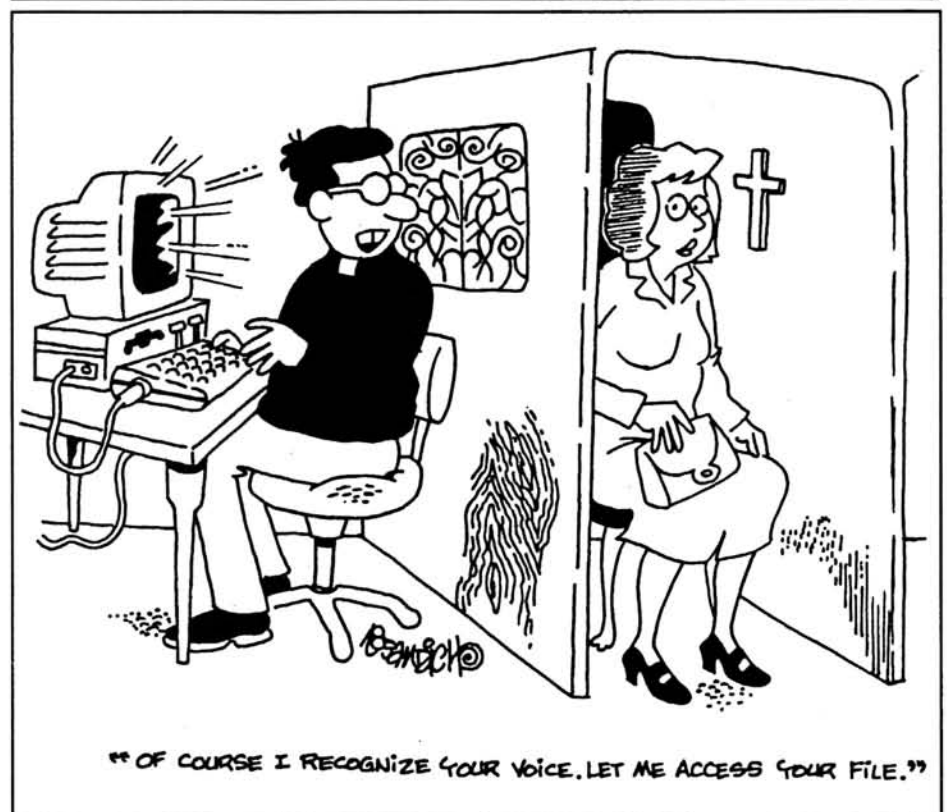
For IDE drives, there is only the single 40-conductor cable to contend with, and it

will never have any of the wires twisted for the second drive. In dual-IDE-drive setups, there is a master-slave relationship between the two drives. Differentiating the drives is thus done by their local jumper settings, where one is designated as master, the other a slave. Position of the drives on the cable is not important, the master drive can be attached at either the end connector or the middle connector. No resistor termination packs need be removed or installed.

SCSI is an entirely different animal, since up to seven drives can be daisy-chained on the same cable. Drive differentiation is always accomplished by physical drive addressing, where each drive on the chain is configured with a unique address, usually in the form of selectable jumpers or a rotary thumbwheel switch.

### Coming

Parts One and Two in this series have now attempted to explain a little about the basic structures of hard drives, the different physical and electrical formats, plus introduce the level of software closest to the actual drive hardware: the BIOS. Part Three will deal with the close relationship between DOS and the hard drive. Since PCs utilize a Disk Operating System (hence, DOS), the next article is probably the most important one in the series because it will contain information likely to be used by a broad range of users, plus it is essential knowledge in the fight to recover lost data when the inevitable disk problem or failure occurs. ✱



# Lotus 1-2-3

## Part 3

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## Release 3.1

### Quick Review

In part 2 of this series of articles you expanded the example worksheet by using the three dimensional capabilities of Lotus 1-2-3. You also learned to use some of the available formulas and @Functions. In Part 3, we will continue to enhance the sample worksheet using more formulas, additional WYSIWYG enhancements, and graphing.

### Trouble Spots

You may have noticed, in Parts 1 and 2, that the worksheet frame on your screen did not match the screen captures exactly. This is because I use a WYSIWYG option to enhance the appearance of the frame. The default 1-2-3 frame does not have separator lines between columns and rows in the frame. I prefer the look of the enhanced

WYSIWYG frame, because it is easier to tell where one column or row ends, and another begins. To alter this setting, enter :Display Options Frame Enhanced Quit Default Update Quit. This set of commands will change the default frame type to the enhanced version.

### Getting Started

Retrieve your worksheet from Part 2 by entering /File Retrieve. When 1-2-3 prompts you, "Enter name of file to retrieve:", type "XYZ91SUM" and press [ENTER]. You should now see your worksheet from last time, which should look like Figure 1.

Periodically, it is a good idea to check on the status of your worksheet. Enter /Worksheet Status. You should see a screen that looks like Figure 2.

This screen shows the current status of your worksheet. The amount of memory available will vary depending on the amount of memory in your machine, how it is configured, and the complexity of the worksheet currently loaded. As the example worksheet grows larger and more complex, it will require more memory. If you are getting low on available memory, you should consider adding additional memory, or reconfiguring the memory you have to allocate more to 1-2-3. This screen also shows the type of processor in your machine, the presence or absence of a math coprocessor, the recalculation defaults, and the global worksheet options that are in effect. To return to your worksheet, press the [SPACE BAR].

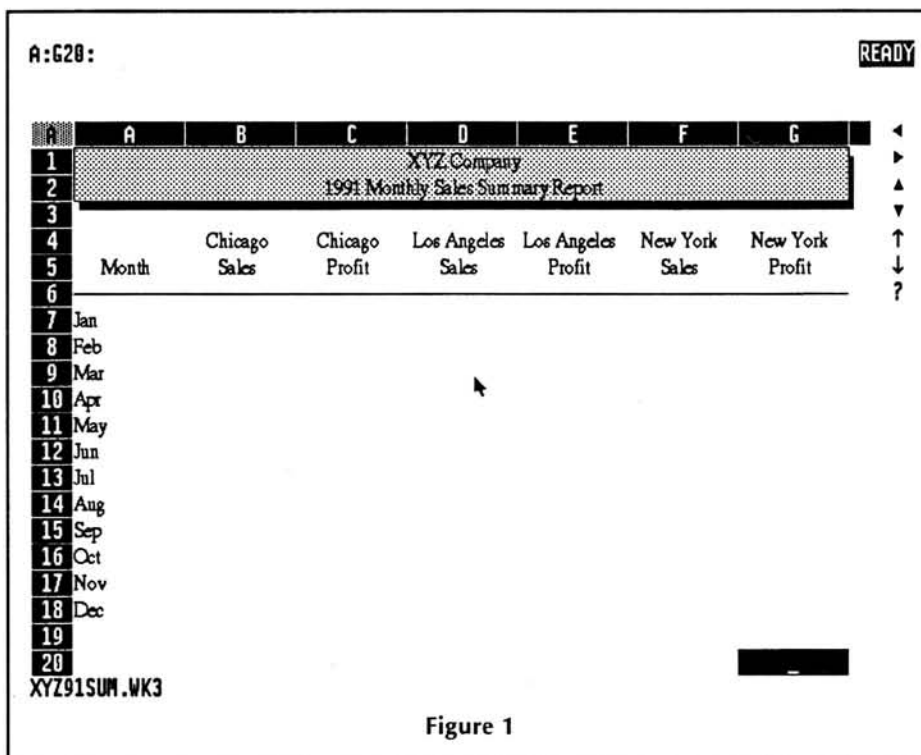


Figure 1



Available memory: 1672938 of 1931074 Bytes (87%)

Processor: 80386  
Math coprocessor: None

Recalculation:  
Method..... Automatic  
Order..... Natural  
Iterations..... 1

Circular reference: (None)

Cell display:  
Format..... (G)  
Label prefix.....  
Column width..... 10  
Zero setting..... No

Global protection: Off

XYZ91SUM.WK3

Figure 2

A:G20: READY

	A	B	C	D	E	F	G
1	XYZ Company						
2	1991 Monthly Sales Summary Report						
3							
4		Chicago	Chicago	Los Angeles	Los Angeles	New York	New York
5	Month	Sales	Profit	Sales	Profit	Sales	Profit
6							
7	Jan	91218.38	28380.24				
8	Feb	112276.48	24833.28				
9	Mar	93047.18	25233.17				
10	Apr	87840.39	24802.23				
11	May	92817.49	25002.14				
12	Jun	60061.39	20798.45				
13	Jul	74773.29	19882.82				
14	Aug	79965.58	-1271.16				
15	Sep	91187.55	11747.55				
16	Oct	94899.47	20599.67				
17	Nov	104472.11	17160.03				
18	Dec	120980.34	27571.84				
19							
20							

XYZ91SUM.WK3

Figure 3

**Putting It All Together**

In Part 2, you completed the individual branch worksheets. What remains is to transfer the desired information to the summary worksheet. Move the cell pointer to A:B7. In order to update the summary report correctly, this cell should contain the January sales for the Chicago branch of XYZ Company. All of the Chicago branch information is contained on worksheet B. In order to transfer the information from the detail worksheet to the summary worksheet, you need to enter a formula. This formula needs to reference both the worksheet letter and the cell location from which the information is being transferred. With the cell pointer at A:B7, type "+", but do not press [ENTER] yet. Press [CTRL-PGUP] to move to worksheet B. In the

second line of the control panel you will see that 1-2-3 has appended the current cell location following the plus sign. Also notice that the mode indicator in the top right corner of the screen indicates that 1-2-3 is in "POINT" mode. Using the arrow keys, move the cell pointer to location B:B7, which is the January Gross Sales figure for the Chicago branch, and press [ENTER]. 1-2-3 will complete the operation by updating the formula in location A:B7 to read "+B:B7". The actual figure in this cell should be "91218.38". (If you are unsure of the exact location that you require for your formula, it is safer to point at the cell that you want. This becomes important as worksheets become more complex because it is difficult to remember exact cell locations.)

With the cell pointer in location A:B7, enter /Copy. When 1-2-3 prompts, "Enter range to copy FROM:", press [ENTER], since you want to copy the formula in cell A:B7. When 1-2-3 prompts, "Enter range to copy TO:", move the cell pointer to location A:B8 and press the period key [.] to anchor the beginning of the target range. Move the cell pointer to location A:B18, which is the end of the target range, and press [ENTER]. 1-2-3 will complete the process by copying the formula in A:B7 to the range A:B8 through A:B18. Notice that these figures are the exact figures shown on the Chicago worksheet for Gross Sales. As you can see, copying between worksheets is very similar to copying within a single worksheet.

Move the cell pointer to location A:C7.

A:G20: READY

	A	B	C	D	E	F	G
1	XYZ Company						
2	1991 Monthly Sales Summary Report						
3							
4		Chicago	Chicago	Los Angeles	Los Angeles	New York	New York
5	Month	Sales	Profit	Sales	Profit	Sales	Profit
6							
7	Jan	91218.38	28380.24	79000	20000	128000	29000
8	Feb	112276.48	24833.28	93000	21000	119000	31000
9	Mar	93047.18	25233.17	97000	6000	99000	-2000
10	Apr	87840.39	24802.23	102000	7000	122000	24000
11	May	92817.49	25002.14	86000	17000	103000	32000
12	Jun	60061.39	20798.45	78000	15000	91000	32000
13	Jul	74773.29	19882.82	69000	18000	94000	31000
14	Aug	79965.58	-1271.16	83000	13000	102000	26000
15	Sep	91187.55	11747.55	92000	13000	142000	24000
16	Oct	94899.47	20599.67	88000	10000	121000	28000
17	Nov	104472.11	17160.03	94000	-9000	133000	24000
18	Dec	120980.34	27571.84	108000	16000	151000	27000
19							
20							

XYZ91SUM.WK3

Figure 4

A:G20: READY

	A	B	C	D	E	F	G
1	XYZ Company						
2	1991 Monthly Sales Summary Report						
3							
4		Chicago	Chicago	Los Angeles	Los Angeles	New York	New York
5	Month	Sales	Profit	Sales	Profit	Sales	Profit
6							
7	Jan	91,218.38	28,380.24	79,000.00	20,000.00	128,000.00	29,000.00
8	Feb	112,276.48	24,833.28	93,000.00	21,000.00	119,000.00	31,000.00
9	Mar	93,047.18	25,233.17	97,000.00	6,000.00	99,000.00	(2,000.00)
10	Apr	87,840.39	24,802.23	102,000.00	7,000.00	122,000.00	24,000.00
11	May	92,817.49	25,002.14	86,000.00	17,000.00	103,000.00	32,000.00
12	Jun	60,061.39	20,798.45	78,000.00	15,000.00	91,000.00	32,000.00
13	Jul	74,773.29	19,882.82	69,000.00	18,000.00	94,000.00	31,000.00
14	Aug	79,965.58	(1,271.16)	83,000.00	13,000.00	102,000.00	26,000.00
15	Sep	91,187.55	11,747.55	92,000.00	13,000.00	142,000.00	24,000.00
16	Oct	94,899.47	20,599.67	88,000.00	10,000.00	121,000.00	28,000.00
17	Nov	104,472.11	17,160.03	94,000.00	(9,000.00)	133,000.00	24,000.00
18	Dec	120,980.34	27,571.84	108,000.00	16,000.00	151,000.00	27,000.00
19							
20							

XYZ91SUM.WK3

Figure 5

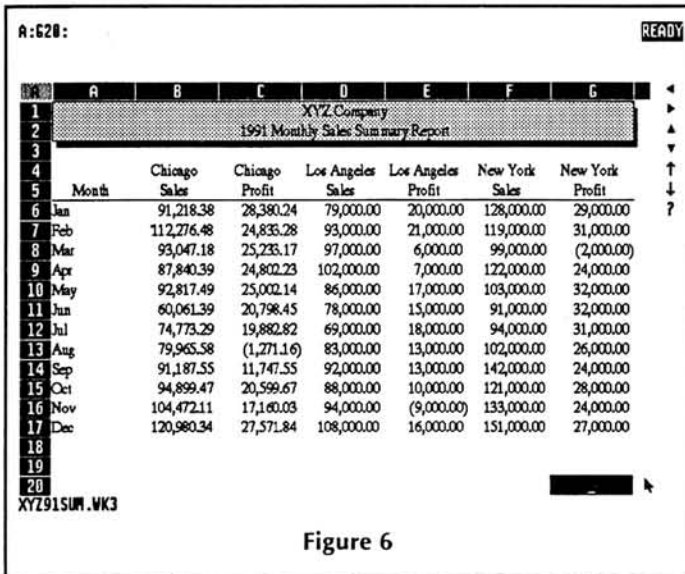


Figure 6

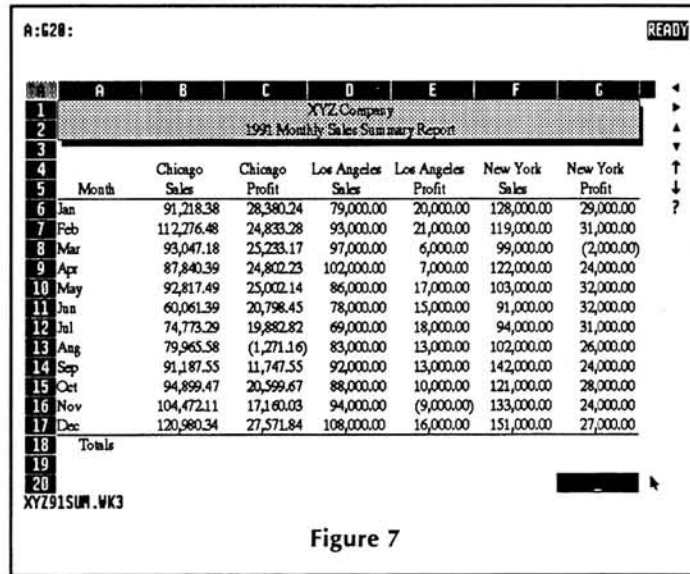


Figure 7

This cell needs to contain the January profit for the Chicago branch of XYZ company. With the cell pointer at location A:C7, type "+", but do not press [ENTER] yet. Press [CTRL-PGUP] to move to worksheet B. Move the cell pointer to location B:D7, which is the January profit figure for the Chicago branch, and press [ENTER]. 1-2-3 will update the formula in the first line of the control panel to reflect the cell you were pointing at, and the figure "28380.24" should appear in location A:C7. Copy the formula in cell A:C7 to the range A:C8 through A:C18. If you completed these steps properly, worksheet A should look like Figure 3.

Using the same general procedure as outlined previously, complete the formulas for the Los Angeles and New York branches of XYZ company. Remember that the detail worksheet for the Los Angeles branch is worksheet C, and the detail worksheet for

the New York branch is worksheet D. If you completed these steps properly, worksheet A should look like Figure 4.

Since you stored all of the detail information for the individual branches on their own worksheets, you have the option of selecting only the information that you want presented in your summary report. In this case, all of the calculations were done on the individual branch worksheets. Only the pertinent information was transferred to the summary worksheet, creating a smaller, more concise report. The detailed information is still available, but it doesn't clutter up the summary report.

### Formatting

If you look closely at Figure 4, you will notice that the numbers are not formatted correctly. Some have decimal points, and others do not. You could format a range of numbers using /Range Format, but 1-2-3

also allows you to set a global format for a worksheet. With the cell pointer located on sheet A, enter /Worksheet Global Format ,(comma) [ENTER]. All of the numbers on worksheet A should now be aligned properly, and your worksheet should look like Figure 5. Text is not affected, since cells with text in them begin with a label prefix, which tells 1-2-3 to treat these cells as text.

### More WYSIWYG

In order to make the summary report even more attractive, you can use some additional WYSIWYG enhancements. Move the cell pointer to location A:A6. Notice that this cell contains "\". As you will recall from Part 1, the backslash (\) is the label prefix for a repeating label, and the hyphen (-) is the character to be repeated for the entire width of the cell. This creates a horizontal line through the center of the cell, but some monitors and printers

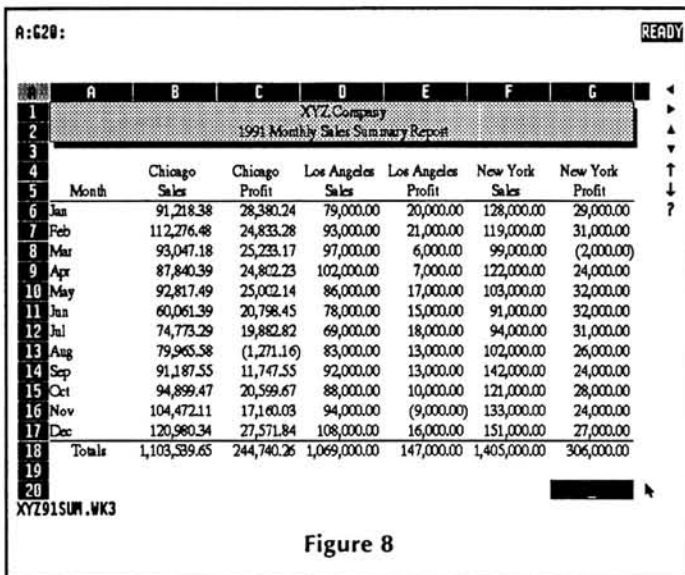


Figure 8

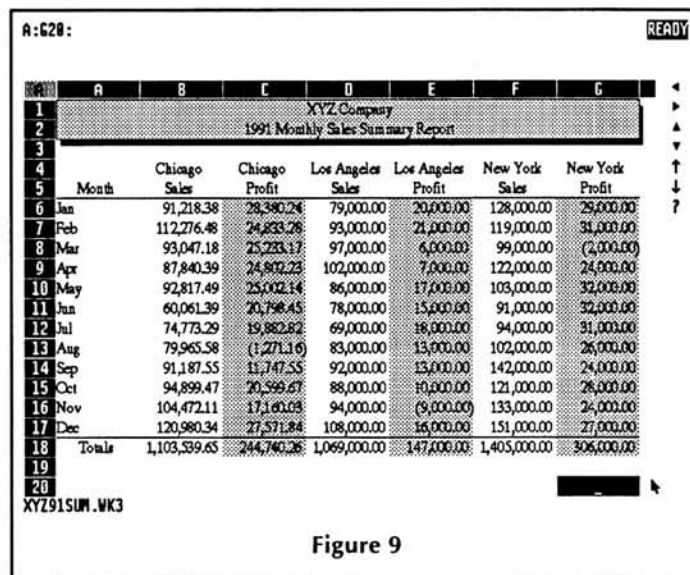


Figure 9

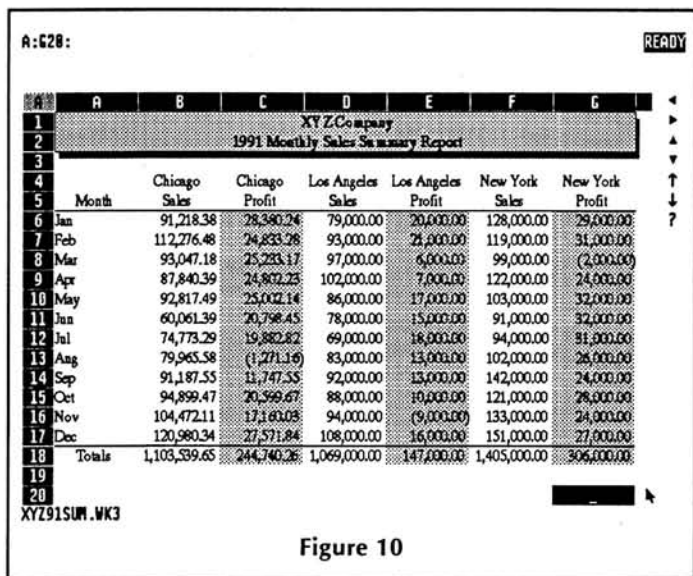


Figure 10

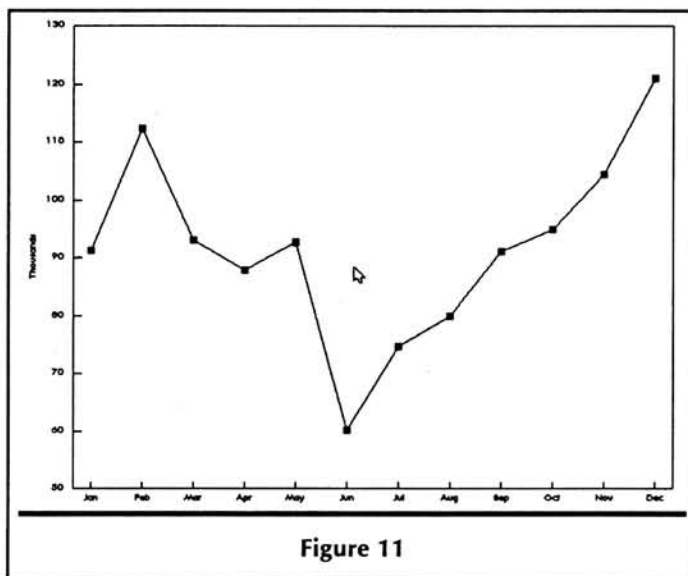


Figure 11

show this as a series of hyphens (—), rather than as a solid line. WYSIWYG allows you to draw solid lines that do not have this limitation. With the cell pointer at location A:A6, enter /Worksheet Delete Row [ENTER]. Notice that the previous contents of row 6 have been deleted, and 1-2-3 moved the rest of your data up one line. Also note that none of the figures have changed. 1-2-3 automatically protects the integrity of all formulas when moved or copied to their new locations. Move the cell pointer to location A:A5, and enter :Format Lines Bottom. When 1-2-3 prompts, “Change the attributes of range:”, use the arrow keys to highlight the range A:A5 through A:G5, and press [ENTER]. If you completed these steps correctly, worksheet A should look like Figure 6.

WYSIWYG lines also have a less obvious benefit. They do not take up any additional cells, so your worksheets become

more compact. As your worksheets become larger and more complicated, this can be a very useful feature.

Move the cell pointer to location A:A18, type “^Totals”, and press [ENTER]. In order to draw a separation line, enter :Format Lines Top. When 1-2-3 prompts, “Change the attributes of range:”, highlight the range A:A18 through A:G18, and press [ENTER]. 1-2-3 placed a WYSIWYG line on the top of the cells in the range A:A18 through A:G18, and your worksheet should look like Figure 7.

Move the cell pointer to location A:B18. In order to total the entire column, type “@SUM(A:B6.A:B17)” and press [ENTER]. You may also use the “POINT” method that we used in Part 2 of this series. Copy the formula in cell A:B18 to the range A:C18 through A:G18 using the skills you learned earlier in this series. When completed, worksheet A should look like Figure

8.

In order to enhance the appearance of the summary worksheet, move the cell pointer to location A:C6. Enter :Format Shade Light. When 1-2-3 prompts, “Change the attributes of range:”, use the arrow keys to highlight the range from A:C6 through A:C18, and press [ENTER]. 1-2-3 adds a light shading to the range you highlighted, making it easier to locate the column of interest. This same technique can be used on a row to make reports easier to follow. Use WYSIWYG to add shading to the Los Angeles and New York Profit columns. When completed, worksheet A should look like Figure 9.

Move the cell pointer to location A:A1. In order to make the worksheet title more pronounced, enter :Format Bold Set. When 1-2-3 prompts, “Change the attributes of range:”, use the arrow keys to highlight the range A:A1 through A:A2, and press [EN-

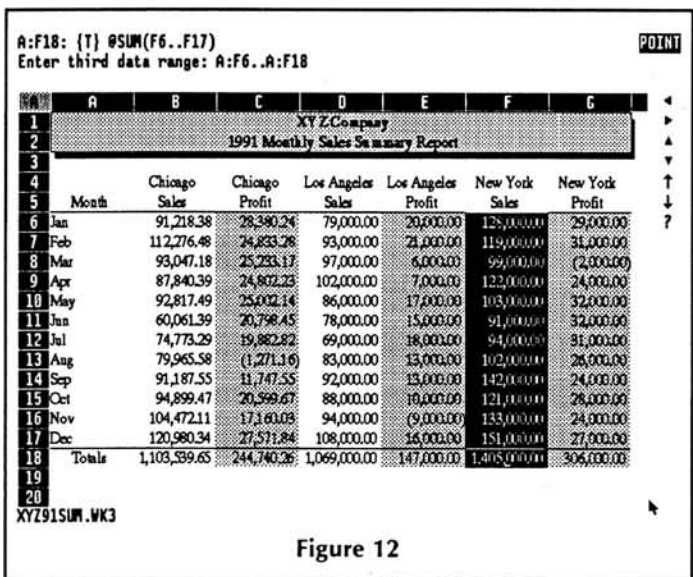


Figure 12

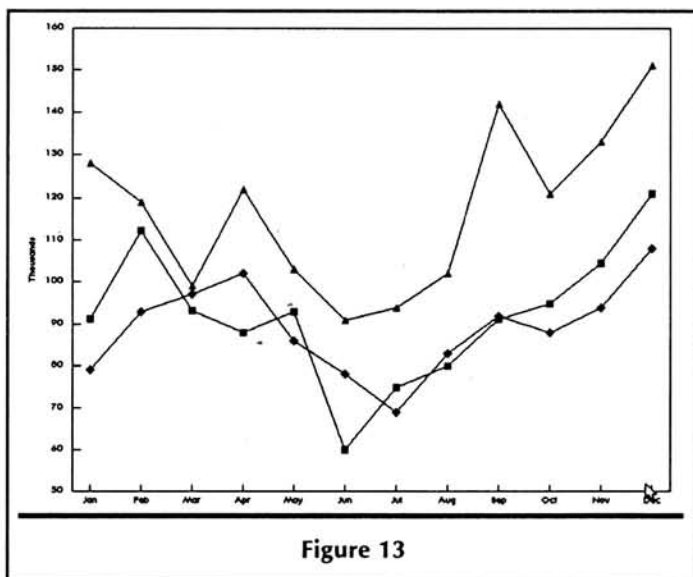


Figure 13



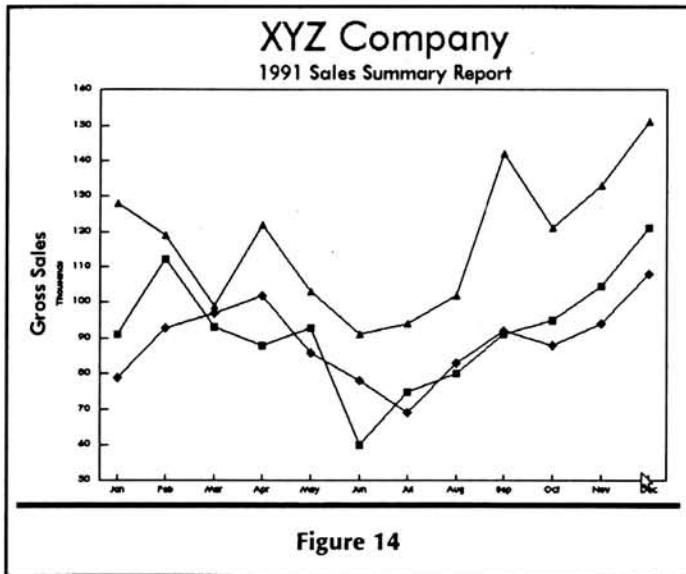


Figure 14

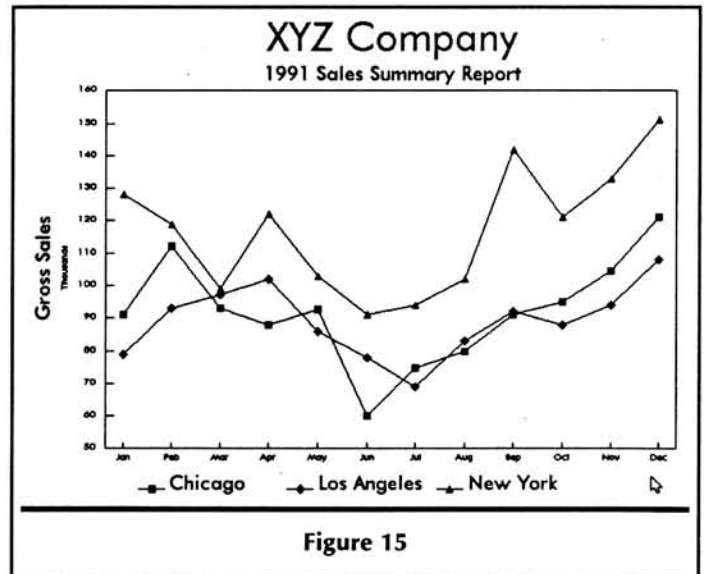


Figure 15

TER]. It is not necessary to highlight the entire range from A:A1 through A:G2, since your text is located only in cells A:A1 and A:A2. The title text should now appear darker and bolder, as shown in Figure 10.

### Graphing

Many presentations can benefit from the inclusion of graphs to help illustrate specific points, such as trends that might not be obvious from a numeric display. 1-2-3 offers a great deal of flexibility in creating graphs. There are several different types of graphs available in 1-2-3, including Line, Bar, XY, Stack-Bar, Pie, and more. A line graph would be an obvious choice to present the type of information contained in a monthly sales summary report.

Enter /Graph to move to the graph menu of 1-2-3. This menu contains all of the graph related commands for 1-2-3, excluding WYSIWYG graph commands, which

will be covered in a future article. Return to your worksheet by pressing [ESC] [ESC] or by selecting the Quit command. As things become more complicated, it is important to remember that if you make a mistake, you can use the [ESC] key to back yourself out of trouble. In the beginning of this section, I will give the commands which will eventually return you to your worksheet after an operation is completed. This may seem unnecessary to some people, but will give everyone a common starting point. If you feel comfortable enough with 1-2-3 to use any shortcuts you know, by all means use them.

Enter /Graph Options B&W Quit Quit. This command sets up 1-2-3 to display graphs in Black & White mode, which is consistent with the screen captures. 1-2-3 graphs can be very colorful, but most people do not have access to color printers on which to print them. It is important to learn

how to manipulate the graphs in Black & White because the vast majority of people will be printing graphs in that mode. Laser printers are especially good at printing graphs since they are superior to dot matrix printers at shading.

Enter /Graph Type Line Quit, to select a line graph. A line graph requires an X-axis range, and one or more data ranges. The X-axis is the horizontal portion of a graph and each of the data ranges comprise the vertical portion, or Y-axis. Move the cell pointer to A:A6. Enter /Graph X. When 1-2-3 prompts, "Enter x-axis range:", press the period key [.] to anchor the beginning of the range here, and use the arrow keys to move the cell pointer to A:A17. The range of cells from A:A6 through A:A17 should now be highlighted. Press [ENTER] Quit, telling 1-2-3 that this is the X-axis range for your graph. To specify the first data range, move the cell pointer to A:B6 and enter

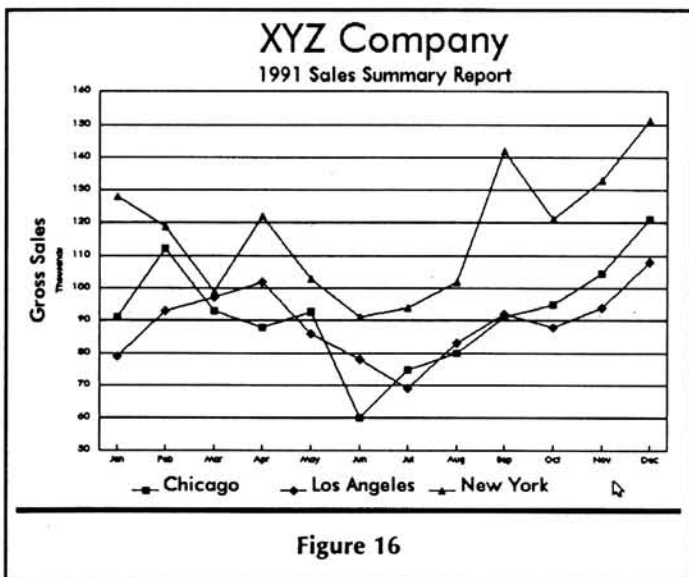


Figure 16

A:J4: READY

	D	E	F	G	H	I	J
1	XYZ Company					Chicago	1,103,339.65
2	1991 Sales Summary Report					Los Angeles	1,069,000.00
3						New York	1,405,000.00
4	Los Angeles	Los Angeles	New York	New York			
5	Sales	Profit	Sales	Profit			
6	79,000.00	20,000.00	128,000.00	29,000.00			
7	93,000.00	21,000.00	119,000.00	31,000.00			
8	97,000.00	6,000.00	99,000.00	(2,000.00)			
9	102,000.00	7,000.00	122,000.00	24,000.00			
10	86,000.00	17,000.00	103,000.00	32,000.00			
11	78,000.00	15,000.00	91,000.00	32,000.00			
12	69,000.00	18,000.00	94,000.00	31,000.00			
13	83,000.00	13,000.00	102,000.00	26,000.00			
14	92,000.00	15,000.00	142,000.00	24,000.00			
15	88,000.00	10,000.00	121,000.00	28,000.00			
16	94,000.00	(9,000.00)	133,000.00	24,000.00			
17	108,000.00	16,000.00	151,000.00	27,000.00			
18	1,069,000.00	147,000.00	1,405,000.00	306,000.00			
19							
20							

XYZ91SUM.WK3

Figure 17

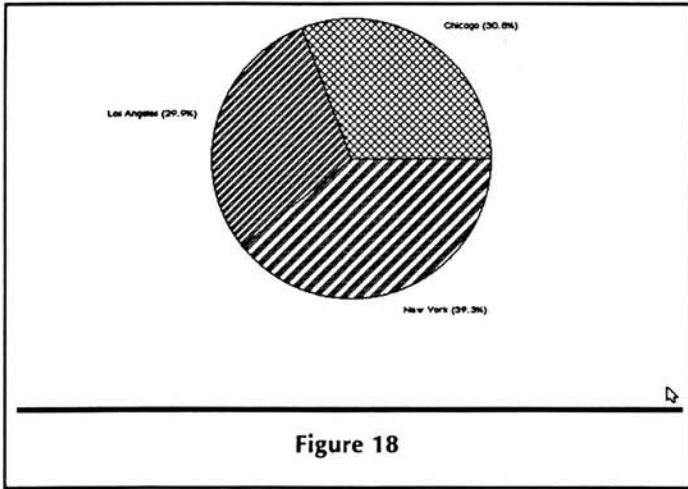


Figure 18

/Graph A. When 1-2-3 prompts, "Enter first data range:", press the period key [.] to anchor the beginning of the range here, and use the arrow keys to move the cell pointer to A:B17. Press [ENTER] to confirm the highlighted range as your first data range, and select Quit to return to your worksheet. Since you now have an X-axis and at least one data range, you can view your graph at this time. Enter /Graph View. You should see a screen that looks like Figure 11.

Notice that 1-2-3 has automatically scaled the Y-axis to contain the data in your first data range. Press the [SPACE BAR] to return to the graph menu, and select Quit to return to your worksheet. Another method to view your graph is to press [F10] when the mode indicator in the top right corner indicates "READY". To return to your worksheet, press the [SPACE BAR]. To add additional data ranges to your graph, move the cell pointer to A:D6 and enter /Graph B. When 1-2-3 prompts, "Enter second data range:", press the period key [.] to anchor the beginning of the target range at this location. Using the arrow keys, highlight the range from A:D6 through A:D17, press [ENTER], and select Quit.

#### A Shortcut

To add a third data range, move the cell pointer to A:F6 and enter /Graph C. When 1-2-3 prompts, "Enter third data range:", press the period key [.] to anchor the beginning of the target range at this location. Instead of using the arrow keys to highlight the range, press [END] [DOWN-ARROW]. (Make sure your NUMLOCK key is off, or use the dedicated keys if you have an enhanced keyboard.) Notice that the cell pointer has moved to the last entry in column F, and the entire range from A:F6 through A:F18 is highlighted as shown in Figure 12.

Press the [UP-ARROW] key to highlight only the range from A:F6 through A:F17, and press [ENTER]. Select Quit to

return to the worksheet. You can use [END] [UP-ARROW], [END] [DOWN-ARROW], [END] [LEFT-ARROW], and [END] [RIGHT-ARROW] to move quickly through columns and rows that are either empty or filled with data. If the cell pointer begins in an empty cell, the cell pointer will stop when it reaches a cell that contains data. If the cell pointer begins in a cell containing data, things become a little more complex, depending on the contents of the adjacent cell in the direction you wish to move. If the adjacent cell contains data, the cell pointer will stop at the last data filled cell. If the adjacent cell is empty, the cell pointer will skip over the empty cell or cells and stop in the first cell that contains data. This technique may be used whenever you need to highlight a range of cells. Press [F10] to view the graph with three data ranges selected. The graph should look like Figure 13.

Press the [SPACE BAR] to return to the worksheet. To make the graph more informative, enter /Graph Options Titles First. When 1-2-3 prompts, "Enter first line of graph title:", type "XYZ Company", and press [ENTER]. This time, instead of entering Quit Quit to return to the worksheet, select Titles Second. When 1-2-3 prompts, "Enter second line of graph title:", type "1991 Sales Summary Report", and press [ENTER]. You can also add a title to the Y-axis. Select Titles Y-Axis. When 1-2-3 prompts, "Enter y-axis title:", type "Gross Sales", and press [ENTER]. As you have just seen, many tasks may be completed within the graph menus and submenus before returning to the worksheet. Select Quit Quit to return to the worksheet. Press [F10] to view your graph, which should look like Figure 14.

Press the [SPACE BAR] to return to the worksheet. To add a legend to the graph, enter /Graph

Options Legend A. When 1-2-3 prompts, "Enter legend for first data range:", type "Chicago", and press [ENTER]. Select Legend B. When 1-2-3 prompts, "Enter legend for second data range:", type "Los Angeles", and press [ENTER]. Select Legend C. When 1-2-3 prompts, "Enter legend for third data range:", type "New York", and press [ENTER]. Select Quit Quit to return to the worksheet, and press [F10] to view the graph. Notice that the symbols next to each branch name coincide with the symbols located on each line of the graph, as shown in Figure 15.

Return to the worksheet by pressing the [SPACE BAR]. To add grid lines to the graph, enter /Graph Options Grid Horizontal Quit Quit. View the graph by pressing [F10]. The horizontal grid lines make the graph more readable, as shown in Figure 16.

Press the [SPACE BAR] to return to the worksheet. Name this graph for later use by entering /Graph Name Create. When 1-2-3 prompts, "Enter graph name:", type "XYZ91LIN", and press [ENTER]. When you name a graph, 1-2-3 stores all of the graph settings so that the graph can be redisplayed at any time. This feature is useful if you want to maintain several graphs for one worksheet. Select Quit to return to the worksheet.

#### Pie Charts

If you wanted to find out what percentage each of the branches of XYZ Company contributed to total sales in 1991, you would use a pie chart. A pie chart differs from a normal graph in that it contains only one data range (A) for its values. Each value is represented by a slice of pie in the chart. The X data range is used to identify each slice of pie with a specific label. 1-2-3 will automatically place these labels next to the corresponding slices of the pie.

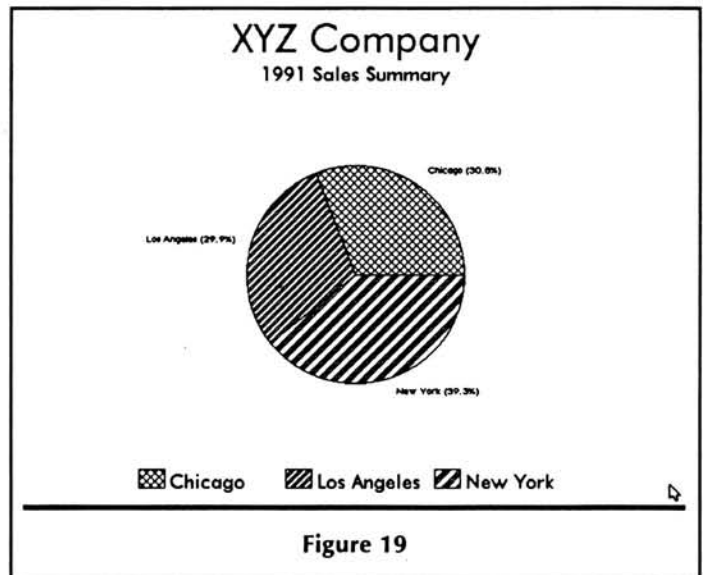


Figure 19

Pie charts have many options that are somewhat hidden from the casual 1-2-3 user. My recommendation is to set up a separate section containing pie chart information. This allows much more flexibility in creating pie charts.

To create a pie chart showing each branch's contribution to sales, proceed as follows. Move the cell pointer to A:11, type "Chicago", and press [ENTER]. Move the cell pointer to A:12, type "Los Angeles", and press [ENTER]. Move the cell pointer to A:13, type "New York", and press [ENTER]. Move the cell pointer to A:J1, type "+A:B18", and press [ENTER]. This cell should now contain the Chicago sales figure for the entire year. Repeat this procedure for the Los Angeles and New York branches by entering "+A:D18" in cell A:J2, and "+A:F18" in cell A:J3. Your worksheet should now look like Figure 17.

Enter /Graph Reset Graph Quit. This set of commands clears all current graph settings, allowing you to start over on a new graph. Enter /Graph Type Pie Quit to select a pie chart. Enter /Graph Options B&W Quit Quit to switch to Black & White mode. Move the cell pointer to A:11. Enter

/Graph X, press the period key [.] to anchor the cell pointer, use the arrow keys to highlight the range A:11 through A:13, press [ENTER], and select Quit. This range will be the labels for each slice of pie. Move the cell pointer to A:J1. Enter /Graph A, press the period key [.] to anchor the cell pointer, use the arrow keys to highlight the range A:J1 through A:J3, press [ENTER], and select Quit. This range will be the data range for the pie chart. Press [F10], and you should see a pie chart that looks like Figure 18.

Press the [SPACE BAR] to return to the worksheet. To enhance the appearance of this chart, enter /Graph Options Titles First. When 1-2-3 prompts, "Enter first line of graph title:", type "XYZ Company", and press [ENTER]. Since it is not necessary to return to the worksheet at this point, simply select Titles, Second. When 1-2-3 prompts, "Enter second line of graph title:", type "1991 Sales Summary", and press [ENTER]. Again, without returning to the worksheet, select Legend A. When 1-2-3 prompts, "Enter legend for first data range:", type "Chicago", and press [ENTER]. By completing the necessary tasks within the graph

menu before returning to the worksheet, you save time and keystrokes. Complete the legend for this chart by entering "Los Angeles" as the legend for the B data range, and "New York" as the legend for the C data range. When you have completed this task, return to the worksheet by selecting Quit Quit. Press [F10], and your pie chart should look like Figure 19.

Press the [SPACE BAR] to return to the worksheet. Name this graph by selecting /Graph Name Create. When 1-2-3 prompts, "Enter graph name:", type "XYZ91PIE", and press [ENTER]. Select Quit to return to the worksheet. Press [HOME] to move to cell A:A1. Save your worksheet by entering /File Save. If the file name shown is "XYZ91SUM.WK3", simply press [ENTER] Backup to save the file and a backup copy. If the file name is incorrect, type in the correct file name and press [ENTER].

### Next Time

In my next article, I will expand on the graphing concepts discussed here, and will include some of the lesser known and used graph features of 1-2-3. ✽

## Microsoft Announces Worldwide Availability of Windows 3.1

### Latest Version of Operating System Is Faster, More Reliable, Easier to Use

CHICAGO — April 6, 1992 — Microsoft Corporation today announced the worldwide availability of the Microsoft® Windows™ operating system version 3.1. The PC operating system includes more than 1,000 enhancements — based on the most extensive user feedback ever obtained in the computer industry — that make it faster, more robust and easier to use.

Microsoft said the enhancements to Windows had created unprecedented user demand, with more than one million orders worldwide in advance of today's release. As of this morning, more than 20,000 resellers worldwide were able to offer more than 750,000 copies of Windows 3.1 to customers. And Microsoft delivered the Windows 3.1 Upgrade to another 175,000 end users today via Federal Express.

To help customers, Microsoft has trained thousands of resellers on Windows 3.1 and has in place more than 500 product support personnel. The company will train more than 90,000 end users during April — and more than 125,000 by the end of June. In addition, more than 85 computer manufacturers are pre-installing Windows 3.1 on their PCs to meet the needs of customers who want Windows without having to install it themselves.

"Windows 3.1 was designed to make PCs easier for everyone to use," said Bill Gates, Microsoft chairman and CEO. "Windows 3.1 provides the power and stability of an advanced operating system, while its user interface and new features greatly simplify the use of a PC and help make people more productive. But we have not stopped with the product. We have developed a new set of programs we call the Commitment Behind the Box to help our customers have a great experience with Windows 3.1."

To develop Windows 3.1, Microsoft held the industry's largest and most rigorous beta test, covering more than 15,000 sites and a wide variety of machine configurations. The company conducted surveys of 11,000 households on computer usage,

sent field teams to study the use of Windows by corporate customers, and made improvements in the product to respond to all commonly asked questions by the more than 2,000 daily callers to its Microsoft Product Support Services.

The result is a product that incorporates major new technologies — TrueType™ fonts, Object Linking and Embedding (OLE), multimedia, and support for pen computing. A range of improvements were also made in installation and ease of use, speed and reliability of applications running under Windows and MS-DOS®, quality and speed of printing, network support, and power management, among many other things.

### Ease of Setup, Learning, and Use

Users of Windows 3.1 can get to their work fast — and work productively — as the result of a suite of enhancements:

- Express Setup lets users install the software by merely typing their name and specifying their printer. For advanced users and system administrators, easy custom configuration is also available.
- The Tutorial teaches basic tasks and lets new users be productive immediately.
- Context-sensitive Help in dialog boxes and more extensive Help files make clear and specific instructions just a mouse-click or keystroke away.
- A StartUp group instructs Windows to start up any application the user chooses automatically when the computer is turned on. The user simply drags and drops the application icon into the StartUp group.
- A range of improvements make the graphics in Windows quicker and easier to use, including icon titles that wordwrap under icons, new icons for MS-DOS operating system-based applications, new wallpaper and built-in screen-saver images. For laptop users, a new mouse cursor tracking control is designed for LCDs.
- Working directories and shortcut keys give users more speed



and flexibility in organizing their files and moving among applications.

### Improved Speed and Reliability

- File Manager operates ten times as fast, and formats disks more quickly. Split window displays let you browse through directories without opening separate windows.
- The completely redesigned SMARTDrive disk cache is ten to 100 percent faster; 32-bit disk access improves the response of MS-DOS applications; and new display drivers also contribute to speed improvements.
- Dynamic downloading of fonts and a universal printer driver make printing faster and more efficient; and a faster Print Manager lets users return to work on an application more quickly after starting a printing task.
- Parameter checking in Windows alerts developers to problems in their applications before they ship, resulting in more robust applications that cause users few problems; and diagnostic tools such as Dr. Watson help support personnel correct problems when they occur.
- If users do have application problems, detailed dialog boxes provide useful messages about the trouble, and users can close the offending application without having to exit and restart other applications or Windows.
- Users can also restart MS-DOS applications if they have problems, also without having to exit and restart other applications or Windows.

### New Capabilities, Technologies Under Windows, MS-DOS

- Advanced Power Management, an industry specification endorsed by Intel Corporation and Microsoft, works in Windows 3.1 to help reduce power requirements for battery-operated notebook PCs and other mobile computers, allowing them to operate up to 25 percent longer on each charge.
- MS-DOS applications run better. More memory is available; support is included for VGA graphics; MS-DOS applications run better in a window or in the background; the mouse now works with an MS-DOS application in a window; different sizes of fonts can be used with an MS-DOS application; more program information files (PIFs) are available, and disk-paging is improved.
- Scalable TrueType font technology provides instant access to typefaces in any point size and high-quality WYSIWYG output on any monitor or printer supported by Windows.
- Object Linking and Embedding (OLE) allows applications to work together seamlessly, by providing standard libraries, interfaces and protocols that applications can use to share information between applications; OLE applications become building blocks to let you produce compound documents containing text, data, charts, and graphical objects.
- Built-in multimedia functionality in Windows 3.1 lets applications control a range of multimedia devices, including audio boards and video players, with a single command set. Developers no longer need drivers for each brand or device type.

### Improved Network Support

- Windows can be automatically installed on a server for access from client workstations.
- A network administrator can use a batch file to automatically set up Windows on workstations of identical type and configuration.
- Windows works better with NetWare. Both the new network protocol (IPX) and shell for NetWare, extensively tested by both Microsoft and Novell, are included. Both can be installed manually; or, through a utility available in the Windows Resource Kit, can be installed automatically.
- An option allows persistent network connections, so users can be automatically reconnected to servers when they log back on

the system.

- Directory and file searches over servers are substantially faster, are handled more intelligently, and can be interrupted by the user.
- Numerous other new features simplify administration of NetWare, LAN Manager, and other networks.

### New Kits Available to Developers

In addition to improving Windows, Microsoft has improved its programs to support third-party application developers for Windows through updated versions of the Windows Software Development Kit (SDK) and Windows Driver Development Kit (DDK). The Windows 3.1 SDK includes twice as much documentation, new and enhanced tools and utilities, and development support for multimedia and pen computing. More than 75,000 Windows SDKs have been shipped to date. The SDK is available from Microsoft for \$349, with the Windows 3.1 Upgrade development kit available for \$150.

The DDK includes nearly 2,000 pages of documentation organized by driver type, new and enhanced sample sources and the new universal printer driver for Windows. The upgrade price of the DDK is \$150 on disk and \$99 on CD-ROM, the suggested retail price for the DDK is \$500.

### System Requirements and Pricing

Use of the Windows operating system version 3.1 requires MS-DOS version 3.1 or later (version 5.0 or later recommended); a PC with at least a 80286 microprocessor (80386SX or higher recommended); and 640K conventional plus 256K extended memory (80286 processors: 1024K extended memory recommended; 386 processors: 2048K extended memory recommended). A pointing device is strongly recommended.

Additional requirements included a 5.25-inch high-density or 3.5-inch disk drive and a hard disk with 6MB available (10MB recommended); EGA, VGA, Super VGA, XGA, 8514/A, Hercules® graphics card or compatible video graphics adapter and monitor support by the Windows operating system (color VGA or better recommended).

The Windows operating system version 3.1 is available for a suggested retail price of \$149.95. Current users of Windows can upgrade to Windows 3.1 at a special Microsoft discount price of \$49.99 between now and June 1, after which the suggested retail price is \$79.95. A special offer of \$99.99 for the Windows 3.1 Upgrade and special 44-font TrueType font package is good until June 1 and is \$179.99 suggested retail price thereafter. Additionally, Windows 3.1 may be purchased with either the Microsoft Mouse or the Microsoft BallPoint™ mouse; each Windows/Mouse package is available for the special price of \$225. Except for the special prices noted, prices are Suggested Retail Price.

Founded in 1975, Microsoft (NASDAQ "MSFT") has become the worldwide leader in software for personal computers. The company offers a wide range of products and services for business and personal use, each designed with the mission of making it easier and more enjoyable for people to take advantage of the full power of personal computing every day.

#####

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All prices listed are U.S. suggested retail prices.

**Editor's Note:** A full list of compatible hardware and software for Microsoft Windows 3.1 is available from Waggener Edstrom at (503) 245-0905. ✻





# HADES II

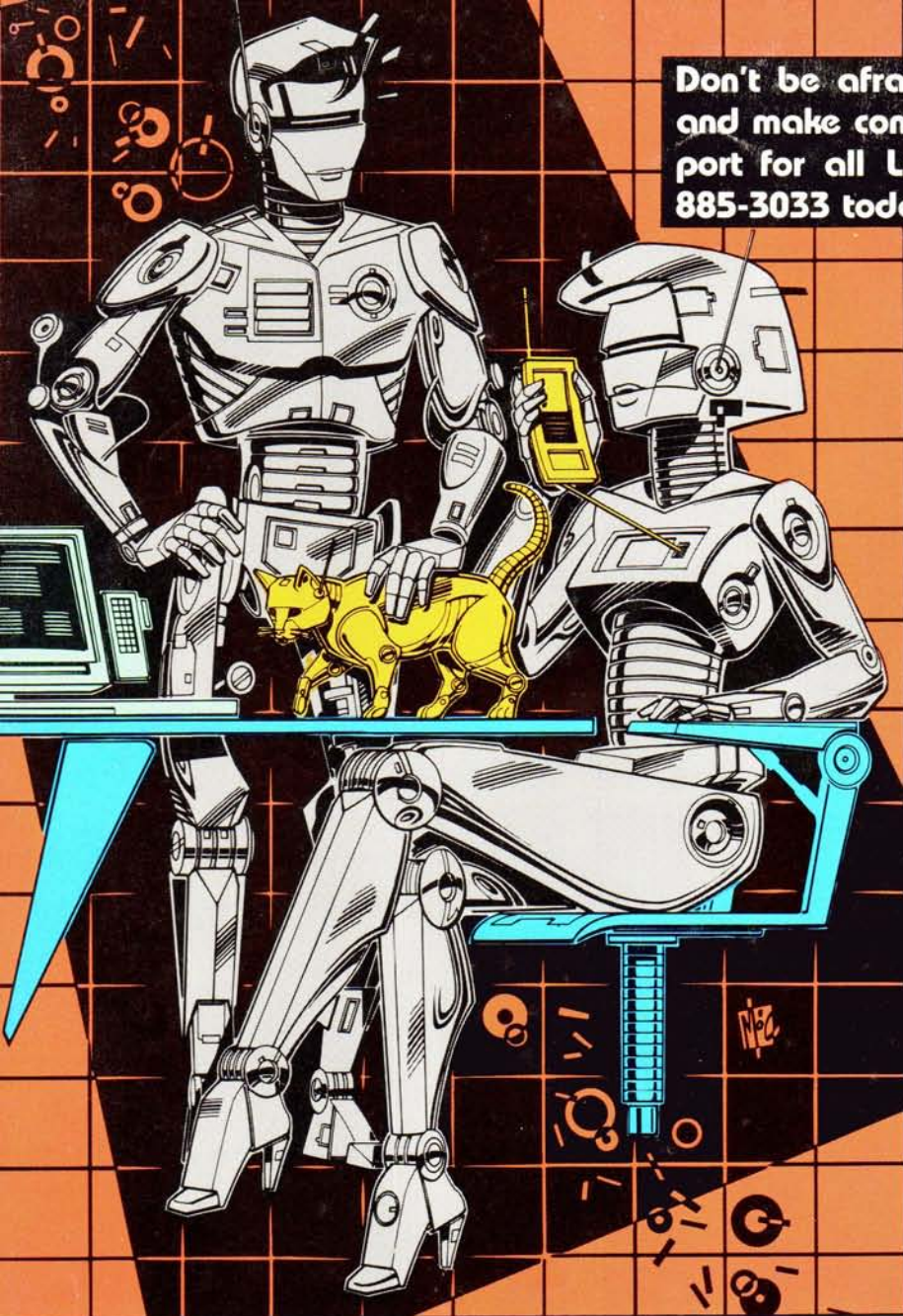
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```
HUGMCP Commands
F1 -- Prints This List, Your Storage Buffer Size, And How Many
      Bytes Are Presently In The Storage Buffer.
F2 -- Allows Sending A Defined Message, Or Character Sequence.
      These Messages Are Entered Using The (F6) Setup Command.
F3 -- Toggles The Storage Buffer On and Off. When The Buffer
      Is On, the Character On The 25th Line Will Be High-Lighted.
F4 -- Allows Saving Data To Disk From The Storage Buffer, Or
      Directly From The Modem By Way Of XMODEM Protocol.
F5 -- Allows Sending Data From Disk, Using Either XON-XOFF,
      Which Optionally Can Be Ignored, Or XMODEM Protocol.
F6 -- Enters The Setup Mode So This Software Can Be Configured.
F7 -- Clears Out Any Data That May Be In The Storage Buffer.
F8 -- Send Data In Storage Buffer To Printer.
F9 -- Exits Back To MS-DOS.

Storage Buffer = 524288 Bytes
Storage Buffer Usage = 0 Bytes

Select Message (A-0), (F1) To List, Anything Else To Abort --) _
F1=List F2=Msg F3=Buf F4=Save F5=Send F6=Clear F7=Clr F8=Print F9=Exit COM
```

```
HUGMCP Configuration Menu:
A --> Modify Read Rate
B --> Modify Parity Type
C --> Modify Baud Length
D --> Modify Or Add Radio-Messages
E --> Miscellaneous Functions
F --> Change Screen Color Assignments
G --> Display Current Configuration
H --> Make Changes Permanent

Select A-C, (F1) For Help, Anything Else To Quit --) _
Read Rate: 19200
Parity: NONE
Baud Length: 8
Reply: FULL
Response To Keyboard Disable: NO
Storage Buffer Data Parity Bit: SET TO ZERO
Send Modem Initialization Text: NO
Delete Character: CONTROL
Make Text Set To: CONTROL
F1=List F2=Msg F3=Buf F4=Save F5=Send F6=Clear F7=Clr F8=Print F9=Exit COM
```

```
HUGMCP Configuration Menu:
A --> Modify Read Rate
B --> Modify Parity Type
C --> Modify Baud Length
D --> Modify Or Add Radio-Messages
E --> Miscellaneous Functions
F --> Change Screen Color Assignments
G --> Display Current Configuration
H --> Make Changes Permanent

Select A-C, (F1) For Help, Anything Else To Quit --) _
Read Rate: 19200
Parity: NONE
Baud Length: 8
Reply: FULL
Response To Keyboard Disable: NO
Storage Buffer Data Parity Bit: SET TO ZERO
Send Modem Initialization Text: NO
Delete Character: CONTROL
Make Text Set To: CONTROL
F1=List F2=Msg F3=Buf F4=Save F5=Send F6=Clear F7=Clr F8=Print F9=Exit COM
```

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