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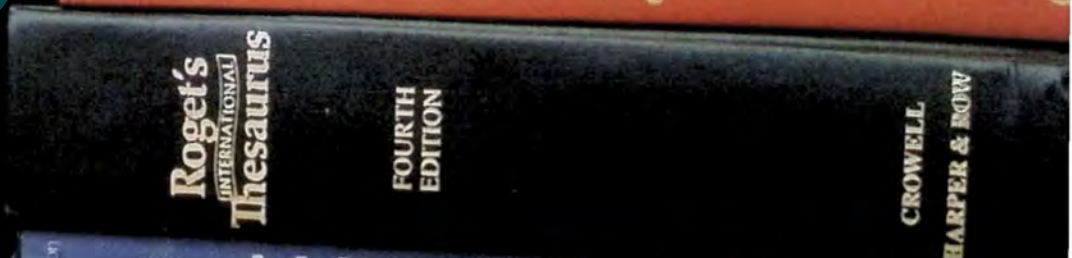
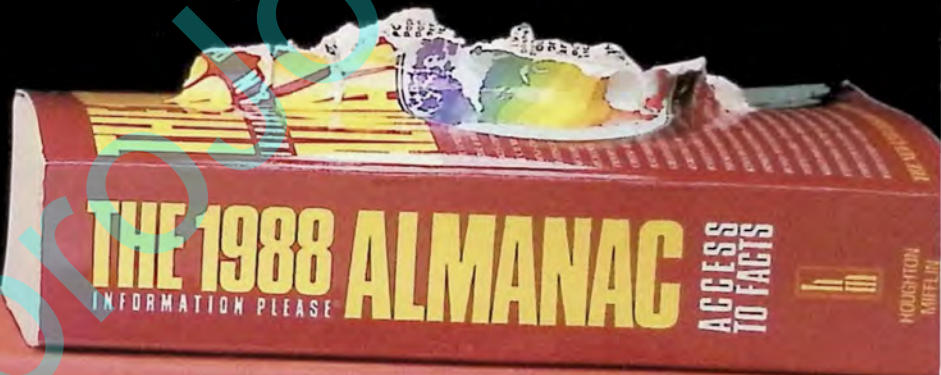
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Ray Bradbury has said that the science-fictional is all around us in the here-and-now and can afford us a lot of amazement, if we only stop to realize it. Nowhere is that more true than in the computer world. In fact, that's probably half the attraction of personal computers. Yes, they really do help us get work done quickly and efficiently—but they're also near the edge technologically, and that's the fun part. There's always something new and mind-boggling coming out or coming up.

Take CD-ROM (compact disc read-only memory) technology, for example: vast amounts of data stored on small, shimmering discs that would have been great as props in the original "Star Trek" series. *PROFILES* first examined CD-ROMs in Brock Meeks' article "550 Megabytes on a Bit of Rainbow" in June 1986, when the technology was just peeking over the horizon.

In this issue, Ted Silveira takes a second look to see what progress has been made in the last couple of years. In "CD-ROM Information Publishing," he observes that the technology is speeding right along—though it hasn't quite arrived for the average user—and will probably be part of the standard personal system in another few years. Its greatest promise is as a publishing medium, and Silveira looks at the ways it's now being employed in that capacity.

Our series of buyer's guides also continues in this issue with Jim Spickard's article, "How to Buy a Modem." Modems have become a truly indispen-

sable part of many home and office systems, and if you're ready to take the plunge, this article is for you. You'll get a thorough primer on the technology, useful consumer information, and a helpful list of questions to take shopping.

Kathleen Low offers additional valuable consumer information in her article "Mail Order Computer Books," a look at prominent computer book publishers, a computer user's dream bookstore, and a variety of computer book clubs.

Also in this issue are three helpful tutorials:

—For the beginning-to-intermediate user of MS-DOS, Ed Quillen provides a discussion of error messages, those cryptic and often daunting SOS's from your computer to you. He explains how to tell where they're coming from, how to figure out what to do about them, and specific first aid for the most common ones.

—Joseph Comanda explores ways to push dBASE III's label generator to its limits to create reports in the first part of his two-part series on generating reports in dBASE.

—Thomas Sutter explains how Perfect Writer users can change the command set in the Turbo Pascal editor (which is geared to WordStar users) to mimic Perfect Writer commands—a real boon to anyone who has been reluctant to learn new commands in order to use the Turbo editor.

Last but not least, see Ted Silveira's new column, "Microscope," beginning in this issue. In this column, Silveira, one of *PROFILES*'s most popular and respected "gurus," will take a closeup look at computers from the user's point of view. He'll provide tips and tricks for both CP/M and MS-DOS users, comments on new hardware and software, and forecasts of industry developments.

Our aim, as always, is to solve your computing problems, boost your productivity, and make life with your computer more enjoyable. Let us know how we're doing.

Gwyn Price

LETTERS

REMEMBER THE M IN LIM

I like to read enthusiastic reviews, like Jack Nimersheim's review of Microsoft Excel for the PC in "At a Glance" in the May 1988 issue.

But I think Mr. Nimersheim fired a dud with his comment on the "irony" of Microsoft outdoing Lotus in using expanded memory efficiently. Perhaps he should have recognized that there's nothing ironic at all about this, since the "LIM" abbreviation he refers to was originally identified as the "L/M/M" standard. This stands for "Lotus/Intel/Microsoft," as in the Lotus/Intel/Microsoft Expanded Memory Specification. Why shouldn't Microsoft, which develops both application software and operating system software, have a good handle on how to use memory efficiently?

Perhaps Mr. Nimersheim would appreciate the "irony" of the fact that the MS-DOS operating system is named for Microsoft, as in "Microsoft Disk Operating System."

Jonathan D. Miller
St. Louis, Missouri

Jack Nimersheim responds: "You are correct in pointing out that the 'M' in LIM refers to Microsoft. The statement you refer to [page 59] was meant to be relative to Microsoft's more efficient use of LIM expanded memory. If the statement was unclear, I certainly take full responsibility. Unfortunately, reviews such as this rarely allow enough space to present all the details."

IF CP/M IS DEAD, CAN MS-DOS BE FAR BEHIND?

As an owner of three Kaypro CP/M computers that I use regularly at home and at work, I read Ted Silveira's article "CP/M Survival in an MS-DOS World" (May 1988, "CP/M Only") with interest and amusement. The thought kept running through my head that in a few years, Silveira could submit the same article for publication, but substitute "MS-DOS" wherever "CP/M" appears. Someday, my MS-DOS friends, your operating environment will die, too. It may take a lit-

tle longer, but it will happen. In fact, with the new OS/2 and Macintosh systems out there, it is already starting.

My advice to all CP/M users is, if your system does everything you need of it, stick with it. For most of us, a computer is a tool to get one or more jobs done. Don't spend the money until you need a new or different tool.

By the way, I also use an MS-DOS [computer], the Epson Equity I, and a Macintosh Plus on occasion. They are mere tools as well.

William E. Jones
Upper Arlington, Ohio

Many CP/M users we have talked to feel the same way. Their trusty Kaypro CP/M computers have served their purpose, with enough memory, speed, and software to fit their home or business needs.

Many others who started out with CP/M Kaypros have added other computer systems (Macs, MS-DOS) as their needs have changed or expanded. Most haven't abandoned CP/M, either. They still use their "first" computers for tasks such as maintaining mailing lists, office management, and telecommunications.

Still other CP/M users who realized that MS-DOS systems offered more flexibility and software choices were unimpressed with the initial MS-DOS offerings. They passed on the PC/XT clones completely, and were mildly impressed with AT-compatible selections. From what we hear, it is the 80386 machines these knowledgeable folks are taking a closer look at.

We can only wait to see what this kaleidoscopic industry deals us next.

ANOTHER CONVERT TO MS-DOS?

I currently own a Kaypro 2X, and probably what is one of the last Kaypro 1s made. Since most of my work is in writing and editing, with limited use of database and spreadsheet software, the CP/M environment has served me admirably—so much so that I can see only one good reason to move up to MS-DOS, and that is [to leave behind] the keyboard that comes with Kaypro's CP/M machines. Carpal-tunnel syndrome, also known as the "morning-

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It's not as if Kaypro never, ever produced a decent keyboard for the old portables—I used one of the MS-DOS 16s, and it was beautiful. Are there any solutions? After-market keyboards I may have overlooked? I love my machines, but I am becoming desperate. To even consider laying out \$1,600 or more for an MS-DOS machine and software, simply for the keyboard, requires desperation indeed. Someday, the bells and whistles would be great—maybe even a laser printer—but in the meantime, I hope someone has a more immediate alternative that can spell "relief."

Jim Mann
Freedom, California

A quick survey of various CP/M adver-

tisers, Kaypro technical support personnel, and the PROFILES staff resulted in bad news. No one knew of any solutions for your problem. One of the biggest constraints will be finding a keyboard unit with a metal casing that will fit the Kaypro's portable case. Sounds like a lot of custom work—if you could find someone who would build it—and therefore, a lot of money.

If any of our resourceful CP/M users have come up with solutions to this problem, please send them in, we will gladly publish any answers to Mr. Mann's question

WORDSTAR 4 BLUES

I've been a CP/M and WordStar user since 1982. (I earn my living writing with a Kaypro 2X and WordStar.) While the latest WordStar 4 has some welcome new

features, the price I pay in speed and productivity loss is more than a little annoying.

Example: In editing I always save major deletions at the bottom of my working file. (I never know when I might want to restore them.) The process is simple: I block mark the deletion, then ^QC takes me to the bottom of the file, then I ^KV to move the block, then I ^QV to return the cursor to its previous position.

Working on a 14-page file with WordStar 3.3, the process takes 55 seconds—a long enough wait. With WordStar 4, it takes two minutes and 15 seconds—an interminable, costly, distracting wait! (Going through this two or three times in a ten-minute period, I start to look longingly at my old Smith Corona.)

Some other problems: Without windows (still not introduced in 4.0) I used

to compare copy blocks side by side by marking one of the paragraphs, writing it to a file, and printing that file out while I was still in the edit mode. Then I held the printout up to the screen and compared the two blocks. I can't do that with 4.0. I must write the paragraph to a file, then save the file I'm working on, print out the paragraph file, then re-load the working file. Drag.

Aborting unwanted commands used to be assigned to ESC. Now it's the job of ^U. But not quite. There are some aborts that still require ESC. If I misjudge and use ESC, I get the Macro menu. If I misjudge and use ^U, I sometimes get two pages of some previous deletion dropped into the middle of my text because ^U is also the command to restore the last deleted text. Another drag.

Let's say I want to delete some files and give myself some more memory while I'm editing. With all previous WS versions, I type ^KF to put up the file directory and via ^KJ delete unneeded files as I identify them from the directory at the top of the screen. No need to leave the working file. I can't do that with WS 4. If I press ^KF I lose the working file. All that's on the screen is the directory. So I have to keep going back to ^KF or write down the names of the files I want to dump.

The good features are clearly good. And some of what I'm carping about is no more than annoying. But the slow processing (with WS 4 the system is always pausing to catch up) is unacceptable. It's as if automotive engineers cut car horsepower in half in order to power a lot of bells and whistles on the dash. (If ^U/UNDO is the culprit, I would gladly trade it for some speed.)

Perhaps it's part of the marketing plan—to show us CP/M holdouts paradise via wonderful new features, and then, by adding the intolerable burden of slow processing, force us to buy hard-disk DOS systems to enjoy those features.

Alan Glass
Great Neck, New York

Any complaints CP/M WordStar 4.0 users have should also be addressed to Micro-

Pro International Corp., 33 San Pablo Avenue, San Rafael, CA 94903. Rumor has it that MicroPro will consider releasing a CP/M version of WordStar 5.0 if there is enough demand in the CP/M community. It wouldn't hurt to let them know what you do and do not like about version 4.0.

'HOTRODDING' ADDENDUM

I just finished "hotrodding" my early Kaypro PC as described in Ed Quillen's article in the June 1988 issue. The increased speed resulting from the new crystal and the V20 chip was a great improvement. However, Mr. Quillen's article did not mention any way to determine if the old 8087 math co-processor chips can operate accurately at the higher speed. Is there any test to determine if old 8087s, which presumably

were not rated for 8 MHz, will function properly? Or must I simply check my results carefully, which may not be easy to do, to try to see if the old chip is working reliably?

Articles like Mr. Quillen's and your new "On the Practical Side" series on upgrading MS-DOS computers make my PROFILES subscription worthwhile. Please keep this kind of information coming.

Robert E. Oshel
Silver Spring, Maryland

Since we had so many calls and letters about "Hotrodding Your Early Kaypro PC," we decided a follow-up was in order. See Marshall Moseley's "Hotrodding Update" on page 26 for answers to this and other related questions.

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BY MARSHALL L. MOSELEY

I hear the terms "extended" and "expanded" memory being tossed about quite frequently. What are they and what are their differences?

To understand what expanded or extended memory is, you need to first understand what memory is and how it fits into your computer system.

Memory is made up of a series of integrated circuits called memory chips, which hold data both prior to and after its use by the microprocessor. It's sort of a staging area where that data is temporarily stored. The more memory you have, the more powerful your computer is, because it can manipulate more information.

Memory is measured in bytes, kilobytes, and megabytes. A byte is a string of eight digits, consisting of ones and zeros; one byte is used to represent one character, such as "A" or "+," so it is useful to think of a byte as one character. A kilobyte is 1,024 bytes, or about as much information as one printed page. A megabyte is 1,024 kilobytes.

Expanded Memory. A PC/XT-type computer, such as the Kaypro PC, has an 8088 processor, which can only recognize one megabyte of memory (1 MB). Under MS-DOS, 384 kilobytes of that megabyte is used by various hardware components, so the maximum addressable memory is 640K. That isn't the limit on how much memory can fit in the machine, mind you; it's just the limit on how much MS-DOS will recognize. This restriction is something users have been butting into and programmers have had to work around for years. In 1986, Lotus Development, Intel, and Microsoft collaborated to create a hardware and software standard by which memory above the 640K limit could be addressed. The result was the Lotus-Intel-Microsoft Expanded Memory Specification, or EMS.

To use expanded memory, you must start with an expansion board that meets EMS hardware standards. Then the software you use must employ EMS memory management techniques, which involves the use of a 64K chunk of memory in the middle of the 384K used by the hardware. Under EMS, that small area addresses

however many megabytes of expanded memory are available. The 64K chunk acts as a sort of "window" that moves through expansion memory, positioning itself over the information that is needed at the moment. This process of shuffling data in and out of a small section of memory is called "bank switching."

The EMS allows any PC-compatible computer to exceed the 640K memory limitation, provided you use a program that also supports EMS. PC Excel does this, as does SideKick Plus. Any new product (or update) that works with calculations, such as a spreadsheet or a database, should support EMS.

Extended Memory. Computers that use the 80286 or 80386 microprocessors can directly access much more memory than the older 8088-based machines. 80286-based machines can handle up to 16 MB of memory, while 80386-based computers will address a billion bytes, or one gigabyte. Unfortunately, most of these computers still use good old MS-DOS as their operating system, meaning they are still limited to 1 MB of memory. Extended memory is any memory installed in an 80286 or 80386 computer that exceeds that 1MB limitation. Extended memory differs from expanded memory in that it is directly addressable from the microprocessor—no bank switching, no software tricks. The memory is there and the processor can use it; the only limitation is the operating system.

Extended memory is currently being used in quite a few ways. First, many extended memory board manufacturers (Kaypro among them) include a special software driver with their product that makes an extended memory board behave like an expanded memory board. That way you have access to the newer software that uses EMS. In local area networks (LANs), extended memory is used for disk caching, which speeds up disk operations immensely. Many people use extended memory to create large RAM disks, on which they do their computing work. An engineer friend of mine does all his electronic design using AutoCAD on a six-megabyte RAM disk, then "backs up" his data to a hard disk at the end of the day.

But the real power of extended memory will become apparent with the increasing popularity of OS/2, the multi-tasking operating system for 80286- and 80386-based computers from Microsoft. Using sophisticated memory management techniques, OS/2 will run multiple programs at the same time, providing a degree of sophistication not found in today's MS-DOS computers.

I have a Kaypro Half-Length Multi-Video board (HLMV), which emulates CGA on a monochrome screen. I find myself switching between standard monochrome and CGA emulation quite frequently. It is tedious, however, to run the menu-driven video mode switching program MS.COM every time I want to change emulations. Is there an alternative?

There are two alternatives. One is to use VSWITCH.COM, which came as part of your software bundle. VSWITCH is a RAM-resident program designed to let you switch video modes by pressing a key sequence (Ctrl-Alt-) and Ctrl-Alt-(). It seemed like a good idea at the time, but as anyone who has worked for Kaypro Software Support will tell you, it turned into a nightmare. (People would call in having "VSWITCHed" out of, say, Microsoft Windows, the bit-mapped color graphics environment. This is the computing equivalent of shifting from fourth into first gear at 60 miles an hour.) As VSWITCH became more widely used, it became apparent that RAM-resident video mode switching was a bad idea. I recommend that you not use VSWITCH. (Those of you with the full length multi-video board can use the MS-DOS MODE command instead; type `MODE CO80` for CGA and `MODE MONO` for monochrome).

The other alternative, and the preferred method, is to use MS.COM with command line parameters and batch files.

If you run MS.COM by simply typing MS and pressing Enter, you will be presented with a menu from which you can select the type of video you prefer. What you may not know is that if you include a few extra characters—called

parameters—on the command line, you can bypass that menu altogether and switch modes directly. Those parameters are listed in Figure 1. (Note: The last two options listed in Figure 1 cause the HLMV to transmit true CGA signals. You should not invoke them when using a monochrome display as that could damage the monitor.)

MT—	for standard monochrome
E80—	for CGA emulation
MG1—	for Hercules Graphics with 1 page of memory
MG2—	for Hercules Graphics with 2 pages of memory
M25—	for Monochrome with 132 columns and 25 lines
M44—	for Monochrome with 132 columns and 44 lines
C80—	for CGA text with 80 columns and 25 lines
C132—	for CGA text with 132 columns and 25 lines

Figure 1

To go directly to color emulation from the command line, type `MS E80` and press Enter. To go back to standard monochrome, type `MS MT` and press Enter.

MS.COM comes in handy when running video-specific software. For example, what if you like monochrome for word processing because it uses true underlining and boldfacing, but you also like to play a public domain pinball game that requires CGA? The solution would be to create a batch file for the game that sets the video mode before the game program executes. If you wanted to play pinball you might use the following batch file:

```
ECHO OFF
MS E80
PINBALL
MS MT
```

MS E80 switches to CGA emulation mode, then the command PINBALL runs the game program. Once you exit the game, MS MT re-invokes standard monochrome video. I have an HLMV at home

and this is the way I do it.

I know that my Kaypro 286i has a battery-powered clock that keeps track of the time and date. I have heard that if this battery fails, my hard disk won't work any more. Is this so?

The hard disk will work, but the computer won't know that it's there.

The battery you mention provides power for a special section of memory called the CMOS RAM, (CMOS stands for complementary metal-oxide semiconductor). Provided it has power, the CMOS RAM will stay on day and night, regardless of whether your computer is on. In the Kaypro 286i, 286, and 386, the CMOS RAM contains information the computer uses when it first powers up.

That information includes the number and types of floppy disk drives, the type of video adapter installed, the amount of extended memory available, and the type of hard disk drive installed. There is, in fact, a table in CMOS RAM containing data on 47 different hard drives, one of which has been designated as the drive installed in the machine. When the computer starts, it looks at that designation to determine the hard disk type, then looks at the drive's data. If the CMOS RAM loses power, the drive designation becomes incorrect and the drive data becomes inaccessible. The computer won't recognize the hard drive at all.

To modify the CMOS RAM and designate the correct drive type, you must run the SETUP program that came with your computer. If the only copy of SETUP you have is on the hard disk when you lose power, you are in deep trouble. It's sort of like locking your car keys in the trunk, only worse. I know, because it happened to me (only once).

The solution is to plan ahead. First, run SETUP. Make sure your printer is ready to print, and press Shift-PrtScr. This will make what is on screen print out, and it will provide you with a record not only of your hard disk type, but every other setting contained in CMOS RAM. Next, format a blank floppy with the MS-DOS operating system on it by issuing the command, `FORMAT A:/S`. Then copy

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SETUP.COM to it and put the disk away. If the computer ever loses power, boot on this floppy, run SETUP, and re-build the CMOS RAM using the printout.

I own a Hayes-compatible 1200 BPS modem, a Kaypro PC, and MITE telecommunications software. One of the configurable options in MITE is the "modem initialization string." What is this, and should I change it?

According to Webster's dictionary, to initialize means to "set to a starting value or position." Modem initialization is the process by which your telecommunications software sets your modem to its starting position. The initialization string is a series of commands that prepare the modem to operate with the software.

Most telecommunications software comes preconfigured for Hayes-compatible modems, with generic initialization strings that perform adequately. These are the four most common commands:

AT These two characters must be the first ones in the initialization string (or in any modem command, for that matter). They tell the modem to come to "Attention"; any ensuing characters are interpreted as commands.

F1 This command sets the modem to full-duplex operation. Any character sent to the modem over the phone line will be echoed back to the sender and will appear on your screen. For half-duplex operation, change this to F0.

E1 causes the modem to display onscreen any characters you type as modem commands. This allows you to see the commands you type as you type them.

Q0 makes the modem send "result codes." A result code is a word or series of characters that tells you the result of a command or informs you of a change in state. When the modem successfully executes a command, for example, it sends the result code "OK." When the phone rings, the code "RING" appears, and when a 1200 BPS connection is made, the code "CONNECT 1200" is sent.

So the most common initialization string would read "AT F1 E1 Q0." Your

needs may be unique, though, and a look at some uncommon initialization commands may help you use your modem and software more efficiently.

S7=nnn determines how long the modem will wait for a signal or "carrier" from another modem. In this command, "nnn" represents the number of seconds and can range from 0 to 255. The default is 30. You will want to change this if you call systems that take a particularly long time to answer.

S0=nnn tells the modem to answer the phone on a specific ring. For example, S0=3 will cause the modem to answer on the third ring, while S0=0 will stop it from answering altogether. Use this command if you want someone to call your computer with a modem.

M0 turns the modem speaker off. If you work in a busy office and the constant beeping and whining that goes with modem operation bothers your co-workers, use this command to make the modem clam up. The default condition is M1, which keeps the speaker on until a carrier is detected. M2 keeps the speaker on at all times. (I've never met anyone who uses this last option. How would you like to work with a high-pitched screeching whine in your ear?)

An initialization string that uses these off-beat commands might read "AT F1 E1 Q0 S7=60 S0=2 M0." This means the modem will wait 60 seconds for a carrier, will answer the phone on the second ring, and that its speaker will be off at all times. For more information on AT commands, see your modem manual.

I often convert my WordStar files to ASCII text, both for use by other word processors and so I can upload messages to bulletin boards. In WordStar I use the underline command (^P ^S) to emphasize specific points in the text. ASCII doesn't allow for underlining, however, and I lose that emphasis. Is there any way around this?

You can't underline in ASCII text, but you can retain emphasis on words and sentences by capitalizing every character in them. For example, you might convert "It is extremely important!" to "It is EX-

TREMELY important!"

Finding all the underlined text and capitalizing it is a dull task at best, but there is a way around the tedium. If you have WordStar 4.0, you can create a macro that will perform the replacements for you. From the WordStar Main Menu, press Esc. When the Macro Menu appears, type ? to edit a macro. Choose E to hold the macro (E for "emphasis"). When prompted for a macro name, call it **Underline replacement**. When asked for the macro itself, type the following:

```
^QF^P^S^M^M^G^K^B^L^G
^K^K^K^E
```

Wherever you see a caret, type a Ctrl-P (^P) and continue to hold the Ctrl key down while you type the next character. For example, the ^Q at the start of the macro should be typed Ctrl-P, Ctrl-Q. The exception to this is the right bracket at the end of the macro. It denotes the escape key (Esc) and is keyed in by typing Ctrl-P then Esc. Once you've keyed everything in, press Enter to finish editing the macro. Press Enter again and answer Y when asked if you want to save the macro to disk.

Let's break this down and see how it works. (Remember that a macro supplies keystrokes as if they were typed at the keyboard; it has to move through the WordStar menus just like you do.) The command ^QF tells WordStar to find specific text, then ^P^S tells it what text to look for. The first carriage return, ^M, ends the search string. The second one accepts the default search options and initiates the search. Once an underline command is found, the command ^G deletes it and ^K^B marks the beginning of a text block. The next underline character is found with the ^L (find again) command, whereupon it is deleted with ^G and the end of the block is marked with ^K^K.

Everything between the underline characters is now a marked block of text. The command ^K converts this text to upper case. The last command, ^[E (Esc-E), makes the macro execute itself. It will keep executing until every pair of underline characters in the file has been replaced.

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THE TECH CORNER

Is your PC clock not working? All Kaypro PC's were equipped with a battery powered calendar clock which loads DOS's clock with the program SETDOS. The exception is the Expansion Unit PC which has no clock. If you had a clock and it is now dead, check to see if the SETDOS program is being run correctly. If it asks for the date and time every time you power up you have a dead battery or a defective clock. Replacing the battery is a pain, but we have a kit with a replaceable battery pack for \$15. If your PC lacks a clock or you have a real early PC which requires soldering to install the battery pack, we recommend use of a \$29 SmartWatch ROM clock which just plugs in. To check if your Kaypro PC has a clock remove the cover. The clock components and battery are mounted on the horizontal circuit board visible just back and left of center of the computer. If all you see are lines on the circuit board, you don't have a clock.

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THE KAYPRO 286 UPGRADE KIT

BY MARSHALL L. MOSELEY

One of the things that sets the Kaypro PC apart from its competitors is its open design. The Kaypro PC features "snap in" technology: Various components of the computing system can be removed and replaced in moments using almost no tools (and it can be done by someone with almost no training). This lets you upgrade—swap an older, less powerful part for a newer, more powerful one—quite easily. The subject of this month's column is the Kaypro 286 upgrade kit (part number 6494; \$900 and up—price varies with availability of memory). This kit allows you to replace the 8088-based processor board in your Kaypro PC with a faster, more powerful 80286-based board.

THE BIG PICTURE

Understanding how the 80286 board works requires that you first understand what a processor board is and how it fits into the Kaypro PC system.

If you removed the cover from your computer and looked down into the chassis, you would see four circuit boards (five if you have a hard disk). Bolted to the bottom of the chassis is the bus board, which acts as a conduit between all the other boards in the system. The bus board holds nine expansion slots. In the original Kaypro PC, all nine were 8-bit slots, but in the later models there were seven 8-bit slots and two 16-bit slots. (For a more complete explanation of the bus board and expansion slots, see last month's "On the Practical Side.")

Rising vertically from the bus board are three other boards. One of them is a video board, which connects the computer to the monitor and provides all the video images you see there. Next to the floppy disk drives is a full-length board connected by cable to the floppy disk drives. This is the multi-function board. It controls the floppy disk drives and contains all of the Kaypro PC's memory. It also houses the parallel and serial ports for the machine.

If you have a hard disk, you also have a hard disk controller board fitted into one of the expansion slots. This board connects the computer's hard disk to the computing system.

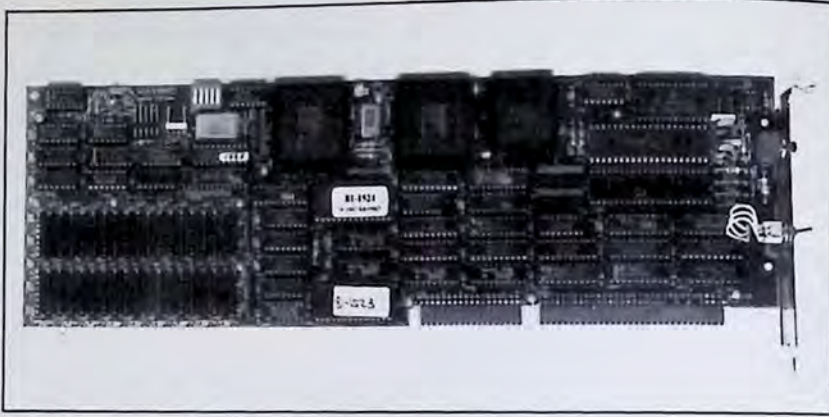


FIGURE 1

The last board is the processor board, which the 286 upgrade kit replaces. The processor board houses the 8088 microprocessor, the integrated circuit that performs all the computer's calculating and sorting tasks. The 8088 is the heart of your system; both the hardware inside the computer and all the software for the Kaypro PC were designed with the 8088 in mind. Also included on the processor board is the keyboard connector, which links the keyboard to the computer itself, and a connector for the computer's speaker.

THE NEW BOARD

The Kaypro 286 upgrade kit contains a processor board based on the 80286 microprocessor. This new board allows current Kaypro PC owners to turn their machines into IBM AT-compatibles. In fact, the 80286 board, pictured in Figure 1, will make your Kaypro twice as powerful as the original AT and Kaypro 286i. Let's take a closer look at the board and at various components to see how they increase computing performance.

Three years ago, this board—which measures 3.25 by 12.25 inches—would have been at least one foot square, maybe larger. Kaypro engineers were able to place all the necessary circuitry on one board by using VLSI technology. VLSI stands for Very Large Scale Integrated circuit. A VLSI chip is a wafer of silicon that contains the equivalent of dozens of standard integrated circuits. The circuits in a VLSI chip are linked together to perform a specific task, just as chips on a

board are.

A few integrated circuitry companies have created AT chip sets, which are a series of four or five VLSI chips that provide all the functions of an AT-compatible computer. Add an 80286 processor and some memory to these chips and you get a fully functional computer on a single, small board. The Kaypro 80286 board uses such a chip set.

The 80286 is a full 16-bit processor. That means it performs calculations using 16-bit numbers and reads and writes to memory and hardware devices 16 bits at a time (the older 8088 does these tasks using eight bits). The 80286 operates at a clock speed of 12 megahertz (Mhz, or millions of cycles per second). A switch at one end of the board lets you change to 6 Mhz operation for software that needs a slower clock speed. By comparison, the early Kaypro PCs had a 4.77 Mhz clock. These two features—16-bit operation and a 12 Mhz clock speed—mean that the 80286 handles data in increments twice as large as the 8088 did, and it moves that data along nearly three times as fast.

Directly below and to the right of the 80286 processor chip on the upgrade board is an empty socket for an 80287 math co-processor. The 80287, when installed, takes some of the mathematical burden off the 80286 by helping it with floating-point calculations. Any co-processor you purchase for the Kaypro 286 board must be designed to operate at the clock speed that you are using. If you run the computer at 12 Mhz, you must

have a 12 Mhz co-processor; run it at 6 Mhz and a 6 Mhz co-processor will do.

The 80286 board comes with one megabyte of memory built into it, which is stored in 36 ZIP (zig-zag in-line packet) memory chips. Only 640 kilobytes of this is available to MS-DOS. The remaining 384K is used as extended memory. (That extra 384K can improve your hard disk performance immensely. I happen to own one of these boards, and I use it with a Seagate ST-225 hard disk, which is a relatively sluggish performer. But when I install Golden Bow's disk caching software Vcache, and tell it to use the 384K to buffer disk data, my ST-225 flies.)

The Kaypro 286 board uses zero wait states. What, you ask, is a wait state? The microprocessors in most MS-DOS computers execute instructions once every four times the clock ticks. After an instruction is executed, however, the average computer doesn't count the next four clock ticks right away. Instead it waits for one clock tick, to allow the relatively slow memory to catch up with the processor. The memory installed in the Kaypro 80286 board is so fast (80 nanoseconds) that this extra waiting period, or wait state, is unnecessary, and the 12 Mhz clock speed is uncompromised.

THE KAYPRO PC FACTOR

There are a few things to take into consideration when using this board in the Kaypro PC.

The 80286 board has its own memory, which will conflict with the original memory in the Kaypro PC. You must adjust certain DIP switches in the Kaypro PC that disable the original memory before installing the 80286 board. The upgrade kit's documentation tells you how to do this.

If you have 8-bit slots, the 80286 board will operate as an AT compatible computer, but you will not be able to install any AT-specific hardware. This is because that hardware expects to receive and transmit data 16 bits at a time. Some of the things you can't use are extended memory boards, AT-type hard disk controllers, and 16-bit VGA boards. If you like, you can replace the bus board with

one that has 16-bit slots and make your computer 100 percent AT compatible. (Again, see last month's column for more information on this topic.)

Another quirk in combining the Kaypro PC and the 80286 card involves the hard disk. Those of you with early PC-10s and PC-20s will have to replace your current hard disk controller before you can use the 80286 board. This is because the oldest controller used in those machines operates at only 5 mhz, while the control bus under the 80286 board operates at 8 Mhz. (Who knew, in 1985, that technology would advance so far so fast?) If you have a hard disk controller consisting of two circuit boards, one bolted to the top of the drive and connected by cables to another board sitting in an expansion slot, you'll have to replace the controller to use the 80286 board.

These may sound like a lot of limita-

tions, but they really aren't. Those of you with 8-bit slots still have a fully functional PC/XT compatible, and you can install any hardware or software in it that the IBM PC uses. This gives you access to the largest software and computer hardware selection anywhere.

CONCLUSION

While the Kaypro 286 upgrade kit is impressive, there are even more powerful products in development. A 16 Mhz 80286 board capable of holding eight megabytes of RAM will debut soon. In development, but still many months away is a replacement processor board based on the 80386 microprocessor.

I don't know about you, but this latest spate of products has put me in heaven. I'm thinking about getting a sticker for the front of my computer that says "Warning: Speed Thrills."

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DATELINE

BY BROCK N. MECKS

NEWS FROM THE FIELD

PALM-SIZE PC

Chicago, IL—Appearances can be deceiving. So can industry buzzwords. At this year's Summer Consumer Electronics Show, held in Chicago, "handheld personal computer" was the buzzword encompassing everything from calculators to pocket-size electronic spelling dictionaries.

What all these down-size "computers" have in common is usability, according to Dr. Howard Morgan of Renaissance Technologies Corporation. Despite the potentially eye-straining size of the displays on these handheld devices, their ease of use make them "user-sective," says Morgan. Another "seductive" feature is that these devices often weigh in with 100K of data built into a Read Only Memory that can't be erased.

The best examples of handheld PCs are the spelling checkers, like those sold by Franklin Computers. These products provide very useful ways of "getting information without knowing anything," says Morgan. For example, a typical dilemma when trying to look up a word in a dictionary is that you don't know how to spell it, yet you have to "get close enough" to even know approximately

where to begin looking. With the handheld spelling PCs, the problem is solved.

These spelling computers have phonetically based spelling features allowing you to type in a word as it sounds. The computerized speller then takes your "spelling" and tries to figure out the correct spelling of the word you really want.

Typing in the word "geraf" on the tiny keys will return the word "giraffe." All the handheld spellers tried by "DATELINE" returned the word "giraffe" as the correct spelling. Microsoft Word's spelling checker, however, offered only the word "grief." Morgan further explained that such handheld PCs are "disposable" in that they aren't worth repairing. "You just buy a new one." But with a price tag of around \$100, grief may be the correct response for a handheld PC gone South.

Rolling Office

New York, NY—The home computer market is booming, and several recent studies prove the point. According to Julian Cohen of the American Home Business Association, there are some 13 million home businesses. Most of

these are small—90 percent have only one full-time employee; however, 60 percent of them use computers.

As the line between home and office blurs with each passing year, soon there may be no line at all. With a laptop computer, cellular phone and car facsimile (fax) machine, you might be able to give up the office completely and conduct all your business on the move—from your car.

NEC America Inc. has announced a 10-pound fax machine that can send and receive documents in the car. It also doubles as a copier. Called the PF-IIC, the unit plugs into the cigarette lighter and transmits data through the cellular phone.

Available this fall, the NEC fax fits into the overall scheme of the "ultimate" rolling office. Housed in a special-edition Cadillac, called the Trump Edition (named for New York real estate tycoon Donald Trump), this rolling office has the NEC fax and laptop computer, three car phones—and a paper shredder.

Add Pictures

The desktop publishing market opened the doors for anyone with a computer to become a publisher. Several graphics packages

helped spice up the crisp laser-printed documents created on DTP systems, but something was missing. Conspicuous by their absence, photographs are seldom used in DTP efforts. Why? They are too expensive for the low-budget publications often cranked out on DTP systems. Until now.

Several "desktop photography" programs are now making their appearance, creating a trend that is likely to raise the quality of DTP publications and at the same time stir up significant controversy.

With these desktop photography programs, it's quite possible to create a super-market tabloid-style front cover photo of First Lady Nancy Reagan cavorting with Rambo on some deserted island. Programs such as SnapShot can turn a computer screen into a "digital dark room." All sorts of photographic "tricks" are now possible, and pictures can, indeed, now "lie."

SnapShot plucks any video image from a TV program, VCR, camcorder or laser disk and allows you to "freeze" it. The computer translates the image into digital information and displays it on the screen. Other programs, such as "ImageStudio," work

with photos that have been sent to the computer through a scanning device.

Once an image is "frozen," it can be manipulated in an almost limitless number of ways. Don't like the look of that building standing behind your head? No problem.

Using desktop photography, you can easily delete the building from the picture as if it never existed. Turn a scowl into a smile; turn a cloudless sky into an artist's palette.

And what used to be called "retouching" is now known as "image enhancement." There are no messy dyes or inks; a computer artist can airbrush a background or create special effects. Standard darkroom techniques such as "dodging" can now be done right on the computer screen. Better yet, the process is reversible.

But for all its potential, desktop photography raises serious copyright and ethical issues. If you edit a well-known artist's photographs that you happen to scan into your PC, who owns the copyright? If I print the Nancy Reagan photo mentioned above, can I be sued?

Is it wrong to tamper with photos? In the past, the rejoinder "The camera doesn't lie" was a cornerstone of journalism. Now, these programs have the potential to turn pictures into shameless fabrications. There are no easy answers for a technology with the potential for doing as much good as harm.

PROFILE

VIDEOTEX: BACK IN THE SADDLE

Universal access to information services of all types, from home shopping to banking to the daily horoscope: This is the dream of the videotex industry. To date, however, it is a dream not realized.

There have been two famous, failed attempts: Viewtron and Gateway. These were hoped to be mass-appeal videotex delivery systems offering everything from stock market quotes to shopping and banking services. They never got out of the test phase for a couple of reasons. One was that they tried to deliver information via television by means of a special adapter, which proved to be too expensive. The other reason was that the information they offered was not personalized enough to be of value; the services didn't add to the convenience of everyday life.

And although there are now several successful information services, such as CompuServe, a true "mass market" videotex service has not developed in North America, as it has in France, where the French videotex system known as Minitel is setting a world standard.

Minitel made its services personal and very useful in everyday life. It started when the government-owned French phone company put the entire

phone book on the system and gave away Minitel terminals. (They include a small screen and keyboard and have the ability to display graphics—they're small dumb terminals attached to the phone.) In place two years, Minitel now offers a home food shopping service with delivery in 48 hours, news and information, and a freight exchange in addition to the phone directory.

Toward the end of this year, we'll see videotex systems come online in this country in the industry's biggest push for mass market acceptance since the earlier failed videotex attempts.

You may have already seen such celebrities as Linda Ellerbee and Alvin Toffler pitching a videotex service called "Prodigy," a joint effort by IBM and Sears that will offer shopping, news and information, celebrity columns on topics such as sports and fitness, stock quotes, games, and educational programming. Propelled by big-bucks advertising based on years of research and market study, Prodigy is finally being rolled out of the lab and into the public market. It will be subsidized by advertising and will be available at a flat fee of \$9.95 per month. You'll be able to access it via a turn-key program with your own computer.

Another videotex system, US Videotel, will employ the same terminals used in the Minitel system in France and will offer similar services.

What will these new services have going for them?

How will they differ from other experiments? And who will benefit from their ideas? "DATELINE" talked with Peter Grunwald, a Washington, D.C.-based communications consultant specializing in information policies and technology.

Grunwald's expertise extends from cable broadcasting, where he helped draft early privacy policies, to several areas of the videotex industry. He brings information providers together with those electronic services best able to distribute that information to a broad range of users.

The following are his comments on the evolution of the videotex market.

Videotex, Then and Now

Today's videotex industry is trying very hard to define a range of electronic services that, if strictly applied, follows the flow of all types of information across several different mediums. Those mediums range from audiotex, such as the '976' dial-up services to specialized computer conferencing forums like you have on CompuServe.

The industry today is different from, say, five years ago when it was focused mainly on electronically distributing the news, and not much else. The industry was hampered by poor marketing strategies and was technologically tied up by using the television as the main information distrib-

utor. And in America, you can't compete with the TV.

Today's efforts are much different. There is much more appeal to the mass market, rather than to the established 'hard core' computer user. In fact, painstaking steps are being taken to reach a user at the lowest common denominator. Technologically speaking, that's the non-PC owner.

Mass Market Makes It Work

The new videotex systems, those wanting to appeal to a mass market, such as the Sears/IBM Prodigy venture, are appealing to home information consumers because they offer an aggregate of services that relate directly to their lives.

In this sense, I like what Bill Loudon, the president of the information system known as GENie says: "There is no mass market, just a collection of smaller, niche markets."

Those niche markets, however, are specifically tailored to a region or lifestyle. For example, some electronic services carried on these mass market videotex services will have a measure of limited-demand services owing to their regionalism: listing of child care facilities, local banking.

However, coupled with such regional information will be a variety of informative and entertaining services [you can] access [with] a simple phone call.

The regional information

will most likely draw the users into the system; these are magnet applications, like the child-care facilities I just mentioned.

In France, for example, the biggest use of the Minitel system is the phone directory service. They've just about done away with phone books in France because the Minitel is easier to use, faster, and has the added advantage of carrying information services that relate to their day-to-day lives, such as the ability to shop from home for food and have it delivered within 48 hours.

The American mass market will be driven by users who appreciate the delivery (via easy-to-use terminals), the timeliness, and unavailability of news from other sources—what national information service is going to carry the summer schedule of your neighborhood YMCA?

And [there are] two big differing factors from early attempts: low-cost access to information (Prodigy will be \$9.95 per month, flat fee) and low-cost terminals. People won't buy a full-blown PC just to access these services, but if they can use a terminal that costs just slightly more than a sophisticated answering machine, they're going to buy.

From Here to There and Back

As the videotex industry operates now, you have a very diversified "niche market." Most of

the people using CompuServe, for example, are doing so, or did so, because it was somehow a "sexy" technology; the fact that the information is delivered online is secondary. It was the technology that first attracted them.

Not so with the users of the new videotex services. First, you won't have to be a techie to get access to these systems. For most, all you'll have to do is flip a switch on a dumb terminal and the rest is taken care of for you, from log on to interacting with the system via a full size keyboard, to logging off.

Next, these new users will have the advantage of "gateways" or "electronic highways" that allow easy access, via the local telephone company, to any of hundreds of services.

These gateways will use simple menus. The user can pick and choose from among the listed offerings with a single key. And because the phone company will handle billing, the user won't have to subscribe to several different information systems just to access one or two special services.

You Can't Take It in the Bathroom

Previous attempts at videotex delivery failed because they used the TV as a delivery medium. That's almost certain doom, competition with the TV.

People overestimated value of straight news reporting delivered through your TV; you can't take the videotex terminal into the bathroom [like a newspaper], so you'd better give the user enough reason to come back, rather than just offering him something he can get for a quarter on the newsstand.

The Main Attraction

The number-one reason people should take a close look at these new videotex systems is that they are offering information in a new and easily accessible manner; most of the work has already been done for you—there's really nothing at risk. It'll be information that really helps you out in your day-to-day routine, regardless of whether you're a career person or a kid working on a term paper.

Second, there are likely hundreds of potential information service providers out there; there are thousands of opportunities for entrepreneurs to develop specialized information services. These consist of small, information-intensive businesses.

In this new era of videotex services, it's not so much a race against the other guy; rather, it's how many people cross your finish line day after day after day.

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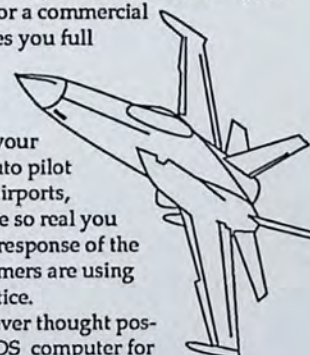
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CD-ROM: INFORMATION PUBLISHING FOR THE PC

The start of a new revolution for personal computers?

BY TED SILVEIRA

One of the few stable truths in the computer world is that however much disk storage you have now, you will need more tomorrow. A few years ago, a 10-megabyte hard disk was big (and expensive). Now, hard disks of 100 megabytes or more are common, and 20-megabyte hard disks are practically sold by peddlers on the street.

In the rush for more and more space, nothing is more tantalizing than optical storage, which promises to store not megabytes but gigabytes. That's *gigabyte*, as in 1000 megabytes. But for the average user, waiting for the arrival of practical optical storage has been like watching a car approach across a vast empty desert—it shimmers on the horizon, magnified by the haze of heat, but even though it's traveling at terrific speed, throwing up great clouds of dust, it seems to creep forward at a



snail's pace.

CURRENT TRENDS

Currently, optical storage is developing along three related but distinct lines. First, there is ROM (read-only memory) storage, which allows you to read information from the ROM disc but not to add, delete, or modify anything on it. You can, however, copy the information onto a regular magnetic disk and work with it there. Second, there is WORM (write once, read many) storage, which allows you to save information to the WORM disc once but not change it once saved. Once you've written information to the WORM disc, it in effect becomes a ROM disc. Third, there is read/write optical storage, which allows you to read and write to the disc just as you do with a normal magnetic floppy disk or hard disk.

The most enticing of these is the read/write optical drive, which would combine all the advantages of today's magnetic disk with the massive storage capacity of optical discs. Though many industry analysts had thought that true read/write optical storage was a long way off, with many technical problems still to be overcome, it now looks much closer to commercial reality than expected. In April of this year, for example, Tandy Corporation (parent of the Radio Shack chain) announced that it had developed a compact disc and player that allowed the disc to be repeatedly erased and re-recorded. Tandy projected that the product, known as the Thor CD, would be available in audio form for home stereo systems in 18 months to two years, with the computer version (for data instead of music) due a year after that.

Tandy's announcement opens up exciting possibilities for computer users in the near future, but it also makes clear that read/write optical discs are not "here" yet. Nor, for that matter, are WORM discs, at least not in terms of products available to individual end-users (that's you and me). At the moment, the only optical storage option for end-users is the CD-ROM disc, so-called because it uses discs and drives almost identical to the audio compact discs and players that have become so popular in the last two years.

THE HOW OF CD-ROM

A CD-ROM and an audio CD both work the same way, except that one holds computer data and the other music. In each case, a laser beam records digital (binary) information on a master disc by burning microscopic pits in its surface. The master disc is used to make molds, which in turn are used to create release CDs that have the same microscopic pits as the original master disc. The release disc is then covered with a silvery reflective coating. When you put a finished CD-ROM or audio CD disc in the proper CD player, a laser beam scans the surface of the disc, and a photo-receptor records the reflected light. The smooth parts of the disc reflect the light back to the receptor, but the pits scatter it. Because of the difference in reflectance, the receptor can recognize the pits and flat spots and interpret them as binary data (1s and 0s), which is then converted into either computer data or music.

Like audio CDs, CD-ROM discs are unaffected by minor scratches, and unlike conventional floppy and hard disks, CD-ROMs are also unaffected by magnets and electrical disturbances because they don't use magnetic recording. The amount of data that can be stored on a disc depends on the size of the disc, the frequency of the lasers used, the file format used, and other factors. Today's standard CD-ROM stores 550 megabytes on one side of a 4.7-inch disc. If companies make the jump to higher frequency lasers, which could create and read even smaller pits in the disc, then the same disc could hold gigabytes instead of megabytes.

*To use
a CD-ROM disc,
you need the disc,
a CD-ROM drive,
a controller board, and
retrieval software.*

To use a CD-ROM disc with your MS-DOS computer, you need the disc, a CD-ROM drive to read the disc, and a controller board (similar to a hard disk controller) that fits into one of your PC's empty slots and connects it to the CD-ROM drive. You also need software—both Microsoft's CD-ROM Extensions, which allow MS-DOS to recognize and control the CD-ROM drive, and any information retrieval software that may be required to help you use the data on the disc.

THE WHY OF CD-ROM

A CD may be fine for music, but what good is it for computer storage if you can't write any data on it? The answer is that you don't use a CD-ROM for storage in the same way that you use a typical floppy disk or hard disk. Instead, the CD-ROM is more like a publishing medium, a way to distribute large amounts of reference information. This information could be corporate or stock market data for past years, phone books and zip code directories, demographic data from the U.S. census, an encyclopedia, a medical, legal, or scientific reference, or any other data that is stable or needs to be updated only periodically.

Once you have information on a CD-ROM, you have quick and easy access to the information, and you have the information in a computer-readable form so that you can easily incorporate it into your work. If your work involves, for example, creating spreadsheets to study stock market prices for the last ten years, the benefits are enormous.

Looked at in this light, CD-ROMs are not like ordinary computer storage at all but instead resemble the large fee-based computer information services such as Dialog, BRS, Dow-Jones,

Lexis, and others. Like these services, CD-ROMs provide massive amounts of on-line reference information. With a CD-ROM, you do not get the daily or even hourly updating of information that you do on information services like Dow-Jones, but neither do you have to pay for each minute of connect time, for each search you conduct, and for each chunk of information you print out. Once you pay for the CD-ROM, you can browse through it for hours on end, search it backward, forward, and upside down, and even print out every record if you have enough paper, all without paying another cent. You can also get at the information more quickly—information services are limited by the speed of your modem—and paste it into your spreadsheet, word processor, or database more easily.

THE CONSUMER CD-ROM?

For some time now, there have been commercial CD-ROM discs available that would be of great interest to corporations, libraries, and other institutions—Bowker's *Books-in-Print* catalogs, the Medline medical abstracts, a postcode address file for Great Britain, Standard & Poor's reports on traded companies, daily stock price histories, and so forth. But there's been little to interest the average computer consumer, until the appearance of Microsoft Bookshelf.

The product description for Microsoft Bookshelf reads like a writer's dream. On one 550 megabyte CD-ROM disc, Bookshelf brings together *The American Heritage Dictionary*, *Roget's II Electronic Thesaurus*, *Bartlett's Familiar Quotations*, *The Chicago Manual of Style* (13th Edition), the *Houghton Mifflin Spelling Verifier and Corrector*, *The Houghton Mifflin Usage Alert*, *The 1987 World Almanac and Book of Facts*, the *U.S. Zip Code Directory*, *Business Information Sources* (a selection of references on business topics), and a collection of business and personal forms and letters.

*The Bookshelf
software, which gives you
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The Bookshelf software, which gives you access to all this information, is RAM-resident so that you can pop it up in the middle of your favorite word processor or other application (even from the DOS command line). You can buy the disc itself for \$295, or a complete package including the disc, an Amdek Laserdrive-1 CD-ROM drive and controller card, and the Microsoft CD-ROM Extensions for MS-DOS for \$1,195.

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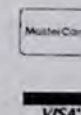
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tures. For example, *The American Heritage Dictionary* is not a simple word list like those used by spelling checkers—it's a real dictionary. It has over 200,000 entries with complete definitions and, unlike many dictionaries, includes 25,000 new words and meanings that have come into use in the 1980s. It also has important geographical and biographical entries.

You can have Bookshelf look up a word from the screen (the word you just typed, for example), you can call Bookshelf and then type in the word you want to look up, or you can simply browse through the dictionary on your own. You can also copy any section out of the dictionary and paste it into your document.

The *Roget's II Electronic Thesaurus* offers 500,000 synonyms based on 87,000 key words. It groups synonyms according to their definition (for words that have more than one meaning) and according to parts of speech. As a bonus, Bookshelf shows the synonyms in the same grammatical form as the original word, so it will show *vocabulary* and *lexicon* as synonyms for *dictionary* but *vocabularies* and *lexicons* for *dictionaries*, for example. As with the dictionary, you can get synonyms for a word on the screen or for a word you type in after calling the thesaurus. If you've selected a word from the screen, you can select any of the synonyms offered and have it automatically replace the word on the screen.

Bartlett's Familiar Quotations lists over 22,000 quotations, including approximately 2,500 recent ones, from over 400 authors. The quotations are generally short but pithy, and all have been traced to their original sources. You can search for all quotations from a particular author or for all quotations containing any combination of key words. You can also just browse through the dictionary on your own, though that can be a dangerous distraction for any writer with a short deadline. As with the dictionary, you can copy any quotation to Bookshelf's clipboard and then paste it into your document.

The *1987 World Almanac and Book of Facts* claims over one million facts on a variety of subjects, including demographic data, events of the year, and political and economic information. You can search for information by combining key words, by locating relevant sections through the table of contents and index, or by browsing. Bookshelf also has special commands for viewing the many tables of information contained in the almanac. For example, you can lock the column and row titles on screen so that they stay in place while you scroll through the table, and you can hide certain rows or columns so that only the information you want shows (very useful when you're going to paste information into a document).

The *Chicago Manual of Style*, the copy editor's ultimate authority on how words should appear on the page, is a reference only (that is, it can't correct anything in your document), but this electronic version is in many ways easier to use than its printed counterpart because you can rapidly find the section you need through a search (for "comma" and "series," for example). The *U.S. Zip Code Directory* can read the address you've just typed on the screen and then paste in the correct zip code for you.

The other parts of the Bookshelf package are less interesting. The *Houghton Mifflin Usage Alert* and *Spelling Verifier* and *Corrector* are not up to the standard set by similar commercial products. And the *Business Information Sources* bibliography and the blank forms contained in *Forms and Letters* will probably only be useful to a small number of users.

Bookshelf offers good search capabilities, a necessity when you have this much information available. You can combine key words in your searches with logical AND or OR. When you ask Bookshelf to find a combination of key words, such as *computer* and *compact disc*, you can also decide whether the terms must be within the same paragraph, subsection, article, or chapter. Once you've located the information you want, you can set bookmarks so that you can jump directly to the information the next time you need it. Many entries also have footnotes (small windows of additional information that pop up on the screen) and electronic cross-references that allow you to jump to related selections.

Bookshelf also supports electronic cut-and-paste so that you can copy information from the references and paste it into your current document. How well this feature works, though, depends on what program you're using. With Microsoft Word, I found that cut-and-paste worked smoothly; with WordStar 4.0, however, all the cut-and-paste features seemed to be disabled, even the word replacement feature in the thesaurus. Without cut-and-paste, Bookshelf becomes considerably less useful.

There are other drawbacks to Bookshelf, too. Even with Microsoft Word, Bookshelf is not as closely integrated as it could be. When you call Bookshelf, it's like entering a completely separate application. You can mark a word on the screen before you call Bookshelf and then use that word in the thesaurus or dictionary, for example, but you can't pick up a second word from the screen without exiting Bookshelf again. Bookshelf is RAM-resident, so it steals memory from your lower 640K, and unfortunately, it makes no use of extended or expanded memory as products like SideKick Plus do. Also, though Bookshelf will run under Microsoft Windows, it only works as an "old application," so it takes up the entire screen while you're using it. Since Microsoft is responsible for both Bookshelf and Windows, you'd expect the two to cooperate a little more.

Microsoft Bookshelf could be a writer's dream, a product that any full-time writer would scrimp and save to own. But in its current incarnation, it feels almost like a prototype for some future product that will really knock our socks off.

CD-ROM TODAY

Even though Bookshelf isn't quite the breakthrough that will bring CD-ROM to the computerized masses (or vice-versa), CD-ROM itself has clearly moved out of the realm of oddball products and set sail for the mainstream. The most heartening sign for CD-ROM promoters is the emergence of CD-ROM standards. For example, Microsoft's CD-ROM Extensions are an important standard because they not only offer a simple way to interface CD-ROM drives and controllers with the ubiquitous PC clones but also allow users to access a CD-ROM drive with

familiar MS-DOS commands such as DIR, COPY, CHDIR, and so forth.

CD-ROM
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the mainstream.

Most CD-ROM manufacturers now support the so-called High Sierra format, which determines how information is stored on the CD-ROM disc. The High Sierra format is now being slightly modified and expanded, to emerge as the official ISO 9660 standard. A number of manufacturers have also announced that they will support ISO 9660, and the new version of the Microsoft CD-ROM Extensions (2.0) will read both High Sierra and ISO 9660 transparently.

Another standard is also emerging. Two years ago, Sony and the Dutch company N.V. Philips announced specifications for a new type of optical disc system called CD-I (Compact Disc Interactive), which would include high-quality sound and full-motion video, features missing from current CD-ROM standards. That shook up the CD-ROM industry because CD-I has some obvious benefits but isn't directly compatible with CD-ROM. Since then, however, RCA has published specifications for a system called DVI (Digital Video Interactive), which, like CD-I, supports combined sound and graphics, including up to 72 minutes of full-motion video at 30 frames per second with a resolution of 256 x 240. Unlike CD-I, DVI is an excellent match for CD-ROM, and a number of companies have already announced support for DVI, including Lotus, Intel, and Microsoft. Any standard that those three companies support is an odds-on favorite, especially since Lotus is now the largest CD-ROM publisher, accounting for approximately half of all the discs sold in 1987.

These emerging standards have helped to clear up consumer confusion about CD-ROM and encouraged more companies to publish CD-ROM titles. Microsoft has now released two other CD-ROMS: Small Business Consultant, a collection of 220 government publications on running a small business; and Stat Pack, a compilation of 10,000 tables of government business and agricultural statistics. PC-SIG offers a CD-ROM containing its entire library of shareware and public domain software. McGraw-Hill has published CD-ROM versions of its *Concise Encyclopedia of Science and Technology* and *Dictionary of Scientific and Technical Terms*. TriStar Publishing released the gigantic *Oxford English Dictionary* on two CD-ROM discs. And Geo-Vision is publishing a very interesting application called Win-

C.P.I. BUSINESS SYSTEMS

These powerful systems are described briefly below. If you don't feel confident yet ask for our 30+ page overview or try an application demo system at half price (demo prices apply to future system orders).

There are no extra charges for shipping, COD, etc. American Express, Mastercard, VISA card orders welcome. We ship in 48 hours. Please tell us what format you want (II/2X/4/10/16), etc. Demo systems in KAYPRO formats only.

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Super system with Invoices, Service Invoices, Statements, etc. A full range of reporting abilities include Customer Reports, Ageing Reports, Transactions Reports, G/L Transaction List, etc. Auto billing feature eliminates mistakes. Sales can be distributed to 100 accounts. Build up statement option combines the virtues of ledger card history detail and the speeds of today's computers. Use preprinted forms and/or plain paper for invoices and statements.

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\$100.00 CP/M PAYROLL \$100.00 MS-DOS

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HARDWARE REQUIREMENTS
CP/M: 64K (53K TPA) & CP/M 2.0 or higher.
MS-DOS: 256K (or more) & MS-DOS/PC-DOS 2.0 or higher - ANSI.SYS.
Printer: 132 columns (compressed pitch supported), continuous forms.
Disk/s: Dual Floppies/Hard Disk/Both - 191K recommended, less works.
CRT: 80/24 with Clear, Home, Clear to EOL, Up, Down, Left, Right.

dows on the World, which is essentially an atlas on disc. With Windows on the World, you can select any area of the U.S. by name or region, select an area, and zoom in until the screen width equals about 40 miles. You can control what features appear (rivers, roads, parks, county boundaries), calculate latitude and longitude for a point and distances between points, and even add your own features (which are saved to a hard disk, not to the CD-ROM, of course).

CD-ROM now even has its own magazine, *CD-ROM Review*. Among other things, the magazine publishes lists of currently available CD-ROM discs. The March 1988 issue, for example, listed 133 different discs, ranging in price from \$20 to \$19,500 per year (for international financial information from Lotus) and up.

Before CD-ROM will become a mass-market item, though, two things must happen. First, one or more breakthrough products must appear—CD-ROM titles or applications so enticing that ordinary computer users will buy CD-ROM drives just so they can use the product. Most of the products currently available are much too specialized to have that kind of mass appeal, but a revised version of Microsoft Bookshelf might do the job.

Second, the price of CD-ROM drives must come down. You can now buy a CD-ROM drive and controller for just under \$1,000, which is still too high to be an easy purchase when you can buy an audio CD player for \$200. There are good reasons why CD-ROM drives cost more than audio CD players—the drive requires a separate controller that an audio player doesn't, the drive's internal mechanism must withstand greater stress because it will constantly be jumping to different parts of the disc, and the error correction circuitry must be much better (small audio errors are unnoticeable but small data errors are disastrous). Even so, most industry leaders feel that the price must come down to no more than \$500 for a CD-ROM drive plus controller.

CD-ROM TOMORROW

In the short run, CD-ROM looks like it's headed for success. More and more CD-ROM titles are being published, half-height CD-ROM drives that will fit easily in a PC are being introduced, and drive prices will undoubtedly drop. Other factors are at work, too. I think it's clear that graphic interfaces with windows—like Windows and OS/2's Presentation Manager—are going to become the norm. Combine this trend with the current interest in desktop publishing, desktop presentations, computer video and animation, and similar applications, and you can see that graphics and sound are going to become important. Graphics and sound files, however, demand lots and lots of space, especially if you keep lots of pictures or sounds on tap. That demand creates a perfect niche for CD-ROM publishers—supplying huge graphics and sound libraries on CD-ROM discs.

In the long run, CD-ROM will face competition from read/write optical discs, which will certainly be attractive to users looking for massive storage. But CD-ROM should still prosper if its producers manage to keep their prices below those

of the competing technology and if they remember that CD-ROM is a publishing medium rather than a storage medium.

**CD-ROM
should prosper
if producers keep prices
low enough and remember
that it's a publishing
medium.**

No matter what happens with read/write optical discs, CD-ROM will still be an excellent medium for any and all kinds of online reference and database information. With the addition of high-quality sound and full-motion video, a CD-ROM could, for example, become the ultimate user's manual. A CD-ROM manual could show you rotating views of how parts fit together or a step-by-step animation of an entire assembly process. And by incorporating key word searches, the CD-ROM manual would offer you the definitive index, one that could locate any information you need in seconds.

And just imagine the ultimate CD-ROM encyclopedia. Every entry could combine text with still pictures, sound, and animation. If you looked up *Beatles*, for example, you could not only read about their career but also hear selections from their music and see film clips of their performances. Using electronic cross-references, you could jump to associated topics (Mersey Beat, Carnaby Street, Transcendental Meditation), compare songs side by side ("I Want to Hold Your Hand" and "Komm, Gib Mir Deine Hand"), and then jump back to your original starting place. All along the way, you could be copying interesting sections to your hard disk to create your own customized database.

In fact, the growth of CD-ROM and CD-ROM information publishing could be the start of a new revolution for personal computers. These computers are powerful tools for processing the vast amount of information that floods into our lives every day—sorting it, analyzing it, selecting and cross-referencing it, making abstracts of it. But so far, the job of getting all that information into the computer has been simply overwhelming in both time and cost. Using normal 360K MS-DOS disks, you'd need 1,565 floppies to feed 550 megabytes of information into your computer—enough to make anyone think twice. But one CD-ROM disc would give you easy access to all that information (and more if storage capacities continue to increase). With that kind of information on tap, the personal computer could become a tool to make sense out of the world.

And how much will it all cost you? Earlier this year, Bill Gates, chairman and founder of Microsoft, predicted that by 1991, the standard personal computer would use the new 80386 process-

ing chip, have a graphically-oriented interface with windows, and include a half-height CD-ROM drive, all for \$1000. I can hardly wait.

Ted Silveira is a freelance writer, editor and desktop publisher living in Santa Cruz, California. He is a regular contributor to PROFILES.

QUICK REFERENCE SUMMARY

Product: *CD-ROM Review* (\$34.97/year)
Manufacturer: CW communications/Peterborough
Address: P.O. Box 921
Farmingdale, NY 11737-9621
Hotline Number: #759-52

Product: Bookshelf (\$295)
Product: Small Business Consultant (\$149)
Product: Stat Pack (\$125)
Manufacturer: Microsoft Corporation
Address: 16011 NE 36th Way
Box 97017
Redmond, WA 98073-9717
Phone: 206-882-8080
Hotline Number: #760-52

Product: PC-SIG CD-ROM (\$295)
Manufacturer: PC-SIG Inc.
Address: 1030-D East Duane Ave.
Sunnyvale, CA 94086
Phone: 408-730-9291
Hotline Number: #761-52

Product: McGraw-Hill CD-ROM Science and Technical Reference Set (\$300)
Manufacturer: McGraw-Hill Book Co.
Address: 11 West 19th St.
New York, NY 10011
Phone: 212-512-2000
Hotline Number: #762-52

Product: *Oxford English Dictionary* (\$1250)
Manufacturer: TriStar Publishing
Address: 475 Virginia Drive
Fort Washington, PA 19034
Phone: 215-641-9600
Hotline Number: #763-52

Product: Windows on the World (\$495)
Product: GEOdisc U.S. Atlas (\$495)
Manufacturer: GeoVision Inc.
Address: 270 Scientific Drive
Norcross, GA 30092
Phone: 404-448-8224
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HOTRODDING THE KAYPRO PC: AN UPDATE

Glitches and solutions

BY MARSHALL L. MOSELEY

The article, "Hotrodding The Early Kaypro PC," by Ed Quillen, which appeared in the June 1988 issue of *PROFILES*, proved to be very popular. Unfortunately, some readers who upgraded their computers to 8 MHz ran into problems. This update will describe the difficulties they encountered and provide you with additional information regarding this upgrade.

Although *PROFILES* tested the procedure described in the article on its machines prior to publication and encountered no difficulties, with literally thousands of products and hardware configurations available for PC compatibles, it is impossible to ensure that every procedure we describe will work on every machine. Hardware modification can be a touchy subject, because once modified the computer no longer meets the specifications set forth by its designers. That's why the alteration described in "Hotrodding the Early Kaypro PC" is not supported or recommended by Kaypro Corporation.

When you perform hardware modifications yourself, you gain computing power at a minimal cost, but you run the risk that either the modification will not work or will cause unforeseen difficulties.

THE PROBLEMS

Most difficulties reported involved the use of CGA video adapters with the 8 MHz upgrade. With MDA, EGA, and VGA video boards, timing for video operations is performed with a clock crystal on the video board itself. With CGA adapters, however, timing is accomplished using the clock on the processor board. When this clock is changed from 4.77 to 8 MHz, the CGA board operates at almost twice its normal speed and the CGA monitor can't handle the change. For this reason you can't use a standard CGA board with the 8 MHz upgrade. If you own a CGA board and are considering following the instructions in this article, keep in mind that you would have to change video boards to do so.

Interestingly enough, a faster CGA board might work with a variable frequency monitor, such as the NEC Multi-Sync or the Mitsubishi Diamond Scan (it did for *PROFILES* subscriber Thomas Topp of Oklahoma City). In a video display, images are projected on screen using an electron gun, which scans the interior surface of the screen many times per second. The increased clock speed causes the CGA adapter to try to double the rate at which the screen is scanned. CGA displays are built to use only the scan rates commensurate with normal CGA operation, so a standard CGA monitor can't handle a turbo-charged CGA board, but variable frequency monitors are designed to adjust to changing scan rates.

The CGA problem also occurs with some EGA adapters in certain situations. To maintain backward compatibility, the Enhanced Graphics Adapter can operate in CGA mode. If your EGA board, during CGA operation, switches its timing functions to the clock on the processor board, the screen will become unreadable. This only occurs when the EGA board is in CGA mode. Most EGA board owners have either an Enhanced Display or a variable frequency monitor, so they have nothing to worry about. But if you run software that kicks your EGA board into CGA mode and the screen goes blank, you'll know why.

A second problem involved floppy disk drives. One reader who contacted us stated that even though he ran the program *FIXCLOCK.COM* that was included in the article, his drives would only write to disks half the time and wouldn't format disks at all. An examination of both the BASIC and assembly language code affirmed that *FIXCLOCK* should work. As *PROFILES* goes to press we are investigating this problem. If anyone encountered similar complications, please write and describe the problem in detail.

CO-PROCESSORS

Math co-processors are integrated circuits that help standard microprocessors perform mathematical calculations. Like microprocessors, co-processors are rated according to speed. You must install one whose rating matches the clock speed of your computer.

The co-processor used with the 8088 and the NEC V20 is the 8087 from Intel Corporation. If you have the Kaypro PC's clock speed above the standard 4.77 MHz and you wish to purchase a math co-processor, you must buy an 8087-2, which is rated for 8 MHz operation.

SOLUTIONS

PROFILES' deadlines did not permit us to include all update information pertaining to this upgrade at this time. Further information will be published as it becomes available.

(Publisher's Note: Spurred by the results of a recent reader survey, PROFILES announced a new editorial direction: to provide detailed, technical instructions for upgrading your Kaypro computer while continuing to publish the tutorial articles you have come to depend on.)

When we initiated this change, we realized that try as we might to anticipate problems and test each procedure, difficulties would arise for the reasons described above. Thus there will be updates of technical articles from time to time containing reader feedback and describing problems encountered with upgrades or modifications.

MAIL-ORDER COMPUTER BOOKS

A resource guide for the armchair shopper

BY KATHLEEN LOW

If you're lucky you may stumble upon a gold mine—books that will tell you all the tips and tricks for using that new computer or that software package you've been struggling with for weeks. The right computer books are a treasure that can save you hours of time and increase your productivity, telling you everything from how to use a certain feature of a particular program to shortcuts in lengthy processes.

But you don't have to rely on luck to find such treasure—it's easy, and you don't even have to leave your home or office to do it. The secret lies in mail-order books and computer book clubs.

One advantage of buying books through the mail is that you can shop for new books anytime, no matter where you are. You no longer need to make special trips to the neighborhood bookstore when computing problems arise, hoping that it will have the book you need. Instead, you can browse through the descriptions of hundreds of new and forthcoming books in publishers' catalogs and have your selections delivered to your mailbox.

Another significant advantage is that you have access to many more titles than are available in most book stores.

Unfortunately, there are also a few disadvantages to shopping by mail. You don't have the luxury of "thumbing through" the books prior to purchase, even though you may be able to return the books if you're not satisfied. And you will be paying postage and handling fees on each book ordered. But these tend to be insignificant inconveniences compared to the benefits of being able to shop from the comfort of your armchair.

FIND A FAVORITE PUBLISHER

The best way to start your treasure hunt is to send away for new-book flyers or catalogs from the publishers of books you now own—just open up the covers of your favorite computer books to find out who the publishers are. (You can get the addresses of publishers by calling your local public library.)

Because of the growth of the computer industry, many companies have begun publishing computer titles, but most are still published by a small but notable group. Some of these

publishers are listed below.

Sybex Books (2021 Challenger Dr., Alameda, CA 94501; 800-227-2346). Sybex publishes an average of 60 new high-quality titles each year covering the field of microcomputers and their applications, hardware, programming languages and communications. Sample titles include *Mastering SAMNA* and *Introduction to Turbo Prolog*.

TAB Books (P.O. Box 40, Blue Ridge Summit, PA 17214; 800-233-1128). TAB publishes about 200 titles per year in a variety of fields, including personal computer software and hardware. Sample new titles include *Modula-2 Programmer's Resource Book*, *VersaCad Tutorial*, and *The Power of Turbo Basic*.

Computer Science Press, Inc. (1803 Research Blvd., Rockville, MD 20850; 301-251-9050). About two dozen new technical computer books are published by this press each year. Topics include computer science and computer engineering.

QED Information Sciences (170 Linden St., P.O. Box 181, Wellesley, MA 02181; 800-343-4848). This publisher tends to publish titles for data processing personnel. Sample titles include *Microcomputer Decision Support Systems: Design, Implementation and Evaluation*, and *The Library of Structured COBOL Programs*.

Microsoft Press (P.O. Box 97017, Redmond, WA 98073-9717; 800-242-7737). In 1987, this division of Microsoft published over 30 microcomputer books. Some of their recent titles include *Managing Your Business With Multiplan*, *Advanced MS-DOS Programming*, and *Programming Windows 2.0*.

John Wiley & Sons, Inc. (605 3rd Ave., New York, NY 10158; 212-850-6418). Wiley and Sons publishes books on a variety of topics, including a good number of computer books. Two 1988 publications published by Wiley are *OS/2: A Business Perspective* and *OS/2: Features, Functions, and Applications*.

Prentice-Hall Inc. (Englewood Cliffs, NJ 07632; 201-592-2000). You're sure to come across books published by Prentice-Hall in the computer section of a library or bookstore. Some 1988 titles include *Advanced Interactive COBOL for Micros* and *Advanced C Programming for Displays*.

*Just open
the covers of your
favorite computer books
to find the names
of publishers to
write to.*

COMPUTE! Books (Box 5406, Greensboro, NC 27403; 800-638-3822). If you're looking for books geared toward a specific computer, you may find what you want from this publisher. They publish three to four dozen new titles each year.

Addison-Wesley Publishing Co. (1 Jacob Way, Reading, MA 01867; 800-447-2226). New titles published by Addison-Wesley include *An Introduction to Programming Using Macintosh Pascal*, *Lotus Magazine*, the *Macro Book*, and *Practical Compiling With Pascal-S*.

A number of other publishers offer computer titles. **QUE Corp.**, **MIT Press**, **Howard W. Sams**, and **Wordware Publishing** are just a few. These and others are listed in the *Literary Marketplace*, the *Writer's Market*, and other resources available at your local public library.

THE COMPUTER USER'S DREAM BOOKSTORE

If sending away for more than one catalog seems like too much work, the Computer Literacy Bookshop provides you with an alternative. Opened in March 1983, the Computer Literacy Bookshop stocks an overwhelming collection of computer books—there are more than 14,000 volumes on its shelves, and there are three stores with computer-literate staffs to serve you. The bookshop strives to carry *all* computer-related titles and does a wonderful job of fulfilling that mission. If there's a computer book you want that isn't on their shelves, they'll order it for you. They also publish a bimonthly new books bulletin that describes selected new titles of considerable interest. Mail and phone orders are welcome, as are corporate accounts. Next day shipment is guaranteed on all books in stock. To get on the mailing list, write to The Computer Literacy Bookshop, 2590 North First St., San Jose, CA 95131, or call (408) 435-1118.

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The bookshop also operates a bulletin board containing the complete text of the new book bulletins and current book reviews. You can also find out what books are available on a given topic and reserve forthcoming books through the bulletin board. You can dial into the board by calling (408) 730-9959, Monday through Friday from 9 p.m. to 9 a.m. or any time Saturday or Sunday (300/1200 baud).

COMPUTER BOOK CLUBS

The easiest way to stay informed of new books published is to

join a computer book club. As a member of a book club you'll receive bulletins of new and bestselling computer titles at regular intervals. The books are usually available to members at a discounted price of up to 40 percent off the publisher's list price. The catch, of course, is that you're obligated to purchase a certain number of books—usually three to five—in the first year, depending upon your membership terms. If you normally purchase a considerable number of computer books, the minimum-purchase requirement is of no consequence. If you don't, you may want to think twice before joining a book club. A listing of clubs follows.

BYTE Book Club (McGraw-Hill Book Clubs, P.O. Box 528, Hightstown, NJ 08520-9959). This book club offers titles for both home and office users. Topics include software and hardware, programming languages, and system design and analysis. Titles range from *Programmable Controller Handbook* to *Introducing PC-DOS and MS-DOS: A Guide for Beginning and Advanced Users*. You must purchase three books in the first year of membership.

Computer Book Club (TAB Books, Inc., P.O. Box 80, Blue Ridge Summit, PA 17214-9988). How-to books and books on programming techniques, software, and hardware are offered by this club. Sample titles include *Maximum Performance with Lotus 1-2-3* and the *Illustrated Handbook of Desktop Publishing and Typesetting*. Three books must be purchased during the first year.

Library of Computer and Information Sciences (Macmillan Book Clubs Inc., Riverside, NJ 08075-9889). The professional will find books on topics ranging from microcomputers, artificial intelligence, and fourth-generation languages to large computers in this book club. Selections include *RS-232 Simplified*, *Advanced MS-DOS*, and *Operating Systems: Design and Implementation*. You must purchase three books during the first year of membership.

Small Computer Book Club (Macmillan Book Clubs, Inc., 8661 Third Ave., New York, NY 10022). For the serious microcomputer user, this club offers books on all applications of microcomputing. You must purchase three books in the first year of membership.

Two specialized book clubs that may be of interest to microcomputer users are:

Electronics & Control Engineers' Book Club (McGraw-Hill Book Clubs, 11 West 19th St., New York, NY 10011). This club is geared toward the electronics and computer engineer. The *Modern Electronic Circuits Reference Manual* is a sample title. You must purchase three books during the first year of membership.

Electronics Book Club (TAB Books, Inc., Blue Ridge Summit, PA 17214). This club offers titles of interest to electronics and computer hobbyists. You must purchase four books in the first year of membership.

Kathleen Low is a librarian in Sacramento, California, who enjoys discovering sources of information about microcomputing as much as pecking away at her Kaypro.

INTERPRETING ERROR MESSAGES

What they mean and what to do about them

BY ED QUILLEN

Pain is your body's way of telling you that something has gone wrong and that you should do something about the problem. Computers don't experience pain, but they use error messages for pretty much the same purpose: To tell you there's a problem that you should act upon.

But when an error message flashes across your screen, you can't very well tell your computer to schedule an appointment for next week or to take two aspirins and call you in the morning—not if you plan on getting any work done, anyway. You must respond immediately: locate the source of the problem, identify it, and find a cure. Along the way, you want to save your work if at all possible.

There are hundreds of error messages that you might encounter, and it's impossible even to list them all—much less explain what each one means and what to do about it—in this space. However, we can tell you how to determine where the problem is coming from—the first step toward identifying and curing it—and give you some general pointers for dealing with various types of problems. And we can look at a few of the most common error messages and tell you more specifically how to handle them.

FIGURING OUT THE SOURCE OF THE PROBLEM

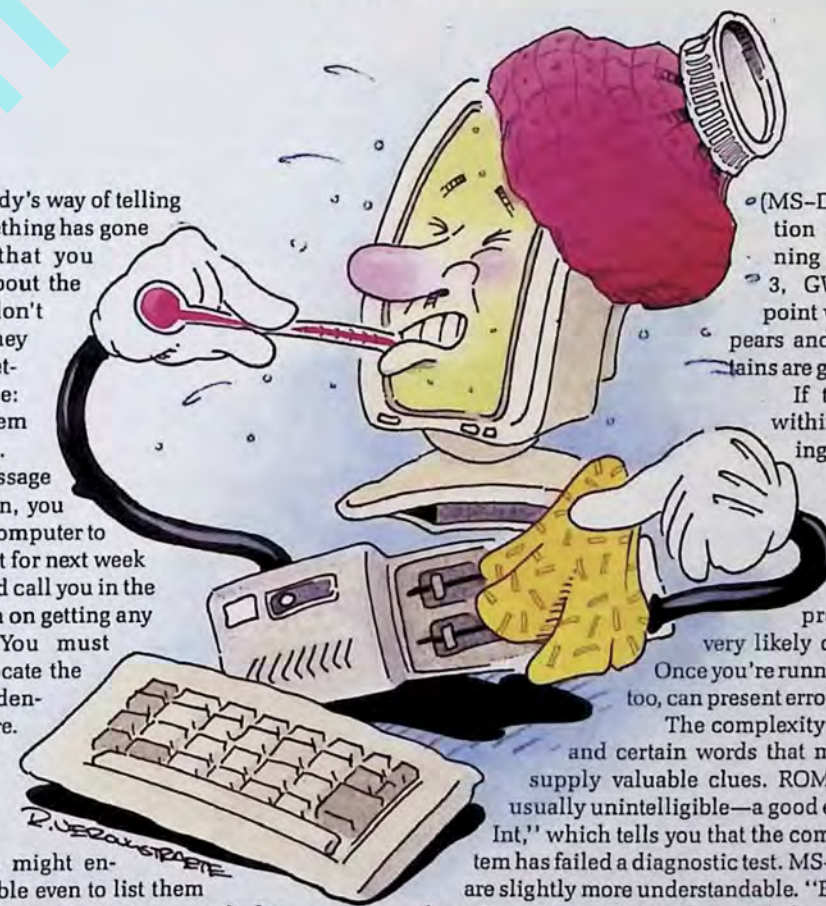
Error messages can come from one of three places: your Kaypro PC's built-in "read-only memory" (ROM), its operating system

(MS-DOS), or the application program you're running (WordStar, Lotus 1-2-3, GWBASIC, etc.). The point when the message appears and the wording it contains are good clues to its origin.

If the problem appears within moments of powering up the computer, the message emerged from the ROM. If it occurs later, when you're running from the MS-DOS prompt, the message very likely came from MS-DOS. Once you're running an application, it, too, can present error messages.

The complexity of the error message and certain words that may appear in it also supply valuable clues. ROM error messages are usually unintelligible—a good example is "Mem Par Int," which tells you that the computer's memory system has failed a diagnostic test. MS-DOS error messages are slightly more understandable. "Error reading drive A: Abort, Retry, Ignore?" is fairly straightforward, and the fact that it contains a device name (drive A:) indicates that it is an MS-DOS message. Messages from applications programs are downright wordy. In dBASE III, for example, generating an error will automatically bring up a full page of help text.

In this article, we'll look at ROM and MS-DOS error messages: what they are, what they mean, and what to do if you get one of them. Since there are thousands of application programs, each with its own way of reporting and handling errors, those can't be covered here. Most modern application programs give you ways to recover from errors without resorting to the reset switch,



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MS-DOS ERROR MESSAGES

which would make you lose any work you haven't saved to disk. Even so, it's still a good idea to save frequently. It's also worthwhile to read the section on "error messages" in the manual for any applications program you use.

ROM ERROR MESSAGES

Although your PC is generally under the control of the operating system, that isn't the case right after you turn it on in the morning or when you reset the machine—either with the little red button on the back of the computer, or from the keyboard (Control-Alt-Del or Control-Sys Req).

Immediately after being turned on or reset, the PC is controlled by its ROM—a set of built-in instructions that check its equipment and its RAM (random access memory). You see the results of the RAM test on the screen: "640kb Good." If those tests find that everything is in order, the PC goes ahead and loads MS-DOS, which takes over from there.

As soon as you get the MS-DOS prompt ("A" or "C" unless you've changed it), then you know all is well with the ROM. If there is a problem with the ROM, or it discovers one elsewhere in the system with its tests, you won't get the prompt. You'll see an error message.

Although the cure can be as simple as opening the floppy drive (more on this in a moment), some problems are more serious and will require a visit to your dealer.

"ROM bad Chksum = ###" is one of those (the "###" stands for any numerals.) It means the ROM has been misprogrammed. If you get this message once, try resetting your machine. If the message vanishes and never appears again, then you can blame the one-time problem on stray cosmic rays or the alignment of the planets, or write it off as "just one of those things." But if you ever see this message a second time, call your dealer and schedule an immediate transplant operation. Your PC's ROM chip will have to be replaced, and the only people authorized to install Kaypro ROMs are Kaypro dealers.

"Mem Par Int," mentioned above, means "Memory Parity Interrupt" and signifies a problem in the RAM rather than the ROM. It means that one of your computer's memory chips isn't working. Most likely, your machine is unusable until you replace the bad chip or chips. That isn't especially expensive or difficult, but it is beyond the scope of this article. If you don't know how, see your dealer or a technically-minded friend.

(However, you may not need to do that. On some mornings last winter, I'd get this message when I started my PC. If I left it on for 15 minutes and then reset the machine, the error message would go away and my computer would run just fine. A little research revealed that I wasn't the only one this happened to. Some memory chips just don't work right when they're cold—which they are if they've been sitting overnight in a cool room. Once they warm up from the heat of the machine as it runs, the chips function perfectly. So try leaving your computer on for a few minutes if you have the misfortune to see this message. If all works fine after a reset, you can postpone surgery indefinitely.)

The ROM can present a host of other messages, far too numerous to list here, that very likely mean your machine has

serious problems that will require a technician's attention. Among those you're most likely to encounter are "128K not OK, par dsb." (which means a large section of memory is not all right), "Ram bad" (self-explanatory), "NMI Int" (which indicates a problem with hardware interface with DOS) and "I/O Board Mem par" (which means there's a problem accessing a device on the control bus).

You may see an option after the error message: "Type (S)hut off NMI" or "Error. Press F1 key." Taking one of those options means the machine will run—but not reliably. It does allow someone to get in with DEBUG or a similar utility and pinpoint the problem.

If resetting your machine doesn't get rid of the error message, then resign yourself to a repair bill—or be grateful that Kaypro provides a one-year warranty.

*Some
ROM error messages mean
resign yourself
to a repair bill; others,
however, are easy
to fix.*

However, there are three ROM error messages that are generally easy to fix.

"Check keyboard" usually means that the lock on the front of your Kaypro PC has been turned. Just unlock it, and everything will work fine. If there's still a keyboard problem, check the cable; chances are it isn't plugged in properly in the back of the machine. If your keyboard is plugged in and unlocked, but still refuses to work, then you should have your computer examined by a qualified Kaypro repair person. "Boot disk failure, Type key to retry" or "Non-System disk or disk error. Replace and strike any key when ready" both mean that the disk in drive A does not have the MS-DOS files required to get the machine up and running. This usually occurs when you have a hard disk; you've reset or started the machine with a floppy in drive A. Just open the floppy drive, and strike any key. Your PC will then load MS-DOS off drive C—the hard disk.

MS-DOS ERROR MESSAGES

Once the ROM finishes its morning chores, your Kaypro PC is up and running under MS-DOS—you know that because MS-MENU is on the screen, or you've got the MS-DOS prompt. Before you start writing or working on a spreadsheet, you might decide to do some "housekeeping"—copying some files, renaming others, etc. And in the process, you can get an error message. MS-DOS errors come in two forms: device errors and other er-

rors. We'll look at each in turn.

Device Errors. To MS-DOS, most components of a computer system are "devices." The printer is PRN or LPT1, the keyboard and screen are CON (for console), and the serial port is COM1 or AUX. Your disk drives are also devices.

MS-DOS treats your computer like a processor that sits in the middle of all these devices. It gets data and instructions from various devices, acts on the data and instructions, and then sends its output to various devices.

If the processor in the middle is receiving data, the processor is "reading." If the processor is sending data, it is "writing."

Most devices can be both read from and written to, but not all. A printer, for instance, can be written to, but not read from. A mouse on the serial port can be read from (the processor receives information from the mouse) but not written to (the processor cannot send information to the mouse). A modem on the serial port can do both.

Given that, it's not surprising that MS-DOS has such a robust repertoire of "device error messages." They take one of two forms:

(What kind of) error reading <device>

or

(What kind of) error writing <device>

Both then give you the options:

Abort, Retry, Ignore?

For example, you might see:

"No paper error writing device PRN:
Abort, Retry, Ignore?"

This means that the printer has run out of paper or that the paper is jammed. Fix the printer and type R (for Retry) to continue. Another message might be:

"Seek error reading drive B:
Abort, Retry, Ignore?"

This indicates that the disk drive can't read the disk reliably (it's "seeking" a place on the disk and it can't find it). Sometimes this happens for no reason, and a Retry command will complete the operation. Most of the time, however, it indicates a damaged and unusable floppy disk.

When you see an error message of this type, no matter what it is, you should always type "R" for Retry. Sometimes the Retry works immediately, but if at first you don't succeed, Retry again. If the error message keeps appearing after half a dozen retries, then your choice is A for Abort or I for Ignore.

Abort is almost always the safer course because it halts whatever operation is taking place (aborts it) and returns you to

the operating system. Ignore tells MS-DOS to ignore the detected error and to continue with the operation—a risky proposition because the chances are that whatever you are attempting cannot be accomplished with the previously detected error in effect.

For MS-DOS version 3.2, the reference manual lists 16 kinds of device errors. Many of these are arcane; you're more likely to win your state lottery jackpot than to see "FCB unavailable error," or "Sharing violation error," or "Bad call format error writing drive D."

A
device error usually occurs
because the device
isn't present,
isn't ready, or isn't
functioning.

A device error usually occurs because the device isn't present, isn't ready, or isn't functioning properly. The general solution is to solve the problem with the device—such as fixing the printer in the above example—or to change the command so that you're not addressing a device that isn't there. Don't configure your modem for COM2, for example, if you have no COM2 installed in your system.

To see how this works in practice, let's examine some common device errors.

My Kaypro PC has a floppy drive, A, and a hard drive, C. There is no B drive. Suppose I issue the command DIR B:. I'll get this error message: "Seek error reading drive B:"

If Microsoft wanted to make life easier for us working folk, the message would have been "There isn't a drive B on this system. Try something else."

Unfortunately, life isn't that simple, and to make things even more complicated, you'll get the same error message if there's a defective area on a disk in a drive you do have. In one case, you have to Abort and then rephrase the command; in the other, you should change disks and Retry.

There are other disk-related error messages that mean you should change the floppy and Retry (bear in mind that "X" in the examples below means a drive, like A or B, and that reading/writing means the message will contain one or the other):

"Non-Dos disk error reading/writing drive X"
"Sector not found error reading/writing drive X"
"Write fault error reading/writing drive X"
"Read fault error reading/writing drive X"
"General failure reading/writing drive X"
"Data error reading drive X"

"Write protect error writing drive X"

In this last case, the disk has a write-protect tab on it. Before you peel it off, consider why the disk might have been protected in the first place.

Disk drives can cause one more common device error: "Not ready error reading/writing drive X." This often occurs when you haven't latched the drive door.

You'll get a similar message, "Not ready error writing device PRN," if your printer is off-line.

Your printer might send another message: "No paper error writing device PRN." I once got it every time I pushed "Prt Scr," even though my printer sat atop a full box of fanfold paper. I'd push A for Abort, and the message would pop up again—and be printed by the printer that supposedly wasn't working.

As it turned out, my Okidata 92 allows you to feed paper from the back or the bottom, and I'd just rearranged things so that it was getting fed from the bottom. But the paper-out sensor sits behind the platen, so it reports a paper outage if the paper is feeding in from the bottom. After discovering that, I stuck the sensing lever down with some strapping tape. Now it always thinks it has paper.

The moral of this story is that sometimes you have to fiddle with devices to get them to work.

Other MS-DOS Errors. Although device errors seem to occur the most frequently, there are many other problems MS-DOS can report—too many to list here.

Two that can inspire panic are "Bad or missing Command Interpreter" and "Invalid COMMAND.COM in drive X."

MS-DOS uses a program called "COMMAND.COM" to read the keyboard and perform other routine tasks, such as reading a directory. Many programs take up every bit of RAM they can find, so they usurp COMMAND.COM's place. That's fine while you're running the application, but when you quit running the application and return to MS-DOS, you could get this message if MS-DOS can't find COMMAND.COM to reload it. This usually happens on computers that run with only floppy disks, since COMMAND.COM is always present in the root directory of a hard disk.

This problem also occurs when you've worked with several versions of MS-DOS. Suppose you've upgraded to Version 3.2, but some of your disks still have the COMMAND.COM from Version 2.11. You might start under 3.2 and run your program. In the process, you've switched floppies in drive A, and the current floppy has COMMAND.COM from Version 2.11. You'll get the above error message.

To cure the problem, put your start-up floppy in drive A. Try pressing Control-C first. If that won't get things up and running again, you'll have to reset your machine.

Another error message you might see if you've got several versions of MS-DOS around is "Incorrect DOS version." Some utilities that run under version 3.2 won't run under version 2.11. You won't be able to do what you planned to do until you reset your machine and load the proper version.

"Invalid number of parameters" is a perfect example of computer jargon that doesn't make much sense, especially when it

shows up on a simple operation—renaming a file.

If you're at the prompt, and you type "REN A:OLDNAME.EXT NEWNAME.EXT" then all will go well. But if you type "REN A:OLDNAME.EXT A:NEWNAME.EXT" then you'll get this error message. You can't move a file to a different drive (or subdirectory) in the process of renaming it. And even though you're keeping it in the same place, MS-DOS won't let you specify the drive (or subdirectory) as part of its new name.

Attempting to rename a file can give you another error message: "Duplicate filename or file not found." This one is reasonably sensible. If your directory shows both OLDNAME.EXT and NEWNAME.EXT, and you type "REN OLDNAME.EXT NEWNAME.EXT" then you've got a duplicate filename. Find another name. If OLDNAME.EXT doesn't exist, and you give that command, then the "file not found" part is appropriate.

"Bad command
or file name" isn't
a moral judgment;
your PC doesn't know what
to do with what
you typed.

When your PC tells you "Bad command or file name," it isn't making a moral judgment. Instead, it is telling you that it doesn't know what to do with what you just typed from the prompt.

Suppose you enter "DIT" when you really wanted "DIR" for a directory. MS-DOS doesn't have a built-in "DIT" command. So it looks through the default directory for "DIT.COM," then "DIT.EXE," and then "DIT.BAT." Failing there, MS-DOS examines any other drives or subdirectories you specified with the PATH command. If MS-DOS can't find a DIT in any of those places, you get this message. In this case, you misspelled a command. Just spell it right when you try again.

You'll also get this message if you specified a program that isn't on the current default directory or anywhere in the current path. Change directories to the place where the command resides. And if you get this message often, set up the appropriate PATH command in your AUTOEXEC.BAT file.

Those of us who recall PIP in CP/M enjoy the ease of the MS-DOS "COPY" command. Convenient as it is, using COPY with disk files can cause two error messages that aren't quite self-explanatory.

"File cannot be copied onto itself" means that you gave the copy the same name and directory as the original. You'd get this if you entered "COPY C:\WRITE\TEXTFILE.DOC TEXTFILE.DOC" and you were in your C:\WRITE subdirectory.

To make the copy, either change the name or change the directory of the copy.

When you use COPY to put two files together, you could destroy one of them in the process. The bad news is that MS-DOS won't stop you from doing this. The good news, such as it is, is that you'll get an error message afterwards.

Suppose you have "ARTICLE" and "ARTICLE2." ARTICLE2 has material that should be at the start. So you decide to copy them both into ARTICLE. You give this command: COPY ARTICLE2+ARTICLE ARTICLE

The copy starts, and then you get "Content of destination lost before copy." When you examine the new ARTICLE, you see that it contains only the material in ARTICLE2. What was in the old ARTICLE has vanished to that great bit bucket in the sky.

Here's what happened. When you told MS-DOS to copy two files into ARTICLE, it opened a new file called ARTICLE. Since you can't have two files with the same name in the same directory, MS-DOS just eliminated the old ARTICLE when it opened the new ARTICLE, which starts out empty.

First ARTICLE2 is copied into it, and then MS-DOS looks for the old ARTICLE. It's not there, and thus the message—too late

for you to do anything about it.

As soon as you quit pounding on your desk and saying nasty things about the folks at Microsoft, realize that you've learned something. Henceforth, when you need to do something like this, copy everything into a new filename. Then you can delete and rename to get what you wanted in the first place.

There's one last mysterious error message I should let you in on. One of the first things you learned in math classes is that you can't divide by zero. Neither can your computer. Whenever it gets an instruction to divide by zero, it sends the message "Divide Overflow."

That's appropriate if you're working with numbers and you do something you shouldn't. But this message sometimes appears when you're just copying a file from one place to another, and there's nothing in any documentation I've seen to explain this. There are people in the local users' group who don't shudder and tremble when they hear phrases like "vector interrupt," so I asked around. There was ample speculation, but no certain explanation. However, I learned some ways to recover from this problem.

Try Control-C first. If that doesn't work, take the disk out and put it back in the drive—it might not have been seated quite properly. Try Control-C again. If you still don't get control of the machine, you'll have to reset it.

MS-DOS error messages are always annoying and can be cryptic. Generally, though, they're the computer's way of saying "You've just told me to do something I can't do, or something I don't know how to do. Let's try it again."

They'll tell you, more or less, what you did wrong, but they don't offer much guidance on how to do it right. When you've mistyped a familiar command, you already know how to enter the command properly. Correcting the problem is simple.

Sometimes the correction isn't so quick or simple because the message is difficult to understand. I've covered the most common problems (at least in my experience) here. If you've run into something else, try these suggestions:

—Read through the "messages" appendix of your Kaypro MS-DOS User's Guide. Then experiment with expendable files.

—Ask questions at the next meeting of your local Kaypro Users' Group. (To find the KUG nearest you, call 1-800-4-KAYPRO.) My little town doesn't have a KUG, but it has an active IBM PC Users' Group. The Kaypro PC is so compatible that we fit in fine.

—Consult one of the many books that explain MS-DOS in detail. Two that I've found most useful for interpreting error messages are *PC-DOS: Introduction to High-Performance Computing*, by Peter Norton (Brady Communications, \$18.95 in paperback; ISBN 0-89303-752-4) and *MS-DOS Bible*, by Steven Simrin (Howard W. Sams, \$18.95 in paperback; ISBN 0-672-22408-9).

Ed Quillen is a free-lance writer and computer hobbyist based in Salida, Colorado. For their assistance in preparing this article, he wishes to thank two other Salidans: Leonel "Marty" Martinez, another hobbyist, and Mark B. Emmer, president and chief programmer of CatSpaw, Inc., a small software house.

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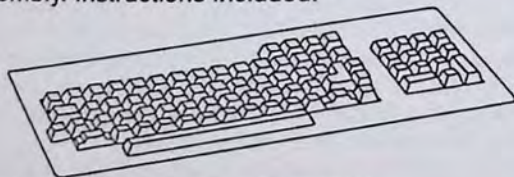
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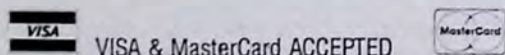
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HURDLING THE LIMITS ON dBASE REPORTS

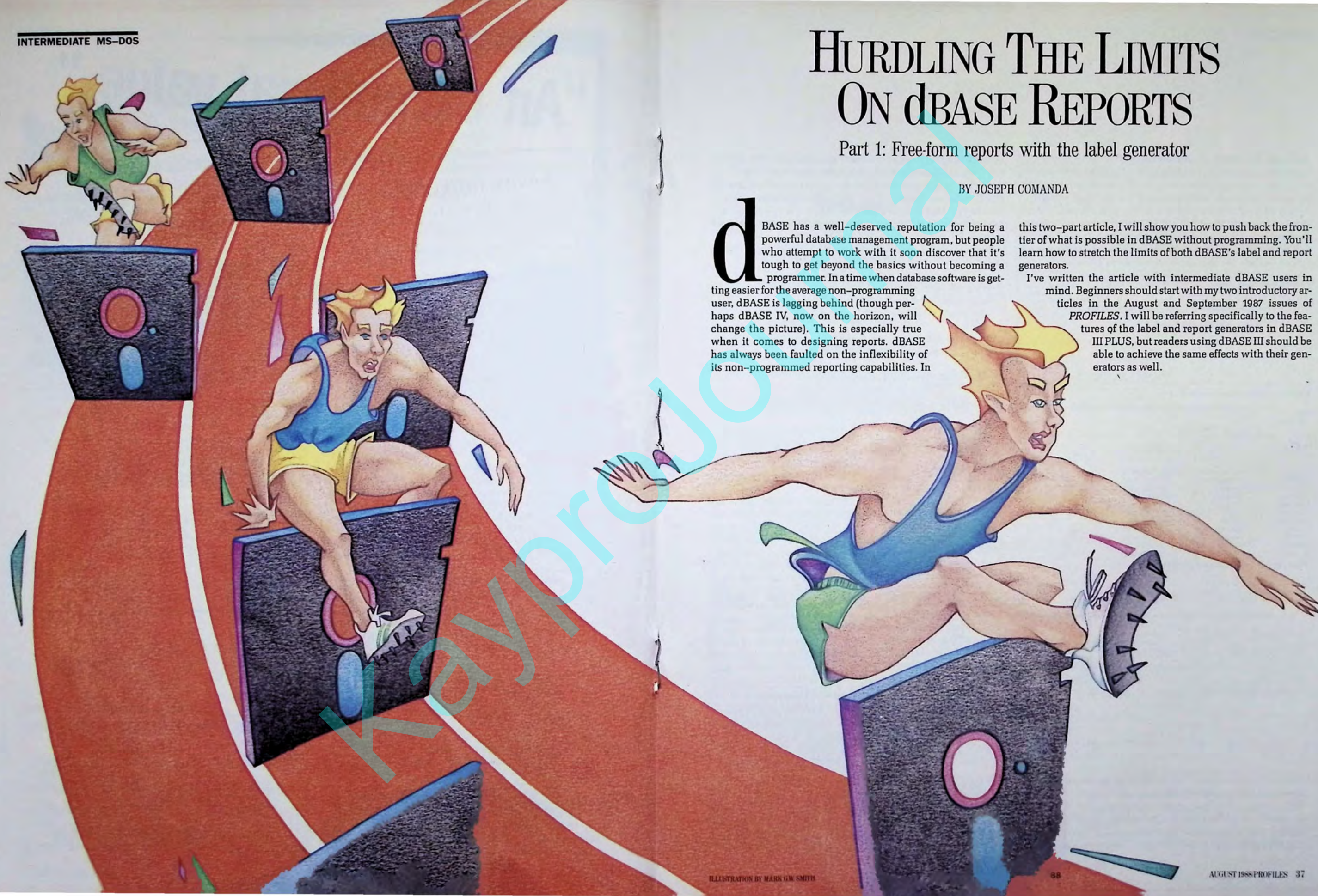
Part 1: Free-form reports with the label generator

BY JOSEPH COMANDA

dBASE has a well-deserved reputation for being a powerful database management program, but people who attempt to work with it soon discover that it's tough to get beyond the basics without becoming a programmer. In a time when database software is getting easier for the average non-programming user, dBASE is lagging behind (though perhaps dBASE IV, now on the horizon, will change the picture). This is especially true when it comes to designing reports. dBASE has always been faulted on the inflexibility of its non-programmed reporting capabilities. In

this two-part article, I will show you how to push back the frontier of what is possible in dBASE without programming. You'll learn how to stretch the limits of both dBASE's label and report generators.

I've written the article with intermediate dBASE users in mind. Beginners should start with my two introductory articles in the August and September 1987 issues of *PROFILES*. I will be referring specifically to the features of the label and report generators in dBASE III PLUS, but readers using dBASE III should be able to achieve the same effects with their generators as well.



TABULAR AND FREE-FORM REPORTS

When you're working with database management programs, the term *report* is often used to mean any kind of printout. That definition is further complicated by the fact that sometimes reports are sent to the screen rather than to the printer. I'll use the term "report" to refer to any display of information from a database generally destined for the printer. Bear in mind that this definition includes a lot of things you might not think of as reports—labels, Rolodex cards, and invoices, for example.

Add/Change Donor Names	
First Name	Eleanor
Last Name	Wilson
Street	123 Newgate Road
City	Ardmore
State	PA
Zip Code	19272
Phone	(215) 456-1237

Figure 1: A typical data-entry screen

Page No.	1
04/23/88	
A List of Donor Names	
Name	Telephone #
Brush	Nicholas (215) 567-4678
Foster	Frederick (215) 932-4467
Johnson	James (632) 123-4567
Johnson	Matthew (302) 123-4567
Marlowe	Philip (202) 123-4567
Milligan	John (415) 123-4567
Norris	Sarah (450) 123-4567
Smith	Madelyn (215) 234-4567
Smith	Neal (215) 427-4562
Walker	Martha (505) 123-4567
Wilson	Eleanor (215) 456-1237

Madelyn Smith 123 Main Street Narberth PA 19045	Philip Marlowe 657 Sunset Blvd. Los Angeles CA 90234
---	--

Martha Walker 987 Elm New Castle DE 18045	Nicholas Brush 123 Market Street Philadelphia PA 19107
---	--

 Charity LTD.
 123 Benevolent Way
 Bonanza, California 92345

Figure 2: A typical dBASE tabular report

Madelyn Smith
123 Main Street
Narberth, PA 19045

Thank you for your recent gift of \$400.00

Figure 3: Free-form reports—labels and receipts

One of the nice things about databases is that you can enter information using one display (often called a data-entry screen) and get it out using a variety of different ones. For example, you can use a data-entry screen like the one in Figure 1 to enter your

names and addresses and then produce a phone list like the one in Figure 2 or labels like the ones in Figure 3.

Database programs tend to divide reports into two categories: tabular and free-form reports. The easiest way to see the difference is to look at some examples. Figure 2 is an example of a tabular report, and Figure 3 shows two examples of a free-form report.

Tabular (or columnar) reports share the following characteristics:

- they are page- rather than form-oriented
- they usually have many records per page
- information is placed in columns and rows

Free-form reports are more varied, but they all share the following characteristics:

- they are form-rather than page-oriented
- they only have one record in each form
- information may be placed anywhere in the form

Of course, some kinds of very common printouts are really hybrids. Look at the invoice in Figure 4, for example. The header information at the top is free-form and the line item and totaling section at the bottom is tabular.

BIG BONANZA CORPORATION 123 Marketing Way Bonanza, California 92345				
Ship to:		Madelyn Smith 123 Main Street Narberth, PA 19045	Date: 04/22/88	
QTY	ITEM	DESCRIPTION	PRICE	AMOUNT
5	AAAA	Saddles	\$400	\$2000
2	BBBB	Bridles	200	400
TOTAL				\$2400

Figure 4: An invoice is a hybrid, part free-form, part tabular report

In this series of articles I will cover the two varieties of reports. In this one, I'll deal with the dBASE label generator and how to push it beyond just labels to generate all kinds of free-form reports. Next time I'll deal with dBASE's column-oriented (tabular) report generator and how to stretch its possibilities.

dBASE'S LABEL GENERATOR

dBASE's label generator is a menu-driven tool for creating a label specification file. The label specification file will have an LBL extension and will contain the instructions for how to print the labels. Later, when you're ready to print the labels, you will have to tell dBASE to print them using the specification file. It

does an excellent job of turning label design into a simple task, but it takes some tricks to get it to do other kinds of free-form reports.

*dBASE's
label generator
can be pushed to generate
all kinds of
free-form reports.*

First, I'll describe how the label generator works, then I'll give you step-by-step instructions for designing and printing a set of labels. After that I'll move on to a more challenging topic: how to get the label generator to design a receipt form like the one in Figure 3.

Like the dBASE III PLUS Assist menu, the label generator screen (shown in Figures 5 and 6) consists of a series of pop-up menu boxes linked to a single top-line menu. You can use the left and right arrow keys to move to different boxes, the up and down arrow keys to move to different selections within the boxes, and the Enter key to select a highlighted option within a box. You can also press the first letter of a top-line menu option to jump directly to its box.

The generator has three boxes:

Options controls settings for overall characteristics of the label, such as its dimensions and how many you'll have side-by-side.

Contents controls what appears on each line of the label.

Exit lets you save or abandon your work.

Designing a label, then, is simply a matter of specifying what size you want, how many across you want, and what information you want on each line. dBASE even simplifies the process further by providing a set of five predefined label sizes that cover most of the mailing label formats you're likely to encounter.

The settings in the Options box in Figure 5 are for common "one-across, one-inch" labels. The only modification was to change the left margin to three characters. The units of measure can get a bit confusing here. The predefined sizes are defined in inches, but the actual settings in the box, which can be changed, are in characters and lines. The assumption is that you're printing at 10 characters per inch and 6 lines per inch. If you planned to print at 12 characters per inch, you would have to change the setting for label width on a 3.5 inch label from 35 to 42.

Figure 6 shows the Contents box for the same label. You get five lines to work with because that's all that will fit on the size label we chose if we print at six lines per inch. The commas on lines 1 and 4 tell dBASE to trim all trailing space off the previous field and then add one space back in before the next field. The labels end up looking like the ones in Figure 3.

DESIGNING AND PRINTING LABELS

If you're treating this as a tutorial, here's what you'll need to do to design your labels:

Options	Contents	Exit
Predesigned size: 3 1/2 x 15/16 by 1		
Label width:	35	
Label height:	5	
Left margin:	3	
Lines between labels:	1	
Spaces between labels:	0	
Labels across page:	1	
CREATE LABEL	(C:) CUSTOMER.LBL	Opt: 1/7

Figure 5: The label generator screen with the Options box displayed

Options	Contents	Exit
Label contents 1: FIRST, LAST		
2: STREET		
3: CITY, STATE, ZIP		
4:		
5:		
CREATE LABEL	(C:) CUSTOMER.LBL	Opt: 1/5

Figure 6: The label generator screen with the Contents box displayed

1. Create a database file called DONORS with the structure shown in Figure 7. The DONORS file from the August 1987 *PROFILES* article will do nicely.
2. Add some records to it.
3. Get into the label generator using the following command:

CREATE LABEL DONORS

- (where DONORS is the name of the label specification file).
4. Follow the steps in Figure 8 to design the label.

When you're done, you'll be ready to print them. The basic command to print labels is **LABEL FORM** (label file) where (label)file is the name of the label specification file (in this case, DONORS). By adding the words **TO PRINT** to the end of the line, you can send them to the printer (otherwise they just go to the screen). You can also add a **FOR** clause to send labels to a

subset of the people on your mailing list. For example, with the clause **FOR STATE = "PA"** you would only get labels for Pennsylvania residents. Finally there is a **SAMPLE** clause that will give you test labels (as many as you want) until you're satisfied that the labels are lined up right.

Field	Field Name	Type	Width	Dec
1	FIRST	Character	15	
2	LAST	Character	15	
3	STREET	Character	30	
4	CITY	Character	17	
5	STATE	Character	2	
6	ZIP	Character	5	
7	GIFT	Numeric	7	2
8	PHONE	Character	13	

Figure 7: The Structure of the DONORS file

Options	
Left Margin	Move to the Options box Use the down arrow key to move to it
Return	Return selects that option and a sideways triangle indicates it has been selected
3	Changes the left margin to 3
Return	Completes selection
Contents	Move to the Contents box
Return	Selects line 1
FIRST, LAST	Type in "FIRST, LAST"
Return	Deselects line 1
Down Arrow	Takes you to line 2
Return	Selects line 2
STREET	Type in "STREET"
Return	Deselects line 2
Down Arrow	Takes you to line 3
Return	Selects line 3
CITY, STATE, ZIP	Type in "CITY, STATE, ZIP"
Return	Deselects line 3
Exit	Move to the Exit box
Return	Selects the Save option

Figure 8: The steps to create simple labels for the DONORS file

The following command will give you test labels before printing the labels for people who live in Pennsylvania:

**LABEL FORM DONORS SAMPLE FOR STATE="PA"
TO PRINT**

If you use the test label option, dBASE will print out a set of test labels with asterisks and ask if you want another one. You're job is to see if they line up right with the labels. If they don't, adjust the labels and ask for another one. Once you've got everything lined up, tell dBASE you don't want any more samples and the labels start coming out.

BREAKING FREE OF LABEL RESTRICTIONS

Because dBASE's label generator was only intended for labels, it has a number of features that get in the way when you try to use it as a more flexible form generator.

First, in a free-form report, you may want to put things in the middle or on the right side of a line, but the label generator tends to want everything to start at the left side of a line.

Second, blank lines can open up a free-form report and make it look less crowded, but the label generator likes to close up blank lines, which look unsightly on labels, especially when they show up in the middle of an address.

Third, it has size limitations that are generous for labels but might be restrictive for some large forms. The maximum label width is 120 characters, which is probably more than adequate, but the maximum label height is only 16 lines.

Finally, it assumes you're only planning to stick a few fields on each line, so it has a limit on instructions per content line of 60 characters. When you try to print text messages you can run into that limit quite easily.

The good news is that there are tricks for getting around most of these limitations—all of them, in fact, except the label width.

The tricks involve using the dBASE functions listed in Figure 9. We'll use all of them to create the receipt in Figure 3. Notice that it has blank lines and that the text is not all placed at the left edge of the line.

Function	Description	Example	Result
CHR()	Returns ASCII character	CHR(10)	Line feed
LTRIM()	Trims leading space	LTRIM(" TTTT")	"TTTT"
REPLICATE()	Repeats character	REPLICATE("T",5)	"TTTTT"
SPACE()	Creates string of spaces	SPACE(5)	" "
STR()	Turns number into string	STR(GIFT,7,2)	" 195.00"
TRIM()	Trims trailing space	TRIM("TTTT ")	"TTTT"

Note: the REPLICATE() and LTRIM() functions are not available in dBASE III.

Figure 9

Here are the commands that produced it, line by line (lines are broken here to accommodate magazine margins):

Line 1: **REPLICATE(" ",70)**

Line 2: **"Charity LTD." + SPACE(35) + "Our cause is your cause"**

Line 3: **"123 Benevolent Way"**

Line 4: **"Bonanza, California 92345" + REPLICATE(CHR(10),3)**

Line 5: **SPACE(25) + FIRST, LAST**

Line 6: **SPACE(25) + STREET**

Line 7: **SPACE(25) + TRIM(CITY) + ", " + STATE + " " + ZIP + REPLICATE(CHR(10),3)**

Line 8: **"Thank you for your recent gift of \$" + LTRIM(STR(GIFT,7,2))**

Line 9: **REPLICATE(" ",70)**

The first thing you should notice is that we ended up with a

15-line label with only nine lines of instructions. The extra lines are the blank ones generated with a combination of the **REPLICATE()** and **CHR()** functions at the end of lines 4 and 7. **CHR(10)** by itself embeds a line feed character that generates an extra line, and **REPLICATE(CHR(10),3)** just repeats **CHR(10)** three times, giving four altogether (the three from the **replicate** command plus the one that would normally come at the end of a line). You can use this technique both to create blank lines anywhere in the form and to get past the 16-line limit for a label.

REPLICATE() also gets us out of another bind on lines 1 and 9. It produces a string of 70 asterisks. If we had done it literally, we could only have put 58 on a line. That plus the two quotation marks would have filled out the 60-character limit for label line instructions.

Next, notice how the **SPACE()** function pushes the donor address 25 characters to the right in lines 5, 6, and 7. It also creates the gap within the two blocks of text on line 1.

In line 8, the **STR()** function, which converts a number to a string, gets us around the dBASE rule about not mixing numbers and characters on the same line. The **LTRIM()** function trims any leading spaces that might result from the conversion. Similarly, the **TRIM()** function trims the trailing space in the **STATE** field on line 7.

PUTTING IT ALL TOGETHER

Here's how you can create the receipt form:

1. Use the **CREATE LABEL** command to get started. You can call the label specification file something like "RECEIPT."
2. Place the following settings in the Options box.

Label width: 80
Label height: 9
Left margin: 5
Lines between labels: 0
Spaces between labels: 0
Labels across page: 1

3. Fill in the content lines with the instructions above. Feel free to make changes to fit your own idea of what a receipt should look like. You can even make it into a different kind of form.

As you fill in a line, it may scroll to the right, opening up more space and hiding the beginning of the line. Don't let it confuse you. You haven't lost anything. Eventually, if the instructions are long enough, you'll hit the 60-character limit. That's one you can't get around. You'll just have to live with the limit.

If dBASE won't let you out of a line, chances are you have a syntax error. You'll see an error message about needing a valid dBASE expression. Try to figure out what you did wrong. It's probably a simple typing error. Use the left and right arrow keys to move around the line until you spot it, and then correct it.

If you are using the data files from my previous tutorials, you may want to try setting up a link between the two files and working from the **GIFTS** work area. You'll also have to refer to the **DONOR** fields by placing the name-of-donor file, followed by a dash and a greater-than sign, in front of the name of each

field (e.g. **DONORS->LAST**). That will cost you precious space. One partial solution is to use a letter for the file name. You can use **A->** to refer to a file in work area 1 and **B->** for one in work area 2.

5. Try printing initially with a condition that doesn't waste lots of paper, and make sure you use the word **SAMPLE** to get test labels first.

LABEL FORM RECEIPT SAMPLE FOR RECNO() <= 3 will do the trick. It will only print receipts for the first three records.

6. Chances are you won't get things right the first time, especially if you're working with pre-printed forms. You may have to play with the content lines a good deal before you get things to print in exactly the right places. Use the **MODIFY LABEL** command (the **CREATE LABEL** command will also do the trick) to go back in and change things.

IN CONCLUSION

You may decide that it's not worth the trouble to force dBASE's label generator to do other types of reports, and who can blame you? However, if you're like me, you will get a certain delight out of having your way in the end with a recalcitrant tool.

Joseph Comanda is a freelance writer and software trainer living in Philadelphia.

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EDIT TURBO PROGRAMS WITH PERFECT WRITER COMMANDS

How to modify the Turbo Pascal editor

BY THOMAS D. SUTTER

If you are familiar with Wordstar, there's no learning curve for Turbo Pascal's built-in editor, but the Turbo editor's commands have little in common with Perfect Writer. If learning a new set of commands has held you back from enjoying Turbo Pascal, or if the manufacturer's default settings for the editor's command set has slowed you down, this tutorial should help you alter the editor to suit your fancy. Borland International, the creator of Turbo Pascal, has given us the ability to reconfigure or customize the Turbo editor any way we want—there are very few constraints on the reconfiguring procedure. We'll examine those constraints and then see how to customize Turbo's editor to closely simulate the Perfect Writer command set.

THE LIMITATIONS

When reconfiguring Turbo's editor, there are really only two things you need to keep in mind. First, no command can be used twice. In other words, you could not use Ctrl-A to go to the beginning of a line and then try to use Ctrl-A to go to the beginning of the file. The second constraint is less apparent but becomes obvious with a little thought: If you assign two keystrokes to any command (such as Ctrl-X Ctrl-C to end the edit session), you're automatically required to follow *all* commands beginning with that first keystroke with a second keystroke. You cannot use Ctrl-X Ctrl-C to end the editing session and then attempt to define just Ctrl-X to restore a deleted line. The configuration program will not allow it, and even if it did, the editor would not know what you wanted if all you entered was Ctrl-X—it would have no way of knowing whether you simply wanted to restore a deleted line or were going to follow the Ctrl-X with a Ctrl-C to end the edit session. It would be waiting for the other shoe to drop.

With these simple constraints in mind, let's look at some of the options available in Turbo's editor that are not available in Perfect Writer and see how to deal with this situation.

EQUATING THE DIFFERENCES

Turbo's editor is just that: an editor. It is not a word processor, so there are some fundamental differences between it and Perfect

Writer. However, we can establish some correlations between their functions in order to decide which Perfect Writer commands to employ and to make learning to use the newly customized editor easier. If my correlations don't seem logical to you, think of ones that are easier to relate to and use them. (I would suggest, though, that you use mine the first time through and make changes later.)

First, Turbo's editor can position the cursor in either the top left or bottom left corner of the screen. Additionally, it can move the cursor to the beginning or end of a sentence or paragraph. Let's equate these concepts: a paragraph in word processing is equivalent to the screen being viewed with a programmer's editor. And a sentence in word processing is equivalent to a marked area of a file in the programmer's editor.

Second, Perfect Writer has the ability to do split-screen editing; not only that, but while editing in split-screen, you can cause the opposite screen to scroll (albeit not one line at a time). Turbo, on the other hand, cannot do split-screen editing but it can scroll one line at a time. Perfect Writer's ability to scroll the other screen while doing split-screen editing can be related to Turbo's ability to scroll one line at a time.

There are a few more differences that we'll examine as they arise. Let's now begin the reconfiguring process.

CUSTOMIZING THE EDITOR

Obviously, you should not make these changes to your original Turbo diskette, and I would not recommend making the changes to your usual working copy, either. Instead, make a "reserved" copy of your working copy and use that. (It's not a bad idea to have two copies in addition to the original, anyway.)

The installation program Borland supplies enabling you to alter the editor's command set is called "TINST.COM". With your reserved copy of Turbo in drive A, at the system prompt invoke the installation program by entering TINST.

*Though
Turbo's program editor
and Perfect Writer
differ, their functions
can be
correlated.*

The first menu you see should look familiar. You will have used it before to tell Turbo the type of screen your Kaypro has. At that time you selected the "S," or Screen Installation option. This time, you need to select the Command Installation option. Enter a "C," and the installation program will begin asking questions. There are actually three columns for each question. The first column is simply the question number and a brief description of the command being reconfigured. The second column shows how that command is presently configured. And the third column is for you to tell the installation program how you want the command configured. An arrow separates columns two and three.

All instructions to TINST, except from the first menu, are terminated with the enter key. If you want to use what Turbo has already set up for a particular command, just strike the enter key when that command is requested. Additionally, entering the letter "B" in the first column of any response will back up and ask the last question again. Backspace and delete are legitimate responses, so do not expect to use either of these to correct a mistake. Instead, strike the enter key, enter a "B" followed by an enter key, then enter the correct response for the prior question.

Now, let's go through the commands. The first set is related to cursor movement. For character left, press the left arrow; TINST will respond with Ctrl-H, which is the equivalent to the left arrow. (Remember, to let TINST know that all you need is the Ctrl-H, you now strike the enter key.) TINST now asks for an alternate to the character-left command. In my customized version, I have this as (ESC) 1. I know that doesn't make sense, but I don't need an alternate, yet TINST expects one. You can use anything you would like within the constraints described earlier.

Character right is the right arrow. Word left is (ESC) B, and word right, the fifth question, is (ESC) F. Line up is the up arrow and line down is the down arrow.

Questions eight and nine relate to the peculiarities I spoke of before that give Turbo's editor the ability to scroll the screen one line at a time. Since I have conceptually equated these com-

mands to Perfect Writer's ability to scroll the opposite screen while in split-screen edit, I used Ctrl-X Ctrl-Z to scroll down and Ctrl-X Ctrl-V to scroll up.

Turbo's page up and page down perform nearly the same function as Perfect Writer's view next screen and view previous screen commands. Therefore, we'll answer questions 10 and 11 with Ctrl-Z and Ctrl-V, respectively.

Question 12 pertains to the ability to move the cursor to the beginning of the line: this would be Ctrl-A. Question 13 refers to moving the cursor to the end of the line: this is Ctrl-E.

Commands to move the cursor to the top of the page or the bottom of the page are not available in Perfect Writer, so I have equated the screen (or page) to a sentence. Top-of-page then becomes (ESC) A and bottom-of-page becomes (ESC) E.

Top-of-file and end-of-file commands work just like their Perfect Writer counterparts: (ESC) < and (ESC) >, respectively.

Moving the cursor to the beginning or end of a marked area is not in Perfect Writer's vocabulary, so I equated the marked-block concept with the concept of

a paragraph. Therefore questions 18 and 19 are answered with (ESC) P and (ESC) N, respectively.

Question 20 provides the ability to move the cursor to its last marked position, somewhat akin to Perfect Writer's ability to swap the cursor's present position and the last mark set. For that function, Perfect Writer uses Ctrl-X Ctrl-X, and we can use that here.

The next set of questions deal with insertion and deletion. Perfect Writer uses two separate commands to toggle the insert mode on or off: Ctrl-O and (ESC) Ctrl-O. Turbo's editor uses only one. We will use Ctrl-O. If the insert mode is on, Ctrl-O will turn it off; if it is off, Ctrl-O will turn it on.

For question 22, Perfect Writer does not have any command that even comes close. This command will insert a carriage return and bring the cursor to the same horizontal position on the new line as it was on the previous line. I assigned Ctrl-X L to this function, though I have never used it in practice.

For questions 23 through 27 there are direct correlations be-

*Turbo's
top-of-file and
end-of-file commands
work just like
their Perfect Writer
counterparts.*

tween the Turbo editor and Perfect Writer. To delete the line, use (ESC) Ctrl-K. To delete to the end of the line, use Ctrl-C. To delete the character under the cursor, use Ctrl-D. And to delete the character to the left of the cursor, use DEL. I left question 28 (alternate delete command) blank.

Now we turn to the block commands. These are the commands that give any editor its extra horsepower. To mark the beginning of a block, we'll use (ESC) (space), and to mark the end of the block (ESC) W, just as in Perfect Writer. Question 31 provides us with a marking ability not found in Perfect Writer: the ability to mark a single word. For this I used (ESC) Ctrl-W.

Perfect Writer essentially uses two commands to delete, copy, move, or restore marked areas: Ctrl-W and Ctrl-Y. Turbo's editor, on the other hand, uses four separate commands, depending on the desired result. I used Ctrl-Y for hide/display block, (ESC) C to copy a block, (ESC) M to move a block, and (ESC) T to delete ("trash") a block. These are the responses for questions 32 through 35.

Let's talk about the hide/display command for just a moment. Let's say you are editing a 1,000-line program. You are on line 849 and you would like to look at lines 121 through 125 as you enter the next five lines of code. That's not an unreasonable request for a programmer's editor. In Turbo's editor, using (ESC) (space), make a beginning mark on line 126 and, with an (ESC) W, make an ending mark on line 848. Now Ctrl-Y will make everything between the two marks disappear (or "hide," as TINST calls it). When you are ready for those lines of code to re-appear, enter Ctrl-Y again and presto! There they are.

The last two commands in the block command section deal with reading and writing a block from or to disk. Perfect Writer uses Ctrl-X Ctrl-R to read from the disk and Ctrl-X Ctrl-W to write a block to the disk. We'll use the same commands.

The last section of commands is entitled "misc. editing commands." These include ending the editor, tabbing, finding and replacing, and entering a special character. Let's take a look. Question 38 pertains to ending the editor; we'll use Ctrl-X Ctrl-C, just as Perfect Writer does. The easiest way to enter the tab character for question 39 is to strike the tab key. TINST responds with Ctrl-I. Question 40 allows us to toggle the auto-tab feature of Turbo's editor on and off. If it is turned on, the cursor will always return directly under the first character of the previous line after a carriage return has been entered. Turning it off makes the cursor go to column one of the next line after a carriage return has been entered. Perfect Writer uses Ctrl-X TAB to set the tab spacing. We will use it instead to toggle the auto-tab switch.

Question 41 provides the ability to restore a deleted line. This is similar to Perfect Writer's yank-back facility. However, we

have already used Ctrl-Y. For this one, let's use (ESC) Y.

Next come the find-and-replace commands. Turbo's editor is not quite as sophisticated in this respect as Perfect Writer, but it has sufficient power for the programmer. What Perfect Writer calls "search" Turbo calls "find." Like Perfect Writer, we'll use Ctrl-S for this command. And, like Perfect Writer, we'll use (ESC) R for find-and-replace.

Perfect Writer has the ability to search backward, which Turbo's editor lacks. However, Turbo's editor can repeat the last find command without the programmer re-entering the string being searched. Let's conceptually equate these two commands and use Ctrl-R for question 44 regarding repeating the last find command.

The last question deals with an undocumented feature in Perfect Writer. Suppose you are using Perfect Writer and you want to enter an ASCII 19 directly into your document. The problem is that an ASCII 19 is Ctrl-S, and as soon as you enter Ctrl-S, Perfect Writer asks what you want to search for. The way around this problem is to preface the special character with the quoted character command, or Ctrl-Q. Any character following a Ctrl-Q will be entered as text by Perfect Writer

and not recognized as a command. While that feature is rarely used in word processing, it is more often needed in a programmer's editor. Turbo's editor uses Ctrl-P (for prefix), but Perfect Writer uses Ctrl-Q (for quote). I prefer Ctrl-Q.

IN CONCLUSION

If you have not duplicated any commands, and if you have used the prefix on two-character commands the same way all the way through, you should now be back at the menu. Enter a Q to quit. If something was answered incorrectly, TINST will tell you the numerical range of the questions where the error occurred. Simply repeat the process, paying particular attention to the suspect questions.

Borland has provided a place in its manual where you can record these changes. It's a good idea to do this. Additionally, I recommend that you cut out the template accompanying this article, attach it to a sturdy piece of poster board with rubber cement, and cut it out with a hobby knife to create a quick reference card that fits neatly over the numeric keypad of your Kaypro.

Now, when you use Turbo Pascal's editor, you should find yourself in comfortably familiar territory.

Thomas D. Sutter is a Baptist minister in Missouri who enjoys programming with Turbo Pascal as a hobby.

TURBOpascal's Customized Editor Commands

CURSOR MOVEMENTS:

Character Left.....↑H
Character Right.....↑L
Word Left.....ESC-B
Word Right.....ESC-F
Line Up.....↑K
Line Down.....↑J
Scroll Up.....↑X↑Z
Scroll Down.....↑X↑V
Page Up.....↑Z
Page Down.....↑V
Beginning of Line.....↑A
End of Line.....↑E
Top of Screen.....ESC-A
Bottom of Screen.....ESC-E
Top of Block.....ESC-P
Bottom of Block.....ESC-N
Top of File.....ESC-<
Bottom of File.....ESC->
Exchange Cursor.....↑X↑X

INSERT - DELETE - RESTORE:

Insert Mode on/off.....↑O
Insert Line.....↑XL
Delete Line.....ESC-↑K
Delete to End of Line.....↑C
Delete Right One Word.....ESC-D
Delete Under Cursor.....↑D
Delete Left of Cursor.....DEL
Restore Line.....ESC-Y

BLOCK COMMANDS:

Mark Beginning Block ESC-space
Mark End Block.....ESC-W
Mark Word.....ESC-↑W
Hide/Display Block.....↑Y
Copy Block.....ESC-C
Move Block.....ESC-M
Delete Block.....↑W
Write Block to Disk.....↑X↑W
Read Block from Disk.....↑X↑R

SEARCH & REPLACE:

Search.....↑S
Search and Replace.....ESC-R
Repeat Last Search.....ESC-↑S

MISCELLANEOUS COMMANDS:

End Edit.....↑X↑C
Tab.....↑I
Auto Tab On/Off.....↑X↑I
Control Char Prefix.....↑Q

HOW TO BUY A MODEM

Hook up to the world

BY JIM SPICKARD

Though not as common a purchase as printers (covered in "How to Buy a Printer" in the July issue), a modem is an extremely useful peripheral. Essentially a device that lets computers "talk" over phone lines, a modem makes a host of information available. It gives you access to news, business data, journal articles, and electronic mail. It allows online as well as time-delay conferencing. It transfers data between company offices with ease.

In this article, after giving you a bit of technological background, I'll tell you what kinds of modems are available, describe key features to look for, and then help you judge what's best for your situation. And I'll look at a couple of products in different price ranges. As with printers, I won't tell you what to buy—you have to decide that—but I'll provide enough information to make your decision easier.

WHAT'S A MODEM?

Visualize a printer cable: It's a bundle of wires—perhaps as many as 25—between two big plugs. Each of these wires carries an electric current. A short pulse from the computer on one end delivers a signal to the printer on the other. These pulses carry *digital* information: on-off signals that tell which character to print.

Now visualize a telephone cord. It's got two wires and a small plug on each end. Each wire carries a continuous current, which modulates with your voice. Small variations in the current make an electric copy of your speech, which the handset at the other end changes back into sound waves. This is called *analog* transmission.

The best way to hook two computers together is digitally. The ones and zeros your computer uses to talk to itself (and to your monitor, disk drives, etc.) flow to the other computer easily, without errors.

That's fine when the computers are in the same room. But what if they're miles apart—or on different continents?

In long-distance computing, there are two choices. You could set up a digital network linking all the computers in North America (at least). That would take years, as anyone who has tried to lease a dedicated phone line can attest. Or you can use the telephone system, which already runs wires to nearly every building in the country.

But digital information can't usually flow across phone lines. Telephone equipment is set to handle analog signals. Phone calls go through switches, filters, amplifiers, echo suppressers, and a host of other equipment. If you don't cooperate with that equipment, you don't get through. And besides, phone wires are prey to electrical disturbances. We've all had connections that sound like we're hollering into a tin can. Can you imagine what such line noise does to computer data?

The solution is to install a modem. Modem is short for "MODulator/DEModulator," a modem translates (modulates) a computer's digital output into analog signals—digital into audio, if you will. A modem at the other end of the line translates (demodulates) them back. With modems, a simple telephone call will hook one computer to another. Information exchange is a snap.

MODULATION

The process works something like this.

Each modem puts out a tone called a carrier wave at a given frequency. Digital ones and zeros are coded by altering various attributes of that wave. Slower modems alter the frequency; faster ones alter the phase angle. Wave frequencies are the easiest to explain, so we'll deal with them first.

Sing an "A." That sound moves the air at about 440 Hertz (cycles per second). Now sing "A" an octave higher. That's about 880 Hz. You have just varied (modulated) the frequency of your voice. You can communicate digital information by such frequency modulations. Just let the high "A" mean "one," the low "A" mean "zero." Then sing out your binary message.

Slower frequency-modulating modems use 1270 Hz to send a "1" and 1070 Hz to send a "0." Every tone transmits one bit of digital information. Seven or eight bits make a byte, enough information to encode an ASCII character. Add in a bit to identify the start of the byte, and another to identify the end (and perhaps one more to check errors) and you've got about 10 tones per character. A 300-bit-per-second modem transmits about 30 characters each second, one way.

Of course, characters have to go both ways. Rather than take turns, most modems send and receive simultaneously. They use two tracks—one to send and the other to receive. That means they need two sets of frequencies. The 1270/1070 pair is called *originate* mode. *Answer* mode uses 2225 Hz for "1" and 2025

Hz for "0." One modem uses one set, the other modem uses the other. That way signals don't cross.

The terms "originate" and "answer," incidentally, just divide up the frequencies. They don't necessarily refer to who actually "originated" and who "answered" a call. *Autodial*/autoanswer modems usually assign originate mode to the caller, though. It's an easy convention to follow.

The range of frequencies from 1070 to 2225 is the signal's *bandwidth*. The telephone line has to keep this bandwidth clear for information to pass. Telephone lines will usually transmit frequencies between 300 and 3000 Hz, so most frequency-modulating modems have few problems. "Noisy" or "dirty" lines mess up some frequencies, though, so the modem has to be able to adjust. Their relatively narrow bandwidth leaves frequency-modulating modems quite a bit of room to maneuver. Noisy lines don't bother them much.

The first popularly available modems operated at 300 variations per second—also called 300 *baud*. Each variation sends one bit of information, so 300-baud modems send 300 bits per second. The practical limit is about twice that: 600 baud.

*Modem
manufacturers
broke the 600-baud barrier
by varying other
parts of the carrier
wave.*

Modem manufacturers have managed to break the 600 baud barrier by varying other parts of the carrier wave. Most often they vary the phase angle. There's no easy vocal analogy, but imagine that each bit of information comes through facing a different direction. Using only the four right-angle phases (0, 90, 180 and 270 degrees), each frequency variation can encode two digital bits. Zero degrees sets both bits to "0"; 90 degrees sets the first bit to "0" and the second to "1"; 180 degrees means "10", and 270 degrees means "11".

A four-phase 600 baud modem thus carries 1200 bits per second—600 variations per second, each variation carrying two bits of information. A 2400 bps modem modulates between 16 different phase states. Each baud variation carries four bits of digital information. That seems pretty fast, but remember that it takes about 10 bits to make a character. A 2400 bps modem thus sends about 250 characters per second—less than four standard lines of text. A 1200 bps modem sends about half that.

As with frequencies, you can only vary the phase angle a certain amount before noisy phone lines start interfering. Given the current state of our telephone system, there's a trade-off be-

tween high speed and clear transmission. I actually think the phone companies do a pretty good job—considering the amount of traffic they carry. Higher-speed modems have to correct the inevitable line errors. It's part of the price they pay.

FREQUENCY STANDARDS

To communicate properly, modems have to know what frequencies to use. Most North American modems adhere to the Bell standards: Bell 103 at 300 bps, Bell 212A at 1200 bps. (Don't buy any modem that doesn't—these are the standards you'll need to meet.) Bell 103 specifies the four originate and answer frequencies mentioned above. Bell 212A specifies 2250 Hz in originate, 1150 Hz in answer.

Bell 202 is a less functional 1200 bps standard that only allows one computer to send at a time. Each machine signals when it is through so the other can start. It's like old-time short-wave radio: "Did you get it? Over." "Yes. Over." This is called *half-duplex* communications; avoid it. Most bulletin boards and online services require *full-duplex*. (Duplex is not *echoplex*: see the glossary on page 52.)

The Bell standards are not popular outside North America because they interfere with other countries' phone systems. Using a Bell modem is illegal in Europe, for example, and could land you in jail. Instead, most of the world uses standards set by CCITT—the *Consultative Committee International Telegraph and Telephone*. Their V. 21 standard governs frequency-modulated modems at 200 and 300 baud. V. 22 governs 1200 bps modems. And V. 22 bis governs 2400 bps. V. 22 bis is an emerging U. S. standard as well, though not all U. S. modems implement all parts of it.

No standard is in place for truly high-speed modems—9600 bps and above. CCITT's V. 32 standard is partially implemented by several manufacturers, but not by all. Often it is not implemented in the same way. 9600 bps modems are often *synchronous*: they tell bits apart by comparing them to a shared clock time, much as interconnected mainframes do. They don't need the extra start and stop bits used in lower-speed *asynchronous* communication. So far, high-speed modems only use synchronous mode when they detect an identical modem on the other end of the line, and they're smart enough to do that themselves. Otherwise they work asynchronously, like their slower cousins.

ERROR-CHECKING

I've mentioned line errors. These errors crop up because phone lines don't provide clean, clear communications channels. A tree limb hitting a line will generate interference, as will birds, bats, and occasional CB truckers.

If you're just reading text off an electronic bulletin board, a few errors don't make much difference. You can still figure out what's what. If you're downloading programs or transferring data from one office to another, however, a misplaced byte can be deadly. To avoid garbage, you've got to filter errors out.

Most error-checking occurs in software. Besides checking *parity* (see the glossary), communications programs offer several

kinds of *protocols* (data transmission techniques) that request retransmission if the data is bad. XMODEM and KERMIT are two of the favorites, though there are about a dozen others. All modems will handle them. Noisy lines mean slower transmission, that's all.

*You
need to consider
where the modem will live
—on top of your desk
or in an
expansion slot.*

High-speed modems, however, need something more. When you're working above 2400 bps—arguably above 1200 bps—software checking isn't fast enough. The hardware has to do some of the work. It's easy to see why. Every error requires retransmission and rechecking, so the computer-to-software-to-modem-to-line-to-modem-to-software-to-computer link is too long for speed. Modem-to-line-to-modem cuts checking time considerably.

Several 2400 bps modems use the Microrim Network Protocol (MNP) to increase transmission speed. MNP has six classes (levels), from a simple link protocol to a protocol designed for 9600 bps transmission. If you buy a modem that implements MNP, don't settle for less than Class 3, which uses simple synchronous communications techniques. They really increase speed.

To use MNP, of course, the modem on the other end of the line must also use the MNP protocol. Make sure your modem supports non-MNP connections as well, as the system is by no means standard. Hayes Microcomputer recently introduced an alternate high-speed hardware protocol based on CCITT's X. 25 error-correction technique. This standard covers both 2400 and 9600 bps modems. If it takes off the way Hayes' command standard did, MNP may be history. (I'll say a bit more about the new Hayes modems below.)

HAYES COMPATIBILITY

There's one last standard to discuss before I help you decide what kind of modem to buy.

In the old days, each modem had its own set of commands. You had to set the modem speed, and you had to shift your modem into originate or answer mode. You could do this with switches or software—the latter was much handier.

As modems developed new skills, their command sets became

more complicated—too elaborate for switches. If your modem dialed automatically, you had to choose between rotary or touch-tone dialing. You had to tell the modem what to do with a busy signal, or what to do if a voice answered unexpectedly. One manufacturer even included commands for hooking a modem to a short-wave radio!

At the same time, users demanded simplicity. Complex command sets were too hard to learn—and too hard to install. Software makers responded by pre-configuring their programs for particular modems—especially the Hayes Smartmodem, one of the early big sellers.

Hayes had certain advantages. Its modem was well built, could automatically dial and answer, and could adjust itself to the speed of the other modem on the line. Its command set was relatively complete, including such arcane but useful features as the ability to set the number of rings before answering. Hayes marketed it well.

As a result, the Hayes command set became a de facto standard, which almost all software now uses. Indeed, some software began to use only the Hayes commands. Owners of other modems were out of luck. In response, modem manufacturers then duplicated the Hayes commands in their own products. Most modems are now "Hayes-compatible," at least in so far as their standard commands are concerned.

Hayes commands begin with "AT"—to get the modem's ATtention. For example, "ATDT14085551212" tells the modem to dial directory information for San Jose, California, using tones; "ATDP14085551212" dials the same number using pulses.

Any modem you buy should mimic at least the basic Hayes commands. You probably won't need the more specialized ones. In any event, you should test the modem you're considering. Try controlling it with Smartcom III, Hayes' own communications program. (Your modem dealer should be happy to let you use a copy in the store.) If Smartcom III works, the modem is Hayes-compatible. If not, it's not, no matter what the salesperson says.

With compatibility, you'll be able to run all your software.

PICK A SPEED

That's probably enough background. Now let's help you choose a modem.

The first factor is speed. How fast a modem you want depends on what you want to use it for. Are you a hobbyist wanting access to bulletin boards and online services? Or are you a business person wanting to send documents from one office to another? In the former case, you're apt to want a modem capable of sending and receiving at 1200 bps. In the latter, you'll want 2400 bps and up.

If you fall into both camps, you'll probably want the faster modem; you can always slow it down for online work.

Why a slower modem for bulletin boards and services? Two reasons. First, while most bulletin boards and online services work at 300 and 1200 bps, only a few provide 2400 bps access. Thus the extra speed is wasted.

Second, online charges increase with transmission speeds. The higher per-hour cost of 1200 bps is worth it: you typically pay only twice as much for four times the throughput you would get at 300 bps. But 1200 bps is about as fast as anyone can read. Why pay extra for speeds you can't keep up with? Unless you're downloading a tremendous amount of material to read later, speeds faster than 1200 bps cost you more, not less.

When transmitting files between offices, however, speed makes sense. A page that takes two minutes to transmit at 300 bps takes 15 seconds to send at 2400 bps. Faster modems ideally cut phone bills to shreds.

Notice I said "ideally." A 2400 bps modem needs cleaner phone lines to work effectively than do slower models. With noisy lines, more information has to be retransmitted. A 2400 bps modem could conceivably run slower than one rated at 1200 bps if each block had to be transmitted two or three times. A 1200 bps modem might only take once. People in rural areas, where phone service is not the best, should be warned.

Many faster modems now incorporate automatic fallback circuitry, though, which lowers their speed to a point at which fewer errors occur. Modems that seem lifeless at 2400 bps often outperform their slower cousins at the slower rates. The newest 9600 bps modems also adjust for noisy lines well.

Business-oriented publications like *InfoWorld* often rate modem performance under unfavorable as well as favorable line conditions. Take a look at their estimates for any modem you're thinking of buying. You might also want to look at their reliability figures. Some modem builders seem to make more lemons than others.

OTHER FACTORS

The next thing to consider is where the modem will live. You've got two choices. External modems are placed on top of your desk; internal modems fit in one of your computer's expansion slots.

External modems are the most flexible. They can be hooked to any kind of computer, or they can be shared by several. This flexibility has a price. The units cost a bit more than internal modems, and you have to buy a modem cable to connect to your computer's serial port. If your computer doesn't have a free serial port, you have to get one.

Internal modems cost less and don't need cables and ports. They also leave your desk cleaner, but they use up an expansion slot. And one modem won't service all your computers. Another consideration is that once an internal modem is placed in an expansion slot, it becomes part of the computer, and the way in which it integrates with your hardware and with MS-DOS itself can cause problems. I once got a free internal modem with a piece of software I wanted. The software worked and the modem worked—but not together (both makers blamed my computer for the problem). An external modem wouldn't have given me trouble because it operates through a standard serial port and doesn't affect the operating system.

Internal modems are an advantage if you travel: you don't have an extra box to carry besides your computer. I've seen a few

cigarette-pack sized external modems, though, that seem like practical traveling companions.

In addition to traveling modems, there's another special type I should mention. A few manufacturers build security modems, which limit access to your company's data, bulletin boards and so on. I mean seriously limit, not just discourage. The modem might require a specific password, then hang up and call the number associated with that password before allowing access. Or it might require the calling modem to provide a hardware-level "answerback" code—insuring that only specific equipment can call in. If you want security, you can get it.

As I mentioned above, you should be sure your modem is Hayes-compatible. And you should always, always be sure it is FCC certified—ideally Class B (approved for both residential and commercial use). The Federal Communications Commission rightly insists that computer equipment not interfere with radio reception. Some excellent modems—the Racal-Vadic 2400VP for example—are only certified for business neighborhoods, not general use.

You should also make sure your modem has a built-in speaker. That way you'll know when you get Uncle Harold on the line instead of CompuServe.

DOT MATRIX REMEDY™

Tired of the low-quality printing you get from your computer? It's time to get **Bradford**, the printing program.

Bradford will print your ASCII and WordStar files in very high quality, using your choice of over **thirty-five** different fonts (typesets). **Bradford requires no hardware adjustment** and costs only **\$39.95**. It works on Epson, Star, IBM, and compatible printers.

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PRICE

Unless you're in the market for a doorstop, you should skip 300 bps modems. Hardly anyone makes them these days, anyway.

1200 bps modems list for between \$100 (mail order) and \$300. Internal versions are a bit less. These modems are becoming commodities—basic packages onto which some makers tack extras. The most expensive ones probably aren't three and a half times better than the cheapest, though they cost three and a half times as much. But increased cost does get you a few more features—such as the ability to set speaker volume in software. And it may increase quality (no guarantees). Quality is the key variable—check product reviews before buying.

2400 bps modems have not become as "commodified" as their slower cousins. For starters, not all support the CCITT protocols. Some provide error-checking in hardware, others don't. And real-life transmission rates vary widely. They are available for as low as \$150 and as high as \$1,100. I'd gladly pay more for service: more protocols matched, better error-checking, better handling of noisy lines.

I'd do the same for 9600 bps modems, which set you back \$1,000 or more. The variables are the same, but the market is not as broad. Features vary too much to cover in a general article.

TWO SAMPLES

Let's take a look at a couple of options. These aren't necessarily recommendations, just modems I've met in my travels.

First, the low-priced spread.

The Novation 1200 XE is a relatively cheap, fully Hayes-compatible external modem. It works well at both 300 and 1200 bps. It supports both the Bell 103 and 212A and the CCITT V. 21 and V. 22 protocols. (That means you can use it overseas.) It can be set up either through software or hardware. After hooking it to the phone line, you plug your phone into its spare jack. Then you can use the phone as if the modem weren't there.

The 1200 XE has several nice features. It can automatically sense dial and busy tones—even the Sprint secondary dial tone. And it can dial several alternate numbers, in case the first number is busy. It is highly resistant to line noise—much better than average.

The \$229 list price includes a copy of ProComm, a powerful shareware communications program. (But you still have to register the program for \$35.) The transformer and cord are included, though the serial cable is not.

Novation sells an internal version for \$159, but it has fewer features. I'd go with the external model.

Now for something speedier—and more expensive. Just last fall, Hayes introduced its V-Series Smartmodems. The line includes both 2400 and 9600 bps editions, plus a "modem enhancer" to bring older Hayes Smartmodems up to speed. The improvement is sensational. Hardware-based data compression and error-checking routines allow throughput of up to 6073 bps for the 2400 bps model and an astounding 16948 bps for the 9600 version.

How can a 2400 bps modem transmit at two and a half times that rate? Data compression is the key. The V-Series cuts out all

the waste space in the files it sends. The matching modem on the other end puts the space back in. Text files have the most dead space, so they can be transmitted the fastest. A spreadsheet has less waste space; it travels "only" 77 percent faster. (Life should always be so hard!)

*How can
a 2400 bps modem
transmit at more than
twice that rate?
Data compression is
the key.*

Line quality seems to make little difference: tests show similar speeds over both clean and noisy connections. That's a real plus!

These modems are, of course, fully Hayes-compatible. That includes such arcane commands as the "@" command for phone systems without dial tones and the "I" command for transferring calls. They also support all the Bell and CCITT standards for 300, 1200 and 2400 bps. No standard yet exists at 9600 bps, but Hayes' modification of CCITT's V. 29 protocol may become the de facto standard to which others adhere.

To make full use of the V-Series, however, you must have a V-Series modem at the other end of the line. Or you need an older Smartmodem with a V-Series enhancer. These modems can identify their own kind automatically; otherwise they transmit at normal speeds. As the installed base grows, inter-company communications will be more practical. For now, expect to buy either a modem or an enhancer for each end of your communications link.

How much will you have to spend? A lot! The external V-Series Smartmodem 2400 lists for \$899—near the top of the 2400 bps modem range. The Smartmodem 9600 lists for \$1,299—not the most expensive fast modem on the market, but not cheap. Internal models list for \$50 to \$100 less. The V-Series Modem Enhancer lists for \$349, a real steal considering the improvements it brings—if you've got an older Hayes modem to enhance.

For a hundred dollars more, Hayes will throw in the Smartcom III communications program. This may not be such a good deal; the program is hard to set up and requires 1 megabyte of disk space. I prefer to use MITE, which came with my Kaypro.

LAST WORDS

No matter which modem you buy, see it work first. Check out its compatibility with both your software and your hardware. Test it in as realistic a setting as possible, doing the kind of online data exchange for which you intend to use it.

If you like it, buy it. You're opening up a whole new world. ■

HOW TO TALK "MODEM"

Here are some key terms from the world of online communications:

Acoustic coupler: Links modem and telephone with sound waves rather than electronics, usually via rubber cups that hook to the phone receiver. Good for motels, pay phones and other locations lacking phone jacks.

Analog signal: An electrical signal that modifies wave characteristics to carry information (over telephone lines, for example). Susceptible to "noisy" phone lines.

Answer mode: A setting that determines which frequencies a modem will use. The other modem must be in *originate* mode.

Asynchronous transmission: A method of exchanging data between computers whose system clocks are not synchronized. The meaning of each bit is determined by its distance from an unambiguous start bit. Typical of telephone connections.

Auto-answer: A modem that can automatically answer the phone.

Auto-dial: A modem that can automatically dial the phone, sometimes repeating if necessary until a connection is made.

Automatic fallback: A feature that tells a modem to transmit more slowly when too many errors occur at higher speeds.

Bandwidth: The range of frequencies a modem uses to communicate.

Baud: A measure of how often a signal changes voltage, frequency, phase angle, etc. Such changes are used to encode data bits. Often mistakenly used for "bits per second" (probably because most 300-baud modems transmit 300 bits per second). Most 1200 and 2400 bps modems operate at 600 baud.

Bell compatibility: Adherence to standards developed by AT&T for the frequencies used in data transmission. Bell 103 is typically used at 300 bps; Bell 212A is typically used at 1200 bps. The modems at both ends of the connection must recognize the same standards.

Bits per second: A measure of communications speed: the number of digital bits that are sent or received each second. With asynchronous communications, each character uses 8 to 10 bits: a start bit, 8 data bits and one or more stop bits. Divide bps by 10 to estimate the speed of character transmission.

CCITT compatibility: Adherence to standards for data transmission developed by CCITT, an international standards commission. Accepted in Europe but not the U.S., CCITT V. 22 is gaining acceptance at 2400 bps, while V. 32 is gaining acceptance at higher speeds.

Digital signal: An electrical signal that codes information as a series of pulses or transitions, as in computer circuits. Relatively immune to noise.

Duplex: The ability of a communications channel to handle two signals simultaneously. A full-duplex modem can send and receive at the same time; a half-duplex modem sends and receives alternately. Not to be confused with echoplex: the way

some online data services echo characters back to the sending computer for display.

Error-checking protocol: A program that transmits binary data over telephone lines while verifying that the data was received correctly. That verification usually entails summing the binary digits composing the information and comparing this against a predetermined number. Some examples of error-checking protocols are XMODEM, YMODEM, and KERMIT.

External modem: A modem that sits outside the computer. It is connected by cable to the computer's serial port.

FCC certified: Approved by the Federal Communications Commission for operation in either business locations (Class A) or business and residential locations (Class B). I.e., the modem does not generate radio interference.

Hayes command set: The command set that runs Hayes modems, which has become a de facto standard. Most commands begin with "AT".

Hayes-compatible: A modem capable of responding to the Hayes command set. The command set is quite extensive, and some modems can only respond to parts of it.

Internal modem: A modem that sits inside the computer, usually in an expansion slot.

Modem cable: A standard cable for connecting an external modem to a computer's serial port. Uses RS-232 connectors.

Noise: Electronic disruptions of an information-carrying signal.

Online communications: Exchange of information by computer over telephone lines.

Originate mode: A setting that determines which frequencies a modem will use. The other modem must be in *answer* mode.

Parity checking: A scheme for detecting errors with each byte (eight-digit binary number). When parity is enabled, each byte contains an extra bit, either 1 or 0, depending on what is required to make the byte plus the bit add up to an even number. When a byte is written to memory it is added to its parity bit and if the result is not an even number, there was an error in transferring the byte. Some systems use odd parity, in which every byte and parity bit must add up to an odd number.

Protocol: See error-checking protocol.

RS-232 cable: See modem cable.

Security modem: A modem designed to prevent unauthorized access to your company files, bulletin board etc.

Start bit: The bit marking the start of a byte of information in asynchronous transmission. It is always set to 1.

Stop bit: The bit (or bits) marking the end of a byte of information in asynchronous transmission. It is always set to 1.

Synchronous transmission: A method of high-speed communication that depends on carefully timing the transmission of each bit. Start and stop bits are not used. ■

QUESTIONS TO ASK YOURSELF

(There is no definitive standard for 9600 bps operation.)

1. What kind of online work am I going to do?

Check all that apply:

- a. Bulletin boards
- b. Online information services
- c. Inter-office data transmission

(If you checked "a" or "b," get a 1200 or 2400 bps modem. If you checked "c" then you might consider a high-speed 9600 bps model [\$1000+])

2. Do I want an external or an internal modem?

I want an external modem if I need to:

- a. use it with several computers
- b. avoid hardware compatibility problems
- c. conserve expansion slots

I want an internal modem if I need to:

- a. travel with my computer
- b. keep desk clutter at a minimum
- c. conserve a serial port
- d. Save a few dollars

3. How much can I afford to spend?

- a. \$79-200(low-end 1200 bps)
- b. \$150-200(high-end 1200, low-end 2400)
- c. \$200-500(high-end 2400 bps)
- d. \$900 & up (high-end 9600 bps)

4. How many modems do I need?

- a. Just one
- b. One for each office

5. Do I need a special modem?

- a. Security modem
- b. Traveling minimodem

6. Do I need a communications program, too?

QUESTIONS TO ASK YOUR DEALER

1. Compatibilities: (check all that apply)

- a. FCC Class B certification
- b. Fully Hayes-compatible
- c. Frequency standards: (circle)
Bell 103(necessary for 300 bps operation)
Bell 212A(necessary for 1200 bps operation)
CCITT: V. 22bis (necessary for 2400 bps operation)

2. Speeds: (circle those available)

300 bps 1200 bps 2400 bps 9600 bps other

3. Hardware Error-checking:(check)

- a. MNP protocol
- b. X. 25 protocol

4. Features: (check)

- a. autodial/autoanswer
- b. repeat dialing
- c. voice recognition
- d. dial tone recognition
- e. built-in speaker
- f. speed, etc. set in software
- g. if an external modem:
 - 1. includes serial cable
 - 2. includes transformer/power cable
 - 3. sturdy (won't break if dropped)
- h. if security modem:
 - 1. password/callback type
 - 2. hardware dependent type
- i. automatic fallback to slower speeds when there are many line errors

5. Is a communications program included?

(Note: this is not always a benefit.)

6. Actual performance:

- a. Transmission rate over clean lines
- b. Transmission rate over noisy lines

7. Reliability:

- a. Warranty period
- b. Dealer support
- c. Toll-free manufacturer's support line
- d. MTBF (mean time between failures)

8. May I test it in the store?

- a. With Smartcom III

(Use Smartcom III because that is Hayes's own telecommunications program; if it works with Smartcom, it's Hayes-compatible.)

b. Transmitting my kind of data
(If you're going to transmit graphics files, for example, then test it with graphics files. That's the only way for you to know how it will operate once you get it home.)

SOFTWARE BARGAINS

Rembrandt

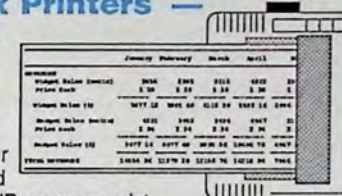
Complete Business Graphics Toolkit —

Profiles said, "This is the program to which all other CP/M graphics programs must be compared." REMBRANDT can do it all — draw lines, circles, boxes and large characters on-screen. Also generates pie charts, xy plots and bar charts from your data and creates dazzling on-screen slide shows. Prints graphics on most dot-matrix and daisy wheel printers. For all Kaypro CP/M, Osborne CP/M, Heath-Zenith CP/M and Radio Shack Model 4 (CP/M) computers. \$39. Cat. #REMB Older (pre-1984) Kaypros, order II/IV version for \$49. Cat. #REMBO

for CP/M and MS-DOS!

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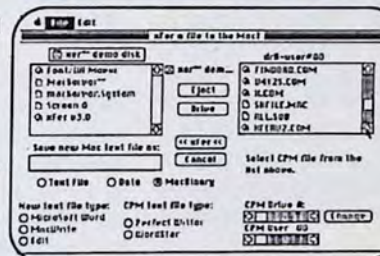
Now print spreadsheets (and most text files) the LONG way (i.e. sideways) on your printer — no more cutting and pasting. Select from four type sizes — condensed to extra-large. With LOUD, you can print giant banners in our Times, Sans Serif, Olde English, Script and Symbol fonts in letters from two to eight inches high. For all CP/M and MS/DOS computers, and most dot-matrix printers. Two great programs at one low price. Special offer: Any two versions for just \$49.95! Cat. #LONL



xFer — Kaypro to MAC File Interchange

You're excited about your new MAC, but the thought of losing all of your existing CP/M files (or re-entering them) is not what you'd call a good feeling. Right? Wrong! Because now you don't have to forget about your old files, all you have to do is transfer them, with xFer.

xFer is a complete file transfer utility for Macintosh and CP/M personal computers. It allows binary (MacBinary or MacBinary II), word processing documents, or database/spreadsheet files (ASCII) files to be transferred between the machines. Order yours today and receive a free transfer cable (\$19.95 value!). Specify Kaypro printer or modem port. Cat. #XFER \$99.



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Order Toll Free Now!

1-800-456-4123

THE LURE OF GOING ONLINE

Give me a modem, my computer, and the phone number of an unknown online system and I'm like a kid at Christmas. I'll admit it: going online is just a lot of fun. For me, this isn't a job, it's an electronic adventure game in real-time mode. I'm never quite sure what's going to come across my screen and end up in my copy buffer, but I'm rarely disappointed.

This "online life" of mine began innocently enough when a buddy of mine dropped over one evening carrying something he called a "modem." The year was 1982.

Before I knew it, there I was, jamming this little plastic box into the back of my Commodore Vic-20 computer. After I'd readjusted my high-tech monitor (a nine-inch black and white TV salvaged from a Saturday garage sale), I dialed a phone number listed as "computer." My ears were treated to a strange prehistoric-sounding screech, at which point my friend instructed me to plug the phone into the modem. That technological hurdle overcome, the remote computer responded with: "Please Log In."

And my life, quite literally, has never been the same.

PASSWORD: COMMUNICATE

Since those first online sessions, I've "talked" with a terminally ill teenage muscular dystrophy patient in Canada whose only window to the world is a modem and whose spirit and courage put me to shame; I've chatted, computer-to-computer, with Soviet scientists sitting in a basement in Moscow; I've debated white South Africans over the policies of Apartheid; I've spent hours searching through arcane online text files to come across a gem that eventually led to a major investigative story.

All this points out one startling fact: this electronic medium helps humans do best what we do worst—communicate.

I could devote this whole column—and more—to my online experiences, but my goal is to convince those of you new to telecommunications to seek out experiences of your own. To that end, this column will be a "travel brochure" describing some of the worthwhile places you can



RICHARD STARRMAN

go with that modem of yours.

MIDNIGHT OIL, LOW ONLINE RATES

Before we lure you online with a look at intriguing bulletin board systems (BBSs), let's sober you up with some facts about online costs.

One non-monetary cost is sleep: going online means staying up late, because nighttime is when the phone rates drop. That's when the "online nation"—some two million strong—comes alive. Online calls can be local, long-distance, or PC Pursuit (PC-P) calls, and your phone bill will, of course, reflect the different rates for each. You can make a local call to connect with a local BBS; local call rates vary with the phone service you use—the cost is similar to making normal local voice calls.

You can also call a "local node" that connects you to a telephonic highway called a packet-switched network. This network then carries your electronic signals to a remote computer system—most likely one of the fee-based online services, such as CompuServe. The cost of using the packet-switched network is included in the cost for using the online service. CompuServe, for example, charges \$12.25 an hour, and about 25 cents of that is for use of the packet-switched network. For calls to non-local BBSs, you pay long-distance rates, which at night average 30 percent less than daytime rates.

BY BROCK N. MEEKS

The drop in phone rates at "non-prime time" corresponds to a drop in rates across the electronic landscape. Several of the fee-based online services (which we'll discuss next month) also drop their rates in the evening, enticing thousands to take advantage of nighttime savings.

PC-Pursuit calls are also local calls because you're dialing a local node to enter the PC-P network. But instead of being charged packet-switched network rates, you pay a flat fee of \$25 per month. For your \$25 you can dial into some 25 metropolitan areas across the nation, giving you unlimited, long-distance online time and access to several hundred BBSs and a handful of regional networks (we'll discuss these next month, too.) (Ed. Note: For a detailed look at PC Pursuit, see "Life at 300 Baud" in the September 1987 issue of PROFILES.)

We'll discuss these next month. Meanwhile, let's look at the promised BBSs.

THE PROVERBIAL FREE LUNCH

Whoever said there's no such thing as a free lunch obviously wasn't aware of BBSs. The day-to-day use of these systems is free, although some charge a small annual fee to help defray operating costs. They are the backbone of the network nation.

On a BBS you can find everything from free software to special interest groups dedicated to a particular topic or hobby. Many of these BBSs are simple, single-

user systems—that is, only one person at a time can be online. However, a growing trend is toward multi-user BBSs (we'll cover these in a future column).

These BBSs are great places to hang out and discover the "local color" of your own electronic backyard. To get a listing of local BBSs, you can pick up one of the local free computer newspapers that are available in most metropolitan area. Most BBSs also carry listings of other BBS phone numbers.

Below is a short list of excellent BBSs. I've picked these systems to cover a broad range of the country. No matter where you're located, one of these systems should be within your reach. Note that in addition to phone numbers, I've provided parameters (8N1, for example, means eight data bits, no parity, one stop bit), and the modem speeds each board supports.

IDI BBS

I've profiled this system before, but the information bears repeating. Run by one of the nation's most qualified telecommunications analysts, Sam Simon, IDI is the source of information for anything pertaining to telecommunications. IDI carries it all, from which long-distance phone service offers the best rates to easy-to-understand commentaries on complex telecommunications issues. In addition, this board carries one of the best samplings of shareware computer programs that I know of.

One of the more unique features is the IDI job board. Here Simon carries a list of job openings in the Washington, D.C. area. Often you'll find several openings in everything from the public broadcasting network to governmental agencies. And Simon keeps it up to date. No fluff here, just good solid information.

You'll also find InfoMat, an electronic publication carried on selected BBSs across the country. It's a good source of information regarding the online community and it's yours for the taking.

Phone: (202) 775-1237

Parameters: 8N1; 300/1200/2400

LLM LAW BOARD

If you're a sysop, put this board on your

must list. It's run by Jon Wallace, a lawyer specializing in computer and high tech law. In addition, Wallace is the author of a new book titled *Syslaw: What Every Sysop Should Know*. The book covers everything from copyright law to the liability a sysop faces if someone is conducting illegal business via his or her BBS.

LLM BBS is a Fido-based board (Fido is a particular type of BBS software most noted for being the first software allowing like systems to be linked in a non-commercial network) for lawyers and those interested in the law. It is affiliated with the New York City Lawyer's User Group. LLM is up from 6 p.m. to 8:30 a.m. daily.

There are several files available for downloading specifically for those in the legal profession. If you've got a question regarding the legalities of computer communications and the law, this board is a great reference source.

Phone: (212) 766-3788

Parameters: 8N1; 300/1200/2400

BIG SKY NETWORK

This BBS serves as a network for more than 100 one-room schools throughout rural Montana. (Yes, they do still exist.)

It's a multi-user BBS and an excellent example of how the power of electronic communications can be used to draw like-minded people together from distant areas.

According to the system's creator, Dave Hughes, the board provides a much-needed link for Montana's school teachers and serves as a model for a rural teacher education program. There is a lesson plan database for anyone to use, and the system supports full color graphics.

Though the board is slanted heavily toward education, the experience of using this sophisticated multi-user type BBS is an education in itself.

Phone: (406) 683-7680

Parameters: 8N1; 300/1200/2400

SPACE NETWORK

This board is sponsored by The Planetary Society and Mars Institute and is run by The Boulder Center for Science and Policy. Its purpose is to "promote space

exploration and development by networking the space community."

The board draws users involved in the space program and serves as a clearinghouse for information on all aspects of the space effort.

The board is open to all and encourages use from scientists, engineers, and educators. Special interest groups include Mars Institute, Space Studies Institute, NASA Ames Research Center, American Astronautical Society, and something called the Mars Underground Society.

Phone: (303) 494-8446

Parameters: 8N1; 300/1200/2400

THOUSAND OAKS TECHNICAL BBS

Don't let the technical part of this board's name scare you off. This the only BBS that I know of that has a CD-ROM online for the general public. (A CD-ROM is an optical disc that can hold up to 550 megabytes of information.) The CD-ROM available here is the complete PC SIG library of programs. It's equal to 1,000 disks full of programs—there are some 10,000 program files online!

The CD-ROM resides on Drive I. To reach it you only have to type in the command I: and a carriage return and you're there. But you'll want to browse through Drive E first. Drive E contains all the program catalogs and tells you what programs are where. If you don't read this first, you'll be lost—I guarantee it.

Once you've perused the catalogs, you can go to the appropriate section of the CD-ROM and download a diskful of programs. The board has a built in "greed filter." You're only allotted enough time to download one disk.

Phone: (805) 492-5492 (805) 493-1495

Parameters: 8N1; 300/1200/2400

THE ENVELOPE, PLEASE

Next month we'll look at what's in store for you when you're ready to leave the local scene and go "national" with some of the nation's commercial information utilities and regional networks.

Now if you'll excuse me, I still have to check out a Cryonics BBS in Los Angeles, a UFO board in Denver, and an underground pirate board in, well, the electronic underground.

A SHAREWARE CLASSIC JOINS THE PROS

I went to high school with a guy who went on to play for the Pittsburgh Steelers. Watching him play pro ball, I found that his style was the same, but his skills had been refined and improved—he had become a mature professional. Upon using Procomm+, the new telecommunications software from Datastorm Technologies, I had a similar reaction. Like my classmate, Procomm has moved into the professional arena. And like him, it has retained its unique style while fulfilling its potential.

Prior to the release of Procomm+, Procomm was a shareware telecommunications package. That meant that you could pick it up at no cost from a bulletin board or a friend and pay for it only if you liked it. Datastorm asked a fee of \$25 and provided an address where you could send a check. Procomm+, on the other hand, is commercial software. It is available only through retail channels and at the more substantial—but still very affordable—price of \$75.

As a commercial offering, Procomm+ must compete in a different league than its older brother. Fortunately, it succeeds, bringing simplicity, style, and power to professional telecommunications.

FEATURES AND PERFORMANCE

Procomm+ retains many of the features that made the original a shareware classic. When you run the program, it automatically goes into terminal mode, allowing you to communicate with a Hayes-compatible modem immediately. This lets you issue any Hayes AT-type command and observe the modem's response. Also preserved are the familiar pop-up menus, invoked with Alt key combinations—Alt-O brings up Chat mode, for example, while Alt-F7 lets you change logged directories.

Other features held over from the shareware version are macros and host mode. A macro is a series of keystrokes assigned to a single key. Procomm+ allows you ten macros, Alt-0 through Alt-9. You can save a set of macros in a file and have as many files as you like.

Host mode is a miniature RBBS built into Procomm+ itself. When you leave your computer for the day you can invoke



MARSH SWEEZY

BY MARSHALL L. MOSELEY

host mode, and then you (or anyone you give the password to) can call your computer and download or upload files. The new version includes electronic mail.

While these old features are nice, and it's to Datastorm's credit they were preserved, it is the new features that make Procomm+ an Editor's Choice.

For the telecommunications novice, Procomm+ has an optional moving bar menu system similar to the one used in Lotus 1-2-3. From it you can access any part of the program. I personally prefer using Alt key combinations, but this menu system makes learning Procomm+ much easier, especially for people who have used Lotus. Procomm+ sports a completely revamped dialing directory. Where the old program had 100 possible numbers, the new one has 200. And you can save and load multiple dialing directory files just as you do macros. The new directory also uses dialing codes, which are single letters with multiple numbers assigned to them. You can create codes that will dial your Sprint access number before dialing a directory entry, or create a code that will dial out of your business phone system and to a specific area code. You can also mark multiple directory entries and the program will dial them one after the other. The program has 13 file transfer protocols built into it. All the popular ones—XMODEM and YMODEM for example—and some obscure ones, such as IMODEM and SEALINK, are

present. Procomm+ supports three "streaming" protocols: YMODEM-G, YMODEM-G BATCH, and IMODEM. Streaming protocols have no built-in transmission error detection. Instead they expect the modem to detect errors. Streaming protocols are intended for use with high-speed, error-correcting modems such as the Courier HST or the Hayes Smartmodem 9600. Because Procomm+ has streaming protocols, it is ideal for use in MIS and data processing departments, where high-speed modems are standard equipment.

The dialing directory also allows you to declare up to three external protocols for file transfers. An external protocol is a separate program that uploads and downloads files. At the appropriate time Procomm+ will cease its own operation and invoke the external protocol. Once the transfer is complete, Procomm+ resumes normal operation.

In addition to multiple transfer protocols, Datastorm provides 11 terminal emulations. Procomm+ can pretend to be a DEC, IBM, Wyse, TeleVideo, ADDS, or Lear-Siegler terminal. These emulations allow the program to communicate with most mainframes in existence.

Procomm+ also supports non-standard serial ports, COM3 through COM8. The technically advanced can change the I/O port address and interrupt request line associated with each serial port name. This allows you to communicate

with any port on the control bus and indicates how serious Datastorm is about producing a commercial product. Such control is rarely needed outside the business environment.

One more powerful adjunct to Procomm+ is its script language, Aspect. A script language is a pseudo-programming language that works with a telecommunications program. Most script languages stop frustratingly short of true programming power, but not Aspect. It provides powerful features like IF/THEN/ELSE and CASE statements and boolean values. With these tools at hand, writing auto-log-on procedures is a snap. I use Aspect to log on to my favorite bulletin board every day.

EASE OF USE

Procomm+ is somewhat easier to use than its predecessor and much easier to use than any other telecommunications package I've encountered.

If you're new to the program, you can invoke context-sensitive help by typing Alt-Z. From terminal mode this brings up a list of almost every key command available. The list is arranged according to function—the left side contains commands directly pertaining to communications, while the right side lists the keystrokes that adjust the basic configuration of the program. When you are in other parts of the program, Alt-Z displays text concerning the area you're in.

Most of the key commands in Procomm+ are mnemonic. Pressing Alt-M brings up the macro menu, for example, and Alt-S invokes the setup menu. The use of mnemonic Alt keys is not exclusive to Procomm+; many products use the same approach. What sets Procomm+ apart is the richness of its command set—you can adjust virtually anything. The parameters that usually need changing are the most accessible, while the obscure ones take a moment more to get to. I logged on to CompuServe once and suddenly realized my parameters were wrong. I changed them to the correct ones with four keystrokes. This accessibility allows you to adjust to problem situations quickly, insuring that your online session suffers only a slight

disturbance instead of a major crash.

Procomm+ features "smart" file transfers. Before going online, you designate a default file transfer protocol to go with a specific phone number. When the time comes for you to transfer a file, Procomm+ presents you with this default value and you press Enter to accept it. The program also remembers the file name you gave the RBBS and offers that as the name of the file to be downloaded. Again, you press Enter to accept. This speeds up the transfer process and cuts way down on typing.

Touching again on Procomm+'s script language, one feature that makes it easy to use is record mode (Alt-R). When you are recording, every prompt that appears on screen and every keystroke you type are placed in an Aspect script file. When the time comes to log on to the same board, just run the script file instead of hitting the keys yourself. This feature came in handy at PROFILES recently. Before leaving on vacation, I recorded a downloading procedure. While I was gone a co-worker used it to retrieve some important files from a fellow editor.

The only thing I didn't like about the program was the lack of an error message when I designated an incorrect path in the Setup section of the program. It did display messages when it encountered other errors, but not in this case.

DOCUMENTATION AND SUPPORT

The Procomm+ manual is well written and illustrated. With deceptive ease it performs the difficult feat of being both a tutorial for the novice and a reference text for the expert.

The manual is divided into 11 chapters. The first chapter describes setting up the program on both hard-disk and floppy-based computers. It provides clear instructions on how to modify the CONFIG.SYS file and the MS-DOS environment to achieve optimum program performance. The second and third chapters are a step-by-step tutorial in how to call an RBBS and download a file. The fourth chapter provides a cursory introduction to script files and macros, enough to whet your appetite for the more complete sections later in the book.

The ensuing chapters contain sections on customizing Procomm+ and using host mode. There is a chapter on how to write script files and a reference text containing every Aspect command. The manual ends with eight appendices that document everything from terminal emulations to trouble-shooting procedures. The last appendix is a seven-page primer on telecommunications that should be required reading for anyone going online.

"Support, technical" is listed in the manual's index, and upon turning to the indicated page I found a phone number. To test Datastorm's support staff, I came up with an obscure problem for which I already knew the solution. My call was answered immediately by a support technician, not an operator. He asked a few questions, walked me through some diagnostic procedures, then came back with the correct answer. You can't get much better than that.

CONCLUSION

Clearly, I like Procomm+. I like its features, the way it's put together, and its command set. Some thought was obviously given to the structure of this program and the result is a powerful, elegant piece of software.

If you use telecommunications in a business environment, you should give this program serious consideration; if you are a home user, Procomm+ has everything you need.

SCORECARD

Features: Excellent
Performance: Excellent
Documentation: Excellent
Ease of Use: Excellent
Error Handling: Very Good
Support: Excellent

QUICK REFERENCE SUMMARY

Product: Procomm+
Manufacturer: Datastorm Technologies
1621 Towne Drive, Suite G
Columbia, MO 65202
Phone: (314) 474-8461
Sugg. List Price: \$75
Hotline Number #756-52

WHO NEEDS A NEW COMPUTER?

This is the first installment of "Microscope," a new column for MS-DOS and CP/M users alike. In this column, Ted Silveira will take a closeup look at personal computers from the user's point of view, including tips and tricks for your Kaypro, comments on new hardware and software, and forecasts of the future.

John Rollwagen, the CEO of Cray, premier manufacturer of supercomputers, says that by the early 1990s, you and I will be able to buy computers that have the same power as the first Cray supercomputer (released in 1976), but costing only \$10,000 to \$20,000 instead of the Cray's \$8 million. For the bargain-conscious, Bill Gates, founder and CEO of Microsoft, predicts that by 1991, \$1,000 will buy an 80386 computer with a graphic Windows-type interface (in high-resolution color, presumably) and a half-height CD-ROM drive.

In the last six years, we've seen personal computers evolve from 8-bit Z80 CP/M computers with 64K of memory and two single-sided floppy disk drives to 16-bit 8088 MS-DOS computers with 10-megabyte hard disks and 640K of memory, and on to fire-breathing 80386 computers with lightning-fast 80-megabyte hard disks and megabytes of extended memory, ready to run OS/2 (if only OS/2 were ready for them). And there's no doubt that the newer computers can do more than the old—they can display gorgeous graphics in high-resolution color, they let you load several programs at once and jump between them instantly, they enable you to create immense spreadsheets with thousands of cells or to combine words and pictures into a polished newsletter without ever touching a piece of paper or an X-Acto knife. In short, they are fantastic machines.

But who needs them? If you ignore, for the moment, both the technology junkies (like me) who are attracted to new equipment just because it's new and the corporate users who really do work with databases of 100,000 names and spreadsheets of 20,000 cells, you're left with an immense group of people with small to medium computer jobs—small business-



GAIL GOODENOW

ses, sole proprietors, freelancers, and individuals. The people in this group work on a smaller scale, and, as many have discovered, if you just want to write a letter, or track your money market funds, or keep a mailing list of customers for your small business, then the aging CP/M computer with its paltry 64K memory and no graphics can do the job as well as the fastest MS-DOS computer with VGA graphics and four megabytes of memory. In that case, if your current MS-DOS Kaypro PC or CP/M Kaypro 4 is doing everything you need it to, and doing it fast enough to suit you, then you don't need to go looking for a new computer just to do the same things faster.

Let's get a clearer idea of what the personal computer of 1992 will look like.

That's true . . . as far as it goes. But in three or four years, I think we'll all be buying these new desktop supercomputers because they're going to change

BY TED SILVEIRA

what we do with personal computers.

SUPER COMPUTERS

Let's get a clearer idea of what the personal computer of 1992 will look like. Like Bill Gates, let's say it will be an 80386-based computer, or maybe even an 80486. It'll run at 25-30 MHz (current standard speed is about 10 MHz for an 80286 computer like the Kaypro 286i). It will have at least four megabytes of RAM (random access memory) but probably 16 or more (16-megabit RAM chips are already under development). For mass storage, it will have a read-only CD-ROM disc drive storing at least a gigabyte and a standard hard disk or read/write optical disc drive storing 100 megabytes with an access time of 20 milliseconds or better (hard disks like these are available already, so I'm probably underestimating here).

The computer will have a high-resolution color display, something better than today's 640 x 480 VGA displays (1000 x 1000 maybe?). More important, the display system will use a graphics coprocessor and a page description language, like Display Postscript, so that we'll finally have true WYSIWYG. The computer will have special sound chips for high-quality digital sound, a mouse or some other pointing device, and a noisy fan (some things don't change). Available peripherals will include 600-dot-per-inch laser printers (at under \$2,000 with PostScript

or some other page description language) and 9600 bps (bits-per-second) modems that may or may not include fax capabilities.

The operating system will be huge—that's where a healthy chunk of your memory and storage will go—and it will allow true multi-tasking, but it will not be UNIX. Programs running under the new system will be able to pass messages to one another (interprocess communication) and to exchange data dynamically (hot links). The basic user interface will have windows and pop-up menus (along with sound and color), and the software that runs under it will use many resources of the operating system so that the user interface will be fairly consistent from one program to the next. Programs will display type fonts, pictures, etc., on screen and will integrate text and graphics wherever appropriate. Most programs

will also let you customize the interface in various ways and add your own keyboard equivalents for the mouse or menu commands.

Almost everyone will need the computer of the 1990s because it will change what we do with computers.

You won't get all this wonderful stuff for \$1,000—maybe for \$2,000 and certainly for under \$3,000 (not counting the

laser printer). But why will you need it?

SCIENCE FICTION?

Many people don't even need the full power of computers available today to accomplish their chosen tasks. Writers and people who work with text, for example, seldom if ever need graphics or color displays. All the same, almost everyone will need (not to mention want) this computer of the 1990s because it's going to change what we do with computers, change it in a way that will leave less powerful computers behind.

Why? One of the hallmarks not just of our decade but of the entire 20th century is information overload. In the past, people were hobbled by information that they didn't have, that didn't exist yet in many cases. Today we're flooded with information, so much that we can't even catalog it, much less read it, absorb it,

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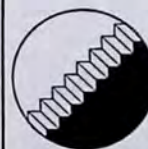
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evaluate it, and connect it to other things we know. Today we don't need more information so much as we need tools to help us make sense out of the information we already have and to help us locate useful information in a barren landscape of facts that stretches before us like the sands of the Sahara.

For 50 years and more, people have dreamed that the computer would someday be the tool we need, a dream you can see clearly in science fiction stories and movies. In science fiction, people don't program computers, build spreadsheets, or enter data—they tap huge banks of information and then ask the computer to make sense out of what it's found. So far, our personal computers have fallen well short of that mark. We're limited by the speed and memory of our current computers but even more by the tremendous problem of getting all that available information into them in some computer-readable form. So far.

But now, right now, we're crossing a threshold into a new phase of personal computing, a phase in which computers will begin to have the processing power and memory needed to make science fiction real. Just as important, these computers will finally begin to have easy access to huge amounts of information through CD-ROM and other optical media publishing, through 9600 bps access to on-line information services, and through integrated voice and data lines running over fiber optic cables.

Up to now, personal computers have been primarily information producers, tools for people whose job is to gather information, enter it into the computer, format it (as a page of text, a balance sheet, or a list of names), and then produce something for other people to read—a newspaper article, a spreadsheet or financial report, an inventory or membership list, and so forth. In the very near future, personal computers will become information processors, tools for a much larger group of people who need to make sense out of massive amounts of information, much of it already available but relatively inaccessible (sometimes simply because of its bulk). These people are not concerned so much with producing reports

as with analyzing information so that they can make decisions, either personal or professional. This task of tapping information resources and making sense out of what's there is so important that it's going to become the primary function of a computer for most people. We'll still write letters, create spreadsheets, and store names and addresses, but these will be ancillary functions.

*You can
see one direction
personal computers are
moving, in the new
free-form
text database
programs.*

One obvious application that's already in vogue is financial analysis for investors, a market that's being heavily mined by Lotus, which is providing not only software but also extensive financial databases on CD-ROM plus instant quotes and updates through on-line service. However, we'll soon see many applications other than financial ones, including demographic and media analysis for advertisers, mortgage rate and benefit analysis along with real estate analysis for home buyers, insurance rate and benefit analysis for individuals, company and job market analysis for job seekers, political and economic analysis for voters, market analysis for small business people and mini-entrepreneurs, and more.

That's only the beginning. You can see one direction personal computers are moving, in the new free-form text database programs like Tornado Notes and Guide, the hypertext program covered in the June 1988 PROFILES. Personal information managers like Agenda and Grandview point toward a new class of software that helps you find patterns in apparently random collections of infor-

mation. The programs we have now are just the first seedlings, but imagine the possibilities. Searching through information captured from an on-line database, you stumble across something that intrigues you—an interesting way of looking at the American Revolution, perhaps, or a new juxtaposition of facts about urban development. So you tell your computer, "Look through all the text and database files I have and find everything that has this same pattern of words or ideas." And off your computer goes, searching first through your hard disk, then through your CD-ROM, and then (after asking your permission) through selected on-line databases over the phone line. Like a faithful retriever, it hunts up everything that matches the pattern you set and drops the results at your feet. In hours, instead of months (or even years), you have not just an interesting but isolated idea—you have its whole intellectual and factual background with connections reaching out in directions you'd never thought of.

And don't overlook the part that will be played by graphics, color, and sound in making this science fiction dream a working reality. Information on a computer screen won't replace books—certainly not in the near future—because it's just too tiring to read a lot of information on a screen and too hard to jump from place to place as easily as you can in a book. But the increased use of high-resolution graphics, color, and even sound is going to make the on-screen display of information more attractive and more easily readable (that is to say, understandable). Graphics, color, and sound are going to be especially useful for computer-based reference materials, how-to manuals, and similar information, especially when combined with animated images.

However chancy these predictions may be, I can guarantee you one thing. The software that performs these miracles for us is going to require every bit of speed and memory that the computers of the 1990s can muster. It takes brute power to crunch that much information yet still present users with a friendly face that makes it all look easy. I'm saving my nickels.

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And here's your chance to meet with other Kaypro users and swap equipment, accessories and services. PROFILES will accept 30 word classified advertisements from our subscribers. For \$25 your ad will be seen by all of your fellow Kaypro users. Price includes up to three insertions, no prorating. This section will be limited to PROFILES subscribers. We will not accept advertisements from businesses or manufacturers in this section. To place your classified ad, send typed copy and check to:

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Solana Beach, CA 92075

User Groups

Learning to operate a computer is not easy — everyone needs help at one time or another. This is precisely the reason why user groups were born.

Basically, a user group is a collection of computer owners and users who learn from each other. These are non-profit membership organizations devoted to making life with a computer easier.

Almost every computer brand and operating system has user groups that support it; many groups are a mixed bag. For example, owners of many different brands of computers find they all use the same operating system, and therefore, have some common ground.

Most user groups have members with a wide range of expertise and experience — from absolute beginners to those who have "working" knowledge to people who are "power users." Often people's expertise breaks down into types of software applications — word processing, data base managers, spreadsheets, telecommunications, etc. Perhaps more often, a member's knowledge is specific to a particular piece of application software.

The bottom line is that user groups are a veritable goldmine — and the mother lode is information, no one is an expert overnight, and no one does it alone.

KUGs

For those readers who own Kaypro computers, Kaypro User Groups (KUGs) exist in every state, in Canada, and in countries all over the world. To find the KUG closest to you, write to Fred Zuill, KUG Manager, at Kaypro Corporation, 533 Stevens Avenue, Solana Beach, CA 92075; (619) 481-4368 (voice). Be sure to include your zip code.

Fred Zuill also maintains a BBS — the KUG ROS — for the exchange of information and help. It contains a message section, as well as lots of public domain software for both the CP/M and DOS operating systems. Public domain programs mentioned in PROFILES can also be found there. The system is online 24/hrs, 7 days a week, and can run at 300/1200/2400 baud.

KUG ROS — (619) 259-4437

When people talk about CP/M survival, they often seem to imagine CP/M users as a grim little band of hunters and gatherers, scratching out a living in the bush, completely cut off from civilization. It is easy to feel isolated, especially when you can't get some simple replacement part or repair, and it's tempting to wear that isolation like a badge of honor. In truth, though, isolation is CP/M's deadliest enemy. Despite the long hours you spend alone at the keyboard, computing is a social activity, and the key to keeping your CP/M computer alive is to stay in touch.

STAYING IN TOUCH WITH DOS

Case 1: You're trying to build a career as a freelance writer and editor (my sympathy). A publishing company asks you to do a major rewrite of the manuscript for a college biology textbook. The job pays well and will lead to better things if you do a good job. The publisher wants to send you the manuscript as a set of WordPerfect files on an MS-DOS disk. You only have a Kaypro 4 with WordStar.

Case 2: You keep your Kaypro 4 in your office at work. For the past three weeks, you've been using it to write a very long and very important report for your department. Last night you finished the report, made backup copies of your disks, and went home for a good night's sleep. This morning, you come in to print out the report, which is due at 11 a.m., but when you turn on your Kaypro, nothing happens—it remains as silent and inscrutable as Stonehenge. There's another computer in the next office, but it's MS-DOS and can't read your CP/M disks. As far as you know, there's not another CP/M Kaypro for miles.

The solution to both these problems is to make sure ahead of time that you can communicate with MS-DOS. Because MS-DOS holds the majority, it's up to you to handle the problem of different disk and file formats.

In the first case, you can get the files you need from the DOS disk to your CP/M disk by using a disk conversion program like Media Master (Intersecting Concepts), Uniform (Micro Solutions), or DOSDisk (PluPerfect Systems—requires

THE CP/M SURVIVALIST: STAY IN TOUCH

BY TED SILVEIRA

the Advent TurboROM). These programs allow your Kaypro to read and write normal MS-DOS disks along with dozens of other disk formats.

Once you get the files to your Kaypro, you face the problem of converting the WordPerfect files into a form you can use with WordStar. You can ask the company you're working for to convert the files to WordStar format (there are a number of ways to do that with MS-DOS programs). Failing that, you can use a CP/M file filter program like FILT7 (available free from bulletin boards and user groups) or FileMate (\$39.95 from Intersecting Concepts) to turn the WordPerfect files into standard ASCII text files. WordStar can read the ASCII files easily, though you'll lose any special formatting in the WordPerfect files. When you're done with your rewrite of the manuscript, you can use your disk conversion program to copy the files back onto an MS-DOS disk in WordStar format (WordPerfect can import WordStar files). Of course, you can also use this method with files from other MS-DOS programs—XyWrite, MultiMate, PFS Write, etc.

Because MS-DOS holds the majority, it's up to you to handle the problem of disk and file formats.

In the second case, you have a different problem. That is, it won't do you any good to have a disk conversion program

for your CP/M Kaypro if your Kaypro isn't working. If you do important work on your Kaypro, especially work that's time-sensitive (where even small delays can be disastrous), then you need to take MS-DOS compatibility a step further. The simplest solution is to get a disk conversion program for your Kaypro, as mentioned above, and then use it to keep regular backups of your work on MS-DOS disks. Then, if your Kaypro breaks down unexpectedly, you can simply take your backup disks to the nearest MS-DOS computer and continue working (or at least print them).

You do need to make sure that you save the backup files in a file format that can be used on the MS-DOS computer. Major CP/M programs such as WordStar, dBase II, and SuperCalc all create files that can be easily read by many MS-DOS programs (including the MS-DOS versions of WordStar, dBase, and SuperCalc, of course). If you have a less popular program, such as Perfect Calc, you'll need to find out beforehand whether it's possible either to read those files in MS-DOS or to convert them into some form that can be read.

The DOS backup disk method only works if you faithfully back up your work every day, because you can bet that the day you don't back up an important file is the day your computer will fail. Of the three disk conversion programs mentioned, Uniform and DOSDisk probably have an edge in convenience. Media Master is essentially a copy program—you run Media Master, convert one of your Kaypro drives to the format you want, copy files to and from the drive, and then exit the program. Once you leave Media Master, your drive returns to its normal Kaypro format.

With Uniform and DOSDisk, on the other hand, when you convert a drive to a

new format, such as MS-DOS, the drive retains that format until you change it or reboot the computer. For example, with DOSDisk or Uniform, you could convert your B drive to an MS-DOS drive, insert an MS-DOS disk in it, and then use WordStar or any other program from the A drive to work on the MS-DOS disk just as if it were a normal Kaypro disk. You could, in fact, keep all your data files on MS-DOS disks instead of just your backup file (you might not want to, though, because the MS-DOS disks hold about 30K less than the Kaypro disks).

As an alternative solution to this second problem, you could buy a disk conversion program for an MS-DOS computer (Media Master is available in a DOS version, for example, as is usual.) and keep it handy. If disaster strikes, use the MS-DOS disk conversion program to let the DOS computer read your CP/M disks.

STAYING IN TOUCH WITH CP/M

Just as it's important to be able to communicate with MS-DOS, it's also important to stay in touch with CP/M—or rather, with CP/M users, because that's where you're most likely to get the help you need when you need it. *PROFILES* is a valuable resource, but when your computer suddenly eats an important file some Sunday evening, you're not going to wait three weeks for the next issue to arrive just on the off chance it'll have a tip to solve your problem. You need someone you can call right then.

Your best resource, of course, is a healthy local KUG (Kaypro Users' Group), which should offer not only people to share your problems and schemes with but also a sizable library of public domain software and group purchases of disks, paper, and other accessories. Unfortunately, local CP/M users' groups are disappearing in many parts of the country. If that's happened to your local KUG, and there's no other local CP/M user's group around that you can join, then it's time to go national.

One of your best national resources is FOG, originally the First Osborne Group. It may seem odd to be recommending an Osborne group to Kaypro users, but FOG

has long since ceased to be an Osborne-only group. They now support most CP/M computers, and they have a strong contingent of Kaypro users.

It's important to stay in touch with CP/M users—that's where you're most likely to get help.

Though FOG has local member groups (called affiliates), it's the national organization that's of real interest to isolated Kaypro users. With something like 13,000 members worldwide, FOG offers a variety of services. It maintains an extensive library of CP/M shareware and public domain software (and can deliver it on Kaypro disks, too). It staffs a free hotline you can call if you need help. And it publishes *FOGHorn*, a 60-page monthly newsletter that's as close to a magazine as you can get without being one. *FOGHorn* offers reviews, how-to articles, and tons of short tips sent in by users (some are specific to certain computers, others are general).

If you have a modem, your other national resources are the commercial online information services, CompuServe and GENie. These two services are like gigantic computer bulletin boards—or rather, each one is like a giant collection of bulletin boards in itself, covering every computer topic you can imagine and non-computer topics from art to zoology. Both CompuServe and GENie have CP/M groups where you can trade messages with other CP/M users and download the latest public domain software. CompuServe also has a special Kaypro group.

The real benefit of these groups is that you get the combined experience of lots and lots of CP/M users from throughout

the country. No matter what problem or question you have, there's probably someone who either knows the answer or knows how to find out, and often you can get an answer within a day or two. It's the same kind of synergy you find in a good users' group, only on a larger scale—a combination coffee house, library, and research center that's open 24 hours a day.

If you want to know what's going on in the CP/M world, get out and mingle. I haunt both CompuServe (72135,1447) and GENie (tsilveira), drop me a line. ■

QUICK REFERENCE SUMMARY

CompuServe Information Services
(800) 848-8199 for information or sign-up
Hotline Number #750-52

GENie
General Electric Information Services
(800) 638-9636 for information or sign-up
Hotline Number #751-52

FOG
\$24/year, including newsletter
P.O. Box 3474
Daly City, CA 94015
(415) 755-2000
Hotline Number #752-52

DOSDisk
\$30 (requires Advent TurboROM)
PluPerfect Systems
410 23rd St.
Santa Monica, CA 90402
Hotline Number #753-52

FileMate
\$49.95 (CP/M or MS-DOS)
Intersecting Concepts
80 Long Court, Suite 1A
Thousand Oaks, CA 91360
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Hotline Number #754-52

Media Master
\$39.95 (CP/M) or \$49.95 (MS-DOS)
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330 Central Avenue
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(800) 533-8049
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FIRST CHOICE

"Jack of all trades, master of none" is a phrase that often comes to mind when working with an all-in-one integrated package. Integrated software seldom appeals to the sophisticated business user because it fails to deliver the performance of full-featured separate programs.

That's not the case with Software Publishing Corporation's First Choice, however. It's an inexpensive (suggested retail \$149) integrated package that combines spreadsheet, word processing, graphics, database, and communications functions. If you're a small business owner with a tight budget, it just might be the answer to your prayers.

First Choice doesn't try to go head-to-head with big guns like Lotus 1-2-3 or Word Perfect. You won't find many Fortune 500 corporations preparing major contract proposals with First Choice—it was designed specifically for the small-business and home-office markets.

The First Choice package includes two sets of master diskettes: a pair of 3.5-inch, 720K micro floppy diskettes (Program and Dictionary disks) and three 5.25-inch 360K floppies (two Program disks and the Dictionary disk). Both sets contain the same program material—the micro diskettes are provided for users with 720K drives.

The program requires two floppy disk drives or a hard disk, at least 512 KB of RAM, MS-DOS Version 2.0 or greater, and a color or monochrome monitor. If you have a color monitor, you'll see some of the most attractive menu screens I've run across in quite a while. Though the program doesn't offer a choice of colors, I guarantee you'll be impressed.

FEATURES AND PERFORMANCE

First Choice's greatest strength is its lack of weaknesses. None of the individual modules is a powerhouse by itself, but, taken together, they make a potent combination that can handle most small-business needs. Ease of use and a short learning curve are also important—First Choice is designed for users who don't have time to learn a multitude of complex commands.

Installation is a snap. To test the

FIRST CHOICE AND WORDSTAR SCREEN EXTENDER

BY TONY EVANS AND JACK NIMERSHEIM

simplicity of the installation procedure, I "borrowed" a friend with minimal computer experience and turned her loose with the manual and master disks. In no time, she had installed First Choice and was meandering happily through the menus.

Another plus for the novice—in addition to the standard pull-down menus and two-keystroke "speed key" combinations, First Choice also works with a mouse. With a mouse, the user can load files, make menu selections, mark text for editing, and scroll up and down the screen—all without touching the keyboard. More important, using the mouse is *fun* and enables the neophyte to take command of the program more quickly than with keyboard commands alone.

*The
First Choice word
processing module is,
as advertised,
easy to learn
and use.*

The mouse, once considered a novelty, is fast becoming a necessity as more programmers design mouse-driven software. The First Choice programmers did a good job with the mouse interface—cursor control is quick and smooth, and mouse button control sequences swiftly become second nature.

The First Choice word processing module is, as advertised, easy to learn and use. Considering that First Choice sells for about half the cost of one of the "big three" word processing programs, its performance is particularly impressive. It has most of the features of the stand-alone programs, and its pull-down

menus are especially easy to use with the mouse.

The word processor can also create personalized form letters. It's designed to integrate data (names, addresses, customer numbers, etc.) from the First Choice database—another useful tool for small business owners who do their own direct mail advertising.

The built-in spell checker and thesaurus are an unexpected plus. Frankly, I didn't expect this low-priced program to have a spell checker, let alone one as good as this. It flags misspelled words, incorrect capitalizations (CaliFornia), and oddball sentence structure ("Paris in the the spring") and provides a list of suggested spelling options. The spell checker has a 75,000-word dictionary, and the thesaurus references a 20,000-keyword library. Both can be used in all First Choice modules. Pretty impressive for a \$149 package.

The spreadsheet has the typical row-column layout, with a special area along the top for headings. Here's a nice touch—if you want to create a series of consecutive day or month headings, there's a "quick entry" feature that enables you to generate them automatically.

The First Choice spreadsheet is capable of a maximum 768 columns by 1,024 rows and can import and export PFS Plan and Lotus 1-2-3 (Release 1A) files. Though it's not a full-featured Lotus clone, it should be adequate for most small business requirements. The spreadsheet allows the user to prepare budgets, do "what-if" analysis, and produce presentation-quality pie, bar, and line graphs from spreadsheet data.

Designed for the beginner, First Choice makes it easy to get started with a built-in library of financial and mathematical formulas that can be called up as needed. For a small business owner who's used to doing financial work with an old-fashioned ledger book and calculator, the spreadsheet is a great leap forward.

Small business owners often want to use their computers to keep track of customers. The File Management module is designed for an easy transition from traditional pen-and-ink methods. The user can design custom data entry screens for manual data entry or import ASCII-delimited data (found in commercial mailing lists).

The term "database" sounds a little intimidating—it conjures up images of room-sized computers staffed by attendants in white lab coats. Maybe that's why Software Publishing chose the terms "forms" and "folders" to describe its database module. The manual compares First Choice data forms to index cards—an analogy that makes the beginner feel right at home. The data forms can be used to print reports, send letters to specific clients, or track sales of different products. For an imaginative user, the possibilities are endless.

Small business owners are less likely to use graphics in day-to-day operations, but the capability is there if it's needed. The quality of the graphs is good—they're sharply defined and can be labeled in a variety of ways. With a few simple keystrokes, the user can create pie, bar, area, and line graphs directly from the graphics module or from data in the spreadsheet.

First Choice graphs can be exported to PFS First Publisher, PFS Professional Write, and Harvard Graphics, or they can be added to First Choice word processor documents. Graphs can be printed by a wide variety of printers and plotters (First Choice supports over 80 printers), including color and laser printers.

First Choice also includes a communications module that is compatible with most popular modems. It's useful for transferring files between home and office, or connecting to online services like CompuServe or The Source. Files can be transferred with XMODEM error-checking protocol, which provides compatibility with most online systems.

The module holds up to eight phone numbers—adequate for most business needs, but a bit limited for the "modem maniac." There's also an option that allows the user to store log-on sequences

for automatic access to online services—a real time-saver. Communications settings can be made individually for each phone number, with full control of parity, stop and data bits, baud rate, and duplex parameters.

Text files can be created or edited directly from the First Choice word processor and saved to disk or printed out as hardcopy. There's also an "Answer Incoming Call" feature that puts the system into host mode—perfect for transferring data between home and office computers.

Moving between modules is easy—just press the Esc key to return to the Main Menu and select the desired option.

DOCUMENTATION AND SUPPORT

"No experience required," it says on the cover of the First Choice manual, and they're not kidding. The documentation is written with the beginner in mind (they even tell you how to pronounce "DOS"), and the manual explains each operation with a minimum of computer jargon.

The layout of the manual is crisp and professional. The illustrations are useful, not merely decorative, and are designed to add visual cues to the text. For the veteran computer user who wants to get started immediately, there's a "Quick Tour" overview at the beginning of the manual. It's perfect for those who would rather learn by exploration than follow a step-by-step lesson plan.

There's also a removable "Find it Quick" card in the back of the manual that lists editing and cursor movement keys, as well as "speed keys" (two-key combinations that invoke various First Choice functions). It's similar to those little plastic slip-over-your-function-keys cards that come with some packages, except that it's better organized, easier to read, and you don't have to worry about whether or not it will fit your keyboard.

For registered users, there's a support line number listed in the "Customer Support Plan" appendix. It's not a toll-free WATS line, but there's no charge for support. I called the number and spoke with a real human being within 60 seconds—no taped messages, no "Hello, please hold," no elevator music. They were able

to answer all of my questions (simple ones, admittedly) directly and gave explanations in plain layman's language, not computerese.

*With
the lowest price
in the integrated
software field,
First choice is a
mini-masterpiece.*

SUMMARY

Software Publishing Corporation has found the recipe for success in the small business or home user market: Take a competent, easy-to-use word processor, spreadsheet, and database, then add mouse support, magnificent color graphics, and communications features. Throw in a first-rate instruction manual, handy on-line help screens, and a telephone support line for registered users. Top it all off with the lowest price in the integrated software field and you've got a mini-masterpiece.

—T.E.

SCORECARD

Features: Very good
Performance: Very good
Documentation: Excellent
Ease of use: Excellent
Support: Excellent

WORDSTAR SCREENEXTENDER

WordStar ScreenExtender, from Stairway Software, is a memory-resident WordStar add-in utility that increases the amount of text you can display when working on a WordStar document.

WordStar ScreenExtender runs on IBM PC/XT, AT, or compatible machines with a floppy or hard disk. It requires DOS 2.0 or later and a graphics monitor, and it supports CGA, EGA, VGA, MCGA, or

Hercules-compatible display modes. Since ScreenExtender is a dedicated WordStar utility, you must also, of course, use that program. ScreenExtender currently supports WordStar Professional Release 4, with support for WordStar Classic Release 5 (not yet available at this writing) already promised in a future version. ScreenExtender is not copy-protected, and the list price is \$59.95.

FEATURES AND PERFORMANCE

ScreenExtender takes advantage of WordStar's legendary open architecture to attach itself to the program's actual code. The ScreenExtender manual contains clear, step-by-step instructions on how to accomplish this, using the WordStar WSCCHANGE program.

After ScreenExtender is properly attached, you simply load the appropriate driver for your display configuration into RAM, where it sits idle until the next time you open WordStar. ScreenExtender uses from 50 to 70K of RAM for its memory-resident code, depending on the display driver you install.

Once you are editing a document in WordStar, pressing a user-defined "hot key" switches you between that program's standard character-based display and the graphics mode ScreenExtender uses to increase your work area. How large a work area ScreenExtender allows depends entirely on your display hardware. With a CGA, for example, you can access 33 rows by 160 columns. In Hercules-compatible display mode, on the other hand, this figure increases to 58 rows by 180 columns, the maximum resolution available with ScreenExtender.

ScreenExtender permits you to choose between two graphics-generated screen fonts for your expanded work area. While each is readable, I wouldn't want to work exclusively with either of them for extended periods of time.

The only other major function ScreenExtender supports is the ability to change the text and background colors on your expanded work area, when installed with a color display. Since WordStar Release 4 allows extensive control over screen colors, including the ability to define different color combinations for highlight-

ing various text attributes, I question just how useful this particular function is. You can at any time, however, revert back to your custom WordStar color configuration, even when working in high-resolution mode.

I tested ScreenExtender with several other memory-resident programs, including SideKick Plus and Microsoft's SMARTdrive disk-caching program, and experienced no compatibility problems. It does what it does, seemingly without conflict. What more can you say?

Disappointing, however, is the fact that ScreenExtender does not work with WordFinder, WordStar's companion Thesaurus program, since that program depends on reading the screen to identify the word for which you have requested a synonym. The ability to switch between ScreenExtender's graphics-based work area and WordStar's standard display provides an acceptable, if somewhat inconvenient, solution to this problem.

DOCUMENTATION AND SUPPORT

The pre-production manual that accompanied my review copy of ScreenExtender was only 24 pages long, including an introduction, installation and operating instructions, and three appendices on using ScreenExtender within specific operating environments. In truth, the program is so straightforward, even this small document seemed excessive. Still, it covers everything in clear, concise language and, once read, can probably be tucked away and never used again.

When I called Stairway Software to inquire about a cryptic message informing me that ScreenExtender's configuration files could not be found during the loading of WordStar, the support technician informed me that this message was more indicative of how WordStar searches subdirectories during start-up than any problem with ScreenExtender. Since the program did, indeed, recognize my configuration, he must have been right.

The technician then asked me for my suggestions on how to avoid the confusion this message might cause—which I promptly offered. I got the feeling that ScreenExtender's program code was not yet "set in concrete," and that my sug-

gestion might even end up incorporated into the program's initial release. This anecdote indicates Stairway Software's willingness to listen to its customers during these early stages of the company's existence.

SUMMARY

In the right environment, ScreenExtender could be a very useful program. Programmers, for example, who regularly write lengthy lines of code and have long felt restricted by WordStar's 80-column display limitations, will undoubtedly consider ScreenExtender an invaluable addition to their programming toolbox. People like me, however, whose primary concern is less specialized writing probably can't justify the program's \$60 purchase price.

—J.N.

SCORECARD

Features: Good
Performance: Very Good
Documentation: Very Good
Ease of Use: Excellent
Support: Very Good

Jack Nimersheim is an independent computer consultant and freelance writer living in Covington, Kentucky.

Tony Evans is a desktop publishing specialist and freelance writer living in Southern California. His interests range from computer technical manuals to articles on sailboat racing.

QUICK REFERENCE SUMMARY

Product: First Choice
Manufacturer: Software Publishing Corp.
P.O. Box 7210
1901 Landings Dr.
Mountain View, CA 94039-7210
Phone: (415) 962-8910
Sugg. List Price: \$149
Hotline Number #757-52

Product: ScreenExtender 1.0
Manufacturer: Stairway Software
700 Harris Street, Suite 24
Charlottesville, VA 22901
Phone: (804) 977-7770
Sugg. List Price: \$59.95
Hotline Number #758-52

KAYPRO 286-16

Preliminary Specifications



Product Description:

The KAYPRO 286 is unique among AT compatible systems in that it features the superior flexibility of open architecture, or slot technology, first introduced by Kaypro with the popular KAYPRO PC. The keyboard selectable tri-speed 80286 processor and advanced engineering features including shadow RAM and page-mode memory running at near-zero wait states make the KAYPRO 286 unparalleled in performance, compatibility, and cost-effectiveness.

Applications:

The KAYPRO 286, utilizing a 16MHz 80286 microprocessor, enhances any applications software by virtue of its high speed. With extended memory or LIM 4.0 compatible expanded memory of up to 8 MB on board, large spreadsheets, CAD/CAE, and network file servers operate with unrivaled efficiency. Advanced shadow RAM techniques provide quick graphics and screen updates commensurate with high-speed processing. Applications which are speed sensitive are accommodated by the ability to invoke low speed operation via the keyboard at any time. The KAYPRO 286 features a comprehensive bundle of applications software to form the basis of today's most powerful 80286 system.

Hardware Specifications:

CPU:	80286 microprocessor, keyboard selectable 8/10/16 MHz clock with near-zero wait states; socket for 80287 math co-processor
RAM:	One MB standard, expandable to 8 MB with no additional boards; system memory expandable to 16 MB
DISK STORAGE:	One double-sided, high-density floppy disk drive; 1.2 MB storage capacity One hard disk drive; 40 MB storage capacity, 35ms average access time
EXPANSION SLOTS:	Nine expansion slots; four are used for the system, leaving five slots available
KEYBOARD:	Detachable, 101 keys, enhanced AT compatible in layout and function keys with adjustable typing angle; may be locked to prevent unauthorized use
INTERNAL CLOCK:	Real-time clock/calendar with battery backup
INPUT/OUTPUT:	One parallel printer port One asynchronous (RS-232C) serial port
DISPLAY:	12" high resolution monochrome monitor; green or amber Multi-Video graphics adapter capable of displaying EGA, CGA, MDA, and Hercules-compatible monochrome graphics on most monitors
POWER SUPPLY:	120/240 volts, 60/50 cycles; 160 watts
CASE:	Metal construction; desktop configuration; Color: beige with eggshell trim
SIZE:	Dimensions: 19 1/2 X 16 X 5 1/2 inches; Weight: 30 pounds
WARRANTY:	One year limited warranty on parts and labor

Standard Software Features:

WORD PROCESSING: WordStar Professional Release 4.0 is the latest version of the industry's leading word processing program.

SPELLING CHECKER: This comprehensive spelling checker proofreads text, highlights questionable words, and suggests possible replacements (included within WordStar Professional Release 4.0).

MAILMERGE: This versatile, multi-purpose program performs special printing tasks by joining files and personalizing standard documents (included within WordStar Professional Release 4.0).

INDEXING: This program creates reference aids to locate information within long documents (included within WordStar Professional Release 4.0).

THESAURUS: Word Finder, an on-line thesaurus of over 222,000 synonyms allows for easy replacement of words within documents with selected synonyms.

DISK MANAGEMENT UTILITY: SpeedStor is a comprehensive software utility providing fixed disk preparation and diagnostic features as well as advanced partition creation, formatting and editing capabilities.

PROGRAMMING: GW-BASIC, a BASIC-A compatible programming language provides the capability to program and run applications software.

OPERATING SYSTEM: MS-DOS 3.3

For more information on any Kaypro product, see your authorized Kaypro Reseller. Or, call 1-800-4-KAYPRO.

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NEW PRODUCTS

EDITED BY K.A. CARRIGAN

The following new product listings are not reviews and should not be considered endorsements. To be considered for publication in this column, press releases should be sent to K.A. Carrigan, "New Products" Editor, c/o PROFILES Magazine, 533 Stevens Ave., Solana Beach, CA 92075. Releases must state prices and the operating systems the products support. Include photos if available.

PC TRAINING KIT

The PC Training Kit is a complete MS-DOS training kit designed for the novice user who wants to become productive sooner. It includes a 40-minute VHS video covering fundamental and intermediate level concepts; an individualized training workbook; a condensed glossary of computer terms and phrases; a hardcover reference guide; a quick reference card; and exercise diskettes.

In addition to MS-DOS, PC Training Kits are also available for Lotus 1-2-3 and WordPerfect.

\$175. Abacus, 5370 52nd St. SE, Grand Rapids, MI 49508; (616) 698-0330.



Hotline #550-52

HALF-HEIGHT BACKUP SYSTEMS

Two new 5 1/4-inch half-height cartridge tape drives are now available in 60 and 150MB capacities. The drives can be configured to run on DOS, LAN, and XENIX systems.

The half-height internal drives require less space and leave room for additional half-height devices, such as hard disks. Power requirements

are significantly lower than those for full-height drives and the drives cost less per MB than their full-height counterparts.

\$1,295 60 MB; \$2,095 150 MB. All Kaypro MS-DOS machines and other IBM-compatibles. Emerald Systems, 4757 Morena Blvd., San Diego, CA 92117; (619) 270-1994.

Hotline #551-52



24-INCH MONOCHROME MONITOR

Monitem's Viking 2400 is a 24-inch monitor for AT-compatibles that supports a resolution of 1280 x 960 pixels refreshed at 66 Hz.

The Viking controllers use the Hitachi HD63484 ACRTC on-board co-processor and are compatible with and provide acceleration to AutoCAD and VersaCAD. They also support Microsoft Windows, GEM, Lotus 1-2-3, and most other CAD and desktop publishing applications.

Monitem has also released a free booklet, "How to Buy the Right Monitor," that is designed to help buyers understand the technical terminology and ergonomic factors of high resolution monitors. It is available free upon written request.

\$2,995. All Kaypro 80286- and 80386-based machines and other IBM/AT compatibles. Monitem Corp., 5740 Green Circle Dr., Minnetonka, MN 55343; (612) 935-4151.

Hotline #552-52

PROGRAM FOR SPECIAL OCCASIONS
Special Days is a program that

creates "Timescripts" for birthdays, anniversaries, graduations, and other special occasions.

A Timescript is a one-page document that recaps the headlines, people, songs, prices, and awards from a selected day from the past.

Special Days comes with three different report formats (birthday, anniversary, and flashback) and a built-in library containing thousands of historical events beginning with the year 1850. It is completely menu-driven and has pop-up help screens.

\$39.95. All Kaypro MS-DOS and IBM-compatibles. The Salinon Corp., 7424 Greenville Ave., Suite 115, Dallas, TX 75231; (214) 692-9091

Hotline #553-52

XYWRITE MADE EASIER

XYWrite Made Easier: Revised and Expanded to Include Version XYWrite III Plus is a book packed with time-saving information about this popular program.

Author David H. Rothman said, "I wanted my XyWrite book to help not just the techies, but also 'civilians' like reporters, writers, and other non-programmers who just want to do their jobs well and quickly."

The book covers how to format disks, achieve quick installation, and set up keyboards and macros. It also explains how to produce true typeset-quality newsletters; customize the program and set it up for a hard disk or laser printer; convert XYWrite code to ASCII, WordStar, or MultiMate; exploit XyWrite's mail-merge capabilities; and how to double or triple cursor speed.

\$21.60 paperback, \$27.95 hardbound. Tab Books, Inc., P.O. Box 40, Blue Ridge Summit, PA 17214; (717) 794-2191.

Hotline #554-52

POWERFUL RECOVERY SOFTWARE

Deja View is a non-copy-protected, memory-resident program designed to help you recover from sudden power loss or hard disk failures.

The program automatically copies all of your PC's RAM and video memory onto your hard disk, saving work in progress. The user specifies (by number of keystrokes or a time interval) how frequently the Auto-Save function executes. A Save-Now key is also available.

Auto-save is available for a wide range of applications, including word processing, spreadsheets, databases, and graphics. The program will also save memory residing on an expanded memory board.

\$95. All Kaypro MS-DOS and IBM-compatibles. Meridian Technology, 7 Corporate Park, Suite 100, Irvine, CA 92714; (714) 261-1199.

Hotline #555-52

PROTECTION FROM POWER LINE DISTURBANCES

A free reprint of "Protect Your Computer From Power Line Disturbances" is available upon request from Electronic Specialists.

The article informs the average computer user about various electrical power problems. Technical jargon is avoided in favor of commonly used and understood terms.

Examples of the effects of power line disturbances are given, as well as advice on steps to take to protect your computer.

Free. Electronic Specialists, Inc., P.O. Box 389, 171 S. Main St., Natick, MA 01760; (800) 225-4876.

Hotline # 556-52

FORGET-ME-NOT

Forget-Me-Not is a time-release program that pops up messages and executes unattended batch files or applications.

This RAM-resident program works on single workstations or in the Local Area Network (LAN) environment. It can send a message to the sender as a reminder or to another LAN node as electronic mail. Multiple messages can be entered and stored and can be delivered immediately or at any designated time

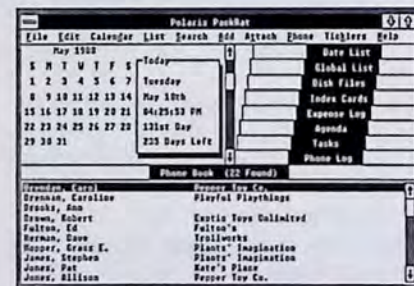
in the future.

Forget-Me-Not can also automate the PC to execute batch files or applications allowing unattended printing, communications, or back up procedures.

\$79.95. All Kaypro MS-DOS machines and other IBM-compatibles. Sterling Castle Software, 702 Washington St., Marina del Rey, CA 90292; (800) 323-6406 in CA; (800) 722-7853 (outside CA).

Hotline # 557-52

PERSONAL INFORMATION MANAGER
Polaris PackRat is a personal information manager built on a text and graphics database. It allows information to be entered in free-form format while providing the structure needed for information retrieval.



PackRat consists of facilities organized to help you manage your personal information. These facilities include a Phone Book, Phone Log, Expense Log, Calendar, Agenda, Task List, Index Cards, and Disk File Log.

Users can search facilities by date or keyword. The Global List provides a full view of PackRat information, allowing searches across all facilities.

\$395. All Kaypro MS-DOS machines and other IBM-compatibles running Microsoft Windows 2.03. Polaris Software, 613 West Valley Parkway, Ste. 323, Escondido, CA 92025; (619) 743-7800

Hotline # 558-52

DOCUMENT COMPUTER TIME

PC Logbook is a program that keeps

track of computer time spent on business projects.

The product supports billing claims for services rendered and provides detailed documentation to accompany home-office tax deductions.

PC Logbook prints detailed reports that include project name, starting and ending times, durations and totals. Reports can be sorted by project name or date, day, month or year.

\$29.95. All Kaypro MS-DOS and IBM compatibles. Kerner Software, 3 Katonah Trail, Andover, NJ 07821; (201) 539-8804.

Hotline # 559-52

TECHNICAL WORD PROCESSING

Printrix 3.0 is a program that allows users to include equations and mathematical expressions in documents created with popular word processors.

The user types English-like descriptions of equations and formulas into text files, and they are automatically formatted into the document.

The PRINTRIX library includes a complete Greek set; logical operators such as union, intersection, and subset; trigonometric functions and symbols; summations, integrals, matrices, and roots; all standard arithmetic operators, and more.

The product supports WordStar, WordStar 2000, Microsoft Word, WordPerfect, and pfs:write. It also accepts data from any ASCII, dBASE, REFLEX, or R:base file. It outputs to over 150 different impact, thermal, inkjet, and laser printers.

\$165. All Kaypro MS-DOS and IBM-compatibles. Data Transforms, 616 Washington St., Denver, CO 80203; (303) 832-1501.

$$R^2 = \frac{\sum (\hat{y} - \bar{y})^2}{\sum (y - \bar{y})^2} = 1 - \frac{\sum (y - \hat{y})^2}{\sum (y - \bar{y})^2}$$

Hotline # 560-52

PRODUCT UPDATES

Logical Connection 3.0 is a product that connects computers and peripherals allowing easy access to several users. The new release has been modified for greater ease of use. As many as 45 connections can be linked together. Fifth Generation Systems, Tustin, CA □ Show Me! Version III is a file viewing utility program for PC-compatibles. Version III includes two new features: a multi-file text retrieval system and true windowing which allows four files to be viewed at once. Serengeti Software, Austin TX □ Genifer 2.0 is a dBASE application generator program. The new version can optimize its output for a particular dBASE version or compiler. It automatically generates index expressions for screen and report modules. Context-sensitive help and error trapping is also available. Version 2.0 features Genifer Template Language (GTL) that helps developers produce more exact applications. Bytel Corp., Berkeley, CA □ LetterMaster 4.0, a sales support program, has been enhanced to include a full contact management system and an improved user interface. The new release now allows multiple access to a client's information and history. Research Development Systems, Arlington, TX □ Fastwire II is a file transfer program that allows users to exchange information between any two PC-compatible desktop, laptop, and PS/2 computers. The new version allows file transfer at 500 kilobaud via keystroke commands. Rupp Brothers, New York, NY □ R&R Relational Report Writer 3.0 for dBASE, a product that reads dBASE III data files and produces professional, informative reports now supports multiple network users. Additional features include reduced memory requirements (from 200K to 25K), and the ability to create user-defined functions. Concentric Data Systems, Inc., Westboro, MA. □ Metro 1.1, a RAM resident desktop manager, now allows the user to reduce RAM requirements to as little as 64K, or unload the program with a single keystroke. Lotus Development Corp., Cambridge, MA □ Disk Optimizer 4.0, a disk management software package that provides disk optimization, data protection and recovery, and file management and security functions has extended its file recovery operations. The product also has additional protection features. SoftLogic Solutions, Manchester NH

A Smart
Money Manager
"...it earns my unequivocal endorsement."

—Wynne Keller, "80 Micro"

"The program shines
when it comes to output."
—PC Magazine, 1/12/88

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to see America's
economy revitalized,
do something about it.

Support America's colleges. Because college is more than a place where young people are preparing for their future. It's where America is preparing for its future.

If our country's going to get smarter, stronger—and more competitive—our colleges and universities simply must become a national priority.

It's an investment we all share in. Government. Private citizens. And the business community. After all, the future of American business depends on it.

So help revitalize America's economy with a corporate gift to the college of your choice—and you'll know you've done your part.

Give to the college of your choice.

How to Use the Buyer's Hotline

Each month you are exposed to several Kaypro-compatible products, both in advertising and editorial. Trying to figure out which product suits your needs and your pocketbook, is never easy. How many times do you wish you had more information on the products listed or advertised in *PROFILES*? Since we have received so many requests for information about products and companies mentioned in the magazine, we have initiated **The Buyer's Hotline**.

The Buyer's Hotline is a brand new service for *PROFILES* readers. Most reader services such as these require that the reader fill out a tedious "bingo" card and send it in, only to wait three months for a response. This time lag is usually the fault of the publication, not the advertiser. We are attempting to eliminate the time lag so you can get the information you need in a more timely manner. With one toll-free phone call, you will be able to get information on the products in each issue of *PROFILES* that interest you.

Here's how it works: Each product manufacturer or distributor will have a Hotline number. This month the numbers are listed next to the page number in the Advertiser's Index. In future months, the number will also be listed within the ad itself or the Quick Reference Summary at the end of each article. Make a note of which products (and the corresponding Hotline number) you would like more information about. Then simply call our toll-free Buyer's Hotline number (1-800-4KAYPRO). Give the operator the information she requests, and that's it!

Weekly reports of our readers' product information requests will be forwarded to the manufacturers and distributors, so that you can get the information quickly... and be able to make an informed buying decision within your own time frame. We sincerely hope that this service will be of great value to all of our readers.

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Advertiser	Page No.	Hotline #
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Listed below are the companies and Hotline numbers for those products mentioned in our editorial features this month.

Product	Hotline #
CD-ROM	
CD-ROM Review	759-52
Bookshelf	760-52
PC-SIG CD-ROM	761-52
McGraw-Hill CD-ROM Science and Technology Reference Set	762-52
Oxford English Dictionary	763-52
Windows on the World	764-52
Editor's Choice	
Procomm+	756-52
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First Choice	757-52
Screen Extender 1.0	758-52
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CompuServe Information Services	750-52
GENie	751-52
FOG	752-52
DOSDisk	753-52
FileMate	754-52
Media Master	014-52
Uniform	755-52

LAP LINK



The Ultimate Laptop and PS/2 Connection

They are still talking about LAP-LINK release #1. It has achieved virtually an unanimous editor's choice as THE solution for connecting Laptop PC's and the new IBM PS/2 series with any 5 1/4 inch disk PC. LAP-LINK eliminates the need to purchase expensive

rebooting. Just type "LL" and LAP-LINK automatically connects itself. And LAP-LINK works between any version 2.xx or 3.xx of the MS-DOS/PC-DOS operating system.

LAP-LINK users couldn't agree more with Jerry Pournelle, "I don't

RELEASE 2 FEATURES

- Transfer speeds over 115,200 baud
- Turbo option increases speed up to 50%
- Unique split window file selection
- Includes file tagging, XTREE disk management and directory sorting
- Can be used for hard disk backup to 3 1/2" floppies
- Supports all IBM PS/2 computers
- Includes both 3 1/2" and 5 1/4" disks with unique universal "4 headed" cable.
- Still Only \$129.95 including cable

know if the manual is any good or not: I've never had any reason to open it. LAP-LINK is so thoroughly intuitive, fast and simple to use that the manual is blooming near superfluous. This is one of those products that sets standards: it does what it's supposed

only ten ounces (cable and disk), you can easily carry it with you for instant connectivity at any location.

Unlike other transfer programs, there is absolutely NO installation required to use LAP-LINK. No messy changes to your CONFIG.SYS file or

to do, does it well, and does it without fuss or bother...."

Release 2 is now available at your local computer store. Get a jump on your friends, and check it out before everyone starts talking about it. Call for FREE Laptop accessory catalog 1-800-343-8080 or 206-483-8088.

Rave Reviews



"Traveling Software's LAP-LINK is the most convenient transfer product...it does not require changes to the CONFIG.SYS or AUTOEXEC.BAT files on either machine as the Brooklyn Bridge does...LAP-LINK transfers data even faster than the Brooklyn Bridge. It seemingly sets a record for the fastest transfer on a PC."

Howard Marks
PC Magazine — July 21, 1987

"LAP-LINK IS NOTHING SHORT OF INCREDIBLE..."

Jerry Pournelle
Byte Magazine — July 1987



Traveling Software



Circle 2 on Reader Service card.

ACCOUNTING FOR MICROS

\$395 Set of Four
\$325 Set of Three
\$465 Set of Five



ACCOUNTING FOR MICROS is a set of integrated accounting programs which meet professional standards. They're fast and easy to use, with complete instructions. Our manual (shown above) also includes helpful information on bookkeeping and computers.

GENERAL LEDGER \$125
 Allows up to 1,000 accounts & 1,000 transactions/month. Retains mo/end balances for Last year, This Year and Forecast. Includes Cash Disbursements, Cash Receipts and General Journals. Reports include Balance Sheet, Income Statement, Annual Summaries and Journal Reports.

ACCOUNTS RECEIVABLE \$125
 Allows up to 2,500 customers and 1,000 invoices per month. Invoicing can access Inventory Module. Keeps customer names and addresses. Invoice prints on plain paper or any pre-printed form. Statements can be printed at any time.

INVENTORY \$125
 Allows up to 4,000 parts. Keeps 3 month history of unit sales as well as year to date. With AR, can be used as point of sale system (prints invoices, handles cash). Reports include Inventory Value and Stock Report, Internal and Customer Price List.

ACCOUNTS PAYABLE \$125
 Allows up to 500 vendors and 600 invoices/mo. Records invoices and handwritten checks. Prints computer checks on any pre-printed form. Keeps vendor names and addresses.

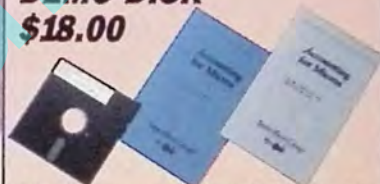
PAYROLL \$125
 Will handle up to 100 employees with eight deductions per employee. Deductions may be determined as fixed dollar amounts or percentages, or referred to a table for automatic look-up. Tax tables are easily entered, or purchased separately. Prints checks and W2's.

SET OF FIVE \$465
SET OF FOUR \$395
SET OF THREE \$325

RUN ON MOST CPM AND MSDOS

Apple CPM	IBM PC,XT,PC jr,AT	Sanyo (all)
Columbia	Kaypro (all)	Tandy (all)
Compaq	Morrow (all)	TeleVideo
Corona	Osborne (all)	Zenith 100 & 150
Eagle (all)	Panasonic	8" CPM
Epson QX-10	Radio Shack CPM	Other compatibles

DEMO DISK \$18.00



Try all 5 programs above (GL, AR, AP, IN, PR). Order our DEMO DISK for \$18.00 (includes shipping). Condensed versions of the programs give you the "feel" of data entry and access. Includes sample reports and instructions. Specify machine.

TMAN \$125
 The "Catch-All" program. Files any type of information for quick access. Name or subject oriented with 15 lines of notes per name. Use TMAN as a mailing list, filing system, notebook, etc. Can be used alone or with data from our other programs.
Try TMAN DEMO \$16

HOW TO ORDER: Please specify machine and disk format. You can pay by check, by VISA or MasterCard (we need your expiration date and card number), or by UPS COD (add \$2.50 COD charge). Our price includes shipping. Minnesota residents, add 6% sales tax. We ship most orders the same day.

James River Group
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