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PROFILES

THE MAGAZINE FOR KAYPRO COMPUTER USERS

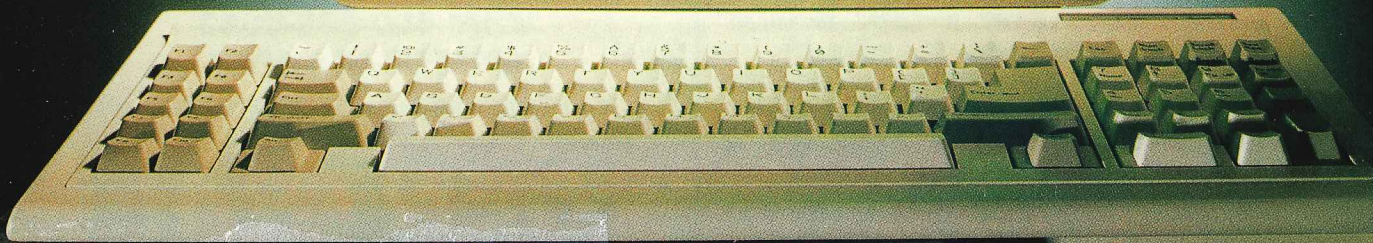
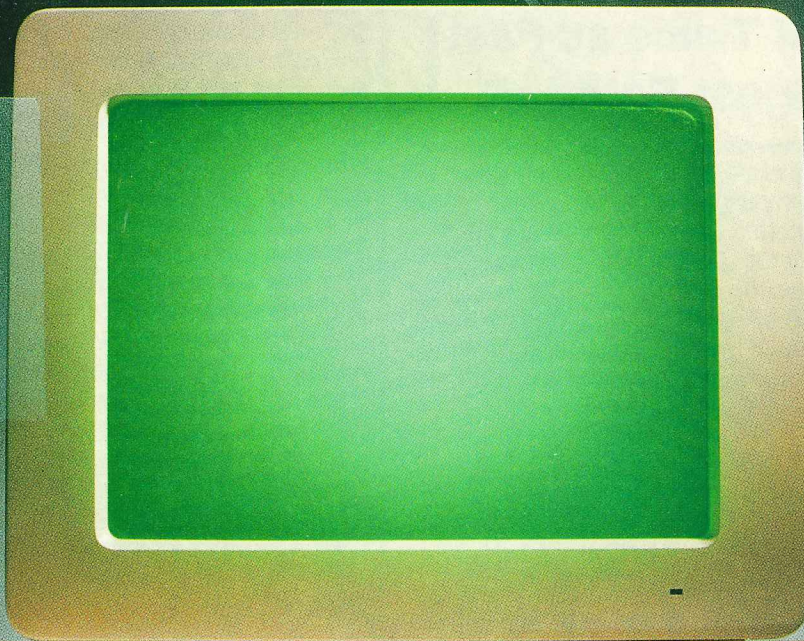
APRIL 1988

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Compilers**

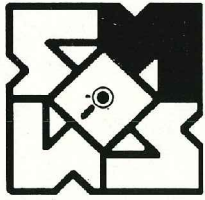
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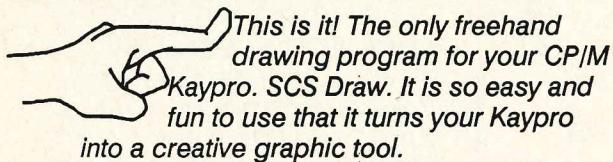
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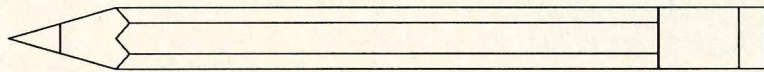


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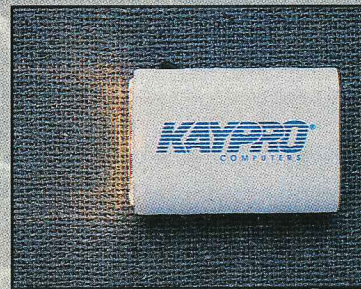
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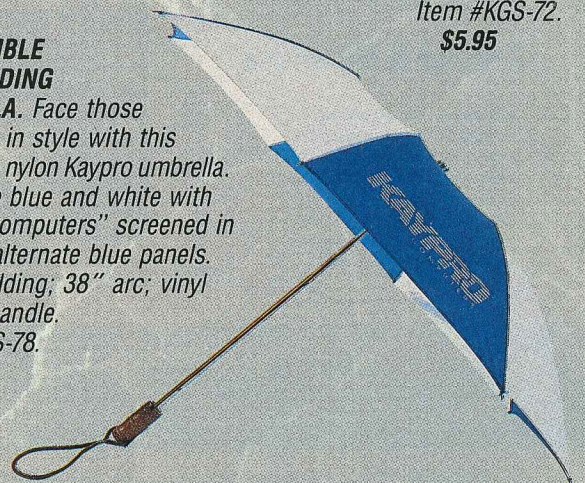
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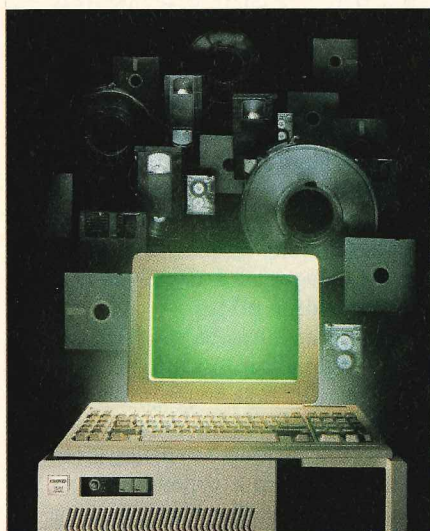
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1988
PROFILES
 VOLUME 5 NUMBER 9 APRIL



ON THE COVER:
 An impressive look at an impressive technology. Photograph by Carl Vanderschuit.

FEATURES

USE IT OR LOSE IT	18
By Brock N. Meeks	
Backing up data involves a lot more than just copying files. Take a look at the latest in back up technology.	
QUICK BASIC AND TURBO BASIC	29
By T.F. Chiang	
Speed, power, graphics, and compatibility—it's your BASIC confrontation.	
GET FULL LASER PRINTER CONTROL WITH MAGIC PRINT	34
By Benjamin H. Cohen	
Discover Magic Print, a text formatting and printing program for CP/M.	
SPACES: THE FINAL FRONTIER	38
By Steve Gilliland	
WordStar is a great writing tool, but it does much more. Here you'll find a step by step guide to filling out preprinted forms with WordStar 4.0.	
MAKE THE MOST OF PERFECT WRITER'S SEARCH COMMANDS	48
By Robert J. Schecter	
You may think you know Perfect Writer's search and replace commands, but this feature provides tips and tricks that you may not be aware of.	
A FIRST SESSION WITH XTREE	53
By Don and Sharyn Conkey	
Hard disk managers can cure a lot of headaches. We get you up and running on the most popular one around, Xtree from Executive Systems, Inc.	

DEPARTMENTS

PUBLISHER'S NOTES	4
LETTERS	5
Q & A	8
ON THE PRACTICAL SIDE	10
DATELINE	13
CLASSIFILES	51
CP/M ONLY	64
KAYPRO INSIDER REPORT	66
NEW PRODUCTS	69
PRODUCT UPDATES	71
ADVERTISERS INDEX	72
BUYERS' HOTLINE	72

COLUMNS

LIFE AT 300 BAUD	16
By Brock N. Meeks	
DESKTOP PUBLISHER	58
By Ted Silveira	
EDITOR'S CHOICE	60
By Tom Enright	
AT A GLANCE	62
By Birrell Walsh	

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Volume 5, Number 9
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PUBLISHER'S NOTES



RICHARD STARBUCK

NEW COLUMN WILL KEEP YOU IN TOUCH WITH MICROCOMPUTER DEVELOPMENTS

The early responses to the reader survey announced in our last issue have been encouraging. For the most part, *PROFILES* readers seem to appreciate the *balance* of editorial material we deliver each month, and the comments you have provided so far will be priceless in planning our future issues. (We'll tell you more about our survey results next month.)

However, in your quest to use your Kaypro to its fullest potential, you are demanding more. You want to be kept informed of up-to-the-minute industry developments and new technologies. And we intend to deliver.

We are introducing a new department this month called "Dateline." Its contents will range from new applications, notable trends, and even explanations of industry buzzwords to interviews with key players in the micro field. This three-page section will keep you up to date on the latest the microcomputer industry has to offer to you, the Kaypro owner.

And who better to bring you the latest news than Brock Meeks? Brock first came on the scene at *PROFILES* in 1985 as a columnist ("Life at 300 Baud") and feature writer. Since then, he has written for *BYTE*, *MicroTimes*, *Popular Science*, *Genetic Engineering News*, and *Link Up*. He is also a group moderator on telecommunications topics for the Byte Information Exchange, was recently named one of the *MicroTimes* 100 (that publication's annual list of the industry's most influential leaders), and received the Computer Press Award in 1986. We feel "Dateline" is in good hands.

Elsewhere in this issue, Meeks explores the alternatives in backup technology. If you don't back up your work on a regular basis, his overview, "Use It Or Lose It," will make you a believer. He covers the different backup systems available and the advantages and disadvantages of each, including prices.

Also in this issue, Steve Gilliland provides a step-by-step guide to using WordStar 4.0 to print data on preprinted forms. If you use such forms extensively and have been accustomed to filling them out by hand or with a typewriter, see his article, "Spaces: The Final Frontier."

Don and Sharyn Conkey offer tips on getting started with XTREE, one of the most popular hard-disk managers on the market, in their feature, "A First Session with XTREE."

For the programmers in our audience, T.F. Chiang looks at BASIC compilers, comparing the features and performance of MicroSoft's QuickBASIC and Borland's Turbo BASIC.

For our CP/M readers, Ben Cohen explores the capabilities of a valuable print-time formatter in "Get Full Laser Printer Control With MagicPrint," and Robert J. Schechter offers tips and tricks that will help you "Make the Most of Perfect Writer's Search Commands." (CP/M users will also want to see part two of Ted Silveira's listing of must-have public domain utilities in "CP/M Only.")

Enjoy.

Gwyn Price

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HAVE YOUR MODEM CALL MY MODEM

I'd appreciate some basic information about starting a bulletin board system. Most of the articles I've read on the subject talk about such things as whether you should have a dedicated phone line, how to handle law breakers and system crashers, etc. What I need to know is how the heck to use a BBS program in the first place.

Steve Smith
Birmingham, Alabama

Your letter requests two very different pieces of information: how to use an electronic bulletin board and how to start one.

If you are interested in accessing the many hundreds of bulletin boards and online services offered nationwide, but aren't quite sure how to begin, read the following articles in back issues of **PROFILES**.

"A Beginner's Guide to Telecommunications," by Marshall L. Moseley (April 1987).

"Information, Please," by Jim Spickard (April 1987).

"The CompuServe Forums," by Mike Craig and William Murdick (November 1986).

"User-Supported ProComm," by Jack Nimersheim (March 1988).

"A First Session with ProComm," by Marshall L. Moseley (April 1988).

As for starting your own bulletin board, we offer some words of caution: Don't try to start a BBS if you are a novice to telecommunications. Once you do have enough experience, be prepared to invest a great deal of time and diligence to the project. Starting a bulletin board is no small task, as many sysops (systems operators) will confirm.

If you are still interested, however, and have the time and patience, the first thing you will need is the software. You can either purchase a bulletin board system or download a public domain program from another board.

If you buy a commercial package, you should be able to call the company for answers to your questions, but there may be a limit to the amount of hand-

holding the company will provide.

You may find programs in the public domain that are more powerful and still easy to use, but support is limited to the documentation files (.DOC files) that accompany the program, and the major drawback is that you're on your own. Realize that by using public domain BBS programs, you will have to learn through trial and error and reading the documentation.

We suggest that you learn the tricks of the trade by becoming a user first. With all the BBSs out there, surely you will find one already up and running that will meet your needs.

MORE ON WORDSTAR 4.0

Ted Silveira's review, "WordStar 4.0 for CP/M: Part 1" (January 1988), surpassed his usual excellence. I have made my living with WordStar for the past three years and find it almost perfect after extensive patching. The new capabilities in WordStar 4.0 induced me to upgrade, but the exact problems Silveira lists in his review have driven me back to WordStar 3.3 for most of my work. I hope MicroPro accepts Silveira's criticisms as suggestions and makes the necessary corrections in WordStar 4.1.

Geoffrey J. Letchworth
Madison, Wisconsin

I've just read Ted Silveira's article on WordStar 4.0 for CP/M and thought I'd mention a few things that he didn't cover.

With all its added features, WordStar 4.0 takes up so much space that the largest file it can keep in RAM is about 10K, which is half the size of the largest file that WordStar 3.3 could keep in RAM. Thus, the largest document that one can edit with any speed at all is about five double-spaced pages; those users who routinely edited files larger than this in 3.3 will find this a serious limitation of 4.0.

WordStar 4.0 is both faster and slower than 3.3 in its operations. Performing block operations and hiding the block markers no longer requires disk accessing, which makes WordStar (4.0) much faster if you do a lot of small block move-

and-hide operations. However, operations on long blocks are much slower, and the limit on the size of a block that can be moved without accessing the disk has also been cut in half. Search-and-replace operations are also significantly slower.

The MS-DOS version of 4.0 is much faster than the CP/M version, as could be expected given the CPU and memory differences, but it won't win any contests for speed against other MS-DOS programs. For the 4.0 release, MicroPro should have rewritten WordStar to be faster, like the editor in Borland's Turbo Pascal (which is speedy even on a CP/M machine), so it wasn't burdened by its additional features. Let's hope that the upcoming version 5.0 for MS-DOS is fast enough to make its split-screen editing and auto reformatting worthwhile.

T.F. Chiang
Providence, Rhode Island

THE CASE OF THE PHANTOM FILES

I really do appreciate the effort you are making, with some considerable success, to keep CP/M users such as myself both interested and informed. However, I have noted on more than one occasion that a public domain program described in **PROFILES** turns out to be unavailable on the commonly used BBSs. Case in point: The February 1988 issue announces that WS4KP4.LBR is available on "CompuServe and CP/M bulletin boards."

I searched both CompuServe and the Kaypro BBS but was unable to find it. Perhaps I looked in the wrong places. Would it be possible to check in advance to confirm availability and to provide more directions? It would be most helpful to those of us who have access to files such as these only through investing in non-trivial long-distance phone calls.

Adolph B. Amster
Ridgecrest, California

We apologize for the trouble you encountered trying to find the patch file WS4KP4.LBR. You should be able to find any public domain or shareware program mentioned in **PROFILES** on Kaypro's bulletin board, Kaypro Online, but this

one slipped through the cracks.

When you look for a file on other bulletin boards, keep in mind that it may be stored under different names on different boards. If you can't find a particular file name, look for key characters (such as WS and/or KP4 in the file mentioned in your letter) in other file names. Not only may file names vary from one BBS to another, but names containing numbers may change as new versions become available.

The file you were looking for is on CompuServe on the MicroPro forum. Here's how to find it: Once logged on CompuServe, type **GO MICROPRO** and press RETURN. The MicroPro forum menu will appear. Choose the last option, "Join the MicroPro forum." Once at the forum main menu, type **DL** for data libraries and press RETURN. From the data library menu, choose "WordStar 4.0 CP/M." The file is in this data library. Type **DOW** for download and press ENTER. Once prompted for the file name, type **WS4KP4.LBR**, choose a transfer protocol, press RETURN, and begin the downloading process from your end.

Although we do not have the space to give specific instructions for finding every public domain file mentioned, in the future we'll try to at least say which forum to access if the file is on CompuServe.

TAKING PERFECT FILER INTO THE '90S

I have a Kaypro II ('82) that was updated to a (Kaypro) 4 two years ago. I use it for all my bookkeeping and letter writing.

My problem is with Perfect Filer, which came with the machine. I have found that when I log on, the date will not accept any year after "88." Unless this can be changed, my files—or at least my use of Filer to write letters to my customers—will die at the end of this year.

Is there any way to change this to "99?"

Lavern Terrill
Kennedy, New York

Yes. In our October 1985 issue, we published a letter from David Porritt of Plano,

Texas, that contained a patch to fix this very problem. Since 1988 is now here, the information bears repeating. Remember, though, to do your patching on a copy of your working disk, and to test the patch thoroughly before trusting it with your data. Porritt wrote:

"I've managed to find the patch location that controls the current date in Perfect Filer 1.2. Put your CP/M disk in drive A and a copy of your Perfect Filer disk in drive B, then type **DDT B:SETUP**. When the program has loaded and the "-" prompt is on the screen, type **S0715**. DDT will display the value in that location to be 58. Type **63** and press RETURN. Next type a period and press RETURN again. Now enter a ^C and you will return to the operating system. Immediately type **SAVE 16 B:SETUP**. Now Perfect Filer will be useful the rest of this century."

CORRECTIONS

The macro I suggested was in error and I am chagrined. In some way, the first part was cut off, making it meaningless. However, I have refined and improved it so it works well even on a seven page document.

It will mark a line of text, leave a "marker" and place the text at the end of the document. It then erases the markers ^KB and ^KK and returns you to your previous place in the document. If you are trying to reorder a number of items or collect lines to combine it later, it is great. However, there are times when you may want to take several lines or sentences and even a paragraph. To do this I made a two macro combination which will complete the full process.

ONE LINE MOVER: ^K1^KB^QD^KK
^QC^M^KV^KK^KB^KK^Q1
MULTI-LINE MOVER: ^K1^KB. Next, move to the end of the words you want moved and use the second macro:
^KK^QC^KV^KK^KB^KK^Q1.

That's all there is to it. It is helpful for editing your writing, or [for] anyone selecting data and combining it in other forms.

Donald T. Lee
Woodland Hills, California

In our Q & A column in the March 1988 issue, the telephone number to hook up to Kaypro Online was listed incorrectly. The correct number is **(619) 259-4437**. We sincerely apologize to our readers who were trying to access the Kaypro bulletin board, and to our friend, Steve Tracy, who was kind enough to help our readers with the correct phone number. Thanks to Pat Gregory at Educomp in Massachusetts for helping us track down the error. ■

AND MORE CORRECTIONS:

As sometimes happens, we at PROFILES let a few incorrect phone numbers slip into previous issues. Below are the errors we found. We regret any inconvenience this may have caused.

Page 28 of the February 1988 issue contains several incorrect phone numbers for FAX board manufacturers. The correct numbers are listed below.

Product: The Complete FAX (CFAX)
Manufacturer: The Complete PC
Phone: (408) 434-0145

Product: GammaFax
Manufacturer: GammaLink
Phone: (415) 856-7421

Product: Mfax
Manufacturer: Microtek
Phone: (213) 321-2121

Pages 15 and 67 of the March 88 Issue contained these errors:

Page 15:
Product: PC Quick-Art
Manufacturer: PC Quick-Art
Phone: 404-543-1779

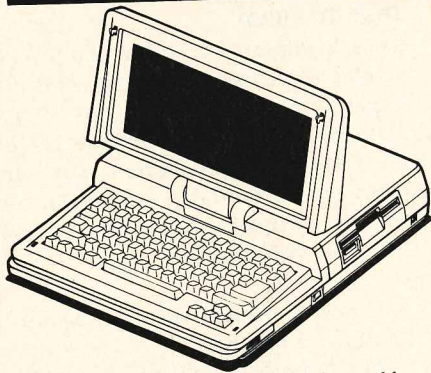
Page 67:
Product: Kodak Displaymaker
Manufacturer: Eastman Kodak Company
Phone: 716-724-3169

Product: The Stock Sampler Kit
Manufacturer: ETS Center
Phone: 216-946-8479

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Puget Sound Computer Systems was founded in 1966 to provide businesses with data processing services using our IBM 709 mainframe. Over the years our business has changed from providing computer services to selling and servicing computers. Today we are best described as a retail computer store, with in-house service facilities, and an above average level of hardware expertise.

We specialize in KAYPRO computers and we have sold and serviced NorthStar and Cordata (Corona) for years as well. Our business policy is to learn a product well and support it for the long haul (our old mainframe ran for over 20 years). This philosophy has helped us survive in a rather turbulent business environment.

PSCS wants you to support your local dealer. However, if you no longer have one, or he does not adequately support you (Many dealers don't support CP/M. We do!) we are here to help you.

These sale prices are good for the month of April 1988. However, we reserve the right to change prices, specifications, and availability as the market dictates.

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THE TECH CORNER

We have been supplying Western Digital controllers with our hard disk kits because they are reliable and used by Kaypro in their hard drive machines. However, we found that the OMTI controller booted four times faster and copied files in 2/3 the time. The reason for the OMTI's speed is its ability to process data from a disk formatted with an interleave of one -- something PC's are not supposed to be able to do. Interleave, if you are not familiar, refers to the writing of consecutive blocks of data (sectors) in a staggered pattern around the disk. This gives the computer enough time to process a sector's data before the next one is read. For example, if a disk was formatted with an interleave of three, the controller would read a sector, skip two, read the next, and so on. As a result, it would require three spins of the disk to read the entire track. The OMTI requires only one.

The OMTI controller costs an additional \$10, but we feel that it's worth it!

BY MARSHALL L. MOSELEY

A dBASE DILEMMA

I'm just getting started programming in dBASE III, using the dBASE editor. I've run into a problem when I try to use the extended character set to draw menus and boxes. I can type them in all right using Alt-key sequences (Alt-196 for a horizontal line, for example), but when I save them and edit them again, something goes wrong and all the extended characters are changed back to standard alphanumeric characters. What gives?

The problem is in the program editor included with dBASE III. It has trouble dealing with the ASCII characters between decimal 127 and 256.

First a quick digression for those unfamiliar with the character set used in Kaypro MS-DOS computers. ASCII is an acronym for American Standard Code for Information Interchange. This code defines all the characters your computer can display and a few that it can't (such as ^G, which sounds a tone on the speaker). The ASCII characters between 1 and 31 are used to control printers and cursor positioning on screen; the characters between 32 and 127 are all the standard letters and numbers; and the characters between 127 and 256 are the extended characters, which are rarely used symbols—Greek letters, mathematical symbols, lines, boxes, etc. Programmers use the lines and boxes to create frames for menus.

Every character is stored in the form of a byte, which is eight bits (binary digits). The letter "A," for example, is 01000001. The bytes for all characters below ASCII 127 begin with a 0; above 127 they begin with 1. When the dBASE III programming editor loads a file from disk it automatically converts every character with an ASCII value over 127 (all the extended characters) to alphanumeric characters by changing the first bit in each byte from 1 to 0. When you save this file all the extended characters are gone.

Note the logical permutations here: You can create a dBASE program with extended characters in it, save it, and it will run. But remember that every byte is altered by the editor when the file is loaded from disk, so reloading the file to

edit it will make any extended characters disappear.

The dBASE III editor has one other little side effect. It won't let you save a file larger than 4.8K. When you load one larger than that, saving it truncates the file with no warning.

You could use WordStar in non-document mode to write programs (many people do), but it doesn't allow you to use extended characters easily.

The best solution is a programming editor, one designed for nothing but writing programs. Two commercial programming editors that I've heard good things about are BRIEF and The Norton Editor.

BRIEF stands for Basic Reconfigurable Interactive Editing Facility. The program works with the extended character set, but its real power is its flexibility. Just about all of its features are adjustable, and you can set up sets of key commands of your own. At \$275 BRIEF is costly, but it is a powerhouse, and every programmer I know who uses it raves about it. For more information contact Solution Systems, 541 Main St., Suite 410, Weymouth MA 02190; (617) 337-6963.

The Norton Editor has some of the same features as BRIEF, though it is not as adjustable. This editor's strength is its speed—it is fast. You can fly through even the longest text files in the blink of an eye. It also has an outline display feature that collapses the structure of a program and lets you see only the main procedures or subroutines (provided that you've indented your code as all good programmers should). The Norton Editor retails for \$75. For more information contact Peter Norton Computing, 2210 Wilshire Blvd., Santa Monica, CA 90403; (213) 453-2361.

In the public domain there are many, many editors. BlackBeard is a popular one that runs as a stand-alone or memory-resident program, allowing you to use it from within other programs. It supports extended characters, letting you "paint" lines and boxes onscreen. QEDIT 1.6 uses WordStar commands and makes use of available memory to hold a given file. It features split-screen editing along with fast text searches. Both of these programs are shareware and are available from

Kaypro's bulletin board, Kaypro On-Line (619/259-4437, 300/1200/2400 BPS, 8 data bits, 1 stop bit, no parity.).

TRUE TO FORM

I use WordStar 4.0 and a Gemini 10-X printer with a tractor feeder and pin-feed paper. To remove a printed page from my printer I have to take the printer off line, press the form-feed button, and stand there waiting while an extra sheet feeds out of the printer. Is there any way to do this from WordStar?

Yes, there is. These instructions apply to WordStar 3.3 as well.

You have to use WordStar's ^P or "literal" command—literal because when you type a ^P, the next character you type is embedded directly in the document (no matter what that character is) and the printer "literally" does whatever the embedded character tells it to do. To see how this works, open a document and edit it as usual. When you reach the end, place a .PA command on a separate line. On the next line type ^P^L and press Enter. Save the file.

Now when your document finishes printing, the .PA command will force WordStar to move to the end of the page. Then, because the ^P^L command embedded the form-feed character (^L) directly in the text, WordStar will send that character to your printer, which will dutifully spit out an extra sheet of paper.

Of course, you could simply type multiple .PA's, but that requires more keystrokes, and the printer will stop to print the page number on the extra sheet. Embedding a ^L is faster and easier.

DRIVING YOUR KAYPRO

I am thinking about buying a second disk drive for my Kaypro 286i and installing it myself. What are some of the things I have to know before I do this?

Once you buy the drive, read your documentation and follow the instructions carefully. When you are installing it, keep in mind these facts about Kaypro computers in particular and floppy disk drives in general.

The most important thing to remember

is that your hardware must match your software. Adding a second drive sometimes requires you to adjust settings within your computer. Also, the settings on the drive itself must be modified to reflect its position in the system. First I'll discuss the computers, then the drives.

The Computers: Kaypro 286i, 286, and 386 owners don't have to make any hardware adjustments, but they do have to configure their computer's CMOS RAM by running *SETUP.COM*, the configuration program that was included with their bundled software. At the *SETUP* menu, press F4 to change the second disk drive type. From the next menu choose the type of drive you are installing, then press Enter. Back at the *SETUP* menu, press Escape. Reset the computer to make the change effective.

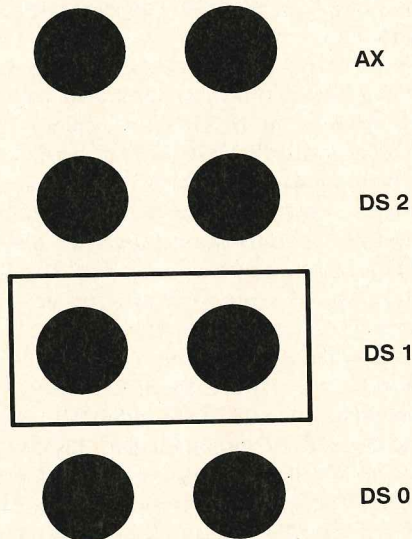
The settings for the Kaypro PC are described on page 68 of the August 1987 issue of *PROFILES*. The floppy disk drive cables in the IBM PCs and compatibles are special drive signal cables. These cables, rather than the drive select jumper on the drive itself, take care of selecting between drives A and B. On Kaypro DOS computers and all IBM compatibles, the drive select jumpers on both floppy drives are set to drive B. So make sure you use the floppy disk drive cable inside your computer, not the one provided with the drive.

CP/M computers rely on the position of the drive select jumper to tell the difference between drives A and B.

The Drives: There are too many floppy disk drives available to describe the drive select jumper settings for each one. Fortunately, there is enough standardization among drive manufacturers to allow for some general instructions.

A jumper is a pair of metal posts set perpendicular to the circuit board on the drive. When jumper posts are connected using a plastic and copper block called a jumper block, an electric circuit is completed. The presence or absence of this jumper block—and therefore the presence or absence of circuits—tells the drive what place in the system it occupies (that is, whether it is the A drive or the B drive.)

There are usually five or more drive select jumpers on a drive. They look something like this:



Notice how they are numbered: DS 0, DS 1, DS 2, and so on (DS stands for Drive Select). Some drives start the numbering with DS 1. If you are working with an MS-DOS computer, you should always place the jumper block over the second jumper. If the numbering starts at DS 0, place the block over DS 1. If it starts at DS 1, place the block over DS 2.

CP/M computers have a more logical system. The first drive in the system, the A drive, is jumpered for the first set of pins, DS 0 or DS 1. The second drive is jumpered for the second set of pins, DS 1 or DS 2.

If the floppy disk drive you're installing is the last one on the drive cable, it may need to have a terminating resistor installed in it. The terminating resistor is a series of resistors in a chip that you insert into a socket on the circuit board of the drive. The resistor is necessary to allow the signal cable to operate properly. Some drives don't use separately installed terminating resistors. Instead they have jumper posts that, when covered, enable a terminating resistor designed into the circuit board of the drive. Check your drive's documentation to see whether it uses a terminating resistor or a jumper. ■

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

DOCUMENTING THE UNDOCUMENTED

BY MARSHALL L. MOSELEY

When you bought your Kaypro, you may have received some bundled software for which there was no documentation, and you've probably been wondering about it ever since. In this column, I'll explain some of the reasons why this may have happened, and I'll describe programs you may have received. I'll tell you whether the programs are machine-specific, what their purposes are, and where space allows, how to use them. If documentation is currently available, part numbers for it are provided.

There are a number of reasons why you may have received undocumented software. One is that although certain programs are machine-specific and can't be used on other machines, the most efficient method for distributing software is to provide every customer with every program. That way there is only one set of disks for Kaypro to create and keep track of, and you're sure to get the programs you need. However, your manual covers only the programs that work with your computer. This situation is not unique; other computer companies do the same thing.

Another reason is that problems occasionally arise after a product is on the market. So now and then programs have to be distributed *right away* because they provide needed fixes for products that people have already bought. It is far easier to get software into distribution channels than documentation, so computer users sometimes get a program and no paperwork to go with it.

THE PROGRAMS

DUTIL.COM. This is a menu-driven program for CP/M computers that have the 2.2u1 ROM, sometimes called the universal ROM. DUTIL replaces many of the stand-alone disk utility programs issued with earlier CP/M machines. Using DUTIL you can format single- or double-sided disks, put the CP/M operating system on them, copy entire disks, or make mirror images of disks. To get DUTIL documentation, ask your dealer to order part number 4918.

VSWITCH.COM. This is a RAM-resident video mode switching program

used in the Kaypro 16s and some Kaypro PCs. It is installed in memory, where it waits for you to strike a specific key combination. **Ctrl Alt >** (the Ctrl key, the Alt key, the greater-than key) gives you standard monochrome, while **Ctrl Alt <** gives you color graphics on an external CGA color monitor, or emulated color graphics on the 16's internal screen.

Always install VSWITCH in memory before any other RAM-resident software, and *do not* switch video modes when running an application program, especially a graphics-based one. That could cause the program to freeze and you'd have to reset your computer.

MS.COM. This is the video mode-switching software for use with the Kaypro half-length multi-video (HLMV) board used in many Kaypro 16s and Kaypro PCs. It does the same thing as later versions of VSWITCH (the early versions were for a different board) and is better than VSWITCH in most cases. MS.COM lets you switch between monochrome, Hercules monochrome, CGA, and emulated CGA video. If your computer's video connector occupies a single vertical slot by itself, you can use MS.COM.

SMS.COM. This program is similar to MS.COM, but it's for a different display adapter: the half-length EGA board. The HLEB has all the same video modes as the HLMV, and it also provides standard EGA and emulated EGA video. The HLEB should have one video connector visible on the back panel, along with a block of five toggle switches. If you have the HLEB, you can use SMS.COM; otherwise you can't.

Both MS.COM and SMS.COM are easy to use because they are menu driven. Just read the menu and follow the instructions. Remember that when switching between color and monochrome video, you should switch monitors as well. Sending color signals to a monochrome monitor or vice versa can damage the monitor in use.

COLOROFF.COM. Both the Kaypro 2000 and 2000+ computers use an LCD screen to emulate color graphics displays. The different colors are translated into one of the four gray tones available with the LCD. Sometimes two different colors

are rendered as the same gray, making it impossible to discern what is on screen. COLOROFF changes the color-to-gray tone combinations, which usually results in a readable screen. Examples of when to run COLOROFF: when the cursor is a black block with nothing inside it, or when you see a blank or partially blank screen.

KCOPY.EXE and CATCH.EXE. KCOPY is a menu-driven file-copying utility for Kaypro MS-DOS computers. Once you run KCOPY, you are presented with a list of files you can "mark," designating them for copying. KCOPY not only copies files, it copies entire directory structures as well. This comes in handy when you need to back up one hard disk onto another.

KCOPY will also transfer files and directories to another computer by sending data out the computer's serial port using the XMODEM batch (XMODEM/B) communications protocol. The receiving computer can run either a telecommunications program or the included program CATCH.EXE. This feature makes KCOPY a viable alternative to data transfer programs like LapLink and The Brooklyn Bridge.

CHMOD.COM. This MS-DOS program is for changing the attributes of any file on disk. An attribute is a file characteristic. Some files are hidden files, for example. They can not be viewed and they're not affected by most programs or commands. There are other attributes that serve different purposes.

CHMOD carries its own documentation. At the MS-DOS prompt, just type **CHMOD** with no parameter and press Enter. The program will display instructions onscreen.

File attributes are an advanced subject, and I recommend that you read a third-party MS-DOS book to learn what they are and the reasons for changing them before you start doing it. (*Super Charging MS-DOS*, by Van Wolvert, is a good one.) But if you do start playing around with CHMOD and you happen to un-hide the files MSDOS.SYS or IO.SYS, *hide them again right away*. Those are the system files for your boot disk, and once they are un-hidden they can be erased or cor-

rupted. Making copies of them won't help because their location on the disk is as important as the files themselves (the copies would have a different location). Don't do anything with them at all except hide them again.

HDSET. This is a hardware-specific program designed for use with the very first Kaypro PCs. At that time Kaypro sold a hard drive kit that would turn a PC into a PC-10, and HDSET worked with that kit. It let the technician tell the hard disk controller exactly what type of hard disk was being installed.

Kaypro no longer sells that hard disk-controller combination, so HDSET is next to useless. Go ahead and delete it from your working disk.

MAXCYL. This is an MS-DOS hard disk parking program that, in my opinion, is not very good. It moves the hard disk read/write head to the maximum (highest numbered) cylinder of the hard disk. This assumes that there is no data there, and indeed on many hard disks there isn't. But if there is and if the head crashes, you can kiss that data goodbye.

Every hard disk has a "park cylinder," a specific spot where data is never written. A good parking program should query the hard disk for the number of that cylinder and then place the read/write head there. Many public domain programs employ this method and you would be better off using them.

D.COM. This program, provided with both CP/M and MS-DOS systems, is a file listing utility similar to DIR. Unlike DIR, it lists the files' sizes in bytes and kilobytes and tells you how much total space they take up on disk, as well as how much space is left. It doesn't scroll the file list off the screen, either, as DIR does. Instead, D stops when the screen is full and waits for you to press a key. To use D, just type the program name along with the file specification you desire. Typing **D *.BAK**, for example, will show you all files with a BAK extension.

SETDOS and SETRTC. Every Kaypro PC, PC-10 and PC-30 contains an electronic clock called a real-time clock. It is powered by a lithium battery which keeps it going even when the computer is off. SETDOS reads the real-time clock,

then sets the software clock maintained by MS-DOS. If you run SETDOS from your AUTOEXEC.BAT file you won't have to set the MS-DOS clock every day.

SETRTC does the reverse of SETDOS. It sets the real-time clock using the values from the MS-DOS clock. SETRTC is used when you first set your system up and when the lithium battery is changed (once every five years or so).

Master Menu. This is the "shell" program that Kaypro supplies with its hard disk-based computers—both MS-DOS machines and the discontinued Kaypro 10 CP/M computer. Like many shells, Master Menu replaces the operating system command line by displaying a list of programs onscreen called a menu. You run the desired program by using the arrow or letter keys to highlight the program name on the menu and pressing Enter. When the program ends you are

returned to Master Menu at the point where you left.

It is possible to modify Master Menu to run programs other than the ones shipped with Kaypro computers. Instructions for doing this to the CP/M version of Master Menu can be found in "Mastering Your Master Menu" in the May 1986 issue of *PROFILES*.

WHERE TO GET MORE INFO

As of February 1988, you should be able to request that your dealer order a short manual titled "The Kaypro MS-DOS utilities," part number 6305. It contains documentation for MAXCYL, KCOPY, D, and Master Menu. It also explains programs I did not discuss here. The best resource for learning about Kaypro Computers is your local Kaypro User's Group. To find the KUG or dealer nearest you call 1-800-4-KAYPRO. ■

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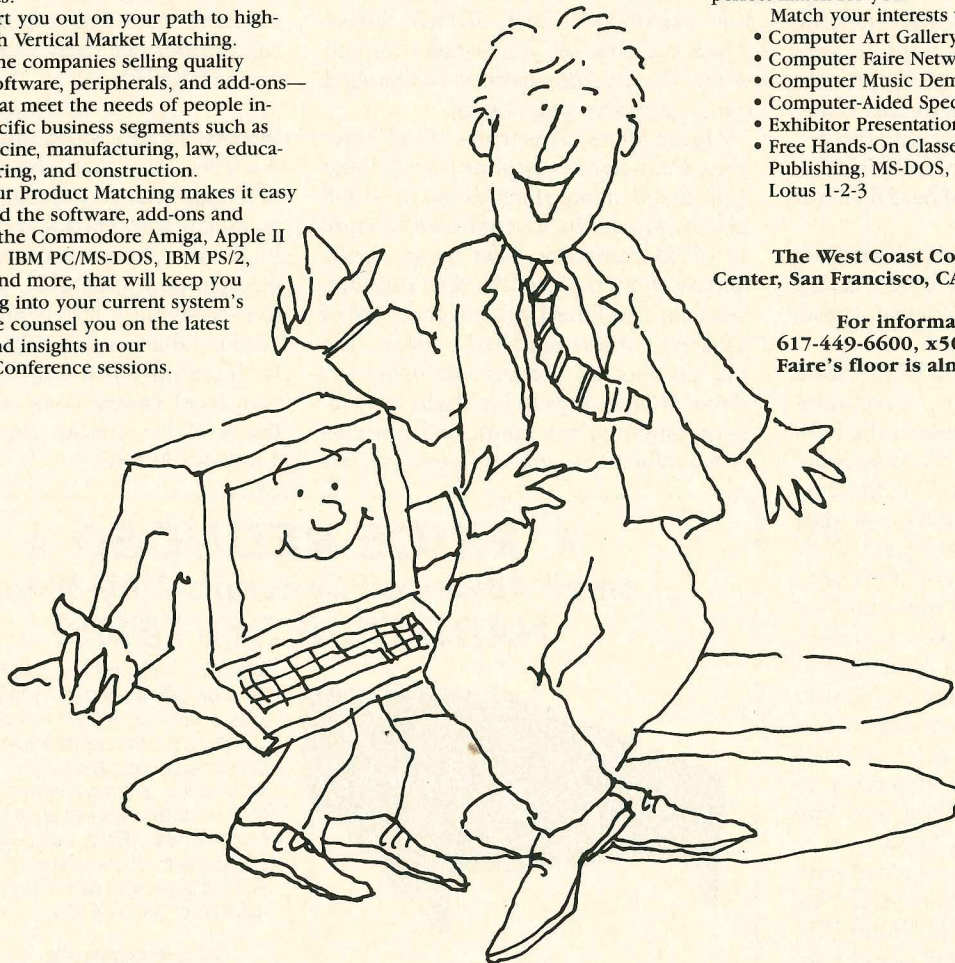
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BY BROCK N. MEEKS

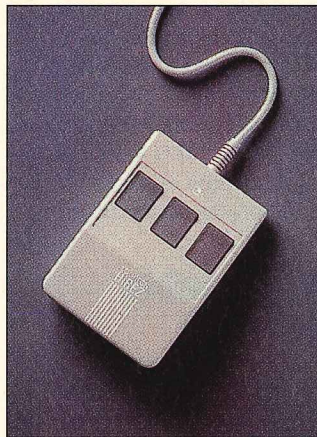
NEWS FROM THE FIELD

RODENT WARS

There's a war brewing over the "mouse," a hand operated device that controls your PC's cursor. It attaches to your PC via a thin cord (hence the "tail" of the mouse), and sends commands to your computer with the "click" of a button. Most of the battles, however, are being fought in research and development labs, rather than the consumer marketplace.

Although the mouse is now used by only 10 percent of PC users, industry pundits expect that many more will be "pointing and clicking" in the coming years.

According to analysts at Dataquest, a market research firm, "the mouse market is going to explode and competition in the mouse field is going to get fierce. New mouse users will be expecting much more from a mouse than is currently available with today's technology." In other words, these are the dark ages of mouse technology. However, a new development from Logitech, a long time mouse manufacturer, has inched the mouse closer to a truly high-tech device.



According to Pierluigi Zappacosta, president of Logitech, "As the numbers of mouse users grow, we expect them to become just as picky about how their mouse works as keyboard users are particular about the feel and layout of their keyboards."

Logitech's HiREZ Mouse has a resolution of 320 dots per inch (dpi) as opposed to the current industry standard of 200 dpi for mouse devices. The finer the resolution, the more precise the position and control of the cursor becomes. This is crucial when doing keyboard intensive work such as graphics or the increasingly popular desktop publishing.

The technology developed by Logitech combines both an optical and mechanical design. Other mouse devices use metallic contacts to determine the coordinates of

the mouse ball (the part that determines the cursor position). The HiREZ Mouse uses light pulses sent from a light emitting diode (LED) through slots of a rotating wheel to an optical transistor. Two wheels rotate with the motion of the mouse ball, one for each screen coordinate (X and Y). By machining finer slits in the rotating wheels and improving the optical transistors, Logitech has been able to achieve the high resolution of 320 dpi.

DOS Lives On

With the recent hyperbole surrounding the impending release OS/2, as the "next generation" operating system for PCs, users of the "vanilla" MS-DOS need not worry that they will be left with an "orphan" operating system.

Although OS/2 promises glitzy functions such as being able to perform several tasks at once (called "multitasking") many users will be quite content to continue using MS-DOS as they always have. But the computer industry isn't static, it grows and evolves. If DOS didn't grow too, users might be "locked out" of taking advantage of these new advances. Word comes from Microsoft: "Fear

not. DOS will continue to evolve and be enhanced. There's no intention to leave DOS in its current state of development."

The most noticeable change in future DOS enhancements will be in the user interface. According to Adrian King, operating system manager for Microsoft, DOS will assume a "shell-like user interface that improves the usability of the system." You can get an advanced peek at what your future DOS will look like by examining Microsoft's Quick BASIC and Quick C, said King. The shell utilizes windows and "pulldown menus" that relieve the user of typing in extensive keystrokes to execute DOS commands. The newer DOS will also execute those commands faster and will be easier to configure, according to King.

Currently, DOS places limits on the amount of online storage it recognizes; but the newer version allows you to utilize large-capacity hard disks, such as those in the 500-to-600 megabyte range. Additional peripheral support will be added for high-resolution displays, 1024 x 768 or greater. And DOS-based workstations will be able to connect to OS/2

servers and gain the performance benefits that OS/2 provides. King indicated that new applications will also be developed to take advantage of this capability.

Microsoft can't say when these future developments will actually hit the market. The key word used by Microsoft is "evolutionary." This simply means that the changes will take place over a period of time; not all improvements will be introduced in a single revision of DOS. However, King says: "DOS is going to remain a viable and very strong system software platform probably forever. At least forever as far as anyone in this industry is concerned."

Software Takes On 'Personality'

If you're still using your computer for wordprocessing, number crunching or database manipulations, think again. Software is swiftly becoming more "human."

A recent article in *Psychology Today* extolled the virtues of the computer as analyst. And now NASA, the people that first brought us such modern miracles as Tang and Teflon, has developed "personal enhancement" software.

True to the "trickle down" theory, where technology developed by the government reaches the consumer market, NASA's personal enhancement software, called Bridges to Greater Personal Success, will be available this spring.

The program was developed by a clinical psychologist, Dr. Taibi Kahler; software house Three-Sixty Inc. will handle the distribution.

The software is designed to help people assess their personal strengths. "The program allows you to compile a profile of yourself," said Kahler. "You're given information of your problem areas and what the warning signals are when you're about to get into trouble."

The program is menu driven and operates by asking you a series of multiple-choice questions. After you finish answering the questions, the program categorizes you as one of six personality types: reactor, workaholic, rebel, dreamer, promoter, or persister. These aren't arbitrary categories, they're based on clinical models. For example, the US population breaks down to 30 percent reactors, 25 percent workaholics, 20 percent rebels, 10 percent dreamers, and 5 percent persisters.

An example of the questions asked are, "What do you do on your coffee break?" "Describe the way you dress." And "Of the following animals, my co-workers see me as..." followed by choices like owl, fox, lion, and so on.

The program can help you determine short-term, immediate needs or long-term goals. Say, for example, you must determine who to promote between two candidates of like qualifications. Promoting one and not the other could create a stressful situation. The program would present you with questions about dealing with such a

stressful situation at this point in time. The answers you provide allows the program to provide hints and tips on how to deal with the stress over a short-term period.

The program could well become a standard tool, much like a "what if" spreadsheet, for corporate managers and personnel officers. Kahler notes that the program isn't intended to remove human interaction, rather, it is to act as sophisticated augmentation to the evaluation process.

Disposable Storage

How would you like to back up your 30 megabyte hard disk onto a piece of paper, and pay only \$1.50? You may be doing just that soon using a new storage medium called "digital paper." It is being touted as the most cost effective method of storage for digital information. Calling it the "world's cheapest" recording and memory storage medium, the method was unveiled last week by ICI, Britain's largest chemical company, which is working with U.S. and Canadian firms to develop recording and playback systems for it.

The material that makes up this "digital paper" is a low-cost polymer film, similar to magnetic tape, but with a layer of polymer dye. Information is placed on the tape by optically "burning" the dye layer with an infrared laser. Playback is read by a low-powered laser, as is

used in any optical recording. Currently the process is a "write once" technology; the tape can't be erased and used over.

The film can be made into a disc, tape, sheet recording, etc., according to an ICI spokesman. The prime fascination with the recording medium is its ability to store huge amounts of data; you can store up to one terabyte (a thousand billion bytes) on one tape 35 millimeter wide by 1,640 feet long. The cost for the tape is estimated at about five cents per megabyte, making it "essentially disposable," said ICI.

However, the system doesn't have any kind of cross-compatibility with any other devices or media. Applications include, but aren't limited to, the computer industry. Other applications include audio and video. An ICI spokesman said, "We're talking digital video only, because that's where very high capacity is needed." The major problem with such digital video recording has been the necessity to compress data many times over to fit it into existing storage media, such as magnetic tape.

Currently the digital paper is available from an ICI pilot plant. The company is working with a Canadian company, Creo, on the development of the optical tape drive. In addition, ICI is also working with Iomega, developer of the Bernoulli Box. Iomega is working on plans to develop drives and cartridges based on the Iomega Bernoulli technology and ICI digital paper. ICI plans on showing the optical drives in March.

P R O F I L E

COMPUTER VIRUSES

Last year the computer world was hit with an invasion, of so-called "Trojan horses." These are programs "loaded" with destructive computer code; the code usually "explodes" when the program is executed. Thousands of users experienced the sensation of their disk drives whirring smoothly while the code from a Trojan horse proceeded to reformat the disk or scramble the data into unusable garbage.

Word spread quickly of these Trojan horse programs as users were alerted to their existence. Once the computer community went on alert, the problem was effectively quelled—until now.

The newest assault on the computer industry comes in the form of a computer "virus."

Dateline spoke with Don Parker, author and head of the information security program of SRI International, in Menlo Park, California. He is recognized as the nation's leading authority on computer security and computer-related crime.

Are these viruses an offshoot of the so-called Trojan Horse?

Viruses are short, usually hostile pieces of code that insert themselves into the operating system of a computer. They are similar to the Trojan horse programs in that they are disguised as seemingly useful programs and freely distributed via the vast network of bulletin board system. These viruses can wreak the same sort of havoc as a Trojan horse with one notable exception: they can automatically infest other disks and they can be passed—like a biological virus—from computer to computer, even to the point of automatically traveling over phone lines.

These viruses have actually been known for five to ten years. They are a form of sabotage. I believe the name



originated with the Department of Defense. It's only been recently that we've seen them start to appear in the commercial computer industry. The vulnerability is growing at the same rate as the number of computers and number of communications with computers.

How extensive is this virus infection?

We've only seen limited exposure of these viruses; but nobody really knows how many incidents have occurred. Out of the 2,000 documented computer crime cases I have in my files, some 20 or 30 virus cases are suspected.

There's no doubt that reports of these viruses are increasing and expanding beyond personal computers to mainframes and other networks.

We've had reports from Australia, where Amiga computers were hit with a virus that was inserted into software distributed with the computers. It destroyed all data already on a user's memory disk. Another virus was discovered at Jerusalem's Hebrew University, but it was destroyed before it

reached the computer's memory and subsequently spread to users outside the university.

The most sensational reports have come out of Germany where a group known as the "Chaos Club" penetrated the Space Physics Analysis Network (SPAN). This group was caught penetrating the network and that was thought to be the end of the story. Then just this month they claim to have planted several Trojan horses that carry viruses.

The details are sketchy, but the group claims that the Trojan horse programs will disrupt SPAN so that users will no longer be able to rely on either the network or the data stored there.

I doubt that their claims are valid, but we'll just have to wait and see. I think people have been forewarned, and it's possible that some more serious things might happen, but I think it'll be a one shot thing, and a minimal amount of damage will be done, I think they are basically just boasting, and that they haven't really infiltrated as many computer systems as they claim. Right now, it's a waiting game.

How is this going to affect the computer software industry?

I think it's hard to say at this point. We have two scenarios.

One is that the virus thing is a media event. Once attention to it has died out, so will the occurrence of these viruses. We will certainly have it as a threat, but the basic idea is that these viruses are just too much work, too tedious to program, there are much easier ways to accomplish the goals than developing a virus attack.

The idea of being first is already accomplished and therefore the "thrill" of being first is gone. So you have the situation dying out and not being a big deal except for an occasional attack.

The other scenario is the extreme in

CONTINUED ON PAGE 66

TELE-POLITICS: ON-LINE ADVOCACY

Tele-politics: It's the next step toward an electronic form of participatory democracy. Online and dialed in. A constituency that never sleeps.

The rise of tele-politics is no big surprise. It's been "just around the corner" for years now. However, it took a "good cause" to really kick it into action. That issue was the Federal Communication Commission's (FCC) proposed access charge.

Last June, the agency proposed to charge computer networks as much as \$5 an hour for each customer to cover the cost of connecting the network to local telephone loops. The FCC says these costs are now borne unfairly by long-distance customers. Currently, networks pay lower costs for private lines.

Last October, in opposition to the ruling, thousands of "tele-activists" formed a loose coalition that more resembled a political action committee than a grassroots organization of electronic hobbyists. Together, these online participants unleashed a torrent of protest on the FCC.

So convincing was the outcry by modem owners against the proposed access charge that it drew the attention of Rep. Edward Markey, a Massachusetts Democrat and chairman of the powerful House telecommunications subcommittee.

When Markey's subcommittee started to examine the issue, he called for public hearings. These hearings, which called for FCC chairman Dennis Patrick to answer the public outcry, ultimately delayed the implementation of the proposal. (The original FCC ruling called for the access fees to be in place by January 1, 1988.)

The proposal, now mired in controversy and under fire from both industry and Congress, may end up being dropped.

APATHY NO MORE

This firestorm of protest illustrates a point I've touched on several times in this column: Online computer networks can be used for political organization on behalf of numerous causes.



RICHARD STARMAN

This online constituency shouldn't be taken lightly. Though the numbers are a bit fuzzy, most industry pundits say there are about one million active modem users. Even a ten-percent response from this group is enough to draw the attention of the most aloof federal agency. Such was the case in the FCC access charge issue.

Modem owners began by marshaling their collective power through the use of every available network. The call to action was spread through thousands of bulletin boards, reaching both obscure research networks like Usenet and the big commercial information services like CompuServe and GENie. The powerful regional networks, such as the WELL and Chariot, were used as hubs of information storage and retrieval.

Informed users in the Washington, D.C., area were quick to pick up on any new developments from the FCC or a change in the political wind. When this happened, someone in Washington would write up a text file and upload it to any of several networks. The plan worked beautifully. The execution of electronic delivery was flawless. The heavyweight newswire services were consistently "scooped."

"Tele-politics is the perfect environment for activists," says Peter Grunwald, a Washington, D.C.-based telecommunications consultant. "Once these activists

BY BROCK N. MEEKS

find a "hot-button" issue for [online] users, it's a relatively small step to create a powerful lobbying organization."

DUMPING THE CUSTOMER

The FCC proposal is a good example of the sort of "hot issue" Grunwald is talking about.

The proposed access charges would be passed on to the user—you and me. Total cost: about \$200 million a year, according to the National Telecommunications and Information Administration, a Commerce Department agency that opposes the plan.

Commercial information utilities, such as the Dow Jones News/Retrieval network, say the added charge would scare off customers. Philip Walker, vice president of regulatory affairs for Telenet, is more blunt: "It would strangle this industry and drive a lot of good services out of business. For example, if the access charge goes through, it'll blow PC Pursuit out of the water."

The high-tech howling spread evenly among several key online services. Users from all corners of the electronic landscape pitched in with expert analysis.

In Boston, Richard Teneyck, an official of the influential Boston Computer Users' Group, wrote a 12-page analysis of the FCC action, including a sample protest letter, and uploaded it to his local Fido network. Within 24 hours, Teneyck's

analysis was posted on several thousand Fido bulletin boards across the nation; within days the FCC began receiving a heavy influx of mail primarily based on Teneyck's example.

Bruce Bergman also wrote a detailed "instruction manual" for submitting formal comments to the FCC (an arcane process that takes exacting work). His outline made the protocol of submitting formal comments easy to understand. The "how-to" manual was first distributed over Usenet and found its way to local bulletin board systems. Not only is this manual an effective guideline for combating the access charge, it's a general instruction manual for any kind of formal response to the FCC.

Some of the commercial online networks also began (finally) to utilize the inherent power of their systems.

CompuServe set up a special "Congressional Delivery" option for its EasyPlex electronic mail system. This allowed users to blanket the entire Congress or to target specific Congress members with letters. For 50 cents, CompuServe would print out the letter and deliver it to any and all addressees. CompuServe dubbed its efforts "on-line advocacy."

Such tactics are crucial to the success of any lobbying effort, says Nick Johnson, former head of the FCC. The key, says Johnson, "is to communicate with the Commission in the bureaucratic jargon they understand and make sure that you follow up with letters to members of Congress in plain English."

CompuServe, with its reported 375,000 users, and The Source with its 100,000 users reprinted the FCC proposal in full and published position papers opposing it. These commercial networks then were used as a kind of nationwide roundtable for discussion of the issue. CompuServe went so far as to waive its usual fees for users who composed letters about the FCC proposal on the system.

The Source implemented a response system similar to CompuServe's. When a subscriber writes a letter to the FCC chairman, the company delivers copies to the seven top FCC officials—and pays for the printing and postage, too.

CompuServe and The Source reprinted the FCC access charge proposal and published papers opposing it.

"We're taking advantage of a medium that lets us communicate with members and mobilize them," says Nancy Beckman, a spokeswoman for The Source.

According to Ruth Milkman, the FCC attorney in charge of the access charge issue, tele-activists deluged the FCC with 6,000 letters and more than 140 formal comments. Milkman said: "This is the greatest response to any telephone-related issue that the FCC has ever received in its history."

Markey's office notes that he has personally received 4,000 letters. Democratic Senator Daniel Inouye of Hawaii, chairman of the Senate communications subcommittee, has collected several thousand letters, too.

DIRECT RESULTS

The efforts of this new brand of tele-politics haven't gone unnoticed. FCC staffers point to the postponement of the access charge as proof that the efforts were taken seriously. Markey has urged the FCC to shelve the matter until it finishes a lengthy proceeding to redesign the telephone network. And Sam Simon, one of Washington's more powerful telecommunications lobbyists, says the opposition was so intense that "the FCC will probably phase in any increase over two or three years—assuming they don't kill the ruling altogether."

(At press time, the FCC still hadn't formally ruled on the access charge issue. According to Milkman, the FCC will review a detailed analysis of all the responses. A final vote of the Commission is due sometime later this month.)

THE PROCESS EXPANDS

The success of tele-politics can be seen in other instances, too. Beyond War, a Palo Alto, California, anti-war group,

last year arranged an October 24 satellite broadcast by enlisting activists over PeaceNet, a global computer network used by some 300 peace groups.

At the opposite end of the political spectrum, the National Association of Manufacturers, a business trade group, started NAMnet to keep its members posted on 45 issues before Congress.

And in Colorado last year, the regional network Chariot was used in what was perhaps the first online political campaign.

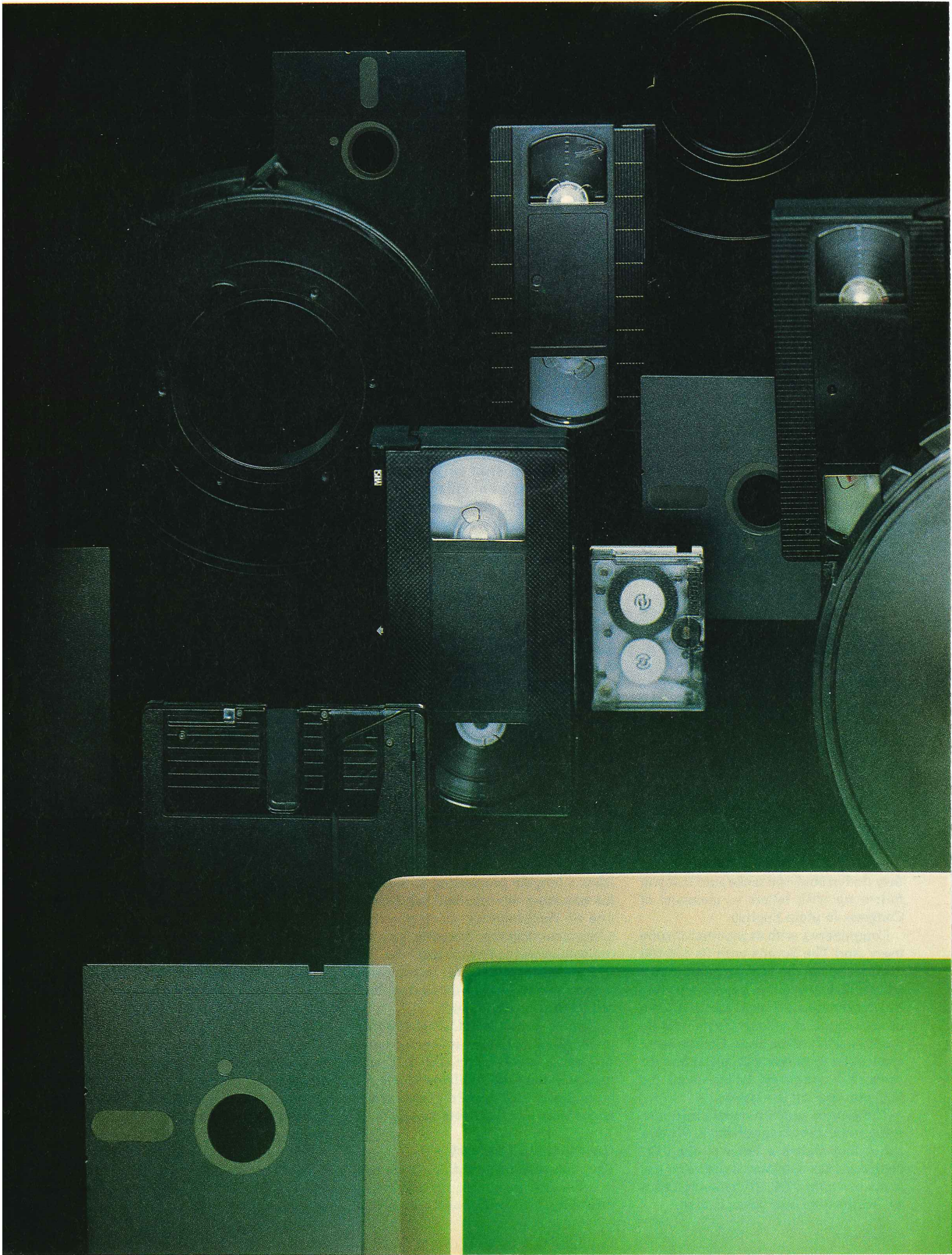
"Wayne Fisher, a local businessman, took his candidacy for city council online," says Dave Hughes, sysop of Chariot. "Wayne was a decided underdog. He was running against a strong incumbent. Nobody knew anything about Wayne until he started posting his platform in our political conferencing section." Fisher garnered a landslide of grassroots support. He won the seat in a lopsided election.

Telecommunications is even popping up in the presidential election process. In Iowa and New Hampshire, Democratic candidate Bruce Babbitt used his modem to keep staffers abreast of his positions on arms control and other issues.

Grunwald contends that these examples of tele-politics are only the beginning: "Within five years, certainly within ten, computer networks will be considered the conventional means of communications for organizing and public advocacy."

We're still a long way from the political environment so pointedly portrayed on the ill-fated *Max Headroom* television show, where people voted with their remote control channel changers and "tele-elections" covered the entire globe. And I'm not so sure we should ever reach that stage. But I do believe in the potential of tele-politics to combat the money-wielding special interest groups. It's a process where the "little guy" definitely gets to have a voice, and, after all, that's what the political process is supposed to be about: government by the people and for the people.

The classic David and Goliath struggle is being reshaped. Instead of slingshot and a small stone, it's now a modem and an uploaded text file. ■



Alternatives in
backup technology.

USE IT OR LOSE IT

BY BROCK N. MEEKS

There are two types of computer users: those who have experienced the agony of a disk crash, and those spared the experience by what can only be attributed to divine intervention.

If you're in the first category, you're well aware of the need for a reliable and consistent data backup system. If you're in the second group, now is not the time to be smug. With computer data, the question isn't if you'll ever lose it—it's when.

If it hasn't happened to you, imagine the following scenario. You've been toiling all night to rewrite a proposal that could catapult your career to levels you've only dreamed of. At last you're finished. You hit the "save" command on that final draft only to stare in horror at the message: "Failure Reading Drive C:—Abort, Retry, or Ignore?"

After 20 minutes of "Retry" or "Ignore," you decide it's time to pull out those backup disks to which you so diligently copied all your files. What? You have no backup disks? The only "backup" was the *.BAK file on the same hard disk that just went south?

You break out in a cold sweat.

If only you could resurrect the "dead." Months (years?) of preparation and research have been demolished in one fell swoop! You agonize, stare heavenward, and wail, "Why!?"

Welcome to computer hell.

CHOICES IN BACKUP SYSTEMS

Like a nagging mother, every computer manual exhorts you to "back up your data." The process is deceptively simple. If you use only a two-floppy disk drive system it's as easy as typing in "Copy ** B:" and inserting a blank disk in the B drive. Quick and dirty, but effective nonetheless.

But even this simple procedure takes a certain amount of discipline—and time. And in this day of “I need it yesterday,” such chores are often given low priority. Lose your data just once, however, and I guarantee you’ll make the time to incorporate some kind of backup strategy into your daily routine.

Fortunately there are several data backup systems to choose from. Basically there are four types: floppies, removable cartridges, tape, and even a backup system that lets you use video tape.

This article will give you an overview of those systems and lay out some guidelines so you can formulate your own backup strategy. A selected list of specific products is included at the end of the article.

FLOPPIES—THE OLD STANDBY

All desktop computers come with a built-in backup system: the floppy drive. A floppy-based backup system may not be very exotic, and you have to sit through the entire backup session, so it’s costly time-wise. But it does work. And floppy disks themselves have the advantage of being inexpensive—you can get them for around 30 cents apiece.

When using a floppy-based backup system you have two options. The first is the “copy ** B:” method mentioned above. The second is to use a software program to expedite the backup process.

The first method is self-explanatory and useful if you’re only backing up a small amount of data—say a couple of disks. Anything approaching a megabyte or more makes the “star-dot-star” method impractical, and you should look for a good software backup program.

All MS-DOS computers come with a program called BACKUP that is designed to backup files from a hard disk to floppies. You can supply a pathname from which files are to be backed up. If no path name is specified, the program assumes the current directory. There are several options when using BACKUP, such as backing up all subdirectories, copying only files modified since last backup, and backing up all files from a certain date. This sounds like an adequate program, but it’s solely command driven (meaning you have to type in the exact functions each time you run a backup session), unlike the more sophisticated backup programs that offer “user-friendly” options such as menus. In addition, BACKUP is incredibly slow. This is due, in part, to the constant attention it demands from you as you type in command after command.

Fortunately there are several excellent software packages that relieve the burden of relying on MS-DOS’s BACKUP. Most of these are compatible with any type of disk: floppy, hard, removable, and even Local Area Network (LAN). Unlike BACKUP, many of these programs rely on high-speed, proprietary, non-DOS formatting schemes that allow them to store large amounts of data on a floppy disk. These programs also speed up the backup process by leaving the disk spinning during the entire process rather than starting it from a standing start each time it must be written to.

Another advantage of these programs can be seen through a

simple comparison. Issue a BACKUP command and watch your hard disk and floppy indicator lights (those red LED status lights). You’ll notice that the hard disk light goes on first, and then the floppy light goes on as the information is first read then written to the backup disk. In more advanced backup programs, the lights come on simultaneously because these programs are capable of reading and writing the information at the same time.

According to the technical support division of Core International, makers of CoreFast (a well-received backup program), disk transfers are managed using a technique called direct memory access (DMA). This technique shifts bytes from disk to memory and back without any intervention from the microprocessor. DOS routinely uses only one of the several available DMA channels for its disk transfers. Most software backup programs use two or more DMA channels, reducing the backup time significantly.

DOS also checks the disk directory and file allocation table (FAT) each time it transfers a file. Then it updates the disk, and then it begins the actual file transfer. Because the FAT table is located on the first track of the disk, the floppy drive Read/Write head must skip back and forth between the FAT and the data areas during both the reading and writing process. This traveling time eats into the actual backup process. The more powerful backup programs gain speed by optimizing floppy drive head movement. Some modify or eliminate the FAT/directory/data DOS arrangement—which means DOS can’t read the backup disks created by these programs. Others simply process all the FAT data prior to making any file transfers; the programs write FAT, directory, and data sequentially. This allows the Read/Write head to move across the disk in a more efficient manner.

These programs are also easier to use than MS-DOS’s BACKUP because of their built-in “user-friendly” options. These options include global defaults (such as drive designations); estimated time of backup procedure and number of disks needed; menu driven choices; exclusion provisions (so you can exclude your program, system, and hidden files from being backed up, assuming you have these on your master system disks); protection from accidental erasure of previously backed up files; overwrite confirmation; and sequential disk labeling.

Floppy disk backups have two distinct advantages: they travel well and they have a built-in “compatibility factor.” A few floppies allow you to transport your files in a completely manageable format (assuming you’re not transporting the contents of 20-megabyte hard disk.) And once you’ve arrived at your destination you need not worry about compatibility; these disks can be immediately put into action simply by sliding them into any DOS-compatible system.

SECONDARY HARD DISKS

Adding a secondary hard disk sub-system (20 or 30 megabytes) is a simple backup strategy. A second hard disk need not be a high-performance model, and it’s not necessary to have an

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additional controller because most disk controllers will handle two different drives. Typically a 20-megabyte hard disk can be added for under \$300. And if you add a program from Tallgrass Technologies called Backtrack, you can set up a system that automatically copies files from your working disk to your backup drive as you create them.

This backup solution, however, isn't without its drawbacks. Any calamity—fire, theft, security breach—that strikes your working hard disk is likely to take out your backup disk, too. A more suitable answer is a removable cartridge disk backup system.

REMOVABLE CARTRIDGE DISKS

Removable media were first popularized when the Iomega Corporation introduced its Bernoulli Box. The Bernoulli Box uses a flexible disk housed in a plastic cartridge that lends itself to easy storage and almost trouble-free operation. The overwhelming popularity of the Bernoulli Box lent sudden credibility to removable hard disk cartridges, which had floundered in relative obscurity.

Today there are two types of removable cartridge disks—flexible and hard disks. For both types, storage capacity is limited only by the number of disks you can afford. And data security is extremely good because you can remove a disk cartridge and store it under lock and key in a physically removed location.

Like floppy disks, removable cartridges have the advantage of being portable, and you can transport large amounts of data on very few disks. For example, you can transport the entire contents of a 20-megabyte drive using two cartridges, at most. Unlike floppy disks, removable cartridges are expensive. Flexible disk cartridges cost from \$50 to \$145; removable hard disks run from \$99 to as high as \$175.

Early Bernoulli Boxes were physical giants. Today, thanks to advances in technology, the Bernoulli Box is little more than the size of half-height floppy drive. Along with Iomega, the Kodak Corporation also produces a flexible disk cartridge. (The Kodak drive is also about the same physical shape of a half-height disk drive.)

While Iomega was steadily shrinking the size of its disk drive, Kodak was busy improving the storage capacity of its flexible disk. When first introduced, the Kodak disk held only 3.3 megabytes of information. Through a series of floppy disk drive improvements that allow precision movement of the Read/Write head on the media, Kodak was able to achieve a disk density of 12 megabytes on its flexible disk cartridge.

Both companies market their technology as OEM (original equipment manufacturer) products. This means that you'll see several "Bernoulli Boxes" and Kodak cartridge systems marketed under other brand names. (Kodak sells its disk drive to end users under the Verbatim brand name.)

Both cartridges use similar disk housings—square plastic shells no larger than ordinary floppy disks. Both have storage capacities in the traditional hard disk range—the Bernoulli cartridge holds 20 megabytes; Kodak's holds 12 megabytes.



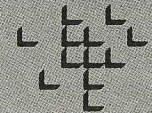
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Bernoulli Box-type systems offer faster disk access and greater storage capacity than Kodak systems, but they also cost more. (Prices for a Bernoulli Box-type system start around \$1,795 and cartridges run as high as \$145.) The Kodak system offers less storage capacity, but is less expensive (\$1,095; cartridges cost \$50.) A Bernoulli Box system typically gives you access times of about 40 milliseconds. By comparison, the Kodak system provides about 60 millisecond access speeds (the speed of a low-quality hard disk drive).

(Editor's note: The Bernoulli Box requires its own controller card and more than one controller is available from IOMEGA. Which controller card you need is dependant on what computer you have. If your computer system has a clock speed faster than 8Mhz, contact IOMEGA to determine the precise controller required for your system.)

In addition, these flexible disks allow you to execute the files you've backed up. This isn't possible with files backed up on floppies or on the cartridge tape drives discussed later. And because the Read/Write heads rest on the disk, these systems all but eliminate the chances of losing your data due to a head crash—always a potential problem of hard disks.

Unlike floppy disks, these cartridges are system dependent. Whereas you can mail a 5¼-inch floppy to your cousin in Peoria and it will boot right up, these cartridges will only function on the same manufacturer's equipment. You cannot exchange cartridges between different manufacturers' systems.

Removable hard disk cartridges have all the advantages outlined for the flexible disk systems and more. For example, a removable hard disk is sturdy enough to pull double duty as a day-to-day mass-storage device and as a backup system. And where flexible disks are limited to 12- or 20-megabyte capacities, hard disk cartridge storage capacity ranges from 10 to 98 megabytes.

Restoring files backed up on a removable hard disk is a simple task. These cartridge hard disks are random access devices and work like your main hard disk; you won't spend hours trying to find and restore a file or program to work with. And like the flexible disk cartridges, these hard disks are transportable. Stick them in the mail or your briefcase. These advantages, coupled with comparable fixed disk access rates (typically in the 40-millisecond range), make a removable hard disk cartridge hard to beat.

Removable hard disk systems do have disadvantages, however. First, hard disk systems are typically more costly. Prices for a removable hard disk system can run close to \$4,000, and cartridges cost from \$99 to \$175. (One low-cost removable hard disk system is available from Tradewinds Peripherals Inc. It lists for \$895 and uses actual Winchester-type hard disks rather than cartridges).

Another disadvantage is that the hard disk platter can't take rough treatment and it's sensitive to dirt—not the kind found in junior's pants cuff, but the type that's microscopic, airborne, and deadly. Fixed hard disks are sealed under clean-room conditions (no dirt or dust), but a removable hard disk, due to its design, is susceptible to dirt each time you load it

and the little cartridge door opens up so the drive head can access the disk. Because the Read/Write head on a hard disk "flies" only about 12 microns (millionths of an inch) above the disk surface, anything larger, such as a smoke particle (typically a whopping 17 microns), will cause the head to crash. The results are usually terminal; there are no survivors in a head crash. The chances of this happening are totally dependent on the environment they're used in—and on fate.

Take DAT

A revolutionary data storage format is lying in the wings. Known as digital audio tape (DAT) drives, these are really high-density digital recorders first developed for the audio industry. However, the underlying technology makes them suitable for tape backup systems, too.

The four-millimeter tape uses a helical-scan recording (HSR) method based on the technology that manufacturers hope will storm the audio market, much as the audio compact disc has done in recent years. DAT cartridges are about the size of a thick credit card; prototype DAT data drives have been shown at various computer shows, but have yet to be delivered to the United States.

Currently DAT technology is embroiled in a bitter Congressional debate. The recording industry claims that DAT technology will ruin the music industry. These claims rise from the fact that a DAT has all the inherent sound quality of audio CD with the added advantage of being able to erase and record. Sometime this spring a Congressional subcommittee is slated to decide whether DAT recorders should be allowed in the U.S.

According to several market research firms, DAT tape drives have the potential to replace DC2000 tape systems as the tape backup system of choice because the DAT drive will fit the PC's 3.5-inch format. An increasing number of PCs manufactured today are equipped with 3.5-inch drives.

Although DAT tape drives promise the capability to store a gigabyte of data, most industry analysts agree that DAT technology won't become cost effective as a tape backup system unless consumer audio DAT recorders become popular. If manufacturers are making thousands of DAT audio recorders, it becomes a small leap to produce DAT tape drives for the computer market.

Several current quarter-inch tape system manufacturers are rumored to be working with Japanese counterparts to produce DAT drives. These drives will most likely premiere, in prototype, at the COMDEX show in Atlanta this spring.

—Brock N. Meeks

TAPE DRIVE SYSTEMS

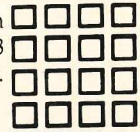
The first tape drive systems were the primordial open-reel nine-track tape systems developed for mainframe computers in the '50s. These are still in use today. Some 20-year-old tapes are still useable by drives attached to PCs. And in many ways, these dinosaurs are the most stable of any backup system around today. The standards for all open-reel tape drives are consistent regardless of manufacturer.

Although nine-track reel-to-reel systems are available for

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GREENVILLE, S.C. 29611
Phone: (803) 294-0494



PCs, they are unwieldy beasts and are too expensive to consider as serious candidates for your own backup system. (However, if you run the data center at a large organization, you might want to do some more research on this subject. Prices for PC open-reel drive units start around \$3,500 and can reach \$10,000.)

From open-reel tape technology came today's popular cartridge-based tape drives. The popularity of these tape systems can be attributed to two major factors: price and size.

Basically there are two types of cartridge tape systems: the DC600 and the DC2000. (Another tape format, the DC1000, uses 1/8-inch tape, but it has yet to gain widespread acceptance.) The cartridge formats were originally developed by the 3M company. Both use 1/4-inch tape.

These tape cartridges function much like the familiar audio cassettes. Indeed, the DC2000 is housed in a plastic cartridge about the size of a standard audio cassette tape; the DC600 cartridge is about the size of a paperback book. The DC600 tape system is typically a desktop stand-alone unit. Its physical size makes it almost impossible to fit in a PC's floppy drive slot. However, DC2000 tape systems usually replace one of your floppy drives, though stand-alone units are available, too.

Both the DC600 and DC2000 tape drives hold more and cost less per megabyte of storage than disk-based systems. For example, a \$100 disk cartridge might hold 20 megabytes, while a \$35 tape can store 60 megabytes.

Both systems work on the same design principle. A friction band moves the tape along, rather than a capstan as used in audio tape. The only mechanism that actually touches the tape is the Read/Write head. A clear plastic hinge closes to protect the tape when not in use. Each tape drive manufacturer supplies software that manages the backup process.

A DC600 cartridge holds 600 feet of tape. It stores information on nine tracks written across the width of the tape using a technique called "serpentine serial recording." This technique stores data sequentially in one direction and on one track at a time, continuing for the length of the tape. When the end of the tape is reached, the tape reverses and recording is started on the next track. This continues until all nine tracks are filled.

DC600 systems offer the advantage of being extremely fast. Their data transfer rate (the rate at which they are able to receive information from the primary system) is the same as most PC hard disks. The fastest system can transfer more than three megabytes per minute.

Compatibility among DC600 systems is a factor you shouldn't overlook. There are two DC600-style backup techniques: image and file-by-file backups. They are not interchangeable.

Image backups are a bit-by-bit copy of the original data and are extremely fast. Basically, an image backup takes a "picture" of your disk—it's much like using the DISKCOPY DOS command. Your disk contains erased files in the directory track, unused areas of data space from files that have been deleted, and so forth. An image backup transfers all these disk characteristics exactly as they are on the original.

\$100.00	GENERAL LEDGER	\$100.00
CP/M		MS-DOS

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\$100.00	ACCOUNTS RECEIVABLE	\$100.00
CP/M		MS-DOS

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.

\$100.00	ACCOUNTS PAYABLE	\$100.00
CP/M		MS-DOS

Improve your cash management with this fine system. You'll get the up to date accurate picture of accounts to be paid, cash requirements for the data on file. Payments and notes vouchered automatically insuring timely payments. Complete check writing included. The system reports include Vendor File Lists, Open Vouchers, Ageing By Due Date, Discount Date Ageing, Cash Requirements, Check Registers, G/L Transaction List, Query Vendor Status, Credit Vouchers, Deleted Vouchers.

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CP/M		MS-DOS

A complete payroll system supplied with current tax routines for every state. Functions include Employee File Maintenance; Employee Lists in multiple levels of detail; Input Worksheets; Time Card Entry; Regular, Overtime, Other, Commissions, Tips, Misc. Pay. Exceptions Processing so you only enter variable data; Weekly, Bi-Weekly, Semi-Monthly, Monthly pay cycles (run individually/combined); Departmental Payrolls; Checks; Check Registers; Earnings Reports; 941s; W-2s; Unemployment Reports; Multi-State; Manual Checks; G/L Transactions. Federal, FICA, State and Local Taxes, Federal/State Add-Ons, FICA, FUTA, SUI, SDI, EIC, 4 other deductions.

HARDWARE REQUIREMENTS

CP/M: 64K (53K TPA) & CP/M 2.0 or higher.
MS-DOS: 128K (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.

It should also be noted that an image backup is a "fitted" procedure. For example, an image backup of a 20-megabyte disk cannot be transferred to a 30-megabyte disk. Because the data image is "fitted" to a 20-megabyte "picture" it cannot fit that data on a 30-megabyte drive.

File-by-file backups add structure to the information as it is backed up; but it also slows this procedure down. File-by-file backup is akin to the "copy **" DOS command. Only the active files are transferred. This gives "structure" to the data, essentially building a backup disk that mirrors the active file structure of your original disk. This makes it easy to retrieve and restore separate files. For example, if you somehow wipe out a subdirectory, you can easily go to your file-by-file backup and restore that single subdirectory. You cannot do that with an image backup, unless you restore the entire disk "image."

The differences between image and file-by-file backups are starting to blur. The two types of backup procedures are still incompatible, but the inability to retrieve single files from an image backup is being overcome by smarter software, and file-by-file backups are becoming faster as a function of better-written software, too.

By comparison, the DC2000 cartridge holds 205 feet of tape. Its main advantage is perhaps its ability to store 40 megabytes on a single tape that fits into your shirt pocket. Standards are currently under development that will allow 60 and 80 megabytes to be stored on a DC2000 tape cartridge. The DC2000 cartridge packs all this information onto tape using 20 to 24 serial data tracks across the tape. Each track holds approximately two megabytes of data.

As with the DC600, the DC2000 is a captive of its own manufacturer. There are two main standards governing DC2000 tape systems: Quarter Inch-Compatibility committee (QIC) 40 and QIC-100. The difference between the two standards is largely a matter of speed and price.

The QIC-40 tape system uses the disk controller in your PC. This means your backup transfer speed is tied to the speed of your on-board floppy disk. However, the QIC-40 system is typically less expensive because you don't need a separate controller board.

The QIC-100 system is the converse of the QIC-40 system. It is dependent on the manufacturer's controller board (which means it takes up an extra slot in your PC). However, these systems are optimized for faster backups because they have their own controller. Because of the additional hardware, they are more expensive. Both QIC-40 and QIC-100 drives fit in a normal PC floppy drive slot.

Both the DC600 and DC2000 tape drive systems take about 40 minutes to format for 40 megabytes (a DC600 system can typically be formatted for 20, 40 or 60 megabytes). This is a function of each system's formatting procedure. Each system goes through the entire tape looking for what amounts to "bad sectors" and locking them out so they can't be used. Each time you use a new tape it must be formatted, and your computer is locked up during the process. You can't use it for anything else

during formatting. If the formatting procedure is too much to bear, preformatted tapes are available; preformatting adds a couple of dollars to the price of the tape.

In reality, a DC2000 system essentially usurps a floppy drive slot and becomes a slow (floppy-disk speed), single-purpose mass storage device. A full 32-megabyte hard disk typically takes between 20 to 30 minutes to back up. A typical DC600 tape system can back up 60 megabytes in about 40 minutes.

However, there are ways to circumvent the inherent slowness of the DC2000 system. One way is to make use of time-initiated backup software. This enables you to make an automatic backup during your lunch break, for example, or after you leave the office.

Prices for a DC2000 system range from \$595 to \$1,390; DC2000 systems have yet to make it into the mail-order houses in a big way. The price of a DC600 system, however, varies depending on where you purchase it. Mail-order systems range from \$600 to \$800. Brand name, off-the-shelf systems are priced as high as \$1,995.

Perhaps the most intriguing development in tape backup systems is that offered by Emerald Systems Corp. Called a VAST (virtual archival storage technology) Device, this tape backup subsystem can hold up to 2.2 gigabytes of information, or the equivalent of 6,200 floppy disks. The tape cassette is the size of a pocket calculator. As you might expect, you'll pay a hefty price for this new technology: \$6,995.

Emerald claims backup speeds of up to 15 megabytes per minute. The new tape system achieves its high data density by using something called a "helical recording technique," a technique similar to that used by popular video cassette recorders. The recording head rotates at a slight angle to the direction of tape travel. The recorded tracks on the tape, if visible, would appear as a series of fine diagonal lines. The helical approach makes maximal use of the surface area of the tape: a one-inch length of the eight millimeter-wide tape reportedly can store a half a megabyte of data.

The tape drive itself is an external unit approximately the size of a small shoebox. It connects to your PC via a controller board supplied with the system.

Emerald is also selling the special tape cartridges in varying capacities, ranging from 250 megabytes to 2.2 gigabytes. A startup kit with five 250-megabyte cassettes costs \$250. The same startup kit with five 2.2-gigabyte cassettes costs \$325.

VIDEO BACKUP

It's possible that you already have a mass-storage device hanging around the house cleverly disguised as a VCR.

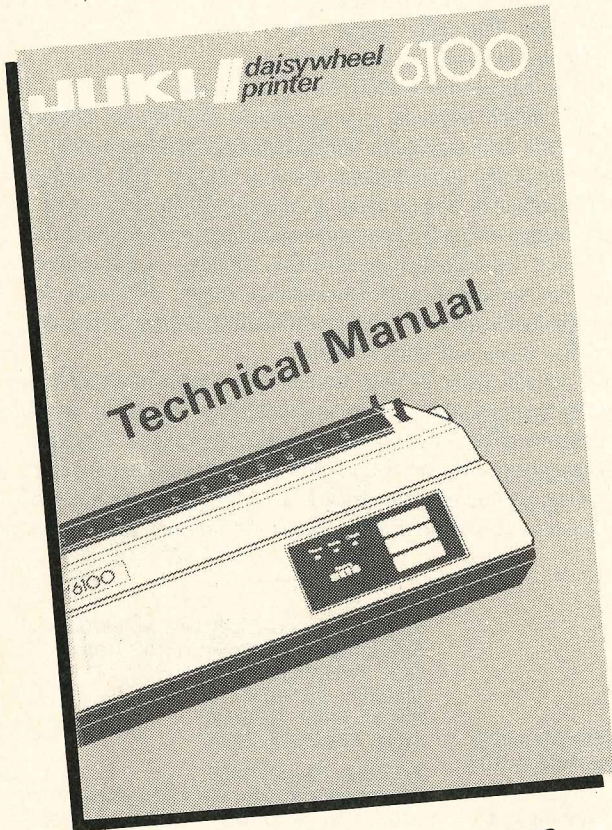
Alpha Microsystems's Videotrax system converts your data into an analog equivalent and turns your VCR into a computer backup system. This system offers the lowest possible cost per megabyte of storage of any system mentioned here.

A plug-in card in your PC converts your data into video signals that are then stored on a regular video cassette tape, either VHS or BETA tape format.

If you don't have a VCR, the Videotrax system comes com-

KAYPRO®

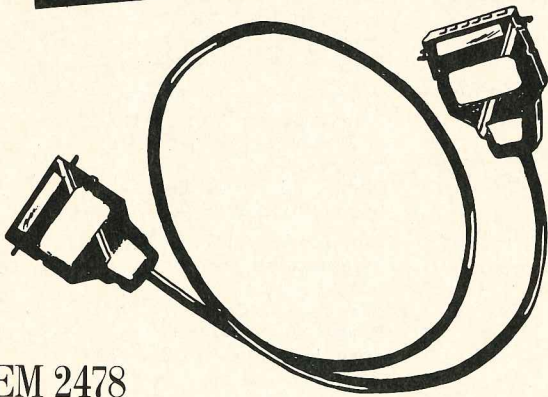
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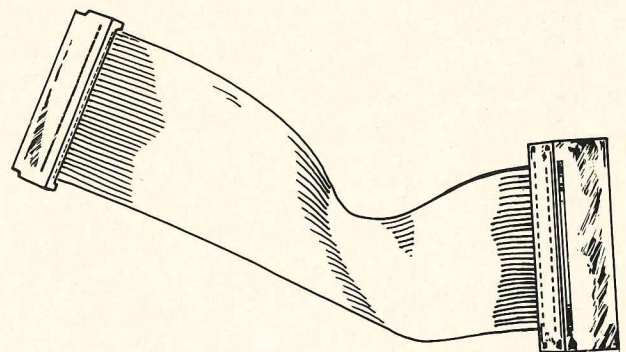


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ITEM 1383 CP/M DISK DRIVE DATA CABLE

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plete with a specially modified VHS system that your PC can control remotely. Your computer takes command of the tape travel during the backup procedure, or you can run the system manually.

The system writes multiple copies of your data to tape in an effort to guard against the "dropouts" inherent in video tape. (Dropouts are like bad blocks sometimes found on floppy disks. These are areas where information can't be stored.) This procedure makes it statistically improbable that any two copies will suffer from the same tape dropouts. But this insurance comes at the expense of reduced storage capacity. Because of file replication, the Videotrax system can only store about 80 megabytes on a standard two-hour tape. Because of the duplication and verification process the system runs on each file, file transfer rate is a lethargic 13 megabytes every 10 minutes.

The main advantage of this system is, of course, the high probability that you already own the VCR hardware. In this case all you need is the data-to-video board, which runs about \$595.

WHICH SYSTEM FOR YOU?

By now you should have an idea of which backup system best suits your needs. The only "right" choice is the one that gives you a workable, reliable backup strategy.

Your choice hinges on certain key questions.

First, how much data do you generate, modify, or collate every day? If it's only a page or two of text or tweaking a simple accounts receivable spreadsheet, then a floppy disk backup system will probably do just fine. At the end of the day, stick a "backup" floppy in the B drive and copy over anything you did during the day. The hardest part of this strategy is remembering to put the backup floppy in a secure place. After all, it's futile to make backups only to have a clumsy janitor or snooping co-worker wipe out your efforts.

Second, do you work at your own PC or one connected to a local area network (LAN)? If you are working on a LAN, think about two kinds of backups: your own and the LAN's. Find out what the backup policy is for the LAN and make sure your data files are being protected. You should also get into the habit of making your own personal copies. You can make copies to your

QUICK REFERENCE SUMMARY

FLEXIBLE DISK CARTRIDGES

Product: Verbatim 12-Megabyte Internal System

Manufacturer: Eastman Kodak Co. Mass Memory Division 343 State St. Rochester, NY 14650

Phone: 800-445-6325

Sugg. List Price: \$1,095; media, \$50

Product: Bernoulli Box II

Manufacturer: Iomega Corp 1821 West 4000 South Roy, UT 84067

Phone: (801) 778-3000

Sugg. List Price: 5¼ inch single drive \$1,450; Dual drive 5¼ inch unit, 2,350; internal drive 1,299; media: \$83 (Iomega tripack, \$249)

REMOVABLE HARD DISK CARTRIDGES

Product: PhD

Manufacturer: Century Data Systems Amcodyne Division 1270 N. Kramer Blvd. Anaheim, CA 92806

Phone: (714) 632-7500

Sugg. List Price: \$4,995; \$175

Product: Diskit 2 Plus

Manufacturer: IDEAssociates, Inc. 29 Dunham Road Billerica, MA 01821

Phone: (617) 663-6878

Sugg. List Price: \$3,595; cartridges, \$99

Product: DuraPak

Manufacturer: Sysgen Inc. 556 Gibraltar Dr. Milpitas, CA 95035

Phone: (408) 263-4411

Sugg. List Price: \$2495 dual internal drive; Single internal drive, \$1495; cartridges, \$115

Product: Traveldisk

Manufacturer: Tradewinds Peripherals Inc. 10243 Glenoaks Blvd. Pacoima, CA 91331

Phone: (818) 896-6634

Sugg. List Price: 10 megs, \$895; 22 megs, \$1,295; 32 megs, \$1,695; 40 and 49 megs, \$2,495; 100 megs, \$4,995

DC600 TAPE CARTRIDGE SYSTEMS

Product: Alloy FT-60

Manufacturer: Alloy Computer Products Inc. 100 Pennsylvania Ave. Framingham, MA 01701

Phone: (617) 875-6100

Sugg. List Price: \$995

Product: Coretape

Manufacturer: Core International 7171 N. Federal Highway Boca Raton, FL 33431

Phone: (305) 997-6055

Sugg. List Price: \$1,595

Product: DOS 60-9000

Manufacturer: Emerald Systems Corp. 4757 Morena Blvd. San Diego, CA 92117

Phone: (619) 270-1994; (800) 553-4030

Sugg. List Price: \$1,795

Product: Galaxy Slimbox 32-50/60TS

Manufacturer: Genoa Systems Corp. 73 E. Trimble Road San Jose, CA 95131

Phone: (408) 432-9090

Sugg. List Price: \$995

Product: Filesafe 7060

Manufacturer: Mountain Computer Inc. 240 E. Hacienda Ave. Campbell, CA 95008

Phone: (800) 458-0300

Sugg. List Price: \$1,795

Product: Priam Storagespace ET60

Manufacturer: Priam Corp. 20 W. Montague Expressway San Jose, CA 95134

Phone: (408) 434-9300

Sugg. List Price: \$1,895

Product: Sysgen Smart Qic-File

Manufacturer: Sysgen Inc. 556 Gibraltar Dr. Milpitas, CA 95035

Phone: (408) 263-4411

Sugg. List Price: Internal, \$795, external, \$995

Product: Tallgrass TG-4060

Manufacturer: Tallgrass Technologies Corp. 11100 W. 82nd St. Overland Park, KS 66214

Phone: (913) 492-6002

Sugg. List Price: \$1,295

Product: Tecmar QT-60e (Ed. yes, a lower case "e")

Manufacturer: Tecmar Inc. 6225 Cochran Rd. Solon, OH 44139

Phone: (216) 349-0600

Sugg. List Price: \$1,495 (external) 1,365 (internal)

local hard disk and to floppy disks that you can lock away.

Third, do you work on your hard disk, not connected to a LAN? This gives you the most options. Any of the backup systems described here will work, but you have to consider the pros and cons of each based on your particular use of the computer, your environment (home or office), etc.

The fourth question is probably the most crucial: How much is your data worth to you? In other words, what are you willing to spend on a backup system? Take into account the value of your time and productivity if you had to painstakingly replace lost files. Of course some files, such as that great American novel, are priceless. How much are you willing to spend to protect them?

You must also consider the cost of the media. In removable media systems, the price of tapes or disks is a major factor in overall cost. For example, the price of a Bernoulli cartridge runs about \$140. For the cost of several of those, you could have bought a complete tape drive system.

Just how much backup storage should you have on hand? A rule of thumb is that you should have enough media to hold a

minimum of three complete backups. For peace of mind you might want sufficient backup storage to cover each day of the week. Tape drive users typically use between six and ten cassettes and rotate them so that each tape has at least one other generation of protection.

Remember, too, that you'll have to replace this magnetic media. None of these storage media lasts forever. All but the cartridge hard disks eventually wear out. Push a certain media beyond its expected life span and it doesn't matter what price you paid, or how diligent you were at following a backup schedule. Abuse the media and your data will die with it.

For example, DC600 cartridges (about \$35 each) are said to be good for between 5,000 to 6,000 passes. Some financial institutions replace them after only 50 or 60 passes. Prudence dictates that you replace all your tapes once a year—just in case.

The bottom line in backup strategy is that the best system is the one that gets used. The backup system that is easiest for you to put into action is also the one least likely to be ignored. Find that system. It's the best one for you. ■

Product: Maynstream System 60
Manufacturer: Maynard Electronics
460 E. Semoran Blvd.
Casselberry, FL 32707
Phone: (305) 331-6402
Sugg. List Price: \$1,995

DC2000 CARTRIDGE SYSTEMS

Product: ADIC TD-440
Manufacturer: Advanced Digital Information Corp.
14737 NE 87th
P.O. Box 2996
Redmond, WA 98052
Phone: (800) 336-1233; (206) 881-8004
Sugg. List Price: \$1,590 (external); \$1,390 (internal)

Product: Alloy Retriever 40
Manufacturer: Alloy Computer Products Inc.
100 Pennsylvania Ave.
Framingham, MA 01701
Phone: (617) 875-6100
Sugg. List Price: \$495

Product: Archive XL 5540
Manufacturer: Archive Corp.
1650 Sunflower
Costa Mesa, CA 92626
Phone: (714) 641-0279
Sugg. List Price: \$649 (for XT models); \$699 (for AT models)

Product: Irwin 145 (internal); Irwin 445 (external)
Manufacturer: Irwin Magnetic Systems Inc.
2101 Commonwealth Blvd.
Ann Arbor, MI 48105
Phone: (800) 421-1879; (313) 996-3300
Sugg. List Price: \$699 (internal); \$799 (external)

Product: MDI External MT-40P/AT
Manufacturer: Micro Design International Inc.
6985 University Blvd.
Winter Park, FL 32792
Phone: (800) 228-0891; (305) 677-8333
Sugg. List Price: \$595

Product: Mountain TD4440
Manufacturer: Mountain Computer Inc.
240 E. Hacienda Ave.
Campbell, CA 95008
Phone: (800) 458-0300
Sugg. List Price: Internal \$595; External \$745 (w/o power supply)

Product: Bridge-Tape
Manufacturer: Sysgen Inc.
556 Gibraltar Dr.
Milpitas, CA 95035
Phone: (408) 263-4411
Sugg. List Price: \$695

Product: TG-1040e HS (external); TG-1040i HS (internal)
Manufacturer: Tallgrass Technologies Corp.
11100 W. 82nd St.
Overland Park, KS 66214
Phone: (913) 492-6002
Sugg. List Price: \$995 (external); \$695 1040i (internal).

SOFTWARE BACKUP PACKAGES

Product: Back-It
Manufacturer: Gazelle Systems
42 N. Univesity Ave., #10
Provo, UT 84601
Phone: (801) 377-1288; 800-233-0383
Sugg. List Price: \$129.95

Product: Corefast
Manufacturer: Core International, Inc.
7171 N. Federal Hwy.
Boca Raton, FL 33431
Phone: (305) 977-6055
Sugg. List Price: \$149

Product: Fastback Plus
Manufacturer: Fifth Generation Systems
909 Electric Ave.
Suite 308
Seal Beach, CA 90740
Phone: (213) 493-4483
Sugg. List Price: \$179

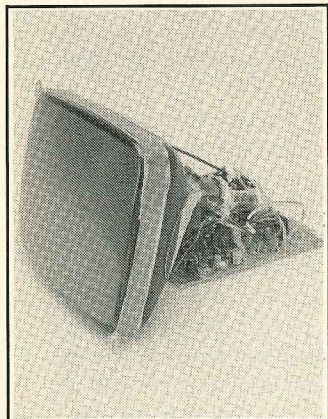
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Manufacturer: Sterling Software
11050 White Rock Rd. Ste. 100
Rancho Cordova, CA 95670
Phone: (916) 635-5535
Sugg. List Price: \$149.95

Product: Take Two Manager
Manufacturer: United Software Security Inc.
8133 Leesburgh Pike
Suite 800
Vienna, VA 22180
Phone: (800) 892-0007; (703) 556-0007
Sugg. List Price: \$139

Product: Video Trax
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330 Central Avenue
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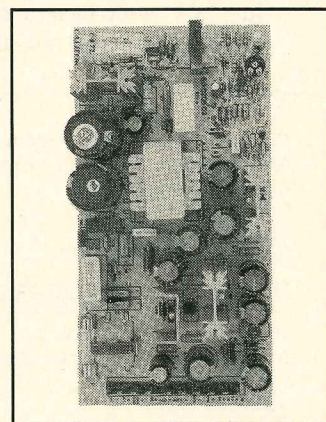
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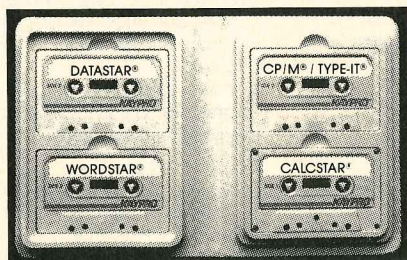


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QUICKBASIC AND TURBO BASIC

Two BASIC compilers that are anything but basic.

BY T.F. CHIANG

If you do programming in interpreted GW-BASIC and are now considering moving up to a compiled BASIC, you're in luck. Microsoft and Borland International are competing head to head in the arena of BASIC compilers; from these two companies we have two low-priced, feature-laden, super-fast BASIC compilers that bring high performance to the BASIC language.

BASIC is often criticized because it's an interpreted language and because it's supposedly less powerful than Pascal or C. However, these compiled versions of BASIC have plenty of extensions to the language, adding all the features that other languages offer. BASIC also offers an additional advantage: a powerful implementation that is *standardized*. The version of the language defined by BASICA and GW-BASIC provides support for sound, graphics (including CGA and EGA), direct access to memory locations (via PEEK and POKE), and a means for accessing the I/O ports on an IBM-compatible machine. Given all this, compiled BASIC is certainly not a bad choice for significant programming projects.

Before we consider the products themselves, let's briefly examine the differences between compilers and interpreters. With an interpreter like GW-BASIC, your program is translated into executable form one statement at a time, every time you run it. A compiler translates your entire program into executable form, but only once; after that, the program can be run by itself, and it runs much faster than if it were interpreted. Traditionally, using a compiler was much more difficult than using an interpreter: you wrote your entire program with a separate editor and then you tried the time-consuming compilation process, only to find syntax errors. So you went back to the editor to fix them, and then tried compiling again. Only once it compiled did you get to see the program execute, and if, upon seeing the output, you wanted to make any changes to your program, you had to go back to the editor, etc.

Borland's Turbo languages and Microsoft's Quick languages put an end to all of that. They integrated the editor and the compiler into one product, so you weren't constantly quitting and loading to switch between two separate programs. They also put the compiled program in memory instead of on disk,

and they made the compilation process so fast that it wasn't inconvenient to wait. The end result was a programming environment that was as easy to use as an interpreter, but that still offered the compiler's benefits of speedy program execution.

Now let's take a look at the newest versions of these two products: Microsoft QuickBASIC 4.0 and Borland Turbo BASIC 1.10.

LANGUAGE EXTENSIONS

The first difference you'll notice about a program in compiled BASIC is that lines don't have to be numbered; however, line numbers are accepted, so you can still use your GW-BASIC programs, or you can use line labels if you want. But the really significant enhancements to interpreted BASIC are the addition of procedures and functions and new flow-of-control statements.

GW-BASIC had DEF FN for single-line functions, but QuickBASIC and Turbo BASIC offer multi-line functions (declared FUNCTIONS in the former, DEF FN in the latter) and subroutines (declared with SUB and invoked with CALL in both products) that act like Pascal procedures. Both products support local variables, parameter passing, and full recursion, resulting in a BASIC that allows powerful modular programming, like Pascal or C.

Both products also offer improved flow-of-control statements, like block IF-THEN-ELSE statements, so you can execute multiple statements instead of just one; SELECT CASE, a general-purpose testing statement that replaces a long chain of IF-THEN's; flexible DO-LOOP constructions that let you test a condition at either the beginning or the end of the loop (WHILE-WEND statements are still supported); and EXIT statements to let you break out of these structures.

Many other features are included in both of these products: binary file mode; Hercules and VGA graphics support; support for a math coprocessor, or emulation if one isn't present; a more accurate format (the IEEE standard) for storing floating-point numbers; ability to enter assembly code in your program; and a long integer data type. QuickBASIC also offers user-defined data types, like records in Pascal.

The documentation for both products is excellent, describing their respective enhancements in detail. QuickBASIC comes with three manuals: an instruction manual, a BASIC language reference, and a volume discussing selected topics in QuickBASIC programming. Turbo BASIC's documentation is one manual, which is aimed more toward the beginner and covers the same ground more quickly. Each product comes with a disk of example programs.

COMPATIBILITY

With all these new language features, will QuickBASIC and Turbo BASIC still work with absolutely standard BASIC programs? For the most part, yes. However, there will be many programs written for GW-BASIC that won't run the first time you load them up with these BASIC compilers, and there are a couple of related reasons.

The first reason is based on the inherent differences in the way compilers and interpreters work. Without going into technical details, there are a couple of problems that you might

Both QuickBASIC and Turbo BASIC allow powerful modular programming, like Pascal or C.

encounter. Arrays have to be declared earlier in the program than where they're used, so your program can't begin with a GOSUB and declare its arrays down in a subroutine. A compiler also requires you to change the arguments to a few statements, such as DRAW; instead of "U=x" you'll have to use "U= +VARPTR\$(x)".

The other reason is more product specific: the compilers' extensions to the language mean that they will expect different things. For instance, both products offer dynamic and static arrays, but use static ones by default, while interpreted BASIC has only dynamic ones; errors may arise if you don't specify which kind you want. Another example is specific to QuickBASIC: it's fussier about structured programming and will produce syntax error messages for things like a NEXT between an IF-THEN and an ELSE, which GW-BASIC and Turbo BASIC both accept. However, all of these incompatibilities are easily fixed with a little editing.

THE PROGRAMMING ENVIRONMENT

Upon loading, both programs have a menu line at the top of the screen, with options such as File, Edit, Debug, and Run. In both programs, an option is selected by hitting Alt and the first letter, which highlights the name; you can use the cursor keys to move across the line, and hitting Return will give you the pull-down menu for the selected option (QuickBASIC supports

a mouse, and its environment is optimized for use with one). For either program, no matter whether you're in a pull-down menu or some other command box, the Escape key will pop you out.

QuickBASIC's edit window is almost the entire screen, and the cursor is automatically placed there; there is also something called the Immediate window at the bottom, which allows you to enter statements directly for immediate execution, allowing you to test them just as you would in the interpreted BASIC environment. You may bring up another editing window to work on two files. All of these windows extend across the entire screen, but you can change their vertical size. The entire screen becomes the output window when executing a program.

Turbo BASIC presents four windows—Edit (the largest one), Compile, Run, and Debug—and leaves the cursor on the menu line by default. You can zoom a window to occupy the full screen, or you can move windows, change their size, or stack them. Either program lets you reset all the screen colors.

Both programs offer online, context-sensitive help on their various functions. QuickBASIC has a help line at the bottom of the screen, which gives a one-line description of the option presently highlighted, and hitting F1 will present a single screen of general help. Hitting F1 in Turbo BASIC will give you multiple screenfuls of contextual help for you to page through. These fully describe whatever option the cursor is on and tell you when you should use the program's various features. When you're editing, QuickBASIC also gives you context-sensitive help with BASIC; hit Shift-F1 and a window will pop up giving the syntax of the BASIC statement your cursor is on.

Both programs' editors emulate WordStar, though QuickBASIC's editor uses fewer WordStar commands, and it has its own methods for searching and for defining blocks. This editor is clearly meant for use with a mouse (there are scroll bars along the edges of the edit window), and unfortunately it cannot be reconfigured. Turbo BASIC's editor is a perfect duplicate of Wordstar, right down to the options for searching, and the installation program allows you to totally redefine the editor if you choose.

Both editors give you the cursor position in the status line, which is very useful for editing a program without line numbers. One characteristic of QuickBASIC's syntax-checking (see below) is that the editor requires you to open a separate edit screen when entering functions or subroutines, forcing you to switch the edit screen to see them; or you can split the screen and work with two.

COMPILING AND RUNNING

Version 4.0 of QuickBASIC introduces an innovative feature for programming environments: precompilation and syntax-checking of your program code as you type it in. Put plainly, that means that when you're entering your program in the editor, every line you write is checked for proper syntax and is partially compiled. If a line contains incorrect syntax, an error message pops up, signalling you to correct it. By the time you've fin-

ished entering your program, it should be ready to run.

When you choose Run, the program is almost totally compiled: all that's left is something called the "binding" process, which takes only a moment even for large programs. Thus there is no compilation delay, and the program executes immediately. However, the program is not compiled into native code (the executable code that normal compilers produce), but into an intermediate code; when you run the program, QuickBASIC is actually acting as an interpreter for this intermediate code. This lets your entire program be error-checked and converted into executable form, similar to normal compilation, but without the delay. However, the execution of this interpreted code is not as fast as with an actually compiled program; for some operations, it's no faster than GW-BASIC. When you choose to produce an .EXE file on disk, QuickBASIC performs normal compilation that results in speedy execution of the finished product.

The syntax checking adopts a kind of "pretty print" format, so the editor automatically capitalizes all reserved words and inserts optional spaces and punctuation (like closing quotes for PRINT) for readability. The actual syntax checking is handy, but on-the-fly syntax checking, by its nature, cannot be as complete as that performed by a real compiler. It will present error messages such as "Expected: expression" if you typed IF GOTO, and it will check the arguments for certain statements. Because syntax checking is performed for individual statements, unmatched FORs and NEXTs aren't flagged. It also can't perform type checking on operations on variables, and it considers misspelled words to be procedure calls. Only during the binding process will errors of these types be found, in which case the cursor is returned to the editing window with an error message. Run-time errors during the program's interpreted execution also take you back to the editing window, and Ctrl-Break interrupts execution of a program.

Turbo BASIC lets you choose to Compile your program, or compile and Run it. The compilation process is extremely fast, and while it's happening the Compile window displays the number of lines compiled so far and the number of seconds taken. If a syntax error is found, the cursor is placed at the statement in the edit window, with a message describing the error. The same thing occurs if a run-time error occurs when you're executing the program in memory. To interrupt the program while executing with Ctrl-Break, you must set a compiler option beforehand.

Compilation to disk is very different for the two products. When QuickBASIC has to actually compile a program instead of merely interpret it, it is much slower and will flag errors it didn't find during the binding process. Moreover, it compiles to an object file (with .OBJ as the file type), which requires the runtime module (BRUN40.EXE) to actually execute it. To produce a stand-alone .EXE file, you must use the linker, which takes still more time. By contrast, Turbo BASIC first compiles to memory with its usual blazing speed and then simply writes the program out to disk as an .EXE file, scarcely taking longer than its normal in-memory compilation.

If a run-time error halts execution when you're running the program as an .EXE file, QuickBASIC gives the address at which the error occurred, which is not very useful. With a compiler option set to produce debug code (producing a larger and slower .EXE file), you get the number of the line where the error occurred, but only if you used line numbers. The .EXE files produced by Turbo BASIC are more helpful: you automatically receive a number called the program counter when a run-time error occurs, and if you go back to Turbo BASIC, the Debug menu has an option that takes the program counter and locates the statement in the source code where the error occurred.

DEBUGGING

In case you're not familiar with them, debuggers are programming tools that allow you to examine the course of the execution of your program. In GW-BASIC, for instance, the TRON statement is a simple debugging command—it prints out the number of the line presently being executed. Debuggers are especially important when you're working with a compiled language. They can answer questions like "Why is my program crashing during the calculation routine?" If your compiled program is behaving improperly, a debugger allows you to peek inside and see just which lines are causing the problems and what exactly is going wrong. A powerful debugger can be a significant timesaver in tracking down your bugs when you're working on a large program.

BENCHMARKS

Below are the results of benchmarks run on BASICA, Turbo BASIC and QuickBASIC. The SIEVE program tests general execution speed, the SAVAGE program tests speed and accuracy of floating point operations, FILEIO tests floppy disk I/O speed, and SCRN tests screen output speed. COMP was a 2,000-line program (consisting of the other benchmarks, repeated) to test compilation speed to disk for a large program. All execution times are for .EXE files; QuickBASIC's speed in interpreted mode was much slower. All tests were performed on an 8 MHz AT with a hard disk and 80287 coprocessor. All times are given in seconds, unless otherwise specified.

	BASICA	Turbo	Quick
SIEVE	(25 min)	8.40	7.97
SAVAGE	49.43	4.39	4.45
error	215	5 × 10e - 12	5 × 10e - 12
FILEIO	267	98.82	76.51
SCRN	1.5	0.164	0.488
COMP			
compilation speed		9 (.EXE)	25 (.OBJ) 44 (.EXE)

QuickBASIC has some fine debugging capabilities built in. On the Debug menu are several options, including a trace function, which displays the source listing of your program and highlights each statement as it's executed. You can single-step through the listing, so that each successive statement

*QuickBASIC has some fine
debugging capabilities
built in; Turbo BASIC's
are very limited.*

is executed only when you're ready, or you can let the program run automatically while you watch. Earlier versions of QuickBASIC presented two windows, an output window and a source window, so you could simultaneously see both the program's output and the lines that were being executed. Unfortunately, version 4.0 does not retain this excellent feature. Instead, it switches the entire screen back and forth from output to source listing every time a line causes screen output. This makes the screen switch back and forth dizzyingly, rather like a strobe lamp, making the trace function useless for program segments that involve screen output. However, it works fine for sections that are purely internal calculation or data manipulation.

Some of QuickBASIC's remaining debugging features that are worthy of mention are the history function, the ability to set breakpoints, and the watch variable function. Setting the history function on makes QuickBASIC continuously remember the last 20 lines executed. If your program crashes or ends up in a strange spot, you can step through the last 20 lines to see how your program got itself into its mess. Breakpoints cause program execution to halt at a specified line, so you can set one right before a troublesome section of code; the program will run as usual until it reaches the breakpoint, where it will halt so that you can closely examine the trouble spot by single-stepping. Finally, you can tell QuickBASIC to watch a particular variable's value; whenever you're single-stepping or tracing, an onscreen window constantly displays the present value of one or more specified variables. This lets you know whether your variable is being incremented properly, or whether a calculation is running smoothly. The history and watch variable functions slow down the interpreter's speed significantly.

Turbo BASIC, on the other hand, has very limited debugging capabilities. All it offers is the TRON statement and a window to display the line numbers only, without the source code. If the lines of your program aren't numbered, then nothing is displayed at all, except line labels and the names of procedures or functions when they're called. For programs that draw

graphics on the screen, this function works very poorly, writing line numbers over your graphics.

MORE DIFFERENCES AND SOME RECOMMENDATIONS

Both QuickBASIC and Turbo BASIC have many other more advanced features that can't be described here because of space limitations, but depending on your programming interests, they may be the deciding factor in choosing a product.

If you're a programmer in interpreted BASIC and/or Turbo Pascal, Turbo BASIC may be the product to choose. It has a comfortable environment (which I personally prefer to QuickBASIC's), and even its powerful features are easy to learn and use. However, Turbo BASIC doesn't allow separate compilation of individual components of a large program; you can break up a giant program into multiple source files, but you have to compile all of them at once. This is a significant drawback, even given its compilation speed. Turbo BASIC also lacks real debugging capabilities, which are invaluable for major programming.

Serious programmers who have used the compiler/linker combinations of other languages may prefer the high-powered features of QuickBASIC. It supports breaking up a giant program into logical modules, and it allows separate compilation and linking, creation of user libraries of routines, and interlanguage calling, with special support for routines written in C. It also has a debugger that falls just short of excellent (because it lacks multiple windows for its trace function). However, QuickBASIC's advanced features for producing large programs are not simple to learn, and you may have no need for them.

Thus, your intended application will determine which BASIC is actually best for you. Both products are excellent programming environments that leave interpreted BASIC in the dust, and either will increase your productivity. And the way things look now, Microsoft and Borland won't leave these products alone. Who knows what will be in the next versions?

T.F. Chiang is a student at Brown University and is a regular contributor to PROFILES.

QUICK REFERENCE SUMMARY

Product: QuickBASIC 4.0
Manufacturer: Microsoft Corporation
 16011 NE 36th Way
 Box 97017
 Redmond, WA 98073-9717
Phone: (800) 426-9400; in Washington, (206) 882-8088
Sugg. List Price: \$99

Product: Turbo BASIC 1.10
Manufacturer: Borland International
 4585 Scotts Valley Drive
 Scotts Valley, CA 95066
Phone: (408) 438-8400
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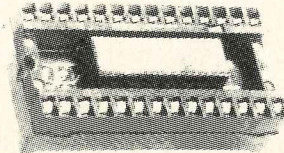
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BY BENJAMIN H. COHEN



We're all aware of the strengths of MS-DOS machines—they have great graphics, they can handle huge spread-sheets, etc. But CP/M is still hard to beat when it comes to word processing, a major use for computers in the business world. And while content is obviously important in a business document, appearance also counts for a lot. Often it is the only contact you have with certain clients or colleagues, so it pays to make the best possible impression.

Because presenting a professional image is so important, dot-matrix printers are generally shunned except for internal memos and rough drafts. Daisywheel printers and carbon ribbons used to be the only way to obtain a businesslike appearance for printed material, but now laser printers are the tool of choice.

Unfortunately, a lot of people are still under the impression that laser printers will not work under CP/M. But as long as your software contains the commands to control a laser printer, the printer doesn't care what computer is sending them.

It's true that CP/M users don't have a wide choice—even the CP/M version of WordStar 4.0 provides only limited laser printer control—but there is a package that gives you all the control you could want: Magic Print, a print-time formatting program from Computer EdiType Systems. Available in both CP/M and MS-DOS versions, it supports HP LaserJets and compatibles. (There are also several companion products: Magic

Index for indexes, Magic Bind to do automatic section and chapter numbering, and Magic Font to provide downloadable laser fonts, which are available for CP/M).

Although we will be looking at the CP/M version of Magic Print in this article, the information applies equally to the MS-DOS version. (An earlier version of the program without laser printer support was covered in "Text Formatting and Beyond," which appeared in the February 1986 issue of *PROFILES*.)

WHAT MAGIC PRINT DOES

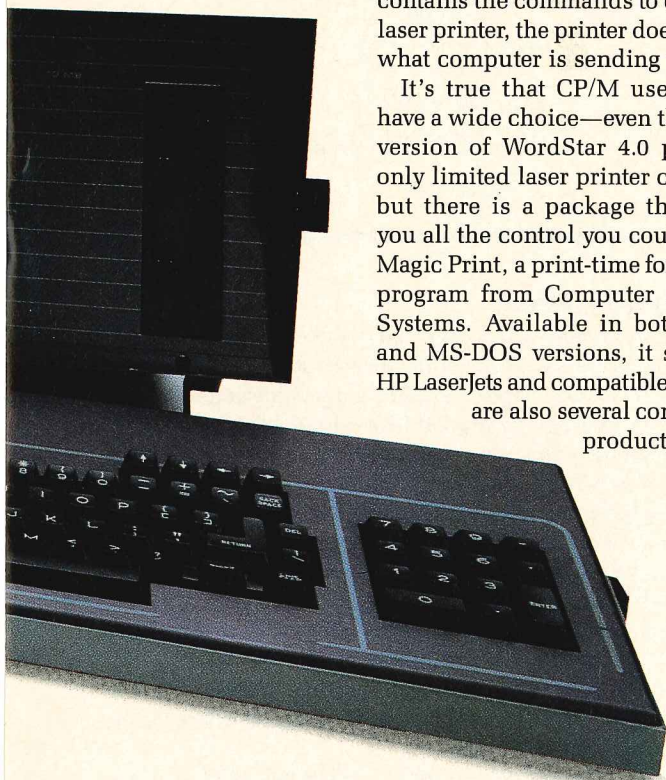
Magic Print lets you format text files before printing in much the same way you format documents with WordStar—commands to Magic Print are control characters embedded in your text and dot commands on separate lines. However, unlike WordStar, what you see on the screen is not what you get on the paper, and Magic Print offers much more precise control of the finished document.

One of Magic Print's key features is "true" proportional spacing. Standard typewriting allots the same amount of space to each letter—an "i" is given the same space as a "w." Simple proportional spacing (as offered in WordStar 3.3) allots more space for wider characters and less for narrow characters. Proportional spacing looks better and is easier to read. "True" proportional spacing goes a step further. In simple proportional spacing, what you see on a line on the screen is what's printed on a line on paper, even if, for example, it has a lot of skinny characters, making a short line. With true proportional spacing, the software adds up the widths of characters until the total equals the length of a line. Then it drops off the last word, and only then it decides on the spacing to make the letters fit the line. If the text on one line is not enough, more text from the next line is brought up to fill the printed line.

Magic Print's other capabilities, which will be discussed in more detail below, include automatic footnoting, column printing (up to four columns automatically), multiple-line headers and footers, proportional or fixed outdenting, multi-tray sheet feeder control, widow and orphan line control, left and right indents, variable sub- and super-scripts, pitch variation, onscreen text preview, six levels of boldface, variable character strike-outs, solid or broken underlines, right flush printing on partial lines, and precision centering.

USING MAGIC PRINT

You don't create your file with Magic Print: You use WordStar, Perfect Writer, or any editor or word



processor that can create an ASCII file. It's not until you begin to print the file that Magic Print starts calculating each line's length and layout.

Magic Print recognizes many of WordStar's embedded commands, so if you create your document with WordStar some of your work will already be done. WordStar's underscore, double-strike, bold, sub- and super-script, overstrike (for accents), form feed, and non-break space commands all work with Magic Print.

Dot commands are a different story. For one thing, Magic Print dot commands begin with two periods, which WordStar interprets as a non-printing comment. That allows you to use WordStar to revise files intended for Magic Print without confusing WordStar. Also, Magic Print's dot commands are different from WordStar's—only a few of them closely resemble WordStar dot commands, so WordStar users will have to learn a whole new set of them.

A few of the Magic Print dot commands are *almost* the same as WordStar's. Setting the initial page number, for instance, is “.Pn” in Magic Print and “.Pn” in WordStar. Other Magic Print dot commands perform similar functions to WordStar dot commands, but use different letters. Vertical motion is controlled in 48ths of an inch, just as in WordStar's “.lh” command, but the command is “.v”. Sub- and super-script roll in Magic Print is controlled by “.vv” instead of “.sr,” and character width is “.h” instead of WordStar's “.cw.”

In some areas Magic Print uses a different approach than WordStar to the same problem. Instead of setting left and right margins, Magic Print sets line length (“.l”), left margin indent (“.i”), and right margin indent (“.w”). The combination of these commands gives Magic Print users a great deal of flexibility in formatting.

Still other Magic Print functions are the same as WordStar's, but they're done differently. Centering, for instance, is done with a dot command, and the line is not physically centered on the screen. The centering command allows up to nine consecutive lines to be centered with one command. Also, centering is calculated to the nearest 720th of an inch, instead of the coarse full-character-width steps used by WordStar. This means no more funny looking pairs of lines that are sort of centered but not quite.

BREAKING NEW GROUND

It's the commands totally unrelated to anything WordStar has to offer that give Magic Print most of its power. Many of these are available for daisywheel printers, as well as for the HP LaserJet and compatibles. The backline or reverse leading command (“.b”), for example, lets you divide a header or footer line into three segments: flush left, centered, and flush right. The header text is entered in three segments, each beginning on a new line. After the first line you would enter dot commands to move back one line and center the next line. After the second line are dot commands to back up one line again and print flush right. The left and right flush segments can be alternated on odd and even pages. The only constraint is that each header or footer is limited to a 250-character maximum length.

Magic Print will also format text into columns with its “.k” command. You can have up to four columns and adjust the distance between the columns. Column mode does have some limitations: variable widow and orphan control (which lets you decide how many words constitute a widow or orphan) is suppressed, and footnotes aren't supported. A bi-directional tractor is required if you are using a daisywheel printer, since Magic Print prints one column and then backs up to start the second column. If your printer can't do this accurately, the columns won't line up evenly.

If you want to print your text on both sides of the page, Magic Print prints odd and even pages separately. A simple command at print time offsets odd and even pages for later reproduction with extra margin at the binding edge.

One of
Magic Print's
key features is
“true” proportional
spacing.

LASER PRINTER SUPPORT

Magic Print provides a whole new batch of commands specifically for laser printers. These control cartridge selection, font selection, symbol sets, page orientation, modification of width tables, and, with Magic Font, soft (downloadable) fonts.

Because Magic Print uses complex command sequences triggered and ended by a tilde (~) to control cartridge and font selection, a word processing program with built-in macro functions (such as WordStar 4 or VDE) or a key redefinition program (such as SmartKey, XtraKey, or GKey2) is recommended to enter these commands without a high probability of error. For example, using Hewlett Packard's B font cartridge, the command to put a word in bold italics is: ^B~d)~bold~(~^B. That's six keystrokes before the word and five after it, and it's a wonderful opportunity to leave out an essential character if you're entering them manually.

Magic Print lets you do a number of things with a laser printer, including print variable width lines both horizontally and vertically, do six levels of bold print, and draw boxes around sections of text.

It also makes columnar tables easy to do. They are often a problem, especially with proportional spacing. Since not all letters take up the same amount of space, the columns may not line up properly. The laser printer version of Magic Print gives you two ways to do it: the back line method with margin changes described earlier for headers and footers, or by setting absolute tab stops. Absolute tab stops are tab stops set at specific distances, measured in inches, from the left margin. You then enter tabs to move from the end of one column to the

*It's the
commands totally unrelated
to anything WordStar offers
that give Magic Print
its power.*

beginning of the next. These tab stops can be set and changed without moving the text. The result is tables with the beginning of each column aligned—even with proportionally spaced text and numbers.

Magic Print also lets you do kerning—that is, remove unwanted space between certain pairs of letters. This is necessary because no matter how you set up a table of character spacing, some letter combinations print clumsily. An example is the space between an uppercase “T” followed by a lowercase “e.” Expensive typesetting equipment automatically moves the “e” in under the cross bar of the “T.” Magic Print lets you manually kern specific letter pairs so that they are easier to read.

PRINTING SPEED

Magic Print does a lot—it has to calculate each line's length at print time and then space it properly, adding the spaces between characters and words to make it look good—and that takes time. You won't get eight pages a minute (the LaserJet's claimed speed) of proportionally spaced text with a laser printer when using Magic Print.

However, Magic Print's performance needs to be put in perspective. The LaserJet won't really print eight pages a minute anyway unless you are repeating the same page. With New-Word 2.16 you can print about 5.2 pages a minute of proportionally spaced text on the LaserJet, and WordStar 4 does about 1.3 pages a minute. How fast Magic Print will push pages out of your LaserJet depends on how fancy your text is. If you change fonts frequently, the computer must send long escape sequences to the LaserJet and wait for the printer to load the new font. Those operations take time. During a recent project that had quite a few font changes on every page, we got a page about every 40 seconds with a 4 Mhz CP/M system. It may interest CP/M users to learn that in a test with an MS-DOS XT, it took two to three times as long to print the same file with the MS-DOS version of Magic Print. And some people think MS-DOS outperforms CP/M in every way!

(If you are using a daisywheel printer, Magic Print can “think” faster than your printer, so printing with Magic Print won't take longer per character. It will, however, take longer per page, since Magic Print puts more characters on the page.)

DOCUMENTATION AND SUPPORT

The Magic Print manual is comprehensive and not difficult to understand, but there is one problem: Magic Bind includes

Magic Print, and Magic Index includes Magic Print and Magic Bind, so there are separate manual segments with separate indices for each. Unfortunately, recent additions to the programs have not brought with them a rewritten manual, but two separate addenda, only one of which has an index. The information is all there, but it needs to be reorganized into a single comprehensive manual.

The support people at Computer EdiType are knowledgeable and helpful. Technical questions that can't be answered by the person who picks up the telephone are quickly referred to Ben Jone, who wrote the program and uses it daily. One user encountered a persistent bug that no one could track down over the phone. Jone asked that person to perform a print to disk and send it to him so he could better evaluate the problem. The bug was found and an upgrade provided for free. If you use Magic Series and have problems, by all means report them in full. These people care about the product.

*Magic Print
does a lot,
and it takes time,
so you won't get
eight pages a minute
on a laser printer.*

SUMMARY

Magic Print gives CP/M users the ability to produce text with top-notch laser printer appearance. It isn't desktop publishing with graphics of the type that Ventura Publisher or PageMaker can produce, but for straight text it gives excellent results. Users have published 900-page books with it, and I produce a 12-page monthly computer user group newsletter using it. With a laser printer, a CP/M Kaypro, and Magic Print you can produce text equal to the best that MS-DOS can do—and you can do it faster. ■

Ben Cohen is a lawyer in Chicago. For three years he was the president of a CP/M user group, and for the past two years has been the editor of its newsletter. He has written for User's Guide magazine and Morrow Owners' Review.

QUICK REFERENCE SUMMARY

Product: Magic Print

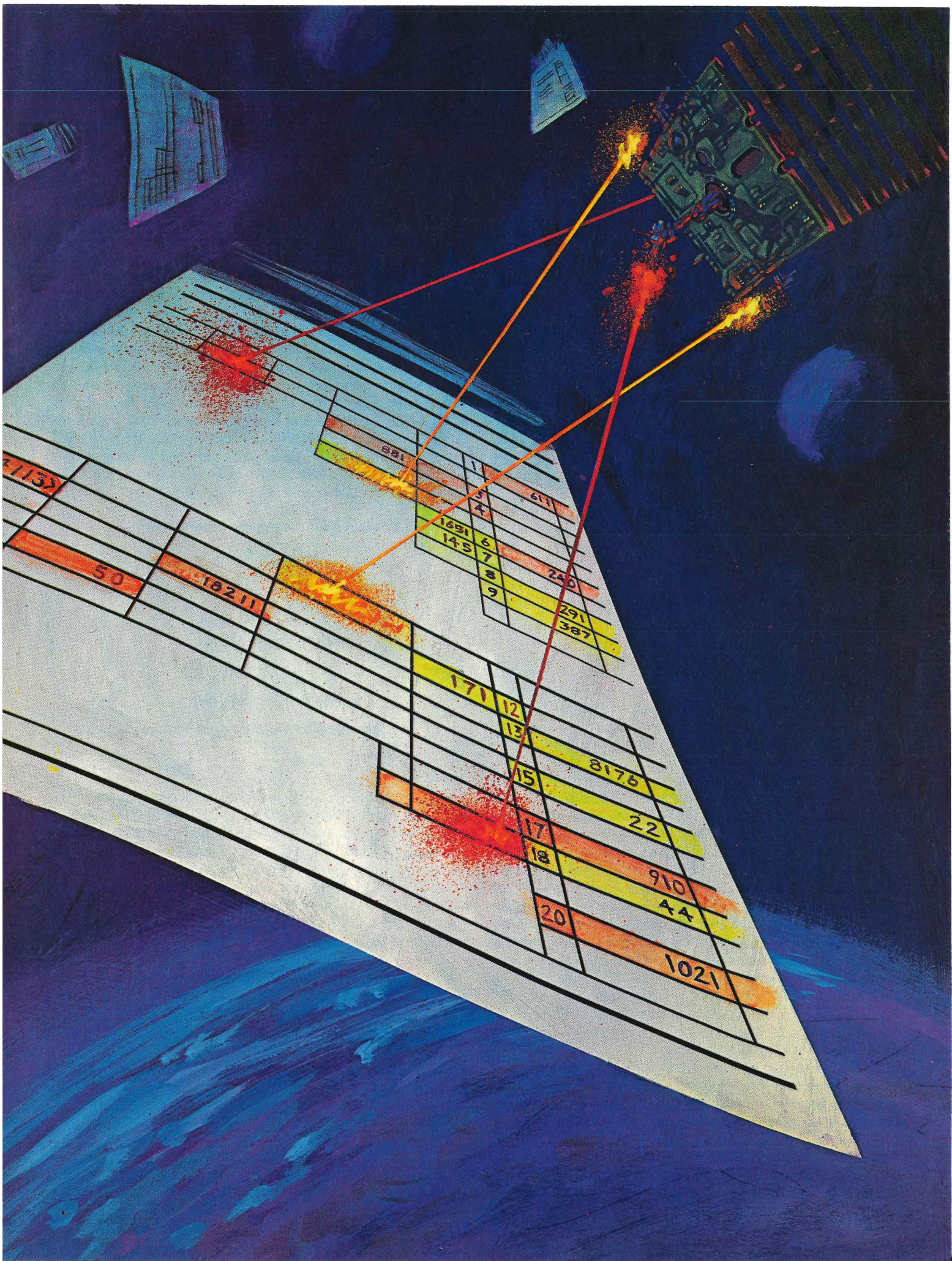
Manufacturer: Computer EdiType Systems

509 Cathedral Parkway, #10-A

New York, NY 10022

Phone: (212) 222-8148

Sugg. Retail Price: Magic Print, \$150 (Magic Bind, \$195; Magic Index, \$245; Magic Font, \$59; font disks, \$50 each [six available], or \$200 for the complete set.)



115

50

10211

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20

1021

SPACES: THE FINAL FRONTIER

At last you can fill in pre-printed forms
using WordStar 4.0.

BY STEVE GILLILAND

WordStar is great. If a typewriter was good, WordStar is better...except when it comes to pre-printed forms: government forms, tax forms, company forms—any piece of paper on which data must be in precisely the right place on blank lines or in teeny little boxes. For pre-printed forms, anything is easier than a word processor. Or it was, until WordStar 4.0. Now, WordStar and MailMerge together allow you to control the movement of the paper in the printer.

WordStar 4.0 will tell your printer exactly where data on pre-printed forms should go, and it will put it there every time. Forms you fill out infrequently may still be done by hand, but those used every day can be automated quickly and easily, once you get the knack.

This article will show you how. It assumes you have WordStar 4.0 and are familiar with WSCHANGE and WordStar's dot commands, especially those dealing with line height, character width, and the merge feature of WordStar 4.0.

In this article, several conventions are used: the caret (^) sign indicates a control character. Thus, ^OO means hold down the "Ctrl" key, press "O", release the "Ctrl" key, and press "O" again. Characters in **boldface** are to be typed exactly as written, except for variable names, which will change for your form. An (n) in an example dot command or variable—for example, ".SV(n)" or "&xxx&/(n)"—means that you enter the number appropriate for your forms, without the parentheses. "&xxx&" means that you enter the variable name you have assigned to a blank line on the form you are setting up for merge printing.

Also, WordStar doesn't care if dot commands or variables are upper or lower case, but upper case makes them easy to distinguish from text. Finally, have a tape measure handy.

GETTING STARTED

There are six steps in creating files to fill in the blanks on pre-printed forms:

1. Turn unwanted WordStar features off and set page format

in master file (using miscellaneous dot commands).

2. Calculate line height and set character width in master file (.LH and .CW);
3. Name variables and set variable size (.RV and .SV).
4. Create data file (.DF).
5. Enter variable names in master file (&xxx&/n).
6. Fine tune master file for precise variable placement on the form.

Two notes of caution: use all of the indicated dot commands, and create the master file using the non-document (n) mode.

As you work, remember that merge print files are actually computer programs. Like all programs, they must be exactly right or they won't work. Patience and precision are useful virtues.

Now find a few blank copies of a pre-printed form you use frequently. If you have several such forms, start with the simplest.

Before going further, make sure your printer is up to the task. Print the PRINT.TST file from the WordStar 4.0 INSTALLATION disk. If your printer performs the variable line height tricks on page two, you're in business. Ninety-five per cent of printers supported by WordStar 4.0 will work. Use WSCHANGE to install the printer drivers ASCII and PRVIEW.

SIZING UP YOUR FORM

Open the master file using "n" (non-document) instead of "d". Name it anything you like. This is where you put the commands to precisely fill in the blanks on your form. The order of the dot commands isn't terribly important, but those that show a "1" in the flag line at the right of your screen must be at the top of the file.

Set up the essential page format with the following:

- .MT 0 (set top margin to 0)
- .MB 0 (set bottom margin to 0)
- .LH (n) (set line height as instructed below)
- .RM (n) (set right margin as instructed below)
- .PO (n) (set page offset as instructed below)

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WORDSTAR FORMS

To determine margins and page offset, measure the width of the blank form at its widest point, excluding the right margin of the form. Leave the left margin at the default value (one) and set the right margin to the measured width. For example, if your character width is 10 cpi, the width of the form is 8.5 inches, and the right margin of the form is 1/2 inch, set the right margin at 80. Use the dot command .RM (.RM 80), not the ^OR command.

Set page offset to the width of the left margin of the form. If it's 1/2 inch, use .PO 5.

Most of the horizontal lines of typed material on your form will be a fixed distance apart. Put the one-inch line of your tape measure at the top of one line. Count the lines of type or blank lines between the one-inch mark and the two-inch mark, including the lines that rest on the one-inch and two-inch marks. If there are three lines per inch, the line height command (.LH) is $48/3 = 16$ or .LH16. Calculate the number of lines per inch as closely as your tape measure will allow and make your best guess. Some lines on the form may not conform to the predominant line spacing of the page. We'll address that later.

Now add these dot commands:

- .OP (omit page numbers)
- .CW 10 (set character width to 10 characters per inch)
- .OJ OFF (right justification off)
- .UJ OFF (microjustification off)
- .PS OFF (proportional spacing off)
- .PF OFF (print-time formatting off)
- .AW OFF (word wrap off)

Check your line spacing (.LH). Just below the last dot command, type a line of dashes with a space after every eighth or ninth dash. Mark (^KB and ^KK) the line. Delete with ^KY. Use ^U to undelete the line, then go to the next line and undelete again. Repeat until you have a page of lines made up of dashes. Print the page on blank paper.

Place this page over your blank form and hold it up to a strong light. With luck you'll be able to see through to the form below. Adjust the first line of dashes so that it lines up exactly with the first line of your blank form. The rest of the lines on each page should be aligned. If they're not, go back to your file, adjust the .LH command, and try again. Be patient. Don't worry now about getting the first line to start printing at precisely the right spot, or about lines (or partial lines) on the form that aren't quite right. We'll fix that later. When the majority of lines on the two forms match, move on.

SETTING UP THE VARIABLES

Next, assign a name to each blank on the form. These names are the "variables" used in your master file and in your data file. They might be NAME, ADDR, CITY, ST, or whatever. Make a note of these names on a scratch pad. If there are multiple-line blanks to be filled out in answer to one question, assign

each blank line a name, perhaps BLNK1, BLNK2, and BLNK3. Don't overlook any blanks and don't use duplicate names unless the duplicate name uses the same data as the original.

Now measure the length of each blank to determine how many characters will fill it. If your NAME blank is three inches long and .CW is set for 10 cpi, you have room for a maximum of 30 characters in the NAME blank. Plan for 27, leaving a space at the beginning and two at the end of the line. If that's enough for the longest name you will ever put in that blank, great. If it's not, adjust .CW for more characters per inch. Repeat for each blank and note the length determined for each name on your scratch pad.

Now create your data file. (See the accompanying article for details on making this task easier.) When you've finished, open the master file again, delete the dashes, and enter as the next dot command:

.DF xxx (name of your data file)

Start the next line (below ".DF") with .RV (Read Variable). Skip a space and enter the name you have chosen for each

Most forms
have questions
that require you to
check a box,
and there's an easy way
to deal with
them.

blank, separating names only by commas, not spaces. When you use about half the line, press **Enter** and start a new line with .RV. Don't use a comma after the last item on each line. You may use as many .RV lines as you need. The variable names in the .RV lines must be in exactly the same order as in your data file.

Winning the lottery just got easier!

Now the best is even better

LOTTO LOGIC, the scientific software program that improves your odds of winning the lottery, has recently been updated and is now more effective than ever before. The sophisticated statistical analysis of the original program has been retained, but customer feedback and our own research have produced the following additions and improvements:

1. A "check your tickets" feature. Your selections can be saved to a file and then checked for you against the winning numbers.
2. The program will now draw from a file of larger number combinations than on the tickets entered in your lottery. For example, if your lottery has a bonus number you can store past number picks of seven in the data base and the program will select picks of six numbers, while dealing statistically with the seventh number. Or, for lotteries like the Pennsylvania Super 7, a data base of eleven number picks will statistically produce sets of seven number combinations.
3. More wheels! We have added every Dimitrov Wheeling System in existence, for a total of 57.
4. Three new picking systems have been incorporated: a Total Average System that determines the average of the sum of past winning combinations, then produces combinations of top numbers within that range; a Last Ten System using numbers that have occurred in the last ten drawings (from which 85% of the winning numbers in any lottery come); and a Permutation System that will produce all possible combinations of top numbers.

5. Data base files can now be changed without exiting the program.

6. Data entry has been simplified.

7. A completely revised and updated manual has been written to accompany these changes.

It's so easy.

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"First time I used your program I played 42 picks in the New York lottery and won \$420.00."

P. Hornbuckle, Haupaug, NY

"First time I scored five in a row (value, \$4,000.00) and three in a row (value, \$5.00). Your program is excellent; it uses statistics in a real-world approach, not random theory."

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Be sure to see the review of LOTTO LOGIC in the August '87 issue of **COMPUTER SHOPPER!** (page 212)

Lotto Logic

The next dot command makes use of a new WordStar feature, the fixed-length set variable. The uses of this feature are many, but we will be concerned only with the command that fixes the allowable length of variable data and the one that places that data flush left at the beginning of the space assigned to the variable.

To create the .SV dot commands, go to your list of character lengths for each variable and number each variable, using a single digit or letter (you may not use the letter "o"). It makes

sense to start with the smallest variable length and work up, but it's not necessary. For each different length, use one .SV command followed by the number or letter identifying it, a comma, a space, and an "L" for each character allowed in the variable. Your .SV commands might look like this:

.SV 1, L (This variable contains one character or less, printed flush left)

.SV 2, LL (two characters, flush left)

Error-Free and Automatic: Painless Data Files

The WordStar merge-print data file format is terrible. Entering large amounts of data without error is almost impossible. One misplaced comma, quotation mark, or carriage return renders the remainder of the file worthless. If the error occurs in record 250 of 1,000, 750 pieces of letterhead stationery might be ruined. Fortunately, there are some quick and easy alternatives to entering data directly into the awkward comma-delimited format WordStar demands. To understand why alternatives are necessary, we need to look at how merge-print works.

When merge-printing, WordStar prints text in the master file until it encounters a variable. A variable is data that varies with each document being printed, such as name, address, and zip code. WordStar reads the variable name (&NAME&), goes to the .RV (read variable) lines, and looks for the variable name. As it looks, it counts field separators (commas or hard returns). When it comes to the variable name in the .RV line, it goes to the current line of data (a record) in the data file (.DF) and counts commas again. When it reaches the number of commas counted in the .RV line, it stops, reads the data between that comma and the next (a field), prints the data in place of &NAME&, and continues printing until it reaches the next variable in the master file.

If WordStar encounters a comma that is part of a field but is not intended as a separator, it blithely counts that comma, too. This throws off the count in the rest of the data file, resulting in garbage in your merge-printed text—the one being printed and all those that come after. The same confusion results from an extra blank line because hard returns are also counted as

commas. WordStar provides a couple of haywire fixes, both of which redirect the problem without solving it.

First, if a comma is enclosed by quotation marks, that comma is ignored during comma count. The safest way to eliminate "don't count me" commas is to enclose all of every field in quotation marks, writing field separators as (";") instead of (,).

Second, you can use WSCHANGE or a note in the .DF line to change the character used as a separator to anything you like.

But no matter what you do to ease things, typing directly into the data file format is programming: one little error dooms the merge-print operation. Here are three ways to let WordStar do the detail work, create perfect data files, and preserve your sanity:

LET YOUR DATABASE DO IT

The first solution may be no further away than your database. Many database programs provide for "exporting" a file to a "comma-separated," "WordStar," "ASCII," or similarly named format. Chances are this will be exactly what WordStar needs for merge-printing. Create a database file to hold merge-print variables, enter data, and export to the comma-separated format, and make this file your merge-print data file. Make sure the ".RV" lines in your master file contain variable names for each of the fields in each database record, even if the merge-print document doesn't use them. If your database will do this, your problems are over. If it won't, read on.

TURN IT OVER TO WORDSTAR

WordStar 4.0 itself can do the trick in two ways, using the ".AV," ".DM," and ".CS" dot commands and merge-print. In the first method, suppose you wish to create a standard data file containing name and address labels. Your variable names might be NAME, ADDR, CITY, ST, and ZIP. A typical master file for creating data files follows. Three caveats: Be sure to use all the indicated dot commands to make sure nothing extraneous finds its way into the file; put all variables for one merged document on the same line, regardless of the length of that line; and create the master file using the non-document (n) mode.

.SV 3, LLL (and so on...)
 .SV 4, LLLLLL
 .SV 5, LLLLLLLLLL
 .SV 6, LLLLLLLLLLLLLLLLLLLLLLLLLLLLLL

When printing the master file, WordStar will force each variable to take up the space indicated by the assigned .SV. If the data is shorter, blanks fill out the space; if it's longer, the data is cut off.

You now have dot commands setting up page format, listing the names of your variables (.RV), and defining the length of each (.SV). Your data file contains the data for each variable. Next, let's see about placing those variables in the master file.

FINISHING THE MASTER FILE

WordStar prints a variable string when it encounters a variable name enclosed by ampersands (&NAME&). The length of the variable is forced to a certain spacing when the variable name

.PL 1 (page length 1 line)
 .MT 0 (set top page margin to 0)
 .MB 0 (set bottom page margin to 0)
 .OP (omit page numbers)
 .RP n (repeat n times)
 .AW OFF (word wrap off)
 .UJ OFF (microjustification off)
 .OJ OFF (justification off)
 .PO 0 (set page offset to 0)
 .RP 200 (number of items to enter)
 .AV NAME
 .AV ADDR
 .AV CITY
 .AV ST.
 .AV ZIP
 &NAME&',' &ADDR&','&CITY&','&ST.&','&ZIP&'

.AV commands replace the .RV lines usually found in a merge file. If you wish, you might also use .DM to display messages while printing and .CS lines to clear the screen.

To enter data in what will become your data file, press "M" to merge-print the master file and type "Enter." Run through the print time questions until you reach "Name of Printer?". Select ASCII and start printing. WordStar will go through the master file as many times as you requested in the .RP (repeat) line, stopping at each variable to ask you for data. Data entered will be printed to the file called ASCII.WS in a perfect data file format. Use this file as your .DF file when you print labels or form letters.

FORGET ABOUT DATA FILES?

Finally, there's a solution that eliminates data files altogether. Suppose you have created a merge-print master file for a pre-printed memorandum form. You plan to use WordStar and your printer to fill out two pre-printed company memos to two different people each day, and the data in each is unique. You don't really need a data file. Try this instead:

First, open your master file and mark and read the .DF and .RV dot command lines to a separate file. You might need them some day. Delete all .DF and .RV lines. Use .AV (ask for variable) instead, one .AV line for each variable. Let's say your form has blanks named TO (27 characters), FROM (27 characters), RE1: and RE2: (2 lines of 70 characters each). You have used .SV

lines to format and limit the size of each variable in the master document. Use .DM for onscreen messages for each variable, in this case to indicate the number of characters allowed in each field and that "RE1:" and "RE2:" are part of the same answer. .CS clears the screen after every question, except for the multiple lines that are part of one "essay question" on the form.

.RP2 (Tell WordStar to do two memos)
 .DM TYPE ONLY TO END OF DASHES! (size warning)
 .dm 27 characters----- (field size)
 .AV TO
 .CS (clear screen)
 .DM TYPE ONLY TO END OF DASHES! (size warning)
 .dm 27 characters----- (field size)
 .AV FROM
 .CS (clear screen)
 .DM Line 1 of a two line narrative field.
 .DM TYPE ONLY TO END OF DASHES! (size warning)
 .dm 70 characters ----... (dashes to 70 characters)
 .AV RE1:
 .DM Line 2 of a two line narrative field.
 .DM TYPE ONLY TO END OF DASHES! (size warning)
 .dm 70 characters ----... (dashes to 70 characters)
 .AV RE2:

The .AV request allows only one line for each answer, a maximum of 80 characters, less the spaces used for the name of the variable. You can create more space on the line by using another .DM line and entering it with the .AV command this way:

.DM Type data for RE2: following the question mark...
 .AV "?",RE2:

The "?" will appear by itself, taking up only one space on the answer line and leaving room for 79 characters in your answer.

That's it. No longer do you need fear using WordStar to merge-print. The uses of the merge-print commands in WordStar 4.0 are limited only by your creativity.

—Steve Gilliland

is followed by a / and the number or letter of an .SV, both within the ampersands. If the form has room for 27 characters for NAME, and our .SV with 27 L's is .SV6, we put &NAME/6& where we want NAME printed.

If your form asks for NAME _____, ADDRESS _____ and DATE OF BIRTH _____ all on the third line of the form, and you have assigned variable names as NAME, ADDR and DOB, do the following:

1. Place the cursor directly under the final dot command at the beginning of the master file (you don't want any spare lines floating around).

2. Hit **Enter** twice to move past the first two lines on the form where nothing is to be printed.

3. Measure the distance between the left margin on the form and the beginning of the blank asking for NAME. Let's say it's one inch.

4. Hit the **space bar** 10 times (if .cw is 10 cpi)

5. Type **&NAME/n&**

6. You know that that .SV6 is going to fill 27 spaces with the name or blank spaces, so press **Space bar** 27 times, type **&ADDRn&**, move 30 spaces, and type **&DOB/n&**.

That's the way variable data placement is determined. Don't worry about exact spacing at this point. On the first pass, concentrate on getting the variables on the correct line of the form.

MULTIPLE LINE BLANKS

Another often-encountered situation is the "essay" question with multiple line blanks for the answer. Imagine that the form demands "Cause of accident. Explain fully." and gives you the rest of that line and four more full lines for the answer. WordStar 4 allows a maximum of 256 characters per variable. A multi-line response will be longer than that. Answer: one variable for each blank line.

1. Measure from the form's left margin to the beginning of the blank following the question, space the appropriate distance, and type **&xxx/n&** (the first blank line name and .SV (n) that goes with it). Press **Enter**.

2. Type the second blank line variable name (**&xxx&/n&**), press **Enter** and continue for each blank line variable needed.

YES-NO AND MULTIPLE CHOICE ANSWERS

Many forms will have questions requiring that you check the appropriate "yes" or "no" box, or "check all that apply," with several choices. You could handle this with a separate variable name for every possible answer, but this creates havoc in data and master files. There's an easier way.

Let's say that questions on one line of your form read: "Customer contacted? Yes No; How contacted? Phone? Mail? Both?" (with little boxes for each choice). You have assigned "CUSTCON" and "HOWCON" as variable names.

Each dot command must begin on its own line. Yet the printer must stay on the same line for at least two passes in order to put "xx" in appropriate boxes. This is accomplished by the WordStar overprint command (^P^M), which tells the

printer to move the print head back to the right margin without moving down a line.

When entering data in the data file, you type Y or N in response to the "CUSTCON?" variable and "P", "M" or "PM" in response to the "HOWCON?" variable, in order to indicate yes (Y) or no (N), phone (P), Mail (M) or Both (PM). Your master file lines are typed like this:

```
.IF &CUSTCON& = Y (Enter)
```

```
  xx^P^M
```

```
.EI
```

```
.IF &CUSTCON& = N (Enter)
```

```
  xx^P^M
```

```
.EI
```

```
.IF &HOWCON& = P (Enter)
```

```
  xx^P^M
```

```
.EI
```

```
.IF &HOWCON& = M (Enter)
```

```
  xx^P^M
```

```
.EI
```

```
.IF &HOWCON& = PM (Enter)
```

```
  xx (Enter)
```

```
.EI
```

The position of each "xx" is determined by measuring from the beginning of the line to the place where "xx" is to go. Note that the "/n" .SV length is not used for a variable name part of an .IF command.

Each .IF command checks the appropriate variable. If the "=" condition is met, WordStar prints the line following. If the .IF condition is not met, WordStar moves on until it encounters an IF statement where the condition is met.

To keep the printer on the same line while multiple choice questions on that line are tested by .IF, we use the command ^P^M (overprint) at the end of the line that prints if the .IF condition is met. A dash appears in the flag line on the right of the screen. At the end of the last conditional answer for the same line on the form, use "Enter" so the printer can move on. Note that following each .IF conditional line, we use .EI (End If). WordStar insists on this.

VARYING LINE HEIGHT

Many pre-printed forms also have varying line heights. Many forms will adhere to one line height for a time, then switch to another. Occasionally, blank lines will vary across one "line" of the page.

A change in form line height can sometimes be handled with a new .LH command, but .LH is temperamental when placed anywhere but at the top of the master file. Instead, use .SR(n) (super/subscript roll) to handle variations.

Suppose the last line on the form, for signature and date, is farther from the preceding line by about an eighth inch, compared to the rest of the lines on the form. The variable &TODAY'SDATE/n& must print down a little from where it would print if left to itself. The default setting for super/sub-

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The Senate intelli
White House request
the panel's probe into
affair. The 7-6 vote in
trolled panel reflected
to wait until new selec
their inquiries. (Story c

Emergency workers
were killed and 176 injured when an Amtrak
passenger train collided with Conrail freight
locomotives. Federal investigators, saying it
was too early to determine the cause, intensi
fied their probe of the accident, focusing
on possible human error or equipment fail
ure. (Story on Page 16)

centuries ago, but now it is arguably the
game of the world's elite.

The domain of racquets once was as
wide as the British Empire. But now the
game is so obscure that it is played by only
200 or so in North America and by an addi
tional 1,500 in British "public" schools and
private clubs. The secret formula for con
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script roll is .SR 3, or 3/48ths of an inch. To get our line to print down an eighth of an inch, we enter:

.SR6 (to cause a subscript roll of 6/48ths or 1/8th inch)

Then, at the appropriate place on the line, enter

^P^V&TODAY'SDATE/N&^P^V

and the printer will roll down an eighth of an inch, print the variable, and return to the original line height scheme. ^P^T (superscript) or ^P^V (subscript) can be used for partial lines, whole lines, or for several lines. .SR(n) can be used as often as needed to set whatever increments are necessary.

*Your
master file will
probably need
fine tuning
to put data exactly
where it belongs on
your forms.*

End your master file with a hard return and add the dot command .PA. This will force a page end, necessary for WordStar to know that the form ends here and it's time to move on to the next. Then move back to the very beginning of the file and insert a .PL (page length) long enough so that the entire master file is just one page long.

Your master file now contains dot commands, variables, and variable placing that—if you carefully followed instructions—should put your data precisely where it belongs on the pre-printed form. It probably won't. Let's look at testing and fixing.

FINE TUNING

Open a file called RULER. Set the right margin the same as in your master file. Set .PO the same as your master file page offset. Press ^OO. A ruler line beginning with “.RR” will appear in your document. Replace .RR with ---. Put exclamation points at the end of the ruler line at the same intervals at which they occur earlier on the line. Make sure your text ruler line ends at the correct right margin setting. Delete the text line with ^Y. Using ^U to undelete, create a page full of text ruler lines.

Save and print the file over a blank copy of your pre-printed form. Start printing at the very top of the form. Don't worry about line positioning. Just get the paper straight in the printer. Your blank form is now full of ruler lines, starting at the left

margin of the text of your form and going to the rightmost edge of the form's text. If it doesn't, adjust things and try again. Save the page.

Now print your master file to PRVIEW by running through the print questions until you're asked for "Printer to use?" and selecting PRVIEW.

The master file will print to the file PRVIEW.WS. Open PRVIEW.WS. This is approximately how the data will look when printed on your form. It may look strange. If you have .IF commands, you will find that PRVIEW.WS. doesn't overprint. You may have forgotten a "&", or an ".EI" or a "/n". Or you may have badly misjudged a variable placement. Or put a data file variable in the wrong order. Or made a typing error.

Relax. This always happens. Fix things up (remember, it's the master file you fix, not PRVIEW.WS) and print to PRVIEW.WS again (and again) until the variable data appears about where you hoped it would. Now let's fine tune.

At the top of the PRVIEW.WS file, enter ^OO. A ruler line beginning with .RR will appear. Put exclamation points on the line as you did earlier and replace “.RR” with hyphens. Delete the line with ^Y. Go to the first line of variable data, hit “Enter” to insert a blank line above the data line, and put a ruler line in the space with ^U.

Now look at the blank form you filled with ruler lines. The ruler line on your screen shows you at which column the variable data actually is printing. The ruler line on your blank form shows at which column the variable data should be printing. Regardless of how strange it may look on the screen, the first "&" of a variable must be in the same onscreen column (according to the ruler line) as the column at which variable data is to begin printing on your blank form. Count and compare and make a note of how many spaces the variables need to move left or right in order to print in the correct spot. Do this with each line of variable data. Go back to your master file and move the variable names to the positions you have just noted. Print to PRVIEW.WS again. Things should be getting close. Keep at it until it all works.

Now for the acid test. Roll a blank form into your printer. Adjust it so that the print head will start printing exactly at the level of the first line containing blanks. Print your master file. With any luck, everything will fall into place the first time. More than likely a few tries will be necessary, but it will work. And the rewards will come every time you use WordStar to fill in a form that used to be done with a pen or a typewriter.

With imagination and Shorthand macros, you can think of all sorts of ways to automate pre-printed forms. For example, you may want to print first to PRVIEW.WS each time you fill out a form, giving you a file showing exactly what data went on the form, when it was done, and who did it. Be creative. But first take a rest. You've earned it. ■

Steve Gilliland is a frequent contributor to PROFILES. He lives in Lake Havasu City, Arizona, where he writes, teaches, and consults.

MAKE THE MOST OF PERFECT WRITER'S SEARCH COMMANDS

Tips that take you beyond the basics.

BY ROBERT J. SCHECHTER

If you've learned the fundamentals of Perfect Writer, you probably know how to search for specific characters within a document, and you may also know to use two related commands: Search and Replace, and Search and Query Replace. But you may not be aware of the nuances of these commands—the details and embellishments that will let you use them to the fullest. In this article, I'll review the basics of all three variations of the Search command, and I'll also offer tips and hints that can make them more valuable to you.

SEARCHING

The "plain old" Search command, as you may already know, is initiated with ^S (hold down the control key press the "s" key. Uppercase "s" is not necessary.) On the command line, you will see "Search Forward For <ESC>:". This tells you two things. First, you're now ready to enter the characters you want to search for; and second, you must end your search phrase with the Escape key rather than with the Enter key.

Say you're writing an essay about World War II, and you want to find the first mention of Eisenhower. Use ^S to search for "Eisenhower;" and your cursor will end up right after the "r" in Eisenhower. If you want to search for the next use of the word Eisenhower, press ^S again. But this time you don't need to type "Eisenhower." You simply press ESC again. This restores the search phrase—"Eisenhower"—from the last time the search command was used.

Now let's consider a slightly more complicated example. Suppose you want to go to the phrase, "end of the war." You could use the ^S command to search for "war." Perfect Writer would deliver you right to the place after the letters "war." However, it might stop on "warm", "swarm", "beware", etc. The

search command is very specific and simple-minded. If you ask for the three letters w, a, and r, that is what you'll get.

You can avoid this problem (with limitations, as discussed below) by placing a space before and after the characters "war." In other words, when asked "Search Forward For <ESC>:", type "[space]war[space]". (Press the space bar—do not type [space]). The space after "war" will prevent matching with words like "warm," and the space before "war" will prevent matching with "beware," etc.

You might suppose it would be simpler just to search for the phrase, "end of the war" and avoid these mismatches. In theory it would be, but in fact you might run into trouble because of a bug (oversight?) in Perfect Writer's search algorithm. The problem is that the search command treats spaces between words differently than the space between the last word on one line and the first word on the next line.

You can get a clue that this is the case by pressing the ^S key and then pressing the ENTER key. What you will see on the command line is <NL>, the Perfect Writer code for a carriage return (New Line). Thus, if "war" is on the same line as "end of the" on your disk file (it's irrelevant whether it is or not on your printed manuscript), you will find a match. If, however, "the" ends one line and "war" begins the next, you won't find a match. You would have to search for "the<NL>war" to match.

If it is absolutely essential that you search for a two-word phrase, you might have to make two searches—one with the words separated by a space, and the other with the words separated by <NL>. Obviously, if you restrict your search to one word only, the problem does not arise.

If you want to return to a particular place in your manuscript by searching for a single word, it's best to choose a word that is likely to appear in as few other places as possible. If you're

searching for the phrase, "the Battle of Burgundy," and you search for "the" or "of," obviously you'll match far too many words. "Battle" will probably match fewer words, and "Burgundy" will match the fewest. Therefore, you would search for "Burgundy."

To return to a place in a manuscript by searching for one word, choose one unlikely to appear often.

Actually, you don't even have to bother to search for the entire word. In the "Eisenhower" example, you could search for just part of the word. The key is to choose the right part. If you search for "ower," for example, you might match up with "power," so search for "hower" instead. You could, of course, search for "Eisen," but then the cursor would be left positioned over the "h", and you would have to move to the end of the word before continuing. I find it's easier to end up after the word—something you can easily accomplish if you search for the entire word or for the ending letters, rather than the beginning or middle letters.

There are a couple of other things about the Search command that are worth mentioning. For one, it treats uppercase letters specially. If you type a search phrase in lowercase letters, the search will match both lowercase and uppercase letters. If you type a search phrase in uppercase letters, however, the search will match only uppercase letters. Thus, if we search for "war", it will match "war," "War," and "WAR." If we search for "War," however, it will not match "war."

Also, the ^S command searches forward from the current cursor position to the end of the document, if necessary. If a match is not found, Perfect Writer will find a close match (just in case you made a typo somewhere and this is really what you wanted) with the phrase "not found" on the command line.

You can also search in the reverse direction. This is done with the command ^R (for reverse). This will search backward from the cursor position. You can search for the same phrase for which you searched forward by typing ^R and then ESC. There's one hitch, though—the reverse search will not search for a single letter or symbol. You must have at least two characters in your search string. In forward searches, you can look for a single character.

And finally, you can use the search command to keep your place in a document. For example, when I used to edit my manuscripts onscreen, I often would be interrupted before I finished. When I returned to my work, I'd have to start over, and I'd end up editing the first part of the manuscript several times and the last part perhaps only once. My initial solution required two steps. First, at the beginning of the document I would write something eye-catching such as @COMMENT(EDIT AT THE *).

Then, if I interrupted my editing, I would type a * where I had left off. When I returned to the document, I would simply search for a "*". Unfortunately, this would also match with the "*" in the @COMMENT line. I then had to issue ^S again, typing the ESC to search once more for the *.

One solution to this is to put the cursor below that @COMMENT line before initiating the search command. What I prefer to do when interrupted is to place a ** at that location. At the beginning of the document, I write @COMMENT(EDIT AT THE DOUBLE *). Then, when I begin, I search for "**", and I end up exactly where I want to be. I delete the ** and continue with my editing. At the conclusion of the editing, I delete the @COMMENT (though it would not show on the final document anyway). There are other things you could use besides **, of course. You could simply write "HERE" at the location, and search for "HERE." Since searching for "HERE" would not match "here," you would be able to immediately go to the correct place in your manuscript.

SEARCHING AND REPLACING

The basic Search command gives you a lot of capabilities, but you can do even more with the Search and Replace function. This uses the search capabilities described above, but you do more once a match is found.

The command ESC R (press Esc, release it, and then press R) initiates the Search and Replace function.

When you press ESC R, the words "Replace <ESC>" will appear on the command line on the bottom of the screen. Again, this tells you that the phrase you enter must be terminated by the Escape key, not by the Enter key. Type the characters to be searched for (including the Enter key if needed, which will produce a <NL> symbol on the command line). Terminate your search string with an Escape.

A new line will appear on the command line. "Replace <ESC>" will disappear and will be replaced by a "with <ESC>." Type the characters with which you want the search characters to be replaced. End this series of characters with the Escape key as well.

(If you made a mistake and do not really want to search and replace anything, don't panic. Simply press ^G and the command will be canceled.)

You can replace one phrase with another with Search and Replace, but it may take two searches.

When you type the Escape key this time, Perfect Writer will go through the document and replace every occurrence of the first character string with the second character string.

Say your editor wants you to change a character's name—

you've used "Smith," and the editor wants a nice ethnic-sounding name instead. Using the ESC-R command, all occurrences of "Smith" can be changed to whatever you wish.

This command can also save you typing time. Instead of typing "Dwight David Eisenhower," you can simply type DDE throughout your manuscript. Then, after you've finished, you can simply replace all occurrences of DDE with Dwight David Eisenhower.

The Perfect Writer manual suggests that you can also replace one phrase with another. Unfortunately, the [space]/<NL> conflict described earlier makes it difficult. For example, you could use the ESC R command to replace Santa Claus with Saint Nick, but if "Santa" is the last word on one line, and "Claus" is the first word on the next, the ESC R command will not pick it up. You would have to do the search-and-replace once with "Santa Claus" replaced by "Saint Nick," and then again with "Santa<NL>Claus" replaced by "Saint<NL>Nick". For longer phrases, of course, there are even more places where <NL> could sneak in. I don't find replacing phrases worth the effort.

SEARCH AND QUERY REPLACE

The third of Perfect Writer's search capabilities is Search and Replace-but-ask-first (known as "Query Replace"). Note that we have already used ^R for reverse search and ESC R for replace; the command for Query Replace is Escape ^R.

When you type these keys, "Query Replace <ESC>" will appear on the command line at the bottom of the screen. Type the characters you want to search for, and end the string by pressing Escape. At this point, the words "with <ESC>" will appear at the bottom of the screen. Just as you did with the ESC R command, type in the characters with which you want to replace the search string.

The Query Replace command can be used as a repeat search option.

If no match is found, nothing will seem to happen. The cursor will remain at its original location, and no message will appear at the bottom of the screen. If a match is found, however, sparks will fly. Let's use our DDE example from above. If a match is found (that is, if DDE is found), the command line will read: "Replacing 'DDE' with 'Dwight David Eisenhower'." What this really means is, "Is it OK if I replace DDE with Dwight David Eisenhower?"

If you type "Y" (uppercase or lowercase) for "yes," the substitution will be made and the cursor will move on to the next occurrence of DDE. If you type "N", (or actually if you type any letter other than a "Y"), the substitution will not be made, and the cursor will move on to the next occurrence of DDE. When no further matches can be found, the cursor will return to the point from which you first started the Query Replace.

Query Replace will do more than just let you choose Yes or No on each match. In fact, there are four other choices you can make.

Instead of typing "Y" or "N," try typing a comma. If you do this, Perfect Writer will make the substitution but will not move on. It will let you see how you like the change and will ask you (on the command line), "Confirm Replace?" If you type "Y," the substitution will be made and the next match will be sought. If you type "N," the original phrase will be restored before the next match is found.

You may try this a couple of times and decide that you like the substitution. Is there any way to avoid having to confirm each and every one of the 97 DDE's you have in your manuscript? Yes. Typing an exclamation point tells Perfect Writer "Yes! I like it!" All remaining occurrences of the search phrase will then be replaced without any more requests for confirmation. On the other hand, perhaps you've had enough. You don't want any more substitutions made. Type a period. No further searches and substitutions will be made, and the cursor will return to the position it was in when the ESC ^R command was given.

Typing ^G also bails you out of the Query Replace command. There is one difference between typing ^G and typing a period, however. Typing a period stops the action and returns you to your starting point. Typing a ^G stops the action and leaves the cursor wherever it is when the command is given.

The Query Replace command can be used as a repeat search option. For example, suppose you want to return to some point in your document at which you mentioned Eisenhower. The most obvious way to do this, of course, is to use the ^S search command. If the first "Eisenhower" is not the one you want, you can type the ^S command again, followed by Escape, as described earlier. But all this can be accomplished even more simply by using the Query Replace command. Simply type ESC ^R. Type in what you wish to search for ("Eisenhower"). When asked what to replace this with, type in anything—your name, for example. You won't be doing any replacement anyway. Perfect Writer will stop at the first "Eisenhower" and ask, "Replacing 'Eisenhower' with '[your name]'". All you have to do is type an "N" and Perfect Writer will move on to the next occurrence of Eisenhower. When you finally reach the desired occurrence, type a ^G. That will discontinue this query-replacing and leave you right there. (Type a ^G rather than a period—remember that a period will return you to the beginning of the document instead of leaving you where you are, which is where you want to be.)

Here's another use of Query Replace. Suppose you have the phrase in your manuscript, "...the one and only in the entire world..." and you decide that that whole phrase should be hyphenated. You could delete each space and replace it with a hyphen, but it's easier to use Query Replace. Place your cursor on the first word in the phrase, "the." Then Query Replace a space (just tap the space bar once) with a hyphen. Perfect Writer will go to the first space and ask if you want to replace the space with a hyphen. Try typing a comma to see how it looks. Assuming you like it, type a "Y" when asked "Confirm Replace?" Per-

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fect Writer will then move to the next space and ask again if you want to perform the substitution. Type "Y." Finally, when you have hyphenated the entire phrase, PW will go on to yet the next space, offering to replace that with a hyphen, too. At this point, type a period (or a ^G) and the hyphenation will stop. Remember, however, that PW will *not* replace the space at the end of the line, which it considers a <NL> and not a space, with the desired hyphen. (That same old bug just bit us again.)

Actually, you can even search for the <NL> character. If you want to check to see if you have triple-spaced anywhere in your document, for example, you can simply search for <NL><NL><NL>. If you want to replace any triple space with a double space, you can use ESC R to replace <NL><NL><NL> with <NL><NL>. You can do the same thing with spaces. If you want to see if you've inadvertently left two blank spaces between words, for example, you can search for [space][space] (tapping the space bar for these). Perfect Writer will search for a sequence of two spaces and will *not* confuse it with double line spacing, due to the distinction between [space] and <NL>. (Every cloud has a silver lining, I guess.)

COMMAND SUMMARY

The following summarizes Perfect Writer's search commands:

Search

Search Forward—^S

Search Reverse—^R

Search and Replace—Escape R

Search and Query—Replace

"Y" causes the item to be replaced. The cursor moves to the next match.

"N" (or any other non-Y letter) causes the item not to be replaced. The cursor moves to the next match.

"," causes the item to be replaced and asks you to confirm the replacement.

"Y" confirms the replacement. The cursor moves to the next match.

"N" (or anything else non-"Y") denies the replacement and restores the original item. The cursor moves to the next match.

!" causes all further matches to be replaced without asking for confirmation.

"" stops the searching and replacing and returns the cursor to the starting point.

"^G" stops the searching and replacing and leaves the cursor just where it is.

Perfect Writer's search and replace commands are equaled by those of few other word processors. Using them can help you to modify and shape your documents with maximum ease, efficiency, and enjoyment. ■

Robert J. Schechter is an eye surgeon in Los Angeles. He has also written a humorous book about computers, *Terminal Diseases—The Not Quite Right Guide to Home Computers*.

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A FIRST SESSION WITH XTREE

Fast, easy file and directory management.

BY DON AND SHARYN CONKEY

Whether you're a power user, comfortable charting your way through paths and finding hidden files, or you're a newcomer to computers, still hunting and pecking your way to the question mark and asterisk, using DOS to keep track of directories, subdirectories, and hundreds of hard disk files can be a headache.

Xtree, a hard disk management program from Executive Systems, Inc., is not only a pain reliever, it's a productivity booster for any user. It gives you immediate access to files throughout your directory structure without all the typing required by MS-DOS, and it helps you maintain DOS files and subdirectories by providing you with simple commands to copy, move, rename, view, print, or delete any file in any directory on your disk. You can also create, rename, and delete subdirectories and diagram the directory structure of your disks.

In this article we'll assume that you are familiar with the fundamentals of MS-DOS, but that you're new to Xtree. We'll be dealing with Xtree version 2.0, rather than Xtree Pro (a new program that offers powerful features such as multiple disk logging and a WordStar-like editor), but most of the information given here will help you get up and running with either program.

GETTING STARTED

Just as a trapeze artist uses a safety net when trying new



tricks, the smart computerist uses "throw-away" files when trying new file and disk handling techniques. For practicing with Xtree, run the program from a spare, freshly formatted system diskette. Copy the files XTREEINS.EXE, XTREEINS.DAT, XTREE.EXE, and READ.ME to the floppy.

Again, as a safety precaution against inadvertently accessing hard disk files while you're practicing, insert your Xtree practice disk in the A drive and reboot your computer.

You can use Xtree just as it is—the program comes installed for a Kaypro PC or compatible; it works with either color or monochrome displays.

To run Xtree, type **XTREE**. The program displays its logo and computes disk statistics for the current drive. When "log on" is completed, you will see Xtree's opening display. See Figure 1.

THE OPENING DISPLAY

The screen is divided into nine areas (you can see a diagram by pressing F2, the Help key; hitting Enter brings you back.) Notice that the disk specification box indicates the logged disk, volume label (the name you've assigned to the disk—it's blank if there is none), and the bytes available on the logged disk. This information will be updated when you change the logged drive or update the disk.

You're automatically placed in the directory window, which

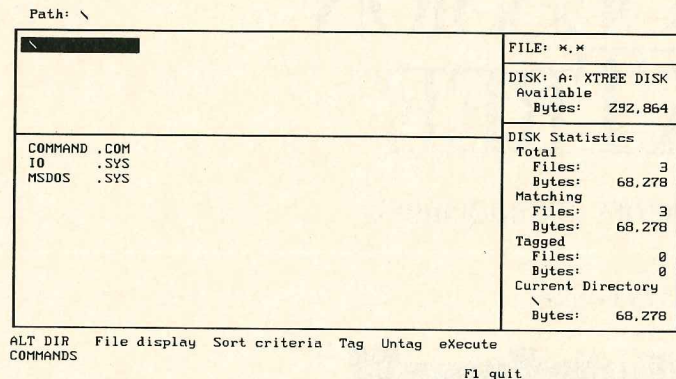


Figure 1

shows the directory structure of the disk. The highlight bar identifies the current directory. The size of that directory is shown at the bottom of the disk statistics box, at the right of the screen. That box also contains statistics on the entire disk, including the total number of files on the disk and the number of "matching" files. Matching files are those that fit the "mask"—the default is **—in the file specification box. Because ** specifies all files, the number of "matching files" equals the total files on the disk. (As you may suspect, you can change the mask. This lets you specify files on which commands will operate. More on this later.)

Press **Enter** to move the highlight bar into the file window. This window lists the files in the current directory in alphabetical order. Notice that the disk statistics box has become the directory statistics box and reflects the current directory and current file. (The highlighted file is the current file. The arrow keys, Home, End, PgUp, and PgDn move the highlight bar in the directory and file windows.) Press **Enter** and the file window is expanded to include the area previously used for the directory window. Press **Enter** again, and the bar will return to the directory window.

Near the bottom of the screen are two lines presenting a menu of commands. The *directory* commands (available from the directory window) affect directories or work across directory boundaries. The *file* commands (invoked from the file or expanded file windows we've just seen) affect only files that match the mask and are located in the current directory. Commands are issued by pressing the highlighted letter. Some commands have alternate forms, invoked by using the CTRL key (designated by ^) along with the first letter of the command. In general, selecting a command by pressing the letter alone will cause the command to act on a single highlighted directory or file. Using the CTRL-letter combination invokes commands that operate on a group of files.

Additional commands are available via the Alt key, a separate menu we will discuss later.

The function keys (detailed on the right half of the prompt line and summarized in Figure 2) are Xtree's safety nets. F3 will cancel any command. In addition, F3 will return you to the directory window from the file windows. F2 gives help; F1 quits.

THE DIRECTORY COMMANDS

The highlight bar should be in the directory window. (If it isn't, press **F3**.) We want to change the volume label. Type **V**; you'll be prompted for the volume label on the prompt line. Xtree's edit keys are Backspace (deletes the character to the left of the cursor) and Esc (deletes line). Additionally, Xtree protects against input errors. If you type inappropriate characters for a filename, directory name, or volume label, they will be rejected. Try this by typing * or \ in your volume label.

The volume label we want is **XTREE TEST**. Type it in, editing as you go. You'll need to press **Enter** to enter the label. Notice that the disk specification box is updated.

To practice directory commands, we'll need some subdirectories. Be sure the root directory (\) is highlighted in the directory window. Type **M** to choose the Mkdir command. You'll be asked for a subdirectory name. Type **UTIL**. Notice that UTIL becomes a subdirectory of the root. Now type **M** and specify **DOS** for the directory name. Since the highlight bar was on the root directory, DOS also became a subdirectory of the root. Note that your directory display has been alphabetized.

Type **M**, then **GOOF1**, creating another subdirectory under the root. We want to create GOOF2, a subdirectory of GOOF1. Use the down arrow key to move the highlighted bar to GOOF1. Type **M**, then **GOOF2** for the subdirectory name.

Next, we want to create a word processing directory under the root. Move the bar back to the root directory (press **Home**). Type **M**, then **WP**.

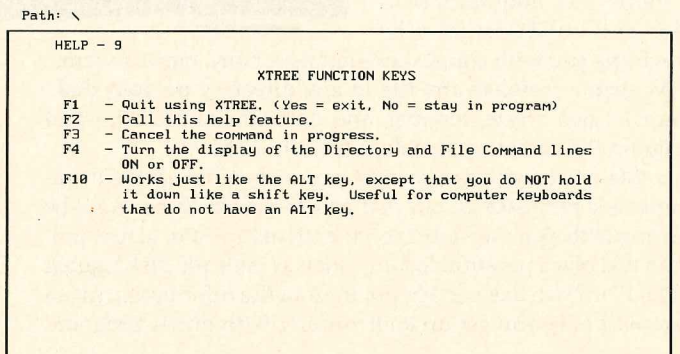
We will create two subdirectories under WP, so we must highlight that directory. Press **End**.

Now make the subdirectory LET. With subdirectory WP highlighted, type **M**, then **LET**. Notice that the directory structure no longer fits in the directory window. You must move the highlight bar down in the window with either the down arrow key, End, or PgDn.

Position the highlight bar on the WP directory and make a subdirectory called MSS. (Type **M**, then **MSS**.)

On second thought, that's a bad name. Let's rename this subdirectory. Press **End** to highlight MSS. Issue the Rename command: Type **R**, then **MEMO**. Notice the change in the directory window.

Press **PgUp**. Notice that the bar moves to GOOF1. It moves up



↑ Page Through Text, RETURN To The Program.

Figure 2

a page in the window. Press PGUP again. The bar moves back another page—to the root directory.

We really don't need the GOOF1 directory, so let's delete it. Highlight GOOF1, then type **D** for Delete. You'll be asked if you want to delete this directory. Answer **Y**.

Whoops—we goofed! You cannot delete a directory that is not empty, and though we have no files in GOOF1, we do have a sub-directory hanging from it. Press any key, then highlight GOOF2 and press **D** to delete it. This time, when you answer **Y** to the prompt, the directory will be deleted and the bar moved automatically to its parent, GOOF1. Go ahead and delete GOOF1. (Type **D**, then **Y**.)

Press **Home** to highlight the root directory.

To get a hard copy of the directory structure, turn your printer on, then issue the Print command by typing **P**. You've got three options. **C** prints a catalog of tagged files. (A tag is like Xtree's equivalent of a Post-it note: It doesn't affect the file's contents, it just marks the "outside" for later operations.) We haven't tagged any files yet, so all we'd get is a page eject. **T** prints the tree, which is what we're looking at in the directory window. Type **P** for pathnames, and you'll see a different representation of your disk: a list of all the paths on the disk. (If you don't want to print, cancel by pressing **F3**.)

The Available command will tell you how much space is available on a specified disk. It's particularly useful when backing up a group of files. For example, suppose we wanted to back up the root directory displayed on the screen. We can see from the disk statistics box the number of bytes we'd need. If you have a B drive, put a floppy disk in it. Type **A** for Available and when prompted for a drive, type **B**. Xtree tells you (just under the file window) how much space is available on B. Press any key.

Notice that the file window lists all the files in the current directory. This is because the mask in the file specification box, ****** by default, has never been changed. Use the Filespec command to change that mask to reflect only the files with the extension **.EXE** (***.EXE**). Type **F**, then type ***.EXE** (**Enter**). Notice that both the file specification box and file window reflect the new mask. The disk statistics window still reflects the total files on the entire disk, but there are now two matching files, and they take up 52,044 bytes (for version 2.0). You will use this mask, which accepts both DOS wildcards (**?** and *****) to choose files on which to operate. Xtree's file commands act on files that match this mask.

Change the Filespec back to ****** by typing **F**, then ****** (**Enter**). Notice the changes in the file window.

With our directory structure intact, let's work with some individual files.

THE FILE COMMANDS

Press **Enter** to move to the file window. Make sure READ.ME is highlighted.

Operating on the current file is straightforward. Simply issue the first letter of the command. Xtree will prompt you for details.

The View command displays the contents of the highlighted file. Type **V** to view READ.ME. Use the arrow keys, **PgUp**, **PgDn**, **Home**, and **End** to move about the file. End by pressing **Home**.

Press **Shift** and the down arrow keys together to scroll continuously through the file. While you're scrolling, press **9**. After a few seconds, press the number **0**. You can type any number from 0 (fastest) to 9 (slowest) to vary the scrolling speed. Press the spacebar to stop.

You can also set up to 10 markers (numbered 0 through 9) in your file; we'll set one. Press **End** to go to the end of the file. Press **PgUp** twice to go back two pages. Press **S**, then **1**. Now go to the top of the file (press **Home**). To go to the marker, press **G**, then **1**. Press **Enter** to exit the view command.

To print the contents of the READ.ME file (seven pages), press **P**. Ready the printer and press **Enter**. (To cancel, press **F3**; Xtree clears the buffer.)

Copy, like all Xtree's file and directory management commands, uses the logged drive as the source. You cannot override this. Let's copy READ.ME to a file named READ.ME in the sub-directory **\WP\MEMO**. With READ.ME highlighted, type **C**. Xtree prompts: "COPY file: READ.ME as". Xtree expects a "to" filename and extension only (unlike DOS, which will accept a drive and path specification.) Since the filename is staying the same, press **Enter**. Xtree prompts: "to:". Here's where you specify your destination. Since the destination directory is on the logged disk, we don't need to type the drive. Just type **\WP\MEMO** (**Enter**).

To operate on the file we created in **\WP\MEMO**, we must make that directory current. Press **F3**, then **End**. Press **Enter** to move to the file window. To Rename READ.ME, type **R**, then answer **NEWNAME** (**Enter**) to the prompt. To Delete NEWNAME, press **D**. You'll be prompted to confirm. Type **Y**.

Return to the files in the root directory (press **Home**, then **Enter**).

You'll often want to perform the same operation on several files. You might want to back up, move, or delete a group of files, for example. The most efficient way to do this is to tag the files on which you want to operate.

When you are in the file window, you can issue **T**, to Tag the highlighted file, or you can issue **^T**, which tags all files in the current directory that match the mask. We'll try both ways. Make sure READ.ME is highlighted, then tag it by pressing **T**. We also want to tag all the "Xtree" files. The easiest way to do this when you have many files is to change the file specification: Type **F**, then **XTREE**** (**Enter**) and notice the change in the file specification box and file window. Issue **^T** to tag the files that match the mask. Notice Xtree's diamond-shaped tag marker.

Whoops! We didn't want to tag XTREEINS.DAT. Highlight XTREEINS.DAT, then untag it by typing **U**. Change the file specification back to all filenames, so you can see all the files in the current directory: Type **F**, then ****** (**Enter**).

Now, what good are tagged files? They save you time. You can type a command once, and it will operate on all the tagged files.

We want to copy the three tagged files to the subdirectory **MEMO**, giving them the extension **.TST**. We could do this one at a time, with the **C** command, or we could do all at once, with **^C**. Enter **^C**. When prompted to "COPY ALL TAGGED FILES as," enter ***TST** (**Enter**). Notice Xtree has "remembered" the path from our last copy operation. Press **Enter** to accept that path. You'll be asked if you want to automatically replace any files in

\WP\MEMO with the same filenames. Answer **Y**.

Let's copy the tagged files to \UTIL. Press **^C**. When prompted for filenames, press **Enter** to keep the same names. You'll be prompted for a destination. Clear the suggested response by pressing **Esc**, then type \UTIL. Answer **Y** to replace existing files.

Notice that the original tagged files remain tagged in the root directory, although the copied files are not tagged. Press **F3** to return to the directory window. Move the highlight bar through it to see the copied filenames in the file window. End with the root directory highlighted.

The Ctrl-Tag command issued from the directory window works differently than the Ctrl-Tag command issued from the file window. From the file window, **^T** tags only the files in the current directory that match the mask. From the directory window, **^T** tags all files on the disk that match the mask. To see this, enter **^T**, then press **End**. Notice that all files—including those in subdirectory MEMO—have been tagged. **^T** from the directory window allows you to mark files for later operations without regard for directory boundaries. For now, let's untag the files (press **^U**), then enter the file window (**Enter**).

There are several more commands available through the Alt menu. These commands are invoked by holding down the Alt key while you type the highlighted letter of the command. Press **Alt-F** to see size and attributes added to the display in the file window. Press **Alt-F** again and you'll see the date and time each file was last modified. You cycle through this command like a merry-go-round. Press **Alt-F** three times to see this. End with the fully expanded file information format.

The Alt-S command "sorts" the files by name (default), extension, size, or date and time. (It's not a physical sort—it just orders the display in the file window.) Press **Alt-S**, then **S** to see files arranged by size, largest to smallest.

The expanded, "sorted" formats produced by Alt-F and Alt-S remain in effect for the file window display until you change them with these commands or reload Xtree.

Finally, there are commands to change file attributes. Highlight the file READ.TST, then enter **A** for the Attributes command. Files have four attributes, indicated by R (Read-only); A (Archive, set when a file has been modified); S (System or DOS files), and H (Hidden from DOS directory listings). These attri-

butes are either "set" or not. If an attribute is off, a period appears in its position in the display. You cannot erase files whose R, S, or H attributes are set.

Notice on the display that only the Archive attribute is set for READ.TST. Let's change this. We're going to turn the Read-only attribute on, the Archive off. Type **+R-A(Enter)**. You'll see Xtree update the file window.

Of what use is this? Some examples: You can set the Read-only attribute to protect files from being written to or erased; the Archive bit is useful for backup procedures; and some programs leave behind hidden files that you may want to un-hide, so you can delete them. System files should typically not be tampered with; you run the risk of crippling DOS.

TIPS

Some hints and a warning:

When you want to copy a file and delete the original, use the Move command. Move doesn't physically copy; it just changes directory pointers, so it's faster.

The Alt menu's Copy command is useful for backing up files to a different disk and maintaining the subdirectory structure of the copied files. For example, if you wanted to copy all files from \UTIL and \WP\MEMO, you could tag the files, use Alt-C, and Xtree will automatically create \UTIL and \WP\MEMO on the target drive.

If you develop procedures that use attribute settings, you'll find the Alt menu's Tag and Untag useful, as they affect files with specified attributes.

The Showall command is perhaps Xtree's most powerful, dangerous command. It allows you to treat all disk files as if they were in the same directory. Press **F3** to select the directory window. Press **S**. You'll see a display of all files on the disk. The window you're looking at is called the show all files window, and except for the statistics in the disk box, it looks like a normal expanded file window. Press **^T**. This tags all files on the disk.

Now stop. Don't do anything!. You're at the edge of the cliff. If you type **^D**, you will be given the opportunity to delete all tagged files on the disk which are not attribute-protected. You're given the option of confirming each deletion, but that's your only safeguard. Xtree has no UNDO command, just **F3**, to cancel.

Let's back away from the precipice: Type **^U** to untag all files. Press **F1**, then **Y** to exit to DOS.

The key to becoming an Xtree power user is to understand which commands work on which files. File management commands are summarized in Figure 3.

Don and Sharyn Conkey develop and write computer training packages that are marketed nationally.

QUICK REFERENCE SUMMARY

Product: Xtree

Manufacturer: Executive Systems, Inc.
15300 Ventura Blvd., Suite 305
Sherman Oaks, CA 91403

Phone: (800) 634-5545; in California, (800) 551-5353

Sugg. Retail Price: \$69.95

(Xtree Pro is available for \$129)

Path: \

HELP - 7a

FILE WINDOW COMMANDS

Single File Operations

Attributes	- View or modify the DOS file attributes of the current file.
Copy	- Copy the current file to a new disk and/or path.
Delete	- Delete the current file.
Filespec	- Selects a new group of files for XTREE operations.
Log disk	- Log on to a different disk drive.
Move	- Move the current file to a different directory.
Print	- Print the contents of the current file.
Rename	- Rename the current file.
Tag	- Tag the current file.
Untag	- Remove the tag from the current file.
View	- View the contents of the current file on the screen.
eXecute	- Execute a program or DOS command.

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Figure 3

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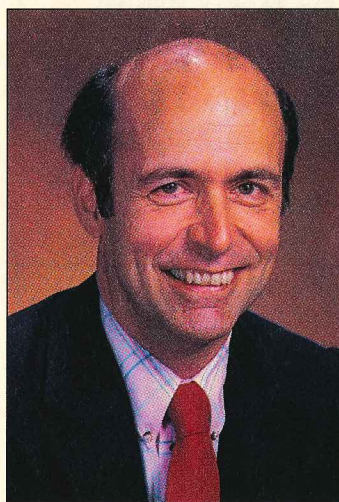
While graphics themselves are fun to play with, graphics files are no fun at all. The problem is that once a graph, logo, or other piece of art is drawn on screen—or digitized with a scanner—it has to be saved to a disk file so that it can be used later by a page make-up program. Unfortunately, almost every graphics program has its own idea about how these files should be structured. And like petty feudal kingdoms, none of them seems interested in establishing diplomatic relations with the others.

CONFLICTING FILE TYPES

To begin, there's the almost-unbridgeable gap between the raster or bit-mapped paint programs (like PC Paintbrush) and vector or object-oriented draw programs (like AutoCAD). The bit-mapped programs store their files as a collection of black and white dots, which will print only at a fixed resolution (300 dots per inch or often less). The object-oriented programs store their files as a collection of objects—lines, circles, boxes, etc.—that will print at the highest resolution of the output device (2,500 dpi on a Linotronic 300 typesetter, for example). And so far, there's no really useful way to translate art from bit-mapped to object-oriented or vice-versa.

That's bad enough. But within each of these two kingdoms, users face a variety of incompatible formats. With bit-mapped paint programs especially, every program seems to want to have its own special format—PC Paintbrush, PC Paint Plus, Microsoft Windows Paint, EGA Paint, and so on.

And now, to make matters worse, the advent of scanners that can read and store gray-scale information from photographs and other continuous-tone art has created a new kind of graphics file—the gray-scale graphics file. Like bit-mapped graphics files, these gray-scale files store their graphics as a collection of dots. However, instead of simply being either black or white, a dot in a gray-scale file may be any one of a number of shades of gray (up to 256 shades in top-line products). So now, along with the bit-mapped and object-oriented file formats, users must face an assortment of gray-



GAIL GOODENOW

scale formats—TIFF, RIFF, and more. Arghh.

TRANSLATING FILES

What does this proliferation of graphics file formats mean to you, the desktop publisher? That depends on what you plan to do. If you plan to provide all your own art, you don't have to worry. You can select any paint and draw programs that suit your needs—as long as their files can be read by your page make-up program—and just ignore all the other programs with their incompatible files. What do you care?

But most of us will never be in that position. At some time or another, almost every desktop publisher needs to use art from an outside source—graphics commissioned from a freelance artist, drawings from an electronic clip-art service, charts or screen dumps provided by a client. And many of us work with such outside art not just occasionally but constantly.

So, unless we want to buy a copy of every graphics program on the market or limit ourselves to working only with clients and freelancers who can provide files in our chosen formats, we need some way to translate graphics files from one format to another. It's not really that we need file translation in order to incorporate the graphics into our publications—page make-up programs like Ventura Publisher and PageMaker can read most bit-mapped and object-

BY TED SILVEIRA

oriented formats directly. It's that we need to be able to import these outside graphics into our own graphics programs in order to modify them. Try as I might to get everything right the first time, I always need to make some changes to the art in any project. I need to change a drawing to match a last-minute change in the product, modify a label on a graph, resize a picture to fit a new page format, clean up a piece of clip art, and so on.

For a partial solution to the problem of incompatible file formats, you can turn to The Graphics Link from PC Quik-Art. You may remember that last month I looked at some clip art from PC Quik-Art and wasn't too impressed, but The Graphics Link is another matter.

The Graphics Link (version 1.5) can translate graphics files to and from any of nine bit-mapped formats—PC Paintbrush (including the new Publisher's Paintbrush), Microsoft Windows Paint, GEM Paint, EGA Paint 2005, Dr. Halo DPE, PC Paint Plus, BLOAD, TIFF, and Macintosh MacPaint. This list covers all the major bit-mapped formats and includes two important extras, TIFF and MacPaint.

TIFF (Tagged Image File Format) is a gray-scale format, used frequently by scanners, and it's the closest thing there is to a standard format in this area. Ordinarily, I'd say that TIFF is likely to become the de facto gray-scale standard, but recently I've heard a certain amount of grumbling about "weaknesses" in

the format. In addition, gray-scale scanning is going to be one of this year's hot topics, so it's quite possible some new format will emerge as the standard by the end of the year. For now, though, TIFF is the leader.

MacPaint is the standard bit-mapped graphics format used on Apple's Macintosh computer—there are other paint programs with their own formats, but they can all read and write MacPaint files. And why should an MS-DOS desktop publisher worry about Macintosh graphics file formats? Because the Macintosh has been a serious graphics-oriented computer for much longer than the PC, one that has always provided a single, consistent environment for graphics hardware and software developers, unlike MS-DOS with its multiple conflicting graphics "standards." As a result, most computer artists use Macintoshes, and more clip art and other off-the-rack graphics are available in Macintosh formats. No matter how dedicated you are to MS-DOS, if you're involved with graphics, you shouldn't cut yourself off from what's available in the Macintosh world.

Also note that The Graphics Link can handle graphics files from both the GEM and Windows environments, which are used by Ventura Publisher and Pagemaker respectively, the two leaders in MS-DOS page make-up software. (Ventura Publisher is supposed to come out in a Windows-compatible version eventually, too.)

The actual conversion of files from one graphics format to another is quite easy with The Graphics Link. You start the program and from the opening menu select the source and target directories, the format you want to translate from, the format you want to translate to, and then the files to be translated. The translation process isn't lightning fast, but it's fast enough, and you can tag a list of files for a batch translation (which will tie up your computer but at least leave you free to do something else).

The Graphics Link also offers three options in the translation process. First, if you have an EGA- or CGA-compatible graphics card, you can view the file on the screen before translating it. Second,

you can have the file reversed to its negative image during translation (black to white and white to black). This reversal can be very useful since some graphics programs paint with black on white while others use white on black. Third, The Graphics Link can also scale graphics up or down (that is, increase or decrease their size) before translation.

On the whole, the program does what it's supposed to without fuss, and it includes a useful on-line help system. The accompanying manual is lousy—much too brief and, just to make matters more confusing, combined helter-skelter with the manual for PC Quik-Art's clip art collection. Fortunately for users, the program is very easy to learn in spite of the manual. (The manual does contain useful basic information on the formats used by different graphics programs.)

I have few complaints about The Graphics Link. The program could al-

ways use more graphics formats, and it still doesn't solve the problem of translating between bit-mapped and object-oriented programs. But for desktop publishers and other people who have to deal with a variety of bit-mapped graphics files, The Graphics Link can be a very useful tool, even an essential one in some cases.

COMING UP

Are those tantalizing full-page monitors worth their hefty price tags? I got the chance to spend some time with the Genius full-page display, and next month I'll tell you what I think. **T**

QUICK REFERENCE SUMMARY

Product: The Graphics Link
Manufacturer: PC Quik-Art, Inc.
 394 S. Milledge Avenue
 Athens, GA 30606
Phone: (800) 523-1796; (404) 543-1779
 (Georgia)
Sugg List Price: \$99

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VCACHE WINS AN ENTHUSIASTIC "THUMBS UP"

Vcache, from Golden Bow Systems, is an MS-DOS disk caching utility that speeds disk I/O by reading larger blocks of information from the disk during each read operation. Included with Vcache are three other programs to speed up floppy I/O, screen writes, and keyboard performance. In most cases Vcache can visibly reduce your disk access time.

To understand how disk caching can benefit you, some knowledge of disk I/O is needed. Whenever a program needs information from a disk file, it asks the operating system to read that file. The operating system reads data from that file into a section of memory called a disk buffer. Data from the disk buffer is passed to the program as needed. If the data your program wants is already in the buffer, there is no reason to physically read the disk. System performance can be markedly enhanced by altering the number and size of disk buffers available.

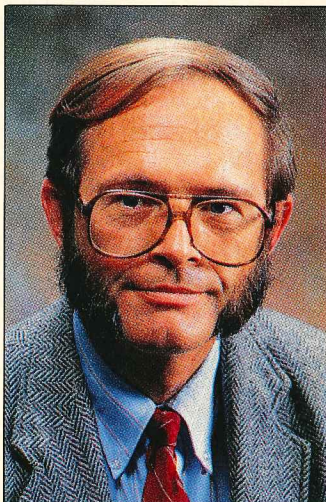
The number of disk buffers is controlled by the CONFIG.SYS file. The line `BUFFERS = 20` inserted in this file reserves 20 buffers for use by the operating system. The size of these buffers is not normally under your control. A program like Vcache is needed to alter buffer size.

VCACHE

The distribution disk from Golden Bow comes with three versions of Vcache: `CACHE`, `CACHE-AT`, and `CACHE-EM`. `CACHE` uses normal memory and subtracts the buffer space from your 640K of system RAM. `CACHE-AT` operates with IBM AT-class extended memory, and `CACHE-EM` uses expanded memory conforming to the Lotus, Intel, and Microsoft expanded memory specification. Which one you use depends on which model computer you have and what kind of memory expansion, if any, has been installed.

Plain `CACHE` offers the least increase in disk I/O speed. Since the buffers it sets up come out of your 640K of system memory, you cannot afford to specify large buffers. However, even with limited expansion of buffer size, you can speed up disk I/O enough to notice the change.

If you have a 286 or 386 class machine



RICHARD STARKMAN

with extended memory or expanded memory, the other two versions of Vcache offer even more potential. Disk caching with a megabyte or more of buffer space offers near RAM-disk speed without the worry of losing everything in a power outage. It also allows optimum speed-up with large database operations like report generation and sorting huge files.

All versions of Vcache accept optional arguments on the command line. These arguments include excluding specific drives from caching, an optional delay on single-sector disk writes (more on this later), increasing the "look-ahead" buffer used during sequential access, accommodating disk partitions larger than 33 megabytes, enabling AutoCad compatibility, and disabling Vcache's default memory diagnostics.

The optional delay on disk writes is an unusual feature. Most caching programs simply pass write operations straight through to the disk controller. Vcache can optionally delay single-sector writes for up to two seconds. (That is a fair amount of time to a computer.) The idea is to avoid multiple writes to the same disk sector. It also accumulates several small write operations and does the physical access for several writes at one time, all of which makes for more efficient use of your hardware.

Increasing the size of the look-ahead buffer is most useful when the file is accessed in sequential mode. Sequential

BY TOM ENRIGHT

access means that records are read in contiguous order. Word processing and some database operations make extensive use of sequential files. With a larger look-ahead buffer, several records are read at each time to save time on subsequent data requests.

Tests of Vcache showed speed increases in disk I/O of up to 90 percent. The amount of increase depends on precisely what type of access is being performed, how much memory is devoted to buffer space, and what kind of equipment you have.

Maximum speed increase is realized during sequential disk access. But other methods still show a significant decrease in disk access time. Naturally, the more memory you can devote to cache buffers, the less time is spent reading the disk. Slower hard disks will show more apparent decrease in disk I/O time than fast drives. The percentage of speed increase is the same; it's just more noticeable in the slower drives.

Some of the engineers at Kaypro also had a chance to put Vcache through its paces, and they discovered some interesting facts about this program. Vcache was the only disk caching program tested that worked correctly with RLL disk controllers. (Kaypro PCs use RLL controllers for hard disk-equipped machines.)

One of the engineers who hot-roads his machines found that Vcache also supports non-standard sector and cluster

sizes. Admittedly, few users will alter sector and cluster sizes on their hard disks, but for those who do, Vcache will operate correctly. Other caching utilities end up trashing the disk when cluster or sector size is altered.

Finally, Vcache was also the only caching program that functioned on an experimental 22-MHz, 386-based machine. Vcache earned an enthusiastic "thumbs up" from some very picky people.

ACCOMPANYING UTILITIES

As mentioned earlier, three utilities are included with Vcache.

Vkeyrate is for altering the typematic rate and delay of your keyboard. If you hold down a key on your keyboard, it will repeatedly type that letter. That feature is called "typematic." Vkeyrate allows you to set the delay time before the key begins repeating and the speed at which the key will repeat. I frankly can't see much use for this program, but it's there if you want it.

Vkette is for speeding up floppy diskette I/O. It is primarily intended for diskette copy and backup operations. The program achieves part of its speed increase by overlapping floppy disk writes with the next DOS operation, so you can process the next command before the floppy drive has finished a read or write operation. What this means is that disk copy and backup operations can run significantly faster. The downside is that you will return to the DOS prompt before the diskette drive is finished, so don't remove the diskette until the drive access light goes out.

The third utility, Vscreen, lets you speed up your screen I/O—that's its only purpose in life, and it works quite well in certain circumstances. What Vscreen does is speed up screen writes that use the normal MS-DOS BIOS routines to access the screen. Any program that writes directly to video memory bypasses the BIOS and will not speed up at all. The majority of applications that display text on the screen use the normal MS-DOS service routines. Those programs will speed up noticeably. Programs that display graphic or write directly to video memory will not.

DOCUMENTATION

Since Vcache is a fairly cut-and-dried package, the documentation is brief—the manual is only 24 pages. It contains a concise explanation of each program and its options.

Experienced users will find the documentation completely adequate. New users may feel that the programs and options are explained too briefly. There are no hand-holding practice sessions to walk the new user through the program. But everything you need to know is in the manual.

THE BOTTOM LINE

For disk-intensive operations, Vcache will pay for itself in a couple of days of use. There are very few programs that pay for themselves that quickly. Those of you who do heavy-duty word processing or

work with large databases or other disk-intensive programs should invest in Vcache. You'll be glad you did. ■

SCORECARD

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QUICK REFERENCE SUMMARY

Product: Vcache
Manufacturer: Golden Bow Systems
 P.O. Box 3039
 San Diego, CA 92103
Phone: 800-284-3269
Sugg. List Price: \$49.95

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EQUATION-SOLVING SOFTWARE

BY BIRRELL WALSH

There is a new type of product that takes much of the drudgery out of mathematics—equation-solving software. These programs solve more complex equations than are practical for spreadsheets, and they allow you to try out ideas quickly and cleanly. Two such programs from opposite ends of the price spectrum are reviewed here. They are Eureka: the Solver from Borland International and MathCAD from MathSoft.

With a “solver,” you simply enter an equation at the keyboard and the program tells you the answer. This means that you don’t have to be a programmer or spend two hours setting up a spreadsheet just to solve equations.

The formulas are not just the simple sort that you can do on a pocket calculator. You can do differentiation, integration, and, in the case of MathCAD, matrix and vector operations. You can make functions of functions and graph them. One of the products allows you to make a finished document that includes your formulas, solutions, and graphs.

These programs are intended for scientists, engineers, architects, and other professionals with a solid foundation in advanced mathematics. Under some conditions these programs do not deliver the correct answer, so users need to be able to judge whether or not a particular answer is reasonable. Given the intended audience for this software, we are altering our normal format and comparing the two packages strictly on the basis of their capabilities, without regard to other criteria such as documentation or product support.

FIRST IMPRESSIONS

MathCAD, which requires 512K of RAM, presents you with a blank screen onto which you type formulas. The usual keyboard substitutions are used for mathematical operations—“*” for multiplication and “^” for exponentiation. What is displayed on the screen is a pleasant surprise. Standard mathematical notation (a floating dot for multiplication, superscripted exponents, etc.) is displayed, and equations are also formatted to take parentheses into account. MathCAD produces symbols that look like pages from

a math text—quite legible and elegantly formatted.

Eureka, which needs 384K of RAM, has a different strategy. Rather than using a single, blank screen, it has several windows. You enter equations into the “edit” window, solutions appear in the “solve” window, a “report” window summarizes inputs and outputs, a “verify” window checks Eureka’s work, and the “graph” window shows character-based graphics.

Unlike MathCAD, Eureka does not use classical math symbols. It uses the substitutes that have been developed for computer languages, and what you type is what you see on the screen. Since, unlike MathCAD, it makes no conversion, formulas are easier to enter. You use the Eureka editor, which has the familiar WordStar-compatible command set, to make the entries and to change them.

MathCAD produces symbols that look like pages from a math text—quite legible and elegantly formatted.

SOLVING EQUATIONS

There are two ways to solve equations, by substitution and by defining an equation with only one possible answer. For example: In the equation $A = X/5$ you need to assume (substitute) some value for X in order to solve for A. The other type of equation, with only one possible answer, could be an equation like $X^3 + 2X^2 + X + 3 = 0$. As this equation is written, only one value of X will result in an answer of zero.

As an initial test, a set of 20 simple equations were entered into both MathCAD and Eureka. In this list, each equation depended on one or more of the others. Both MathCAD and Eureka solved the problems and displayed the 20 answers in less than three seconds on a 10 MHz system. Eureka will also solve the equations by including on the DOS command line the name of an ASCII file containing the equations. If the equations

were stored in a file called EQUA.DAT, the DOS command line would be EUREKA EQUA.DAT. Both programs can read and write ASCII data files, but only Eureka accepts the file name on the DOS command line that runs the program.

The solutions look different in each of the programs. Eureka places all solutions in its “solve” window. With MathCAD, you must first enter the equation with the defining equals sign, “f := e + a + b”, to tell the program to assume that this equation is true. If you want to see a solution for variable f, enter “f = ”, leaving a blank space after the equals sign. MathCAD will find the answer immediately if you are in auto-calculate mode, or after you press F9 if you are in manual mode.

A second kind of equation, with a single solution, is the “find the root” sort. To find the value of x for which “ $x^3 + 2x^2 + x + 3 = 0$ ” is true, you want to find the root(s) of this equation.

Eureka accepted this input gracefully and announced the solution in about a second and a half:

Solution:

Variables Values

x = -.33333299

Maximum error is 2.8518519

It’s not the right answer. The correct answer is negative 2.175. The manual explains that Eureka occasionally doesn’t find a solution. That was certainly true with this example equation.

MathCAD is less gracious with this sort of equation. You must start with an initial guess, which is awkward if you have no clue what the answer will be. Having entered the equation, I made an initial guess that x equaled 3. MathCAD thought it over for a moment and told me that the answer was -2.17455941. A check revealed that this value worked to six places. MathCAD was more awkward to get under way—but it worked.

Further research revealed that sometimes Eureka also requires a starting value. In fact, Eureka substitutes one of its own if you don’t supply one. It uses the value “1.” Apparently, Eureka had trou-

Both programs need seed values or initial guesses to begin from, which can result in wrong answers.

ble making it to -2.175 from 1.

Both programs have strong abilities to solve equations. The algorithm in each program, however, needs seed values or initial guesses to begin from. Some initial values will result in no answer or a wrong answer. Neither of these programs should be relied on unless you have the ability to judge the "reasonableness" of the answer. This limits the usefulness of both programs significantly. Hopefully this problem will be solved in future releases.

FUNCTIONS

Both Eureka and MathCAD allow you to define your own functions. You can make functions as long as you wish. Each function can be of one variable or of several.

You can define and use units of measurement in both programs. Eureka can be set to convert automatically between units—as in converting from kilometers per hour to miles per hour. MathCAD will convert from one unit to another, and will also flag erroneous units. It will not let you define speed in weeks per month if you have already made speed equal to distance per time.

Both programs have predefined functions. These functions give you a head start on your problem. Both support complex numbers, although MathCAD's support is more complete.

MathCAD supports vector and matrix operations, while Eureka does not. This is a serious advantage for engineering uses that rely heavily on these operations. A full range of matrix operations is provided, including dot and cross product, determinants, inverses, traces, identity matrix, the Kronecker delta, and the completely antisymmetric tensor of rank 3.

Eureka provides 28 built-in functions. MathCAD has 77 built-in functions: in

addition to complex, vector and matrix operations, there are statistical, logical, Bessel, Fast Fourier, interpolative, and spline functions.

GRAPHING CAPABILITIES

Eureka has a very rudimentary graphing mechanism. There is a dedicated graph window, but the graphs are limited to character graphics. Points are marked with periods or degree signs as close as possible to where they belong. You do get a graph, but it is clumsy and not well labeled.

MathCAD has sophisticated and facile graphics. Choose a location for your graph and type "@". You can choose from several graph formats, set the vertical and horizontal dimensions of the graph, determine the number of grid lines, and designate whether they are linear or logarithmic. You can choose whether the data points are shown as points, rectangles, pluses, diamonds, or x's, and whether they are connected by lines or stand alone.

Eureka has a rudimentary graphing mechanism; MathCad has sophisticated and facile graphics.

MathCAD can also cut and paste graphs into different locations. These graphs are high-resolution, easy to modify, and suitable for printing and presentation.

REPORT FUNCTIONS

Some mathematics are for the pleasure or edification of the user. Most, however, must be shown to other people.

Eureka has a simple report function. It will list the date, time, all the equations you gave it, and Eureka's solutions. The character-based graph will be included, if you made it. All of this can be saved to a disk file in ASCII format. Since they are ASCII files, you can use either your own word processor or Eureka's editor for

polishing. Unfortunately, Eureka supports only Epson and Epson-compatible printers.

With MathCAD you prepare your entire report, including graphs, inside the program. A competent word processor is included for text manipulation. Text, elegantly formatted formulas, and graphs can be placed where you wish and moved around until the output is what you need. It is easy to prepare a good-looking report using MathCAD. MathCAD should appeal to those who publish their results, because it supports most printers, plotters, and the HP LaserJet.

THE ENVELOPE, PLEASE

Until the solvers appeared on the market, users had to translate the mathematics they used on paper to a special format used in computers. Only a few programs could solve complex equations, and they were add-on products for spreadsheets. Now there are two products that solve equations and present the results.

MathCAD is a clear winner in equation-formatting, built-in functions, graphics, and report-generation.

Eureka's documentation is adequate, but not outstanding. MathCAD's documentation is excellent. MathCAD provides a toll-free support line, while Eureka does not.

Eureka has fewer facilities and falls midway between two niches. It is neither a language nor a professional "mathematics processor". The \$99 list price is nice—MathCAD's is considerably higher—but Eureka falls short in the area of dependability and output formatting. If you want to do serious work with mathematics, you want MathCAD. ■

QUICK REFERENCE SUMMARY

Product: MathCAD, version 2
Manufacturer: MathSoft, Inc.
One Kendall Square
Cambridge MA 02139
Phone: 800-MATHCAD
Sugg. List Price: \$349

Product: Eureka: The Solver
Manufacturer: Borland International
4585 Scotts Valley Drive
Scotts Valley, CA 95066
Phone: 800-543-7543
Sugg. List Price: \$99

Last month I began my list of essential public domain programs with NewSweep, Unerase, BadDisk, SuperDirectory, MEX, IMP, VDE, Outliner, GKey2, and QwikKey. Now, here's the rest of my public domain toolkit.

SEARCH

Search, by Eric Bohlman, is halfway between a utility and an application program. You tell Search to find certain words or phrases, and it dives into the underbrush of your text files, thrashes about, and then comes faithfully back and dumps every occurrence of those words or phrases at your feet. I use it to dig information out of my past columns or to find out if I've already covered a particular product. You could also use it to search through letters, memos, name and address lists, inventory lists, and so forth. You could even use Search as a primitive sort of free-form text database.

Search can find not only single items but also combinations, using logical AND (to find only text containing all search items) and logical OR (to find text containing any search item). The program can find phrases even if they fall across a line break, and it can search for a combination of letters only at the beginning of a word, only at the end, or anywhere within. It can search more than one file and can handle squeezed and crunched files as well as files in libraries (LBR files).

When Search finds what you're looking for, it will display the whole block of text on the screen or save it in a file. You can tell Search what to use as a block marker, so you can have it search lines, paragraphs, or blocks of text bounded by some arbitrary marker.

Search isn't as sophisticated as commercial programs like Electra-Find or Free-Filer, but it works well, and it's free. If you work with a lot of text files, you need it or something very much like it.

FINREP

FinRep, by Eric Gans, is a find-and-replace program. It will search any file, even a program (.COM) file, for any string of characters you specify and then replace that string with another. Both the search

THE PUBLIC DOMAIN TOOLKIT, PART 2**BY TED SILVEIRA**

string and the replacement string can contain control characters and hexadecimal values (for unprintable characters). You can even use wildcards in the search string, so you can, for example, find words with the same root but different endings.

When FinRep replaces a word, it alters the replacement string to match the capitalization of the found string (very useful for changing names in screenplays and similar things). FinRep also accepts wildcards when you specify the file to search, so you can have it work on a whole batch of files (all the chapters of your novel?) with a single command, and you can use it in batch files with Submit.

For the most part, I've used FinRep as a way to overcome the limitations of the search command in WordStar 3.3 (to search for ^S, for example). I don't use it quite as much now because WordStar 4.0 has an improved search function, but FinRep can still do some things that WordStar can't.

PAIRX

WordStar users all know what happens if you fail to insert your print control characters in pairs—you come back at the end of a long print run to find the last 98 pages printed entirely in boldface or underline (and your ribbon worn out from the extra work). PairX, also from Eric Gans, is a small program that simply checks your text files to make sure that all your print control characters (^B, ^S, etc.) are paired. That's enough to make it essential for anyone using WordStar 3.3 or earlier. WordStar 4.0 highlights boldface and underlined words, which usually makes it obvious if you've missed a closing ^B or ^S, but if you want to play it safe, you'll still use PairX.

MAGE31, SAVESTAR, RESQ

Also for WordStar users are Mage31 (from the original Mage by Chris and Steve Rudek), SaveStar (David Weinberger), and Resq (Mike Yarus). These programs can recover lost text from your computer's memory after WordStar crashes or freezes due to a disk-full error, power surge or brownout, operator error, or other condition short of a complete power failure.

The secret is that when WordStar freezes up, forcing you to press the reset button to regain control of your computer, the text you had in memory isn't really lost—the computer has just forgotten where it is. What Mage31, SaveStar, and Resq all do is locate that surviving text and save it to disk. All three programs are easy to use and relatively reliable, as long as you haven't turned off the power or run another program before attempting the recovery.

Mage31 and SaveStar work with WordStar only and must be configured specifically for the version of WordStar you use (2.26, 3.0, 3.3, 4.0) by making minor changes in an assembly language source file (MAGE31.ASM or SAVESTAR.ASM). Resq, on the other hand, needs no configuration. You just give it a phrase that's in your lost text, and it will find the phrase, back up to find the beginning of the text, and then save it all to disk. Resq will also work with some programs other than WordStar (but not very well with Perfect Writer, I'm afraid).

HARDSOFT, FILT7

The most basic medium of exchange in computer text files is the plain ASCII file, consisting only of printable characters. WordStar, as many people have discovered to their great frustration, doesn't create plain ASCII files. Instead, it inserts

print control characters, high-bit markers, and other strange elements into its document files. To convert a WordStar document file into a plain ASCII file, you need a filter program.

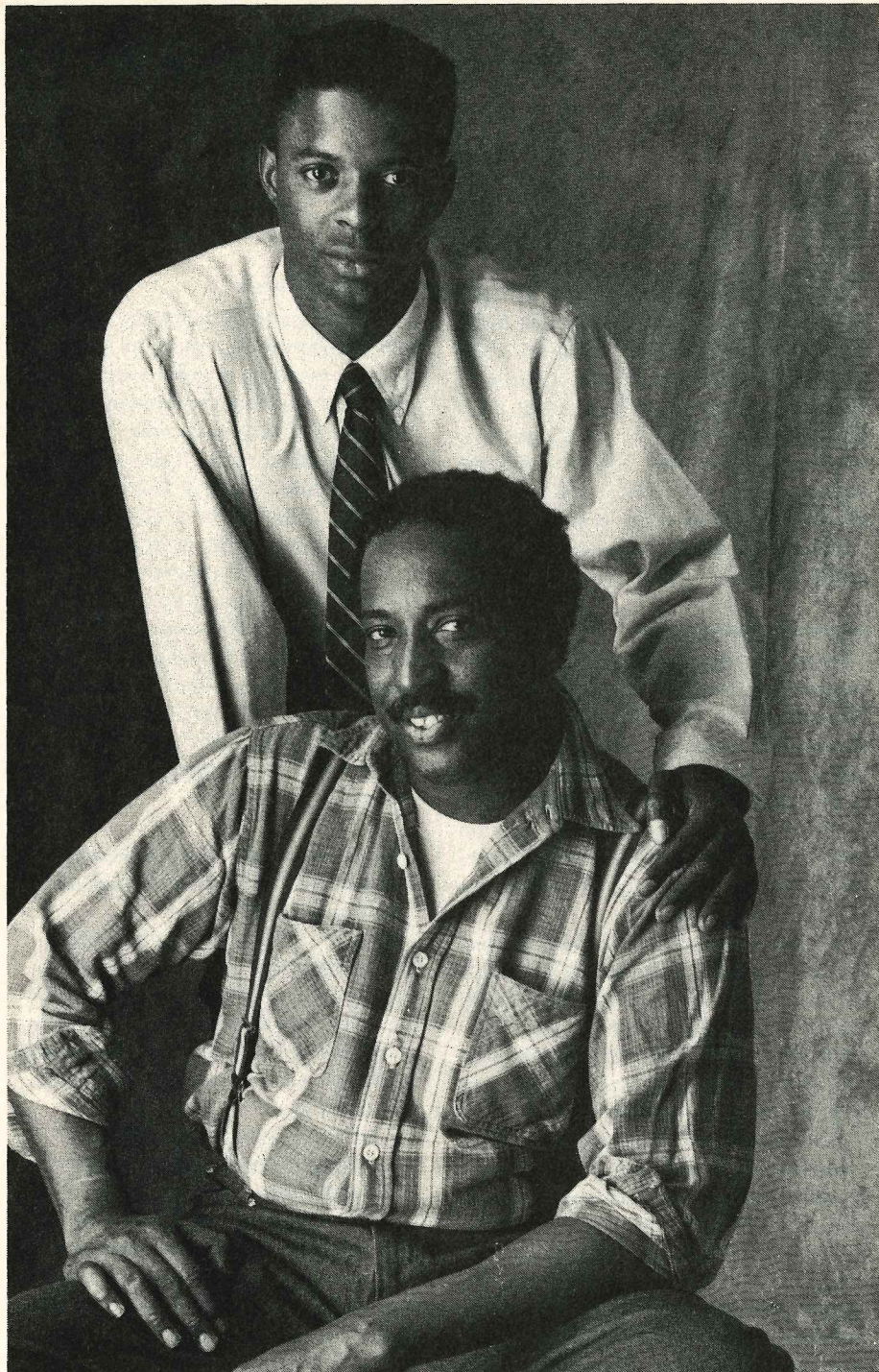
Filt7 (Irv Hoff) will read a text file of any size and remove all print control characters, high-bit characters, and other "foreign" elements inserted by WordStar (and other programs), leaving you with a plain ASCII text file (welcome everywhere). Filt7 can also do some other useful tricks, like changing all tab characters (^I) to spaces or groups of spaces to tabs, and it works on any kind of text file, not just WordStar files.

HardSoft (Kenneth Toy) is so named because one of its most common uses is getting rid of hard carriage returns in files where they occur at the end of every line. It is written specifically for WordStar files and can only handle files that will fit in memory (under 40K, so it's usually not a problem), but it's small (2K) and fast. And it has an extra trick—it can convert ASCII files to WordStar document files, a real time-saver if you need to reformat an ASCII file.

With WordStar 4.0, you no longer need an external filter program to create an ASCII file from a WordStar document file, though I often find that Filt7 or HardSoft is faster and more convenient.

NULU

Nulu, by Martin Murray, is a NewSweep-like program written especially to work with library files. A library file (which always has the filetype LBR, as in SAMPLE.LBR) is really a collection of smaller files that have been hooked together so that CP/M thinks they're one large file. The LBR file will be slightly smaller than the sum or its parts, but its real advantage is that it keeps the collected files together. The library file SEARCH.LBR, for example, might contain SEARCH.COM (the program itself), SEARCH.DOC (the documentation), -READ.ME (some last minute updates), and SAMPLE.TXT (a practice file to test the program on). For this reason, LBR files are used extensively in CP/M user groups, on CP/M bulletin boards, and in the CP/M sections of information services like CompuServe.



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To use the files contained in an LBR file, though, you have to extract them from the library—that's where Nulu comes in. With Nulu, you can open up a library, browse through its contents, copy files out of the library, and even delete or rename member files. You can also use Nulu to create a new library file or add new member files to an existing library.

If you want to take advantage of CP/M public domain software, you need Nulu.

CRUNCH/UNCRUNCH

Crunch, by Steven Greenberg, is a file-compression program. Crunch reads in a file, analyzes it, then saves it in a special compacted form that uses considerably less space (often saving 30 percent or more). Because of these savings, Crunch is heavily used for storing public domain software on CP/M bulletin boards (where space is always tight) and in the libraries of CP/M user groups.

To make use of the crunched files, though, you have to restore them to their normal state. That's where Uncrunch, also by Greenberg, comes in. Uncrunch reads the crunched file, unscrambles the special encoding, and saves the file in its original, uncrunched form.

There is another common system of file compression, called squeezing. Though squeezing predates crunching by several years, crunching is now more popular because it almost always yields better compression. To take advantage of public domain software, you must be able to deal with both squeezed and crunched files. NewSweep, the file maintenance program reviewed here last month, can squeeze and unsqueeze files, but to work with crunch files, you'll need Greenberg's Crunch and Uncrunch.

COMING UP

That's my starter list of essential CP/M public domain programs. What's yours?

As usual, all the programs mentioned this month and last can be found through major CP/M bulletin boards and user groups and on the Kaypro bulletin board at (619) 259-4437.

Next month, I'm going to start on the CP/M Survivalist's Guide. See you here.



CONTINUED FROM PAGE 15

scope and maliciousness and could end up destroying the entire public domain resource of software, because everyone would be frightened to accept software from anybody else. You might see a "Tylenol scare" type of product contamination that could eventually destroy a large software company.

Now, what's going to happen is, at this point, hard to predict. I tend to favor the least damaging scenario, the one that says, it'll just go away. There are other people here that strongly disagree with me, and say, "not this time" that this one is really serious and will grow and not go away and have a very serious economic impact on our entire industry.

There's been talk that the Pentagon is looking at viruses as a counter-intelligence tool

Any such work would be classified and if there was anything I could or would say, I couldn't, because of the security classification. I couldn't say what, if anything, the NSA is doing in regards to examining the problem or use of viruses.

I would point out a particularly interesting novel, however, called "Softwar." The novel, by a couple of French authors, Breton and Beneich (Holt, Reinhart & Winston, 1984) revolves around a plot that has the U.S. planting a very destructive virus in a computer that is sold to the French, who are in turn directed to sell it to the Soviets, where the virus infiltrates the Soviet computer system.

Editor's Note: The microcomputer community has its share of vandals, and consequently you too have to worry about virus and bomb programs. A particularly destructive program can ruin months or even years of data and hard work. Fortunately the precautions against this are straightforward and fairly simple to follow.

The best form of protection is to get software from somebody you trust, such as a bulletin board where the sysop tests each upload before he or

she places it in a public area. Beware of an "upgrade" to an earlier program whose size or interface is markedly different from its predecessor. Also watch out for programs whose size seems too large for what they do—a 60 kilobyte file listing program is a little suspicious, for example. Once you have a program there are several ways to test its safety.

Most bombs go right for jugular: the file allocation table (FAT). The FAT is a table that contains all the information as to where data is stored on disk; when the FAT is destroyed, the disk is destroyed. Other programs seek to write over existing information, or to format the disk altogether. To do any of these things, however, a bomb program must write to the disk and that's where you can stop it.

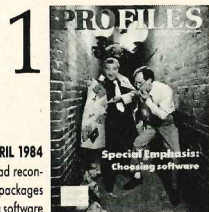
CHK4BOMB.EXE, by Andy Hopkins, is an MS-DOS utility program that examines program files and tells you if they do anything suspicious, such as write to absolute sectors, or format disks. The first thing you do when you download a program is run CHK4BOMB on it.

DPROTECT.COM, from Gee Wiz Software Company of New Brunswick, New Jersey, is a RAM resident program designed for use during program testing. DPROTECT sits in memory while you run a suspect program and if that program tries to write to the hard disk, DPROTECT immediately halts its execution. A message is then displayed informing you of the attempted disk write, then the computer re-boots.

Both of these programs are in the PROFILES section of Kaypro's bulletin board, Kaypro OnLine. The version of DPROTECT posted there (1.01) guards against disk access made through the BIOS (Basic Input/Output System) services only. There are other, more direct ways to mangle a disk. CHK4BOMB too can't always help; what if the program you are testing is designed to write to your disk, such as a disk editor? The bottom line is that you can never know for sure that a program is safe.

— Marshall L. Moseley

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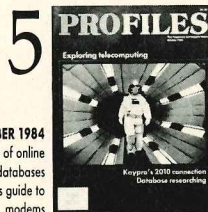
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• Science fiction writers
• Perfect Writer book reviews



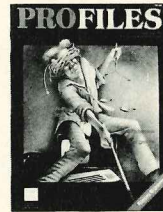
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• Turbo Pascal review
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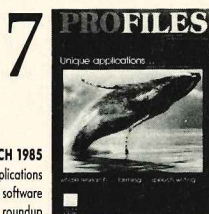


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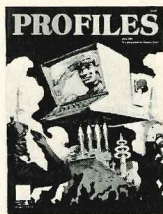
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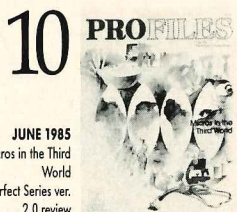
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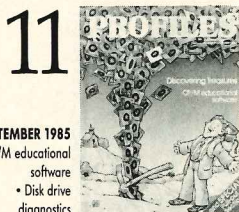
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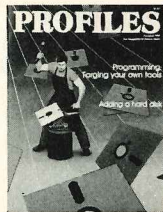
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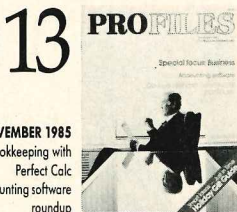
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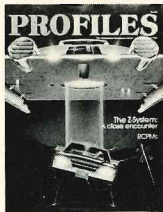
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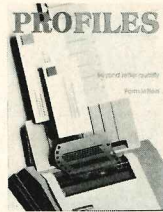
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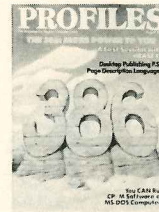
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NEW PRODUCTS

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.

VGA BOARD

The Orchid Designer VGA video board gives users 2.5 times the standard VGA resolution.

The board eliminates the need to separate products by resolution by offering a one-card solution. It enhances every type of application, from paint programs to AutoCAD.

In addition to the standard VGA modes, the Orchid Designer VGA supports 640 x 480 x 256 colors, 800 x 600 x 16 colors, and 1,024 x 768 x 16 colors.

The product provides register level compatibility in all modes of operation: VGA, EGA, CGA, MCGA, MDA, and Hercules. All information is written directly to the hardware, giving users more speed and a higher degree of software and hardware compatibility.

\$499. Kaypro MS-DOS, and all IBM-compatible computers except the 2000 and 2000+. Orchid Technology, 45365 Northport Loop West, Fremont, CA 94538; (415) 683-0300.

Buyers Hotline #550-48

PERSONAL FINANCE

Andrew Tobias' Financial Calculator is MECA Venture's newest personal finance product. It was developed from Chapter 6 of the top-selling personal finance program *Managing Your Money*, by Andrew Tobias.

The product incorporates new features and applications in subsections on tax planning, retirement planning, college planning, rental property analysis, investment analysis, internal rate of return, bond yields, compound interest calculations, and more.

The Financial Calculator includes the latest tax laws for 1987 and 1988 and offers a depreciation calculator

and an on-line calculator.

The product comes with a demo disk of *Managing Your Money*.

\$44.95. Kaypro MS-DOS, and all IBM-compatible computers. MECA Ventures, 355 Riverside Ave., Westport, CT 06880; (203) 226-2400.

Buyers Hotline #551-48

1-2-3 ADD-INS

The Worksheet Utilities are six add-in programs that improve Lotus 1-2-3 users' productivity.

File Name	Date	Description
ADNOTES.WKI	5-Nov-87 9:34a	2,124 Key advertising rates for the major...
ADNOTES.WKR	5-Nov-87 9:33a	750 compressed version of Adnotes
ADNOTES.WKL	5-Nov-87 9:34a	2,124 Key advertising rates for the major...
BTC.WKI	13-Nov-87 7:01t	15,934 From more industry tips
BPLN.WKI	9-Aug-87 2:22a	6,838 1988 business assumptions includin...
BSHRT.WKI	4-Jan-88 1:02a	2,156 supporting regression analysis for...
CHANGES.WKI	4-Jan-88 12:05a	9,615 listing of all domestic dealers
CISTS.WKI	4-Jan-88 1:39a	1,941 fixed cost assumptions for 1988
DEPTBUD.WKR	19-Nov-87 10:42a	8,636 compressed version
DEPTBUD.WKI	9-Aug-87 2:23a	10,365 product marketing department budg...
DIRECTRY.WKI	4-Jan-88 4:56a	2,645 direct mail backup data for the 19...
FACFSM.WKI	4-Jan-88 12:13a	6,449 monthly forecast template
HOTZ.WKI	6-Nov-87 2:43a	3,830 compressed version
HOTZ.WKR	4-Jan-88 5:26a	7,740 important channel and press contac...
HOTZ.LST	4-Jan-88 12:43a	5,239 hot international Q4 prospects
HPZS.WKI	4-Jan-88 12:06a	1,702 printer string relay template for...

As add-in programs, the set of utilities is automatically overlaid in a common memory space or can operate from expanded memory if available.

The Worksheet Utilities include the following tools: Formula Editor, Search and Replace, Print Settings, File Manager, AutoSave, and Range Column Width. It is available in both 3.5-inch and 5.25-inch formats.

\$99.95. Kaypro MS-DOS, and all IBM-compatible computers. Funk Software Inc., 222 Third St., Cambridge, MA 02142; (617) 497-6339.

Buyers Hotline #552-48

ACCELERATOR CARDS

The 286 Express-12 and 286 Express-16 are two new half-slot accelerator cards for PC- and XT-type computers.

The accelerators allow the system to boot in the 8088 mode, pass all the ROM BIOS time-dependent tests, then software-switch to 80286 processing without rebooting. Simple keyboard commands select 80286 or 8088 processing.

Support for three kinds of optional numeric coprocessors is also provided for processor-intensive applications.

\$645 and \$795. Kaypro MS-DOS, and all IBM-compatible computers. PC Technologies Inc., 704 Airport Blvd., Ann Arbor, MI 48108; (800) 821-3086.

Buyers Hotline #553-48

WYSIWYG FOR DESKTOP PUBLISHING

WYSIfonts! is a program that automatically installs any HP soft font format or SoftCraft font into Ventura Publisher, Aldus PageMaker, or Microsoft Windows and constructs a corresponding screen font.

The product automates the installation procedure for soft fonts. It is menu-driven and installs all HP and SoftCraft laser-format fonts for both screen and printer. Kerning information is provided.

An Old English 20-point font is included with WYSIfonts!, and additional disks are available for \$15 each.

\$95. Kaypro MS-DOS, and all IBM-compatible computers. SoftCraft, Inc., 16 N. Carroll St., Ste. 500, Madison, WI 53703; (608) 257-3300.

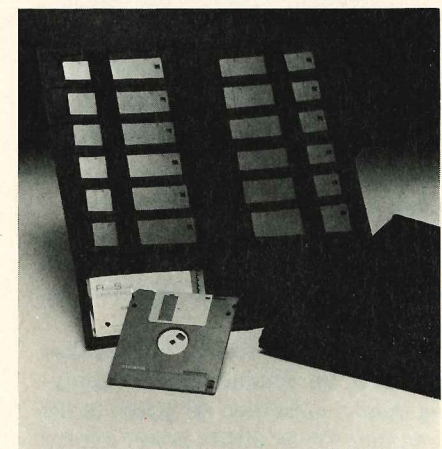
Buyers Hotline #557-48

DISK VALET

The Disk Valet is a nylon case for storing and transporting floppy disks. Up to 12 disks can be stored in individual pockets, secured by an elastic strap.

When fully loaded the case is less than 1.5 inches thick, so it fits easily in a purse or briefcase. The case is available for either 3½-inch or 5¼-inch diskettes.

Custom fabric colors and imprinting



are available for corporate or product identification.

\$11.95. RamStar Group, Inc., 5996 Paradise Point Drive, Miami, FL 33157; (800) 327-2303.

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FREE CATALOG

Dynacomp's Winter 1987-88 catalog is available free upon written request.

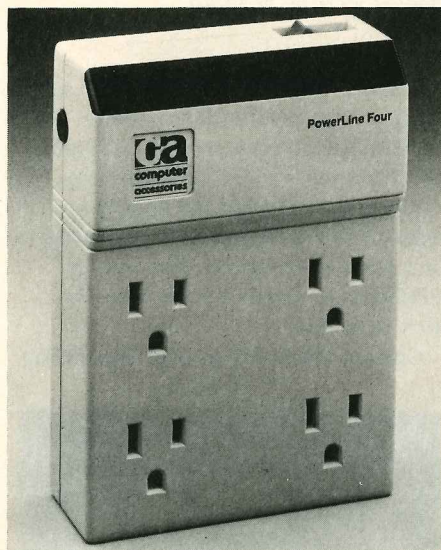
It features software for CP/M and MS-DOS systems. This edition includes expanded sections in education, business, investment, science, engineering, and public domain software.

Free. DYNACOMP, Inc., 178 Phillips Rd., Webster, NY 14579.

Buyers Hotline #561-48

SLIM-LINE UNINTERRUPTIBLE POWER SUPPLY

The Power Saver Plus is a two-inch-high standby power supply designed to fit under any monitor and provide power status information.



The product combines uninterruptible power with line conditioning, surge suppression, and power control. It protects the computer system and data from black-outs, voltage dips, surges, and spikes.

If utility power fails or drops below tolerance, the product begins supplying steady, noise-free AC power to the computer. When utility power returns

to normal, the product automatically switches back to the AC power line.

\$799.95. All Kaypro computers, and all IBM-compatible computers. Computer Accessories Corporation, 6610 Nancy Ridge Dr., San Diego, CA 92121; (629) 457-5500.

Buyers Hotline #559-48

MUSIC ACCESSORY

The MIDI (Musical Instrument Digital Interface) Starter System is a music accessory for personal computers that includes complete hardware and software support.

The MIDI coprocessor card connects synthesizers, drum machines, MIDI guitars, and other electronic instruments to the PC.

The software uses a "point and click" interface and full-screen displays with pop-up windows. The Easy-8 Sequencer program functions as an eight-track digital tape recorder with editing tools to record, correct, and play back the musician's performance.

Sound editing and librarian software is also included to create new musical sounds for popular synthesizers.

\$199. Kaypro MS-DOS, and all IBM-compatible computers. Music Quest, Inc., 1700 Alma Dr., Ste. 260, Plano, TX 75075; (214) 881-7408.

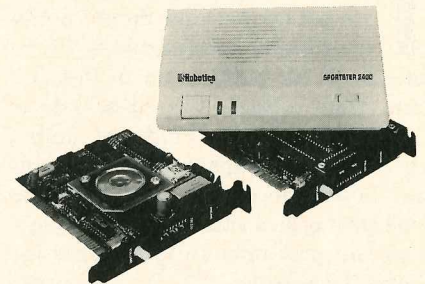
Buyers Hotline #558-48

SPORTSTER MODEMS

U.S. Robotics has introduced three new 2400- and 1200-bps Sportster brand modems. The Sportster 2400 external modem operates at 2400/1200/300 bps. It can be connected to any computer with an RS-232C serial interface. The case features a summary of modem operations printed on the bottom panel and an AC power adapter.

Two internal modems, the 2400/1200/300-bps 2400PC and the 1200/300-bps 1200PC are configured as half-card-sized expansion boards and include Telpac data communications software and an installation program disk.

Each model is an auto-dial, auto-answer modem and uses the standard "AT" command to insure compatibility



with all popular communications software. All three are Bell 212A-compatible at 1200 bps and Bell 103-compatible at 300 bps.

Sportster 2400, \$249; Sportster 2400PC, \$239; and 1200PC, \$139. Kaypro MS-DOS, and all IBM-compatible computers. U.S. Robotics, Inc., 8100 North McCormick Blvd., Skokie, IL 60076; (312) 982-5010.

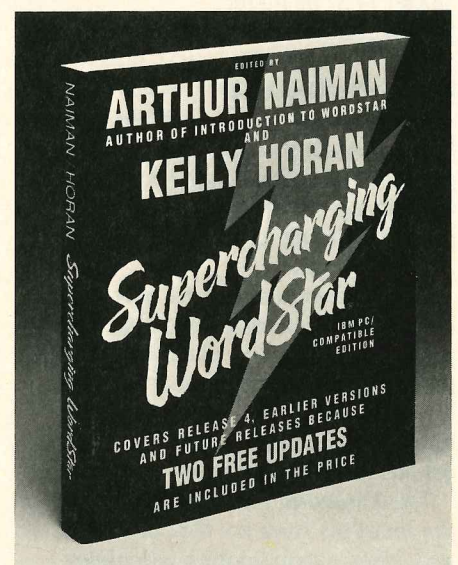
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WORDSTAR RESOURCE

SuperCharging WordStar is a 345-page book of tips and shortcuts for WordStar users.

The tips include mastering the built-in WSCHANGE command for customizing the program and converting files to all-lowercase characters using three keys.

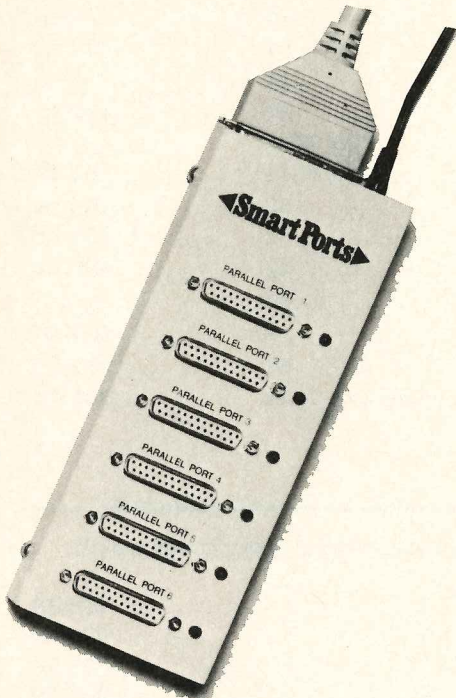
The book includes WordStar 4.0 and earlier releases. It also offers two free updates in order to cover future releases. Currently, limited information is avail-



able for the CP/M user, but full assistance will be provided in the first of two updates.

\$18. All Kaypro computers, and all IBM-compatible computers. Goldstein & Blair, P.O. Box 7635, Berkeley, CA 94707; (415) 524-4000.

Buyers Hotline #560-48



PRINTER SWITCHING

SmartPorts is an intelligent printer port expansion strip that allows a computer to direct any print output to up to six parallel printer devices without mechanical switches.

The strip is installed by plugging it into a computer's existing parallel port. Printers are then connected by plugging them into the strip.

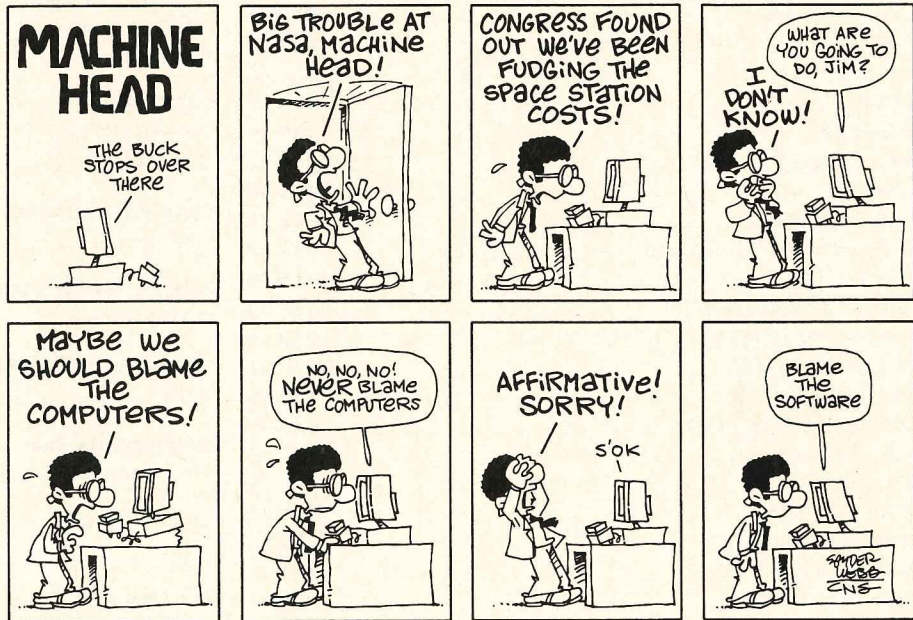
The user can select a printer from a pop-up menu or by embedding a code directly in the software or setup string. This eliminates A/B switching and changing forms. Traffic to all printers is controlled by SmartPorts.

\$119. Kaypro, and all IBM-compatible computers. Dresselhaus Computer Products, 8560 Vineyard Ave. #405, Rancho Cucamonga, CA 91730; (800) 368-7737.

Buyers Hotline #556-48

Condor 3, version 2.11.07, a fully relational CP/M database management system, is available at a reduced price of \$149. (Current users can update for \$95.) It features screen painting for creating custom menus, input forms and reports, and non-procedural English language commands. Condor Computer Corporation, Ann Arbor, MI □ **Pagemaker 3.0** for the PC adds new support for long documents, enhanced graphics capabilities, and extensions to the user interface, including templates. The new version accepts unformatted ASCII text files from any word processor that generates text-only files. Additional printer and font support has also been added. Aldus Corporation, Seattle, WA □ **The Z80 Card** now includes a free copy of **UniForm-PC** and **UniDOS**. The card allows the user to run CP/M programs on a PC-compatible. It includes 64K of on-board memory and fits in one half-size expansion slot. MicroSolutions, DeKalb, IL □ **Turbo Basic 1.1** now supports Hercules graphics. It also allows users to swap disks that hold \$include files, allowing development

of larger programs on floppy-based systems. Borland International, Scotts Valley, CA □ **Managing Your Money** has been upgraded to version 4.0. The program now offers a full-featured word processor that allows users to customize keystrokes. Version 4.0 supports the new tax law structure through its tax estimator chapter. It features IRA decision making, mailmerge, and expanded printer support. Meca Ventures, Westport, CT □ **Windows 2.0** and **Windows/386** offer improved support for expanded memory hardware, enhanced data exchange support for MS-DOS applications, and two- to four-fold speed improvements. Microsoft Corporation, Redmond, WA □ **PerfectPal** version 2.1 is a productivity tool designed for use with WordPerfect 4.1 and 4.2. The product uses a system of over 400 pre-coded macros that reduce keystrokes for WordPerfect functions. The new version offers pop-up instructions for column settings, indexing, table of contents, etc. It also includes 100 pre-formatted page style set-ups. PC Template, Glendale, CA



How to Use the Buyer's Hotline

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.

Advertiser	Page No.	Hotline #
Advanced Concepts E&C	11	111-48
CDE Software	59	158-48
Central Computer Products	Inside Front Cover, 1, 33, 40	014-48
CLASSIFILES	57	----
Computer Professionals, Inc.	23	022-48
E-Z Systems	61	323-48
The Interface Group	12	----
Intersecting Concepts	21	340-48
James River Group	Back Cover	----
Kaypro Accessories	25, 28, 41	151-48
Kaypro Corp.	52	153-48
Kaypro General Store	2	152-48
Macton Industries, Inc.	42	920-48
PROFILES BACK ISSUES	67, 68	----
Puget Sound Computer Systems	7	934-48
Southwest Computing	63	371-48
Traveling Software	Inside Back Cover	999-48

Listed below are the companies and Hotline numbers for those products mentioned in our editorial features this month.

Product	Hotline #
Backup Technology:	
Verbatim 12-Megabyte Internal System	635-48
Bernoulli Box II	636-48
PhD	637-48
Diskit 2 Plus	638-48
DuraPak	639-48
Traveldisk	640-48
Alloy FT-60	641-48
Coretape	642-48
DOS 60-9000	643-48
Galaxy Slimbox 32-50/60TS	644-48
Filesafe 7060	645-48
Priam Storaospace ET60	646-48
Sysgen Smart Qic-File	659-48
Tallgrass TG-4060	647-48
Tecmar QT-60e	648-48
Maynstream System 60	649-48
ADIC TD-440	650-48
Alloy Retriever 40	660-48
Archive XL 5540	651-48
Irwin 145, Irwin 445	652-48
MDI External MT-40P/AT	653-48
Mountain TD 4440	654-48
Bridge-Tape	661-48
TG-1040e HS, TG-1040i HS	662-48
Back-It	655-48
Corefast	663-48
Fastback Plus	656-48
Intelligent-Backup	657-48
Take Two Manager	658-48
Video Trax	614-48
BASIC Compilers:	
QuickBASIC 4.0	664-48
Turbo BASIC 1.10	665-48
Laser Print with CP/M:	
Magic Print	666-48
Spaces: The Final Frontier:	
WordStar 4.0	608-48
File and Directory Management:	
Xtree	667-48
Desktop Publisher:	
The Graphics Link	633-48
Editor's Choice:	
Vcache	668-48
At a Glance:	
MathCAD, version 2	669-48
Eureka: The Solver	670-48

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 external disk drives. Even if you own an external disk drive, LAP-LINK's incredible transfer speeds are much faster than a normal disk copy— transfer megabytes of information in just minutes! And since LAP-LINK weighs

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

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

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..."

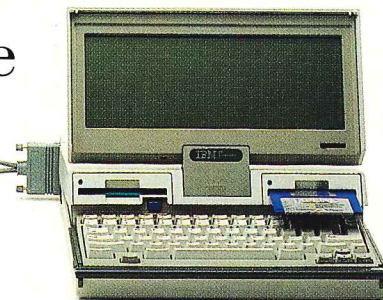
Jerry Pournelle
Byte Magazine — July 1987



Traveling Software

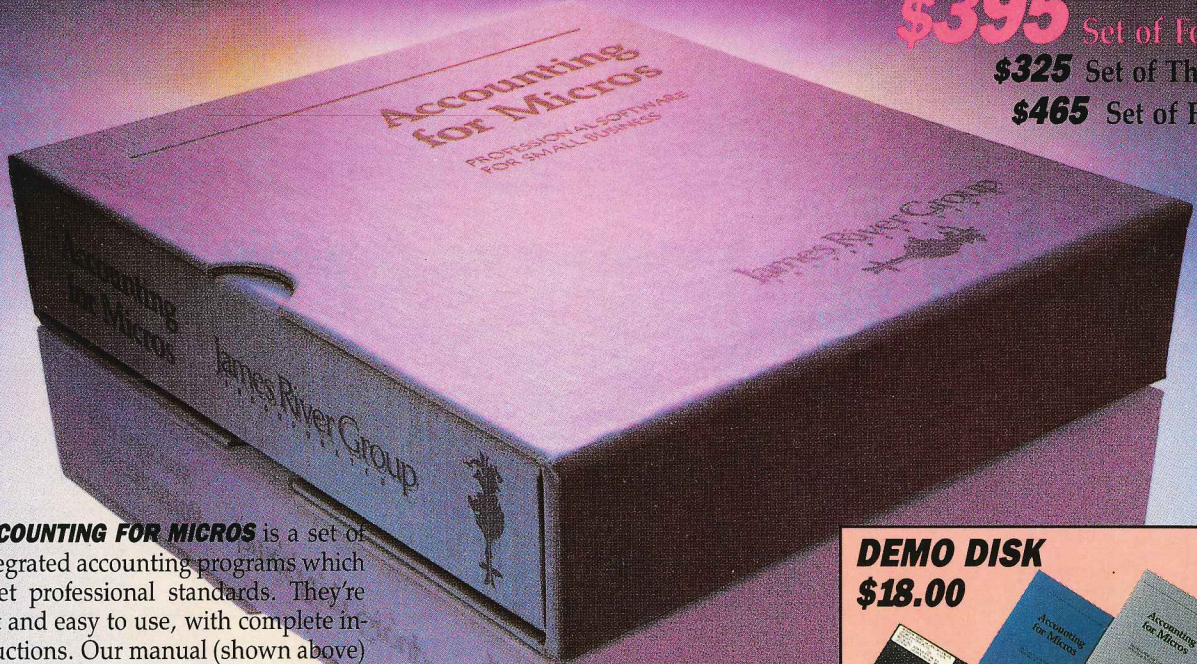


Circle 2 on Reader Service card.



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**

HOWTO 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
 I N C O R P O R A T E D



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