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THE MAGAZINE FOR KAYPRO COMPUTER USERS

JUNE 1988 $3.50

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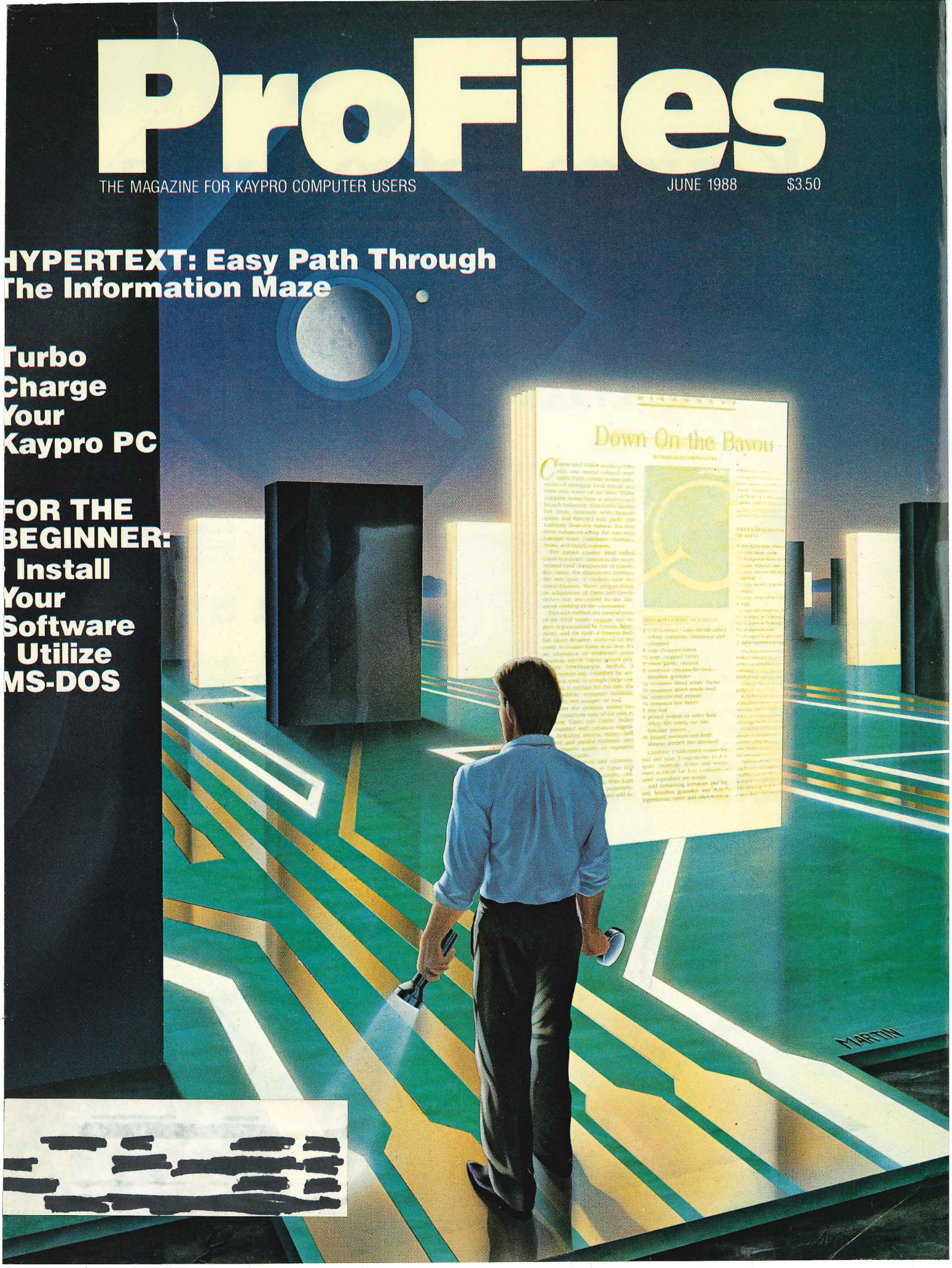
FOR THE BEGINNER: Install Your Software Utilize MS-DOS



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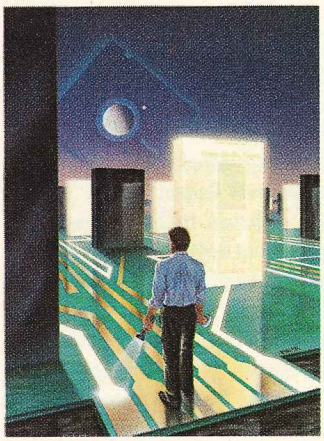
CONTENTS

ProFiles

VOLUME 5 NUMBER 11 JUNE 1988



ON THE COVER: Artist Greg Martin illustrates the Hypertext concept.

FEATURES

HYPERTEXT: LINKING RELATED DOCUMENTS *by T.F. Chiang* **18**
Indexing and referencing is a task well suited to computers. Modern hypertext software lets you perform these tasks with amazing speed. Information retrieval will never be the same.

HOTRODDING THE EARLY KAYPRO PC *by Ed Quillen* **24**
The original Kaypro PC was rugged, compatible, and loaded with features. Today's machines, however, run much faster. Double the speed of your early model.

TAKING THE MYSTERY OUT OF MS-DOS: PART 1 *by William Murdick* **29**
MS-DOS while being very useful, can also be intimidating. Here are the ins and outs of MS-DOS for the beginner.

BEFORE YOU BEGIN *by Daniel L. Schuster and Marshall L. Moseley* **36**
Knowing how to install software requires that you know your machine. This article tells you how your computer is put together.

AUTOMATING CP/M FOR THE OCCASIONAL USER **43**
by David G. Mills and Marshall L. Moseley
You've mastered CP/M. But what about the others who use your computer? Featured here are three easy steps to streamline CP/M.

A FIRST SESSION WITH WORDSTAR DOT COMMANDS *by Steve Gilliland* **48**
Dot commands give you powerful text formatting abilities. We explain step by step how to use these impressive features.

DEPARTMENTS

PUBLISHER'S NOTES 2
LETTERS 3
Q & A 6
ON THE PRACTICAL SIDE 10
DATELINE 13
CLASSIFILES 47
CP/M ONLY 60
KAYPRO PRODUCT SPOTLIGHT 65
NEW PRODUCTS 70
PRODUCT UPDATES 71
ADVERTISERS INDEX 72
BUYERS' HOTLINE 72

COLUMNS

LIFE AT 300 BAUD *by Brock N. Meeks* 54
DESKTOP PUBLISHER *by Ted Silveira* 56
EDITOR'S CHOICE 58
by Marshall L. Moseley
AT A GLANCE 67
by Joseph I. Mortensen and Jack Nimersheim

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INFORMATION YOU CAN USE TODAY...AND TOMORROW

Although step-by-step, how-to information that can be put to immediate, practical use is generally of the most interest and value to personal computer users, sometimes it's worthwhile to look up from the keyboard and see what's on the horizon--to catch a glimpse of the computing world of tomorrow.

Periodically we do this in *PROFILES*, and this month, in "Hypertext: Linking Related Documents," Ted Chiang takes us on a tour of hypertext, an information-linking concept that's been likened to the science- fictional idea of "hyperspace": a way to get from place to place without crossing the intervening space.

Though the idea of hypertext originated in 1945, implementations of it are still largely a thing of the future--but not the distant future. If, as some claim, hypertext will soon create a revolution in personal computing, now's the time to become familiar with it and to understand its possibilities.

Back in the world of immediate practicality, Ed Quillen tells Kaypro PC owners how to double their computers' speed in "Hotrodding the Kaypro PC." All you need is $20 worth of electronic components and a soldering pencil, and the results are impressive.

William Murdick provides newcomers to MS-DOS with a hands-on guide to the basics of this operating system in part one of "Taking the Mystery Out of MS-DOS". Whether you're new to MS-DOS yourself or are trying to introduce others to it, you'll find this series worth keeping as a handy reference.

Daniel Schuster offers more nuts-and-bolts information--literally--in "Before You Begin," a guide to hardware components that affect software installation. This guide for beginners explains the variations available among monitors, printers and other components, as well as how to determine what you have and how to apply this knowledge when installing programs on your computer.

For WordStar 4.0 users (both CP/M and MS-DOS) who've learned the fundamentals and want to take the next step toward mastery of this program, Steve Gilliland provides an introduction to dot commands: what they are, the kinds of things they can do for you, and how to use them effectively.

And for CP/M owners who want to make life easier for occasional users of their machines--or to take some of the tedium out of their own work--David Mills and Marshall Moseley explain several methods for automating CP/M.

(CP/M users should also take note of Joseph Mortensen's review of two new versions of Xtrakey in "At a Glance" and Ted Silveira's tips on getting parts and repairs in "CP/M Only.")

All in all, the content of this issue reflects our attempts to give our readers what they've asked for in letters and surveys. As always, we hope to solve some problem or clear up some mystery for you and make life with your Kaypro more productive and satisfactory.

Gwyn Price

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FILLING OUT FORMS

Steve Gilliland's article ("Spaces: The Final Frontier," April 1988) on using WordStar 4.0 to fill in pre–printed forms was loaded with helpful tips for putting WordStar through its paces in other tasks as well. Although I have used WordStar, MailMerge, and SuperSort for years, Steve opened up some interesting ideas that will make them work even better.

In one place, Steve nodded. Having been duped so often myself by WordStar's confusing .CW numbers, I chuckled when I caught Steve explaining .CW 10 as the way to "set character width to 10 characters per inch." Steve knows, of course, as would any WordStar veteran, that .CW 12 invokes 10 cpi and .CW 10 calls up 12 cpi. It is a minor slip–up, but one that would give the novice WordStar user fits in trying to follow the rest of Steve's thorough instructions.

Also, on page 43, Steve's "Turn It Over to WordStar" program will not run correctly unless the final line (the one right after all the dot commands) begins with a quotation mark.

Thanks for your practical enlightenment on so many levels.

Gene Shelburne
Amarillo, Texas

Thanks for pointing out the dot command error, but we must confess that Steve Gilliland did provide the correct .CW numbers in his submission. The PROFILES crew deserves a rap on the knuckles for changing Steve's .CW 12 to .CW 10. Our apologies to our readers and to Steve.

MAKING AN EDUCATED GUESS

I read Birrell Walsh's review of equation–solving software ("At A Glance," April 1988) with great interest. Walsh explained that "you must start with an initial guess, which is awkward if you have no clue what the answer will be," and stated that "neither of these programs should be relied upon unless you have the ability to judge the reasonableness of the answer."

In fact, the solutions to both problems are right at your fingertips. Simply use the graphing capabilities of either program to make a graph of the equation. Look to see where the line intersects the X–axis (eyeballing it will do) and use that as an initial guess. To see how good the final answer is, just plug it back into the original equation. The closer the equation comes to zero, the better the answer is.

John Moore
Houston, Texas

OFF BY A MICROMETER

Brock Meeks's "Use It or Lose It" on data back–up (April 1988) was excellent. But one minor error should be noted. A micron is one–millionth of a meter, not

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:

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5. **Data base files** can now be changed without exiting the program.
6. **Data entry** has been simplified.
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P. Hornbuckle, Haupauge, 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.
CRB, Daly City, CA

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RLK, Annandale, VA

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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®

one– millionth of an inch as he states on page 22. Thus it is almost 40 times as large as a micro–inch.

Actually, "micron" is an obsolete term these days: the SI unit is micrometer (pronounced MIKE–ro–meter, to distinguish it from my–CROM–meter, which is a measuring instrument).

I doubt whether there is any such thing as a "standard" smoke particle. But whether such a particle is 17 micrometers or 17 micro–inches, if it gets onto your hard disk, it's too big!

Charles H. Chandler
Malden, Massachusetts

PC UPGRADE INFO

As described in "A Drive Dilemma" ("Q&A," January 1988 issue), I also switch disks between my PC 30 at home and the mainframe at work (1.2 megabyte drive access). I requested my local Kaypro dealer to install a 1.2 meg drive in my PC 30 so I can transfer files larger than 360K without altering them. I received the follwing response: "Most PCs (other than Kaypro) can accept the 1.2 meg drive without any problem; the cost would be about $200. The Kaypro PC 30 requires major circuitry rework costing about $500 plus."

My questions are: 1) Is this true? 2) Why? 3) Is there any less expensive solution?

W.E. Berry
San Carlos, California

For the answers to your questions, see "Q&A," which begins on page 6.

MORE TECHNICAL INFO, PLEASE

Recently I responded to a survey in *PROFILES*. The survey asked what I needed/wanted out of *PROFILES* and about my buying habits. I am writing to clarify my answers and to expand on them.

First, what I wanted out of *PROFILES* was Kaypro– specific information. The series of articles on the various video boards was the sort of information I am talking about.

In addition, I would have liked to see reviews on specific products as they run on the PC (such as the Intel 386 PC and Quadram's equivalent). I can always read *PC Magazine* for mildly biased reporting (or *PC World* for short reviews that read like advertising copy).

No source that I know of reviews equipment from the standpoint of a Kaypro PC user–– and sometimes that makes a difference as to whether or not a particular item will work.

Aside from the technical articles that I can use to evaluate possible purchases, I would also like to see Kaypro–related news. The corporate decision to get out of CP/M machines and "transportables" should have hit *PROFILES* before it hit the advertisements.

I'm not sure I've told you what you want to know, but I have explained why I'm not re– subscribing to *PROFILES*. The magazine does not give me enough machine–specific technical information and reviews.

I wish you luck. I do not want to add myself to the class of people who [will be] buying a new computer in the next year. With the reliability and quality that is your standard, I don't think I'll have to.

Steve Marsh
Wichita Falls, Texas

Many of the comments we received in our recent readership survey conveyed these and similar points. Computer novices appreciated the tutorial articles we feature on a regular basis. Beginners also mentioned that they read "Q&A" regularly because that column answers practical questions for them.

Intermediate to advanced readers, however, felt that PROFILES *should provide them with more technical, Kaypro–specific information dealing with upgrades and compatibility. We agree with both groups of users and are currently working to develop articles in these areas.*

Beginning this month, "Q&A" will be expanded to include even more practical tips for beginning and intermediate Kaypro users. Also, stay tuned to "On the Practical Side." In the next few issues, Marshall Moseley will address the subject of upgrading the PC. This month, he describes the general options open to you; in future issues he'll provide specific, how–to information.

On the subject of upgrades, Kaypro recently announced a new 286 board for the Kaypro PC. The board is now available through your local Kaypro dealer.

We hope that the editorial changes we are now implementing will be perceived as a positive trend by the end user. We will do our part to keep you informed of policy changes, new products, compatibility, and upgrade information.

BULLETPROOFING TURBO PASCAL

Your point about protecting Turbo Pascal programs from crashes due to I/O error can't be overemphasized ("Bulletproof Your Programs," February 1988). I see many otherwise good public domain programs on bulletin boards that quit at the slightest user input error.

Your remedies, particularly your procedure INTCHECK, are ingenious and will certainly do the job. However, I wonder why you didn't suggest using Borland's built–in function IOResult instead of INTCHECK. IOResult works equally well for integers or reals and is fully covered in Borland's Turbo Tutor. I've used it successfully in many interactive programs for computer novices.

Where possible, I combine IOResult with range checking to ensure not only that a number is entered instead of a string, but that the number is in the right range. The following won't crash and won't accept anything but a number between 0 and 100:

```
BEGIN
  {$I-}
  REPEAT
    ClrScr;
    Write('Enter a number: ');
    Read(X);
  UNTIL (IOResult=0) AND (X0) AND (Xd);
  {$I+}
END;
```

In practice, I'd have it dolled up with GoToXYs and ClrEOLs instead of ClrScr and possibly even an error message asking for a re– entry. However, the prin-

ciple itself is simple and elegant and "bulletproof."

R.K. Barcus
Spokane, Washington

Author Jim Spickard responds: "Your suggestion is simple and elegant--and I wish I'd thought of it for my article! The only advantage of my INTCHECK routine is its ability to abort character input with ESC, transfering control to another point in the program. Users who don't need this should use Barcus's suggestion."

CP/M SUGGESTIONS

In the late '70s I became interested in computers and built a crude RCA 1802 "computer," complete with eight data entry switches. I resisted the TRS-80, but when I read a review of the Kaypro II, I fell in love. I couldn't logically justify the purchase (it was still $1,895 at the time, and I really didn't have a practical use for a computer), but when was love ever logical? Not being one to defy destiny, I bought it, along with an acoustic modem and a 132-column daisywheel printer.

I now have my "II" converted to what we "Micro Cornucopia" addicts call a "Kaypro 8+," running at 5MHz with double-sided, quad- density drives. I recently bought a Kaypro I from a liquidator, and I plan to populate the modem/clock circuitry and buy a fairly fast dot-matrix printer to use with it.

The "8+" combination, along with a good small business program, should be quite adequate for accounting and inventory control at the antique shop in which my wife is a partner. I shall keep the modified "I" at home so that I can help at the shop in my spare time without having to go there, and also to use with my amateur radio activities.

Much of the early development in amateur radio data communications was done on Commodore C-64 computers. As these modes became popular, computer technology began to be dictated by MS-DOS compatibility, and it looked as though CP/M would be bypassed. Fortunately, the communications terminal manufacturers began to build smarter terminals, with all the protocols resident in ROM. Now, all we need to use these modes is the "TERM" program supplied with the [Kaypro] II, although we need a modem program for disk operations. I am sure you are aware of all of all this. If you aren't, and you are seriously concerned, as I assume you are, about all your CP/M owners out there, then I suggest that you point out to the marketing research folks over at "the factory" that there are 420,000 licensed radio amateurs in the United States alone. I have no idea how many of them own Kaypros or other CP/M machines, but it might bear examination.

One further comment might be of interest. You might wish to point out to CP/M users that before they pass up a software review because of the MS-DOS label, they should check to see if the program is available in a CP/M version. A really good program should be functionally equivalent, subject only to operating system and memory constraints for both systems. Even if the meaning of MS-DOS commands, file names, or extents is not readily apparent, we can reasonably expect a functional equivalent to exist in the CP/M version.

Thank you for my Kaypro and for *PROFILES*.

Bob Carlos
Waterville, Ohio

SMART TIP

A Smartkey macro used with COPY is MS5 C [return] [return]. It copies the disk and returns to the menu. I use a Kaypro IV '83 and designate the feed key for this macro because the macro is used so often when copying.

Walter Becker, Publisher
Academic Enterprises
Pullman, Washington

CORRRECTION

"On the Practical Side" in the April 1988 issue contained a typographical error. On page 11, the part number for the short manual titled "The Kaypro MS-DOS Utilities" is actually 6385. The manual is available from your Kaypro dealer. ■

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BY MARSHALL L. MOSELEY

I want to use WordStar 4.0 in a batch file to print several documents. Is there any way to do this and have the batch file move on to other tasks?

There are two ways that I know of: by using WordStar's command line ability in conjunction with MergePrint, or by using the same feature with replaceable parameters.

As Robert Sawyer pointed out in his article "The Power User's Guide to the New WordStar" (*PROFILES*, March 1988), you can tell WordStar to run, print a file using MergePrint, and exit back to MS-DOS with a single command. If you had a form letter named CUSTOMER.LET for all your customers, for example, you could MergePrint from a batch file with the command WS CUSTOMER.LET MX. The M stands for MergePrint and the X for exit.

This only works if you want to print the exactly same files every day. Using replaceable parameters, you can make WordStar print up to nine different files. This is accomplished using batch files nd by designating the files on the command line.

A parameter is a character or series of characters typed along with a command. When you type COPY *.* A:, for instance, the characters *.* and A: are parameters, while COPY is the command.

A replaceable parameter is a symbol inside a batch file that is replaced by a parameter when the batch file executes. As an example, look at this batch file named VIEW.BAT:

```
ECHO OFF
TYPE %1
```

Type VIEW TELCOMM.DOC, and as the batch file runs, the symbol %1 will be replaced by the parameter TELCOMM.DOC and that file will be typed on the screen. You could use the same batch file to view DATABASE.DOC, or WORDPROC.DOC. Change the parameter and you will see a different file.

In a batch file for WordStar, replace the file name you want to print with a parameter symbol. You might create a batch file named PRINTIT.BAT that reads:

```
ECHO OFF
WS %1 MX
```

Type PRINTIT CUSTOMER.LET and %1 will be replaced with CUSTOMER.LET. You can use up to nine replaceable parameters--%1 through %9--and type nine different file names on the command line. The first parameter becomes %1, the second becomes %2, and so on.

In this case, however, if you use more than one replaceable parameter, you have to use the batch file command EXIST, which verifies that a file exists before a command is executed. If you didn't do this, the batch file might try to print files that weren't there and would bomb horribly. The nine-file version of PRINTIT.BAT is:

```
ECHO OFF
IF EXIST %1 WS %1 MX
IF EXIST %2 WS %2 MX
IF EXIST %3 WS %3 MX
IF EXIST %4 WS %4 MX
IF EXIST %5 WS %5 MX
IF EXIST %6 WS %6 MX
IF EXIST %7 WS %7 MX
IF EXIST %8 WS %8 MX
IF EXIST %9 WS %9 MX
```

For more information on batch files, see "A Beginner's Guide to Batch Files" in the August 1986 *PROFILES*, or "Taming DOS," a two-part article by Don and Sharon Conkey, in the December-January and February 1987 issues of *PROFILES*.

I've received conflicting information on how parallel ports are set up in my Kaypro PC. I've heard, for example, that if I have a monochrome video board, my printer port is different than if I had a color video board. Is this so?

It may be different, but if so it's a difference that doesn't matter to you. To understand the answer to this question, you need to understand what parallel ports are and how MS-DOS handles them.

For a computer to work it must be able to receive and send information to devices outside of the computing system. For that reason every system has built into it certain points specifically designed for exchanging information with external devices. Those points are called I/O (input/output) ports.

Ports are part of the computer hardware. Every component of your system--the monitor, the keyboard, the printer--is accessed by your computer via an I/O port. MS-DOS sends information to I/O ports by telling the computer the *address* of the port in question, then sending the information. The address, expressed in hexadecimal (base 16) numbering, denotes the spot inside the computer where the port is--addresses are physical locations inside the computer.

Your computer has many standard ports built into it, but the ones you should be concerned with now are the parallel ports, which are almost always used for printers.

When your computer is turned on and the operating system is loaded, each port is linked to a *device*. A device is a discrete part of MS-DOS that can send and receive information. The device names used for parallel ports are LPT1 and LPT2 (LPT1 can also be called PRN, but that term is falling into disfavor). LPT1 is the device linked to the primary parallel port. Almost all MS-DOS computers have LPT1. LPT2 is a designation available for a second port, should you decide to install one. The newer versions of MS-DOS can have up to six parallel ports-- LPT1 through LPT6--installed.

Where does video fit in? The first DOS computer, the IBM PC, contained a video expansion board called the Monochrome Display Adapter (MDA). Besides housing the video circuitry for the computer, it also contained the primary parallel port, LPT1, and its support circuitry. That port had an address of 3BCh. When a PC powered up, it looked at this address for a parallel port, and if it found one, that port became LPT1.

This would have been fine, except that for some reason IBM implemented a *second* LPT1, at address 378h, in every computer that didn't have the MDA board. Every MS-DOS computer built since that time, including the Kaypro PC,

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has had LPT1 at 378h. As a result, the original MDA board with LPT1 at 3BCh has become something of an oddity. The only boards that have the same configuration are those designed to exactly emulate the IBM MDA, such as the Hercules Monochrome Graphics board and certain boards from overseas manufacturers.

So whether you have an MDA– type parallel port or a standard port, it doesn't matter. It's still LPT1; hook up your printer and it will work. Interested Kaypro PC owners can adjust the parallel port to make it LPT1 according to the MDA standard, or LPT2 (it was shipped from Kaypro set as standard LPT1–– 378h). Changing the port designation requires that you change the switches located at SW2 on the Multi–Function board (Figure 1), and move the jumper block between chips U37 and U38 on the same board (Figure 2).

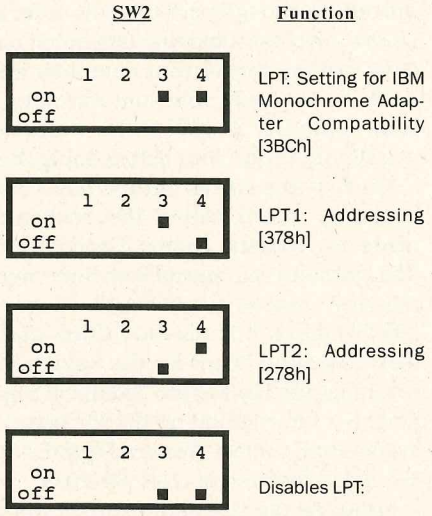

Figure 1:

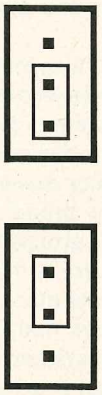

Figure 2:

Can I install an AT–type high–density disk controller in my Kaypro PC?

Yes. Before I tell you how to do it, though, you should be aware that this

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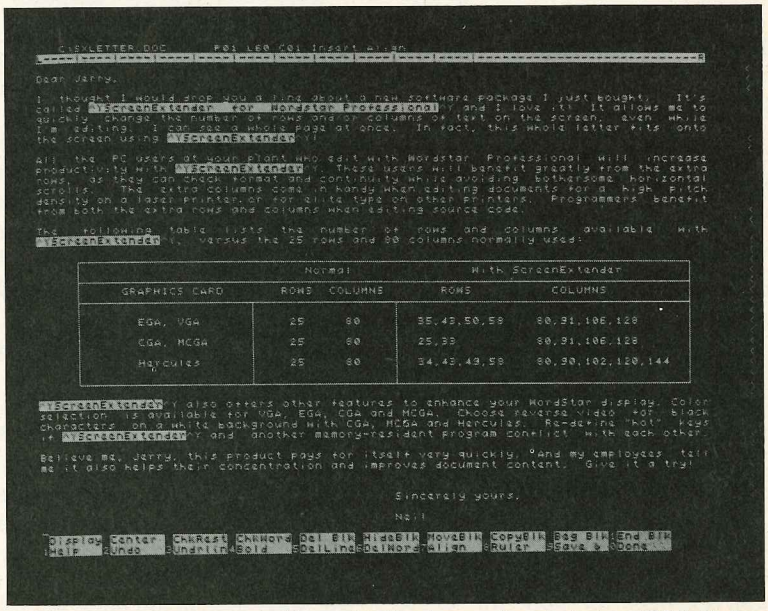

50 rows by 91 columns. Actual photo of EGA display.

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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 soft ware 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

procedure, though perfectly safe as far as I know, involves removing integrated circuits that are part of your computer and for that reason will void your warranty. If your computer is still under warranty, you should think twice before doing this.

The first step is to go out and buy a disk controller board called the Foxboard, made by Western Digital Corporation. The Foxboard can control both high–density and double–sided double–density (DSDD) disks. It is the only third–party disk controller board for the Kaypro PC recommended by Kaypro Technical Support. For information on the the board's availability, contact Western Digital's Retail Sales Division at (714) 474-2033.

Installing the Foxboard requires you to first disable the floppy disk controller inside the Kaypro PC. Turn off the computer and disconnect the power cable. Remove the five screws on the back panel that hold the computer cover in place and slide the cover forward. When it won't come forward any more, tilt the front of it up and pull it away.

Look down into the computer and find the full–length expansion board closest to the power supply. It has a two–inch ribbon cable running into it. Disconnect the cable and remove the screw that clamps the board to the computer chassis. Now carefully take the board in both hands and lift it out of its socket with a gentle rocking motion. Once it is free of the computer, place it in front of you with the bracket pointing to the right and the integrated circuits facing up.

The integrated circuits you must remove are at positions U46 and U48 on this board. Start with the one at U48, which is the larger of the two. Pick one side of the chip and using a small flat–blade screw driver slide the tip of the blade between the chip and socket. Then lever the screwdriver up, until you see the side of the chip rise slightly. Move to the other side of the chip. Re–install the board, but don't re–connect the ribbon cable. Now install the Foxboard according to the directions that came with it.

I have a Kaypro 16, which I use with dBASE III. The problem is that every time I print a report or a spreadsheet, the computer is tied up for as much as a half an hour. I've played with print spoolers, but with one installed the computer's performance becomes too sluggish. Is there a way to speed up printing?

I recommend that you purchase a print buffer. A print buffer is an electronic device that sits between your computer and your printer. When you print something, the buffer accepts the printer data and stores it in its own memory. Because data is going directly to memory, the computer "prints" the file in seconds instead of minutes.

Once data has been sent to it, the buffer takes over communications with the printer, sending data to it only as fast as the printer can take it. The computer, meanwhile, can move on to other tasks.

There are a few features a good buffer will have. In addition to print buffering, it should act as a protocol converter. That means you can send it data via the computer's parallel port and it will transmit that data via a serial port, or vice versa. You should also be able to add memory to a buffer.

Check first with your Kaypro dealer for a buffer. If none is available, you might try the mail order route.

Black Box Corporation is a mail–order firm that specializes in data communications. It offers three print buffers. The Basic Buffer, at $349, has 256K of memory, does not do protocol conversion, and cannot have memory added to it. The Basic Buffer Plus, which can take extra memory and has an LED status display, goes for $545 for 256K and $695 for 512K. The Universal Data buffer holds up to 256K, performs protocol conversion, and will pause printing and print multiple copies. The cost is $425 for the 64K model, with 64K expansion modules available for $65 each. To order the Black Box catalog, call (412) 746–5500

Rose Electronics of Houston, Texas, offers the Rose Printer Buffer. It comes with 256K, and offers protocol conversion. The price is $390. A 1 megabyte memory expansion module is available for $560, and there's a 512K module for $280. For a Rose catalog, call (713) 933– 7673.

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THE TECH CORNER

As a Kaypro service center we are often presented with a crashed hard disk which has not been backed up. Sometimes the customer is lucky and the data is recoverable, but usually it is not.

Our experience has shown these five causes of data loss: 1) Operator error, 2) Program error, 3) Hardware failure, 4) Theft, 5) Fire or water damage. Theft can be the most disastrous, affecting floppy and hard disk systems equally -- often the disks are stolen too. We have seen a church lose all its member and pledge records, and a Ph.D. candidate lose two years of research to computer theft. Back up your data, but keep a copy off premises.

Since most users have never have had any problems with their hard disk, proper data back up is often overlooked. Now that quality tape backup drives -- such as the Archive XL advertised above -- cost under $400, one can only be described as foolish if he does not protect his computer data.

UPGRADES FOR MS-DOS COMPUTERS

BY MARSHALL L. MOSELEY

Kaypro MS-DOS computers are sturdy, reliable, and powerful enough for just about any computing task. As good as they are, though, they can be made better. By doing a little streamlining, a little tweaking, and adding some new parts, you can upgrade your computer to make it a more powerful and more productive machine.

In the the next few installments of this column, I'll be covering the ways you can enhance your computing system. This month I'll explain the general options open to you--modifying the microprocessor and improving disk drive performance. You'll find out about the various ways you can fine-tune your system for increased speed and better performance. In the future I'll go into detail about specific products and procedures for upgrading Kaypro computers.

Let's start with modifying the microprocessor--of all the ways to get better performance, this produces the most dramatic results.

THE HEART OF THE MATTER

The microprocessor is the device that controls all the internal operations of your computer. It is an integrated circuit consisting of a single silicon chip sandwiched between two ceramic or plastic plates. That silicon chip contains many transistors, each of which is almost microscopic in size (a single microprocessor chip can hold the equivalent of 200,000 transistors). The microprocessor does all of the computer's mathematical and sorting tasks. It is the heart of your computer.

The microprocessor used in the Kaypro PC is either the 8088 from Intel Corporation or the V20 from Nippon Electric Company (NEC). The Kaypro 286i and 286 use the 80286 processor, and the Kaypro 386 uses the 80386, both from Intel. The 8088 and V20 are the least powerful processors. The 80286 is next, and the 80386 is the top of the line, with a great deal of speed and power.

The microprocessors in Kaypro computers use a clock to control the rate at which information is processed. The original Kaypro PC operated at a clock speed of 4.77 megahertz (millions of cycles per second). The first 286i operated at 6 Mhz, and the 80386 currently runs at 16 Mhz. By increasing clock speed, you increase the speed of your computer.

By increasing clock speed, you can increase the speed of your computer.

If you have a Kaypro PC with 4.77 Mhz clock, you can buy one of two processor boards from Kaypro Corporation that offer faster clocks. These are the 8 Mhz 8088/V-20 board, part number 5238; and the 10 Mhz 8088/V20 board, part number 5962. Many PC owners already have one of these boards-- they've been standard equipment for almost two years now. If there is a toggle switch on the back panel of your computer near the reset button, then you already have either an 8 or 10 Mhz machine.

To install a faster clock yourself, follow the instructions in "Hotrodding Your Kaypro PC" by Ed Quillen, on page 6.

Owners of early PC-10s and PC- 20s cannot use the newer, faster boards. If you have a hard disk controller consisting of two circuit boards, one bolted to the top of the drive and connected by cables to another board sitting in an expansion slot, you cannot upgrade (unless you replace your hard disk controller).

Supposedly, the faster the clock speed, the further you drift from IBM compatibility, and the closer you remain to 4.77 Mhz, the more guarantee you have of compatibility with industry-standard software and hardware. However, I've used both 8 and 10 Mhz Kaypro PCs for hundreds of hours with many different software packages and have never encountered a compatibility problem. And since both fast processor boards let you switch back to 4.77 Mhz, I recommend these boards without reservation.

Kaypro 286i owners can take their computers to their dealers and have the clock crystal and various other chips replaced, upgrading the computer from 6 or 8 Mhz to 10 Mhz, or even 12. Again, the faster you go, the more likely you are to run into compatibility problems--I have seen such problems with high-speed AT-class machines. The biggest danger area is telecommunications. Most newer programs--such as Crosstalk, Qmodem, and Procomm +--can handle the faster machines. Older programs can't. You might want to test your telecommunications software on a fast machine before you upgrade.

If you soup up your 286i to 10 or 12 Mhz, you will have to replace the memory chips inside the computer with chips that can withstand the faster clock speed. Memory chip speed is measured in *nanoseconds*, which are billionths of a second. The slowest chips used in the 286i are 150-nanosecond chips; the fastest are 100-nanosecond chips. If you upgrade to 10 or 12 Mhz, the computer's memory must operate at at least 120 nanoseconds. To find out how fast your memory chips are, locate the chips themselves at positions U1 through U49 on the mainboard. Every chip has a long number stenciled on it, followed by a dash and a two-digit number. If the two-digit number is 15, you have 150-nanosecond chips. If it's 12, you have 120-nanosecond chips, and if it's 10, you have 100- nanosecond chips.

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FLOPPY DISK DRIVES

Processor speed is measured in millionths of a second and memory speed in billionths of a second, but disk speed is measured in thousandths of a second, or milliseconds. You can have a 20 Mhz 80386 crunching numbers with the help of 80–nanosecond RAM––the equivalent of a rocket fueled by liquid nitrogen––but if you have a slow or inefficient disk drive, the entire system slows down to a crawl.

There is not much you can do to improve floppy disk drive performance per se. Most 360K disk drives operate at the same speed and in the same way. However, you can change to higher capacity drives. Kaypro PC, 286i, and PC 286 owners can replace their 360K drives with 3.5–inch 720K drives, doubling their disk capacity. These drives use the same disks that the Kaypro 2000 does and are available in kit form through your Kaypro dealer (part number 5248). Kaypro PC users can swap their standard 360K drives for high–capacity 1.2 megabyte drives by replacing their drive controller circuitry with a high–capacity disk controller. For instructions on doing this see "Q&A" on page 6.

There's not much you can do to improve your disk drive performance per se, but you can replace it with a higher capacity drive.

HARD DISKS

Owners of floppy disk computers should also consider purchasing a hard disk. A hard disk can store up to 1,000 times more information than a floppy disk and can access that information much faster. This puts an end to swapping floppies in and out of disk drives and the interminable waiting that goes with that process. Hard disk prices start at about $300 and go as high as $1,000 or more.

Owners of Kaypro PC–10s, PC– 20s, and PC–30s already have hard disks, and those disks are quite good. They are, however, XT–class hard disks, meaning they have an average disk access time of about 80 milliseconds. That is relatively slow. More modern AT–class hard disks have access times ranging from 60 milliseconds to as little as 6 milliseconds

Spreadsheet and database management programs are disk intensive; if you use them extensively and find yourself doing more waiting than computing, then a faster hard disk might be for you. One competitively priced fast– access hard disk is the Seagate ST 251–1, with an average access time of 28 milliseconds. Prices for this disk range from $450 to $600.

If you already have a hard disk and are not inclined to buy a newer, faster one, there still are a few things you can do to improve your disk's performance: optimize it, and/or use disk–caching software.

The more a disk is used, the more fragmented the information on it becomes. An optimizing program will analyze the structure of a disk, note the whereabouts of every file, and reorganize the disk so that file data is no longer fragmented but stored contiguously. This improves disk performance–– especially hard disk performance–– markedly. Some popular optimizing programs are Disk Optimizer from SoftLogic Solutions (800/272–9900), and VOPT from Golden Bow Systems (800/284–3269).

Disk caching is a process whereby disk read–write operations are analyzed and the data that the disk is most likely to use next is stored in a section of memory called the cache. When the software makes a request for information in the cache, data retrieval takes place at electronic speeds rather than disk speeds (millionths of a second versus thousandths). Disk caching makes XT hard disks perform like AT hard disks, and AT hard disks perform like Ferraris. VCACHE, also from Golden Bow Systems, is a caching program that has proved itself to work reliably in all Kaypro hard– disk computers. For more information on VCACHE, see "Editor's Choice" in the April 1988 issue of *PROFILES*.

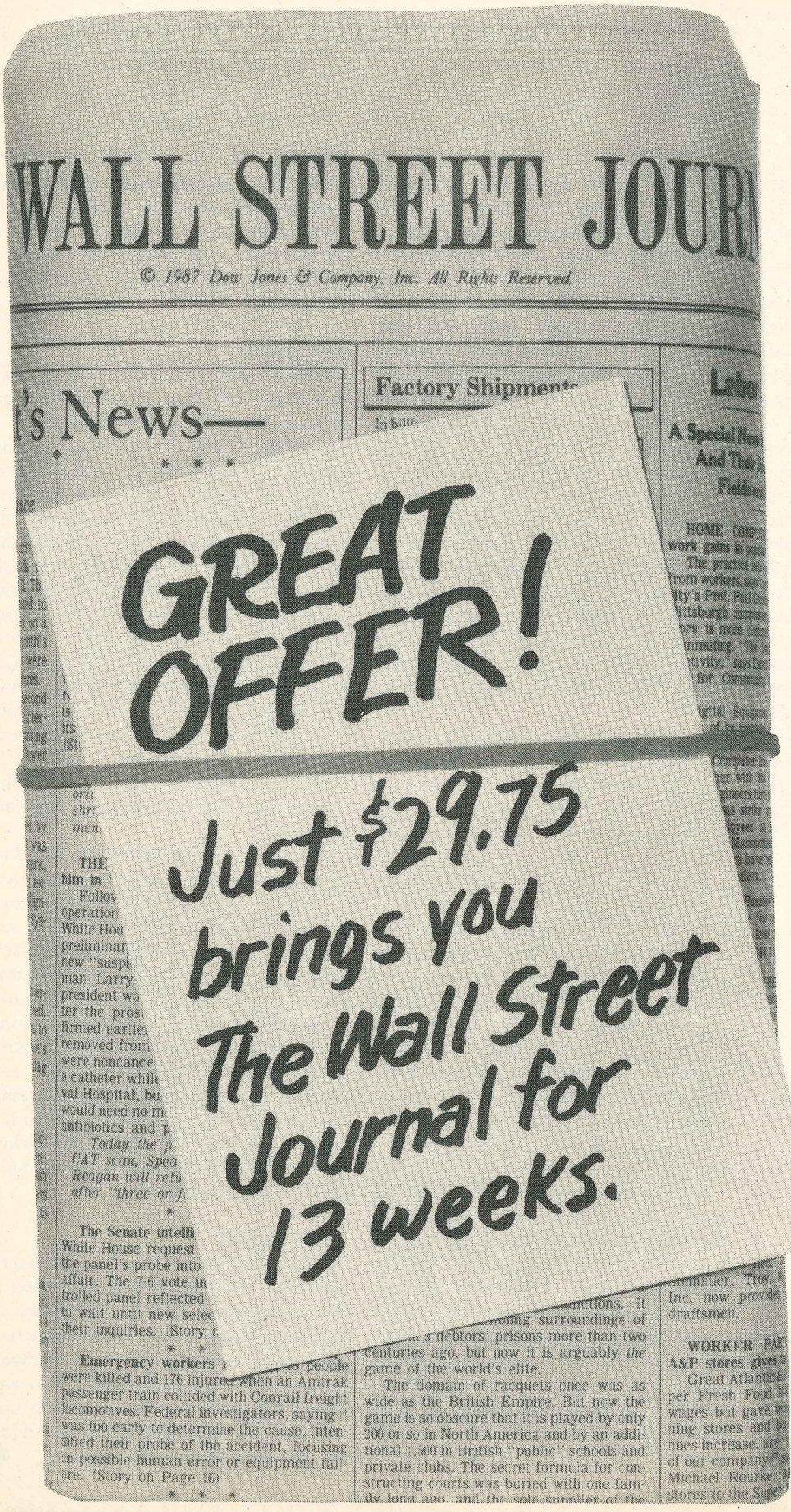
RAM DISKS

Another option for improving performance is a RAMdisk, which is a portion of memory configured to behave like a disk drive. As with disk caching, reading and writing to a RAMdisk takes place at electronic speeds, improving performance a great deal. The Kaypro PC has always been shipped with a RAMdisk program. Under MS– DOS version 2.1, it was called RAMDISK.BIN; with versions 3.2 and 3.21 there have been two programs: VDISK.SYS and RAMDRIVE.SYS. VDISK.SYS uses the extra 128K in Kaypro PCs that have 768K; RAMDRIVE.SYS is a RAMdisk program from Microsoft. The drawback to these programs is that memory used by a RAMdisk is taken from RAM used by the computer, which lowers computing performance.

For those of you with MS–DOS 3.2 or higher, there is an answer. You can buy a memory board that adheres to the Lotus–Intel– Microsoft specification for expanded memory. The LIM specification was instituted by the Big Three so that hardware and software developers would have a standard set of rules for dealing with memory. If you use a LIM memory board with RAMDRIVE.SYS, you can create a RAMdisk using expanded memory and not steal a single byte from the 640K necessary for optimum performance. RAMDRIVE.SYS is part of MS–DOS 3.2 or higher only.

NEXT MONTH

For the next two months, "On the Practical Side" will deal with all the upgrade options open to Kaypro PC owners. In part one I'll discuss the internal structure of the PC's bus board and how it affects upgrade choices. In part two I'll go over specific Kaypro upgrade products and tell you what they offer in the way of improved computing performance.



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DATELINE

BY BROCK N. MEEKS

NEWS FROM THE FIELD

I'LL BUY THAT

San Jose, CA—It's been called the operating system of the future. Supposedly, applications running under this *wunderkind* will effortlessly communicate with each other, providing sophisticated and novice computer users alike with all the computing power they'll ever need. What is this miracle worker? OS/2? Apple's windows and icons? No, it's UNIX.

Maybe you've heard that name whispered at a users' group meeting, or perhaps you've seen it scrawled on the restroom walls of some university computer science building. If that's the full extent of your knowledge of UNIX, don't feel bad—you're not alone.

UNIX, a multi-user operating system created by AT&T's Bell Labs over a decade ago, has long suffered from "great potential." UNIX is like a racehorse with a great bloodline that has never lived up to expectations.

Although UNIX is acknowledged as one of the most powerful operating systems available, its user base is about 350,000; by comparison, MS-DOS has a user base of some 10 million. The problem with UNIX: it's not easy to use. But that's changing.

With the help of Sun Microsystems, AT&T is banking on a new look for UNIX that uses graphics instead of typed-in commands. It's called Open Look, and it could open up that promised land that UNIX has sought for so long.

Open Look will enable you to run several applications at one time: You can, for example, pop into a word processor while your spreadsheet is recalculating. The entire system will be menu-driven, will have a windows capacity, and will support a mouse.

The system will have a clipboard-type cut-and-paste buffer, menu bars, scroll elevators, layered and adjustable windows, and "pushbuttons." If that sounds conspicuously close to the Macintosh user interface, you're right. However, in order to stay the wrath of Apple's aggressive legal department, Sun Microsystems has obtained a license for the icon and windowing concepts of Open Look from Xerox, the originators of the icons and windows.

The Open Look prototype that DATELINE viewed showed a unique windowing capability: Windows can be resized or moved by the use of "picture mounts" at each corner of the window.

Another feature is the "pushpin" menu. This allows you to display all the pull-down menus directly in the work area; you can take these menus and "pin" them anywhere on the screen. There are also 3-D Notices (dialog boxes that appear on the screen with various instructions). These are attached to the related window or application. They are called 3-D because they actually look like a slick 3-D projection of the actual dialog box.

Even though AT&T has dressed up UNIX, no one is sure whether it has anywhere to go. AT&T is hyping Open Look as the "new standard," and Ashton-Tate, maker of dBASE IV, is promising to develop applications for it. The final authority is the customer. You'll decide the standard and just what operating system you'll take into the next decade.

MAKE MINE FLAT

Beaverton, OR—One of the discomforts computer users have always put up with is the glare and distortion of CRTs. There's glare because CRTs are made out of glass and distortion because the screens are convex. Things are changing, though. If the flat-panel displays from Planar Systems are any indication, the future of computer displays is looking very "flat" indeed.

The mention of a flat-panel display usually conjures up visions of a hard-to-read LCD screen associated with low-end laptop computers, or the eerie glow of a gas-plasma screen. Kaypro did much to dispel that stereotype with the introduction of its 2000+ laptop computer, which uses "cold-cathode" LCD technology to display a brightly lit EGA-compatible screen. It is the brightest LCD screen on the market, bar none. The resolution of Planar Systems flat-panel displays, however, exceeds even the 2000+ 's. It rivals that of a monochrome monitor.

By 1989 we'll be seeing portable computers sporting flat-panel VGA displays, said Rolland Von Stroh of Planar Systems, a major manufacturer of thin-film electroluminescent (TFEL) displays. Planar now sells a 640 x 400 EL display and will introduce the VGA 640 x 480 with a 16-shade gray-scale display in 1989.

Beyond the portable computer market, Von Stroh said that Planar is also developing a 19-inch flat-panel display for use in some engineering workstations. The significance

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of this, he pointed out, is that such workstations typically use demanding graphics applications.

The next major development in flat-panel displays is an obvious one: the move to color displays. However, the consumer market isn't likely to see these until early in 1990. "The first applications will be for the military," said Von Stroh, adding that Planar is planning a flat-panel color display for military airplanes to be installed by 1990. "Later that year the first industrial applications of full-color flat-panel displays will be available."

The potential of flat-panel displays hasn't escaped the notice of market analysts. Frost & Sullivan, a major market research firm, predicted that flat-panel displays will eventually capture a large share of the CRT market—F&S expects that 50 percent of all computer monitors will have flat-panel displays by 1995.

The F&S report notes several advantages of flat-panel displays over traditional CRTs:

— They're more compact.

— Their flat surface creates much less glare.

— They consume less power (they don't eat battery power).

— They're more reliable—flat-panels are rated at about 45,000 hours minimum time to failure; CRTs are rated at 10,000 hours.

The big drawback: price. Flat-panel displays cost anywhere from three to five times as much as CRTs. However, Von Stroh points out that despite their price, electroluminescent displays are already starting to replace the popular backlit LCD and gas plasma displays.

COLOR BY NUMBERS

Las Vegas, NV—If you're tired of black-and-white dot matrix printouts, you're in luck. You can now send your computer's video output directly to a thermal-transfer color printer developed by Sony Corporation. Designed primarily for use in broadcasting (creating still photos from videotape), it offers a tantalizing peek at the future of color printing technology.

Known as the UP-5000, the Sony device imports video information—rather than ordinary printer data—through an RS-232 port. It accepts a variety of standard video inputs, including analog RGB, and exotic sounding standards such as differential R-Y and S-video. Using digitized video information, the device can print 256 variations on each of the three primary colors. Bottom line: a possibility of 10 million colors for each pixel.

The printer captures a video image in an internal buffer, much the way a communications program buffer stores text. The device can hold up to two frames (two separate images.) By viewing the image on a color monitor, you can adjust the color and tone by computer. A full-size print from the UP-5000 is 6 x 4.5 inches; it can also produce overhead transparencies. Multiple copies from each frame are possible.

The print quality of the UP-5000 is almost as stunning as its price. This device retails for about $7,000—but for $7,000 you get print quality that is virtually indistinguishable from a commercial color print, far from the mushy colors of other color printers.

This is a new technology and, as such, it's expensive. But a Sony spokesman told DATELINE that he expects the price of this printer to "drop dramatically within 24 months," bringing it in reach of smaller companies and individuals.

CHEAP THRILLS

San Francisco, CA—You've seen those fancy graphics in the slick ads. And you've probably wished for even half that kind of graphic capability: low-cost, high-speed, 3-D animation. Dream on, right? Wrong. You can have it all.

At the West Coast Computer Faire in San Francisco, several low-cost, high-speed graphics packages were demonstrated, including a package called AcroSpin.

This product allows you to design three-dimensional "wire-frame" animated graphics that you can rotate, translate to other dimensions, and move in and out, all in real time—and all for only $30.

Manufactured by Acrobits in Menlo Park, California, the program's high-speed capability comes from heavy use of assembly language program code. A demonstration witnessed by DATELINE showed a surprisingly fast animation sequence running on a generic IBM-compatible.

However, despite the low cost of the package, there is a price to pay for the amazing graphics (you knew this was coming): the program is tremendously tedious to use. You must first break down an image into a series of line segments and then list the coordinates of these line segments in an ASCII file. The company says, however, that it will soon solve this problem by offering a version that can input AutoCAD files. (AutoCAD is the most popular computer-aided drafting program on the market.)

THE PROCESSOR THAT WOULDN'T DIE

San Jose, CA—CP/M owners may be gratified to know that although the venerable Z80 microprocessor is no longer being used in the manufacture of personal computers, it's thriving in other applications.

Intel, Motorola, and National Semiconductor may be grabbing the headlines, but Zilog, maker of the Z80 microprocessor (the same one used in early Kaypro computers) is still cranking out 10 million of the 8-bit beasts a year.

Where are they going, if not into microcomputers? They're being used in computerized devices of all sorts—everything from cellular phones to copy machines to robot controllers to gas pumps.

A market study by Dataquest, a San Jose-based market research firm, shows that close to 60 million 8-bit microprocessors were sold last year.

One analyst said, "The only place the Z80 is dead is in the press." The reason? It's cheap, it's easy to program, and it has a low transistor count, which means it's easy to use in complicated design applications.

PROFILE

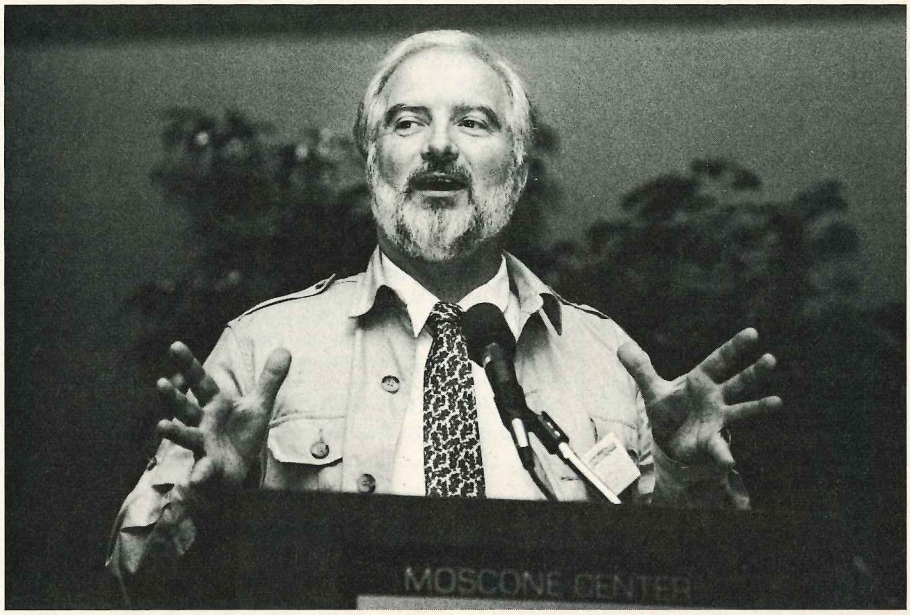
THE VOICE OF EXPERIENCE SPEAKS OUT ABOUT THE FUTURE

There are some people in the computer industry who believe we haven't yet begun to tap the potential of the personal computer. One of those people is Jim Warren.

Warren is best known for having created and chaired the West Coast Computer Faire for its first eight years; the annual event has traditionally been the gathering place of the microcomputer industry's most innovative minds.

He was also founding editor of *Dr. Dobbs Journal* and *Silicon Gulch Gazette*, the publication that is today called *InfoWorld*.

His involvement in the computer industry goes back to the primordial days of computing, when paper tape storage was a luxury afforded only the Federal Government, and he has strong opinions about where the industry is today and where it should be going.



What's the basic difference between the early days of computing and now?

In a word: sharing. In the early days all the entrepreneurs and engineers and developers were facing the same problems. And as problems were solved, the solutions were shared openly. It was a win-win situation. The result: a very rapid development of the industry.

But once people started clutching their solutions tightly to their chests and rushing to the patent office for a couple of years' delay, we saw a definite slowdown in the development and spread of innovations.

To me, there's a strong selfish motivation for sharing, because everybody wins. Nobody can generate all the answers, not even IBM. But when we're greedy and try to clutch and hold these solutions to our chests, all we do is delay and deter further advancement by everyone.

Is this "locking up" of technology the industry's future?

I think it's probably a continuing trend and I don't like it. I think that it's a dinosaur approach to social and technical development, but I suspect that's the way it's going to go.

I think there's a potential for it to lead us [the United States] to be a technological also-ran. If you look at Japan, one of the major reasons that Japan is a technological leader is that they cooperate.

Is the computer industry having a positive or negative effect on society?

I think that it's making a positive statement. And I think in some cases that's happening in spite of the bucks hustlers.

I think that part of it is that it's fun to do something new. I think that the innovators of the industry continue to be driven by something other than just making money. They're motivating us toward the 21st century.

Even the most turgid of money changers and dollar counters in the temples of technologies cannot restrain that continuing contribution.

How do you answer those who say there's nothing left to do in the computer industry?

(Laughing) There's almost an endless multitude of things that haven't been done. I'd say do those things that have not been done rather than what has been done. Don't worry about making a better text editor with more features than those out there already, because you can bet that the developers of those text editors are adding the same features you have in mind.

If something already exists, forget it.

I think by far the two hottest areas are clearly information access and infor-

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DATELINE

mation distribution. And when I say information, I'm talking about both digital and analog, [about] pictorial images, both static and motion, and I'm also talking about audio in the form of voice and music and other types of input.

The range of options in the world of video, for example, is increasing by leaps and bounds. Digital video technology is in its infancy, but already it is quite powerful. In the next few years it will let you change images on tape and viewers will be unable to tell that something was deleted. If a plane flies over your scene of 1776, you just edit the plane out.

So the future is centered on the human element? And not driven by the corporate world?

I don't agree that the corporate entity is what drives the industry today. I think that it's one of several people elbowing to get in the driver's seat.

To the extent that we can make machines do things that people are interested in doing, people will buy those machines. If we happen to make them do things that business people are interested in, then business people will buy them.

We have to make them do things that the lay consumer is interested in doing, be it flight simulators or some video game, or allowing a person to become an accomplished musician without being an accomplished musician.

We'll have to have systems—plural—that allow people to access information relevant to their everyday lives.

There's no reason why we can't have access to a system that enables you to say, "Here's my shopping list. I don't want to make over three stops, I want to shop on Wednesday, and I don't want to travel over 20 miles starting from my house. What should I buy where?"

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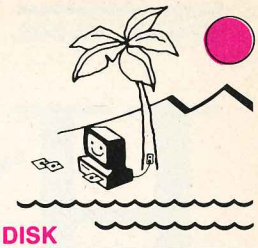

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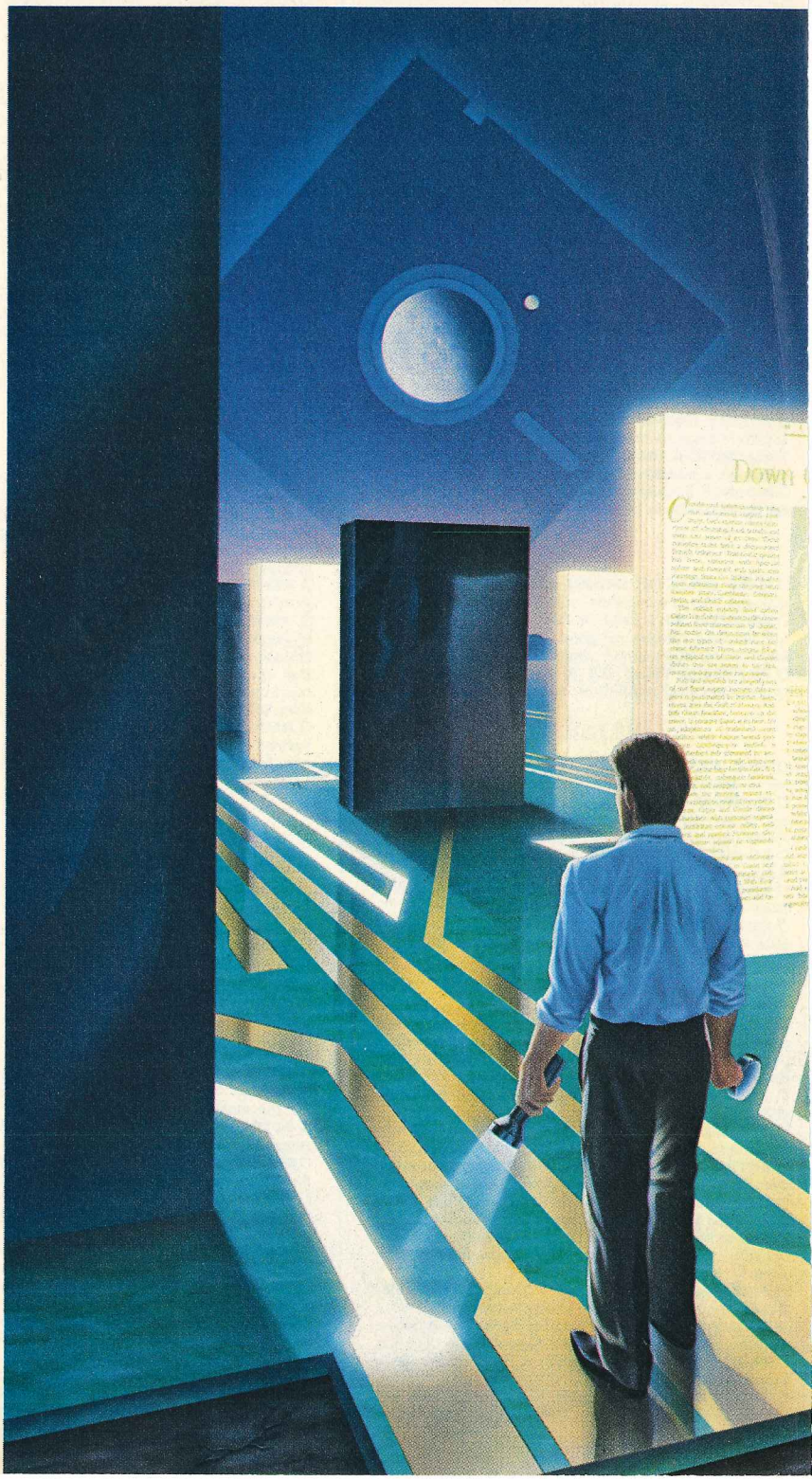
HYPERTEXT:

"Everything is related to everything else." That may sound like nothing more than a "pop metaphysics" truism, so generalized as to be meaningless and of no practical value to anyone. But to the computer user it has great potential—what's needed is an efficient way to *access* the information that's related to what you're looking at. And that is precisely the function of hypertext.

Consider any document: a magazine article, a business report, a section of a software manual. You start reading it at the beginning and stop once you've reached the end; if you want more information, you find another document and start at its beginning, though you may have to skim past long passages that are useless to you in order to find what is useful. This is "text."

Now consider reading just a section of a document, the part covering what you're interested in. Then you instantly skip to another section much farther down in the document. Once you're done, you jump to another relevant passage in the middle of a separate document that is otherwise unrelated; after that, to a footnote in a third document. This is "hypertext."

There are a lot of metaphorical descriptions of hypertext floating around in the computer community. Some say it's a totally free-form database. Some say it's 3-D documents instead of 2-D. Some say it's "hyperspace" for information, letting you jump from one point to another without crossing the intervening space. However you describe it, some people believe hypertext will change the way people use computers. Very soon now, many companies may be coming out with implementations of hypertext, so you may want to familiarize yourself with the concept. In this article we'll examine the development of hypertext, look at the pros and cons, and "tour" two current hypertext products.



THE PAST AND PRESENT OF HYPERTEXT

The notion of hypertext can be traced all the way back to 1945, when Vannevar Bush, former science advisor to Franklin Roosevelt, wrote an essay entitled "As We May Think." At a time when computers were giant electromechanical contraptions, Bush had an astonishing notion of how machines would someday be able to handle information. He envisioned a desk-sized device called a "memex" that could hold the equivalent of many libraries on microfilm, display any documents requested on viewplates, and would allow "associative indexing"; the user would be able to link

LINKING RELATED DOCUMENTS

Electronic text processing—path to the future

BY T.F. CHIANG

items together, so that when viewing one later he could jump instantly to another.

This idea didn't move into the realm of the possible until the early '60s. Over a period of a few years, Ted Nelson, then a graduate student, refined the notion of connecting documents by their contents and saw how this idea could actually be implemented. (By this time computers were just gaining such features as video screens). He called it "hypertext" and began working to implement it. He was soon joined by people like Douglas Englebart, inventor of the mouse, and Andries van Dam, computer graphics pioneer. Over time, various incarnations of hypertext appeared on workstations at research centers and universities.

Rudimentary forms of hypertext have been seen on personal computers for a few years now. The online context-sensitive help offered by some programs is an example. Text database and retrieval programs, which let you search for files and notecards containing specific keywords, also offer some of the data accessing capabilities of hypertext. Finally, there are several reference databases available on CD-ROM, such as the Grolier Electronic Encyclopedia, which has cross-reference links between different entries, and Microsoft's Bookshelf, which lets you zoom from an index reference to the text itself.

True hypertext made its first big splash in the world of personal computing in August 1987, when Apple released its HyperCard program for its Macintosh computers. HyperCard is being marketed as a "personal toolkit" for manipulating text, graphics and sound, and it's so flexible that people find it difficult to describe: it can act as anything from a personal data manager to a powerful programming language that lets nonprogrammers write applications. Apple considers HyperCard so fundamental to the way personal computers ought to be used that it's bundling the program free with new Macintoshes, and selling it to previous owners for a mere $49.

USING A HYPERTEXT PRODUCT

So what will hypertext look like on your computer screen? In general, a hypertext document will consist of text and graphics, with the embedded links to other documents indicated by visible markers. A mouse would be the fastest way to move across the screen, so when you want to traverse a link to another document, you'll move the mouse pointer over the link marker and click the mouse button.

Though hypertext implementations will vary, there will be three basic types of links, which are already found in the two hypertext products described below. The first is the note link. When you click on one of these, a small window opens up in a corner of the screen, displaying text or graphics, and you simply close it up when you're done. These windows might contain parenthetical information or a footnote; a detailed definition of a term (e.g., the text mentions *bildungsroman*, and the note window gives the term's derivation and some examples); a little graphic of what something looks like; or a context-related note to another reader (e.g., "Jan, put the revised projections here before we make our final presentation").

Another type of link is the expansion link. When you click on one of these, an extended passage of text replaces the original text of the link, rather like expanding one level on an outline processor. For example, if a document displayed a list of topic headings, you'd click on just the one you were interested in; the heading would be replaced by several paragraphs of text with graphics, and you'd close it up again once you'd read it. The conceptual difference between an expansion link and a note link is that the material within an expansion should make sense in the context, so that if it were left permanently expanded the document would still read coherently. A note link may be more of an interruption.

Finally, there's the reference link, the heart of hypertext. Clicking on this takes you to another location elsewhere in the same document or inside another one; the destination is often called the reference point. You can continue jumping, or you can retrace your steps, called backtracking; a link isn't symmetric, so you can't click on the destination to return to the source, though you could define a chain of links that loops around to form a ring. As with expansion links, you can use a list of topic headings as a starting point for reference links to branch out of, though these headings are tangents to separate subject areas rather than subtopics. Or, you can follow every mention of a certain idea within a lengthy document, or within an entire library. You can also add reference links to establish connections according to the way you personally see things.

How can you use hypertext? Databases for reference are an obvious application. A hypertext database would be an ideal environment for browsing as well as research; it could broaden users' thinking by allowing them to see connections in different areas, and the

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links that they added would enrich the database. Hypertext could also be useful for an online help manual, taking you right to the information you need. Reports or presentations could be written in a hypertext format, so that graphs and technical appendices could be called up whenever desired. Hypertext would also be a good medium for people working in groups to write those reports. Businesses could store customer information as hypertext, allowing connections between all the files related to a particular client.

A hypertext document will consist of text and graphics, with embedded links to other documents.

CRITICISMS OF HYPERTEXT

Hypertext is not universally hailed as the wave of the future. Some people think hypertext is just plain hype and that it will be hardly of any use at all, let alone revolutionary.

One criticism is that hypertext documents may not be linked on the keys you need, isolating you from relevant articles. While valid, this is a criticism of indexing in general rather than hypertext in particular. Whenever you look in the index at the back of a book or in the subject card catalog in a library, you're at the mercy of those who performed the indexing. If they didn't record a reference to a piece of information valuable to you, you won't be able to find it. One advantage of hypertext is that it's dynamic, allowing new links to be added if users find relations that were overlooked.

Another criticism is that you won't be able to tell which chain of links will lead you to what you want to know; you may follow a trail that leads to a dead end, or you may give up when going one step further would have produced the information you needed. Again, these are valid points, but they're just as applicable to ordinary text: you may chase down a score of items listed in a book's bibliography, only to find that they're useless, and the valuable information lay in the references you didn't look up.

What these critics are actually saying is that the same problems that afflicted ordinary text will also plague hypertext, but they'll become more noticeable because of instant access. To a large degree these difficulties could be answered with an extensive, properly designed system of links, but this leads us to what may be a real problem with the concept of hypertext: overambition. A really useful hypertext system would be extraordinarily difficult to design; it would require someone to exhaustively index an astronomical quantity of data, and then structure it intelligently. The ability to add new links is invalu-

able, especially in a database accessed by many users, but it will still take time before those links are added.

Now that we've examined both the pros and cons, let's take a closer look at two hypertext products presently available for MS-DOS machines.

Critics of hypertext say the same problems that afflicted ordinary text will plague hypertext.

GUIDE (OWL INTERNATIONAL)

OWL's Guide was actually released for the Macintosh before HyperCard came out, but it was overshadowed by all of Apple's promotion for HyperCard. It later came out for MS-DOS machines, and I reviewed a beta copy of the new release, version 2.0, which should be out by the time you read this.

Guide runs under Microsoft Windows 2.0 (which requires an EGA or Hercules display, with a hard disk recommended), and requires a mouse. If you don't have Windows, a run-time version is included so you can use Guide by itself. Being a Windows application, Guide has proportionally spaced text of various fonts displayed in inverse video, overlapping windows of adjustable size and position, scroll bars, and pull-down menus. When you're traversing reference links between documents, the previous documents remain open as inactive windows; you click on a backtrack icon at the border of a document window to retrace your steps. You must explicitly close files if you want to get rid of their windows.

A hypertext document for Guide is called a Guideline (with the extension .GUI), and the links are called buttons. The text of note buttons is underlined, expansions are in boldface, and references are italicized, though you can reset these. As an additional indicator, the onscreen mouse pointer changes shape whenever it passes over a button, the precise shape depending on the type of the button. Several sample Guidelines—help file, user tutorials, and examples—are included, and they demonstrate every type of button. You can write a Guideline from scratch with Guide's own limited editing capabilities, or you can start off with ASCII files written with Microsoft Windows Write or other word processors.

Guide allows you to group expansion buttons into something called an inquiry. If a block of text or graphics containing expansion buttons is defined as an inquiry, only one expansion button can be opened at a time; all of the other buttons disappear for as long as one is expanded. This restricts users from opening up all of them at once, preventing them from getting lost in too many expansions. For instance, the HELP.GUI Guideline uses inquiries for its help menus whose choices

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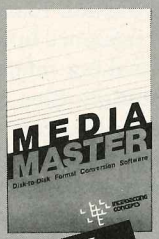

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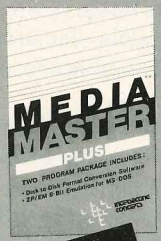

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lead to further menus. Opening all of them at once would create a bewildering mess on the screen.

Guide also has a fourth type of button, called a command button. Clicking on one of these lets you execute an independent program, which will return you to Guide upon completion (this feature requires the full version of Windows). Thus you can integrate other programs into your hypertext system. A command button can also be used to control external devices connected to the serial port, using scripts consisting of simple driver commands. You cannot actually read data in from another device, but it should be possible to control a device like a laserdisc player with its own display by this means.

When defining any kind of button, you must specify both the button and the destination, whether they're text or graphics. Guide lets you specify either the button or the destination first, though it's generally easier going in one direction than the other; you can also link up existing note and reference buttons to previously defined destinations. When making reference links to other files, you can easily keep multiple files open thanks to the Windows environment. For ease of editing, you can "freeze" the Guideline, temporarily deactivating the buttons so you can operate on them without being sent to another document. There is no way to remove a button besides manually recopying the button text and then deleting the button.

There are no provisions for actually creating graphics in Guide, but you can import them using the Clipboard. Once placed in a Guideline, graphic images can be clipped, resized, moved around, or laid overlapping one another. As with Windows Write, you cannot enter text to the side of a graphic, only above or below. You can define an entire image to be any kind of button, so if the mouse is anywhere on the image it will register it as a button; you can also define invisible elements for use as buttons, if you want only a section of an image to act as a button.

As an accessory to Guide, a product called Guide Envelope will be available from OWL soon. It will allow you to convert a Guideline document to a stand-alone program that you can distribute freely, so that others who don't have Guide will be able to read your hypertext documents but not edit them. Also in the works is a method for converting between the Macintosh and MS-DOS versions of Guide.

BLACK MAGIC (NTERGAID)

Ntergaid calls Black Magic a hypertext word processor. In order to facilitate the acceptance of hypertext, Ntergaid has released into the public domain a reader program, MAGREAD, which allows you to view hypertext documents created by Black Magic without being able to edit them. Ntergaid also runs a BBS as a forum for hypertext users.

Black Magic requires an EGA display, a hard disk, and 128k memory, and it supports a Microsoft mouse, though one isn't required. It can display bit-mapped graphics and text attributes such as boldface and italics onscreen. If you use cursor keys to move around, hitting F1 will let you traverse a link, and ESC will backtrack. Since Black Magic is meant for the creation of hypertext documents, it has a few more word processing capabilities than Guide, including a macro feature.

A Black Magic document (with extension .MAG for text files, .MGR for graphics) has small embedded markers indicating the links. For example, if "Prometheus" were a reference link, little green triangles would appear on either side of the word (pink squares for expansions, and yellow diamonds for notes). For graphics, you place a graphic link symbol—resembling a circle with an "x" in it—next to or on a graphic image. To traverse a link from a graphic, you must click on the link symbol, not on the image itself. You can assign multiple link symbols to a single graphic, since there is no association between them except for proximity.

The text links in Black Magic are created a bit differently from those in Guide. You must always define the link's origin first, instead of working backward from the destination text, and expansion links cannot contain graphics in their replacement text. When creating a reference link, you can link it to some location in the same or a different document, or you can invoke a blank screen in which to enter new text. Text entered in this manner is still part of the original document, but it is accessible *only* by traversing a reference link to a new screen; you cannot scroll through the document and find it. This is a truly non-sequential document, and if you really want to depart from linear text, you may like the idea.

To facilitate acceptance of hypertext, Ntergaid released a public domain hypertext reader program.

Unlike Guide, Black Magic has no provisions for manipulating graphics; you simply load in a graphics file created by the included program, GrabIt, a utility for capturing a section of a graphics screen. Black Magic does have some features that Guide lacks, such as an UnMagic command for deactivating links; link destinations of deactivated reference links are maintained if you want to undo them, while note and expansion text are lost unless you copy them. Black Magic also includes a limited mapping feature, which lists all the links within a single document. Finally, Black Magic lets you leave a Bookmark in a hypertext document when you exit for a quick return to a particular location.

Black Magic is not yet a fully polished product. Execution is rather slow, screen rewriting is a bit messy, the cursor stutters when moving across text, and it's much too easy to lock up the computer by doing something you're not supposed to, like backspacing over a reference link. These are just weaknesses in

the present version, however, and updates to Black Magic are frequent.

The goal of the Xanadu project is a global network containing a giant hypertext database.

VISIONS OF THE FUTURE

The present implementations of hypertext are promising, but the future holds far greater things in store. The first things we can expect are more powerful hypertext systems that utilize mass storage devices, such as CD-ROM. (*Ed. note: For an introduction to CD-ROM technology, see "550 Megabytes on a Bit of Rainbow" in the June 1986 issue of* PROFILES.) Their usefulness will increase dramatically when optical WORM (Write Once, Read Many) devices become available; users will then be able to add new links that they discern. And with greater storage, a more general concept will become practical to implement: "hypermedia." This will include not only text and graphics, but animation, sound and motion video, too.

At the same time, hypertext will also become seamlessly integrated with other applications, removing the distinctions between word processing, graphics, database creation, and spreadsheet forecasting. Many people believe that artificial intelligence will play a key role in the future of hypertext, allowing intuitive queries and commands.

Looking into the next century, we have Ted Nelson's Xanadu project. Begun in 1967, the present goal of Xanadu is a global network containing *every* document written in a giant hypertext database. It would alter our notions of publishing, royalties, and rights to reproduce text; any document containing quotes of another would have links back to the original. Another view of the future is that of Apple CEO John Scully, who imagines a "knowledge navigator," your very own artificial intelligence program that could scan vast databases, recognize what material would be relevant to your purposes, and present it in a personalized format.

Far-fetched, you say? Maybe so, but remember what computers were like ten years ago: 8K of RAM was all you could hope for. Since then we've had a revolution in computing hardware, and it's time for software to catch up. Certainly there are plenty of claims about what will constitute the upcoming revolution, but hypertext may very well play a major role; it could, as its advocates claim, change the way we think. And this could be the year it all starts.

T.F. Chiang is a regular contributor to PROFILES.

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HOTRODDING THE EARLY KAYPRO PC

Double your machine's speed for under $20

BY ED QUILLEN

Being the first kid on the block with something new is a lot of fun, but sometimes it has its drawbacks—especially when you were among the first with any specific model of a computer.

It's a competitive industry, and later models of your machine often provide enhanced features that you'd like to have, too. Specifically, I have an early model of the Kaypro PC. It's become a trustworthy friend, but I couldn't help feeling jealous when I saw the later models.

My Kaypro PC was stuck running at the standard PC speed, whereas the newer models (all those built since May 1986) have a "turbo" switch that allows them to run at almost double the standard speed. That is, a computation that took 60 seconds on my machine would require but 36 seconds on a newer machine. In October 1987 Kaypro souped them up again, making them more than twice as fast as the original. I found a way to bring my Kaypro PC up to modern speeds. It takes less than an hour and costs less than $20.

This article will tell you how to almost double the speed of your Kaypro PC by changing two electronic components on its processor board. The steps described are fairly easy to follow and you shouldn't have any problems, but this procedure does involve physically altering one of your computer's circuit boards. For that reason these operations will void your computer's warranty. If you're the cautious type, you may want to have this procedure performed by a trained technician; if you are a hobbyist, then read on.

You will need a small soldering iron called a soldering pencil, a small flat-blade screwdriver, a phillips screwdriver, and a pair of needle-nose pliers.

THE CLOCK CRYSTAL

Inside a standard PC, signals can be switched on or off 4,772,727 times every second. Engineers call this the system clock speed. Since it's unwieldy to talk about 4,777,727 cycles per second, this is abbreviated to 4.77 Mhz—the Mhz stands for megahertz. A "hertz," named for one of the inventors of radio, means one cycle per second, and "mega" means million.

The computer's system clock is controlled by a tiny quartz crystal (just like those in quartz watches) that vibrates at a specific rate. One way to speed up the computer, then, is to install a faster crystal. There is a catch, however. Dozens of other components inside the machine—such as the memory chips—must be capable of handling the faster crystal, and they have their speed limitations. For the Kaypro PC, the fastest practical rate is 8 Mhz. (*Ed. Note: The Kaypro PCs currently being produced have 10 Mhz clock speeds, but this is the result of extensive redesign. Older Kaypro PCs cannot withstand this speed.*)

Digi-Key Corporation sells clock crystals by mail order. They cost a whopping $1.62.

The crystal inside the original 4.77 Mhz Kaypro is rated at 14.31818 Mhz; the system divides its output by 3 to get the 4.77 Mhz clock speed. Getting that up to 8 Mhz would thus require a 24 Mhz crystal. If you can find one, more power to you. The store I went to didn't have them, so I had settle for a 22.1184 Mhz crystal. My system clock speed is thus 22.1184 divided by 3, or 7.37 Mhz.

Digi-Key Corporation sells clock crystals by mail order. You can order a 21.1184 Mhz crystal, part number X063, by calling (800) 344-4539. If you like, you can use a 23.4 Mhz crystal, part number X064, which would give you a clock speed of 7.8 Mhz.

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Nobody's tried this one, mind you, but it should work. Both crystals cost a whopping $1.62.

Crystals come in two forms—one kind is meant to be plugged into a socket, and the other has wire leads. The Kaypro PC uses the kind with leads, so if you buy a crystal over the counter get that type.

THE MICROPROCESSOR

The microprocessor is an integrated circuit that performs all of the computer's mathematical and sorting tasks. It does all the actual computing, and in fact is the heart of your computer system. It can be very fussy about speed, though.

On the older Kaypro PC's, the microprocessor is a standard Intel 8088, and it won't run reliably at more than 4.77 Mhz, so if you wish to speed up your computer you must buy a new microprocessor as well as a new clock crystal.

You have two choices in microprocessors. You could buy a newer Intel 8088, called the 8088-2. It's rated at any speed up to 8 Mhz. A better choice, however, might be the 8 Mhz version of a chip called the NEC V20.

The V20 (formally known as the NEC V20 UPD70108-8) uses the same instructions and pins as the Intel 8088, so you can just plug it into the 8088's socket without changing anything else. Internally, the V20 is faster at some operations, such as multiplication and string searches. So even when it runs at the same speed as an 8088-2, the V20 generally makes programs go 10 to 20 percent faster. The V20 is also available from Digi-Key for $11.88. Appropriately enough, the Digi-Key part number is V20.

NUTS AND BOLTS

Begin by placing your Kaypro PC's system unit on a wide, stable surface, such as a sturdy table or a workbench, and have your tools and soldering pencil handy. *Disconnect the power cable.* Remove the five screws on the rear panel that hold the computer cover in place—there is one in each corner, and one in the center of the panel near the top of the computer.

Once the screws are removed, grip the cover by its sides and pull it toward you slowly. Be careful when it's halfway off the chassis, because it may snag on the floppy-drive cable. If this happens, hold the cover in place with one hand and reach inside to free the cable. When the cover is almost off it will stop moving forward; angle the front of the cover up, then lift, and the cover should come off.

Looking down into the Kaypro PC, you'll see three vertically mounted boards connected to a single horizontal one. The left-most vertical board is the processor board, and it is the one you will be working on.

First disconnect the two wires attached to the processor board, carefully noting how they are attached so you can re-attach them. Next, look at the spot on the rear panel where the processor board meets the chassis; a bracket there is attached to the panel with a small screw. Remove this screw with a phillips screwdriver.

With both hands, grip both ends of the board and lift it upward with a slight rocking motion. The board should pull free from its connector and slide out of the chassis. (If this doesn't happen *don't force it*. Stop and look at the problem. A wire may still be attached, or there may be something blocking the board's path.)

Lay the board in front of you so that the chips are on top and the bracket is on your right. The clock crystal will be near the center, almost at the bottom of the board, near chip position U32 (see figure 1). It's lying on its side atop some sticky padding; two wires come out the side of the crystal and bend down into two holes in the board. Turn the board over and find the other side of those two holes; they will be filled with solder.

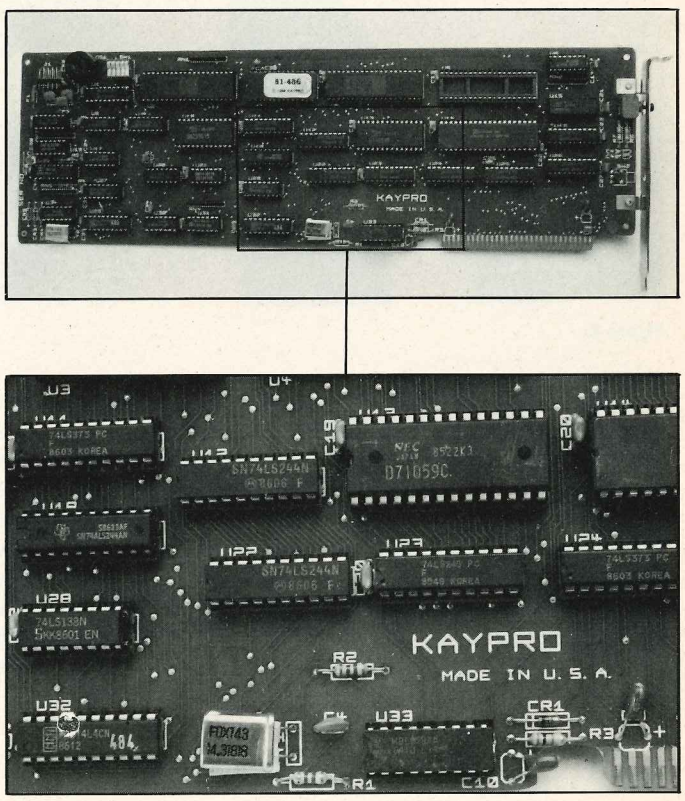

Figure 1:

SOLDERING ON THE BOARD

Turn the board back over and wedge the tip of a small knife or flat-blade screwdriver between the crystal and the padding. Then lever the crystal up until it rises vertically from the circuit board.

This is where it gets tricky. Now you need to set the board on edge so that the card edge connector is pointing straight up. This gives you access to both the crystal on one side and the solder on the other. Because you are going to need both hands to remove the crystal, you might want to have someone help at this point by holding the board upright.

Using a pair of needle-nose pliers, firmly grip the crystal.

With the other hand, pick up the soldering pencil and apply its tip to one of the points on the back of the board where the crystal is soldered in place (see Figure 2). When you see the solder become liquid, pull gently on the crystal until you feel it shift slightly. Move to where the other wire lead is soldered to the board and repeat the process. Keep doing this until you work the crystal free.

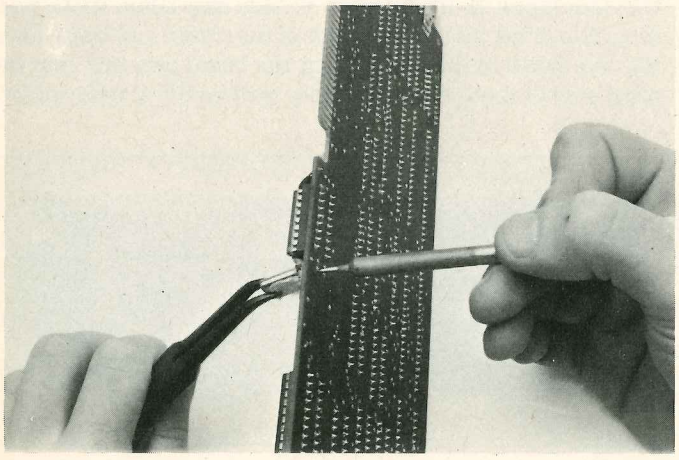

Figure 2:

Once the old crystal is out, trim the wire leads on the new crystal to match the length of those on the old one—about a quarter of an inch. Set the board on edge again. Hold the new crystal with the leads about a half-inch away from the board and the recently vacated holes. Make sure you have the crystal positioned correctly. That is, the writing on it should be oriented in exactly the same way as the writing on the nearby chips. Heat the solder in one of the holes on the back of the board, and once it becomes liquid insert a lead from the other side. Move to the other hole and repeat the process with the other lead.

Removing the old clock crystal and soldering in the new one gets tricky; you might ask for help.

Give the connections at least one minute to cool off, then push the crystal over onto its bed of sticky stuff.

The really tricky part is finished; now all you have to do is swap processors.

CHANGING MICROPROCESSORS

The microprocessor is at chip position U14 near the top of the board, just below a big empty socket (which is for the 8087 math co-processor). It's a big chip, and somewhere on it will be printed "8088" or "08088" or something similar. On the left side of the chip will be a notch.

Look carefully at the 8088 and you will notice that the chip itself rests in a plastic socket. Take the small flat-blade screwdriver you used a few minutes ago and carefully wedge its tip between the chip and the socket on the right side of the processor (see Figure 3). Gently push the screwdriver down, which will lever the chip up slightly. Move to the other side of the chip and do the same thing. Keep doing this until the chip has been worked completely out of its socket.

Now, install your new V20 chip in the socket with its notch pointed the same way as the 8088's. Just take it easy, making sure the pins go in where they're supposed to go.

After that, wiggle the board back into its slot in the computer, plug in the two sets of wires, and replace the screw on the bracket. Then put the cover back on, and you're ready to boot up a faster Kaypro PC.

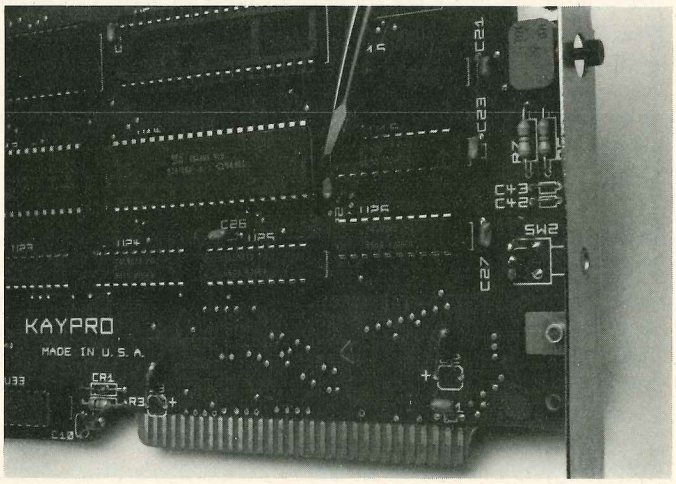

Figure 3:

SPEED CONSIDERATIONS

I have read that not all software will run at the faster speed, but everything I've tried runs just fine, and I tried all the software that came bundled with my Kaypro, as well as many other programs. WordStar zips right along, spreadsheets recalculate more rapidly, and games get more challenging. But there was one problem.

The Kaypro PC has two methods for maintaining the correct time and date. One is an integrated circuit on the bus board called a real-time clock (RTC). This chip is linked to a lithium battery so it runs all the time, 24 hours a day. The other method is a clock program—called the system clock—maintained as part of the operating system. It operates only when the computer is on and the operating system is loaded.

The RTC is not dependent on the computer's clock crystal, but the system clock is. When you replace the clock crystal with a faster one, you make the system clock run faster. After I upgraded my Kaypro PC, the system clock would say that an hour had gone by when in reality only 39 minutes had passed. Further, disk drives didn't stay on as long as they should. This was worse than annoying, so I did the smart thing: I found an expert.

Mark Emmer, an assembly language guru and president of Catspaw, Inc., figured out how to solve the problem.

As he explained it, the PC keeps time with the 8253 timer chip. When the machine first boots, the processor sends the timer a value of 65,536. The timer counts that down to 0. When it reaches 0, the timer tells the processor and again begins to count down from 65,536. Whenever the processor receives such a signal from the timer, the system clock is incremented.

This happens 18.2 times per second on a standard PC. On an 8 Mhz machine, it occurs 28.1 times each second, which explains why the clock runs too fast.

Theoretically, the best solution would be to make the timer count down from a bigger value, which would take longer. In my case, I had changed the system speed from 4.77 Mhz to 7.37 Mhz. That's 1.54 times faster, so the real-time clock would be accurate if we had the timer count down from 1.54 * 65,536, or 101,238. However, 65,536 is the biggest number that will fit on the timer chip.

So we divided the 101,238 in half to get 50,619. We have the processor send that value to the timer, so it's running twice as fast as it should. But we tell the processor to ignore every other tick. The result is that the system clock is accurate.

Emmer has written a program called FIXCLOCK.COM, which compensates for faster crystals. To generate this program he wrote FIXCLOCK.BAS, which is listed below.

Type in FIXCLOCK.BAS. When you run it under GW-BASIC, it will ask for the speed of your new crystal in Mhz. So if you bought a 24 Mhz crystal, just type 24 and press Enter when you're asked. (You must enter an integer, not a real number, so round off the crystal's speed to the nearest integer). FIXCLOCK.BAS will calculate the correct timer adjustments for your new crystal and create the program FIXCLOCK.COM.

A faster crystal makes the system clock inaccurate; the program FIXCLOCK.COM compensates for this.

Put FIXCLOCK.COM on your boot-up floppy or your hard disk's root directory, and make sure that your AUTOEXEC.BAT file calls FIXCLOCK.COM. It stays in memory, keeping good time while you work or play.

That's all there is to it—less than $20 worth of hardware, and less than an hour of soldering, chip-swapping, and typing. Your early Kaypro PC now runs as fast as the later models—somewhat faster, in fact, thanks to the V20's greater efficiency at some operations.

How much faster? The Norton Utilities come with the SYSINFO program, which sets 1.0 as the speed of a standard PC. With the V20 and my new crystal, my early Kaypro now runs at 2.7 on that scale. It should be noted, though, that Norton's program favors what the V20 does best. My own tests show that my machine runs between 2.0 and 2.2 times faster than before, depending on the program.

By any measure, that's a substantial improvement in performance for a minimal investment of cash and time.

Ed Quillen is a Salida, Colorado-based freelance writer who enjoys programming in his spare time.

```
10   ' FIXCLOCK.BAS
20   ' Adjusts real-time clock on Kaypro PC
30   ' when faster crystal is installed
40   ' Produces file FIXCLOCK.COM, which should be called
50   ' from the AUTOEXEC.BAT file when booting up
60   ' It stays resident to keep clock in line
70   ' Prompt for speed of new crystal
80   CLS
90   INPUT "What speed is your new crystal (in mHz)? ",XTAL#
100   ' Now get ratio of that to standard speed of 14.31818 mHz
110  RATIO# = XTAL# / 14.31818
120  ' Multiply by 32,768 to see what value to load on timer chip
130  ' and make it an integer (same as mult by 65,536 and div by 2)
140  VALUE! = INT(32768!*RATIO#)
150  ' Convert it to a two-byte integer;
160  ' get MSB (most-significant byte) and LSB (least-significant)
170  MSB% = INT(VALUE!/256)
180  LSB% = VALUE! - (256 * MSB%)
190  HEAD$ = CHR$(184) + CHR$(LSB%) + CHR$(MSB%)
200  TAIL$ = CHR$(207)
210  ' That's the start and end of the .COM file.
220  ' Read in the rest as DATA statements with checksums.
230  FOR A% = 1 TO 7
240     FOR B% = 1 TO 8
250        READ BYTE%
260        CHECK% = CHECK% + BYTE%
270        TOUT$ = TOUT$ + CHR$(BYTE%)
280     NEXT B%
290     READ D%
300     IF D%=CHECK% THEN 320
310        PRINT "Data entry error in line"; 430 + (10*A%):END
320     CHECK% = 0
330     TOUT$(A%) = TOUT$
340     TOUT$ = ""
350  NEXT A%
360  OPEN "FIXCLOCK.COM" FOR OUTPUT AS 1
370  PRINT #1,HEAD$;
380  FOR A% = 1 TO 7
390     PRINT #1,TOUT$(A%);
400  NEXT A%
410  PRINT #1,TAIL$;
420  CLOSE #1
430  END
440  DATA   230,   64,  138,  196,  230,   64,  176,    8, 1106
450  DATA   180,   53,  205,   33,  137,   30,   49,    1,  688
460  DATA   140,    6,   51,    1,  141,   22,   40,    1,  402
470  DATA   176,    8,  180,   37,  205,   33,  141,   22,  802
480  DATA    60,    1,  205,   39,    0,   46,  128,   54,  533
490  DATA    39,    1,    1,  116,    5,  234,    0,    0,  396
500  DATA     0,    0,   80,  176,   32,  230,   32,   88,  638
```

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TAKING THE MYSTERY OUT OF MS-DOS: PART 1

How to use DOS's internal and external programs

BY WILLIAM MURDICK

You may be brand-new to computers, starting from scratch with *everything*. Or so far you may have learned to use just a particular application in your daily work—a word processing program, perhaps. Or you may have used another type of computer before and be unfamiliar with MS-DOS machines.

Whatever the reason, you may not have had occasion to learn about MS-DOS, your computer's "operating system (a term that will be defined in a moment).

This article and its sequel comprise an introduction to MS-DOS, a set of programs that came with your Kaypro. Some of these programs are necessary in order for your computer to run at all, and some are simply useful in everyday "housekeeping" chores. The more you know about MS-DOS, the more comfortable—and efficient—you will be with your Kaypro.

Part I, which you have in your hand, will discuss the nature of MS-DOS and then show you how to use DOS programs to carry out the mundane chores that attend computer work. During this session, it will be assumed that you understand such fundamentals as what files are and that you are using a dual floppy disk system; however, hard disk owners should have no trouble following along. The second part of this article, to be published next month, will begin with information useful to all, but will then take up issues of interest only to hard disk owners.

DOS DEFINED

Let's get the initials straight. DOS stands for Disk Operating System (though it does a lot more than operate the disk drives). The MS in MS-DOS stands for Microsoft, the vendor of this software product. IBM's computers (until recently) have been using a slightly unique version of MS-DOS known as PC-DOS, the PC standing for Personal Computer.

An operating system is a set of programs that manages the operations of your computer, similar to the way your brain manages the movement and employment of the rest of your body. Without DOS, your Kaypro would only sit and blink.

The first step in running a DOS computer is to transfer certain crucial DOS programs from their permanent home on a floppy or hard disk into the computer itself so that the computer can operate. Two of these programs, IO.SYS and MSDOS.SYS, are system files. They are hidden from your view and can't be deleted or copied, or even listed on screen. The third program, COMMAND.COM, is not invisible and can be found on every MS-DOS disk.

The process of transferring these files from disk into the computer and then running them is called "booting" the computer system. A floppy disk that contains the crucial DOS files for starting the computer is called a "system disk"; a floppy disk without such programs is called a "non-system disk." This article will tell you how to create and use both kinds.

Once your Kaypro is booted you can use non-system disks, but if you try to start up your computer with a non-system disk, a message will appear on your monitor informing you of your error. Why would anyone bother to create and use non-system disks? Unfortunately, those crucial DOS files take up a lot of

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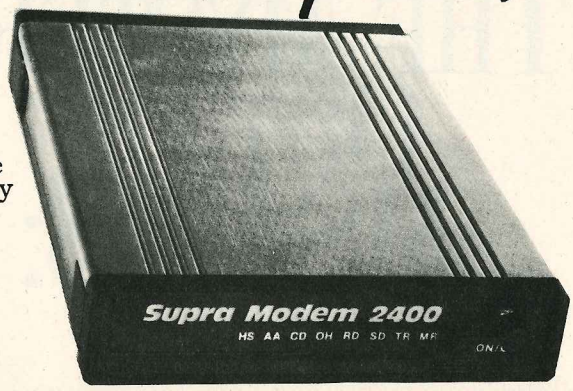

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room, about one-sixth of the space available on a floppy disk. In some cases, you may not be able to fit on one disk both the DOS booting files and all the program files you want. So you would boot with a system disk and then exchange that system disk for your non-system disk containing the programs you want to run. As for your data disk in Drive B:, boot-up files serve no purpose there.

Besides crucial boot-up programs, DOS provides programs you control and use for your own purposes.

Besides those crucial boot up and operating programs, which remain invisible to you, DOS provides a set of programs that you will control and use for your own purposes. These "utility" programs are divided into two groups: internal programs and external programs. Much of the rest of this article will concern the use of those utilities.

Internal programs get loaded into your Kaypro at boot-up time. They are always available and can be run whenever you see the "system prompt" (explained below). The DEL program, which deletes files from your disks, is an internal program. External programs do not get loaded into the system when you start up. They remain on disk, and to run one of them, you have to have a disk containing the program in one of your disk drives (or the program must be on your hard disk). The CHKDSK program, which you use to check your disk to determine how much space is left on it, is an external program.

The rest of Part I of this article consists of a tutorial/reference-guide for the most commonly used DOS internal and external programs. The article concludes with a section entitled "If Things Go Wrong." If you have any trouble trying out any of the DOS commands, jump to that section for help.

Before beginning the tutorials, you should understand the concepts of "system level" and "system prompt." When you have your computer started up but you don't have any program like WordStar loaded, you are at the "system level." You will see one of the possible system prompts for your computer: A:, B:, or, on hard-disk systems, C: (perhaps taking the form of A⟩ instead of A:). The cursor will be blinking next to the prompt, waiting for your command. At the system level you can do one of two things. You can load a program like WordStar, if it is on one of the disks currently in your drives, by typing in its program name (such as WS) and hitting ⟨ENTER⟩, or you can run an internal DOS program, like DEL or DIR. In the second case, you would be directly addressing DOS (hence the phrase "at the DOS level").

In the tutorials below, you will regularly be told to obtain a system prompt. If your dealer has set up your Kaypro to load a menu every time you turn it on, you will have to select from that menu "exit to DOS" or "exit" or "exit to system." An alternative is to make your own boot disk following the directions under the "Format a Disk" tutorial below; then put that boot disk in drive A before turning on the computer.

THE ALL-IMPORTANT DIR

DIR, which stands for DIRECTORY, is so important a program that it will be considered first and separately from the rest. It is an internal program, always available at a system prompt. You use DIR to get your Kaypro to list on the monitor the names of the files that reside on a disk. If you have an A: prompt on your screen, and you want to see a list of the files on the disk in drive A:, simply type DIR and hit ⟨ENTER⟩. (Note: caps are not necessary, so **dir** would do just as well; the ⟨⟩ braces indicate a key, not a set of letters to type.)

If you are looking for that memo you wrote last month to Jones, you might need the DIR command to search through likely disks. You would also use DIR to remind yourself of the name you gave to a file (was it CHAP1.BK or CHAP-ONE.BK?) before you copy that file to another disk or erase it. You will also use DIR to examine new disks that you acquire.

However, in order to make sense out of the list of names that appears on your screen when you use the DIR command, you must know the conventions of computer file naming.

File names have two parts. The main part consists of from one to eight characters, usually letters or numbers. That part can be followed by an extension, which consists of a period followed by from one to three characters. The main part of a filename usually identifies the specific file; the extension identifies the type of file. For example, WS.EXE consists of the specific program identifier WS (short for WordStar) and the classifying extension .EXE (short for executable). You might have several .EXE files on your disk, but only one WS.EXE.

Here are some conventional extensions that you are likely to come across:

EXE—Stands for "executable"; this is a program that you can run. You run a program by typing its name (without the extension) followed by ⟨ENTER⟩ at the system prompt.

COM—Stands for "command"; like EXE, a runnable program. (*Ed. note: for an explanation of the differences between .EXE and .COM files and further discussion of files in general, see "On the Practical Side" in the May 1988 issue of* PROFILES.)

DOC—Stands for "document"; may be a text that teaches you how to use a program (e.g. WS.DOC would instruct you in WordStar); sometimes also used to indicate any word processing text.

TXT—Stands for "text"; a word processing text file, often "pure ASCII" (a term that will be explained later).

BAS—Stands for "BASIC programming language"; a program that can be run only after loading BASIC. (Similarly, PAS for Pascal language files; ASM for assembly language files.)

DAT—Stands for "data"; a file that consists of a set of information, such as names and addresses in a mailing list; usually in ASCII format.

DTA—Same as DAT.

(Here's some good advice about making up your own filenames. Don't create short cryptic names like T5; use all eight characters if possible. Use extensions to classify: MEM for memos, LET for letters, AUG for August. When you name a file, imagine a complete stranger searching through your disks looking for a particular file, knowing the content but not the filename. That stranger is you a month from now.)

Using the DIR command, you could examine a new program disk, picking out the files that will instruct you (.DOC extension) and the program names you would type in at the system prompt to run the programs (.COM or .EXE extensions).

Step-by-step instructions for using DIR follow.

1. Boot your Kaypro and obtain a system prompt (A: or A⟩).

2. To view the contents of the disk in drive A, at the A: prompt type DIR ⟨ENTER⟩. (To reiterate, "At the A: prompt" means "when you see A: on your monitor with the cursor blinking next to it.")

3. To view the contents of a disk in another drive, such as drive B, at the A: prompt type DIR B: ⟨ENTER⟩.

Or at the A: prompt type B: ⟨ENTER⟩ to obtain a B: prompt, and then type DIR. This principle of using either DIR B:, or B:⟨ENTER⟩ to operate directly from a B: prompt, works for all internal DOS programs.

Vertical lists of files sometimes scroll off the top of the screen. To prevent that by forcing the system to pause after each screenful of text, type DIR/P or (to view the disk in drive B) DIR/P B:. Hit any key to continue the scrolling after a pause. You can also solve the problem, usually, by typing DIR/W, which causes the filenames to be spread out "wide" across the screen. Try both DIR/P and DIR/W.

If you want to print a directory, you can do it in two ways. Use DIR/P or DIR/W and then, while the filenames are visible on the monitor, prepare your printer and hit the ⟨PrtSc⟩ key. Or, at the system prompt, hold down the ⟨Ctrl⟩ key and type P. Then enter your DIR command; everything that appears on the monitor (including everything that you type) will be printed (again, the printer must be turned on). In fact, this is a good way to practice these tutorials—you'll get a written record of everything you did and of every response by your Kaypro.

Note: after each program name, such as DIR, is typed, you must hit ⟨ENTER⟩ to carry out the command; that understanding will be assumed from now on and there will be no further references to ⟨ENTER⟩.

OTHER DOS INTERNAL PROGRAMS

Reset. Resetting the computer means, in effect, turning it off and then back on again without cutting the electrical power. Turning the power off and then quickly back on can harm the system, adding an overload of new voltage to the residual voltage that hasn't yet dissipated. Resetting, by contrast, can't harm the computer. It clears the memory and allows you to start over.

You occasionally need to reset the computer because certain programs or commands will cause it to freeze or "hang up." (The most frequent cause of this is running a color graphics program using a monochrome monitor.) Beginners who are learning about MS-DOS often get so mired in an incorrectly executed command that resetting is the only solution; if that happens to you in this tutorial, go ahead and reset the computer.

Unlike most other MS-DOS programs, Reset is invoked not by typing its name, but by hitting a specific sequence of keys instead. The one-step process for resetting is simple:

1. Hold down these three keys simultaneously: ⟨CTRL⟩, ⟨ALT⟩, and ⟨DEL⟩.

WARNING: The awkward design of the reset key sequence is deliberate so that it won't be struck accidentally. If you are working with a file and you reset without having first saved, you will lose your file.

When you name a file, imagine a stranger searching for it; that stranger is you a month from now.

Copy. To copy a file is to make a duplicate of it. You will want to copy files for various purposes: to make extra copies, called back-ups, in case your primary copy goes bad for some reason; to share data or text files with co-workers or friends; or to take data home and work with it there.

You can copy data files, such as those generated by word processors, spreadsheets and data base programs, all you like. Program files are a different story. Legally, you can only make copies of program files for back-up purposes. Copying even an MS-DOS utility file and giving it away is against the copyright laws of the United States. Giving someone else copyrighted software is illegal, and software companies are within their rights to prosecute you if they find out you are doing so.

With this lesson in copyright law out of the way, let's learn how to copy a file.

1. Use a system disk to obtain a system prompt: A: or A⟩.

2. Remove the system disk and replace it with the disk containing the file you wish to copy (called the "source disk").

3. Put the disk that will receive the copy (the "target disk") into drive B.

4. Type COPY FILENAME.EXT B:

(Note: Substitute the name of your file for "FILENAME.EXT".)

5. Some variations: To copy all files from A: to B:, type COPY A:*.* B:, or to copy only files with a particular extension (EXT), type COPY A:*.EXT B:

You will learn more about the asterisk "wild card" in Part 2.

Delete. Deleting a file means you eliminate it. The file's name disappears from the disk and and the information in it is no longer available. The purpose of deleting files is to dispose of

older information, thus freeing space for newer files. Be very careful when using this command. Once you delete a file, recovering the information in it is almost impossible.

To delete a file:

1. At the A: prompt, type DEL FILENAME.EXT if the file is on drive A. Type DEL B:FILENAME.EXT if the file is on drive B.

The Rename utility allows you to change the name of a file to any other valid file name.

Use your DIR command to obtain the exact filename before deleting and to confirm that the file is gone after deleting.

Rename. The Rename utility allows you to change the name of a file to any other valid file name.

There are several reasons for doing this. You may wish to change the name of a single file to make it more appropriate or easier to remember, or you may someday want to reorganize your files into a different system of names and extensions. It's generally not a good idea to rename a program file, but if you do, be sure to keep its .EXE or .COM extension.

This command comes in especially handy when you are working with back-up files. WordStar, for example, automatically creates back up files—copies of the document with which you are working. Those files have a .BAK extension. However, WordStar won't edit back up files (this is a form of protection). You have to rename the file from, say, LETTER.BAK to LETTER.TXT before you can edit it.

To rename a file:

1. Use a system disk to obtain a system prompt.
2. Remove the system disk and replace it with the disk containing the file whose name you wish to change.
3. Type REN OLDNAME NEWNAME, substituting appropriate filenames for "oldname" and "newname."

Type. This command will display onscreen the contents of any text file you designate. The file you are viewing must be standard ASCII text. ASCII stands for American Standard Code for Information Interchange, which is a widely followed specification for how text is encoded in a file.

Most word processors, database programs, and spreadsheets do not use ASCII as their text format, so the Type command is somewhat limited. The two areas where ASCII is prevalent are the system configuration files CONFIG.SYS and AUTOEXEC.BAT, which are part of MS-DOS, and the documentation files included with public domain software (software that is available for free).

To use the Type commmand:

1. After obtaining a system prompt, to view a file called "filename.doc" on drive A, type TYPE FILENAME.DOC
2. Use CTRL S to stop the continuous scrolling; hit any key to resume scrolling.

If you Type a WordStar file, it will probably be barely readable. That's because word processing programs insert invisible characters into your text. Those characters are used by the program to format the text or create underlining and boldfacing. When viewed from the system level, rather than via the word processing program, formatting characters become visible, which makes the text on screen appear garbled.

DOS EXTERNAL PROGRAMS

These programs can be found on your DOS disk, or in your DOS hard disk area (more on that in Part II). If you received DOS spread out over several disks, you would be wise to create a DOS disk with all the useful external programs on it. The tutorials in Part I will give you all the information you will need to create such a disk. In the meantime, use DIR to find the disks containing the DOS programs discussed below. Note: different versions of DOS use different extensions for these programs: either .EXE or .COM. This tutorial will assume .EXE, but substitute .COM if that's what you have.

Format. No new blank disk can be used in your computer until it has been formatted. During the formatting process, the computer magnetically establishes its own system for holding and organizing information on the disk. You can format disks to be system disks or non-system disks.

To format a disk:

1. Put a disk containing the DOS program FORMAT.EXE in drive A. (Hard disk people have to get into their DOS area on the hard disk.)
2. Put a blank disk in drive B. Make sure the disk is blank or contains files you don't mind giving up—because formatting erases!
3. To format the blank disk as a non-system disk, type FORMAT B:
4. To format the blank disk as a system disk, type FORMAT B:/S

Diskcopy. This program is for dual floppy disk systems only. It is the means by which you back up important disks. This process copies the whole disk, including system files if there are any, so a system disk copies as a system disk.

To copy a disk:

1. Obtain a system prompt and put a disk containing the DOS program DISKCOPY.EXE in drive A.
2. Put a blank disk in drive B.
3. Type DISKCOPY A: B: and then follow the directions on the screen. You will be asked to put the source disk in A: (removing the DOS disk, unless you're trying to copy it) and to put the

target disk in B: (it's already there). Hit ⟨ENTER⟩ after each step. Type N at the end of the process to return to the system prompt.

WARNING: Don't forget the A: B: after the word DISKCOPY; if you forget, DOS will use only drive A and you may end up ruining your source disk by copying it onto itself.

Chkdsk. The DIR command tells you how much space is left on the disk whose directory you just examined, but the CHKDSK program provides more elaborate information.

To check the contents of a disk:

1. Obtain a system prompt and put a disk containing CHKDSK.EXE in drive A.

2. To check the space on the disk in drive B, at the A: prompt type CHKDSK B:

You will get something like this:

362496 bytes total disk space
23552 bytes in 3 hidden files
316416 bytes in 7 user files
22528 bytes available on disk
6553620 bytes total memory
5181824 bytes free

Once again, some definitions are in order:

BYTE—A storage unit equal to one character in a text file.

TOTAL DISK SPACE—The amount of original space on the disk.

HIDDEN FILES—The crucial invisible DOS programs for operating the computer.

USER FILES—Your stuff.

BYTES AVAILABLE ON DISK—What you usually want to know: how much space is left on your disk.

TOTAL MEMORY—Your Kaypro's internal memory.

BYTES FREE—How much of your Kaypro's memory is free for programs you may want to load.

Print. PRINT reads the data in an ASCII text file from disk and sends it out to the computer's printer port. After running PRINT, you are immediately returned to the system level. In a process called *background* operation, PRINT continues to operate while you run other programs.

There are two uses for the PRINT commmand. First, you can instruct your word processor to generate a file specially formatted for the print command. Once you use PRINT on that file, you can use a different application—a database management or telecommunications program, for example—while your word processing document prints.

You can also use PRINT with documentation files found with public domain programs. Those files are usually formatted with margins and page breaks tailored to the PRINT command.

To use PRINT:

1. Obtain the system prompt and put a disk in drive A containing PRINT.EXE.

2. Put a disk containing the file you wish to print in drive B.

3. At the A: prompt, type PRINT B:FILENAME.EXT

4. You should see "Name of list device [PRN]:" which means that if you hit ⟨ENTER⟩ the file will be printed. Hit ⟨ENTER⟩.

IF THINGS GO WRONG

If you had problems when trying any of the internal or external programs mentioned here, check the following list to find a solution.

1. PROBLEM: Nothing happens after you type in the command.
   CAUSE: You didn't hit ⟨ENTER⟩.

2. PROBLEM: "Bad Command or Filename" message appears.
   CAUSE: You misspelled the command; retype being careful about blank spaces. OR, you don't have a disk in drive A containing the external program you're trying to run.

3. PROBLEM: "Not Ready Error" message appears.
   CAUSE: No disk in the indicated drive. OR, the drive door is open. OR, the disk is in sideways or backwards or upside down (put disks in label side up so that the label is the last part to go in).

4. PROBLEM: Format failure message.
   CAUSE: Bad disk; throw it away.

5. PROBLEM: "General Failure Error reading drive B" message appears.
   CAUSE: You are trying to use an unformatted disk. See "How to Format a Disk."

6. PROBLEM: "Unrecoverable read [or write] error on Drive A: [or B:]" message appears.
   CAUSE: Bad disk in the indicated drive; throw it out.

7. PROBLEM: "File not found" message appears.
   CAUSE: Either the file you are trying to do something with is not on the disk you think it's on, or you misspelled the filename.

8. PROBLEM: "Disk full" message appears.
   CAUSE: You are trying to copy more onto a disk than the disk can hold. If your target disk has damaged sections, it may not hold as much as the source disk.

9. PROBLEM: "File cannot be copied onto itself" message appears.
   CAUSE: You're using the source drive as the target drive; the target drive must be different (put B: or some other target drive designation after the filename).

Coming in part 2: The second part of this article will cover the following subjects: Use of wild cards (the asterisk); batch files, including AUTOEXEC.BAT and CONFIG.SYS; creating a WordStar disk that boots the computer and automatically loads WordStar; and basics of hard disk management.

William Murdick is a professor at the California University of Pennsylvania and a frequent contributor to PROFILES.

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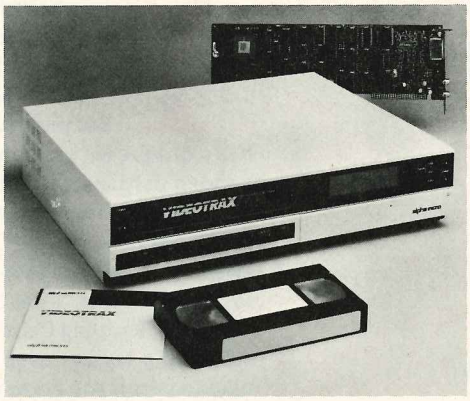

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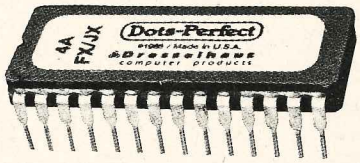

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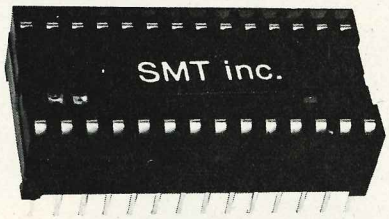

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BEFORE YOU BEGIN...

What you must know about your system to install software

BY DANIEL L. SCHUSTER
AND MARSHALL L. MOSELEY

Your hardware and software have to work together: When you install a software program, it has to know all about the hardware it's going to be working with in order to run properly, and for many programs you have to supply that information.

That may sound simple and straightforward, but unfortunately, it isn't. Every computer system has a unique set or "configuration" of hardware consisting of a video display, hard or floppy disks, memory, and printers. Each one of these items can take several different forms and most software you use *must* know exactly what each item is—what video display you have, whether you have one or more hard disks, what type of printer is attached to the computer, etc. Keeping track of all these details can make installing software a trying, even infuriating task, but the job can be made easier if you know exactly what your system includes. In this article we'll explain what

PHOTOGRAPH BY BOB NISHIHIRA

software installation is, and then we'll cover the basic structure of the standard MS-DOS microcomputer system, providing you with background knowledge and a frame of reference that will help you understand the rest of the article. Next we'll look at each of the computer components listed above, explain how they affect software installation, and explore the advantages and disadvantages of the various options open to you. Finally, we'll explain how the hardware you choose affects the software you use.

We'll take a quick look at installing for video displays, parallel and serial ports, disk drives, and printers. When we're done, you should have a better idea of how to install software to work properly with your hardware.

SOFTWARE INSTALLATION

Software installaton is the process of altering a given program to work with your specific computer hardware. Installation procedures run the gamut from the very difficult—more a black art than a procedure or technique—to the very easy, in which a menu-driven program asks you a few simple questions, then sets everything up for you. How difficult or simple an installation is depends on the design of the installation procedure, the complexity and size of the program, your knowledge of your equipment, and probably most of all on the clarity of the documentation that came with the software.

When you open a software package for the first time, make backup copies of the master disks *immediately*. (We'll explain how in a moment.) Your program may come on ten floppies or only one, but that original floppy is the last resort if the dog eats your working copy or gremlins attack your hard disk. Make a backup copy, then do all work with it. If your software is copy protected, consult its manual to see if it is possible to make any sort of copy for your own protection.

A major worry for beginners is that they will wipe out the original program disk before they make a copy of it—and this can indeed happen. To prevent this, find the small (¼ x 1-inch) black or silver tabs that comes with a box of blank disks. These tabs, called write-protect tabs, go over the square notch on the edge of the floppy, and they prevent data from being written to the disk or deleted from the disk. Place one tab over the notch on each disk in the software package and these disks will be safe from such problems.

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To make a backup copy, use the MS-DOS DISKCOPY command. Type **DISKCOPY A: B:** at the MS-DOS prompt and press Enter. The DISKCOPY program will prompt you to insert the "source diskette" in drive A. Those of you with dual drive machines will be instructed to place the "target" disk—the one you wish to hold the copy—in drive B. Those with a single disk drive will be prompted to swap "source" and "target" disks in out of the one drive until the copying process is complete. (For further explanation of this and other basic MS-DOS commands, see "A Short Course in MS-DOS" on page 29 in this issue.)

Once you've got working copies of the software, file the originals somewhere safe and don't use them unless absolutely necessary. Now, on with the installation.

Software installation almost always requires the use of an installation program supplied with the program itself. Installation programs automate the file copying and software configuration process; they ask you whether you have a hard disk machine and install the program on floppies or hard disks, depending on your answer. They also ask you specific questions about your computer equipment and adjust "parameters" within the program accordingly. Answering those questions requires that you understand how an MS-DOS computer system is put together, so we'll tackle that next.

Software installation almost always requires the use of an installation program.

THE SUM OF ITS PARTS

Like a high-quality stereo, an MS-DOS computer is modular in nature. It consists of various independent components that, when connected to each other, form a complete system.

At the center of the system is the system unit. This is a large square box containing several circuit boards, floppy and hard disk drives, the power switch, and a few connectors on the rear panel for attaching other components.

The circuit boards inside the system unit hold three parts of the computer system: the microprocessor, memory, and expansion slots. The microprocessor is an integrated circuit that performs all of the computer's mathematical and sorting tasks. It does all the actual computing, and in fact is the heart of your computer system. Memory is a group of integrated circuits linked together and used for holding information. It's a kind of staging area for the microprocessor—data is held in memory both prior to and after being used by the microprocessor.

Expansion slots are connectors built into one of the circuit boards. They exist so you can add devices—called expansion boards—to the computing system. There are expansion boards to do just about everything. You can buy boards that add memory to the computer, or that supply extra printer ports or even new types of video.

Several components of the system that you probably tend to think of as integral—such as the circuitry for controlling video or disk drives—are actually housed in expansion boards. This lets you change those components easily. You can swap monochrome for color video, for example, or low-density drives for high-performance high-density drives, simply by installing new video or disk controller expansion boards (and then replacing the actual monitor and drives, of course).

Monitors, display adapters, disk drives, memory, mice, and output ports all affect software installation.

Outside of the system unit there are two more components: the monitor and the keyboard. The type of monitor you have is dependent on the the type of video expansion board (sometimes called a display adapter) in your system. You have many choices in this area, ranging from inexpensive but adequate monochrome displays and adapters to mind-blowing, wallet-draining color graphics devices.

Keyboards, on the other hand, are standardized pieces of equipment. Older keyboard have 84 keys, while the newer ones have 102. The new keyboards have more function keys than the old keyboards, along with separate numeric and cursor control keys. The older keyboards have one set of keys performing both functions. Like just about everything else in the MS-DOS world, keyboards are removable and replacable. You can, if you like, purchase more expensive keyboards designed for specific applications, such as computer aided design (CAD) or desktop publishing. (This is rarely done, however.)

As should be clear by now, your computer system consists of several interacting components. To "configure" or install software for your particular system (which you must do if you are to use the software), you should have a clear understanding of the nature of each component.

WHAT DO I HAVE?

The components that affect software installation are monitors and display adapters, disk drives, memory, mice, and output ports. Let's look at each in turn.

Monitors and display adapters. As previously stated, the video display system for a computer has two components: the monitor itself and the display adapter, which fits into one of

the computer's expansion slots. There are several such video systems.

The simplest uses a Monochrome Display Adapter. The MDA card works with a monochrome (amber or green) monitor to produce the standard IBM character set of the letters A through Z, symbols, and box-drawing characters. For word processing, monochrome displays will give you onscreen underlining, something not generally possible with color screens, as well as a very sharp, easy-to-read image. You can't use them to draw figures on screen, however, or create animated figures, so you can't tap the graphing ability of programs like Lotus 1-2-3, and games such as "Flight Simulator" are out of the question.

The Monochrome Display Adapter has largely been replaced by the Hercules Monochrome Graphics adapter, invented by Hercules Computer Technology Inc. It allows monochrome monitors to display high-resolution graphics onscreen, using varying shades of a single color. With a Hercules or compatible board and a monochrome display, you get exceptionally sharp display of monochrome characters, as well as graphics capabilities for games, desktop publishing, and drawing programs.

There are also color-emulating monochrome display adapters that accept color signals from the computer, translate them into varying shades of one color, and display those shades on screen. What you are actually seeing is color pictures rendered in monochrome. This means that in a software installation program you would select "Color Graphics Adapter" or "Enhanced Graphics Adapter" from the video selection menu, even though you have a monochrome screen.

Both Kaypro's half-length multi-video board (HLMV) and its half-length EGA board (HLEB), one of which was shipped with almost every Kaypro PC, emulate color graphics in this manner. They emulate the Hercules graphics board as well.

Besides the various types of monochrome adapters, there are adapters that let you do real color graphics. These include the Color Graphics Adapter (CGA), which is designed to drive an RGB (red-green-blue) color monitor. Though the text is a bit fuzzy and most word processing programs won't show onscreen underlining, this color system can provide a decent image, as well as graphics and color for games. It is an old video standard, though, and is falling into disfavor as EGA boards and monitors drop in price.

The Enhanced Graphics Adapter, or EGA, is a color system featuring a much sharper image than the CGA. Though an EGA card can be used with an RGB monitor, the system really shines when hooked up to an EGA monitor. Almost as sharp as monochrome, EGA systems provide clear, crisp text as well as high-resolution graphics and more colors than CGA boards and monitors. And because the EGA is compatible with the CGA standard, any software designed for a CGA system will work fine under EGA.

To determine what type of video board you have, consult the documentation that came with your computer. If you cannot make a determination, contact your dealer and ask him or her.

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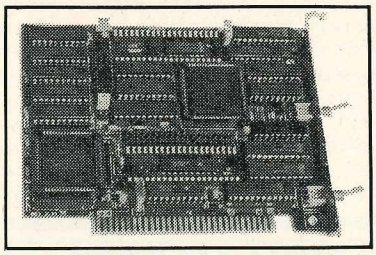

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chrome Display Adapter, then choose "MDA" from the menu of any installation program you might run. If you have a Hercules or Hercules-compatible board, then choose "Hercules Monochrome Graphics Adapter." If you have Kaypro's HLMV, and it's set for color emulation, choose "Color Graphics Adapter" or "RGB Adapter." And if you have the HLEB set for EGA emulation, choose "Enhanced Graphics Adapter with Enhanced Display."

To install software for CGA video, choose the option in the installation program for either "Color Graphics Adapter" (or its acronym, "CGA"), or "RGB."

To install software for an EGA board and monitor, choose "Enhanced Graphics Adapter with Enhanced Display" from any installation program.

Disk drives. The standard floppy disk drive is the double-sided, double-density, 360K drive. With this drive, industry-standard 5.25-inch floppy disks can store the equivalent of about 140 typed, double spaced pages of information. A system may have only one of these, in which case DOS identifies it as drive A. A system with two floppies has drives A and B.

Computers that are compatible with the IBM AT, such as the Kaypro 286 series, usually come with a 1.2 megabyte drive as drive A. This drive uses 5.25-inch high-density floppies, which are different from standard floppy disks. High-density disks store the equivalent of three standard floppies.

In software installation programs, high-density drives are typically listed as "HD" or "96 TPI" drives. Standard floppies are "DSDD" or "48 TPI" drives. (TPI stands for "tracks per inch"—floppies are magnetically divided into a series of concentric circles called tracks. High-density drives have more tracks than low-density drives.)

A relatively new arrival on the scene is the 3.5-inch microfloppy. Popular on portable computers such as the Kaypro 2000+, these stiff-cased floppies hold either 720K or 1440K (1.44 megabytes). In installation programs they are listed as "720K 3.5 inch" drives or "1.44 MB 3.5 inch" drives.

A hard disk is similar to a floppy disk in that it has a letter designation and holds computer data. It differs from its flexible relative in that it is permanently mounted inside the computer, is made out of metal instead of plastic, and can hold up to 1,000 times more information.

The important things to know about your hard disk during software installation are its letter designation and how much room is on it. Most hard disks have the letter designation C. If you have a high-capacity hard disk (over 30 megabytes), it is probably further divided into more disks, designated D, E, F, and so on. To reiterate: Before installing software on a hard disk, carefully note the letter designation of the disk, and then check to make sure there is enough room on the disk to hold the program you are installing. The program specifications listed in the front of the software manual will tell you how much space the program needs. Hard disk space is measured in bytes. To see how much room is on the hard disk, use the MS-DOS commmand DIR, which will tell you the available

number of bytes. (Again, you can find directions on using this command in "A Short Course in MS-DOS.") Divide by 1,024 to get the number of kilobytes, and compare this to your program's requirements.

Memory. The typical MS-DOS computer has anywhere between 64 and 640 kilobytes of memory. Since most programs require at least 128K to run at all, 128K of memory is considered the minimum required for a functioning machine. Kaypro computers have always come with at least 512K, and for the last two years they have held the maximum 640K, with an extra 128K thrown in for use as a RAM disk (a RAM disk is a section of memory configured to act like a disk drive; it has a letter designation and you can read and write information to it).

Installation programs do not usually ask questions concerning memory. They simply assume that you have enough inside the computer to run the program you are installing. To find out how much memory you have, turn on your computer. The first thing it will do is run a memory checking program, which will report the total amount of memory in your system. Then check the software manual to make sure that your memory meets the program's requirements.

Ports. Computers communicate with external devices through output ports, which are connectors on the back of the machine. Ports come in two very distinct varieties: parallel and serial. You don't have to know anything about the differences in how they work. They are visually quite distinct and physically incompatible, so you can't hook things up wrong.

Parallel ports are used almost exclusively for attaching printers and are sometimes called printer ports. Most printers come set up for a parallel connection. You can identify the parallel port on the back of the computer by finding a D-shaped protrusion with 25 holes. The D shape keeps you from connecting a printer cable to it in the the wrong way. A computer often has one parallel port, called the primary parallel port. For most users one port is enough, but if you have two printers you can add a second printer port with an expansion board.

MS-DOS has two names for the primary parallel port: PRN and LPT1. PRN is a term held over from mainframe days, and most installation programs don't use it. When an installation program asks you the designation for your printer port, choose LPT1.

Serial ports, sometimes called RS-232 ports, are used for several purposes. Some printers, typically the older letter-quality printers, require a serial port, and others can be used with parallel or serial ports. More commonly, a serial port is used to connect an external modem or mouse (more on mice in a moment). As with parallel ports, you can add secondary serial ports via expansion boards.

We've already said that on most computers the parallel port can be seen as a D-shaped connector with 25 pins. On all Kaypros, and on most AT compatible computers, the serial port is a similarly shaped but smaller connector with only nine pins.

MS-DOS's name for the primary serial port is COM1, and that is the designation you should choose when installing software for that port.

Mice. A mouse is a computer input device that provides an alternative to the keyboard. It allows you to move a small arrow, called a pointer, around on screen and invoke different commands using that pointer. The mouse itself consists of a small plastic module set on wheels or a rolling ball so it can roll across a desktop. It's called a mouse because the module and the wire that comes out of it look like a mouse with a long tail. Mice are not necessary for operating your computer, but lately they have become very popular, and more software than ever makes use of them. It's important to know how installation programs handle them.

There are two types of mice: serial and bus. A serial mouse connects to the serial port on the back of your computer. When installing software for a serial mouse, you must be aware of which port it is attached to—COM1, COM2 etc.

A bus mouse has its own expansion board, which plugs into an expansion slot inside the computer (those slots are often called an "expansion bus"—hence the term bus mouse).

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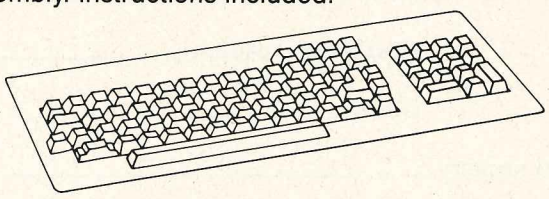

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The three most popular brands of mice are the Microsoft Mouse, the MouseSystems Mouse, and the Logitech Mouse. Your mouse probably is one of these, or it emulates one of these. Look at your mouse documentation and determine exactly what type of mouse you have.

When running an installation program, the things to know about your mouse are whether it is a serial or a bus mouse; if it is serial, what port it uses; and what brand of mouse it is or what brand it emulates.

That's a quick roundup of the major features of a computer. You need to be familiar with them to understand correct software installation. One more component that is not part of the computer itself, but that you also need to understand, is the printer.

PRINTERS

Publishers who produce software programs that control printers must make it possible for those programs to control different printer features, such as boldfacing, underlining, etc. Since there are hundreds of different printers, and no single control code to activate these features on all of them, publishers often must deal with very long lists of printers. Fortunately, you don't have these worries.

When installing a program, you are almost always presented with a menu of printers the program supports. All you need do is select your printer from the choices available.

But there can be complications. Suppose you have a Yamawhoosa TX100 printer. From reading its manual, you know it comes with its own set of printer control codes, and that with the flip of a switch it can also emulate (imitate) the popular IBM Proprinter. Since you guess there are more software packages supporting the IBM Proprinter, you flip the appropriate DIP switch on your printer. When you install your word processor, which printer do you choose, Yamawhoosa or IBM? Since the printer is now emulating an IBM Proprinter, you select the IBM—be aware though that not all emulations are perfect.

Another problem arises when your printer isn't even listed. In this case, here are some safe bets to get you going. If you've got a dot matrix printer, the chances are very good that it works more or less like an Epson MX-80 or Epson FX-85. Try these selections, and the printer should deliver a usable document. If you've got a daisywheel letter-quality printer, try selecting the Diablo 630. Many daisywheel printers emulate (more or less) this popular printer. If this gets you going, fine. A letter or a phone call to the printer manufacturer will then get you more information on exactly what your printer does and how it does it.

Now let's suppose the worst—that your printer is an off-brand: It doesn't appear on the printer menu and it doesn't imitate any other printer. In this case you would have to perform a custom installation in which you tell the software exactly what codes control your printer. Space constraints make it impossible to explain how to do that here. (Suffice to say that if you ever have to do a custom printer installation, you'll become either a printer expert or an outpatient at the local mental health clinic!)

A FINAL WRINKLE

AUTOEXEC.BAT and CONFIG.SYS files are files that DOS reads when the computer boots up. They can specify certain aspects of the computer system's operation. Most programs have no special requirements for these files, but for a few you'll need to create these files or modify ones that exist. Again, space limitations prohibit us from going into the details here; we can only tell you that you'll need to use an ASCII word processor (such as Wordstar in non-document mode) and follow the software publisher's instructions.

GETTING IT ALL STRAIGHT

If all this seems overwhelming, don't panic. For most software, installation is a matter of reading instructions and making selections from a list. Read the manual, work slowly and carefully, and you should be in good shape.

Daniel Schuster teaches math and computer science at the College of Eastern Utah. Marshall Moseley is technical editor of PROFILES.

You may wish to fill in and clip the following form to help you keep track of your hardware configuration. It could come in handy the next time you do a software installation.

Video Display_____

Video Card_____

Floppy drives: Drive A capacity_____

Drive B capacity_____

Hard Drive C capacity_____

Other_____

RAM memory_____

Ports: # parallel_____

serial_____

Printer: brand_____

model_____

current setting_____

(list any active emulation of other printer)

AUTOMATING CP/M FOR THE OCCASIONAL USER

Four ways to make your system run programs automatically

BY DAVID G. MILLS AND MARSHALL L. MOSELEY

If you own a Kaypro CP/M computer, you have probably had it for some time and become quite proficient with it. However, other people—a spouse, a child, a friend—may occasionally want to use your machine. Explaining CP/M and all its quirks can be a hassle at best, and a nightmare at worst. But you can automate CP/M so that the computer runs the programs you want whenever it starts, making things simple for the occasional user. And you can do it with common CP/M and public domain utility programs.

This article will explain several ways to automate CP/M. It includes information about CP/M's batch file program, SUBMIT; the public domain programs COMLINE and DU-V87, which directly modify your CP/M boot disk so that it runs what ever programs you designate; and a menu-driven program for CP/M that lets you select a program and run it without even typing the program name.

SUBMIT

The first step in automating CP/M is learning how to run multiple commands with a single command. For that you use SUBMIT.COM, which was shipped with every CP/M Kaypro computer. SUBMIT will read an ASCII text file that contains lists of commands and execute those commands one after the other.

SUBMIT has some interesting functions and can be used in a fairly complex manner. For the purposes of this article, however, we will just show you how to execute a series of programs and CP/M commands. For more information on using SUBMIT, read "The Best Kept Secret in CP/M," by William Hogan, in the July/August 1985 issue of *PROFILES*.

A SUBMIT file can be created with Wordstar in the non-document mode or with any other word processor that creates standard ASCII text. The file must have a SUB extension. Here is an example of a SUBMIT file called WSRUN.SUB that will change the default drive to B, run Wordstar on the A drive, and then automatically erase the .BAK files that Wordstar leaves on the default disk:

```
B:
A:WS
ERA B:*.BAK
```

For SUBMIT to work, both SUBMIT.COM and the SUBMIT file you create must be in the same user area. To run this file, you would enter the command SUBMIT WSRUN at the system prompt. If you liked, you could store WSRUN.SUB on a different drive—the B drive, for example—and run it by changing the command to SUBMIT B:WSRUN.

SUBMIT takes you a long way toward automating your machine, but once the computer boots you still have to type that

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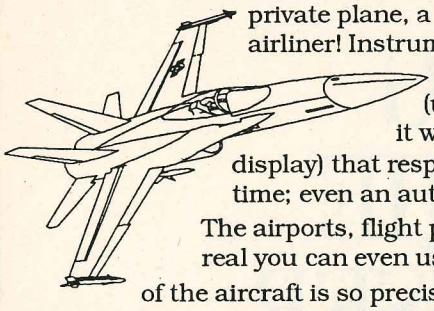

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initial command line. The program COMLINE can completely automate the process.

CP/M'S COMMAND LINE

The CP/M operating system provides a surprisingly easy way to automatically execute commands. In the first part of the operating system tracks on CP/M disks there is a space set aside for a command line. When CP/M boots, it reads this line and executes the command it finds there just as if it had been typed at the keyboard. If there is nothing in the command line space, CP/M goes on to display the A0› prompt on your screen, awaiting your command. (For the technically curious, this command line space begins at track 0, sector 2, byte 8 on all Kaypro CP/M disks.)

CP/M provides an easy way to automatically execute programs: the command line space.

Inserting a program name into this space was not an easy task until a public domain program called COMLINE.COM became available. (You can obtain COMLINE.COM from the Kaypro bulletin board, Kaypro On-Line, at 619/259-4437.) COMLINE is a small (6K), menu-driven program that inserts any command line you like into the reserved space on the system tracks.

To use COMLINE with the above SUBMIT file, copy COMLINE.COM onto a test copy of your CP/M disk (*don't* copy it onto your working master; you should always test new programs and techniques on expendable disks). Boot the computer on this disk, and then run the program by typing **COMLINE** at the system prompt. The program will run and display this simple menu:

```
CCP Command Line Utility
Version 1.02

1 Create a command line
2 Clear the command line
3 Display a command line
4 Return to CP/M

Enter the desired selection number –
```

Select option one and COMLINE will prompt you for the command you want CP/M to execute. Type **SUBMIT WSRUN** and press Return. COMLINE will then ask you what drive you want the command installed on. Place your WordStar boot disk in drive B and type **B**.

Now when you boot the computer on this WordStar disk, SUBMIT will automatically execute the commands in WSRUN.SUB. Since this includes logging on to the B drive, make sure you have a formatted disk in that drive.

The other COMLINE options are fairly self-explanatory. Choosing option 2 will erase whatever command line happens to be on the disk. Option 3 will display the current command, while option 4 will return you to CP/M.

USING DU-V87

You can also modify CP/M with the public domain disk modification program DU-V87 (also available on Kaypro On-Line). Earlier versions, such as DU-V77, work too. This is not a program for the beginner. It can, however, be used by novices for this specific purpose if they follow these instructions exactly. For a complete tutorial on using DU, see Ted Silveira's two-part article "DU to the Rescue" in the September and October 1985 issues of *PROFILES*.

DU-V87.COM is a disk editor. It allows you to read and write directly to any portion of your disk, including areas that are normally inaccessible, such as the system tracks and the disk directory. DU is normally used to make repairs, such as rebuilding damaged disks or recovering erased files. In this case you will use it to write a command onto the system tracks of the disk.

First, put the working copy of your program disk into the A drive. Make sure that the program you wish to have CP/M automatically run and DU-V87.COM are both on it.

Warm boot the computer (^C), and at the operating system prompt type **DU-V87** and press Return. DU will load, sign on, and respond with a ":" (colon) prompt as shown below:

```
DISK UTILITY v8.7
Universal Version under CP/M 2.2

Type ? for help
Type X to exit

:
```

At the colon prompt, type **T0;S2** and press Return. This will move the disk drive head to track 0, sector 2. Note that the "0" in T0 is a zero and that the T0 and S2 are separated by a semicolon. Next type **D** and press Return. This is the display command. DU-V87 will display the data that is on the disk at track 0, sector 2:

```
00 0000E7C3 58E77F0B 5355424D 49542043  *..gCXg..          *
10 4F4C4400 00002020 434F5059 52494748  *       COPYRIGHT*
20 54202843 29203139 37392C20 44494749  *T (C) 1979, DIGI  *
30 54414C20 52455345 41524348 20200000  *TAL RESEARCH..*
40 00000000 00000000 00000000 00000000  *................*
50 00000000 00000000 00000000 00000000  *................*
60 00000000 00000000 00000000 00000000  *................*
70 00000000 00000000 00000000 CBFA1401  * ...........Kz..*
```

The left side of the display uses the hexadecimal numbering system. In hexadecimal values are expressed in base 16, which uses 16 single character numbers (0 through 9, then A, B, C, D, E, F). On the right side you can see the characters denoted by the numbers. Every two numbers on the left denote one character on the right. The space for the command line begins eight characters into line 00.

You must preface the command line with a byte denoting the length of the command. SUBMIT WSRUN has 12 characters, so you type CH7, OC and press Return (OC is 12 in hexadecimal). To insert the command line type CA8, SUBMIT WSRUN and press Return. Make the changes permanent by typing W and pressing Return. Leave the program by typing X and for the last time pressing Return.

A CP/M OVERLAY PROGRAM

A good way to make use of automatic command execution is to have the disk boot right into the public domain program FRONT51, which is available on many bulletin board systems (including Kaypro On-Line). It usually is contained in the library FRONT51.LBR.

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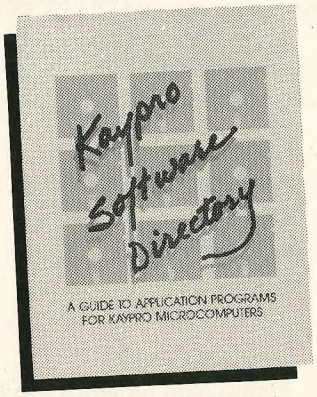

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FRONT51.COM, by Claude Ostyn, is a shareware program for CP/M that replaces the familiar A0› operating system prompt with a sorted menu of programs available on the disk. It is a small (6K) program that gives you a lot of features.

When FRONT51.COM runs, the standard CP/M command prompt is replaced by an alphabetically sorted listing of all the program files on disk, with the first file highlighted. Press Return and the highlighted program will run. To select a program, use the arrow keys to move the cursor to your selection and then press Return. If the program you want to run requires arguments, press the space bar instead of Return. Type the arguments and then press the Return key.

You can also select a program by beginning to type its name. FRONT.COM will erase the program names on screen that don't match your selection, until only one program is left. You are then prompted for any arguments that may be necessary. Pressing Return executes the program.

One of the nicest features of FRONT51.COM is the way it handles MBASIC, dBASE II, and other programs that require an interpreter to be loaded before a program can be run. Using the included installation program FRNSTL51.COM, you can designate files with different extensions, such as CMD or BAS, as being program files. This causes them to appear on the FRONT menu. Up to eight different interpreter file extension types can be selected, in addition to the normal COM programs.

You can associate these file extensions with different interpreters so that FRONT will run the interpreter first, then the program. If you had a dBASE program called REPORTS.CMD, for example, you could select REPORTS from the menu and FRONT would know to execute the dBASE interpreter first, then run REPORTS.

Another feature of FRONT51.COM is its ability to display the first line of the file the cursor is on by entering a "?". This can be helpful when working with MBASIC and dBASE programs, which are ASCII text files. It's next to useless for COM files, however, because they are binary program code, which appears as gibberish on screen.

After you run a program and exit from it, FRONT51.COM automatically runs again. If your program does not end with a warm boot command (^C), you will have to type one yourself.

IN CONCLUSION

For the beginner, CP/M can be difficult to learn and to use. But the combination of a COMLINE or DU-V87 modified disk and the clean menu interface of FRONT51.COM can make the task much easier.

(Now if only we could figure out a way to make the *computer* type commands at the keyboard. That would completely automate the process. H'mmm.)

David Mills is a business owner, manager, and consultant in Orange County, California. Marshall Moseley is technical editor of PROFILES.

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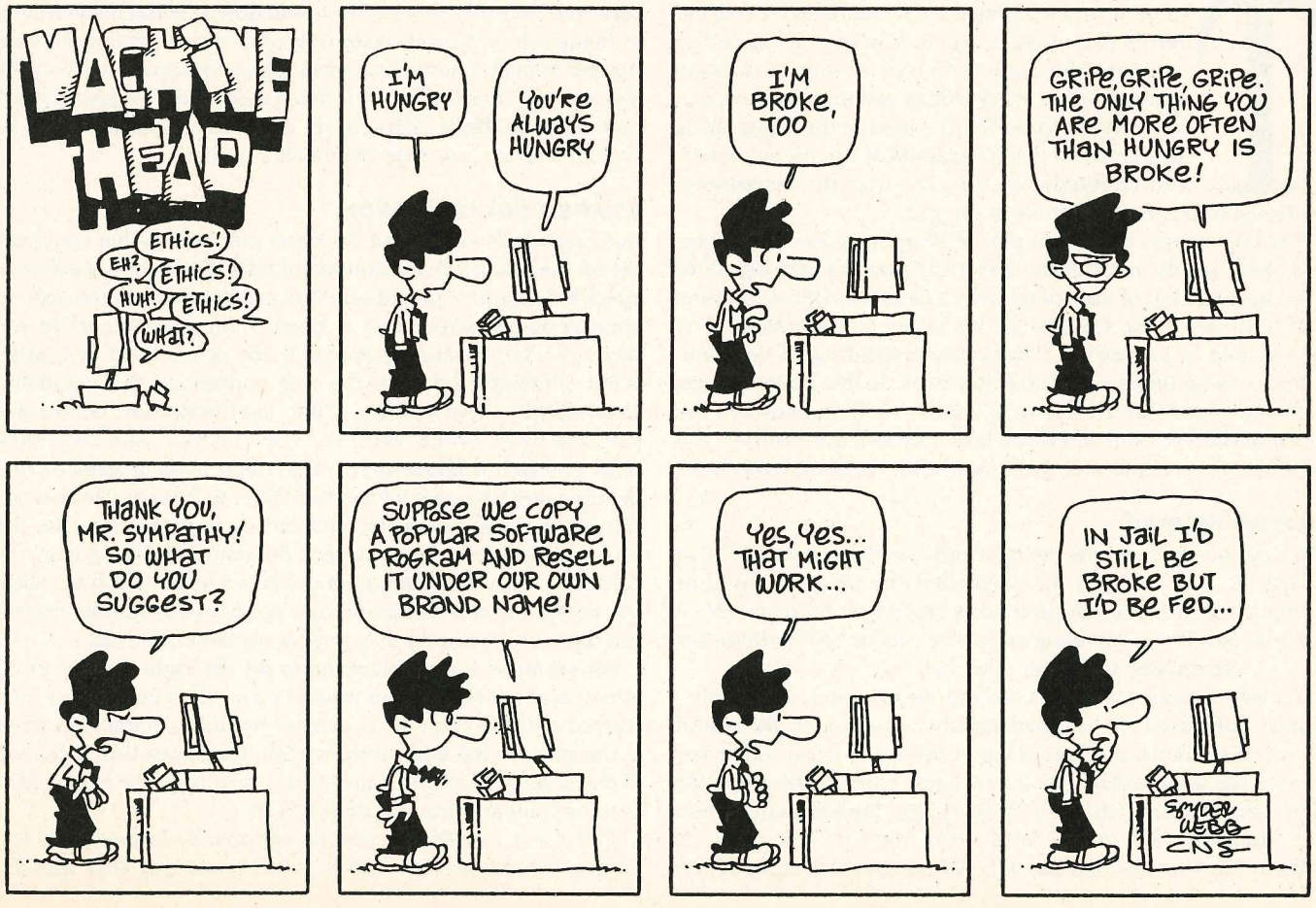

A First Session With WordStar Dot Commands

How to tap more of WordStar's versatility

BY STEVE GILLILAND

The path to becoming an accomplished WordStar user is like many things in life: your imagination can make the road seem rockier than it is. Mere contemplation of the things you need to learn can be overwhelming. Not the least of the mysteries is the subject of dot commands. If, for all you know, a dot command is a directive from the Department of Transportation, this article is for you.

Dot commands have been part of WordStar since the beginning and supply much of the versatility that has kept WordStar at or near the top of user popularity charts for almost 10 years. But until you grasp the basics, this power is unavailable. The intent here is to provide a basic understanding of dot commands—what they are and how they work. In this limited space, we cannot examine all dot commands—we'll demonstrate the use of just a few—but when you have finished this tutorial, you will be able to explore on your own what we don't cover here.

GETTING STARTED

We assume that you are using WordStar Release 4, CP/M or MS-DOS, and that you have installed the program for your computer, following the directions beginning on page one of the manual (if you are using an earlier version of WordStar, see the accompanying article on page 29).

As usual, some standard conventions are used. An instruction in **boldface** is to be typed exactly as you see it. Be careful about this—an unintentional tap of the space bar or Enter key can cause unexpected results. A carat sign (^) means hold down the Control (Ctrl) key while typing the following letter. For example, ^KD means hold down the Ctrl key, press K, release the Ctrl key and press D. Remember that most of the keys automatically repeat when held down. Avoid bedevilment by being careful to press a key only once unless you want a continuous repeat. Quotation marks are used occasionally in the text, but only to set off what is being discussed. Unless they are part of the **boldface** instructions, quotation marks are not to be included when you type commands or text.

WHAT'S A DOT COMMAND?

Dot commands are a set of WordStar commands that you don't see on the menus. A dot command tells WordStar to perform a specific function. This instruction is embedded in the text—it appears on the screen and is stored with your text when you save a file, but it does not appear in the printed text. It's called a dot command because the line containing the command always begins with a period ("dot") at the extreme left margin (column one). When WordStar encounters a line beginning with a period, it knows that 1) the line is to be ignored during printing and 2) a special instruction is to follow. The instruction is executed when encountered during printing, but the line is not printed. Because each dot command must begin in column 1, only one dot command is permitted per line. Nothing except the dot command and special instructions regarding that dot command may appear on the same line.

For example, a dot command to set the right margin to 72, which is about right if you want to print 12 characters per inch instead of the default 10, is entered by first placing the cursor at the extreme left edge of the screen (the status line at the top of the screen must indicate "C01," meaning the cursor is at column one) and then typing .RM 72

The "." at C01 begins the dot command. Immediately following the dot are the letters "RM," meaning that this dot

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command will set the right margin to a new value. Then there is a space, followed by the special instruction "72," which tells WordStar to reset the right margin to 72.

All dot commands must begin with a period in column one, followed by an optional space and two letters, plus special instructions if needed. When you type a period in column 1, a question mark appears in the flag line (the column at the far right of the screen). When you type the second letter of the dot command, the question mark should be automatically replaced by a colon, a period, or a 1, which tell you something about the function of the command (more on this in a moment). If the "?" remains in the flag line after you've typed a dot command, it means the command is invalid and WordStar doesn't understand it. Check for accuracy. If you make a mistake, you can erase the line with ^Y, just as with regular text, and begin again.

Dot commands begin with a period in column one, followed by an optional space and two letters.

Dot commands fall loosely into three categories: those affecting both screen appearance and printing; those affecting printing only; and MergePrint dot commands. We will look at examples of all three types.

USING DOT COMMANDS

Using dot commands is easier than explaining them, so let's set up some sample text and add dot commands representative of the three categories.

Imagine you are sending your employees a memo exhorting them to work harder to complete a contract. The memo will go to several people, and will include a quotation. The body of the text will be double spaced, with a ragged right (unjustified) margin, and the quotation will be single spaced and right justified, with left and right margins narrower than the rest of the text. We'll let WordStar's MergePrint feature personalize the salutation and last paragraph for each employee.

Start WordStar by typing **WS** at the C⟩ or A⟩ prompt and pressing ⟨**Enter**⟩. At the Opening Menu, press **D** to open a document file. Type **Memo**⟨**Enter**⟩ to create the file. The cursor will be at the top of the typing area. The EDIT MENU shows you the basic WordStar commands. We assume that you have left all WordStar defaults as set.

Type the following text exactly as you see it. Begin each paragraph (except the quotation beginning "There is...") with the ⟨TAB⟩ key. Remember that WordStar will use word wrap to automatically move down to the next line when you reach the right margin, so don't press ⟨Enter⟩ at the end of any line except as indicated. Use the Backspace key to correct errors:

TO: John Jones⟨Enter⟩
FROM: THE BOSS⟨Enter⟩

Let me put this bluntly: If we don't finish the automatic commode seat lifter contract on time and under budget, you and I are both out of a job. If we do, we're both on the town council of Fat City. Shakespeare said it:⟨Enter⟩
There is a tide in the affairs of men, which, taken at the flood, leads on to fortune; Omitted, all the voyage of their life is bound in shallows and in miseries.⟨Enter⟩

Let's take the tide, John. Or else.

Press **^KS** to save your file and return to the cursor position. Type **^QR** to move to the top of the file. Press ⟨**Enter**⟩ to insert a blank line and move the text down. Use the up arrow key to move the cursor up a line. Look at the status line at the top of the screen and make sure that it says (among other things) "L01 C01", indicating that the cursor is on the first line and in the first column.

Our first dot command will increase the top margin from the default of 3 (three lines, or ½ inch) to 9 (nine lines, or 1½ inches) to make room for the letterhead. Type:

.MT 9⟨Enter⟩ (change Margin Top to nine lines)

Now type:

.LH 16⟨Enter⟩

This command changes the line height. WordStar divides each vertical inch into 48ths, or as close to that as your printer can come. The default is 8/48ths, or six lines per inch (LPI). ".LH16" means a line height of 16/48ths of an inch, or three LPI, which gives you double spacing. The dot command ".LS 2" (line spacing) would have the same effect, but ".LS" is limited to line spacing of 1, 2 or 3, while ".LH" is much more versatile. The value you enter after the ".LH" divides an inch into n/48ths. ".LH 24" would provide 2 LPI, while ".LH 6" is 6/48ths or 8 LPI.

DOT COMMANDS THAT GO AT THE TOP OF A FILE

Notice that a "1" appears onscreen in the flag line at the extreme right of your dot command lines. A "1" in the flag line means the dot command works best if it's placed at the beginning of a file and may cause trouble if placed elsewhere.

Several other dot commands make the same demand. Since only one dot command can actually be first, how do you decide? It turns out that as long as these dot commands are placed together at the top, the order isn't important unless one dot command affects others below it. In the commands just entered, the new top margin will be based on the default line height of 6 LPI because WordStar executes dot commands in the order encountered. ".MT 9" sets the new top margin before

''.LH 16'' changes the line height to three LPI. Had ''.MT'' been entered after ''.LH'', the new top margin would be based on the new value of three LPI, leaving three inches instead of one and a half at the top of the printed page.

Now look at the status line. The cursor is obviously on the third line of the screen, but the status line says ''L01 C01.'' What's going on? A dot command line is ignored when the file is printed, so WordStar doesn't count dot command lines as part of the text. Note too that even though line height has doubled, the display is single spaced. This is because technically you have not changed to double spacing. What ''.LH 16'' did was to change the distance between single-spaced lines. Changes will show up on the printed page but not on the screen.

Dot commands are ignored when a file is printed, so dot command lines don't count as part of text.

DOT COMMANDS THAT AFFECT SCREEN OR PRINTING

Next, let's use a dot command that changes justification from the default ''on'' setting to ''off.'' If justification is on, your right margin will be even. If it's off, the right margin will be uneven or ''ragged.'' To make the change to the memo, make sure the cursor is at column one just below the earlier dot commands and type

.OJ OFF⟨Enter⟩

The flag line at the right edge of the screen now shows ''.'', indicating that the dot command will make changes to both the screen display and the printed text.

Since the memo will be less than one page long, let's add the dot command that suppresses page numbering in a document. Type:

.OP⟨Enter⟩

This time there is a '':'' in the flag line, indicating that the dot command affects printing only.

DOT COMMANDS TO MERGE PRINT

Next, let's set up the text so the memo will act as a ''master file'' for the MergePrint functions that personalize each memo with the recipient's first name. It is with the merge functions that dot commands are most versatile...and most sensitive to error.

Use the arrow keys to move to the first occurrence of the name ''John,'' and use the delete or backspace key to delete the first name. Place the cursor where the first name is to begin and type **&fname&**. Do the same thing for ''Jones,'' this time typing **&lname&**. You have just created the two MergePrint ''variable names'' used in this document. The name line of your text should now read:

TO: &fname& &lname&

Move the cursor to ''John'' in the last paragraph and replace it with **&fname&**.

When WordStar encounters a variable name, it stops, checks the ''read variable'' and ''data file'' dot commands for information to replace the variable name and prints those characters in place of the variable name. We'll set up the read variable (''.RV'') and data file (''.DF'') in a moment.

In this memo, you will use two variables. In real life, you can use as many variable names in your text as you please. You must enclose each variable name with an ampersand (&). A variable name can be up to 39 characters long, may not contain commas, and must be only one word. If you need more than one word, use a hyphen instead of a space between words.

After you have named the variables, WordStar must be told where to find the data to fill them. Data to fill variables is stored in a ''data file,'' which, in our example, will contain the names of the employees receiving the memo.

Review your data file for accuracy. MergePrint tolerates no errors.

Move to the top of the file (^QR) and use the down arrow to move to column one of the blank line just below ''.OP''. Type:

.DF EMP⟨Enter⟩

This dot command names the data file where employee names will be stored. Now type:

.RV fname,lname

This is the ''Read Variable'' line. It tells WordStar the names of the variables and the order in which the variables are listed in the data file you are about to create. Each variable name is

separated by a comma and no spaces.

Save this file with **^KD**. You are back at the Opening Menu. Open the data file by typing **NEMP⟨Enter⟩**. You used "N" (nondocument) rather than "D" (document) to open the data file because we don't want word wrap to insert any automatic carriage returns. Each line in the data file must end with a "hard" carriage return; that is, you will end each line by pressing ⟨Enter⟩.

Each line of the data file contains the information to replace all variable names—in this case "&fname&" and "&lname&"—in the master file. When merge printing the master file, WordStar prints the master file once for each line in the data file.

Within each data file line, information for each variable name is separated by commas and quotation marks. You can have as many lines as you need, but we'll use just two. Type:

"John","Jones"⟨Enter⟩
"Jane","Doe"⟨Enter⟩

You can place the variables in any order you wish (Jones before John, for example), but the ".RV" dot command in the master file must list the variables in the same order as they are entered in the data file.

Each line must begin and end with quotation marks. Press ⟨Enter⟩ immediately after the line-ending quotation marks to insert a hard carriage return. Here you used just two variables. Had there been more, each of them would have been separated with ",". The quotation marks are optional, but using them allows any character, including a comma, to be used in your variable data.

Review your data file for accuracy. MergePrint tolerates no errors. Now save the data file by typing **^KD**. Open the master file again by typing **DMEMO⟨Enter⟩**.

Enter **^QC** to move to the bottom of the file. The cursor should be in column one just below the last line. Type: **.PA⟨Enter⟩**

This dot command, with the hard carriage return, forces the end of a page. You need this, even though your master file is less than a page long. WordStar must be signaled when one document is done and when to begin printing the next document using the next line of information in the data file.

Now let's change the format of the quotation to single space and indent the left and right margins. While we're at it, we'll right justify the text. Move the cursor to column one of the line that begins, "There is a tide...." Type **⟨Enter⟩** to insert a blank line. Move the cursor up to the blank line and enter:

PRE-RELEASE 4...DON'T FEEL LEFT OUT

Some accounts say there may be five million copies of WordStar out there. Certainly not all of them have been upgraded to Release 4. If you have one of the earlier versions, don't despair. Dot commands have been essentially the same since at least version 2.x.

The main article deals with Release 4, but the fact is that most of the dot commands illustrated were also part of earlier versions, the exceptions being ".RM", ".LM" and ".OJ", all of which are additions to Release 4.

Even so, most of the "new" dot commands in Release 4 are available to earlier users, but in another form. ".RM" sets the right margin, for example. But ^OR does the same thing. ".OJ (Off or ON)" turns justification on or off. ^OJ (On or Off) does the same thing.

Many commands formerly available only as a Ctrl key sequence are now also included as dot commands. The reason is obvious: a dot command allows you to turn certain parameters on or off while a document is printing. Thus, in the main article example, part of the document can be right justified while the rest is ragged right.

Earlier versions of WordStar can do this, but it's a little more complex. To right justify a paragraph with 3.x or earlier, you first change the default (which is right justify on) by typing ^OJ. Then type the document with ragged right margins. Go to the start of the paragraph to be justified, type ^OJ (to turn justification back on), and type ^B. The paragraph will reformat using right justification.

Since earlier versions have no way of "remembering" from one re-format to the next, you must do this each time you change margins—hardly impossible, just a bit inconvenient.

Changing margins within a document in earlier versions is done in the same way.

Conditional dot commands allowing IF, AND and OR functions while printing have been greatly expanded in Release 4, and some dot commands in Release 4 are just not possible in earlier versions without patching the WS.COM file using the WordStar installation program.

Should you upgrade to Release 4? Not until you are familiar with the version you have. As you use early WordStar versions you will become more aware of the features you wish it had. You can get an idea of what Release 4 offers by going to your dealer and asking to see documentation for Release 4. A separate booklet called "What's New" details all of the new features of Release 4, including dot commands.

At this writing, MicroPro was still offering an upgrade to Release 4 in exchange for the serial number of your current version (registered or unregistered) and $89.95, plus tax and shipping. **— SG**

.OJ ON⟨**Enter**⟩ (turn on right justification).
.RM 60⟨**Enter**⟩ (pull in the right margin).
.LM 5⟨**Enter**⟩ (further indent the left margin).
.LH 8⟨**Enter**⟩ (reset line height to 8/48th or 6 LPI).

Following the quotation, put things back the way they were. Move the cursor to the line following the quotation (beginning "Let's take...). Type ⟨**Enter**⟩ to insert a blank line. Move the cursor up to column one of the blank line. Type:

.OJ OFF⟨**Enter**⟩ (turn off right justification).
.RM 66 (restore default right margin).
.LM 1 (restore left margin).
.LH 16 (reset line height to 16/48ths or three LPI).

You may be wondering about that left-margin value, but it's correct. At print time WordStar creates an automatic left margin of eight spaces (called "page offset"). The initial left margin change to five will create a printed left margin of 13 for the quotation. The left margin is set onscreen to one, leaving a left margin of eight at print time. You can change the page offset setting with the dot command ".PO" followed by the number of spaces to indent the body of the text.

Move to the top of the file and do a continuous reformat by entering **^QU**. The cursor will move through the document, changing the format of the document to reflect the dot commands you have entered. When formatted, your document should look like Figure 1.

```
.MT 9
.LH 16
.OJ OFF
.OP
.DF EMP
.RV fname,lname
TO: &fname& &lname&
FROM: THE BOSS
     Let me put this bluntly:  If we don't finish the automatic
commode seat lifter contract on time and under budget, you and I are
both out of a job.  If we do, we're both on the town council of Fat
City.  Shakespeare said it:
.OJ ON
.RM 60
.LM 5
.LH 8
    There is a tide in the affairs of men, Which, taken at
    the flood, leads on to fortune;  Omitted, all the voyage
    of their life Is bound in shallows and in miseries.
.OJ OFF
.RM 66
.LM 1
.LH 16
     Let's take the tide, &fname&.  Or else.
.PA
```

Figure 1:

Save the master file (**^KD**). Before committing to paper, we will print to another file instead of using the printer so you can see on the screen approximately how things will look on paper and to check the MergePrint setup. Type:

M (start merge printing)
MEMO⟨**Enter**⟩ (print the master file)
⟨**Enter**⟩ (when you press ⟨Enter⟩, you are selecting the default of one copy)
(WordStar will automatically print as many copies as there are lines in the data file)
⟨**Enter**⟩ (select the default "NO")
(if you have a single-sheet printer, type **Y** to pause to insert a new sheet)
⟨**Enter**⟩ (select default "NO")
⟨**Enter**⟩ (select default "ONE")
⟨**Enter**⟩ (select default "ONE")
⟨**Enter**⟩ (select default "NO")
PRVIEW (select "PRVIEW.WS" as receiving file)
⟨**Enter**⟩ (start printing)

When printing is finished, type **DPRVIEW.WS**⟨**Enter**⟩ to open the print preview file. It won't look quite as you expect, since the text will all be single spaced on the screen. What you're checking is that the variable data printed in the right place. If it didn't, check to make sure the master file looks like Figure 2 and that the data file has no extra spaces or carriage returns.

NOTES TO YOURSELF

You might find it handy to be able to include notes to yourself in your text without having them print in the final version. You can do this by beginning a line with two dots instead of one, then writing the note. Don't forget to begin *each line* of such notes with two dots.

That's about it. All dot commands work in about the same way, though many require some thought to get them just right. There is one other thing:

BEGINNING A LINE WITH A PERIOD

There are occasions—though infrequent—when you want to start a line with a period...and the line is not a dot command. How do you make WordStar let the line print as usual? Deception. Type ^PB^PB at the beginning of the line, then begin the line with a period. The first thing WordStar encounters is not a period, it's the embedded (and invisible when printed) command to begin boldface. The line doesn't *begin* with a dot, so it's not a dot command. The second thing encountered on the line is the command to turn off boldface. Nothing has happened to the text. The line will print as though it began with a period, and WordStar is none the wiser.

MOVING ON

That's a very brief look at dot commands. Don't be reluctant to spend some time examining the several dozen others. Entering ^J followed by a period will give you a quick look at what's available. Even old WordStar hands can waste hours before remembering that a dot command can often solve a vexatious problem. Enjoy yourself.

Steve Gilliland is a writer, educator and consultant who writes and teaches others the joys of personal computers and commercial software.

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AN INNOCENT ABROAD

RICHARD STARKMAN

BY BROCK N. MEEKS

Hannover, West Germany--My assignment: report on CeBIT '88, Europe's largest computer-oriented trade show. My reports would be uploaded from my laptop computer.

My uploading arrangements were deceptively simple. All I needed I could pack into my soft briefcase: laptop computer, acoustic modem, and a few phone numbers.

It sounded so easy; there was a sort of minimalist charm to it all. But my naivete was surpassed only by my arrogance. For ten days I lived a telecommunications nightmare.

IRONY AND AGONY

International telecommunications is complicated by a morass of governmental regulations. Each country's data network is different, with different rules and operating instructions.

Want to dial the U.S. direct? Getting good transmission quality over long-distance phone lines is a constant battle, and one that's often lost.

In European countries, the government runs the telephone system as a monopoly. Whatever the government says goes. So, even though Tymnet is accessible from Germany, you have to cooperate with the government's monopoly to gain access to it. For example, in West Germany it is a crime to connect a non-approved modem to any government-run data network. Scratch my acoustic modem.

As it turns out, however, the acoustic modem I took with me would have been of little use. (I figured I could always bypass the West German data network and call direct. More on this later.)

In my "ugly American" arrogance, I assumed that all telephones were made like those in America. They aren't.

In Germany the handsets are longer, by an inch, than American handsets. This made inserting the German handsets into my fixed acoustic modem impossible. (You can buy acoustic cups that are not molded into a fixed position; however, that knowledge is of little use 5,000 miles from home.)

Want a direct connection? Forget those convenient little modular jacks we've grown so fond of in the U.S.; they don't exist in Germany. Scratch the built-in modem, too.

Then there's the matter of the Network User's Identification, or NUI. This is an international, country-specific password and ID that allows you to use the data networks from inside a foreign country. It is how you are identified and ultimately billed for your online time.

An NUI can only be issued by the government, a procedure that takes weeks, sometimes months. And in some cases, to qualify for the NUI, you must have a residence in the host country. Catch-22. (Also, the prompts for these foreign networks are not in English.)

DRASTIC TIMES, DRASTIC MEASURES

My clever strategy had disintegrated in the time it took Pan Am flight 151 to taxi from the runway to chocks.

Two possibilities remained: I could dial the U.S. direct (assuming I could scrounge up an acoustic modem that fit the German handsets); or I could type everything and send it via a facsimile machine.

The former option was prohibitively costly: a five-minute, prime-time phone call to one of my editors (with whom I pleaded for understanding) cost me $20. When I suggested sending a fax, there was an eerie moment of silence, followed by words I'd rather not spell. The gist of the message was that the cost of sending a fax and the cost of staff time to key the article into a computer made this option less than acceptable.

Click. Buzz. The conversation ended. I shuffled out of the government-owned phone booth, located in the government-owned post office, ponied up 35 deutsche marks (they don't take U.S. dollars or American Express), and looked for a place to hide.

HOPE RETURNS

My first ray of hope came when I stumbled across Michael Bernard, vice president of Touchbase, Inc., makers of the Worldport modems. Touchbase was one of 175 U.S. companies attending CeBIT this year. Touchbase just happened to have an acoustic modem with split cups that fit a German-made handset. And yes, I could borrow it. First problem solved.

Now I could at least access the telephone lines, but I still had the problem of enormous phone bills if I dialed direct. That problem was solved at the AT&T booth.

An AT&T representative told me about an AT&T calling program known as "USA Direct." To use USA Direct, you dial a special access number and you're automatically connected to an American AT&T operator. Two benefits here: you're speaking English, and as soon as you're connected, all charges are billed by AT&T, not the host government.

The USA Direct calls are billed to your

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AT&T calling card. The cost, though still high, is nowhere near the cost of dialing direct from the host country. (Another five-minute call, via USA Direct, cost me less than $10.)

The USA Direct operator can connect you with any phone number, including an American packet- switched network.

This is all well and good if you've remembered to bring along your AT&T calling card. But what if you forget it (I had), or don't have one to begin with?

Enter the white knight of international telecommunications: Comco.

COMCO TO THE RESCUE

During my short visit at the Touchbase booth, it was suggested that I visit the booth hosted by Comco. I did and discovered what is perhaps today's most sophisticated tool for international telecommunicators.

Comco, a Swedish company, has developed a so-called "smart card" that makes it possible for users to gain access to virtually any public data network in the world through a network of specially designed electronic gateways. Comco gateways are strategically located throughout the world.

Comco's smart card has an embedded microchip capable of storing 8K of data. Physically, the plastic card matches your Visa card in size and weight. The embedded microchip contains all the necessary information used by Comco for account "housekeeping" and logging onto the various gateways.

Roland Meylan, Comco president, says, "We've taken care of all the legwork. We've gone to every governmental PTT (postal, telephone, and telegraph) authority in Europe and worked with them to obtain a clear 'operating permit' for our clients."

Meylan added that Comco is currently the only company that has such agreements with each European PTT. In this sense, Comco acts as your online proxy to all foreign PTTs. Instead of dealing with the PTTs, you deal directly with Comco.

COMCO GATEWAYS

Each smart card is programmed to call the Comco gateway nearest your overseas location. The card can even be programmed to prompt you in the language of your choice.

Once you're into the network of your choice, it's just like sitting at the keyboard back home.

Comco gateways are currently located in New York, London, Paris, Geneva, Frankfurt, Brussels, Amsterdam, Hong Kong, and Sydney. More gateways are being added at a rate of one per month.

Within the next six months the following cities will be up on the Comco network: Tokyo, Singapore, Rome, Madrid, Lisbon, Stockholm, and Copenhagen.

And as a tour de force, Comco is supplying a special press gateway for journalists covering the summer Olympics.

NUTS AND BOLTS

The Comco system consists of a palm-sized smart card reader connected to a flexible 300-bps CCITT-compatible modem.

Users request cards programmed with pre-paid time units, roughly similar to having a pre-paid telephone calling card. Every time a user logs on to the Comco system, these time units are debited from the card automatically.

Software on the card's chip keeps a running tab on the number of credits used and how many remain; you never have to guess how much time (units) you have left on the card. When you reach zero time units, the card is returned to Comco and you are issued a newly "charged" card.

LOGGING ON

The entire process of accessing a Comco gateway is automated by the card's programmed microchip. All you have to do to activate the system is insert the card into the reader and hit the "." and "Enter" keys, and Comco takes care of all the dialing and connections.

Once into a Comco gateway, hitting the Enter key will log you onto any electronic service you've had pre-programmed on the smart card. Or you can override this feature by entering the online address of the network you wish to access.

Once you're into the network of your choice, the process is no different than if you were sitting at the keyboard back home. I logged onto MCI Mail, CompuServe, and BIX with no problems and no hassles.

THE COST

Each time unit provides you with about 100 seconds of transmission time (about 700 words) within Europe and 30 seconds of transmission time (about 200 words) between Europe and the U.S.

Time units are bought in blocks of 200 and cost about 55 cents each. Discounts are available if you purchase more blocks of time.

The cost of the card reader, which can be attached to any CCITT- compatible acoustic modem, is about $500; the card reader/modem combination is just under $1,500.

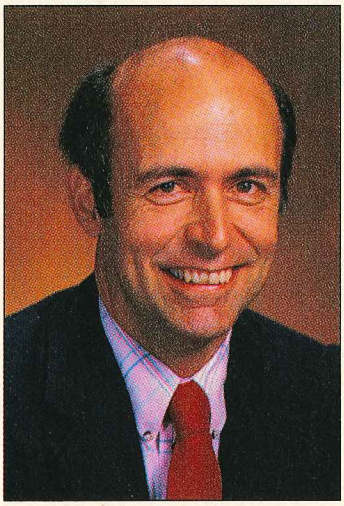
Meylan said that some Comco dealers are leasing or renting systems to travelers who only need to use them on an intermittent basis.

SO WHAT'S THE CATCH?

There are two minor drawbacks. First, the system only runs at 300 bps. Second, you can only access a computer system available on a packet-switched network. You can't, for example, dial into your favorite bulletin board or the company computer if they're not connected to a packet-switched network. However, these are hardly a major problems. If you must dial into one of these types of systems, the USA Direct service is well worth investigating. Just call your local AT&T service representative for more information.

The U.S. contact for Comco is Multiwares in New York City, which can be reached at (212) 601-3876 or by MCI Mail: Comco.

THE LASER'S EDGE



GAIL GOODENOW

BY TED SILVEIRA

The laser printer has been the key to the desktop publishing boom. Powerful computers and cheap memory helped, high-resolution video displays helped, and page layout programs were essential, but it was the affordable, 300 dpi laser printer that made it into *desktop* publishing. And the laser printer continues to drive the development of desktop publishing, as the page layout programs, video displays, and even computers struggle to exploit things the laser printers can do.

The best news for users is that prices for laser printers continue to drop as competition among major printer manufacturers heats up. If the discount price of a basic laser printer isn't down to $1,000 by the time you read this, you can bet it will be before the end of the year. But with increased competition, the laser printer buyer is now faced with a much wider variety of choices. Not too long ago, the choice was simple--you bought Hewlett- Packard's Laserjet or Apple's Laserwriter. But no longer. And since laser printers usually cost more than the computers that run them, it's worth taking a close look at the options.

PCL VS. POSTSCRIPT

The first and most important choice you have in buying a laser printer is between printers that use Hewlett-Packard's Printer Command Language (PCL) and those that use Adobe's Postscript page description language. Both PCL and Postscript serve the same function- -they are the command languages that tell the laser printer what to do--but there's a world of difference between them. In brief, PCL laser printers are cheap but limited; Postscript laser printers are expensive but versatile.

PCL is really just a more sophisticated version of the printer control codes and escape sequences that have been used to control dot matrix and even daisywheel printers for years. That's one reason why almost every modern word processor supports the Laserjet printer and its clones (even the CP/M edition of WordStar 4.0). It's also one of the reasons PCL printers are cheap. Like a dot matrix printer, the PCL laser printer has few brains of its own and lets the computer (and its software) do all the thinking for it. In essence, the computer tells the printer where to put every dot on the page.

A PCL printer can produce good-looking pages, but in desktop publishing you run into limitations.

A PCL printer like the Laserjet can produce good-looking pages, but when you really dig into desktop publishing, you run into PCL's limitations. First, PCL printers use bit-mapped type fonts. That means you need a separate font file for every size of every typeface you want to use, and if you want to use 11 point type but only have 10 and 12 point, you're out of luck. Most PCL printers can use font cartridges that store several different sizes and typefaces, but if you intend to build up a good type library, you have to use "soft" fonts (font files that you download to the printer at print time). And once you start collecting soft fonts, kiss your 20-megabyte hard disk good-bye. You're going to be looking for a 40-megabyte drive or even an 80, because bit-mapped fonts take lots of space, especially if you work with large display-size type. (For that matter, display type is hard to come by. Most PCL printer fonts stop at 30 points.)

Second, when your software talks to a PCL laser printer, it basically sends the printer dot-by-dot instructions for printing the page, just as it would with a dot matrix printer. That works fine when you're printing on the 300 dpi laser printer, but it means (so far, anyway) that you're limited to that 300 dpi output.

Third, most PCL printers are shipped with only a limited amount of RAM (random access memory), often 512K. Limited memory means limited type fonts--the less memory you have, the fewer soft fonts you can download at print time. Limited memory also means limited graphics--you can't print a full- page graphic with only 512K.

In contrast to a PCL printer, a Postscript printer is like a computer that prints. Postscript printers have their own brains (usually based on the Motorola 68000 chip) and at least a megabyte of RAM (often two or three megabytes). In addition, Postscript itself is not a simple printer command language but a true programming language, a language for creating type and graphics.

Postscript has a number of benefits for the desktop publisher, but there are two

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very important ones. First, it doesn't use bit-mapped font files. Instead, a Postscript font is simply a collection of outlines (mathematical descriptions of the shapes of the characters) that can be scaled to whatever size you need, all from one file. You can use 9 point type, 10 point, 11.5 point, 72 point--it doesn't matter. Your software tells the printer the size, and the printer scales the outline font and figures out where to put all the dots.

Second, because Postscript works with type fonts and many graphics as outlines, converting them into bit-mapped output only at print time, it can use the full resolution of whatever printer you print on. In other words, if you print your page on a 300 dpi Postscript laser printer, you'll get a 300 dpi page back. If you print the same page on one of the new 600 dpi Varityper laser printers, you'll get a 600 dpi page. If you print the page on a 2,500 dpi Linotronic 300 typesetter, you'll get a 2,500 dpi page. For a fuller description of Postscript, see "Programmable Pages," *in PROFILES*, August 1987.

People quibble about the relative merits of PCL and Postscript printers, asking whether a PCL printer with a good bit-mapped font doesn't produce slightly better type than a Postscript printer at a given size and so forth. But for a desktop publisher, there's only one major drawback to Postscript printers--they're expensive. At a time when the street price of a PCL printer is now approaching $1,000, the lowest list price for a Postscript laser printer is $4,000 (and until six or eight months ago, it was $5,000). Why so expensive? Mainly because the printer needs extra intelligence and extra memory to work with Postscript.

You can create beautiful pages with a PCL printer and Ventura Publisher or PageMaker (or even Microsoft Word or WordStar 2000), if you're willing to work with limited type sizes, smaller graphics, and fewer special effects, and if you're willing to stick with 300 dpi resolution. Many people will never need more. But if you're a desktop publisher, the Postscript printer is the one you want . . . if you can afford it.

For the desktop publisher there's only one drawback to Postscript printers--they're expensive.

WRITE-BLACK VS. WRITE- WHITE

The second choice you have to make when buying a laser printer concerns the printer engine. Canon was the first with an affordable 300 dpi printer engine, the Canon CX, which was used in the first laser printers, including both Hewlett-Pack-ard's Laserjet and Apple's Laserwriter. But now other companies, including Ricoh and Sharp, manufacture laser printer engines and have taken part of the market from Canon. Though all these printer engines do the same basic job, they don't all do it the same way. Specifically, some are "write- black" engines and others are "write-white".

A laser printer works like a photocopy machine. The laser creates a pattern of charges on a revolving drum, and the drum picks up the black toner and transfers it to the paper. In a write-black engine, the laser traces the parts of the drum that should pick up toner--the parts of your image that will be black. In a write-white engine, the laser traces the parts of the drum that should not pick up toner--the parts of your image that will be white.

For some time, there's been debate over which system produces better prints. The write-black engines, like the old Canon CX engine, created clean edges and fine detail, but they had trouble printing large areas of solid black, often showing some streaking or mottling The write-white engines, on the other hand, produced rich, solid blacks but couldn't quite match the clean edges and details of the write- black engines.

It made for a difficult choice, especially for people whose work combined strong graphics with fine type. Now, however, Canon has released a new write-black printer engine, the Canon SX, that retains the clean edges and detail of the earlier CX engine but also prints better blacks. The Canon SX engine is used in the latest laser printers from both Hew-lett-Packard (the Laserjet II) and Apple (the Laserwriter II series), and it looks like the engine to get, at least for the moment.

OTHER FEATURES

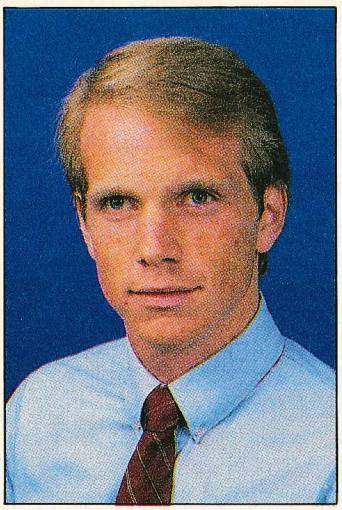
Once you have the two big decisions out of the way, it's time to go shopping for features. You want memory, the more the better. Two megabytes is good, three is better, and a printer with expandable memory is best of all. You want a large paper tray or, better yet, multiple paper trays. You want a strong warranty and a good service department--a laser printer is a big-ticket item with a potentially long life.

If you buy a PCL printer, you want complete Laserjet Plus (or Laserjet II) compatibility, along with the ability to accept both H-P font cartridges and soft fonts. If you buy a Postscript printer, you want the latest version of the Postscript ROMs (version 47 but possibly higher by the time you read this), as there have been substantial improvements in speed over earlier versions. Apple, for one, continued to ship older versions of Postscript long after newer, faster ones were available.

If you decide on a Postscript printer, you also have to face the question of Postscript clones. The first laser printers using "Postscript- compatible" languages not licensed from Adobe are just appearing, creating a very tricky situation. It's very likely we'll see the price of Postscript and Postscript-compatible printers come down noticeably in this year. And it's certain that the price leaders will be using a Postscript- compatible clone rather than the genuine Postscript from Adobe.

But Postscript is a complex language, and software developers are still exploring the complicated and intricate things it can do. So the question is, how compatible will the clones be? Unfortunately, we won't know for some months. So tread carefully, and if you do complex graphics, stick with genuine Postscript for now.

XTREEPRO: A CUT ABOVE THE REST



MARK SWEZEY

BY MARSHALL L. MOSELEY

Well-designed software is a rare thing. Most programs are adequately designed at best. Once in a while though, a product comes along whose structure is impressive enough to make it rise above the pack. XTreePro version 1.0 from Executive Systems is such a program. XTreePro is a disk management program intended to make copying, deleting, sorting, and viewing files and directories much easier. It does this by reading disk data and displaying a full-screen diagram of the disk's directory structure. You can move the cursor around inside this diagram and copy or delete files and directories.

Executive Systems is also the creator of Xtree, a very popular hard disk management program that has been around for four years. XTreePro is a comprehensive update of Xtree, and Executive Systems has added a host of new and powerful features. They include a built-in word processor, multiple disk-logging, and a global file-handling mode that lets you access all the files on up to 26 disks.

XTreePro is intended for a specific audience: professionals who work with files on both hard and floppy disks all day long. Yet it is so well designed that even the casual user can benefit from its powerful features.

XTreePro requires a 100 percent IBM-compatible computer such as the Kaypro PC or 286i, 256K of RAM, and MS-DOS version 2.1 or higher. Though it can run on floppy-based systems, it is not really intended for for them--at 144K, the program and its ancillary files take up almost half of a 360K floppy. XTreePro is intended for hard disk operation, and that is where it shines.

XTreePro is easily installed on your hard disk with the included program INSTALL.EXE. INSTALL is menu-driven, allowing you to designate the drive and subdirectory where you want XTreePro placed. It can also change the AUTOEXEC.BAT file on your hard disk so that XTreePro runs automatically whenever you start your system.

FEATURES AND PERFORMANCE

When you run XTreePro, you're presented with a screen divided into five sections that give you various types of information about your hard disk.

When you run XtreePro, a screen divided into five sections gives you information about your disk.

The File Specification Box tells you what files are being displayed (you can change this specification so that XTreePro displays any file or series of files you like). The Disk Specification box lists the drive letter and volume name, along with the number of unused bytes on the disk. The Statistics Box lists the total number of files on disk, the total number of files matching the current file specification, and the number of bytes all of them use. The File window displays the files in the current directory that match file specification. And the Directory window displays a diagram of the hierarchical structure of your hard disk, with directory currently being addressed highlighted.

With XTreePro, the entire hard disk structure is laid out in front of you, and you can move around it freely: To move the highlight bar to a directory on the same level as the current one, you press the Tab key; to move back, you press Shift-Tab. To move down a level, you press the down-arrow key; to move up, you press the up arrow key. PgDn and PgUp take the highlight bar to the bottom and the top of the screen, while End sends it to the last directory in the structure. Home returns it to the root directory.

This method of moving within the directory structure is far superior to MS-DOS's change-directory command. Quite soon the key commands become almost second nature. This is where XTreePro's power is most apparent; I was soon *flying* through my hard disk's directory structure, doing in seconds what use to take minutes.

File manipulation is just as easy. When you position the highlight bar on a specific directory, a list of the files within that directory appears. Pressing Enter expands the Files window and places the highlight bar on the first file in the list.

The default display shows only the file names and their extensions. Tap a few keys, though, and the time and date the files were created and all of the file attributes will be displayed. The list can be

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sorted five ways: by file name or extension (both alphabetically), by the date they were created or last altered, by their size (smallest to largest), and unsorted, which is the way you would view them using the MS-DOS DIR command.

Once the highlight bar is positioned on a file name, typing V (for view) will display that file's contents onscreen. The default display mode is for ASCII text files, but you can switch viewing modes to examine WordStar files or program and data files.

Perhaps XTreePro's most powerful feature is its ability to work with tagged files. A tagged file can be copied or moved while the files around it remain unaffected. You can tag ten files, for example, in a directory that has 60, then invoke commands that affect only the tagged files. When a file is tagged, its name and size is immediately displayed in the Statistics Box. A running total of the number of bytes used by tagged files is maintained so you can tell whether they will fit on a floppy disk. XTreePro offers three levels of commands: standard commands in which a single key is pressed; Ctrl commands in which the Ctrl key is held down while command keys are pressed; and Alt commands in which the Alt key is held down while command keys are pressed.

The standard commands operate on single files or directories only. For instance, if you are in the Directory window, typing D will delete the highlighted directory.

The Ctrl commands operate on groups of files. To tag every file in a directory, for example, type T. And to un-tag them type U.

Alt-T and Alt-U will tag and un-tag files respectively, based on their file attributes (system, hidden, read-only or archive). Alt-C will copy files *and the directory structures that go with them* to another disk, thus performing the same function as the MS-DOS command XCOPY and making hard disk back up a breeze.

Sometimes directories and drive names get in the way. That's why XTreePro includes the Showall and Global commands. Showall, invoked by typing S from the Directory window, will expand the file window and list every file on the disk, regardless of the directory it's in. It's as if there were no directories on disk. This lets you tag and copy files located in widely separated directories. The Global command, initiated by typing G, does the same thing except it works with all the logged drives, eliminating disk disk drive names as well as directories; you can look at all the files on the A, B, C, and D drive as if they were on a single drive.

Sometimes the directories and file names get in the way, so XtreePro includes Showall and Global commands.

XTreePro also has an ASCII word processor called 1Word built into it. To use it, just put the highlight bar on a text file and press E. 1Word features word wrap, search and replace functions, programmable function keys, case conversion, and an optional menu-driven interface. Most of its cursor movement and file handling commands imitate WordStar's, so many people will already know how to use it. 1Word is a powerful adjunct to an already powerful program. It is ideal for on-the-fly editing of batch files, memos, or any ASCII document.

DOCUMENTATION AND SUPPORT

The XTreePro manual is tightly organized and well written.

The first two sections give complete instructions on installing and running XTreePro for the first time. The third section goes over every window and box in detail, explaining exactly what each one does and how it does it. The fourth section documents the commands under each window and tells you how to use 1Word.

The last two sections are the most helpful to the expert user. They provide detailed technical information, along with tips on memory management, planning a work session, and organizing a hard disk. The back of the manual contains a glossary and a quick reference guide to XTreePro's key command.

XTreePro's documentation strikes a nice balance between tutorial and reference text. It is coherent and useful, a rarity in software documentation.

Executive Systems offers a toll-free technical support line. When I called posing as a novice user with a problem, I was helped quickly by a knowledgable, pleasant support technician.

SUMMARY

There are still other aspects of XTreePro that I couldn't cover here, such as the configuration program, which lets you change screen colors, and the command shell, which lets you execute any MS-DOS command or program from within XTreePro. You could spend hours discovering all that XTreePro can do.

The most important thing for you to know is that XTreePro will improve your productivity. Its intuitive key commands and logical structure let you manage your hard disk more efficiently than you ever could using MS-DOS.

SCORECARD

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

QUICK REFERENCE SUMMARY

Product: XTreePro
Manufacturer: Executive Systems
Adderss: 15300 Ventura Blvd., Suite 305
Sheman Oaks, CA 91403
Phone: (818) 990-3457
Sugg. List Price: $129

THE CP/M SURVIVALIST: WHAT TO DO WHEN THINGS BREAK

BY TED SILVEIRA

Let's say you've decided, for perverse reasons of your own, that you're going to keep your CP/M Kaypro alive forever--or at least for a few more years. You know that repair shops for CP/M computers are hard to find, so you want to be prepared. What's likely to go wrong, and what can you do about it?

FLOPPY DISK DRIVES

Floppy disk drives are full of moving parts, and they get used a lot, especially the A drive, so they eventually wear out. They may lose their accuracy and begin to generate a variety of disk errors, sometimes even making previously good disks unreadable. Or they may simply stop working--thud--all at once.

Fortunately, the floppy disk drives used in CP/M Kaypros are standard items. And though drives can be realigned and even repaired in some cases, new drives are so cheap ($60-100 each) that it's often better just to replace the problem drive rather than pay $65 an hour to have it repaired.

Kaypro has used two different kinds of floppy disk drives in its CP/M computers. On the old Kaypro II and the later Kaypro 2, you'll find single-sided, double-density drives, having 40 tracks on one side and storing 191K bytes per disk. On the old Kaypro IV, all Kaypro 10s, and the Kaypro 2X, 4, and 1, you'll find double-sided double-density drives, having 40 tracks on each side and storing 390K. Kaypro used many different brands--full-height Tandons on the Kaypro II and IV, half-height Toshibas, High-Tecs, TECs, and others on the Kaypro 2, 4, and 2X.

If you try to replace any of these drives, you won't find any mail-order house or computer parts retailer selling "390K Kaypro disk drives." But fear not. You can replace any double-sided 390K Kaypro floppy disk drive with a drive that is advertised as a "360K PC-compatible" drive, because the drives are the same: double-sided, double-density drives that use 40 tracks per side. IBM PC compatibles (including Kaypro's own PC) only get 360K storage on a disk because they format the disks differently.

If you have an old Kaypro IV or 10 with full-height drives, you'll probably have to replace the bad drive with a half-height drive, because nobody makes full-height drives any more. That will leave you with a gap in the front of your computer, but it won't affect operation at all (unless your kids decide to hide things in the empty space).

If you have a Kaypro II or Kaypro 2 with bad single-sided drive, you'll also have a hard time finding a single-sided drive to replace it--nobody's making single- sided drives, either. You can, however, replace the single-sided drive with a double-sided drive. In the single-sided system, the double-sided drive will act just like a single-sided drive, and, if you later add an Advent TurboROM to your system, you'll be able to use the double-sided drive with double- sided disks. (This is probably the most popular upgrade for the Kaypro II and 2--everybody needs more disk space.)

If your Kaypro II or 2 single-sided drive is bad you'll have to replace it with a double- sided drive.

Disk drives are a "commodity item" now, readily available at a fairly wide range of prices, so check discount dealers and mail- order houses for the best deals. For more information on disk drives, including instructions for swapping drives in a CP/M Kaypro, see "Do-It-Yourself Drive Swap" in *PROFILES*, June 1986.

HARD DISK DRIVES

Kaypro 10 users have a hard disk drive in addition to the floppy disk drive, as do many other users who have hopped up their Kaypros over the years. A hard disk drive will also wear out eventually, because it runs all the time your computer is on, spinning madly at 3600 rpm. And when a hard disk goes, it can take a lot of your data with it, so you want to be alert for the first signs of trouble.

Fortunately, hard disk drives are now commodity items, too, just like floppy disk drives. Because your Kaypro already has the drive controller and power supply for the hard disk drive, all you need to buy is the bare drive itself (assuming it's the drive that malfunctions, rather than the controller). You can get bare drives now for $200 and sometimes even less from the same discount and mail-order sources that handle floppy disk drives. You can also replace the full-height drive in your Kaypro 10 with a half-height drive if you want. Just make sure you get a drive with an ST-506 interface--it's a common one, but there *are* other interfaces that won't work with your machine.

Installing, formatting, and setting up a hard disk drive is not quite as easy as swapping in a new floppy disk drive, so you may need to yell for help here, but at least you can get the parts.

KEYBOARDS

Along with the disk drives, the part of your computer that gets the most wear is the keyboard, especially if you really pound it when you type. Sooner or later, one or more keys will announce their demise by sticking periodically, causing doubled letters, or simply refusing to work. You can replace individual keys, but it's not easy. You have to find just the right kind of key. When you find it, it will probably be expensive ($5-8 per key). And then you'll have to remove the old key and solder the new one in place, or have a technician do it for you ($$$).

Your best bet here is to swap the whole keyboard for a new one. Keep the old keyboard as a source of replacement keys for that time in the future when the new keyboard starts to wear out. You can get keyboards from ERAC in San Diego for $75 and from the Kaypro Promotions

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Department for $20 (easy choice).

In fact, the Kaypro General Store has many CP/M parts for sale. More importantly, buyers of used Kaypros can purchase manuals for much of the software included with the CP/M machines. You will find in many cases that the General Store is the only source of documentation for some of the older programs. They also offer a technical manual for the original Kaypro Letter Quality Printer (actually a Juki 6100 with a Kaypro label).

If keys on your keyboard go bad, your best bet is to swap the whole keyboard for a new one.

CRT AND VIDEO PARTS

The screen on your Kaypro is like a television screen, and it's prey to the same problems a television screen is. As your Kaypro gets old, your screen may grow dim, develop some distortion or fuzziness, begin to flicker or jump, or just go blank.

The video section inside your Kaypro has adjustments that can fix some problems, like fuzziness or horizontal alignment. But beware-- there are dangerous and potentially lethal voltages in the video section of the computer. If you're not trained in these things, leave the work to a professional. Video adjustments are pretty generic, so you can probably get your screen adjusted at a computer repair shop that's never heard of CP/M, or even at a television repair shop.

If your problem is not solved by a simple adjustment, though, you may be in for some trouble. You can get replacements for the CRT tube itself (the actual screen) from a variety of sources, including the Kaypro Promotions Department ($99) and ERAC ($35). But the rest of the video section is a different matter--it is not a standard item. Many of the parts used are standard electronic parts, so you might be able to find some technical whiz to trace the trouble and replace the faulty components, but it will cost you hours of expensive repair time. And even then you could be stymied--if the Kaypro custom video ROM chip fails, your technician isn't going to find a replacement at Radio Shack. The prognosis is not good unless you can scavenge parts from a similar model Kaypro.

POWER SUPPLY

A computer's power supply takes the AC current from your wall plug and turns it into nicely regulated DC current at the voltages that your computer wants (-5 volts, +5 volts, and +12 volts for most computers). Power supplies are tough and will usually last many years, as long as you protect them by using a surge protector.

However, power supplies do fail sometimes. You can find a replacement for your Kaypro's power supply through the Kaypro Promotions Department ($69), or you or your technician can probably find a non-Kaypro computer power supply that will do the job, though you'll have to improvise a mount for it.

Older Kaypros, like the Kaypro II, are also susceptible to a power supply problem that can be easily fixed without replacing the power supply itself. The cable that takes power from the power supply to other parts of the computer has a plug that fits onto some pins that are soldered to the power supply board. After a time, the solder can deteriorate, creating a faulty--but not completely broken-- connection. As a result the voltage delivered to other parts of the computer will fluctuate, causing intermittent problems. One of the most common symptoms is trouble with the disk drives: occasional disk errors, drives apparently starting or stopping by themselves, and so on. The solution is to have someone who knows how to solder around electronics resolder the pins for you.

CUSTOM CHIPS AND CIRCUIT BOARDS

Your Kaypro has a number of custom parts. Specifically, the main circuit board and several custom ROM chips (the monitor ROM and the video ROM) are made only by Kaypro. These items are very unlikely to fail and unlikely to be damaged in normal use, if you use a surge protector. But if something does happen, you have a major problem. Circuit boards can be repaired if you find a superior technician, but it's prohibitively expensive given the current market value of used CP/M Kaypros. ROM chips can't be repaired at all. They have to be replaced, either with a Kaypro ROM of the proper vintage or with a compatible alternative like the Advent TurboROM.

THE ALL-IN-ONE SOLUTION

Right now, you could find a replacement for any part in any Kaypro ever made. But we're not talking about now--we're talking about six months, a year, two years from now. All that's certain about the future is that parts will be fewer and harder to find, especially if you don't live near a city with lots of computer activity.

To keep your Kaypro alive you need replacement parts. The best way to get them is to buy a used Kaypro.

If you're committed to keeping your Kaypro alive into the 1990s, you need a supply of replacement parts. You could buy them all piecemeal--a power supply here, a CRT tube there--but there's a better and cheaper solution. Buy a used Kaypro. Today, you can find clean Kaypros in perfect repair for $200-300 on the used computer market, much less than you would pay to assemble a decent collection of spare parts. And for your investment, you get a complete working computer. If and when your current Kaypro bites the dust, you can either cannibalize your second computer for parts or simply switch to the second computer and keep the first one for parts. Either way, you have at least one spare for

CP/M ONLY

everything.

When you buy a backup computer, get one that's the same model as your current one. If you aren't sure what model you have, here's a quick tour: The first Kaypros were the the '83 models, so-called because they were manufactured up through 1983. You can identify the '83 models because they use full-height disk drives and have one parallel port and only one serial port on the back. The Kaypro II has two single-sided drives (191K each), while the Kaypro IV has two double- sided drives (390K each). The II and the IV don't have the same main circuit board, so if you have a IV, don't buy a II, and vice-versa. (A few late Kaypro IIs were shipped with the Kaypro IV boards, but it takes more space than I've got to explain how to identify them.)

In 1984, Kaypro brought out a revamped line of computers, which are now called the '84 models. You can spot the '84s because they use half-height disk drives and have *two* serial ports along with one parallel port in the back. There have been a number of different models--the 2, 2X, 4, New 2, and 1--but all came with the same main circuit board. The Kaypro 2 has two single-sided drives (191K each), while the 2X, 4, and 1 all have two double-sided drives (390K each), and the New 2 (rare) has one double-sided drive. The 2X and 4 were sometimes shipped with a built-in 300 baud modem and clock. Generally, though, the '84 models are all similar enough to swap parts.

Next month, software.

PRODUCT SUMMARY

Advent Products, Inc.
3154-F E. La Palma Ave.
Anaheim, CA 92806
(714) 630-0446

ERAC Co.
8280 Clairemont Mesa Blvd.
Suite 117
San Diego, CA 92111
(619) 569-1864

Kaypro Promotions Department
533 Stevens Avenue
Solana Beach, CA 92075
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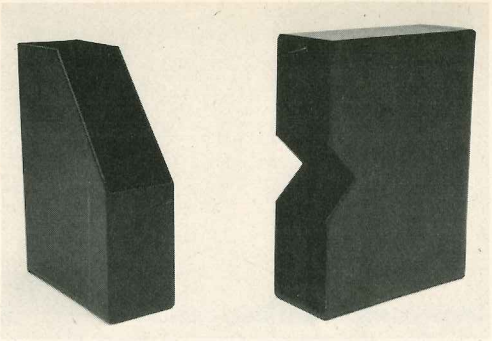

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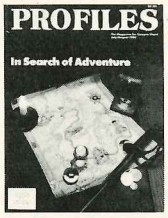

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- Turbo Pascal review
- Printing with Perfect Writer

4

SEPTEMBER 1984
- LOGO on Kaypro
- Education with PILOT

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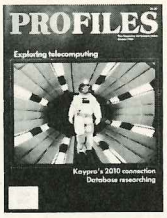

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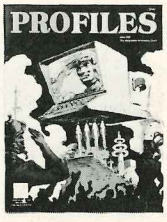

MAY 1985
- Alvin Toffler interview
- MBASIC marvels

10

JUNE 1985
- Micros in the Third World
- Perfect Series ver. 2.0 review

11

SEPTEMBER 1985
- CP/M educational software
- Disk drive diagnostics

12

OCTOBER 1985
- Sorting algorithms
- C programming language

13

NOVEMBER 1985
- Bookkeeping with Perfect Calc
- Accounting software roundup

14

DECEMBER 1985
- Z-System, part 1
- Key definition programs

15

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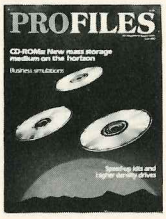

JUNE 1986
- CD-ROMs: an overview
- Business simulations

18

JULY 1986
- Idea processors for CP/M
- Changing WordStar translation tables
- Multi-format programs

19

AUGUST 1986
- Hong Kong software
- Multi-tasking software

20

SEPTEMBER 1986
- #1 in programming series
- Kaypro-turned-cash-register

21

OCTOBER 1986
- Relational data bases
- 2400-bps modems

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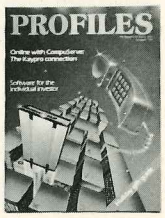


NOVEMBER 1986
- CompuServe forums
- Stock market software

23

DECEMBER 1986
JANUARY 1987
CPM Version Only
- Desktop Publishing – An Overview
- Planning a program with Flowcharts

24

FEBRUARY 1987
- Electronic mail services
- BASIC tutorial

25

MARCH 1987
- Laser printers
- Mailing list managers

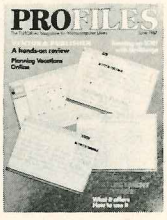
26

APRIL 1987
- Online information services
- Beginners guide to telecommunication

27

MAY 1987
- Data entry with Bar Code
- A first session with LOTUS 1-2-3

28

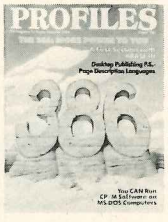


JUNE 1987
- Review of Ventura Publisher
- Project Management Software reviews

29

JULY 1987
- WordPerfect vs. MicroSoft Word – which one to buy?
- Local Area Networks – Workstations of the future

30



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KAYPRO PRODUCT SPOTLIGHT

This month, we feature part II of a price listing of Kaypro computers and accessories. Last month, we covered computers, systems, monitors, drives, and cables. Here, we feature various computer accessories and add-on cards available at press time (April 1988). For more information on any Kaypro product, see your local Kaypro dealer or call 1-800-4-KAYPRO.

CLIP AND SAVE

COMPUTER ACCESSORIES

Description	Sugg. Retail Price
Diskettes, package of 5 (720K, 3.5")	$ 28.95
Diskettes, package of 10 (DSDD, 5.25", Reinforced Hub)	19.95
101 key, enhanced AT keyboard (PC/286/386)	109.00
Surge Suppressor	19.95
Kaypro PC dust cover	19.95
Disk drive head cleaning kit	9.95
Keyboard/monitor cleaning kit	14.95

KAYPRO 2000 ACCESSORIES

Description	Sugg. Retail Price
Padded carrying case	$ 15.00
Base unit This workstation for the Kaypro 2000 provides two full-length slots, serial/parallel ports, and a 5.25" 360K floppy drive. Space is provided to add an additional 5.25" or 3.5" device.	495.00
External 5.25" drive kit (multi-adaptor) The drive comes in a case with power supply and data cable for attaching to the multi-adaptor.	295.00
Internal modem A 300/1200 baud Hayes compatible modem that plugs into a special pin connector on the 2000.	149.00
External battery pack Useful in situations where additional running time is needed and external power is unavailable.	45.00
Charger assembly 115V	39.00
Charger assembly 240V	39.00
Multi-adaptor This device provides a parallel port, 3.5" drive port, 5.25" drive port, and a 1/2 card slot. The slot is used primarily for adding external video capability.	155.00
Auto power adaptor	45.00
External 3.5" drive (multi-adaptor) For use with the multi-adaptor, the drive requires no cables or external power.	249.00
Internal 3.5" drive kit (Base Unit) The kit is designed for installation on the 2000 Base Unit for use as a B drive.	236.00
Serial/parallel adaptor kit Converts the serial port on the Kaypro 2000 to a parallel printer port.	65.00

KAYPRO 2000+ ACCESSORIES

Description	Sugg. Retail Price
External 5.25" drive kit Similar to that available for the Kaypro 2000 except it does not require a multi-adaptor.	$295.00
D-cell adaptor An external power source for the 2000+ that uses standard D-cell batteries.	29.95
Padded carrying case	49.95
Charger assembly 240V	49.95

CONTROLLER CARDS

Description	Sugg. Retail Price
FD/HD controller (PC-286) A PC height version of above.	219.00
Multi-function (PC) Used in the Kaypro PC, PC/30, XL, and XL-20. A PC height full-length card that offers a maximum 768K RAM, serial and parallel ports, and floppy disk controller for up to two drives. Supports 360K 5.25" and 720K 3.5" formats.	489.00*
RLL hard disk controller (PC) A PC height card that supports two hard disks. Requires RLL qualified hard disks.	119.00

INPUT/OUTPUT CARDS

Description	Sugg. Retail Price
Serial/parallel input/output (286/386) A PC height half card with one serial and one parallel port. The ports are AT compatible and recommended for use only in the PC-286, 286i, and 386.	$119.00

VIDEO ADAPTOR CARDS

Description	Sugg. Retail Price
Color graphics (4.77 MHz PC only) This is a full length PC height card used in original Kaypro PC. It supports CGA on an RGB monitor and MDA on a monochrome monitor.	$ 89.00
1/2 Card multi-video (PC) Recommended for use in PC compatible Kaypro computers, this half card supports CGA, Hercules compatible monographics, MDA, and features CGA emulation on a monochrome monitor.	139.00
Kaypro EGA video-CGA, MDA (PC/286/386) A PC height full-length card comparable to the IBM EGA card. It supports EGA, CGA, and MDA with 256K video RAM.	187.00
Monographics with parallel port (PC) This PC height, full-length card provides Hercules compatible monographics and one parallel port.	95.00
1/2 Card EGA multi-video (PC/286) This half card provides, EGA, CGA, MDA, and Hercules compatible monographics output on most monitors.	249.00
Mono/Herc CGA+ video half card This half card supports MDA and Hercules compatible monographics on a monochrome monitor, and CGA on an RGB monitor. The card is also capable of double-scan (640x400) CGA on a multi-scan monitor.	99.00

PROCESSOR CARDS

Description	Sugg. Retail Price
Single speed processor Used in the original Kaypro PC, this full-length card provides the equivalent speed of an IBM XT (4.77 MHz).	$149.00
Dual speed processor 4.77/8MHz (PC) A full-length card currently used in the Kaypro XL series, it has a reset and toggle switch. It runs about 3 times the speed of an IBM XT when set to 8MHz (based on the Norton SI rating).	300.00
Dual speed processor 4.77/10MHz (PC) Similar to the above processor, this card provides a performance increase of 10-15% over the 8MHz version.	340.00
Dual speed PC-286 processor 6/12MHz Used in the Kaypro PC-286, this 80286 PC height processor card runs at 6 or 12 MHz and comes with 1 MB of RAM standard.	1219.00*

*Prices may vary dependant upon current DRAM prices.
Check with your local Kaypro dealer for current price.

SNOW REPORT WRITER AND XTRAKEY

BY JACK NIMERSHEIM AND JOSEPH I. MORTENSEN

SNOW REPORT WRITER

Snow Report Writer is a forms query and report writing program that lets you design and generate custom reports containing data from multiple files.

Snow Report Writer runs on IBM PC, XT, AT or compatible machines with two disk drives or a hard disk.The program supports either a monochrome or color display.It requires 384K of RAM.According to the documentation, a printer is optional--a somewhat strange statement about a program that aims to simplify the process of designing and generating reports. Report Writer is also available in Unix, Xenix, and LAN versions.

FEATURES AND PERFORMANCE

Report Writer is a potentially useful program that, unfortunately, suffers from its own hype.On the back cover of the manual, in capital letters, are claims that Report Writer can generate complex reports using data from "ALL software," in "just about ANY file format," to "suit YOUR needs." Okay, I'll buy that; after all, nothing promised so far is technically impossible.

Then, however, the marketing folks at Snow Software took that extra step, stating that all this can be accomplished "without programming." That's when my skepticism surfaced--with just cause, as I soon discovered.

Report Writer is, indeed, compatible with a wide variety of software...and it can import data from virtually any file format...and its report output can be customized to an impressive degree.But (you saw that coming, didn't you?) such power does exact a price, and to assert that no programming experience is required to access all of Report Writer's powerful capabilities is somewhat akin to claiming that one need only possess a driver's license to compete in the Indianapolis 500.

Despite its promises of power without programming, the Report Writer automatically reads only three file formats: Lotus, dBASE, and COBOL.To use data from any other program in a report, you first must define that program's file and field structure--a complicated process that demands more than a little technical expertise and programming experience, certainly more than the documentation implies.This definition process includes specifying file type, record size, key definitions, field separators, and several other items with which non- programmers will feel, at best, uncomfortable.Once this extensive groundwork is laid, however, Report Writer's logical menu structure and use of option boxes (reminiscent of dBASE Plus) greatly simplify the process of designing intricately formatted reports containing data from multiple files.

Despite promises of power without programming, Report Writer demands technical expertise.

You use the Lay Out a Query/Report option to format your reports.The actual physical appearance of a report is defined using the layout screen, which displays a column grid for easy alignment of report elements. Header lines, detail lines, subtotal breaks, and footer lines are all defined using this layout screen.

While laying out a report, you can specify multiple sort levels, as well as whether a sort should be performed in ascending or descending order.Numeric fields can be totaled and subtotaled at each level break.Once you have finished designing a report format, that format can be saved to disk for future use.

Once a report is laid out, you use the Perform a Query/Report option to generate that report. Selection criteria for a given report are specified at this time. The program supports a comprehensive set of Boolean operators for indicating selection criteria.Several additional options also are available on the Perform a Query/Report screen. For example, you can specify that a given report omit detail lines and only include total and/or subtotal level breaks.You can also request that a sample form be printed. This permits easy alignment of pre-printed forms--mailing labels, invoice forms, packing slips, etc. --prior to initiating an actual report printout.

Reports can be output to a printer, the screen, or a disk file. If you send a report to a disk file, you can specify whether the report should replace or be appended to a current file, if one exists.Disk reports also can be translated automatically into a number of popular formats, including DIF, Lotus .WKS, Perfect Calc, Multiplan SYLK, or several ASCII standards.

Report Writer includes a Fast Query/Report option that allows you to generate simple reports quickly. Reports generated in this manner are list-only reports.They can be sorted and can contain level breaks, but cannot include calculated fields.However, Fast Query reports can incorporate data from multiple files. Selection criteria can also be specified for a Fast Query/Report.

Report Writer supports a variety of printers.Here again, though, the Report Writer's documentation exaggerates its simplicity.You must use control codes to specify printer fonts and options --boldface, italics, underline, etc.Customizing your own print driver certainly falls under the category of programming.

DOCUMENTATION AND SUPPORT

The Report Writer documentation seems to suffer from the same identity crisis that afflicts the program itself.The manual tends to over-explain some topics (e.g., modifying queries and reports), while barely touching on others. For example, the chapter on specifying font controls--a fairly important component of report design--is a grand total of two pages long.Furthermore, the general tone of the

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manual is, again, oriented toward someone with more than a passing knowledge of database design and programming concepts.

If Snow Software would admit to Report Writer's complexity, it could have a winner on its hands.

Nowhere in the manual is a telephone number listed for Snow Software.Worse still, the only place I could find the company's complete mailing address was on the enclosed warranty card.This oversight is unforgivable for a product as powerful and as complex as Report Writer.Even experienced users would appreciate some support, should they want to take full advantage of the program's potential.

SUMMARY

Report Writer is a powerful program that suffers most from trying to project a false image of simplicity.If Snow Software would admit to the program's complexity and design its documentation and support policies accordingly, it could have a winner on its hands.——**J.N.**

SCORECARD

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

XTRAKEY

Anything new in CP/M software is news.Two new versions of XtraKey, the keyboard redefinition package from XPert Software, will be good news to countless owners of CP/M Kaypros and other computers running CP/M 2.2.Those who've long enjoyed the convenience and speed of macros--whole words or phrases or complex commands available at the press of a key--will welcome Xtrakey 2.6 and 3.0, the new breed recently trotted out of XPert's stable.

Version 2.6 represents a modest upgrade, but 3.0 (which was still being beta tested as this was written) has features that set a new standard for CP/M keyboard enhancers.Both new versions are available in more than a dozen variations, with a configuration utility (XConfig) for each, so whether you have an '83 or '84 Kaypro or a generic CP/M computer, the distribution disk has an XtraKey edition to suit you.If you choose, you can have a save-screen-to-file feature.If you have an '84 Kaypro, screen blanking is an option.If you are a Dvorak keyboard devotee, there's even a variant for you.XPert also supplies XSave to save keystrings to files, XEdit to edit them, and XCompile to make keystring files from text files.Readymade key redefinition files for popular programs such as WordStar, Perfect Calc, and Turbo Pascal round out the Xtrakey package.

FEATURES AND PERFORMANCE

XtraKey 2.6 and 3.0 do everything the old versions did and much more, without devouring lots more memory. You can redefine every key on the keyboard and keypad and have up to seven more definitions per key using "X-shift" keys.The new Xtrakey versions will still channel output to your screen, printer, or to the screen and printer together.This means you can send escape codes to the printer or use your computer as a typewriter even as you're using WordStar or any other program.The procedure for creating "on-the-fly" key redefinitions remains the same. Pressing \ ! (backslash and exclamation point) or an optional setup key opens a one-line window in which XtraKey asks you for a key or shifted key to redefine.Then you enter the keystring, which waits in RAM at your beck and call."On-the-fly" definitions are saved for future use with XSave.

So what is new about XtraKey 2.6 and 3.0? Both can nest keystrings--that is, one keystring sequence can call up another or even itself.Another up-graded directive allows pauses for fixes as well as variable-length keyboard input.Keystring execution can now be aborted during input pauses. Give up another 768 bytes of RAM and you have a most welcome save-screen-to-file option.

XtraKey 3.0, however, has unique talents that clearly distinguish it from 2.6 and put it in a class by itself.For one thing, it does windows.Combined with the CRT directive, the window directive lets you put your own pop-up menus or help messages on any line of the screen.When you close the window, XtraKey restores the screen display.Your word processor or spreadsheet remains undisturbed by the windowing activity.

Xtrakey 3.0 has unique talents that distinguish it from 2.6 and put it in a class by itself.

More technically minded users of XtraKey 3.0 will appreciate the advanced features Peek, Poke, and Get. The Get command retrieves a character from any given memory location and displays it on the screen.With Poke you can put eight- or 16-bit values into any memory address specified by keystring or keyboard input.Poke will not only do arithmetic and Boolean operations on values in memory, but will also communicate with input and output ports.Peek works much like the programming structures IF, FOR...NEXT, or the WHILE...WEND commands in BASIC, permitting looping, branching, and other conditional operations. Combining XtraKey's chaining capability with Peek and Poke lets you create highly sophisticated macros which are almost programs themselves. A GO TO

PAGE: command for WordStar (versions 3.30 and earlier), included on the distribution disk, hints at some of the things you can do with the combined power of these advanced features.

Three more of XtraKey 3.0's added capabilities merit mention. A speed command controls how fast the computer handles keyboard or keystring input.The delay directive permits timed pauses in keystring execution.Another useful new command allows easy entry of decimal (but, alas, not hexadecimal) numbers during on-the-fly editing.

DOCUMENTATION AND SUPPORT

XtraKey 2.6 and 3.0 rely on the 90-page looseleaf user guide produced for version 2.5, plus Addendum 1.0, Addendum 2.0, and a three-page "Dear Customer" letter.The manual, not bad for software documentation, employs "Do this, see this" pedagogy--just the thing for a beginner. Separate chapters show how to use XEdit, XSave, XConfig, and XCompile, the utilities that complete the XtraKey package.Appendices cover technical matters of interest to advanced users and the sample definition files for Turbo Pascal, BASIC, WordStar, Perfect Writer, Perfect Calc, and dBaseII.

Addendum 1.0 explains Kaypro specific matters.Addendum 2.0 is the technical reference for the new versions of XtraKey and especially the enhancements in release 3.0. In its present form it is far from adequate (understandable in a beta test version).The Peek, Poke, and Get directives need clearer explanation and more examples of ways to use them. Other sections of Addendum 2.0 will seem pretty cryptic even to advanced users.XtraKey's manual needs a complete rewrite full of good examples to illustrate release 3.0's power and complexity.

The manual says to call or write XPert if you need help using XtraKey, but neither an address nor a telephone number appears in the manual. Fortunately, the three-page letter that accompanies Xtrakey 3.0 has this information.

XPert Software produces quality products at very reasonable prices and appears ready to respond to users' needs for help.—— **J.M.**

SCORECARD

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

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

Joseph I. Mortensen is a freelance writer from Midland, Michigan, where he is pastor of First Baptist Church.

QUICK REFERENCE SUMMARY

Product: SNOW REPORT WRITER
Manufacturer: Snow Software
Address: 2360 Congress Avenue, Clearwater, FL 33519
Phone: (813) 784-8899
Sugg. List Price: $695 (MS-DOS version)

Product: Xtrakey 2.6 and 3.0
Manufacturer: XPert Software
Address: 8865 Pollard Ave., San Diego, CA 92123
Phone: (619) 268-0112
Suggested List Price: $29.95

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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.

PROFESSIONAL DESKTOP MANAGER

SideKick Plus is a new system of integrated yet modular applications for time and task management, outlining and report preparation, background communications, note-taking and simple text editing, DOS file and directory management, and other desktop functions.

The product can be used as a resident or non-resident application in as little as 70K of RAM.

SideKick Plus employs an interactive menu system with nested windows that display context-sensitive commands available from the user's current activity in the program.

Users can exit to DOS and re- enter SideKick Plus with all applications open just as the user left them. The product also includes user-definable function keys.

$199.95. All Kaypro MS-DOS computers and other IBM compatibles. Borland International, 4585 Scotts Valley Drive, Scotts Valley, CA 95066; (800) 543-7543.

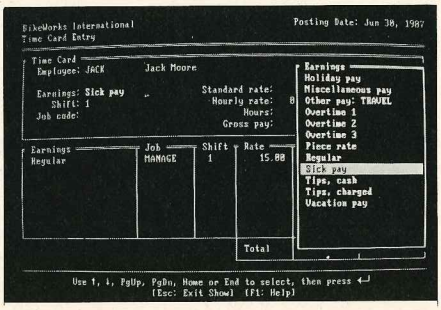
Hotline Number #550-50

PAYROLL SYSTEM

The BusinessWorks PC Payroll System is the latest addition to Manzanita Software Systems' accounting package.

The Payroll module can handle an unlimited number of employees. The program tracks dates of hire, review, and termination; cash and charged tips; sick leave; vacation and comp time; and wage history.

The product also produces paychecks and check stubs and can track state and federal tax liabilities and deposits. In addition, PC Payroll produces reports such as W-2 forms, W-3s, and 940 and 941 worksheets.



The PC Payroll System can export detailed financial information and reports to other programs, including Lotus 1-2-3, Multiplan, dBASE, WordPerfect, and WordStar.

BusinessWorks PC is designed for small to medium-sized companies. Other accounting modules include General Ledger, Accounts Payable, and Accounts Receivable.

$295. All Kaypro MS-DOS computers and other IBM compatibles. Manzanita Software Systems, One SierraGate Plaza, Ste. 200-A, Roseville, CA; (800) 531-3552, inside California (800) 447-5700.

Hotline #551-50

ON-LINE LAPTOP SUPPORT

Traveling Software, Inc., has announced its sponsorship of the Laptops RoundTable on GEnie (GE Network for Information Exchange).

This service will provide an international forum in which users of all laptop computers can electronically share information, tips, and programs for their computers. User access is available 24 hours a day.

Each Monday at 10:30 p.m. (EST) the system operators host a real-time conference where users communicate "live" to share tips and get help with their computers.

The General Electric network is accessible by local numbers in the U.S. and Canada, as well as many places in Europe and Asia. Users are charged $5 an hour for either 300- or 1200-baud line speeds.

Traveling Software, Inc., 19310 North Creek Parkway, Bothwell, WA 98011; (800) 343-8080.

Hotline #552-50

GRAPHICS ORIENTED WORD PROCESSOR

GEM 1st Word Plus is a full- featured word processor that utilizes a graphics interface with icons, drop-down or pull-down menus, and help facilities.

Graphics, including diagrams, drawings, charts and special illustrations, can be combined to produce documents.

In addition to standard word processing features, the product also offers hyphenations, footnote management, decimal tabulation, personal stylesheets, and mouse- or keyboard-driven block operations.

A conversion utility is provided for transferring files from WordStar to GEM 1st Word Plus, saving all the attributes from the original document.

$199. All Kaypro MS-DOS computers and other IBM compatibles. Digital Research, Box DRI, Monterey, CA 93942; (800) 443-4200.

Hotline #553-50

386 BUYER'S GUIDE

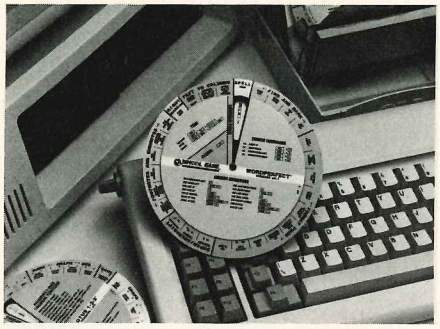
386 World: A Buying Guide is a disk-based guide to PCs using the 80386 microprocessor. It contains information on products from more than 100 vendors.

Listings include descriptions of 386 software, complete systems, add-on boards, replacement motherboards, and books. The guide also includes short synopses of magazine product reviews, as well as tips on buying a 386 system.

$5. All Kaypro MS-DOS computers and other IBM compatibles. Packet Press, 14704 Seneca Castle Ct., Gaithersburg, MD, 20878; (301) 762-7145.

SOFTWARE GUIDE

Wheel Ease is a series of reference guides for ten of the most popular MS-DOS software packages. Each guide is a hand-held wheel--you point the arrow to the function you want and read the command(s)/keystroke(s) in the window.



These software guides are available for WordStar Professional 4.0, WordStar 1.0 through 3.3, WordPerfect 4/4.1, Crosstalk XVI 3.6, Lotus 1-2-3 1.XX, MS-DOS 2.XX and 3.XX, MS-WORD 3.1, DisplayWrite 4 1.0, MultiMate Advantage 3.6, and dBASE III PLUS 1.1 (a three-wheel set).

$12.95 each for one to five copies; $11.95 each for 6 to 24 copies, and $10.95 each for 25 or more coies. (dBASE III three-wheel set: $27.95 each for one to five copies; $25.95 each for six to 24 copies, and $23.95 each for 25 or more copies.) GP Technologies, 160 Meister Ave., Somerville, NJ 08876; (201) 722-7117.

Hotline #554-50

DATA LOSS PREVENTION--SOFTWARE

Vaccine is a software utility that helps prevent unintentional data loss due to user mistakes and also provides protection from intentional data loss caused by data-destructive software--i.e., computer "viruses" or "bombs."

The product provides data protection, data security, system checks, system enhancements, and data recovery functions

The Surveillance Module protects against approximately 90 percent of all "illegal" disk writes. The Bomb Shelter Module prevents potentially harmful hard disk activity. The Quality Assurance Module checks files for bugs, errors, and intentional modifications or patches.

The Installation and System Check-Up Modules examine the hard disk for such things as mixed versions of DOS and inappropriate use of subdirectories. It checks AUTOEXEC.BAT and CONFIG.SYS files for vital information.

Critical Disk provides zero keystroke restoration of data.

$92. All Kaypro MS-DOS computers and other IBM compatibles. FoundationWare, 2135 Renrock Rd., Cleveland, OH 44118; (800) PC CURES.

Hotline #555-50

DATA LOSS PREVENTION--HARDWARE

The Disk Defender is a write- protect device utilizing a circuit board that mounts into the half-size option slot of a computer and a control box to select the level of protection desired.

Once the device is installed and operating, it will write- protect all or a portion of the hard disk. It intercepts write signals between the controller and the disk and blocks all signals that are destined for the portion of the disk that has been write-protected. Since this is a hardware device, it cannot be circumvented by any keyboard actions.

The user can select the level of protection desired. "Full" protection makes 100 percent of the disk write-protected. "Zone" protection makes pre-selected portions of the disk write- protected. "None" removes all protection so 100 percent of the disk is accessible.

$240. All Kaypro MS-DOS computers and other IBM compatibles. Director Technologies, 906 University Place, Evanston, IL 60201; (312) 491-2334.

Hotline #556-50

PRODUCT UPDATES

Display Master 3.0 is an EGA/VGA screen enhancement utility that permits more lines, columns, and customized fonts and palette colors to be seen onscreen. The product permits Lotus 1-2-3, Symphony, Framework, and PlanPerfect users to view a larger portion of their spreadsheet data. Intersecting Concepts, Thousand Oaks CA ☐ **XTreePro** is an enhanced version of the hard disk management package Xtree. The new product simplifies file and directory handling through single keystroke commands. XTreePro adds features designed specifically for users of large personal computer systems, including greater file handling capabilities on simultaneously logged drives and as much as a sevenfold speed increase. Executive Systems, Sherman Oaks, CA ☐ **One-Write Plus 2.0**, a small business ac-counting series, now offers an automated installation procedure. The new version also provides an optional stand-alone feature for all four accounting modules: Master (G/L), Accounts Receivable, Accounts Payable, and Payroll. Great American Software, Amherst, NH.☐ **Prospecting Plus**, a sales support software program, now offers immediate access to files by company name, contact name, telephone number, and follow-up date. It can include special bids and comments in form letters. The new version also offers simplified procedures to move records from laptop to desktop computers. Key Systems, Inc., Louisville, KY☐ **Tree86 1.1** is a DOS extender and file management utility. New features include Xcopy, the ability to search on multiple file specifications and work globally on those files, enhanced mouse support, the ability to use a browse/view utility, and reporting of total and available expanded memory. The Aldridge Company, Houston, TX ☐ **EZ- Forms Executive 2.0** is a program that allows users to create, fill out, store, and modify custom-generated forms. The new version adds spreadsheet-style math, data merge features, auto date, auto time, auto numbering, and encryption. New applications for the program include point-of- sale receipts, error-free invoicing, instant inventory values, and any automatic calculation needed within a form. EZX Corporation, Webster, TX

ADVERTISER'S INDEX

How to Use the Buyer's Hotline

Each month you are exposed to several Kaypro-compatible products, both in advertising and editorial. Trying to figure out which product suits your needs and your pocketbook, is never easy. How many times do you wish you had more information on the products listed or advertised in *PROFILES*? Since we have received so many requests for information about products and companies mentioned in the magazine, we have initiated **The Buyer's Hotline**.

The Buyer's Hotline is a brand new service for *PROFILES* readers. Most reader services such as these require that the reader fill out a tedious "bingo" card and send it in, only to wait three months for a response. This time lag is usually the fault of the publication, not the advertiser. We are attempting to eliminate the time lag so you can get the information you need in a more timely manner. With one toll-free phone call, you will be able to get information on the products in each issue of *PROFILES* that interest you.

Here's how it works: Each product manufacturer or distributor will have a Hotline number. This month the numbers are listed next to the page number in the Advertiser's Index. In future months, the number will also be listed within the ad itself or the Quick Reference Summary at the end of each article. Make a note of which products (and the corresponding Hotline number) you would like more information about. Then simply call our toll-free Buyer's Hotline number (1-800-4KAYPRO). Give the operator the information she requests, and that's it!

Weekly reports of our readers' product information requests will be forwarded to the manufacturers and distributors, so that you can get the information quickly... and be able to make an informed buying decision within your own time frame. We sincerely hope that this service will be of great value to all of our readers.

Advertiser	Page No.	Hotline #
Advanced Concepts E&C	16	111-50
CDE Software	16	158-50
Central Computer Products	30,35,39,44	014-50
CLASSIFILES	47	----
Computer Professionals, Inc.	20	022-50
Concom Enterprises	40	399-50
Golden Bow Systems	5	400-50
Intersecting Concepts	21	340-50
James River Group	Back Cover	048-50
Kaypro Accessories	28,41,46	151-50
Kaypro Corp.	Inside Front Cover	153-50
Kaypro General Store	53	152-50
Macton Industries, Inc.	3	920-50
PC Plus Consulting	17	996-50
PC Problem Solvers	69	997-50
Puget SoundComputer Systems	9	398-50
PROFILES BACK ISSUES	63,64	----
PROFILES BINDERS	62	----
Stairway Software	7	402-50
Traveling Software	Inside Back Cover	999-50
Varitek	40	401-50
Wall Street Journal	12	998-50

Listed below are the companies and Hotline numbers for those products mentioned in our editorial features this month.

Product	Hotline #
Editor's Choice	
XTreePro	1010-50
CP/M Only	
Advent TurboROM	1020-50
At A Glance	
Snow Report Writer	1040-50
XtraKey v.2.6 and v.3.0	1041-50

LAPLINK

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 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.**

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**

Rave Reviews

PC MAGAZINE EDITORS' CHOICE

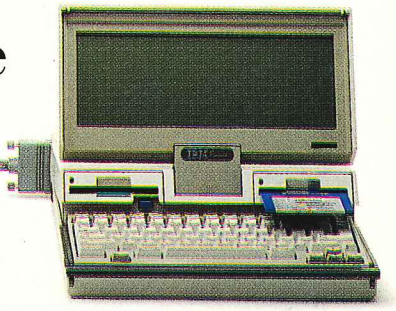
"Traveling Software's LAP-LINK is the most convenient transfer product...it does not require changes to the CONFIG.SYS or AUTOEXEC.BAT files on either machine as the Brooklyn Bridge does...LAP-LINK transfers data even faster than the Brooklyn Bridge. It seemingly sets a record for the fastest transfer 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.

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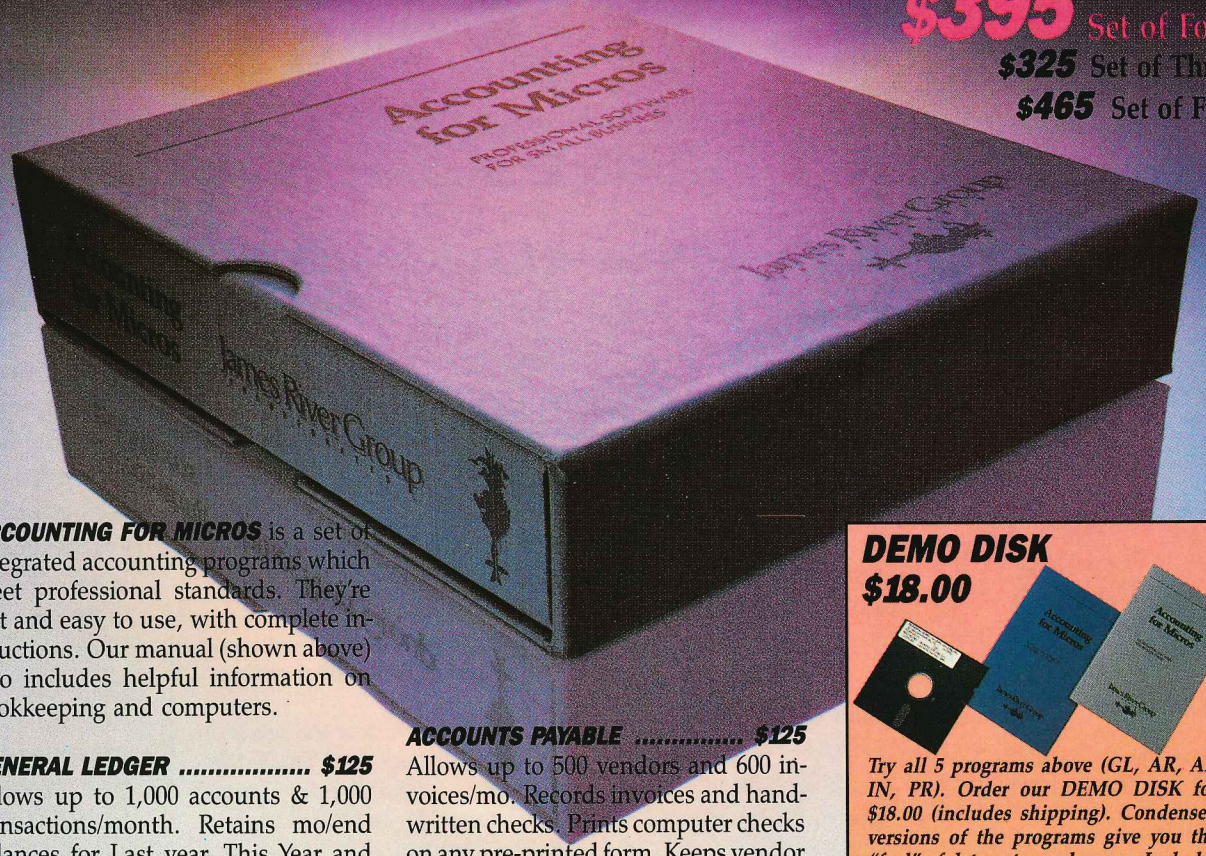
ACCOUNTING FOR MICROS

$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 hand-written checks. Prints computer checks on any pre-printed form. Keeps vendor names and addresses.

PAYROLL $125
Will handle up to 100 employees with eight deductions per employee. Deductions may be determined as fixed dollar amounts or percentages, or referred to a table for automatic look-up. Tax tables are easily entered, or purchased separately. Prints checks and W2's.

SET OF FIVE $465
SET OF FOUR $395
SET OF THREE $325

RUN ON MOST CPM AND MSDOS

Apple CPM	*IBM PC,XT,PC jr,AT*	*Sanyo (all)*
Columbia	*Kaypro (all)*	*Tandy (all)*
Compaq	*Morrow (all)*	*TeleVideo*
Corona	*Osborne (all)*	*Zenith 100 & 150*
Eagle (all)	*Panasonic*	*8" CPM*
Epson QX-10	*Radio Shack CPM*	*Other compatibles*

DEMO DISK $18.00

Try all 5 programs above (GL, AR, AP, IN, PR). Order our DEMO DISK for $18.00 (includes shipping). Condensed versions of the programs give you the "feel" of data entry and access. Includes sample reports and instructions. Specify machine.

TMAN $125
The "Catch-All" program. Files any type of information for quick access. Name or subject oriented with 15 lines of notes per name. Use TMAN as a mailing list, filing system, notebook, etc. Can be used alone or with data from our other programs.
Try ***TMAN DEMO $16***

HOW TO ORDER: Please specify machine and disk format. You can pay by check, by VISA or MasterCard (we need your expiration date and card number), or by UPS COD (add $2.50 COD charge). Our price includes shipping. Minnesota residents, add 6% sales tax). We ship most orders the same day.

James River Group
INCORPORATED

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