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PROFILES

THE MAGAZINE FOR KAYPRO COMPUTER USERS

MARCH 1988

UNLEASH THE SECRET POWERS OF WORDSTAR 4.0

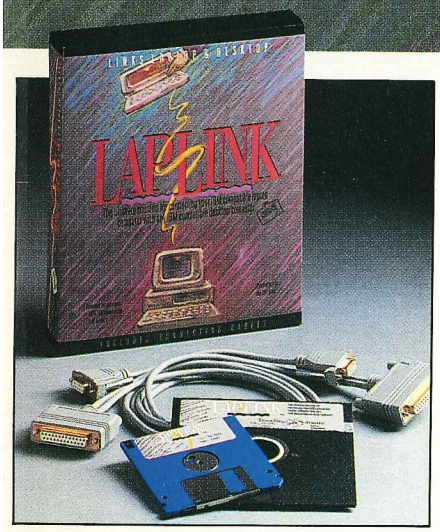
GOING ONLINE WITH PROCOMM

GW-BASIC GRAPHICS — AND A FREE PROGRAM

LOTUS KILLER: A FIRST LOOK AT BORLAND'S QUATTRO

LAPLINK

BEST OF '87



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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.

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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.**

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Rave Reviews

PC MAGAZINE EDITORS CHOICE

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Howard Marks
PC Magazine — July 21,1987

"LAP-LINK IS NOTHING SHORT OF INCREDIBLE..."

Jerry Pournelle
Byte Magazine — July 1987

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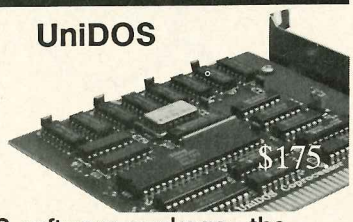
UniDOS



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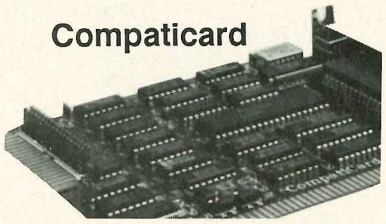
Compaticard



Compaticard allows you to connect any of the above mentioned types of disk drives to your computer. When installed in conjunction with the Uniform-PC software package, you'll be able to use diskettes in literally hundreds of DOS and CP/M formats. **$175.** Catalog **#COMP** Uniform PC, **$59. #UNIF**

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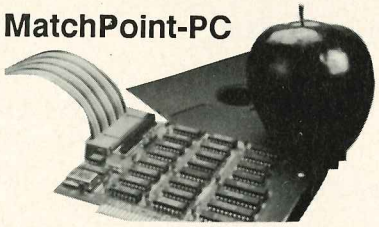
First you get the manufacturer's guarantee. Everything will work as promised, or return it. The second guarantee is ours, and we promise to stand behind everything we sell.!

• Apple II Diskettes on Your PC?

MatchPoint-PC



Impossible! Not anymore. If you want to read Apple II diskettes in your IBM or compatible, MatchPoint-PC is for you. Matchpoint-PC combines hardware and software to give you the ability to access files stored on Apple DOS, ProDOS, SOS, and Apple CP/M diskettes. Matchpoint-PC uses your existing 360k floppy disk drive to read Apple format diskettes whenever you use one of Matchpoint- PC commands. Matchpoint-PC will not interfere with the drive's ability to read IBM format diskettes. Now you can have an easy way to access information stored on Apple format diskettes. Matchpoint-PC gives you the complete capability to copy to and from Apple format diskettes. You can even initialize blank diskettes in Apple format on your computer. Combine Uniform PC with Matchpoint-PC to allow the use of Apple Software CP/M format diskettes. Use your Apple CP/M diskettes as though they were in DOS format, your computer won't know the difference. **$195.** Catalog **#MATP**

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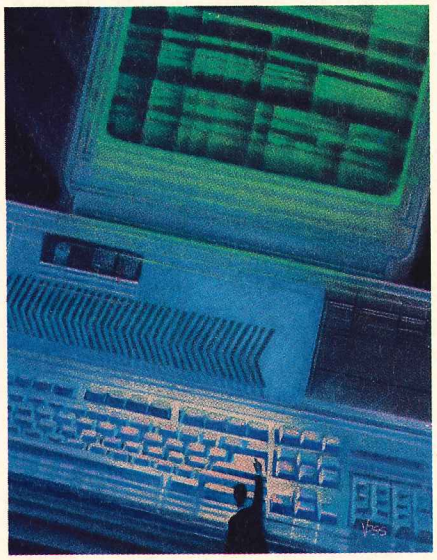

ON THE COVER:
Artist Tom Voss gives us his conceptualization of the power behind the new WordStar 4.0.

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DEPARTMENTS

COLUMNS

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GETTING TO KNOW YOU

As an avid reader of magazines, I too often sense a complacent attitude among editors. Many seem to paint a mental portrait of what they believe most closely represents their "average" reader and proceed to feed us the same old "formula" month after month.

For most of the magazines out there, this system may work. Over several months, or even years, their subscriber profile may remain pretty consistent. Unlike most magazines, however, PROFILES reaches several thousand brand new readers every month. These folks have just purchased a new Kaypro computer and their interests and computing needs may or may not match those of our current subscribers. All computer users are searching for solutions to their business and computing problems. As a support vehicle specifically for Kaypro users, we want to address these problems and provide as many solutions as possible to our readers.

In order to accomplish our goal, we'd like to get to know you better. Because a get-together is unfortunately out of the question, we have come up with a list of questions that will enable us to find out more about you, as well as find out what you are interested in reading about in PROFILES.

Many of you recently received a reader survey in the mail. For those who did not, we are running the same survey on a card between pages 40 and 41. We have included ten questions and plenty of space for you to "let it all hang out"—about yourself, PROFILES, Kaypro, the computer industry, whatever. And, yes, we will share some of your thoughts with our readers as space allows. So please take a moment of your time to fill out the questionnaire and drop it in the mail.

And because we appreciate your lending us your valuable time, we will be holding a drawing of those surveys received by March 15, 1987. The winner will receive a Kaypro 2000+ laptop computer! See our ad on page 41 for more details on this exciting prize. If you've already sent back a completed questionnaire, there's no need to send another one—you're already entered in our drawing.

Judging from the letters and phone calls I receive daily, you're an active, demanding and responsive audience. I respect that, and appreciate your helping me keep up with your pace.

Gwyn Price

Our basic one-year subscription rate is $19.97 for 12 issues. If your first issue does not arrive within eight weeks after ordering, or you miss an issue, please write to us: PROFILES Magazine, P.O. Box 2889, Del Mar, CA 92014. We'll extend your subscription or send the issue. To direct PROFILES to a new address, attach a recent mailing label plus your old and new addresses. Allow eight weeks for processing. International subscriptions are available directly through PROFILES Magazine only. Our regular yearly international rate is USD $40 (includes postage). Checks MUST be drawn on a U.S. bank in U.S. dollars only.

TONS O' TIPS

I enjoyed Jerome Ruderman's article "Analyzing Mutual Funds with Profit Plan" (January 1988) very much. As it happens, though, I'm more familiar and comfortable with Perfect Calc.

In his article, Mr. Ruderman mentioned that he had difficulty "moving a column of formulas in Perfect Calc." So [did] I, but there is a simple solution to the problem. I'd like to share it with my fellow Perfect Calc users.

The solution is to move the columns of data rather than attempt to move the formulas. Assume that your screen looks like Figure 1 of Mr. Ruderman's article (page 50). To move the data, "set mark" in the cell with the date 9/26. Move the cursor to "bottom column" and "end line." The cursor should now be in the cell containing "27.28" at the bottom of the 10/24 column. Now copy the region. Don't delete the region or you'll wreck the formulas. Move the cursor to the cell containing the date 9/19 and yank.

Your screen should now look similar to Figure 2 (page 51), except that there is a duplicate 10/24 column where the 10/31 column should be. Now simply type in the new information for 10//31, overwriting the duplicate 10/24 column. As you type in the new information, Perfect Calc will recalculate the "Change" columns.

Solutions that *don't* work include deleting the 9/19 column (this wrecks the five-week formulas) and locking the formulas and then deleting the 9/19 column (this still results in wrecked formulas). Apparently a cell must at least exist. Otherwise, Perfect Calc will enter a question mark in place of the reference to the non-existent cell. This is why you must copy the region rather than delete it.

Now we Perfect Calc users can enjoy Mr. Ruderman's technique.

Tom Meyers
Mission Viejo, California

Some of your readers who have Kaypro 2'83s or 4'83s and buy the latest WordStar Release 4, CP/M edition, will find that cursor keys on their machines will not move the cursor as they should. With the very kind help of MicroPro's technical service department, I reprogrammed my cursor keys to work with the new WordStar. It may help other Kaypro 2'83 or 4'83 users to outline the procedure here:

Place your CP/M disk with CONFIG.COM on it in drive A.

Place your WordStar 4 disk (working copy) in drive B.

At the A prompt, type CONFIG and return.

From the menu that appears, select "3--->Cursor keys definitions."

From the next menu, select "2---> Change the cursor key settings."

On the table that appears, the cursor will be at "OB" for the "up" cursor. (Note that these are hexidecimal code designations.) Change that by typing 05.

The cursor will then move to the next block showing the "down" cursor. Change that by typing 18.

The cursor will then move to the third block from left for the "left" cursor. Change that by typing 13.

The cursor will then move to the last block for the "right" cursor. Change that to 04.

Hit the escape key once to return to the previous menu and again for the main menu. The menu will appear once again.

Hit the escape key to return to CP/M.

Voila! Happy cursors!

Barney Daehler
San Lorenzo, California

Editors Note: Though these directions are correct for most versions of CONFIG shipped with '83 series Kaypro computers, they do not match the later versions in which some menus and key

functions were changed. Examine your copy of CONFIG and modify the above directions to suit your version. Remember, change the up arrow to ^E (05h), the down arrow to ^X (18h), the left arrow to ^S (13h), and the right arrow to ^D (04h)

Also, make these changes on your WordStar working disk only, not your CP/M disk.

For three years I have been intending to write this letter of appreciation for *PROFILES*. There is only one fault with *PROFILES*: it is too short to last until the next issue.

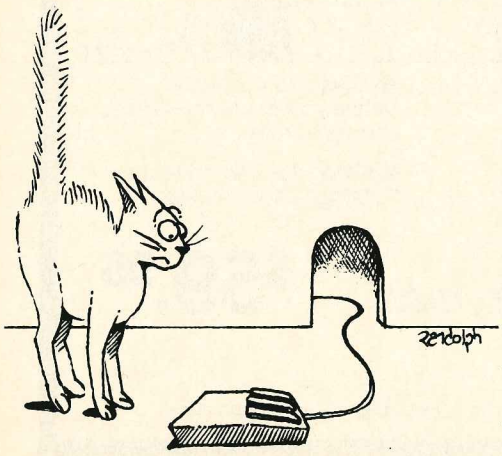
The new changes are all good, and the fine articles by Matson, Nimersheim, and Ruderman in the January issue may keep me busy until the February issue arrives.

Ted Silveira's material is always great, and I was most pleased to learn his macro to "dump garbage" to the end of a file. However, it bothered me to have it merged with the copy at the end of the file. I did not want to leave it highlighted and deal with only one change at a time. I modified it as follows to set the dump apart as a separate paragraph: ^QC^KV^M^B^QV. This is most useful for writers.

What about a feature each month on useful macros worked out by others?

Donald T. Lee
Woodland Hills, California

We sincerely appreciate helpful tips from our readers (both end users and Kaypro dealers). Passing along these tips and enabling you to make the most of your Kaypro is why PROFILES *is published. We will continue to publish your tips (including macros for WordStar, Lotus 1-2-3, and other favorites) in this column and throughout the magazine as space allows. Keep those letters coming!*



STRIKING A BALANCE

I'd like to add my two cents to the ongoing MS-DOS vs. CP/M discussion. I like the fact that *PROFILES* attempts to satisfy both groups of users via the same magazine. While I am heavily and determinedly "into" CP/M at this time, I know that circumstances can induce one to change. Should I have the need to use an MS-DOS machine, I already have access to potentially valuable material in my old issues of *PROFILES*. A year ago, I didn't think I'd ever be able to get a new Kaypro CP/M machine. Now, a 2X has become my *main machine*, and I'm contemplating the purchase of another Kaypro. So, who knows what the future will produce?

Kevin P. Murphy
Chicago, Illinois

Back in December of 1983 I purchased my Kaypro 4'83 as a Christmas present to myself. Shortly after that I became a subscriber to *PROFILES*.

I found that, as a novice computer user, the majority of the articles drew little of my attention. But as I began to learn more, the more valuable my subscription became. Then Kaypro moved into the world of MS-DOS.

At first the few MS-DOS articles drew little or none of my attention—until I began to use a PC at work. Suddenly the articles became more interesting and useful. For a while it was the best of both worlds. But more recently I have seen few CP/M articles, and of those articles, only a few pertain to my interests or needs.

At the October Boston Computer Show, I told the Kaypro representative that I was toying with the idea of letting my subscription go when it hit me: It's not entirely the fault of the magazine. Not only is there less happening commercially in CP/M, but the majority of the users have been around CP/M long enough to have gotten over many of the more common hurdles (myself included).

To get more information that is useful to the average user, the people with the information will have to share it. This letter is my first step in doing just that. Without user support or interest, I am afraid CP/M will slowly slip into obscurity.

Scott D. Courtney
Pawtucket, Rhode Island

PROFILES keeps telling us CP/Mers that we aren't being abandoned, but more and more it looks just the opposite.

Shortly after I purchased my Kaypro 2X three years ago, I learned I could not depend on dealer support when it came to acquiring software for my computer. In fact, all of the software I've added to that which came bundled with my computer I ordered through the mail.

I learned of much of this software through *PROFILES*.

I became concerned when I learned that *PROFILES* would be published in two versions—one for CP/M and one for MS-DOS. I would still have a magazine filled with articles and advertisements for things for CP/M Kaypros. Then you went back to a single PROFILES format, and the mix constantly favors the Kaypro MS-DOS user and the proportion of articles grows in favor of the MS-DOS user.

Someday, I will add a Kaypro MS-DOS computer. But I don't plan on giving up my 2X until it falls apart at the seams. I can't see starting from scratch with my software acquisitions.

Please, if we have to have one *PROFILES* for both MS-DOS and CP/M, go for a 50-50 ratio in copy and advertisements. Give us loyal CP/Mers a break and a fair shake. MicroPro didn't forget us when it was time to update old faithful WordStar.

Robert W. Pepper
Alamogordo, New Mexico

Be assured that we have not forgotten our CP/M users. In fact, we have put a lot of time recently into developing interesting and meaningful articles for the CP/M

community. Our ace CP/M columnist, Ted Silveira, is busy putting together a series we know you will enjoy and find extremely useful.

SLIGHTLY AHEAD OF OUR TIME?

My complaint is the timeliness of your issues. No, they never arrive late... my problem is quite the opposite. I like reading "recent" news. *PROFILES* often arrives at my home months before it should and covers old topics. For example, in early October my November issue arrived and by mid-month, I received my December issue, which discusses the "old" topic of Microsoft Windows. I get the magazine in spurts. Nothing shows up for a month or two and then, boom-boom-boom, I have three months' worth to read. How current can you be if you publish like that?

The bottom line is that I simply don't get enough out of your publication to justify the annoyance of receiving its dated information in spurts. I know you have a lot of readers who would disagree with my views, but perhaps they don't have access to the number of current computer publications that I do. You are very good at addressing the needs of the small business and home user, but similar articles appear in other publications months before they show up in *PROFILES*.

Douglas Keith Lawson
Troy, New York

Since there are quite a few issues contained in this letter, let's tackle them one by one.

First of all, PROFILES *is distributed at the same time every month. If you are receiving your magazine in spurts (or experiencing other delivery problems), the first step is to talk to your local postmaster. If the Post Office assures you that your magazine is delivered to you as soon as it arrives at their branch, then give our circulation department a call. Although our delivery control ceases once* PROFILES *leaves the printer, we may be able to track down the problem for you.*

Now that we've assured you that PROFILES *will arrive at the same time every month, we should probably explain why you received this issue about three weeks later than usual. For the last year, your copies probably showed up in your mailbox anywhere from four to six weeks ahead of the cover date. Not only did it bother our staff and our readers, but it confused our writers, illustrators, and advertisers, who were never quite sure when their material would appear. Beginning with this issue, your copy should arrive between the 12th and the 20th*

Knowledge is POWER

In these times of an uncertain economy, a thorough knowledge of your finances is essential. The right program can give you that essential edge to come out a winner.

So, what is the Quickest, Easiest program for you to use?

Only One...

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Checks & Balances version 4.14 is the easiest program you can use to manage your finances, track income and expenses, pay bills and balance your checkbook. It is simple enough for the home while powerful enough for the business.

Before you buy another program, compare it to Checks & Balances:

✓ *No accounting experience is required. It works just like your checkbook.*

✓ *Checks & Balances reconciles the checkbook - maintaining both the last bank statement balance and your check register balance.*

✓ *C&B easily handles checks as well as cash, credit card, automatic bank card transactions and ATM transactions. After all, checks are not the only way you spend money. A thorough knowledge of your finances is important for proper management.*

✓ *Manage your BILLs. Proper management of your payments can keep you afloat in hard times. Pay them right from Checks & Balances when due - or when you want to.*

✓ *Generate an itemized list of tax deductions and taxable income. Each item may be flagged TAX or Not-TAX related. Better, accurate information can help you get a bigger tax refund and breeze through an audit.*

✓ *Profit & Loss (Income & Expense) report broken down as Income, Adjustments to Income, Cost of Goods and Expenses for NET and GROSS profit with percentages or item counts.*

✓ *Any report may be generated with a fast, easy to remember command. They can even be sent to a disk file for editing into other documents.*

✓ *Versatile Name/Address file which prints complete names and addresses on checks, as well as account numbers. It even prints labels, cards and envelopes (Features Quicken doesn't have).*

If you thought of buying *Quicken* for your IBM or compatible, you must read our comparison chart.

✓ *You may not realize how important the Net Worth statement is until you apply for a loan. Can Quicken do that?*

✓ *Special features for business let you track mileage and travel, and petty cash. Important not only for your records but for an IRS audit and your Mileage deduction.*

✓ *HP Laser printer support in the IBM version.*

✓ *Print any check form (even Quicken's) on any printer - even HP Laser printers.*

✓ *PLUS - a Quarterly newsletter to keep you up to date and give you helpful tips on managing your finances and using Checks & Balances.*

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VISA MasterCard **or check accepted** *(No COD)*

Checks & Balances is available for **IBM** and **Compatibles** on **5"** or **3.5"** disk and most **CP/M systems including Kaypro.** If you have both systems, data files are compatible between the CP/M and MS-DOS versions.

of the month preceding the cover date (i.e., the April issue will be delivered by March 20th).

As for your complaint that PROFILES *does not provide "current" computer news, we have never tried to be a "news" magazine. Our editorial goal is to provide you with information on ways to make your Kaypro more useful and to protect your investment, no matter what your level of computing expertise.*

We do realize, however, that our readers enjoy being on the cutting edge of technology and appreciate knowing what innovations will do for them in the future. Beginning in April, we will offer such information on a monthly basis. We don't want to give away all the details—let's just say PROFILES *will help you stay one step ahead.*

Thank you for your letter. It couldn't have been more "timely."

CORRECTION

PROFILES has come a long way from when I got my first complimentary issue for buying a Kaypro. In fact, the December issue, with its Windows cover and liberal use of color throughout the magazine, is one of the best issues I can remember. You and all of the people who work so hard are to be complimented on your very fine publication.

A couple of months ago, you called me to get additional information on a product that Phoenix [Tech Group, Inc.] developed and markets called TheBASE. And, sure enough, in the December issue there was a new product announcement for TheBASE. A couple of things need to be clarified for the benefit of your readers. First, there was an error in the number of fields that TheBASE supports. The correct number is 1,023 fields, limited to 256,000 bytes per record. Second, our corporate address was incorrect. The zip code is 06830 and our main number is (203) 622-3903. Many of your readers have contacted us already—obviously calling information and getting the number that way.

Kenneth A. Brown, President
Phoenix Tech Group, Inc.
Greenwich, Connecticut

Q & A

BY MARSHALL L. MOSELEY

MEMORY ON THE 386

I own a Kaypro 386, and I've been thinking of buying an extended memory board. What should I take into consideration while shopping for one?

The most important thing to remember is that the Kaypro 386 reads and writes to memory 32 bits at a time (a bit is a binary digit, either 1 or 0; it is the smallest unit of information your computer works with). The entire 512 kilobytes of RAM on the 386 mainboard is 32-bit memory, and that is what the computer expects to find when it accesses RAM. Unfortunately, almost every memory board on the market uses 8- or 16-bit memory, even the powerful extended memory boards for the Kaypro 286i and other AT compatibles.

But Kaypro has not left you out in the cold. The Kaypro 386 has two specially designed expansion slots intended for 32-bit memory boards only; they receive and transmit data 32 bits at a time. On the mainboard they are labeled J7/J19, and J8/J20.

There are two companies that make memory boards for these slots: Intel Corporation of Santa Clara, California, and Tall Tree Systems of Palo Alto, California.

Intel makes the SSBC-386 MEM-020 and the PSBC-386 MEM-080. Both boards use 32-bit memory. The 020 is a two-megabyte extended memory board that uses 256-kilobit RAM chips. Its suggested retail price is $800. The 080 is an eight- megabyte, 32-bit board that uses one-megabit chips (a megabit is 1,000,000 bits), and its suggested retail price is $2,695.

Tall Tree Systems makes the JRAM 386-1 and the JRAM 386-2. The 386-1 is a two-megabyte extended memory board, and the 386-2 holds eight megabytes. Both JRAM boards are sold either with or without memory on them, letting you buy the memory elsewhere and install it yourself. Unless you are a computing hobbyist and are familiar with memory installation, this isn't a good idea. Also, neither board can be partially populated; if you buy the eight-megabyte board, you must install all eight megabytes to make it work.

The suggested retail price for the 386-1 without memory installed is $399; with memory, it's $879. The 386-2 goes for $499 without memory, and a whopping $4,090 with memory installed.

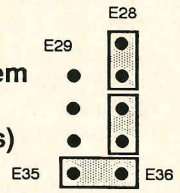
All of these boards work in the Kaypro 386 and they all perform similarly. If either manufacturer has the edge, it's Tall Tree Systems because its products are marginally faster than Intel's.

There is a problem with the eight-megabyte boards, however. They function only if there is already a two-megabyte board in the system. So you can't really buy eight megabytes; you have to buy ten.

Once memory is installed, the Kaypro 386 doesn't know it's there until you tell it. To do this, you have to set a series of jumper switches on the mainboard at positions E19 through E36. They are near the left side of the drive cage, so you have to remove the disk controller board to get to them. These are the settings:

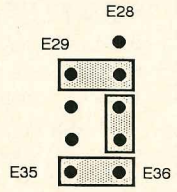
1

512KB on system board (no memory boards)



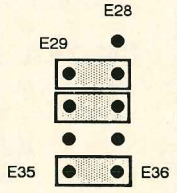
2

2 MB expansion in slot J7/J19



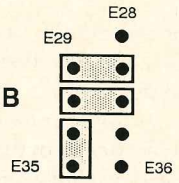
3

2MB each in slots J7/J19 and J8/J20



4

2MB in slot J7/J19 and 8MB in slot J8/J20



Once you set the jumpers correctly, the 386 should use extended memory to fill the RAM up to the 640K maximum.

COMMAND LINE EDITING

Is there any way to repeat a command using a Kaypro PC? Typing the same one over and over can get pretty tedious.

Indeed it can. That's why MS-DOS makes use of the function keys as command line editing keys. On the older Kaypro MS-DOS computers, ten function keys labled F1 thorugh F10 are located on the left side of the keyboard. On the newer models, there are 12 keys labled F1 through F12 above the keyboard proper. After you type a command—DIR, REN, ERASE, anything—and press Enter, that command is held in a special section of memory called the template. Using the function keys, you can copy the template to the current command line while inserting or deleting characters.

F1 lets you repeat a command one character at a time. For example, type **DIR** and press Enter. A file listing will scroll by and the system prompt will return. Tap the F1 key. You'll see D, the first letter in the previous command, reappear. Now tap it repeatedly and you'll see the entire command reappear. Press Escape to clear the command line (the template will remain intact). Now redisplay the entire command by pressing F3. Invoke the command by pressing Enter.

F2 and F4 are also command line editing keys. F2 copies the template into the command line, up to a character that you specify. For example, suppose the command **PROMPT $P** is in the template and you want the next command to stop at the dollar sign. Press F2, then type **$**. The command in the template will be displayed up to—but excluding—the dollar sign.

F4 will copy the template to the command line starting at the character you

specify. Using the above example, if you wanted to start the next command with a dollar sign you would type F4, the dollar sign, and then F3 to display the rest of the template.

To insert characters into the command line, keep pressing the F1 key until you reach the insertion point. Then press Ins, which is located on the numeric keypad. Whatever you type now will be inserted into the template. If you wish to display the rest of the command in the template, just press F1 or F3. Deleting characters requires almost the same procedure: press F1 until you reach the deletion point, then press Del (also on the numeric pad) to delete the desired character. Delete multiple characters by repeatedly tapping Del.

While the MS-DOS command line editing keys are useful, they could stand improvement. It would be nice, for example, to be able to see what you are doing while you delete or insert characters. Also, it would be helpful to have access to the last few commands typed. The public domain program DOSEDIT provides these features. DOSEDIT has key commands that let you move around in the command line a character or a word at a time. Also, DOSEDIT remembers the last 14 commands typed and can place any of them on the command line.

DOSEDIT is available through local bulletin boards and user groups, or on the Kaypro bulletin board, Kaypro Online. Call (619) 481-4374 at 300, 1200, or 2400 BPS with your communication parameters set to 8 data bits, 1 stop bit, no parity.

COMPARING FILES

I sometimes run into a situation where I have two files of the same name and I don't know if they contain the same information or not. Is there any way to compare them?

If they are MS-DOS files, the easiest way to compare them is to list them using the DIR command. Then you can check the time and date in each file and choose the one you want based on your knowledge of when they were last altered.

If this isn't feasible, you can use a file comparison utility program. One is included with MS-DOS. CP/M users will find several good ones in the public domain.

File comparison programs operate either in text mode or in binary mode. In text mode the program reads two text files, usually generated by a word processor, and displays any differences it finds onscreen. In binary mode, the program compares the individual bytes in each file (a byte is a unit of information—eight binary digits; data is stored on disk in the form of bytes), The differences it finds are displayed on screen as hexadecimal numbers.

Two file comparison utilities have been distributed with MS-DOS: COMP.COM, distributed with MS-DOS 2.1; and FC.EXE, shipped with versions 3.2 and 3.21. COMP is a small program (2K) that does binary comparisons only. To use it, simply type the program name along with the file names of the two programs you want to compare. COMP does not use any program switches (characters placed at the end of a command to make it behave in a specified way). If the files match, COMP will tell you so. If they don't, COMP will tell you how far into the file the differences appear.

FC is much larger than COMP (14K). It is also more powerful because it does text comparisons and supports a variety of switches. In its default mode, FC assumes you wish to compare text files. Add the /B switch and it does a binary comparison; add a /C and it will ignore tabs and spaces. Both FC and COMP are fully documented in the MS-DOS User's Guide.

No file comparison utilities were included with CP/M, but there are a few in the public domain. COMPARE.COM and DIFCOM.COM do binary file comparisons, while DF.COM compares text files. All of these programs can be found on on Kaypro's bulletin board, Kaypro On-line. (See the reply to the previous question for directions on calling the board.)

PLOTTERS

I've noticed that advertisements for graphics programs often include detailed, colorful graphs and charts. How are these generated?

They are usually produced with a device called a plotter. A plotter is a computer peripheral that draws high-resolution charts and graphs by means of a mechanically controlled pen or marker. It connects to your Kaypro via the computer's RS-232C serial port. Plotters can have single or multiple pens, with a different color assigned to each pen.

Almost every popular program that generates graphs or charts works with a plotter. Lotus 1-2-3 from Lotus Development does, for example, as do ChartMaster from Ashton-Tate and Energraphics from Enertronics. The graphics generated are very appealing, featuring bright colors and very fine resolution (as fine as one millimeter, or .039 inches, wide).

There are six sizes of plotters: A, B, C, D, E and E-roll. An A size plotter uses standard 8.5 by 11-inch paper. The B size uses 11 by 17-inch paper, the C size uses 17 by 22-inch paper, and so on. The E-roll size sets no limit on the vertical length of the paper; the plotter assumes that it is on a roll.

The most popular plotters are made by Hewlett Packard. In fact, they set the standard for plotters in much the same way that Hayes modems set the standard for modems. Hewlett Packard has developed a specialized "language" that its plotters understand, called Hewlett Packard Graphics Language, or HPGL. Programs that work with Hewlett Packard plotters send them drawing commands in HPGL. Many plotters and some laser printers use HPGL as a graphics language, making them Hewlett Packard or HPGL compatible.

Plotter prices start at around $200 and go as high as $10,000. Using the most inexpensive plotters in a business environment could lead to problems, though, because they can't withstand the daily pounding such use entails. In my opinion, for the office you should look at plotters whose prices start at over $500. Search for one that offers HPGL compatibility and a warranty of 90 days or more at an equitable price.

THE PUBLIC DOMAIN TOOLKIT, PART 1

BY TED SILVEIRA

Though the CP/M public domain doesn't produce much in the way of new programs any more, it still contains a lot of excellent software, including a number of programs that should be on everyone's disks.

HOUSEKEEPING UTILITIES

NewSweep, by Dave Rand, is the one program that everybody should have. It lets you copy, rename, and delete files, either singly or in groups. With it, you can also view text files, dump files to the printer (without formatting, though), set a file's attributes (such as Read Only or System), and squeeze or unsqueeze files. NewSweep tells you the size of each file and how much space is left on a disk, and it can work in any CP/M drive or user area, so it's excellent for hard disks as well as floppies. It replaces PIP and STAT almost entirely, all in one neat 12K package. If you haven't got it, get it—the current (and classic) version is NSWP207.

Unerase is a simple program that you can ignore most of the time, but when you need it, you need it a lot. True to its name, Unerase will recover files that you've accidentally erased, restoring them to life as if nothing had happened. If you run Unerase immediately after accidentally deleting a file, your chances of recovering are close to 100 percent. If you're new to computers and have never accidentally erased a file, don't be fooled—you will, eventually. And when you do, you'll be glad you have Unerase around. The current version is UNERA32.

SuperDirectory, better known as SD, is another simple program. It improves on CP/M's built-in DIR command by listing the directory of files on any disk in alphabetical order and giving the size of each file and the free space left on the disk. You could do the same thing with NewSweep, but SD is much faster, smaller, and more convenient. You'll use it many times a day, so keep it on all your program disks. CP/M Kaypros all came with a close cousin of SD, called D.COM, which does the job just fine. If you don't have D.COM for some reason, make sure you pick up a copy of it or the original SD (current version SD123).

BadDisk, by Irv Hoff, checks floppy disks for bad sectors. When it finds one, it reports the location and then locks out the sector so that CP/M won't try to use it. All floppy disks wear out eventually and start to generate errors, so it's a good idea to check your disks with BadDisk periodically in order to locate trouble spots before they eat your files. Look for the current version, BD04,' or you can look for FindBad, which is almost identical (current version FBAD60).

MAJOR PROGRAMS

MEX (Ron Fowler) and *IMP* (Irv Hoff) are communications programs that connect your Kaypro to the world through a modem and a telephone line. Both programs are sophisticated and reliable, and either can handle 100 percent of the communication needs of most people. They can dial phone numbers from a library, store up to 10 macros, and send and receive files of all kinds using the Xmodem protocol. IMP has been updated more recently and offers better support for 2400 baud modems and for the Ymodem protocol. MEX has a limited scripting ability and comes in a special Kaypro version that can switch between an external modem and the internal modem found in some Kaypros. It's a toss-up, but you definitely need one or the other. These programs are not only your key to the world of public domain software (through the network of CP/M bulletin board systems) but are also often the best way to exchange information with an otherwise incompatible computer (such as an MS-DOS computer).

VDE, by Eric Meyer, is a nifty WordStar-like text editor. I reviewed it here just two months ago, so I won't go over it again, except to say that it's small, fast, and very capable. It's a great little program to keep around for writing notes, programs, messages for on-line transmission, and so forth. Since I last covered it, it has been updated yet again (bug fixes and a few improvements). The current version is VDE262.

Outliner, by David Usher, is an outline processor that's very similar to Thoughtline, the Spite Software outline processor that I've reviewed here before. Outliner can't handle as large a file or as many out-

VDE is a nifty WordStar-like text editor. It's small, fast, and very capable.

line levels as Thoughtline, and it has some other limitations (along with a few advantages), but like VDE, it is small, fast, and capable. If you don't already know what outline processors can do, I haven't got room to tell you here, but if you do know, or if you're interested in finding out, Outliner is a good way to start. Outliner is sometimes found in a Kaypro-only version under the name *OKP*.

GKey (Eric Gans) and *QwikKey* (Anton Fleig) are key-definition programs (also called macro programs), like the commercial programs XtraKey and SmartKey. With these programs, you can redefine keys on your keyboard or keypad so that a single keypress will deliver a whole string of commands or text. They're particularly useful in programs like WordStar for automating repetitive tasks and making the program more user-friendly. Both QwikKey and GKey can distinguish between the Kaypro's keypad and keyboard keys, so you can redefine the keypad number keys but still get the numerals from the upper row of keyboard keys. If you don't already have a key-definition program, pick up one of these—it will change your life (your computer life, anyway). There's not much to choose between the two, though I lean toward GKey. The current versions are GKEY2 and QK21.

Next month, I'll finish this list of CP/M essentials. In the meantime, you can get the programs mentioned here through most CP/M user groups and bulletin boards and on the Kaypro bulletin board at (619) 259-4437.

C.P.I. BUSINESS SYSTEMS

Our software saves you money before it's installed

Computer Professionals, Inc. has been developing computer applications for business and industry for TWENTY years, often working behind the scenes for some of the biggest names in the industry. We have learned how to pack a lot of power into each computer program but we know that raw power and ability is worth little unless coupled with ease of use, good documentation and responsive support. CPI's Business Systems are all these things and more. They run faster, support larger capacities and cost less than any similar systems marketed today. They have been installed by thousands of users (since 1978) and are available from us directly or from your KAYPRO dealer. We specialize in KAYPRO systems.

We know that floppy disk users don't appreciate shuffling four or five disks in and out per application. We know that no users like to abort in the middle of an application to change printer pitch. We know that users don't like copy protection and complex licensing agreements. We don't believe that any systems with these 'features' can be considered easy to use so we left them all out of CPI Business Systems.

Fancy packaging and expensive type set manuals add greatly to the cost of most application packages but have little lasting value. Once your system/s are up and running for a week or so their real worth is their day-to-day productivity and responsiveness; the other materials gather dust. CPI Business Systems include **comprehensive manuals, sample data files, tutorial sessions, etc.—everything you need is included.**

No system is perfect; CPI Business Systems are not exceptions. That's why users are entitled to support when they need it and that's why CPI continues to enhance each system regularly based on user's suggestions.

Most users need a little support when getting started so we include 45 days of FREE support with each application. Others charge hundreds of dollars extra. Users of CPI Business Systems can extend support for a full year for less than ten cents per day per application.

CP/M users may become MS-DOS users in the years ahead; CPI has planned ahead for this possibility and we provide data file conversion service to any user. CPI will, however, continue to support and enhance these fine systems for CP/M users for years to come. Your investments today will not be obsoleted by tomorrow's technology.

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

There are no extra charges for shipping, COD, etc. American Express, Mastercard, VISA card orders welcome. We ship in 48 hours. Please tell us what format you want (11/2X/4/10/16), etc. Demo systems in KAYPRO formats only.

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GENERAL LEDGER

$100.00 CP/M — $100.00 MS-DOS

Comprehensive system with most wanted features. Provides accurate and well organized financial information for your business. Programs adapt easily to your unique needs. Create, modify and list charts (3 formats); make new departments automatically. Easy journal entry process to enter, change, delete, list, save, increment reference-#'s, duplicate data from prior entry, last 7 entries on display; source/run totals; validate account numbers at entry; prior period adjustments; repeating entries for depreciation, etc. Trial Balance high speed posting option plus trial balance report, worksheet, detail general ledger. Financial Statements (4 formats): current year, current and prior year, current quarterly, cumulative quarterly; report on prior period/s; variable # of current period months, optional disclaimer lines, show ratios with 1 or 2 decimals, optional computation of ratios based on non-income amounts. Budget Reporting (3 formats): remaining or variance ($ and %); current, YTD, both; rerun prior periods; variable # months in current period. Full year Detail General Ledger. End-Of-Period makes backup file, updates repeating entries for next month, selects month/year end processing automatically; updates prior year's data. Accounting Transfer inputs data from other CPI Business Systems; posts; prints control reports; multiple transfers. Query Account/s to CRT or printer. Multi-client processing functions included for both CP/M and MS-DOS systems.

CAPACITIES: CP/M – 600 Accounts; MS-DOS – 2000 Accounts – 3-5 Digits for Account Numbers – 99 departments with 3.2 structure.

ACCOUNTS RECEIVABLE

$100.00 CP/M — $100.00 MS-DOS

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

CAPACITIES of 600 Customers (CP/M) 2000 (MS-DOS) – no limit on transactions, multiple customer disks OK.

PAYROLL

$100.00 CP/M — $100.00 MS-DOS

A complete payroll system supplied with current tax routines for every state. Functions include Employee File Maintenance; Employee Lists in multiple levels of detail; Input Worksheets; Time Card Entry; Regular, Overtime, Other, Commissions, Tips, Misc. Pay, Exceptions Processing so you only enter variable data; Weekly, Bi-Weekly, Semi-Monthly, Monthly pay cycles (run individually/combined); Departmental Payrolls; Checks; Check Registers; Earnings Reports; 941s; W-2s; Unemployment Reports; Multi-State; Manual Checks; G/L Transactions. Federal, FICA, State and Local Taxes, Federal/State Add-Ons, FICA, FUTA, SUI, SDI, EIC, 4 other deductions. CAPACITIES – 600/2000 emp. (CPM/MSDOS), 98 Tax File Rcds.

ACCOUNTS PAYABLE

$100.00 CP//M — $100.00 MS-DOS

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

CAPACITIES – 600 Vendors, (CP/M), 2000 Vendors (MS-DOS) – no limit on transactions.

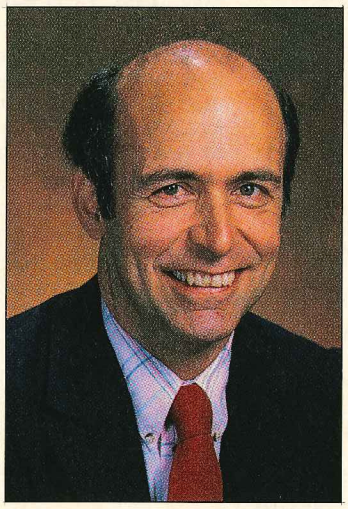
HARDWARE REQUIREMENTS

CP/M:	64K (53K TPA) & CP/M 2.0 or higher.
MS-DOS:	128K (or more) & MS-DOS/PC-DOS 2.0 or higher – ANSI.SYS.
Printer:	132 columns (compressed pitch supported), continuous forms.
Disk/s:	Dual Floppies/Hard Disk/Both – 191K recommended, less works.
CRT:	80/24 with Clear, Home, Clear to EOL, Up, Down, Left, Right.

CURRENT UPDATE:

WE ARE PLEASED TO ANNOUNCE OUR CONTINUING SUPPORT FOR CP/M USERS IN 1988

In 1988 CPI will begin releasing a new line of professional accounting systems for MS-DOS users (512K and hard disk required). These advanced systems provide context sensitive help, full screen displays (monochrome/ CGA/EGA), color and laser printer support, print spooling, full screen reporting, keyboard macros, application templates, automatic installation, etc. Each application will retail for $250 and includes 6 months of system updates and telephone support. More on the professional series in the next issue...


GAIL GOODENOW

BY TED SILVEIRA

WORDS AND PICTURES: MORE RESOURCES FOR VENTURA PUBLISHER

Last month I reviewed one of two major books on Ventura Publisher, *Ventura Tips and Tricks*, by Ted Nace. This month, I'm going to review the other, *Inside Xerox Ventura Publisher*, by James Cavuoto and Jesse Berst ($19.95, New Writers Publishing, P.O. Box 4846-V, Thousand Oaks, CA 91360).

Unlike *Ventura Tips and Tricks*, which begins immediately with three tutorials, *Inside Xerox Ventura Publisher* begins in a more traditional way, by giving you some background on desktop publishing and Ventura Publisher itself. The first chapter defines desktop publishing, discusses its benefits and shortcomings (a good idea—the shortcomings are often ignored amid all the current hype), outlines the advantages of Ventura Publisher over other (unnamed) desktop publishing programs, and gives a brief review of the traditional publishing process.

The second chapter opens with a very short (10-minute) tutorial on Ventura, then discusses the unique aspects of Ventura's user interface (the GEM system, the mouse, menus, dialog boxes, frames and pages, etc.), passes on to what it calls the "Ventura formula" (text + pictures + style sheet = document), and finally ends with an explanation of traditional typographic terms (picas, points, ems, ens, etc.).

Much of the information in these first two chapters is very useful, especially for people new to publishing, but the overall effect is a bit confusing because the chapters consist of short sections strung together without a clear sense of direction. The description of the traditional publishing process, for example, would be more enlightening if it preceded the discussion of desktop publishing's benefits and shortcomings. In addition, the tutorial at the beginning of the second chapter is really too brief to be useful.

Once past the opening two chapters, however, the book settles into a clear and logical organization, proceeding through chapters on text, pictures, style sheets, document layout, and printing. These chapters are the heart of the book and contain a lot of valuable information. The chapter on text, for example, discusses creating text not only with various word processors but also with spreadsheets and database programs. It also covers Ventura's tagging system (so you can insert format tags directly in the text with your word processor) and explains the program's system of font codes.

The chapter on pictures covers the difference between bit-mapped and object-oriented graphics and gives useful tips for working with graphics from a number of different programs, including Lotus 1-2-3 and AutoCAD. It also briefly reviews scanners and screen capture utilities.

The chapter on style sheets explains not only how to create and use these powerful elements but also how to edit and maintain them once created. It includes very useful discussions of all the elements that can go into a style sheet, including the tricky ones such as space or rules above or below paragraphs.

The chapter on document layout is also very meaty, covering everything from combining text files and using the extended character set, through creating footnotes and indexes, to scaling graphics and placing captions. The chapter on printing covers important topics such as multi-chapter printing, downloading fonts, and creating color separations, but it's rather skimpy, especially compared to the previous two chapters.

The final two chapters cover more advanced topics such as drop caps, reverse type, leading and kerning, hyphenation, and memory management (like most desktop publishing programs, Ventura is a memory hog).

As with *Ventura Tips and Tricks*, the real value of *Inside Xerox Ventura Publisher* lies not in the rehashing of information you can find in the Ventura manual (which is usable, if not outstanding) but in the numerous tips scattered throughout. You'll learn, for example, how to create a dashed vertical rule even though Ventura doesn't provide one (create a frame, put a dashed ruling box around it, and then give it a width of 0). You could waste hours trying to figure that out on your own. My one complaint about the tips in this book is that many of them are buried in the text rather than

The real value of Inside Xerox Ventura Publisher *lies in the numerous tips scattered throughout.*

being clearly set off (by placing them in a special box or at the end of each chapter, for example). That makes them harder to find when you need them.

I have one other gripe about this book—its design. The text is printed in a rather heavy typeface (ITC Bookman) in a larger than usual size (12 point). It's also set in a single wide column with narrow margins (considering the size and weight of the type) so that the pages have a close, crowded feel and the subheads don't stand out as clearly as they might. By contrast, *Ventura Tips and Tricks* has a lighter and more open feel—it's set in 10 point Times, two columns per page, with more space around the subheads so they stand out more clearly.

Though I prefer *Ventura Tips and Tricks* to *Inside Xerox Ventura Publisher*, I really recommend that you buy both books if you're planning to use the program. Both are full of good information, and each has some valuable tips that the other lacks. If you get even one useful tip from each book, that book has paid for itself.

PICTURES FOR SALE

If, like me, you have no talent for drawing, either on the computer screen or off, you've probably been intrigued by the disks of clip art that are now available from various companies. These disks contain collections of drawings pertaining to different subjects (business, maps, holidays, sports, etc.), and when you buy a disk, you gain the right to use the art it contains. Potentially, clip art can be a great help to budget-minded people who want a drawing or two to dress up a newsletter, brochure, or advertisement.

Recently, I had the chance to look over a volume of PC Quik-Art, from the company of the same name. The volume I received contained 204 different drawings (on seven disks) of business-related art, a very generous selection. Unfortunately, the results were disappointing.

First of all, in common with most computer clip art, the PC Quik-Art drawings are bit-mapped "paint" files. Bit-mapped files are limited to a set resolution—no matter how high the resolution of your printer or typesetter, the bit-mapped drawing will always print at its original resolution, usually 300 dots per inch or less. Generally, the resolution of such drawings is good enough for informal newsletters but not for books or other professional publications. This is a problem with all bit-mapped graphics.

PC Quik-Art drawings are bit-mapped files, limited to a set resolution—usually 300 dots per inch.

Second, again in common with most clip art, the PC Quik-Art drawings in this volume are generic, both in subject matter and in style. You get a series of cartoon-like figures, "realistic" figures of wholesome-looking men and women, and dollar signs and other symbols, all of which will look immediately familiar because you've seen them (or their first cousins) many times before on fliers from your local supermarket, in the yellow pages of the phone book, and in ads from the back pages of your newspaper. Clip art almost has to be generic, of course, to appeal to the widest audience, but these drawings seem not only generic but also dated, as if they were originally drawn in the 1970s, 1960s, or even 1950s.

Third, the drawings in this volume seem to have been translated into computer form from existing books of clip art by means of a scanner rather than drawn directly with a computer graphics program. That's the only thing I can think of that would account for the fuzziness of many of the lines and letters in the drawings. If you have a computer paint program like PC Paintbrush, you can clean up the drawings and remove the fuzziness, but it's a tedious process (though easier for most people than trying to draw the figure anew).

The PC Quik-Art company puts out many volumes of clip art, but judging from the samples of other volumes included on the volume I received, they are all of much the same style and quality. If you're looking for some generic art for a school newsletter or a low-rent brochure or ad, PC Quik-Art might have what you need. But if you aim higher, you should look elsewhere or, better yet, start saving your pennies to hire an artist.

MORE FROM PC QUIK-ART

Along with its volumes of clip art, PC Quik-Art also markets a promising program called The Graphics Link. The Graphics Link actually translates graphics files between different graphics programs, including both MS-DOS and Macintosh formats. I'll report on it next month.

PC Quik-Art
$59.95/volume
PC Quik-Art, Inc.
394 S. Milledge Ave., Suite 200
Athens, GA 30606
(800) 523-1796

COMPUTERIZED COPS AND ROBBERS

RICHARD STARKMAN

BY BROCK MEEKS

A "cops and robbers" scenario is being played out with cool calculation in the online world, and it's taking on all characteristics of the infamous shoot-out at the OK Corral.

Here are some clips randomly chosen from my file called "online crime blotter":

• Two thousand students at Texas Tech University in Lubbock were involved in a scam to steal as much as $1 million worth of MCI Corporation's long-distance phone service. Investigators nailed a computer cracker who invaded the phone system and obtained access codes that were then used by students living in campus dormitories.

• Five teenagers from Berks County, Pennsylvania, who were using their home computers and modems along with stolen credit card numbers to order computer equipment and steal online access to CompuServe, were apprehended by local and federal authorities. The local police called in the Secret Service for help.

• Robert Cheatham of the Bronx, New York, pleaded guilty to stealing $5 million in electronic equipment. During his confession, Cheatham outlined his use of a modem to tap into the computers of corporations around the country, figure out their billing system, and order equipment. Cheatham detailed his operation in a five-hour confession that left law enforcement officials dumbfounded.

• McGraw-Hill's Byte Information Exchange was "terrorized" for over a year by a man who continually logged on using stolen credit card numbers. With each online "raid," the man slung incredible racial slurs and peppered hundreds of messages with four-letter words. He was finally caught through a nationwide "electronic manhunt."

And the litany of crimes goes on and on. The "good guys" are fighting back, but the results may be more troubling than reassuring.

THE RIGHT TO WHISPER

The advancements in communications technology have outpaced the nation's privacy laws. Spawning a vast array of new surveillance methods, communications advancements "may be robbing us of our right to whisper," the Office of Technology Assessment (OTA) claimed during a series of hearings on the subject of privacy and "new technologies."

The advancements in communication technology have outpaced the nation's privacy laws.

The OTA claimed that Americans have little legal protection against a burgeoning arsenal of electronic spying devices, whether used by government or private adversaries.

The OTA report, requested by House and Senate committees, notes that many new and uncontrolled methods of surveillance are made possible by the very technologies more and more Americans are using—electronic mail and computer conferencing among them.

"The law has not kept pace," the agency said. "Although the principle of the Fourth Amendment is timeless, its application has not kept abreast of current technologies."

As a result of all the attention given to computer-related crime, much of it in the *War Games* vein, law enforcement officials have joined the electronic battle, and so far it's one with few constraints.

ELECTRONIC STING

Two years ago, a small ad was placed in several publications that read in part: "Wanted: Computer-literate individuals to train for a new high-tech unit. Applicants should be knowledgeable of various computer-mediated communications methods." The ad was placed by the Federal Bureau of Investigation.

The response must have been overwhelming—no subsequent ads were ever placed. The training program worked so well that several other government agencies sent their personnel to the FBI school in Quantico, Virginia; local law enforcement agencies from around the nation also began sending personnel.

Richard Louv, in his nationally syndicated column, "The New American," wrote about the use of new technologies by police, saying: "What we've got here [in Los Angeles and San Diego] and in a number of other police departments around the country is an Information Age arms race—dueling computers—between the New Cops and the New Robbers."

One of the methods used by these New Cops was outlined in the April 1986 issue of *InfoWorld*: A growing number of law enforcement agencies nationwide are running bulletin board "sting" operations.

A "sting board" is a BBS set up by a police department (or the FBI, or the Justice Department, or some other agency) to attract users of dubious (read: illegal) in-

A "sting board" is a BBS set up by a police department to attract users of "dubious" intent.

tent. Unwitting users call and begin to fill the board's various databases with a variety of messages—some of them illegal.

One such sting operation was outlined in the *InfoWorld* story. After two years of running a sting board called the Underground Tunnel, the Austin police department dropped the hammer on the board's users. Sgt. Robert Ansley, who ran the board, said it was run as a test to see how many "pirates" could be snared by it.

"Initially, the board was designed for information gathering," Ansley said, "just to find out what was going on and decide the best way to deal with it." Ansley claims to have gathered various illegal computer-related items, such as stolen long-distance access codes and passwords to mainframe computers.

The sting operation raised doubts among the users of the board; many felt "entrapped." Jim Harrington of the Texas Civil Liberties Union says Ansley's online efforts come close to "high-tech entrapment" and unwarranted government interference in private lives. Apparently some of the former users took the matter quite personally—Ansley reported threats on his life soon after he brought the board "out of the closet."

There was also concern about the privacy and sanctity of electronic mail left on the board. Michael Whalen, former managing editor of the *Daily Texan*, a student newspaper of the University of Texas, said: "Ansley said users are foolish if they don't think a system operator reads mail left on the board."

RANK AND FILE

Tired of being called computer illiterate, the Los Angeles police department created a computer fraud unit. The special division was organized in response to at least three factors: a greater incidence of crime involving computers; public awareness that these crimes pose a threat to individuals; and a rush by the state legislature to enact laws making it a crime to invade someone else's computer system.

Clifton Garret, Los Angeles County assistant attorney, sends a warning to those who use modems for illegal purposes: "Modern electronic cops have the knowledge, persistence, and abilities to apprehend and prosecute computerized robbers."

One company assisting the New Cops is Teleconnect, a Cedar Rapids, Iowa, telecommunications firm. Teleconnect says its clients have had unusually few incidents of computer intrusion because of a new system that monitors the lines.

Vice President Casey Mahon says, "It's more likely that we would discover hacking before customers see it on their bill.

If a computer line can be monitored for "unusual" calling patterns, might messages be monitored too?

Any unusual calling pattern is immediately flagged and investigated." Which brings up an urgent question: If any computer line can be monitored for "unusual" calling patterns, might it also be used to monitor "unusual message traffic"?

Mahon refused to comment.

In the emerging world of cellular phone communications, the battle is also raging. Initially a status symbol of the important and powerful, the cellular phone has become a tool for "cellular bandits." Authorities have documented everything from drug deals to investment scams conducted via cellular phone.

Because listening into cellular phone conversations is a federal crime (thanks to the Electronic Communications Privacy Act passed in 1986), law enforcement agencies are placed in a thorny situation.

John Markoff, writing for the Scripps Howard News Service, reports that "police agencies use scanners [to eavesdrop on cellular conversations] to develop intelligence information on criminal activities, but never present the information in court."

Larry Lippman, a forensics scientist at Recognition Research Corp. in Clarence, New York, is quoted by Markoff regarding law enforcement's use of scanners: "None of the information [gathered through use of a scanner] was ever used in court per se, but it may have contributed to the 'probable cause' for looking in a certain public place at a certain time. When any investigator was pressed in court for the 'basis of probable cause,' the information was attributed to an 'anonymous informant.' "

THE VERDICT IS...

Though law enforcement officials can wander at will through any confiscated computer data (including electronic mail, electronic storage areas, and databases) there is a catch—a legislative one, according to Jay Bloombecker, director of the National Computer Crime Center.

According to Bloombecker, although the majority of states have computer crime legislation on the books, authorities find it difficult to gain convictions using these laws.

Federal rules of evidence make no mention of computer data, so prosecutors often find themselves in a quandary over the admissibility of such evidence. Computer printouts may be fine substitutes for hard copy in the office, but they don't compare to handwritten documents in a court of law.

"It's so subject to chance," says Don Foster, top computer crime expert for the Department of Justice, speaking of apprehended computer data. "Who knows who put the information in there, or made changes to it? It's not impossible, but nearly impossible to make good use of it."

Rest assured, however, they will try.

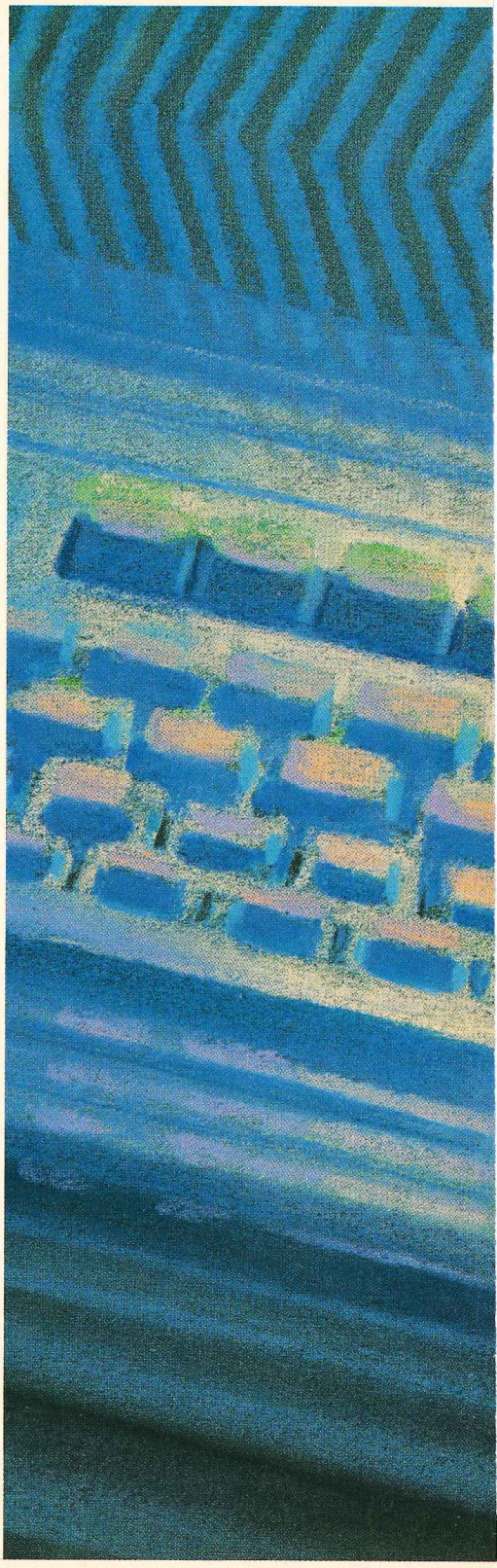
In this game of cops and robbers, the stakes are high. Legislation is being written and updated yearly, but the "smoking cursor" may count among its victims' rights and privileges not easily regained.

THE POWER USER'S GUIDE

Undocumented techniques and time-saving procedures.

BY ROBERT J. SAWYER

With the release of updated versions of WordStar for both MS-DOS and CP/M, users of this most venerable word processing program now have many new and powerful features at their fingertips. This article will help you get the most out of WordStar 4.0.



OPENING MENU SHORTCUTS (CP/M AND MS-DOS)

From the Opening Menu, you can change the help level with the undocumented **H** command, instead of **JJ**, saving a keystroke.

Pressing a command letter followed by ⟨ESC⟩ will execute the specified command on the last file you worked on without you having to re-enter the file name. For example, **D⟨Esc⟩** will re-open the last document you edited.

To see a list of file types currently excluded from the directory display, issue **JF**.

The file delete command, **Y**, now supports wildcards. Y followed by *.BAK will erase all back-up files on the logged disk or directory.

MOVING AROUND THE FILE DIRECTORIES (MS-DOS ONLY)

MS-DOS WordStar now has point-and-shoot file directories. Instead of typing a file name at an Opening Menu or Block Menu prompt, press **^X** or the down arrow. This will drop your cursor into the file directory. According to the documentation, you can use the cursor keys to move to the file name you want, and then press Enter to select it.

I've stumbled across some undocumented techniques that make cruising the file directories even easier. **^A** or **^F** will skip past sub-directory listings. Typing a letter jumps to the first file name that begins with that letter. Typing the same letter again jumps to the next filename that begins with that letter. Since a square bracket comes after Z in ASCII alphabetical order, typing **]** will usually jump to the last file on the list.

MOVING FILES (MS-DOS ONLY)

Here's another undocumented goody I found by accident: MS-DOS WordStar 4.0 can move files from one subdirectory to another, using its rename commands. Issue **E** from the Opening Menu or **^KE** while editing and respond to the prompts like this:

Document to be renamed? **OLDNAME**
What do you want its new name to be?
\NEWDIRECTORY\NEWNAME

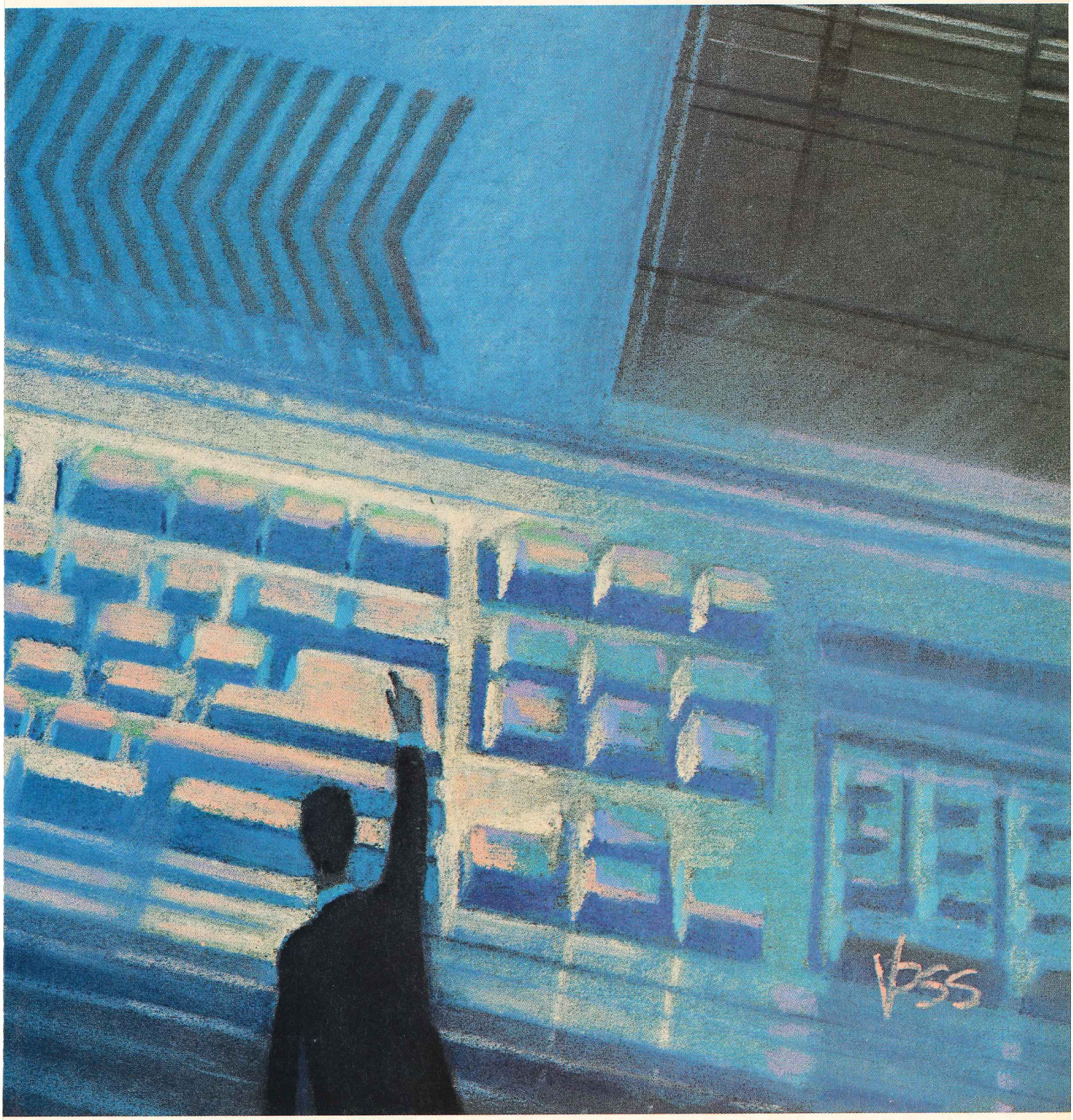
If you want to move the file without renaming it, make NEWNAME the same as OLDNAME.

DELETE TO END OF FILE (CP/M AND MS-DOS)

WordStar's new **^QT** command deletes from the cursor position up to and including the next character typed. It occurred to me to try ^QT followed by **^Z**, which is what WordStar uses to mark the end of a file. WordStar won't delete ^Z, so this command does what I'd hoped it would do: eliminate everything from the cursor position to the end of the document.

ILLUSTRATION BY TOM VOSS

TO THE NEW WORDSTAR



^QT^Z does what I hoped it would: eliminate everything from the cursor to the end of the document.

I told MicroPro about this trick, and they ran their own tests, certifying its safety—at least in MS-DOS. It works in CP/M, too, but hasn't been extensively evaluated. Be warned: in this one special case, ^QT does not tell you if the deletion won't fit into the unerase buffer.

FORCING INSERT ON (MS-DOS ONLY)

Consider this macro: **^QS^PB^QD^PB** (Go to beginning of line [^QS], turn boldface on [^PB], go to end of line [^QD], turn boldface off [^PB]).

If insert is on, issuing this macro will boldface the current line, inserting ^PB just before the first character. But if insert is off, this macro overwrites the first character with ^PB.

In macros, the undocumented MS-DOS WordStar command **^Q~** will force insert on while the macro is executing. Once the macro is finished, it will restore insert to whatever its state was before you issued the macro. Thus, **^Q~^QS^PB^QD^PB** will always properly boldface the current line.

CHANGING BLOCK MARKERS (CP/M AND MS-DOS)

If your cursor was at the left edge of the screen, old WordStar used to let you mark a line of text with three commands: ^KB, ^X, ^KK. In the new MS-DOS version, you can't do that anymore because the **⟨B⟩** and **⟨K⟩** block markers push the cursor out of vertical alignment. To mark a line now requires **^KB, ^X, ^S, ^S, ^S, ^KK**.

MicroPro will probably fix this in WordStar 5, but, until then, here's a work-around. Using WSCHANGE, the WordStar customization program, you can make the block markers invisible, like those in the Notepad of Borland's SideKick, without affecting block highlighting.

Go to WSCHANGE menu D-B-D-C. That is, first select menu option D (WordStar), then B (Editing Settings), then D (Blocks), and then C (Beginning block marker).

WSCHANGE will show you ⟨B⟩, the default value stored at this address (which MicroPro calls BBLOCK), and ask "Do you want to change this? (Y/N)". Answer "Y". At the "Enter new value" prompt, just hit return. This will enter an empty string and take you back to the "Blocks" menu. Select item D (End block marker or address KBLOCK) and make the same change for ⟨K⟩.

^X will jump you back to the top of WSCHANGE and Y will let you exit.

If you're a CP/M user, you have an easier time: you can choose whether the block markers deflect the cursor out of vertical alignment by changing the toggle switch at WSCHANGE menu D-B-H-D (address BLKFLG). But if you have a 1984 or later CP/M Kaypro (one that's capable of onscreen highlighting), you might want to use the procedure above to change the block markers to just B and K, without the screen-cluttering angle brackets.

DISABLING WORD-WRAP AT HYPHENS (MS-DOS ONLY)

WordStar 4.0 has the annoying habit of wrapping words at hyphens. This can cause equations, such as 7–4=3, to be split over two lines, and words like "co-habitat" to be put asunder.

I complained about this on CompuServe's excellent MicroPro forum, and, within days, science-fiction novelist John E. Stith from Colorado had posted this elegant solution.

Patch WordStar so that some rarely used character takes the place of the hyphen for word-wrap. To find the location to patch (which varies depending on when MicroPro issued your copy of WordStar 4.0), use the program DEBUG.EXE (supplied with the MS-DOS operating system). Type what appears in boldface below.

```
C>ren ws.exe ws.tmp
C>debug ws.tmp
-s cs:0000 ffff 0c 01 c3 3c 2d
```

DEBUG will display two four-digit hexadecimal numbers separated by a colon. Add 4 hex to the second number and substitute the result for XXXX below. (The value of XXXX for the original version of WS.EXE is 9a72; for the 5-22-87 version, it's 9b00.) Continue in DEBUG as follows:

```
-e cs:XXXX
-YY [where YY is hex for the new wrap-around character,
e.g., 7E for ~]
-w
-q
C>rename ws.tmp ws.exe
```

With this patch in place, only hyphens entered with WordStar's "Hyphen Help" feature will break words during word wrap.

I haven't been able to find a patch to disable word wrap at hyphens in the CP/M edition, but, for those who want to go

The patch point for disabling word wrap in the CP/M edition must be hidden in an overlay file.

looking, I'll give you a hint: I tried changing all hyphen characters in WS.COM and that didn't do the trick, so the appropriate patch point must be hidden in one of the overlay files.

CHANGING THE DECIMAL CHARACTER (CP/M AND MS-DOS)

Most Europeans and French Canadians use a comma (2C hex) instead of a period (2E hex) as the decimal character and a space (20 hex) instead of a comma to separate thousands in a number. WordStar needs to know which characters you're using if its decimal tabbing and ^QM Math Menu are to function properly.

In CP/M WordStar 4.0, these characters can be changed from WSCHANGE menus D-B-F-O (address COMCHR, the thousands separator) and D-B-F-P (address DECCHR, the decimal character).

Courtesy of MicroPro, here's how to change them in MS-DOS WordStar 4.0 using DEBUG.EXE. Type what appears in boldface:

C>**debug wsmsgs.ovr**
-**e4260**
4FD7:4260 2E. **2c** [changes decimal character]
-**e425f**
4FD7:425F 2C. **20** [changes thousands separator]
-**w**
Writing AA94 bytes
-**q**

WordStar 4.0 provides a predefined Shorthand character, **$**, that formats the result of the last math calculation as a dollar value, with the thousands grouped together and two digits to the right of the decimal character. You have to change the way this command works if you want to use <ESC>$ after making the modifications I've just described. At WSCHANGE menu D-C-D-E (MS-DOS) or D-C-D-C (CP/M), you will see that the default formatting style for this macro, stored at address DOLLAR, is:

--,---,---,---.99

Change it to:

-- --- --- ---,99

PRIMARY AND SECONDARY INDEX ENTRIES (CP/M AND MS-DOS)

WordStar 4.0 gives you two ways to put a normal entry into your index. You can either surround the word or phrase as it appears in your document with **^PK** markers, like so:

^PKKaypro Corporation^PK

Or you can put a **.IX** command in your text, thus:

.IX Kaypro Corporation

Either way, WordStar's indexing command, invoked by **I** from the Opening Menu, will produce an index entry that looks like this:

Kaypro Corporation, 7

Good indexes differentiate between passing mentions of a topic and places where the author discusses it in depth. This is usually done by boldfacing page numbers for the latter. WordStar can do that for you, too. If you use a **.IX +** command instead of simply .IX, the current page number will appear in boldface (that is, surrounded by ^PB markers) in the index file. So if on page four of your corrected document you add a line like this:

.IX⟨space⟩+⟨space⟩Kaypro Corporation

WordStar will produce a combined index entry that looks like this:

Kaypro Corporation, **4**, 7

This technique is documented in the CP/M WordStar 4.0 manual, but not in the MS-DOS manual. However, it works equally well for both versions, except that very early copies of MS-DOS WordStar 4.0 (those with WSPRINT.OVR files dated before 4-30-1987) can't do secondary index entries.

CROSS REFERENCING PAGES (CP/M AND MS-DOS)

Suppose, on page 14, you have a line like this:

The CN Tower in Toronto is the world's tallest free-standing structure.

And, on page 22, you want to make this reference:

Although the world's most voluminous building is at Cape Canaveral, the tallest is in Toronto (see page 14).

You could insert the page number yourself, but if the document gets rearranged during editing, the page number might be wrong. It's much better to let WordStar automatically insert the page reference. To do so, go back to page 14 and put this dot command just before the line about the CN Tower:

.SV CNT = &#&

&#& is a new standard MailMerge variable equal to the current page number. **.SV** is the old "Set Variable" MailMerge command. **CNT** could be any legal variable name, but here it's just the initials of "CN Tower." Thus, that command says "set the variable called CNT to the value of the current page number."

Now, go to page 22 and, instead of typing "see page 14," use this instead:

see page &CNT&

If you merge-print this file, WordStar will insert the correct page reference for you. The only restriction is that the .SV command must come before the &CNT& variable in the document.

MS-DOS WordStar 4.0 has a bug in the variable for keeping track of the current line number, &__&.

By the way, WordStar 4.0 also has a variable that keeps track of the current line number, &__&. You could use it to automatically number lines in BASIC programs or legal documents. Note, though, that there's a bug in the MS-DOS version, so that &__& is really equal to the current line number minus 1.

MANIPULATING BOXES (MS-DOS ONLY)

WordStar's new **^K**" command converts characters in a marked block to uppercase. Likewise, **^K**′ forces characters to lower case. Without sacrificing this capability, I worked out a simple patch that will cause ^K" to also change single-outline boxes that you have marked as a block to double-outline boxes. The same patch will make ^K′ do the reverse. Type the following as a non-document file and read it into WS.EXE using the autopatcher command at WSCHANGE menu E-A.

```
CASTBL+11=CD,C4
 =BA,B3
 =C9,DA
 =C8,C0
 =BB,BF
 =BC,D9
 =CC,C3
 =B9,B4
```

This patch uses spare bytes in the table that contains accented extended-character case conversions. It only affects the four corners, the vertical and horizontal lines, and the left and right intersecting line characters.

Speaking of boxes, the double-outline ones that WordStar draws around its menus look cluttered. If you prefer single outlines, this little patch will do the trick. Type it as a non-document file and read it into WS.EXE using WSCHANGE's autopatcher.

```
BOXCHR=C4,B3,DA,C0,BF,D9
```

BINDING MARGINS (MS-DOS ONLY)

If you're going to photocopy your printout onto both sides of sheets of paper and then bind the pages down the left edge, you may want to have a greater margin on the left side of the paper than on the right. MS-DOS WordStar 4.0 finally provides a way to handle originals destined for two-sided copying. While not elegant, it does work.

Make two copies on disk of your document. At the beginning of the first copy, insert a page-offset dot command to give you a wider left margin than right. If you're using standard paper and WordStar's line length and pitch defaults, .PO 15 will give you a 1.5 inch left margin and 0.5 inch right margin.

At the beginning of the second copy, insert a command to make the right margin bigger than the left. The command .PO5 will give you half an inch on the left and three times that on the right.

Now, issue **P** (or **M**, if you prefer to print with MailMerge) from the Opening Menu. Specify your first file as the document to print. At the "Starting page?" prompt, enter the letter **O** (for "Odd"). WordStar will then print only the odd-numbered pages from your first file. Later, repeat the process with the second file, but specify **E** (for "Even") and you'll get just the even-numbered pages printed. When both printouts are done, you can shuffle the pages together.

CALLING ANOTHER PROGRAM WITH ONE STROKE (CP/M ONLY)

The CP/M version of WordStar 4.0 has an extra command letter on its Opening Menu. By default, **S** tries to call up The Word

WORDSTAR SHORTHAND

SAMPLES OF MACROS YOU CAN CREATE

WordStar now includes its own keyboard macro processor, "Shorthand." The macros that follow, each of which uses some commands only available in WordStar 4.0 and above, are designed to show you the wide range of tasks that you can perform with Shorthand. (Each macro appears in boldface, followed by a description of its function.)

CP/M users don't have the ^Q~ command, discussed in the accompanying article, so they should leave it out. For them, macros that would have contained ^Q~ will only execute properly if insert is on.

It's not mentioned in the onscreen help, but pressing ^R while revising a Shorthand definition will bring the old macro into the edit window. If you run out of macro space, you can increase the size of the Shorthand buffer (address HANMAX) from WSCHANGE menu C-C-I (MS-DOS) or C-C-D (CP/M).

For a more detailed discussion of creating macros with Shorthand, see "WordStar 4.0 Macros" in the February 1988 *PROFILES*.

^Q~^[@ at ^[! For MS-DOS only; inserts the current date and time. *New features:* ^Q~ (force insert on); pre-defined date (^[@) and time (^[!) macros; macros calling other macros.

^QT. Delete to end of sentence. *New features:* ^QT (delete up to and including next character typed).

D\Journal^M^QC^KB^[@^KK^K": MS-DOS only. Opens a file called "Journal" in the root directory, jumps to the end of the file, reads the date from the system clock, marks the date as a block, and converts it to capital letters. (You could shorten the filename "Journal" to conserve macro space.) *New features:* subdirectory support; ^[@; ^K" (convert marked block to upper case).

^F^QH^M^KB^F^QG^M^KK Mark paragraph. *New features:* ^QH (jump back to next character typed); ^QG (jump ahead to next character typed).

^QS^S^F^QY^U^QS^N^V.TC^U^QS^OR70^M^I^I^I#^OR65 ^M^V Easy table of contents. Takes the current title line, whether centered or not, and makes an appropriate ".TC" command, complete with the same print enhancements as used on the title.

Notes on use: 1. You must use the default right margin of 65. 2. You must use WSCHANGE menu D,A,C,A to install only two tabs before column 65 and a third past the right margin at column 69. If you want to install more tabs, increase the number of ^I commands in the macro by one for each additional tab. 3. You must have insert on before issuing this macro (since it turns insert off to tab the cursor without inserting blanks, you can't use ^Q~). 4. This macro will work from anywhere on the title line. 5. This macro will not work on the first line of a file.

New features: ^U (unerase) to make quick copy; ".TC" (table of contents).

^QG^P^S^G^KB^L^G^KK^K"^[U Finds underlined text and converts it to all capitals (e.g., finds: "This is a ^Sgood^S macro" and converts it to "This is a GOOD macro"). Useful as a prelude to converting a WordStar file to ASCII so that emphasis in original text will not be lost. This macro assumes that you have installed it as Shorthand character "U." The ^[U at the end makes the macro recursive, calling itself over and over again. *New features:* finding print control codes (this works with ^QA, ^QF, and ^QH, too); ^K"; recursive macros. *Note:* a recursive macro leaves its own Shorthand character at the end of the file when it finishes running. You can delete it with ^H.

—R.J. Sawyer

WordStar's new command line arguments let you create powerful batch and submit files.

Plus spelling checker, which, if you have a Kaypro with single-sided drives, won't fit on your WordStar program disk. Fortunately, you can easily patch what program S summons up.

For instance, WordStar comes with WC.COM, a utility for counting words. WSCHANGE menu D-C-A-A (address SPCMD) will ask you to supply a "Command to run spelling check." If you change the default value of TW to WC, **S** will then call up WC.COM. If you have this program on your WordStar disk, you can get at a total of the words in the last file you edited by issuing S followed by ⟨ESC⟩. Or you can specify a different file to tally by typing **S FILENAME** and hitting Enter.

You can make S call up any other small program, such as the file-management utility NewSweep. If you do choose a program that doesn't accept a file name on its command line, then you must prevent WordStar from trying to pass on the name of a file to it. You do that by turning off the "Ask for document to be checked?" feature at WSCHANGE menu D-C-A-B (address SPFILE).

WORDSTAR AND BATCH OR SUBMIT FILES (CP/M AND MS-DOS)

WordStar now lets you specify editing mode on the command line:

C⟨**WS FILENAME D** [for document]
C⟨**WS FILENAME N** [for non-document]

It also lets you begin printing using the default driver immediately upon booting up:

C⟨**WS FILENAME P** [or **M**, if you prefer MailMerge]

You can add an X to the command line so that WordStar will quit once printing is finished.

In MS-DOS and CP/M, you can create files listing series of commands you want to execute consecutively. MS-DOS calls these "Batch" files; in CP/M, they're known as "Submit" files. WordStar's new command line arguments let you create powerful batch and submit files. Consider this one:

```
DBASE
WS FILENAME.MRG MX
DBASE
```

Executing such a file would boot up dBASE (a database management program), let you select a series of addresses to export to a MailMerge-readable data file (use the dBASE command "copy to FILENAME.SDF delimited"), have WordStar automatically merge-print personalized letters to all the people mentioned in FILENAME.SDF (assuming that FILENAME.MRG is a Mailmerge template with a ".DF FILENAME.SDF" command at its beginning), and then, when the printing is done, automatically return you to dBASE.

MODIFYING THE COMMAND KEYS (CP/M AND MS-DOS)

My first article for *PROFILES*, "Do It Your Way" (July 1986), told how to modify WordStar 3's keyboard command tables, altering which keystrokes invoke which functions. Similar but less flexible modifications can be made to WordStar 4.0. Its keyboard tables are located at the beginning of WSMSGS.OVR and are shown in Figure 1 on page 25. You can modify these tables to suit your preferences using a debugging tool. For instance, if you swap P and M in Keyboard Table 1 (which governs the Opening Menu), P will call merge-printing and M will call normal printing.

Keyboard Tables 2 and 3 contain the control codes you can use while editing a file. All possible control codes are listed in Table 2. Table 3 contains only those that are also allowed under preview mode (MS-DOS) and protected mode (MS-DOS and CP/M). If you want to change one of WordStar's control codes, you should do so in both Table 2 and Table 3.

Keyboard Tables 4, 5, and 6 contain the letters and symbols that are acceptable after ^K, ^Q, and ^O, respectively. These are the tables that you are most likely to want to modify. For instance, if you find yourself constantly hitting **^QU** (reformat document) when you mean to hit **^QY** (delete to end of line), you can make the former **^Q%** by changing the byte at offset 108 hex (MS-DOS) or 218 (CP/M) from 55 to 25, which is hex for the percent sign. Or, if you prefer to eliminate ^QU altogether (^QQ^B does the same thing, anyway), then replace the byte with FF hex.

The new WordStar has a lot of power, and learning to harness it can be half the fun. Enjoy.

Robert J. Sawyer hosts the radio program "Talking About Computers" heard on CIUT-FM, Toronto. You can reach him in care of PROFILES *or on CompuServe (74630,115).*

QUICK REFERENCE SUMMARY

Product: WordStar Professional Release 4.0 (MS-DOS); WordStar, CP/M Edition, Release 4.0
Manufacturer: MicroPro International Corporation
33 San Pablo Avenue
San Rafael, CA 94903
Phone: (800) 227-5609
Sugg. List Price: $395 (MS-DOS); $295 (CP/M); Upgrades, $89 plus $5 shipping.

Keyboard Table 1: Opening Menu Commands

```
MS-DOS begin:      80 hex
MS-DOS end:        95 hex
MS-DOS sequence:   FZWDNEL<FFh>OPMITCXYRJH\<ESC>?

CP/M begin:        18D hex
CP/M end:          1A2 hex
CP/M sequence:     FZWDNEL<FFh>OPMITCXYRJH\<ESC>?S
```

Keyboard Table 2: Editing Control Codes

```
MS-DOS begin:      B0 hex
MS-DOS end:        CD hex
MS-DOS sequence:   ^A ^B ^C ^D ^E ^F ^G ^H ^I ^J ^K ^L
                   ^M ^N ^O ^P ^Q ^R ^S ^T ^U ^V ^W ^X
                   ^Y ^Z <ESC> ^\ <DEL> ^^

CP/M begin:        1BD hex
CP/M end:          1DA hex
CP/M sequence:     ^A ^B ^C ^D ^E ^F ^G ^H ^I ^J ^K ^L
                   ^M ^N ^O ^P ^Q ^R ^S ^T ^U ^V ^W ^X
                   ^Y ^Z <ESC> ^\ <DEL> ^^
```

Keyboard Table 3: Protected (and Preview) Control Codes

```
MS-DOS begin:      D0 hex
MS-DOS end:        E1 hex
MS-DOS sequence:   ^D ^S ^F ^A ^X ^E ^C ^R ^W ^Z ^O ^Q
                   ^K ^L ^J <ESC> ^\ ^^

CP/M begin:        1DD hex
CP/M end:          1EF hex
CP/M sequence:     ^D ^S ^H ^F ^A ^X ^E ^C ^R ^W ^Z ^O
                   ^Q ^K ^L ^J <ESC> ^\ ^^
```

Keyboard Table 4: Characters After ^K

```
MS-DOS begin:      E4 hex
MS-DOS end:        104 hex
MS-DOS sequence:   ICVYR"'FBKHNMWDXSQOJEPL0123456789

CP/M begin:        1F2 hex
CP/M end:          211 hex

CP/M sequence:     DXSCVYR"'IBKHWQOJLEMNF0123456789
```

Keyboard Table 5: Characters After ^Q

```
MS-DOS begin:      107 hex
MS-DOS end:        12C hex
MS-DOS sequence:   AUY<DEL>TLNOEXSDRCPVBK0123456789FGHIMQWZ?

CP/M begin:        214 hex
CP/M end:          235 hex
CP/M sequence:     AY<DEL>TUQRCFISDEXGHWZMPBKV01234567897
```

Keyboard Table 6: Characters After ^O

```
MS-DOS begin:      12F hex
MS-DOS end:        140 hex
MS-DOS sequence:   LRXOWJEGSCHINTFDPB

CP/M begin:        238
CP/M end:          248
CP/M sequence:     LRXOWJEGSCHINTFDB
```

Figure 1: The keyboard command tables for MS-DOS and CP/M editions of WordStar 4.0.

GRAPHICS PROGRAMMING IN GWBASIC

The surprise is how much you can do.

BY T.F. CHIANG

BASIC is the language that most of us learned first, whether it was on a Commodore or a Radio Shack or a CP/M Kaypro. Of course, every machine's version is different; the version included with Kaypro's MS-DOS machines is called GWBASIC, by Microsoft, and it's the same as the BASICA that IBM's machines include. This implementation has some very impressive features (some people joke that the "GW" in the name is short for "Gee Whiz"), and the graphics commands included are a prime example of its power. Here we'll take a look at how much graphics control is possible with GWBASIC and a CGA graphics adapter.

To showcase GWBASIC's graphic commands, we'll write a simple drawing program, similar to the public domain program DDRAW for CP/M Kaypros. We'll follow this program's development from the ground up and learn the necessary commands as the program grows. (Most of commands we'll see have more options than we'll actually use here; consult the GWBASIC manual for all the details).

DRAWING IN COLOR

When we enter BASIC, we're in 80-column text mode, without any graphics capability, so we have to enter graphics mode via the SCREEN command. SCREEN 1 gives us 320 by 200 pixels in four colors for graphics, or 40 columns for text; this is the mode we'll be doing our work in (use SCREEN 0, or WIDTH 80, to return to ordinary text mode). Next, we use the statement COLOR ⟨background⟩,⟨palette⟩ to choose the colors we'd like (the COLOR statement can also be used in 80-column mode, but the format is different then). ⟨Background⟩ is a number from zero to 15, specifying the background color of the screen from these choices:

0 black	6 brown	12 light red
1 blue	7 white	13 light magenta
2 green	8 gray	14 yellow
3 cyan	9 light blue	15 bright white
4 red	10 light green	
5 magenta	11 light cyan	

⟨Palette⟩ is either 0 or 1, which gives us a choice of three colors for everything else; the colors of all the figures we draw are chosen from a single palette. Here are the palette offerings:

	Palette 0	Palette 1
color 0	⟨background⟩	⟨background⟩
1	green	cyan
2	red	magenta
3	brown	white

We're going to start out with COLOR 0,1, giving us color 0 (black) for the background, and palette 1, so we can use white for drawing.

So what will our drawing program do? For starters, we'll want a drawing mode like an Etch-a-Sketch toy, where the user has a cursor that's one pixel in size, which can be moved around the screen to draw a picture. However, Etch-a-Sketches can draw only single-line pictures, the kind that can be drawn without lifting the pencil off the paper. For our program, the user should also be able to move the cursor around without it leaving a line in its tracks.

To program this drawing mode, we'll need to be able to do two things: turn on any pixel onscreen that we want, and read the keyboard for cursor movement. We'll use a loop that works as follows: first read a cursor command from the keyboard,

then move the cursor pixel accordingly, and then repeat. Here's what the code looks like:

```
100  CLS: X=160: Y=100: PSET(X,Y) : BLANK=0
1000 CMD$=INKEY$: IF CMD$="" THEN 1000
1010    IF BLANK=1 THEN PSET(X,Y),0
1020    CURSOR$ = MID$(CMD$,2,1)
1030    IF CURSOR$ = CHR$(72) THEN Y=Y-1
1040    IF CURSOR$ = CHR$(80) THEN Y=Y+1
1050    IF CURSOR$ = CHR$(75) THEN X=X-1
1060    IF CURSOR$ = CHR$(77) THEN X=X+1
1070    IF CURSOR$ = CHR$(71) THEN Y=Y-1: X=X-1
1080    IF CURSOR$ = CHR$(73) THEN Y=Y-1: X=X+1
1090    IF CURSOR$ = CHR$(79) THEN Y=Y+1: X=X-1
1100    IF CURSOR$ = CHR$(81) THEN Y=Y+1: X=X+1
1110    IF CURSOR$ = CHR$(82) THEN BLANK=(BLANK XOR 1)
1120    PSET(X,Y),3
1130 GOTO 1000
```

The variables X and Y store the horizontal and vertical coordinates of the drawing pixel in our program, as measured from the upper left corner of the screen. PSET is GWBASIC's command for turning on a particular pixel, specified by its coordinates; the third parameter is the color (recall from the above table that color 3 is white). Thus, line 100 clears the screen and turns on the pixel at (160,100), the very center, which is how we want our program to begin. We also have the variable BLANK, which is our draw/non-draw flag; it's initially set to 0, which means that the cursor will leave a trail of lit pixels wherever it goes. When BLANK equals 1, we'll turn off the pixels behind us when the cursor moves, giving us our non-draw mode.

Next comes reading the keyboard. We could use the INPUT statement, but then the user would have to hit RETURN all the time. Instead, line 1000 uses the INKEY$ function to check if any key has been pressed at the keyboard and assigns the received character to the string variable CMD$; if this turns out to be nothing (a null string) then it tries again until an actual character is received.

Now, we want to use the numeric keypad instead of the ordinary keys for cursor control, and when those keys are hit they actually send two bytes instead of one: the first byte has the ASCII value 0, and the second byte tells which key was pressed. Accordingly, line 1020 takes the second byte of the input string and puts it in the variable CURSOR$, which is examined in the next nine lines. If the up-arrow key was pressed, we update the coordinates of our pixel by subtracting one from the y-value (remember, we're counting from the top); or, if the right arrow was pressed, we increase the x-value, and so forth (we're also pretending that some of the other keypad keys act as diagonal cursor keys). Finally, line 1120 uses PSET again, to turn on the pixel at the new position, and then we start all over again.

Note that in line 1010, we checked the value of BLANK. If BLANK equals 1, then PSET turns off the pixel at the old position (i.e., changes the pixel's color to black by using 0 as the color parameter) before one is turned on at the updated position. Otherwise, we're in normal draw mode, and we leave the pixels lit. The user toggles between draw and nondraw modes by hitting the INS key; line 1110 changes BLANK's value whenever INS is hit. So here's a final summary of what our loop actually does: read a cursor command, blank out the old cursor position if it's non-draw mode, then find the new position and turn on a pixel there.

THE BIG DRAW

Okay, so now we've got an Etch-a-Sketch program, in 14 lines of code. What other capabilites do we want our program to have? Well, the user should be able to change the background color and choose the drawing color from any of the three palette colors. The ability to draw a line between any two points and to draw boxes and circles are also reasonable things for our program to do; and of course it should have the ability to fill in those shapes. And while we're making requests, being able to define regions of the screen as subpictures and then move them around wouldn't be bad either.

Take a look at the complete program listing on page 28; it's called DRW (since it's an abbreviated drawing program), and you'll see that it's been drastically expanded from our short segment of code above. The lines numbered in the 1000's constitute the main program, while the rest of the program is subroutines, each renumbered at intervals of one thousand. Let's take them one at a time; the commands used in each section are listed.

THE MAIN PROGRAM

This section (1000-; uses SCREEN, COLOR, PSET, and PAINT) is pretty simple. It initializes most of the variables and contains a loop that examines the input. Most of the variables' purposes are obvious—PALET is the palette we're using, KOLOR is the drawing color (the arrays will be explained later on). When the program begins, the user has the Etch-a-Sketch at his disposal, with both its draw and non-draw modes handled by the main program. For every key the user presses, we check to see if a command has been entered, resulting in a GOSUB to the appropriate subroutine.

The only command that is actually handled here is **f** for "Fill Region," which uses the PAINT command. Using the present cursor color, this will paint any closed figure whose boundaries are that same color (e.g., it will fill a red square with red, or a white circle with white).

CURSOR MOVEMENT

The cursor movement routine (2000-; uses COLOR and POINT function) has been placed in its own subroutine because it will be called by all of the other subroutines. As before, it updates the position of the drawing cursor, but now it also checks for various commands to change colors. Hitting the space bar will change the background color by issuing a new COLOR statement; after 16 times, the background color will cycle back to black. The number keys at the top of the keyboard change the drawing color; hitting 1, 2, or 3 will make the cursor another of the available palette colors by resetting the value of KOLOR. (You can also hit 0 to make the cursor the same color as the background, making it invisible; then the cursor becomes an eraser.) Similarly, if you want a different palette, hit **p** to toggle between the two.

Another new feature is seen in line 2100: PREVKOLOR = POINT(X,Y). The POINT function in GWBASIC returns the color of the specified pixel, which is a very powerful and useful function; if it weren't provided, we'd have to store the color of each of the screen's 64,000 pixels. But since we do have this function, we're able to improve our non-drawing mode (in which the cursor moves around without leaving a trail). In the short code segment we saw first, the cursor blanked out every pixel it traversed, leaving a trail of unlit pixels whenever it crossed a region of lit ones. Now, we can store the color of a pixel when our cursor crosses it, and then restore that color after the cursor has passed, making our non-draw mode nondestructive.

To top it all off, line 2140 leads us to a Jump command, as a sub-subroutine. When using this program, you'll find that the cursor moves along pretty slowly; for instantaneous cursor movement, hit **j**. Then the program prints your present coordinates, asks for a new pair, and resets the cursor at that position. (I've neglected to explain a couple of lines that appear in this and the next couple of subroutines, because they involve some more advanced commands; we'll get to them in a moment.)

SHAPE DRAWING

Here we have a couple of subroutines (3000- and 4000-; uses LINE and CIRCLE) that are nearly identical and are both very simple thanks to GWBASIC's built-in commands. The first one begins at line 3000 and draws both lines and boxes using GWBASIC's LINE command. Whenever the user wants to draw a line, he moves the cursor to a desired endpoint and hits **l** (lower-case L), causing the main program to execute a GOSUB down to this subroutine. The first thing we do here is save the cursor's present location in X1POINT and Y1POINT, so we'll remember the first endpoint. Then we let the user move the cursor to a new location for the other endpoint. This involves an ordinary input loop, just as before, with a GOSUB 2000 to the cursor movement routine.

The user hits **l** again to indicate that he wants a line drawn from the first point to the current location. When that happens, all we do is use LINE (x1,y1) – (x2,y2) to draw a line between the two points. Drawing a box is done in precisely the same way. The user moves the cursor and hits "b" to choose two points, just as before, except that these are the two opposite corners of the box. The LINE command is used again, this time with a "B" as an additional parameter, causing a box to be drawn. In the case of either a line or a box, after the second point is specified, we jump out of the input loop and RETURN from the subroutine back to the main program.

The third subroutine, beginning at line 4000, uses the CIRCLE command to draw—guess what—circles. The general format of this subroutine is the same as the previous one's. The user hits **c** and the current cursor location is stored as the center of the circle. Then the user moves the cursor around and hits **c** to establish a point on the circumference of the circle. When this is done, we calculate the radius of the circle from the difference in the points' coordinates, and we use the CIR-

```
1000 PALET=1: BACKGND=0
1010 SCREEN 1 : COLOR BACKGND,PALET: CLS   '  initialize screen
1020 DIM PROMPT(250), PRMPT2(250), WHOLE(4100) '  declare arrays
1030 X=160: Y=100: KOLOR=3: PREVKOLOR=0: BLANK=0: PSET(X,Y)
1040 CMD$=INKEY$: IF CMD$="" THEN 1040   ' main program loop
1050     CURSOR$=MID$(CMD$,2,1)
1060     IF CURSOR$ = CHR$(82) THEN BLANK=(BLANK XOR 1)   ' draw on/off toggle
1070     IF CMD$="q" THEN GOTO 1180      '    quit
1080     IF CMD$="b" THEN GOSUB 3000     '    box
1090     IF CMD$="l" THEN GOSUB 3000     '    line
1100     IF CMD$="c" THEN GOSUB 4000     '    circle
1110     IF CMD$="s" THEN GOSUB 5000     '    subpicture
1120     IF CMD$="h" THEN GOSUB 6000     '    help
1130     IF CMD$="f" THEN PRESET(X,Y): PAINT (X,Y),KOLOR   '  fill
1140     IF BLANK THEN PSET(X,Y),PREVKOLOR
1150     GOSUB 2000
1160     PSET(X,Y),KOLOR
1170 GOTO 1040
1180 WIDTH 80: END   ' end of main program
2000 REM  cursor movement and color changes
2010     CURSOR$=MID$(CMD$,2,1)
2020     IF CURSOR$ = CHR$(72) THEN Y=Y-1    '  up
2030     IF CURSOR$ = CHR$(80) THEN Y=Y+1    '  down
2040     IF CURSOR$ = CHR$(75) THEN X=X-1    '  left
2050     IF CURSOR$ = CHR$(77) THEN X=X+1    '  right
2060     IF CURSOR$ = CHR$(71) THEN Y=Y-1: X=X-1   '  upleft
2070     IF CURSOR$ = CHR$(73) THEN Y=Y-1: X=X+1   '  upright
2080     IF CURSOR$ = CHR$(79) THEN Y=Y+1: X=X-1   '  dnleft
2090     IF CURSOR$ = CHR$(81) THEN Y=Y+1: X=X+1   '  dnright
2100     PREVKOLOR=POINT(X,Y)
2110     IF ASC(CMD$)>47 AND ASC(CMD$)<52 THEN KOLOR=ASC(CMD$)-48
2120     IF CMD$="p" THEN PALET=(PALET XOR 1): COLOR BACKGND,PALET
2130     IF CMD$=" " THEN BACKGND=(BACKGND+1) MOD 16: COLOR BACKGND,PALET
2140     IF CMD$="j" THEN GOSUB 2500
2150 RETURN
2500 REM jump command
2510     GET (8,8)-(300,16),PRMPT2
2520     LOCATE 2,2 : PRINT "jump from ("X","Y") to ";: INPUT XNEW,YNEW
2530     PSET(X,Y),PREVKOLOR: X=XNEW: Y=YNEW
2540     PUT (8,8),PRMPT2,PSET
2550 RETURN
3000 REM box/line draw
3010     GET(8,8)-(128,16),PROMPT : LOCATE 2,2 : PRINT "box/line draw"
3020     X1POINT=X: Y1POINT=Y
3030     CMD$=INKEY$: IF CMD$="" THEN 3030   ' loop
3040       PSET(X,Y),PREVKOLOR
3050       PSET(X1POINT,Y1POINT),KOLOR
3060       GOSUB 2000
3070       PSET(X,Y),KOLOR
3080       IF CMD$="b" THEN LINE(X1POINT,Y1POINT)-(X,Y),KOLOR,B: GOTO 3110
3090       IF CMD$="l" THEN LINE(X1POINT,Y1POINT)-(X,Y),KOLOR: GOTO 3110
3100     GOTO 3030
3110 PUT (8,8),PROMPT,PSET
3120 RETURN
4000 REM circle draw
4010     GET (8,8)-(128,16),PROMPT : LOCATE 2,2 : PRINT "circle draw"
4020     XCENTER=X: YCENTER=Y
4030     CMD$=INKEY$: IF CMD$="" THEN 4030   ' loop
4040       PSET(X,Y),PREVKOLOR
4050       PSET(XCENTER,YCENTER),KOLOR
4060       GOSUB 2000
4070       PSET(X,Y),KOLOR
4080       IF CMD$="c" THEN GOTO 4100
4090     GOTO 4030
4100     RADIUS#=SQR ( (X-XCENTER)^2 + (Y-YCENTER)^2 )
4110     CIRCLE(XCENTER,YCENTER),RADIUS#,KOLOR,,,1
4120     PUT (8,8),PROMPT,PSET
4130 RETURN
5000 REM subpicture
5010     GET (8,8)-(166,16),PROMPT : LOCATE 2,2 : PRINT "subpicture "
5020     X1POINT=X: Y1POINT=Y
5030     CMD$=INKEY$: IF CMD$="" THEN 5030   ' loop: define subpic
5040        PSET(X,Y),PREVKOLOR
5050        GOSUB 2000
5060        PSET(X,Y),KOLOR
5070        IF CMD$="s" THEN GET(X1POINT,Y1POINT)-(X-1,Y),WHOLE : GOTO 5090
5080     GOTO 5030
5090     LOCATE 2,13 : PRINT "(c,n,o,q)"
5100     CMD$=INKEY$: IF CMD$="" THEN 5100   ' loop: manipulate subpic
5110        PSET(X,Y),PREVKOLOR
5120        GOSUB 2000
5130        PSET(X,Y),KOLOR
5140        IF CMD$="c" THEN PUT (X,Y),WHOLE,PSET   '   copy
5150        IF CMD$="o" THEN PUT (X,Y),WHOLE,XOR    '   overlay
5160        IF CMD$="n" THEN PUT (X,Y),WHOLE,PRESET '   negative
5170        IF CMD$="q" THEN GOTO 5190              '   quit
5180     GOTO 5100
5190 PUT (8,8),PROMPT,PSET
5200 RETURN
6000 REM help screen
6010     GET (1,1)-(319,199),WHOLE:  WIDTH 80
6020     PRINT: PRINT"      HELP SCREEN ": PRINT
6030     PRINT " <keypad>    cursor movement"
6040     PRINT " <INS>       Draw On/Off"
6050     PRINT " b           Box draw"
6060     PRINT " l           Line draw"
6070     PRINT " c           Circle draw"
6080     PRINT " f           Fill region"
6090     PRINT " s           Subpicture (Copy,Neg,Overlay,Quit)"
6100     PRINT " h           Help"
6110     PRINT " j           Jump to specified location"
6120     PRINT " 1,2,3,0     change color"
6130     PRINT " p           change palette"
6140     PRINT " <space>     change background color"
6150     PRINT " q           quit": PRINT
6160     PRINT "     HIT ANY KEY TO LEAVE HELP"
6170     QUIT$=INKEY$: IF QUIT$="" THEN 6170
6180     SCREEN 1 : COLOR 0,1
6190     PUT (1,1),WHOLE,PSET
6200 RETURN
```

CLE command in line 4110.

The CIRCLE command will accept a couple of other parameters, which I've left out here (the commas near the end of the line are their place holders), but I will mention the last parameter given, the *aspect ratio*. Varying the value of this allows you to draw ellipses, and it can also be used to compensate for your CRT's characteristics. Its default value is 5/6, which produces nice round circles on most screens, because the pixels on those screens aren't square. An aspect ratio of 1 produces a circle whose width and height in pixels are the same, but which looks a bit elliptical on some screens. I chose this because this is the only way that the circle produced coincides with the point chosen by the user; the default aspect ratio gives a round circle that literally misses the point.

Note that in both of these subroutines, it's possible for the user to change the pixel color (or the palette) while specifying the second point, because those aspects are handled by the cursor movement routine that these shape routines call.

SUBPICTURES

Now we come to a pair of the most powerful graphics commands that GWBASIC has to offer: PUT and GET (5000-). GET allows us to define a region of our graphics screen and store it in an array, while PUT can place the contents of the array in a new location on the screen. These are really nice capabilities for any drawing program to have, and as built-in commands they execute far faster than hand-written routines would.

Let's say the user has filled the screen with nice graphic doodles and wants to define a subpicture. It's done the same way as drawing a box: he moves the cursor to one corner of the region he wants and hits **s**; then, when the cursor is at the opposite corner, entering **s** again defines the rectangle in between as a subpicture. The GET command receives the coordinates of the two points and places the intervening area in the array WHOLE (which we defined at the beginning of the program).

We don't exit the subroutine yet, as we did from the shape-drawing subroutines. Instead, we enter another input loop, where the user can move the cursor around some more and play with the newly defined subpicture. Now it's time for the PUT command; the user specifies a pair of destination coordinates and an array name as parameters, and PUT places the stored image at that location. The PUT command also accepts an additional parameter specifying the operation to be performed with the image; I've chosen three different parameters for our program, giving the user three commands at this point (in addition to a Quit command to exit back into the Etch-a-Sketch mode).

The first one is **c** for "Copy," which simply places a copy of the subpicture at the new cursor location. The parameter for this command is PSET, meaning that the pixels at the destination are directly set to the colors of the subpicture, replacing whatever was there before. Another command is **n** for "Negative;" here the parameter is PRESET, and the result is similar to a photographic negative: unlit pixels are replaced by lit ones, and colors are reversed. The third command is **o** for "Overlay," and it's the most powerful of the three. The parameter involved, XOR, means that the XOR operation is performed between each pixel in the subpicture and the corresponding one at the destination. What this means is that the subpicture image is drawn over blank areas, but where it overlaps something already there, a negative/reversed region results. This operation is also reversible, so that if you hit **o** twice at the same place, every pixel at the destination goes back to its original color. This lets you to delete the original image, or remove duplicate images that you've positioned incorrectly; you should actually use this option to get a feel for what it can do, so try it out.

Now we can also explain the occurrences of GET and PUT in the previous subroutines. For any of our subroutines, it's helpful to give the user a prompt displaying the command being executed—i.e., a prompt that says "circle draw" while waiting for the second point to be defined. Normally, this would be difficult, since there's no place where we can display a prompt without overwriting some user-drawn graphics. GET and PUT take care of that. At the beginning of each subroutine, we GET a rectangular area near the top of the screen, and then we display our prompt; the LOCATE statement is needed to position the cursor properly. Once the subroutine is over, we replace the prompt with the original graphics with PUT. The length of the rectangle that's stored depends on the length of the prompt, and each letter is eight by eight pixels in size. The size of the array depends on the size of the region to be stored, naturally; as a rule of thumb, the number of array elements should be more than one-sixteenth the number of pixels in the region (see the manual for specifics).

Something similar is done in the last subroutine (lines 6000-), which displays a Help screen. For this, the entire screen is saved into an array, and WIDTH 80 is used so we can fit everything properly. The user hits any key to exit, and we return to graphics mode and restore the screen.

YOU TAKE IT FROM HERE

As I said earlier, this program is a showcase of GWBASIC's graphics commands; DRW doesn't put the commands to really good use—it simply displays them. In fact, I've skipped several options of these commands and left out a few commands entirely. If we were to actually utilize the full power of GWBASIC's commands, we could produce an amazing drawing program with features like a pattern fill, paintbrushes, and icons. (DRW is also missing a lot of things that have nothing to do with graphics, such as proper error checking.) Or if you're looking for other graphic applications, you can do some slick animation with GET and PUT. Using a compiled version of BASIC would also let any large program of yours really fly. So investigate GWBASIC; you'll be surprised at how much you can do with it.

T.F. Chiang is a student at Brown University and an active member of the International Kaypro Users Group.

How To Build Graphics With Rembrandt

Even older CP/M machines can do it.

BY STAN STRICK

You can hardly pick up a piece of paper anymore without finding that your eye is drawn to a chart or graph. Making a picture helps readers understand raw numerical data in a simple, straightforward way. "Math anxiety" fades in the presence of the familiar pie or bar chart.

Such graphics generally are the realm of MS-DOS computers, or at least the newer CP/M machines with onscreen graphics capabilities. But with Rembrandt, "the Complete Graphics Toolkit" from Spectre Technologies, Inc., owners of even older CP/M Kaypros can produce respectable graphics that can be included in reports and memos. These charts, with their "staircase" lines, will admittedly be more suitable for less formal business and hobby uses than boardroom presentations, but they do get the job done.

Within Rembrandt, separate programs draw pie charts, horizontal and vertical bar charts, and xy plots from data you provide. A fifth program, the drawing board, allows you to customize images made by the graph programs.

Owners of Kaypros without graphics (usually those machines with model numbers having Roman numerals or those with only one serial port) will need to install a chip that adds limited graphics capabilities to their machines before they can use the programs. This chip is included in the Rembrandt package for Kaypro IIs and IVs. Installation is simple—you remove the machine's cover, locate the proper chip, remove it, and plug in the new one—and complete instructions are provided. The chip substitutes graphics symbols for the 32 Greek characters in the older machines' character set.

This article and the sample graphics accompanying it were prepared with a Kaypro II '83 with the special graphics chip and a Star-Gemini 10X printer (Rembrandt provides printer drivers for the most common dot matrix and daisywheel printers).

In this article I'll demonstrate how to build a simple pie chart and how to improve it by adding better labels, shading the pie slices, and, finally, "exploding" a piece of the chart for emphasis. Any chart or graph produced with Rembrandt can be similarly enhanced.

To follow the techniques described below, you should already know how to create charts and graphs with the program and be able to load them into the drawing board. New users of the program should read the parts of the manual titled "For the Impatient User" and go through the step-by-step example on building a bar chart to equip them with the background needed to use the techniques described below.

CREATING A PIE CHART WITH SALARY DATA

We'll use data from a paycheck stub to create a pie chart that shows how big a bite taxes and deductions take from earnings. You can use the figures below or substitute ones from your own check stub.

For our example, we'll say that monthly earnings of $2,720 consist of $510 in federal, state and Social Security taxes and $430 in deductions for medical and life insurance and pension and savings plans; the remainder, $1,780, is take-home pay.

Start the pie chart program and answer **N** when asked if you want to load data or format files. When prompted for a title, type **SALARY ANALYSIS**. For a subtitle, enter **Taxes, Deductions, and Take-home Pay**.

ENTERING DATA

Next, you'll enter the values you want the program to chart, along with their identifying labels. At the data entry screen, type **A** to add the first label and data point. Enter the word **Taxes** for the label and **510** for the value.

Repeat the process for the second entry, making the label **Deductions** and the value **430**. Add the last record, **Take-home Pay** with a value of **1780**.

Now the basic pie chart can be viewed on the screen. Before pressing the (V)iew key, make sure the current mode is PRINT FORMAT and not SCREEN FORMAT.

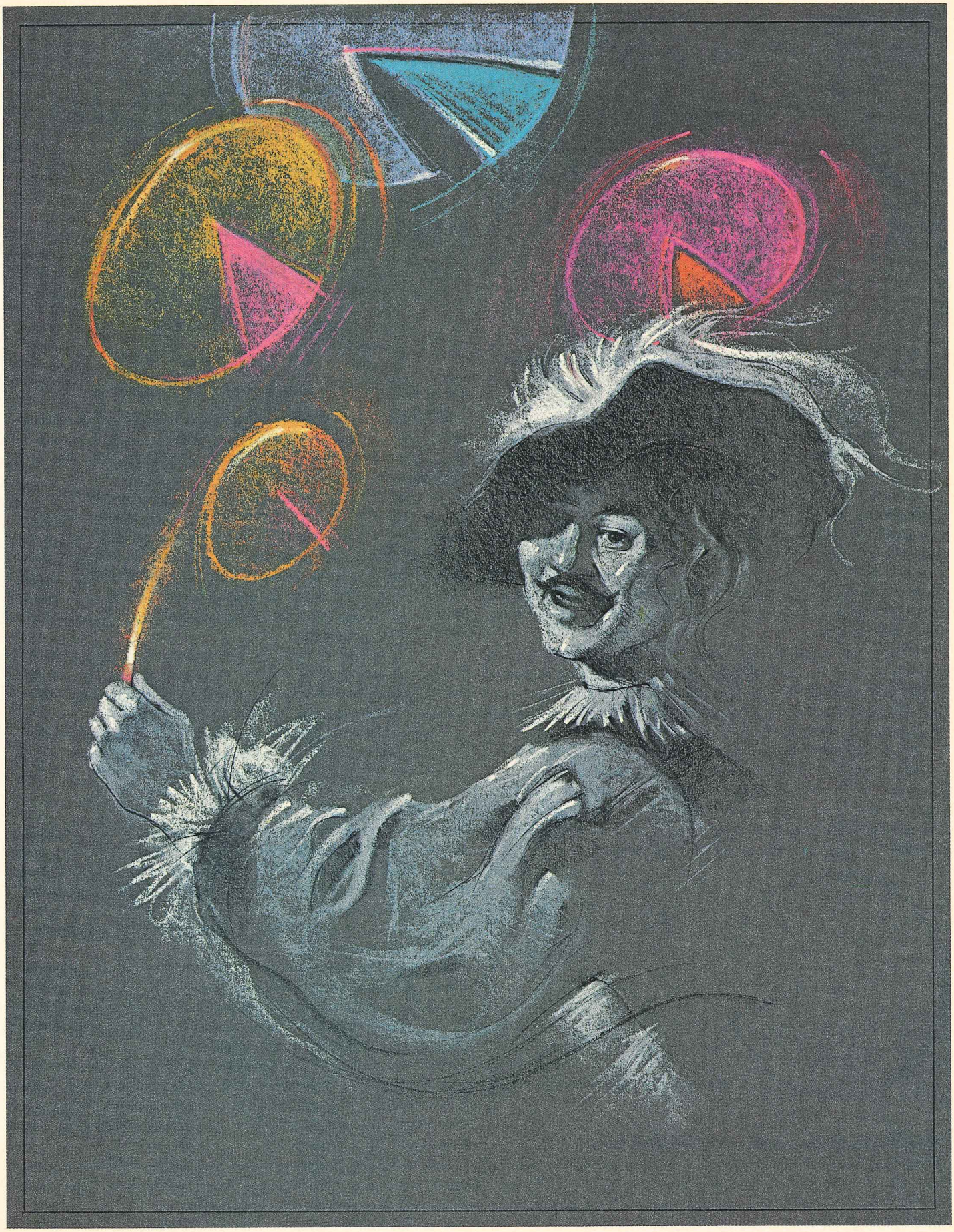
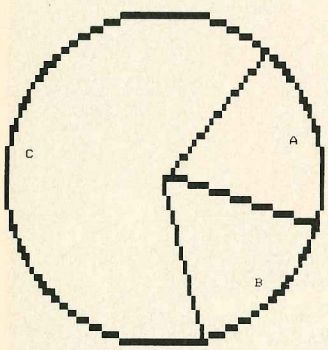


ILLUSTRATION BY GREG SHED



SALARY ANALYSIS
Taxes, Deductions and Take-home Pay

LABEL	VALUE	%
A Taxes	510	18.75
B Deductions	430	15.81
C Take-home Pay	1780	65.44

Figure 1: Basic pie chart without enhancement.

We can improve the pie chart by adding text to the slices in place of the letters A, B, and C.

VIEWING THE CHART ONSCREEN

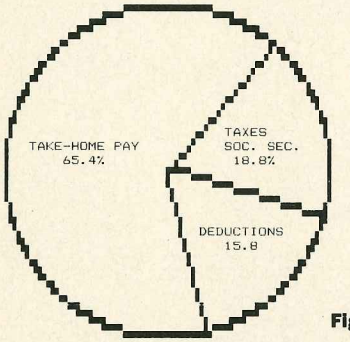
The program will draw the pie chart with a shape more like an egg than a circle on the left half of the screen and the data table on the right. Slices contain the letters A, B, and C to correspond to information listed in the data table. The table also lists the percentage each slice is of the whole, a number the program calculates (see Figure 1.) Before going further, save the chart to disk as SALARY.PIE.

Now we're ready to make the first improvement by adding text to the pie slices in place of the letters A, B and C. Typing **^C** puts a cursor at the top right corner of the screen and allows you to enter text.

Use the arrow keys to move to the A slice and type **Taxes** on the line the A is on, making sure you avoid typing over any pieces of the chart. Use a space to erase the A. Type **Soc. Sec.** on the next line and center **15.8%** underneath that, taking the number from the data table and rounding it off.

Repeat the steps for the B and C slices. When entering the percentages, round the numbers to one decimal place.

Move to the data table and replace A, B and C with blank spaces, since the letters no longer refer to slices of the pie chart. You also need to line up the headings with the data in Figure 2, below, and round off the percentages.



SALARY ANALYSIS
Taxes, Deductions and Take-home Pay

LABEL	VALUE	%
Taxes	510	18.8
Deductions	430	15.8
Take-home Pay	1780	65.4

Figure 2: Pie chart with edited text.

ENHANCING CHARTS WITH THE DRAWING BOARD

We've taken the pie chart program about as far as we can, so save the chart you've created as SALARY.EDT (for EDIT) and we'll move on to the drawing board program with its powerful block functions and programmable graphics keys.

We'll use the drawing board program to take apart the chart and create separate files for the data table and each slice of the pie. Then we'll enhance each slice and reassemble the pie chart to make a new image.

Type **BOARD** and hit Return to load the program, and answer **N** when asked "Overlay files?". We'll rely heavily on the program's block-mode functions to make the changes. Start by marking a block that includes the pie chart, but not the data table. With the cursor at the top left corner of the screen, type **^BB** to mark its beginning. Move the cursor over and down until it's even with the rightmost portion of the pie chart. Type **^BE** to mark its ending.

To check your work, type the Block Show command, **^BS**, to display the blocked area, which will either appear as flashing characters or alternate between reverse and normal video. After a second or two, the normal display will reappear.

When you're ready, delete the block with **^BD**, so that only the data table remains. If you made a mistake, the Block Undo command, **^BU**, will restore the deleted block.

TEMPORARY FILES

Save the table as DATA.TMP (for temporary), reload SALARY.EDT, and answer **N** to the "Overlay files?" query.

Now mark a block that includes the data table and delete the table. Save the pie chart that remains as CHART.TMP and return to the drawing board.

Three more temporary files, one for each slice of the pie, need to be created.

Start with the Taxes wedge. The goal is to leave only the two sides and outer rim of the pie wedge. Usually, the fastest method is to eliminate as much material as possible with the Block Delete command, then remove everything else that's unwanted by replacing it with spaces.

Mark a block beginning at the top left corner of the screen. Move the cursor to the bottom of the screen and one space left of the center of the graph. Mark the end of the block and check your work with the Block Show command. If everything is okay, delete the block.

Now mark and delete a second block that removes the area below the center of the graph, and then replace remaining characters outside the lines with blanks.

At first, remove each character individually until you get a

feel for the operation. When you're comfortable with it, type **^A** to switch to auto-repeat mode. Now each cursor move will enter whatever graphics character was last selected—in this case, a space. Typing ^A again will turn off the auto-repeat feature.

Repeat the sequence for the Deductions and Take-home Pay slices, saving them as DEDUCT.TMP and TAKEHOME.TMP.

THE OVERLAY FEATURE

The four temporary files, if put together, would equal the original pie chart. In fact, you could reconstruct it by loading the files onto an empty drawing board and answering with Y each time the program asked "Overlay files?". The "Yes" answer keeps previous images from being erased.

To add shading to a pie slice, begin by choosing the graphics characters to use for shading and programming them into the keypad keys. Then a three-step process accomplishes the shading itself.

To select characters for shading, type **^P** to display the graphic and alphanumeric characters available. For this example, the characters chosen create close vertical lines, wavy lines and small squares. (These are the first, 13th, and 26th characters in the top line in the Kaypro 2'83 and 4'83 graphics set. Kaypros with graphics will show different characters in those positions.)

Program the first character into keypad key 1 by moving the cursor to the desired character and pressing 1. Move the cursor to the next character and program it into key 2. Repeat the process for key 3.

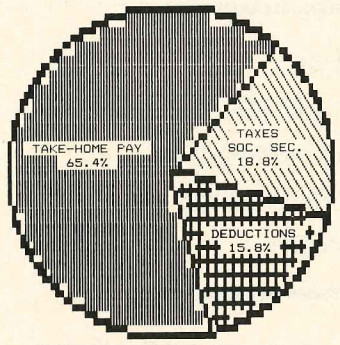
To add shading to a pie chart, begin by programming graphics characters into the keypad keys choosing graphics.

Now follow these steps for TAXES.TMP, DEDUCT.TMP AND TAKEHOME.TMP:

1. Define a block that encompasses the pie slice, then fill the space with graphics characters using the the Block Fill (**^BF**) command. This step will obliterate the slice itself.

2. Reload the pie slice on top of the shading by answering **Y** to the "Overlay files?" question. Blank spots on the inside of the slice will be filled, along with spaces within the block outside the slice.

3. Replace characters outside the wedge with spaces and add a space at the end of each label line to set off the text from the shading. Put spaces between words in labels. Save the slices as TAXES.SHD (for shaded), DEDUCT.SHD, AND TAKEHOME.SHD.



SALARY ANALYSIS
Taxes, Deductions and Take-home Pay

LABEL	VALUE	%
Taxes	510	18.8
Deductions	430	15.8
Take-home Pay	1780	65.4

SALARY.SHD

Figure 3: Pie chart with shading.

THE FINAL IMAGE

Now the final chart can be put together. Start by loading DATA.TMP, answering **N** to the "Overlay files?" question to clear the drawing-board screen.

Next Load TAXES.SHD, DEDUCT.SHD, and TAKEHOME.SHD, answering **Y** to the "Overlay Files?" question each time so that the new image will be added to the current one. When the last file is loaded, return to the drawing board to view your creation (Figure 3).

Shading differentiates pie slices, but you can add emphasis by pulling a wedge away from the pie.

The simple pie chart come has a long way, but there's more to be done with it.

Before doing anything else, save the completed chart, calling it SALARY.SHD. Now let's return to the chart to add one more touch, a border to enclose the data table. At the same time, we'll make the chart more compact and reposition it to make room to explode a pie slice.

IMPROVING THE DATA TABLE

First, block the label column and move it one space to the right, placing it even with the word "Taxes" in the subtitle. Next, block the Values column and move it two spaces to the left, making the right edge flush with the subtitle.

Type **^G** to make the keyboard and keys operate normally, and move the cursor to the label heading, making it read CATEGORY. Type **^G** to return to graphics mode.

Finally, block the entire table and move the cursor to where you want the top left corner of the table to be, in this case seven lines up from the bottom and 37 spaces in from the right margin.

You can check the position of the cursor and the beginning of the block through the Mode command, **^M**. The letter X is used to represent the number of spaces from the left side, and Y the number of lines from the top. In this case, X should equal 43 and Y 16.

Once the cursor is properly positioned, execute the Block Move (**^BM**) command.

To create the border, create a block starting one line up and one space to the left of the top left corner of the table and ending one line down and one space to the right of the bottom right corner. Type the Block Outline command, **^BO**, and watch as the border encloses the table.

Save the finished chart as SALARY.SHD again and it's ready to be printed.

EXPLODING THE PIE

Shading is great for differentiating between pie slices, but what if you want to emphasize one of the wedges? The way to do that is to "explode" the piece by pulling it away from the rest of the pie using some of the same commands and techniques covered above. We need to break the chart into two pieces for this operation, so reload SALARY.SHD. Use spaces to eliminate the outside edge, text, and shading of the "Taxes" slice. Save this piece, which will look something like PacMan, as SALARY.XPL.

Load TAXES.SHD, answering **N** to the "Overlay Files?" question, and define a block that just encloses the Taxes slice. Return the cursor to the top left corner of the block.

Using **^M**, the cursor and block starting positions should both show X as 20 and Y as 3.

Move the cursor four spaces to the right and one line up and move the block. Save the slice as TAXES.XPL.

Now load SALARY.XPL on top of the repositioned Taxes wedge by answering **Y** to the "Overlay Files?" question. Now look at the final image.

The pie slice will be slightly separated from the rest of the chart, drawing the reader's eye to it because of its positioning (see Figure 4).

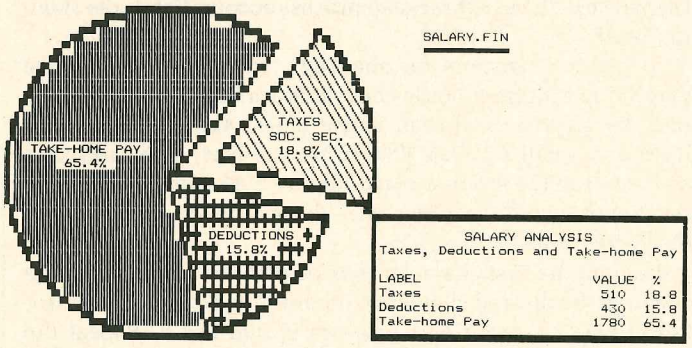


Figure 4: Pie chart with "exploded" slice.

Save your final effort as SALARY.FIN and it's ready to be printed or incorporated into a text file through your word processor using one of Rembrandt's printer drivers.

Now you can begin experimenting with any chart produced by the Rembrandt package. Move elements around and try new graphics characters in place of those the programs use. When you see a chart you like in a newspaper or magazine, try to duplicate it. Chances are you'll be able to come reasonably close. ■

QUICK REFERENCE SUMMARY

Product: Rembrandt
Manufacturer: Spectre Technologies, Inc.
22458 Venture Blvd., Suite E
Woodland Hills, CA 91364
Phone: (818) 716-1655
Sugg. List Price: $39.95 for Kaypros with graphics; $44.95 for Kaypro II and IV

As managing editor of The Herald *in Everett, Washington, Stan Strick works with PCs and a mainframe text-editing system. He also has written on computers for the Associated Press Managing Editors, an organization for newspaper executives. At home, he stills uses his Kaypro 2'83.*

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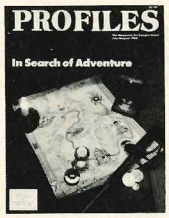

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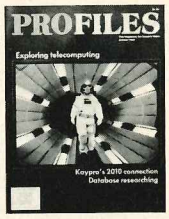

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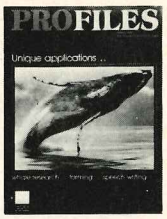

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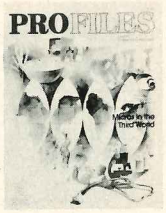

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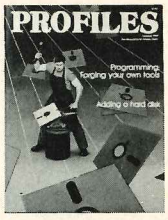

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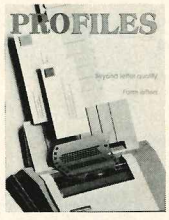

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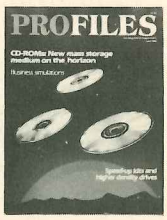

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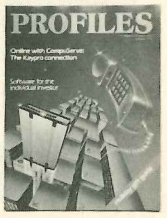

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TAX QUESTIONS FOR PROGRAMMERS

What you must know now that the rules have changed.

BY ISAAC SZLECHTER

If you write software or are thinking of getting into this activity—either professionally or as a hobby—you need to understand how the Tax Reform Act of 1986 will affect your returns for 1987 and beyond. Your status—hobbyist or professional—will have a significant bearing on your tax situation. And if you're like me, you have spent a fair amount on software and peripherals for your Kaypro and will want to know about their deductibility.

Here's some good news: If you used your computer to write programs and sell them for fun and profit, your expenses are deductible. The not-so-good news is that you may be required to report income from your sales. Whether your income from selling programs last year was $60 for publishing a single game or $60,000 for writing and selling an array of original programs, you must report that income to the Internal Revenue Service, *if you entered into the activity with the intent of making a profit.* (More on this critical point in a moment.)

Whether you're a hobbyist or a professional matters to the IRS and drastically affects your pocketbook.

Failure to report your income from selling programs (in addition to your other income) is taken seriously by the IRS. It may be considered tax fraud and, therefore, punishable by a stiff fine and a jail sentence. It is actually to your advantage to report this income because, by reporting, you can recover your initial investment in the hardware, peripherals, and software you need for writing and selling programs. ("Although every individual case is different," Joel Bronchick, a Lake Success, NY accountant said, "under the so-called 'Uniform Capitalization' provisions of the new law, the costs of producing a program such as research, typing, etc., are accumulated and written off over the productive or revenue life of the program.")

Perhaps the most important financial decision you must make is to determine whether or not you are writing and selling programs with the intent of making a profit. The IRS determines profit motive according to several criteria:

- use of business-like methods
- the taxpayer's expertise
- the time and effort spent in the business
- the expected appreciation on the activity's assets
- the taxpayer's past success in business activities
- the profit and loss history of the activity
- the taxpayer's financial status
- the elements of personal pleasure or recreation derived from the activity

It might not matter much to you now, but it matters to the IRS and, in the end, it affects your pocketbook drastically.

The basic difference, according to J. Perez, a New Jersey accountant, lies in how expenses are considered. If you are just selling programs as a hobby, expenses are deductible up to certain amount. If expenses exceed income, your loss cannot be applied against other income. But if you are selling programs as a business, a net operating loss may be used to offset income from other sources. Some examples should help clarify this concept.

REPORTING INCOME FROM A HOBBY

Let's say that John Doe sold programs for a total of $2,000. Expenses included interest on a loan and sales taxes of $500. Operating expenses for transportation, advertising, computer club fees, and books totaled $1,400, with an additional $600 for depreciation of equipment. (Depreciation was one-fifth of the

$3,000 cost of a Kaypro computer and software). Overall, his business had a net loss of $500.

Gross income	$2,000
1. Less: interest and taxes	500
Limitation on expenses	1,500
2. Less: operating expenses	1,400
Limitation on depreciation	100
3. Less: depreciation ($600) but no more than limitation.	600
Loss	(500)

Income from selling programs or any other activity from which you do not expect to make a profit must be entered on line 21 of Form 1040.

Under both the old and new laws, expenses are deductible on Schedule A as itemized deductions only, up to the amount of your income from selling programs reported on your return, in the following order:

1. Interest, state and local taxes, and casualty losses.
2. All other selling-related expenses.
3. Depreciation.

A new wrinkle in the Tax Reform Act of 1986: Those expenses are now subject to the two percent AGI (Adjusted Gross Income) limit as a miscellaneous deduction, and if you don't itemize, you will not get the deduction for the expenses—but you must still report the gross income on the front page of the 1040 form.

Hardware, peripherals and software with an estimated useful life of more than one year are depreciable assets; however, you cannot deduct their full cost as an expense. Instead, you must spread the cost over, say, five years and deduct a portion at a time. You may not depreciate (recover the cost of) property you use for personal purposes only.

Losses from a hobby are not deductible from other income, so John Doe lost $500 selling programs as a hobby that year. And the Tax Reform Act of 1986 limits the deductibility of hobby expenses to the extent of income derived from that activity.

REPORTING INCOME FROM A BUSINESS

According to an IRS spokesman, to be eligible for deducting losses from other income, you must establish to the IRS that you are indeed selling programs as a business—at least a part-time business.

Under the old law, to be considered "in business," you had to have reasonable expectation of profit and you had to show a profit in two out of five consecutive years. The Tax Reform Act changes the time period. Your program-selling activity must show profit in three out of five consecutive taxable years. You can postpone this determination, however, by filing Form 5213, Election to Postpone Determination. Filing this form postpones any determination that your writing and selling of programs is not carried on for profit until five years have passed since you first started the activity. Form 5213 must be filed within three years after the due date of your return for the year in which you first carried on the activity.

You must report all your business income and expenses on Schedule C, Form 1040. Schedule C is a statement of profit or loss from a business or profession of which you are the sole proprietor (the sole owner of an unincorporated business). Deductions for expenses are claimed on Schedule C, whether or not you itemized your personal deductions on Schedule A.

Schedule C is the primary form you will use in calculating your tax on income from selling programs, though you may need to use other schedules as well. For instance, if after totaling your income and subtracting your deductions, you have a net income of $400 or more, you must file the Schedule SE, Computation of Social Security Self-Employment Tax. And if you bought hardware, peripherals, or software, use Form 4562, Depreciation And Amortization, to report your depreciable deductions.

It's important to keep good records so the IRS can review them quickly and easily if necessary.

It is important to keep good records. You must maintain an expense/income ledger, so that IRS agents can review the information quickly and easily if necessary. Ledgers are available at any office supply store, or you can program your computer to produce them.

Such ledgers break expenses down in various categories, allowing you to analyze and summarize your costs efficiently. Keep your ledger entries up to date. Back up the ledger entries with receipts, canceled checks and any other evidences of your expenses.

(You'll also need to document your time spent at the computer to qualify for the acceleration of depreciation, showing computer time spent for each of the following: business, investments, and personal use.)

To keep your income from selling programs separate from your other income, thus making it easier to report, deposit all your income into a separate checking or savings account. Write down on your deposit slips where the money came from.

Remember that if you realize a loss, you must pay attention to the "at-risk" rules (tax shelter loss limitations). These apply to the amount of cash and (on an adjusted basis) other assets you contributed to the activity, and the amount borrowed for use in the activity for which you are personally liable.

ROYALTIES FROM COPYRIGHTS

Royalties from copyrights are fees paid to you for the right to use your work over a specified period of time. Royalties are generally based on the number of units sold, and they are taxable.

You may recover your costs for producing the copyrighted work and related expenses incurred through depreciation deductions over the life of the copyright. Deductible expenses include stationery and other supplies, travel expenses, and legal and other fees for the copyright.

You will probably receive a Form 1099 from the company paying you royalties if the income from royalties exceeds $600 in the tax year; you generally report it on Part 1, Schedule E (Form 1040).

BUSINESS EXPENSES

The IRS rules that business expenses are deductible if they are "ordinary and necessary" expenses directly connected with the taxpayer's trade, business or profession, and are reasonable in amount for that trade, business or profession.

The following expenses, to the extent that they are ordinary and necessary to your writing and selling of programs, are deductible: accounting fees, books, bookkeeping, transportation, subscriptions, diskettes, stationary, supplies, computer club fees, insurance, telephone, utilities, repairs, typing, copying costs, etc.

Business expenses are deductible if they are "ordinary and necessary" and are reasonable.

You can deduct automobile expenses using one of two methods of calculation. The first is to take the actual business mileage at 22½ cents per mile for the first 15,000 miles and 11 cents per mile for business miles in excess of 15,000. The second method involves calculating what percentage business miles are of your total mileage and multiplying this by the actual expenses for operating a vehicle. Thus if your business mileage were 20 percent of your total mileage, your deductible automobile expenses would be 20 percent of the total cost of operating your car.

Office-in-home expenses also require special attention. To qualify, the area must be used regularly and exclusively for business, and in addition, one of the following must apply: The area must be the principal place of business (though it need not be the taxpayer's main business); or it must be an area where clients meet or deal with you in the normal course of business; or it must be a separate structure; or it must be a place for storage of inventory.

If you maintain a separate room or area in your home for writing programs, an allocable share of the home expenses, such as rent, utilities, insurance, repairs, taxes, and interest qualify as deductions. The percentage of business expenses that qualify is usually computed using a formula based on the amount of business square feet compared to total square feet in your home.

Whether you are writing and selling programs as hobby or as a business, obtain receipts for every expense for which it is possible to do so. You may not need them to support deductions on your tax return, but you should not try to determine whether or not they are necessary—it is far better to have too many than too few. Keep the receipts and other supporting evidence, such as canceled checks, in case you are asked to substantiate your deductions. Remember, many taxpayers lose what are otherwise allowable deductions because they are unable to substantiate them.

When selling programs results in a net income, consider the

TAX REFORM ACT: HIGHLIGHTS

The chart below compares the old tax laws with the new Tax Reform Act that applies to your 1987 tax return.

Item	Old Law	Tax Reform
Hobby expenses	Deductible in specified order on Schedule A, limited to hobby income reported on return	Expenses allowed to the extent of gross income for the hobby.
Investment Tax Credit	6% to 10% of qualified property	Repealed, effective 1/86
Entertainment and meals expenses	100% of ordinary and necessary business expenses are deductible	Deduction limited to 80% of eligible expenses
Office-in-home expense	Deduction limited to gross income from business. IRS and Tax Court disagree about meaning of gross income	Deduction limited to net profits before office expenses. Amount not allowed because of limit maybe carried over.
Regular income averaging	Used by qualified taxpayers if results in lower tax	Repealed, effective 1987
Health-care benefits	Not taxed	Self-employed not covered by any employer plan may deduct 25% of health-care insurance premiums from business income
Depreciation	Most property classified as 3 years, 5 years, or 19 years for real property	Classification revised resulting in longer recovery for most equipment, cars, residential rental, real property.
Presumption of profit motive	Activity is presumed to be for profit if it shows a profit in 2 out of 5 consecutive years.	Activity must show profit in 3 out of 5 years for presumption to apply.

GLOSSARY

Asset. A property that is useful and/or has value that can be converted to cash.

Audit. An official examination of financial records. In tax returns, an examination by the Internal Revenue Service.

Deductions. Expenses that can be claimed as reductions of income.

Depreciable Assets. Property used in business or held for the production of income with a determinable useful life of one or more years.

Depreciation. The estimated decrease in value of an asset over time.

Gross Income. All the income subject to tax without regard to deductions.

Interest. A charge for borrowed money; generally a percentage of the amount borrowed.

Investment Credit. A credit against income tax based on the purchase price of tangible personal property to be used in a trade or business.

Net Operating Loss. A net loss for the year attributable to business or casualty losses.

Proprietor. The sole owner of a trade or business.

Royalty Income. Income received in exchange for the right to utilize property.

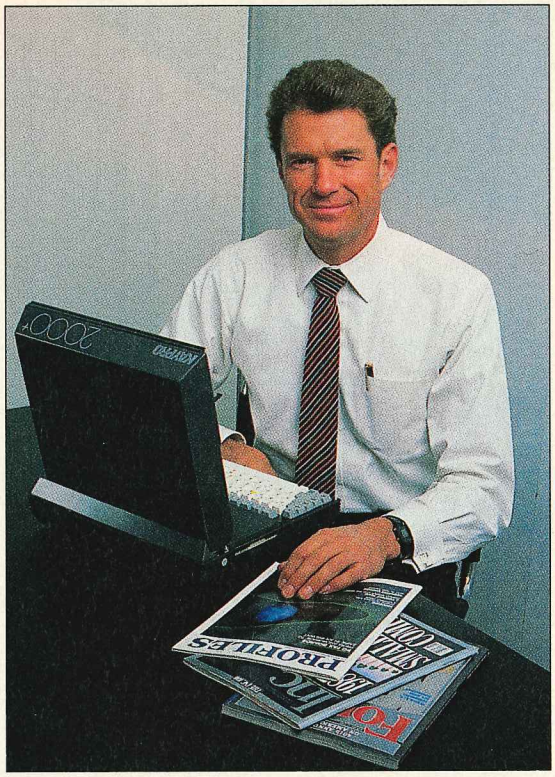
Tangible Personal Property. Property, such as vehicles, machinery, equipment, and furnishings.

Useful Life. The estimated life in years during which a taxpayer will use an asset in a trade or business.

advantage of establishing a self-employed retirement plan (Keogh Plan), which, if the appropriate requirements are met, allows you to deduct on your tax return up to 25 percent of your net self-employment income, figured after subtracting the Keogh contribution, not to exceed $30,000.

This brief review is necessarily a broad picture, and you should use it solely as a general guide. Always consult your own tax adviser or accountant when filling out your tax return.

Isaac Szlechter is a freelance writer who specializes in business and technology reporting.



David A. Kay, President, Kaypro Corp.

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Whether you are involved in corporate, small business or home management, your time is valuable. In the business world, keeping up with market trends and the competition often means being away from your office - and your precious data. Wouldn't it be something if you could take your office with you?

Fortunately, our new Kaypro 2000+ enables you to do just that - stay in touch and on top of things wherever your business takes you. The most impressive feature of the 2000+ is our high contrast LCD screen, which utilizes cold cathode backlighting. This revolutionary technology gives our screen the highest readability in the industry. Other exciting features standard on the Kaypro 2000+ include two 3.5 inch disk drives, 768K of RAM, EGA graphics, detachable keyboard, built-in modem, and a wealth of software. We think these features make Kaypro's newest laptop an important PLUS for any business environment.

But we don't stop at making a great computer. A busy person such as yourself can't always invest the time necessary to be able to get the most out of your computer. PROFILES, The Magazine for Kaypro Computer Users, provides practical solutions that help you get the most from your computer investment. Answers to the most commonly asked questions are provided each month, in addition to our helpful buyer's guides to software and peripherals. Most importantly, we show you how to get up and running on today's most popular and innovative software products.

In order for us to fully understand your needs, we need your input. For this, we have enclosed a reader survey. Please take a moment of your time to fill out the questionnaire and send it in.

And, because your time is so valuable, we will be having a drawing of those surveys returned by March 15, 1988. The winner will be awarded a new KAYPRO 2000+!*

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WINNER WILL BE ANNOUNCED IN MAY 1988 ISSUE

**For those of you who can't wait for the drawing, check out the new Kaypro 2000+ by calling 1-800-4 KAYPRO for the dealer nearest you.*

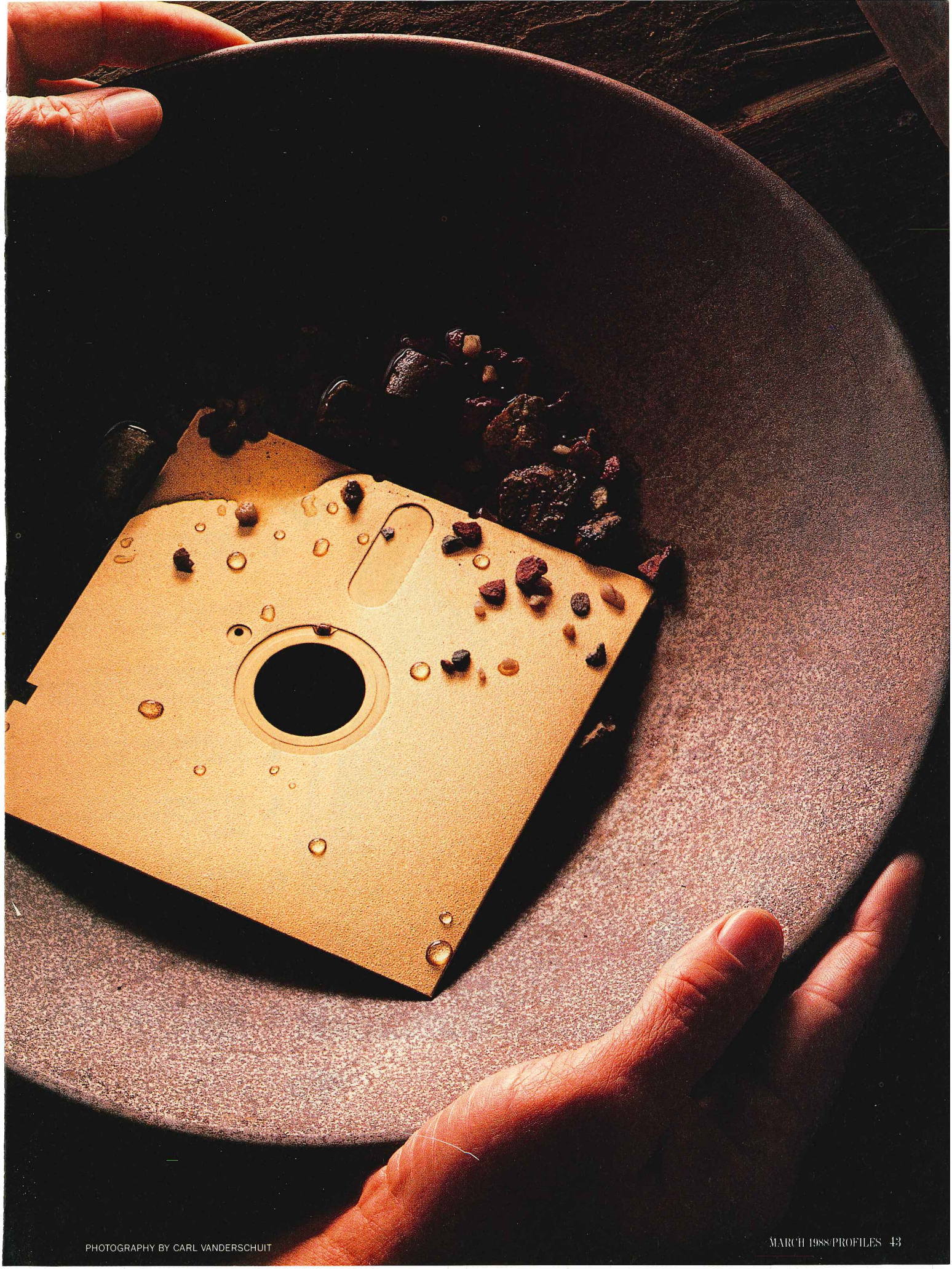
A First Session with ProComm

Getting started with this public domain treasure.

BY MARSHALL L. MOSELEY

Sifting through public domain software is like panning for gold: You go through a lot of rocks before you find the occasional gold nugget. But when you finally do hit pay dirt in the form of a good program, your search pays off in both monetary savings and the pleasure of learning new, well-designed software.

ProComm, the telecommunications program from DataStorm Technologies, is solid gold. It has advanced features usually found in programs costing hundreds of dollars, including pop-up windows, multiple transfer protocols, terminal emulations, keyboard macros, unattended and timed operation, and a full-featured script language. ProComm is user-supported software, which means that DataStorm



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encourages its unlimited copying and distribution by the public, but expects those who use the program to pay a $25 registration fee. For more information, see "User Supported ProComm," by Jack Nimersheim, in the February 1988 *PROFILES*.

In this article, I will describe ProComm version 2.4.2 only—this is the current user-supported version of ProComm. At the time of this writing, Datastorm has announced a commercial version of ProComm, called ProComm+. Steve Monaco of Datastorm states that ProComm+ "is really a brand-new product, though it shares some key commands with the shareware [user-supported] version of ProComm."

This article will take you through an elementary session with ProComm. You'll see how to prepare it for use, what its structure is, and, as a practical exercise, how to call Kaypro's remote bulletin board system, Kaypro On-line, and retrieve a file from that board.

I'll assume that you have a Hayes or Hayes-compatible 300- or 1200-baud modem and the correct cable for connecting it to the computer, and that you are familiar with the MS-DOS operating system. If you do not know anything about telecommunications, you may find it helpful to read the article "A Beginner's Guide to Telecommunications" in the April 1987 issue of *PROFILES* first.

WHERE TO GET PROCOMM

ProComm is available on just about every major RBBS in the United States. (An RBBS is a remote bulletin board system: a computer with a modem, maintained by a computer hobbyist and dedicated to telecommunications. Computer users call RBBSs to exchange electronic mail and to find public domain software.)

If you have no way of getting ProComm from a local bulletin board, ask a friend with a computer and modem to do it. If that isn't feasible, contact your local Kaypro User's Group (KUG). These are clubs that meet weekly or monthly to discuss Kaypro computer use and to exchange tips and public domain programs. Most KUGs maintain public domain libraries in which you will surely find ProComm. (To find the KUG nearest you, call 800/4-KAYPRO and be ready to tell the operator your zip code.)

KEY CONCEPTS

Before you begin using ProComm, you need to understand two concepts: terminal operation and binary file transfers.

A terminal is a keyboard and screen that connect to a computer. A terminal is used to operate a computer—commands are typed on the keyboard and the results appear on the screen. A terminal can be located right next to its computer, or hundreds of miles away. When you connect with an RBBS, your modem software makes your computer emulate a terminal. Text transmitted from the other computer appears on your screen, and your keyboard acts like its keyboard. Most of the time you are connected to an RBBS, your software is in this *terminal mode* and the RBBS acts as a *host*.

The only time your computer isn't in terminal mode is when you perform a binary file transfer. In a binary file transfer, your computer switches out of terminal mode, and one or more files are sent directly over the telephone line in binary form—that is, as individual bits that are constantly checked by both the sending and receiving computers to make sure that the file is coming through correctly. (Files may also be sent in ASCII form, in which no error-checking occurs.)

Before you use ProComm, you need to understand terminal operation and binary file transfers.

In binary file transfers, this error checking is done using a *transfer protocol*, which is a specific set of rules governing the order in which the bits that comprise a file are transferred and checked for validity. Each computer must use the same protocol, or the file doesn't go anywhere. ProComm makes nine different protocols available, each of which is appropriate under different circumstances (Kermit, for example, is used for communicating with mainframes). You'll be using the most popular one, Xmodem, to retrieve a file from Kaypro On-line. But before doing that, you must get to know ProComm a little better.

PREPARING PROCOMM

Many files are included with ProComm, most of which are for advanced users of the program. The two we're interested in for the purposes of this article are PROCOMM.DOC and PROCOMM.EXE.

PROCOMM.DOC is a complete manual in the form of a specially formatted ASCII file. You'll want to print this manual using the MS-DOS PRINT command. Be sure you have a lot of paper in the printer, and be prepared to wait at least half an hour if you have a dot-matrix printer—longer if you have a letter-quality printer.

PROCOMM.EXE is the program itself. If you have a dual-drive computer, such as the Kaypro PC, put a system disk containing PROCOMM.EXE in the A drive. If you have a hard disk computer like the PC-10 or PC-30, use the MS-DOS make-directory command to create a new directory, then copy PROCOMM.EXE into it. Now you're ready to start telecommunicating.

RUNNING PROCOMM

Make sure your modem is on and connected to the serial port (unless you have an internal modem). From the MS-DOS

prompt, type **PROCOMM** and press Enter. ProComm will run, displaying the DataStorm logo and copyright information. Then the message "CREATING SYSTEM FILES" will appear at the bottom of the screen. The system files being created are ones that ProComm uses every time it runs. The parameter file PROCOMM.PRM contains default values, such as the baud rate and modem settings; PROCOMM.XLT is a translation table that designates what keystrokes invoke what characters; PROCOMM.KEY stores any keyboard macros you might create; and PROCOMM.DIR is the dialing directory, which can contain up to 100 telephone numbers and the communications parameters that go with them.

After the system files are created, you will be presented with an almost blank screen where text and messages from the other computer will appear once you connect to it. At the bottom of the screen is the the status line. This line is always present and supplies information about the *communications parameters* currently being used. (Communications parameters are a series of values in your software that tell it what modem speed and serial port to use, and what methods it should employ to transmit data. The parameters you set must match the parameters of the RBBS or online service you are calling;

ARCHIVE PROGRAMS

Computer users who buy modems are quickly confronted with two harsh facts: one, spending time on-line costs money; and two, some files are *large*, requiring a lot of time on-line to send or receive. Fortunately, some of this financial sting is eased by the use of archiving programs.

An archiving program reads single or multiple files, then copies and compresses them into one file, called an archive file. An archive file is smaller than the un-compressed files used to create it. Because of their reduced size, almost all MS-DOS files transferred with telecommunications programs are stored as archive files. You can recognize them by their .ARC extension.

In creating an archive file, the archive program analyzes the subject files and determines the best way to compress them. There are four options available: no compression, for files that are already stored as efficiently as possible; repeated-character compression, in which repeated sequences of the same characters are changed into a three-character code sequence; Huffman coding, in which each character is encoded according to the number of times it appears in the file; and LZW compression, in which single characters represent entire strings of characters. (For a more complete description of archiving techniques, see "Data Compression Programs" in the September 1987 issue of *PROFILES*.)

Archive programs don't just create archive files, however. They also let you manipulate those files in many ways. You can list the compressed files in an archive file, add or subtract files from the archive, or update older entries with new ones. You can also "move" files into or out of the archive, deleting the source files in the process.

The two most popular archiving programs are both shareware. They are ARC version 5.12 from System Enhancement Associates, and PKARC/PKXARC from PKWARE Inc.

ARC version 5.21 is an all-in-one archiving utility. It creates archives files, lists the entries contained within, and extracts files from them. The syntax for ARC is:

ARC ⟨Command⟩ ⟨ArchiveFile⟩ ⟨SourceFile⟩

In the above, replace ⟨Command⟩ with any of ARC's 18 single-letter commands. There are too many to list them all here, but the three most important are L, which lists the compressed files inside an archive file; A, which adds files to an archive file, creating one if one doesn't already exist; and X, for extracting files and un-compressing them. Replace ⟨ArchiveFile⟩ with the name of the archive file you're working on, and replace ⟨SourceFile⟩ with the name of the file you wish to archive or de-archive.

For example, to list the contents of the archive file LIST61.ARC onscreen, you would type **ARC L LIST61**, then press Enter. A list of the compressed files in LIST61.ARC would appear. To extract all the files from the same archive, you would type **ARC X LIST61**. To extract only the file LIST.DOC from LIST61.ARC, you would type **ARC X LIST61 LIST.DOC.**

PKARC and PKXARC from PKWARE are separate programs that do the same thing as ARC. PKARC creates and updates archive files, while PKXARC extracts files from an archive. The notable difference between ARC and the PKWARE programs is speed; the latter are *fast*, up to 40 percent faster than ARC. PKARC also uses a compression method that ARC can't understand. Because of this the PKWARE programs can work with files created by ARC, but ARC can't always work with files created by PKARC. The syntax for PKXARC is:

PKXARC ⟨Command⟩ ⟨SourceFile⟩

There are six PKXARC commands, but you don't have to use any of them; if no command is typed, the program will extract all the files from the designated archive file. Continuing with the above example, you could un-compress all the files in LIST61.ARC by typing **PKXARC LIST61**.

Because archiving programs are publicly distributed, the best way to find one is to ask a fellow computer user for a copy. Or you can contact your local Kaypro User Group. KUGs usually maintain a library of public domain programs in which you will surely find an archiving program. To contact your local KUG, call 1-800-4-KAYPRO and tell the operator your zip code. He or she will tell you how to contact the KUG nearest you. You can also contact the software manufacturers directly at the addresses listed below.

—Marshall Moseley

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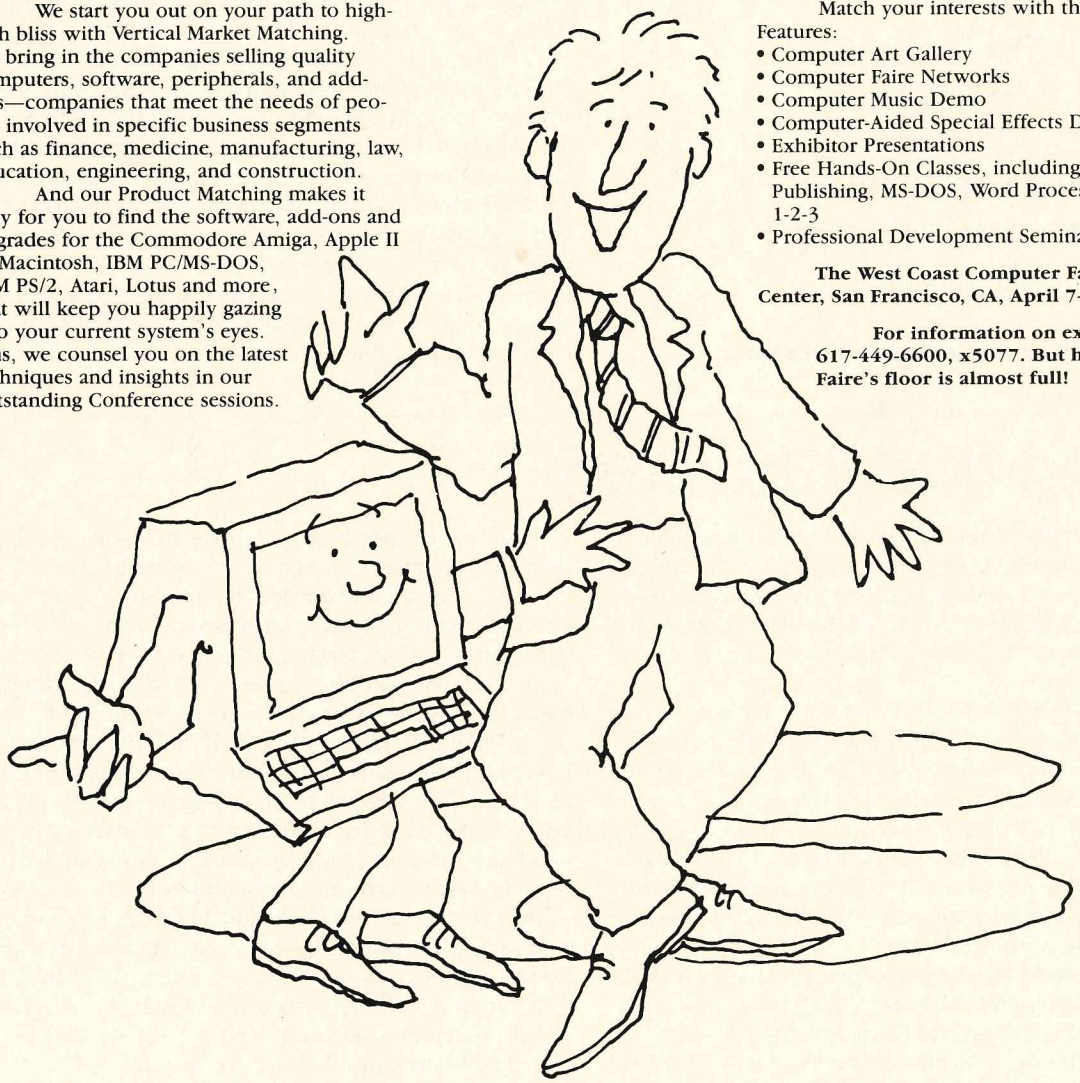

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The ProComm help system is a pop-up screen that you can invoke any time while using the program.

otherwise, you'll be unable to communicate.)

I'll provide a short explanation for each term in the status line and then discuss two of them in depth.

The first one, ALT-F10 HELP, tells you that the keys Alt and F10 call up the ProComm help screen; ANSI-BBS is the type of terminal the software is currently emulating; FDX tells you that the software is operating at full duplex; 1200 N81 tells you that the current communications parameters are 1200 baud, no parity, 8 data bits, and 1 stop bit; LOG CLOSED means that whatever appears on the screen will not be saved to a text file; PRT OFF tells you that whatever appears on screen will not be sent to the printer; and finally, the two CRs tell ProComm what to do at the end of a line—move left and overwrite the current line or move left and go down to a new line.

COMMUNICATIONS PARAMETERS

Okay, you have your brand new modem connected to your computer. Your telecommunications software is up and running, and you're ready to dial your first bulletin board. You type the correct command and press Enter. When the connection is made, instead of recognizable information, the following appears: ^bf?* $@!+d.

"What the heck is ^bf?* $@!+d?" you ask, "and why is it on my screen?" Believe it or not, "^bf?* $@!+d" is actually intelligible information. You just can't read it because your program's *communications parameters* are incorrectly set.

Communications parameters are software settings associated with telecommunications. They define the exact communication methods used by your computer. If your parameters don't match the ones used by the computer you are calling, you cannot exchange coherent information.

Before you can use telecommunications effectively, it is important that you understand what the various communications parameters are, so you can change them to suit your needs. The parameters you will adjust most often are the bits-per-second rate, the number of data bits, the number of stop bits, and the type of parity used. Following are short definitions of each of these terms.

Bits per second. As you may know, a bit is a binary digit, either 1 or 0. It is the smallest unit of information your computer can manipulate and the basic building block for all computer data and programs. Every program and file in your computer is composed of bits. Bits per second, or bps, is a measurement of the number of bits a modem can transmit or receive in one second. Typically, telecommunications take place at 300, 1200, 2400 or 9600 bps.

The bps rate is often confused with the baud rate. Though they are similar, they are not the same thing. The baud rate tells you the exact number of times the signal from your serial port changes its electrical state, from +5 or more volts to –5 or less volts. At lower operating speeds the baud rate and bps rate are the same because a change in the signal state is what denotes another bit being transmitted, but at higher speeds—2400 bps and up—the bps and baud rates are not necessarily equal. Bps is the more precise term and the one most widely used.

Data bits. To denote alphabetic and numeric characters, your computer organizes bits into strings eight digits long called bytes. Each byte represents one of 256 different characters. In telecommunications, bytes being transmitted are referred to as data bits. They are often truncated to a length of seven bits, allowing only 128 discrete characters. Most bulletin boards use eight data bits, but a few expect seven, as do some online services. If you are unsure of how many data bits to use, choose eight.

Stop bits. Once the last data bit is transmitted, another bit is sent telling the receiving computer that data-bit transmission for this character is over. This is the stop bit. Once a stop bit is received, a new series of data bits is sent. Most bulletin board and online systems use one stop bit, but there are rare ones that use two. When in doubt, use one stop bit.

Parity. Parity in a general sense means "likeness" or "equal value"; in this context it refers to the way in which your data is checked for transmission errors—that is, for equality between what is sent and what is received. In parity checking, a parity bit is transmitted with each string of data bits. The value of the parity bit is odd or even, depending on the sum of the data bits. The data bits received are added together, and if the resultant answer doesn't match the parity bit, a transmission error has occurred and that whole group of bits is retransmitted.

With most RBBSs, parity is not used, so if you are calling an RBBS set the parity to none.

Almost every RBBS in the United States uses these parameters: eight data bits, one stop bit, and no parity. Some online services require different parameter settings. Consult the manual for your service to determine what your settings should be.

—Marshall Moseley

ALT-F10. The ProComm help system is a pop-up screen that you can invoke at any time while you are using the program. It lists the most-used commands and the keystrokes that bring them up. Look at the help screen now by holding the Alt key down and pressing F10 (see figure 1). Major functions are usually accessed when you are offline, while the utility and file functions are used while you are actively telecommunicating. This screen is a life saver. Many times I've forgotten a key sequence and taken a quick look at the help screen to jog my memory.

Full or Half Duplex. In full duplex operation, the two-way communication between your computer and another is simultaneous—you can transmit while the other receives and vice versa. You will notice this most when typing while on-

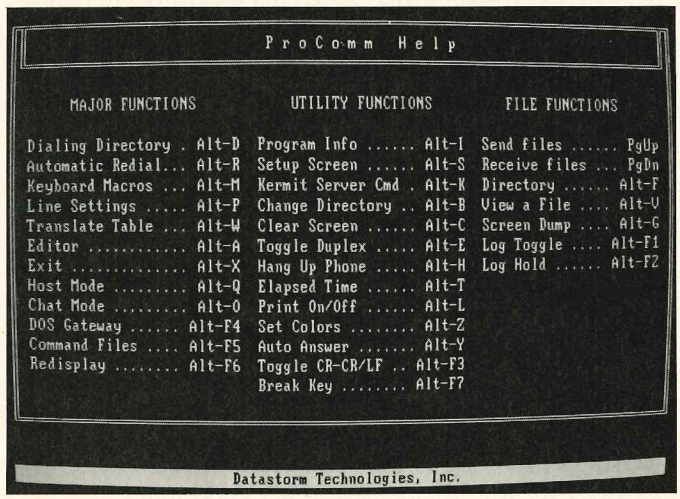

Figure 1: ProComm Help Screen

line. Any characters you see as you type are first transmitted to the host computer, then transmitted back to you. This is called echoing characters and it takes place only in full duplex operation. In half duplex operation ProComm simply sends characters out and, not expecting the host to echo them, types them on your screen itself. Most of the time you will use full duplex operation because that's the method used by the boards you will call.

EXECUTING COMMANDS

Most of ProComm's features are accessed the same way as the help menu—by pressing the Alt key and holding it down, then pressing another key to activate the function. For example, press Alt F right now; ProComm will run the MS-DOS command DIR for you. It is currently paused to let you enter command parameters, such as /W for a wide display, or /P to make the listing pause. Press Escape to get back to the communications screen.

You should be getting a feel for how ProComm functions: It stays online and communicating unless you invoke a command,

Each number in ProComm's phone list has its own set of parameters, which you need set up just once.

at which time a window pops up containing a prompt or a menu. Once the command is complete, the communications screen reappears.

To continue, Press Alt P. This brings up the Line Settings menu, which allows you to designate the communications parameters Procomm will use when it first runs. This menu is a numbered list of the different settings available and an option to save the current settings to disk. If you have a 300 bps modem, select number 7; if you have a 1200 bps modem, select number 8. If your modem is connected to COM2, select option 21. Type **24** to save the changes. When you are done, press Escape to return to terminal mode.

MAKING A CALL

Start your online session by pressing Alt D. The Dialing Directory will appear (see Figure 2). From here you create or add to the list of telephone numbers ProComm can dial. The list holds up to 100 numbers, and each number has its own set of communications parameters. If, for example, you sometimes call a bulletin board that uses non-standard parameters (such as 7 data bits, or even parity), you can link those parameters to the name and number of that bulletin board. By maintaining a separate set of parameters for each number, ProComm ensures

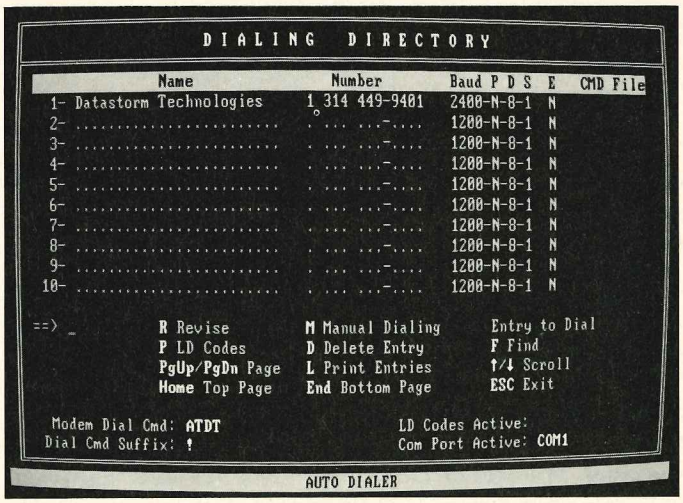

Figure 2: ProComm Dialing Directory

that you won't constantly be resetting parameter values. You set up a number once and that's it.

To enter a number in the Dialing Directory, press R for Revise. A window will pop up asking you what entry to revise. Reply by pressing **2**. When prompted for the name, type Kaypro On-line; when prompted for the number, type **1 619 259-4437**. (If you are in the 619 area code, don't type 1 619. If you are calling from a business phone, you may have to preface the number with a special code to get an outside line.)

The next five questions all concern communications parameters. The default values are correct, so keep pressing Enter until you see the question "Save entry 2 to disk (Y/N)?" Reply by pressing **Y**.

Once back at the dialing directory, dial the phone by typing 2 and pressing Enter. The modem speaker will activate. You will hear the modem get a dial tone and dial the number. If you're lucky, you will hear the phone at the other end ringing and being answered. If not, you'll hear a busy signal.

If you get a busy signal, ProComm has an automatic redialer. Type **Alt-R**. A window will appear asking you to enter a number or to press Enter to redial the last number used. Press Enter. ProComm will keep trying the Kaypro On-line number until it gets an answer (this auto-redialer is often called a "demon dialer"—it dials like a demon until it gets results).

When you do get an answer, you will hear a high-pitched whine and then silence as the word CONNECT appears on your screen. You are now online.

KAYPRO ON-LINE

The screen will fill with Kaypro On-line's sign-on message. You will then be prompted for your first and last name. After you enter your name, the board will ask you what Kaypro User Group you are affiliated with. Leave this blank if you have no affiliation. It will then ask you for your address and telephone number.

After you enter all this data, the board will inform you that you currently have "Non-Classified privileges," meaning you are not yet a registered user of Kaypro On-line. (A registered user is one whose address and phone number have been verified by the person running the RBBS, called the system operator or "sysop.")

Why go through this? Because many people call the board once and never call again, while others call every day. Different privilege levels give frequent users more time online. Also, having your name and address handy allows the sysop to provide technical support in case you ever run into a problem.

But your goal for this call is to get Kaypro On-line to send you a program, not to register. From the Main Menu choose **F** for the File Menu.

DOWNLOADING A FILE

You will see a menu from which you choose what type of file you want, MS-DOS or CP/M. Press **D** for MS-DOS. Then you will see a menu labeled DOS Directory Selection. Type **P** to go to the *PROFILES* section. You will see the following screen:

Current Protocol: XMODEM DOS PROFILES -
Files mentioned in PROFILES magazine.

⟨Q⟩uick file list — ⟨S⟩ummary file list — ⟨P⟩rotocol change.
To DOWNLOAD A FILE enter FILENAME.EXT or 1 to 37
To READ DESCRIPTION enter FILENAME or /1 to /37

Selection (⟨Enter⟩ if none): _

Let's take a quick look at the files available. Type **Q**. A list of about 40 files will appear, and then the menu shown above will reappear. On that list is LIST61.ARC—version 6.1 of the popular file-viewing program LIST. It contains many improvements over the old version and is well worth downloading. Do so now by typing **LIST61.ARC** and pressing Enter. You will be told to begin receiving the file using the Xmodem protocol.

Now you'll need to switch from Kaypro On-line back to ProComm itself. To do this, make sure the Num Lock light is off, then press **Pg Dn**. A menu of the available file transfer protocols will appear. Type **1** for Xmodem. A prompt will appear asking you to enter the file name. Type **LIST61.ARC** and press Enter and the file transfer will begin. A text box will appear with the file's name inside it, along with details on the status of the file transfer—how much of the file has been sent and how many transmission errors have been found and corrected.

LOGGING OFF

Once the file transfer is complete, the file transfer prompt will appear again. Press Enter to go to the previous menu, then press it twice more to go the main menu. Log off Kaypro On-line by typing **H**. The board will ask you if you are sure. Reply by typing **Y** for yes. Kaypro On-line will hang up.

Exit ProComm by typing **Alt-X**, and replying **Y** to the "Exit to DOS?" query.

This ends your first session with ProComm. Just a few aspects of ProComm have been covered here. If you study the manual you'll learn about script files, host mode, keyboard macros, and many other features. All of these elements, combined with intuitive key commands and a rock bottom price, are what make ProComm as good as gold.

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Manufacturer: PKWARE, Inc.
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Shareware Fee: $45

Product: ARC, version 5.21
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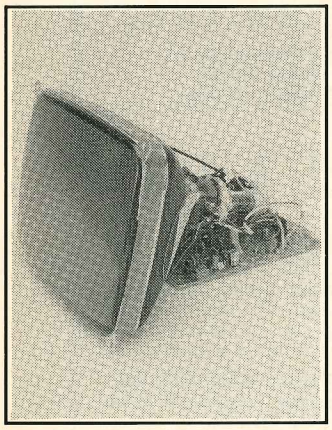

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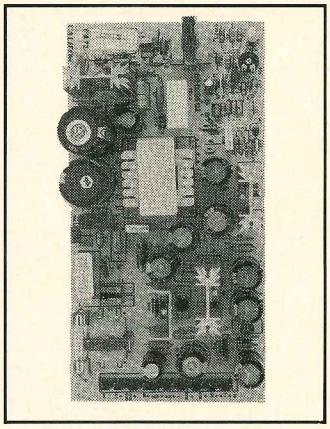

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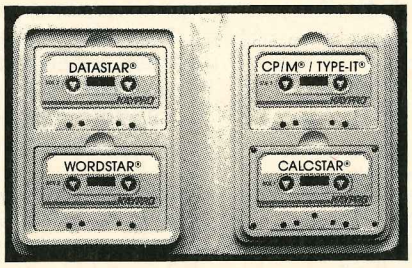

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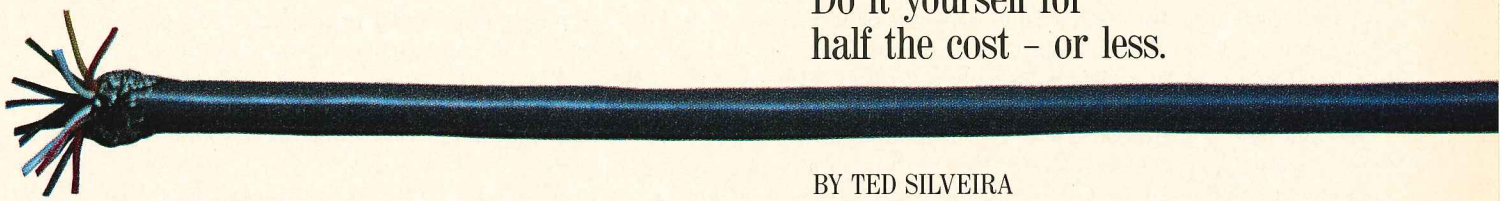


BY TED SILVEIRA

Imagine this scene: At great loss to your bank account, you buy a new Hayes Smartmodem. You go home, unpack the modem, set it up next to your computer, plug its power cord into the wall, and turn it on. You turn on your computer, start up your public domain or shareware communications program, and dial a number. Nothing happens.

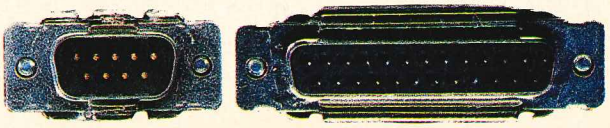
Oops, forgot to plug the modem into the computer. Look at the back of the modem. No cable. Look at the back of the computer. No cable. Call the local computer store and ask about a cable. $24.95, when they have them. Next shipment due in a week.

At this point, a normal human being might be tempted to stuff the modem back in its box and stomp on it. But with a pair of pliers, a knife, a screwdriver, and some cable parts from an electronics store, you can make your own modem cable in an hour...and for half the cost or less. Here's how:

COLLECT THE PARTS

To make a modem cable, you need a length of multi-conductor cable and two connectors, one for each end. You can get all the parts you need at almost any electronic parts supply store (if they advertise computer parts and/or repairs, they'll have what you need). You may also be able to find the parts at a chain store like Radio Shack.

The cable. The cable you want is multi-conductor cable, sometimes called communications cable. This cable contains a number of separate wires, each insu-



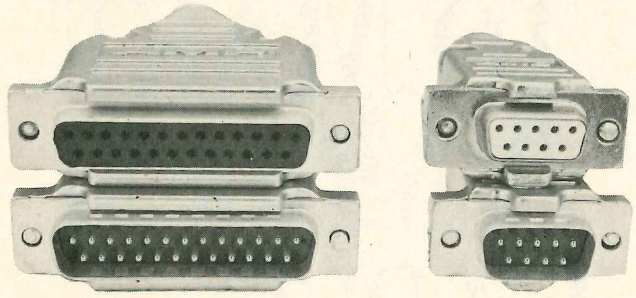


Figure 1: DB-25S, DB-25P, DB-9S, and DB-9P (with hoods).

lated from the others. You need a cable with at least nine wires to make the modem cable—I suggest you get 12-wire cable at least, to allow for mistakes. (More than once I've inadvertently clipped a wire too short.)

The cable also comes in shielded and unshielded forms. The shielded cable is wrapped with a metallic foil that cuts down electronic interference, but it's unnecessary for this application. Buy the cheaper unshielded cable.

This cable is usually sold by the foot from a roll. How much you need depends on how far your modem will be from your computer. Don't make it too short, though—it's better to make

You can make your own modem cable in an hour for half the cost.

a six-foot cable and let four feet of it dangle than to make a two-foot cable and find out you need six.

The connectors. All connectors are either *plugs* (also called *male* connectors) or *sockets* (also called *female* connectors). The plugs, or male connectors, have a number of small pins on the end, while the sockets, or female connectors, have holes to receive the pins. The plug and socket connectors fit together just like an electrical plug and socket in your home.

The connectors used for modem cables are often called *D-Subminiature* connectors and are classified according to the number of pins or holes they have. The two most common are the DB-9 (a nine-pin connector) and the DB-25 (a 25-pin connector). A DB-9P connector is a 9-pin plug, a DB-9S is a 9-pin socket, a DB-25P is a 25-pin plug, and a DB-25S is a 25-pin socket (see Figure 1).

You need to get connectors that will mate with the connectors on your modem and your computer:

The modem connector. If you have a Hayes modem, you'll see it has a DB-25S connector (a socket) on the back, so you need one DB-25P connector (a plug) to mate with it.

If you have a different modem, check to see what kind of connector it has. If the modem has a 25-pin plug, you need a DB-25S connector to mate with it; if it has a 25-pin socket, you need a DB-25P connector. (A very few modems use a 9-pin DB-9 connector instead of a DB-25, in which case you'll need the corresponding DB-9 plug or socket.)

The computer connector. If you have a CP/M Kaypro, any model, you'll need a DB-25P connector for the computer end of your cable.

If you have a Kaypro 286i MS-DOS computer, you'll need a DB-9S connector for the computer end of your cable.

If you have a Kaypro PC, check the serial port on the back of the computer. Newer Kaypro PCs (with the dual speed option and the half-length multi-video board) have a DB-9P connector, so you'll need a DB-9S connector for the computer end of your cable. Older Kaypro PCs, however, have a DB-9S connector, so you'll need a DB-9P for the computer end of your cable. (Also, the cables for these two models must be wired differently, as you'll see later.)

Crimp-on connectors. No matter what connectors you need—DB-25 or DB-9, plug or socket—you'll have a choice between two styles. The cheapest and most common connectors are *solder-cup* connectors, which require you to solder the wires of the multi-conductor cable to the back of the connector. If you know how to solder, you can use these and save a dollar or two, but if you don't, avoid them.

Even though I can handle a soldering iron, I prefer a connector called a *crimp-on* connector (made by AMP), which requires no soldering. With these connectors, the individual gold-plated pins and sockets come separate from the plastic connector body (see Figure 2). To assemble the connector, you crimp the appropriate pins or sockets onto the wires and then insert them in holes in the connector body.

Though they are a bit more expensive, these crimp-on connectors have two advantages over solder-cup connectors. First, there are fewer chances for accidents, since you don't have a hot soldering iron to endanger the plastic connectors (and your fingers). And second, you can reconfigure a cable made with these con-

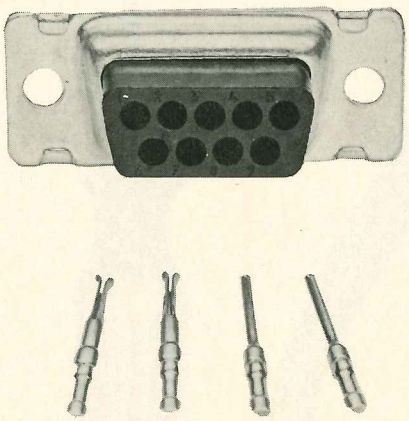


Figure 2: Crimp-on connector with pins and/or sockets.

nectors by pulling out the pins or sockets and inserting them in different holes (it requires care, but it's easier than changing a soldered connection).

I recommend crimp-on connectors even if you do know how to solder, and for the rest of this article, I'll assume that you're using them. If you're using solder-cup connectors, adjust the instructions accordingly.

The connector hoods. Because the wires in the multi-conductor cable are small, they are easily broken. To protect the wires where they're attached to the connectors, you need a *cable hood,* a plastic shell that covers the back part of the connector. Get a DB-25 hood for every DB-25 connector (plug or socket) and a DB-9 hood for every DB-9 connector.

I recommend crimp-on connectors even if you know how to solder.

Your shopping list. So here's what you need to buy:

- Several feet of multi-conductor cable, at least 9-wire and preferably 12-wire.
- One connector to mate with the connector on your modem.
- One connector to mate with the serial port connector on your computer.
- Two connector hoods to match the two connectors you buy.

PREPARING THE CABLE

You'll need the following tools to assemble your cable:

Small needle nose pliers for crimping the non-solder pins and sockets onto the cable wires. These pliers can also be used to insert the pins and sockets into the cable connector body.

Small straight-blade screwdriver for attaching the hoods to the completed connectors.

Small, sharp knife for removing insulation from the cable wires. A small pocket knife or an X-Acto knife will do.

I chose the above tools because many people already have them and because they all serve useful purposes beyond making cables. If you're going to go into cable-making in a big way, you can buy specialized tools for the job, including a pin insertion/removal tool and a combination crimping/wire-stripping tool. The pin insertion tool is not a good deal—it's expensive ($5 or so) and breaks easily.

Let's get to work:

Step 1. You first need to remove part of the outer covering (usually gray, sometimes black) from each end of the cable, to expose the wires inside. Starting at one end of the cable, use your knife to slit the gray covering along the length of the cable about 1¼ inches (the measurement doesn't have to be exact). Cut carefully—you want to cut through the covering without damaging the wires underneath.

Figure 3: Cable with outer insulation cut away.

Then, at the end of the slit, cut all the way around the cable so that you can pull the outer covering off the end of the cable, exposing the wires underneath (see Figure 3). Again, be careful not to cut into the wires themselves.

Repeat this operation at the other end of the cable so that you have about 1¼ inches exposed at each end.

Step 2. Now that you've exposed the wires inside the cable, you can see that each one is a different color (so that you can tell which is which at each end of the cable).

You need nine of these wires. If your cable has more than nine wires, select nine and bend the other wires out of the way (don't cut them off, just in case you make a mistake and need an extra wire). Avoid using wires whose colors could be confused (such as red and orange), and make sure you've selected the same nine wires at each end (no kidding—it happened to me).

Next, strip the colored insulation from the ends of each wire. Measure 3/16 inch down from the end of the wire, and with your knife, cut through the insulation all around the wire. Be careful as you cut because the wire underneath is usually made of many find strands that can easily be cut through, and you can easily cut yourself if you slip.

Once you've cut through the insulation, remove the end piece so that the end of the wire is bare (see Figure 4). If the exposed wire is stranded rather than solid, twist the strands tightly together with your fingers.

Repeat this procedure for each end of all nine wires.

Step 3. Once you've stripped the insulation from the ends of all the wires, you're ready to attach the individual pins or sockets to each wire. Before you proceed, though, label one end of the cable *Modem* and the other end *Computer* (I usually write on gummed labels and then wrap them around the cable, one at each end).

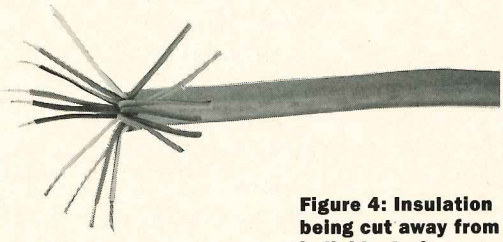


Figure 4: Insulation being cut away from individual wire; stripped wires are also shown.

Table 1 Hayes modem to Kaypro 286i or new Kaypro PC

Modem end (DB-25P)	Signal name	Computer end (DB-9S)
2	transmit data	3
3	receive data	2
4	request to send	7
5	clear to send	8
6	data set ready	6
7	signal ground	5
8	carrier detect	1
20	data terminal ready	4
22	ring detect	9

Table 2 Hayes modem to old Kaypro PC

Modem end (DB-25P)	Signal name	Computer end (DB-9P)
2	transmit data	2
3	receive data	4
4	request to send	8
5	clear to send	3
6	data set ready	1
7	signal ground	5
8	carrier detect	7
20	data terminal ready	6
22	ring detect	9

Table 3 Hayes modem to CP/M Kaypro

Modem end (DB-25P)	Signal name	Computer end (DB-25P)
1	frame ground	1
2	transmit data	2
3	receive data	3
4	request to send	4
5	clear to send	5
6	data set ready	6
7	signal ground	7
8	carrier detect	8
20	data terminal ready	20

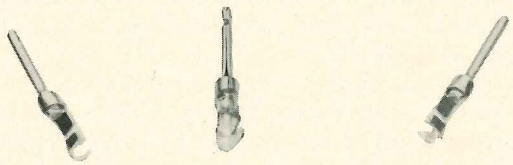


Figure 5: Single pin (note crimp-flaps).

Now take a close look at one of the individual gold pins or sockets (see Figure 5). It has three parts—the long front part, which is the real pin or socket; the barrel (the cylindrical bulge) in the middle; and, at the back end, four flaps that you will crimp down to hold the wire in place. If you look at the pin or socket end-on from the back, you'll see that it's hollow.

To install the pin or socket on a wire, slide the bare end of the wire into the back of the pin or socket as far as it will go, and then use your pliers to crimp the flaps down on the wire to hold it in place (see Figure 6). The front pair of flaps should be crimped down on the bare wire itself, while the back pair should be crimped down on the end of the insulation.

Start at one end of the cable and install the appropriate pins or sockets on all nine wires. Then do the same for the other end of the cable.

MAKING THE CONNECTIONS

Now you need to assemble the connectors by plugging the wires (with their crimped-on pins or sockets) into the appropriate holes in the connector bodies.

If you look closely at the face of each connector, you'll see that all the holes are numbered—from 1 to 25 in a DB-25 connector and from 1 to 9 in a DB-9 connector. The numbers are very small, so you may need a magnifying glass. As you look at the front face of a connector, the holes on a plug connector are numbered from left to right, with hole 1 at the top left, but the holes on a socket connector are numbered from right to left, with hole 1 at the top right (that way, when you connect a plug and a socket, hole 1 matches hole 1, hole 2 matches hole 2, and so on).

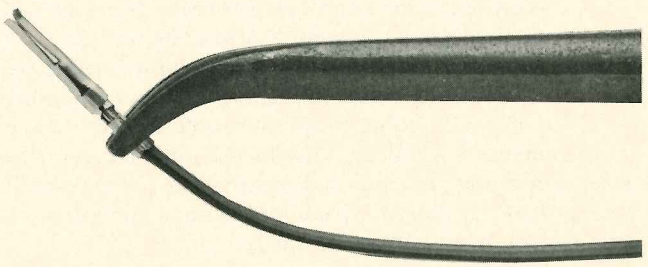


Figure 6: Wire inserted in pin, with pliers crimping down flap.

It's very important to identify the holes correctly. If you inadvertently plug a wire into hole 2 instead of hole 3, your cable won't work (and you could go crazy trying to figure out why).

Inserting a pin or socket. To insert a wire into the connector body, simply take the attached pin or socket and push it into a hole in the *back* of the connector (see Figure 7). When you've pushed it in as far as you can with your fingers, grab the back part of the pin (near the flaps) with your pliers and then push it in further. When you get the pin pushed all the way in, you'll feel it snap into place.

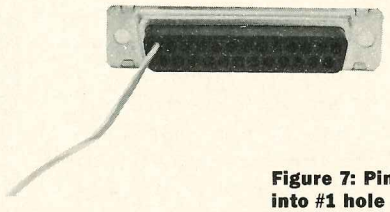


Figure 7: Pin inserted into #1 hole of DB-25P connector.

Assemble your cable one wire at a time, connecting each wire at both ends of the cable.

Assembling the cable. Once you know how to insert the pins, the rest is easy—you just have to make sure your wires are connected to the right hole at each end of the cable. Tables 1 through 3 show the connections needed for the Kaypro 286i and newer Kaypro PC (Table 1), for the older Kaypro PC (Table 2), and for any CP/M Kaypro (Table 3). *(Tables appear on page 56.)*

To avoid mistakes, assemble your cable one wire at a time, connecting each wire at both ends of the cable before going on to the next wire.

For example, if you're going to make a cable for a Kaypro 286i, select a wire, plug one end of it into hole 2 of the modem connector, and then plug the other end of the same wire into hole 3 of the computer connector, as shown in Table 1. Then select a second wire, plug one end of it into hole 3 of the modem connector, and then plug the other end of it into hole 2 of the computer connector. Proceed in the same fashion with the third wire, the fourth wire, and so on, until you have all nine wires connected at both ends.

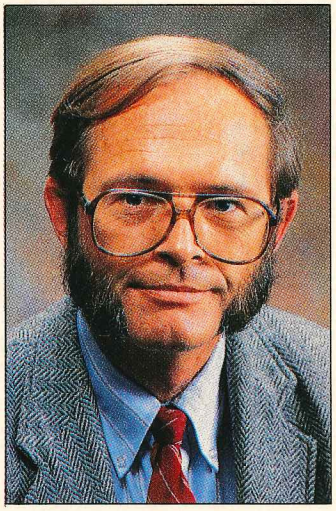
Testing the cable. Once you have all the lines connected, double-check the connections against the proper table, plug the cable into the computer and modem, turn them both on, start up your communications program, and try dialing a number. If the modem dials (you'll hear it if your modem has a speaker, as most do) and then connects when another computer answers the phone at the other end, you're in business. Put the connector hoods on the connectors and put away your tools—you're finished.

If the modem seems dead—it won't dial or respond in any way—check lines 2 and 3 from the modem end to make sure they are connected to the right holes on the computer end.

If the modem will dial, but it won't respond when the computer at the other end answers the phone, or it appears to hang up as soon as the connection is made, check lines 6, 8, and 20 from the modem end to make sure they are connected to the right holes on the computer end.

Also, check both ends of the cable to make sure that no wires are broken and that none of the wires or pins are touching each other.

PRINTRIX AND FONTRIX


RICHARD STARKMAN

BY TOM ENRIGHT

This month we'll be looking at two products from Data Transforms of Denver, Colorado. The products are Printrix 2.45 for printing with special fonts and Fontrix 2.85 for designing and modifying the fonts. Either product can be used by itself, but when used together they present an alternative to desktop publishing for some uses.

These programs require an IBM PC, AT or compatible with at least 256K of RAM and DOS 2.0 or newer. You'll also need at least CGA video and a dot-matrix or laser printer with graphics capability. All printed output is done in graphics mode, so laser printers need as much memory as they can get.

A major feature Printrix and Fontrix share is printer support—it's nothing short of massive. The programs support 33 different brands of printers, including several laser printers and both the JLaser and Laser Master controller boards. Both programs support more than one model of each brand of printer and several levels of resolution for each model. The net result is that 190 printer options are available from the printer selection menu.

Another common feature is that fonts print at different sizes on different printers. Each font size is defined as a bit image X dots wide and Y dots high. Your printer will print those dots at the resolution you chose when selecting the printer. A character 30 dots high prints at one size on a 300-dot-per-inch laser printer and somewhat larger on a 180-dot-per-inch dot-matrix.

Fontrix is a font editor —it comes with 12 fonts you can use as-is or modify to meet your needs.

For example, a font such as HELVET30 prints seven-point characters (slightly smaller than the type you are now reading) on a 300-dot-per-inch laser printer. But on a 180-dot-per-inch dot-matrix, the same font prints approximately 12-point characters—the type size used for the name of this column. It takes a little experimentation to find a font that prints the size that you want on your printer.

The upshot of this printing complexity is that the printed output of both programs is excellent. With a high-resolution dot-matrix printer you can produce presentation-quality text using these programs.

FONTRIX

Features: Fontrix has a number of secondary features worth mentioning: It has a graphics editor, and it can read text files into a Fontrix file in whatever font you have selected, mix text and graphics, and print the results.

When installing Fontrix, you specify which word processor will be used to create text files. Word processors supported include PFS:Write, Word Perfect, WordStar, WordStar 2000, and Easy. Once Fontrix knows which word processor you are using, it can import and use text files produced by that word processor without problems.

But Fontrix is primarily a font editor. The program comes with 12 fonts that you can use as-is or modify to meet your needs. You can change existing fonts, enlarging or shrinking them, or you can create an entirely new font from scratch. You can also use Fontrix to create character graphics fonts for any number of specialized uses. Graphics fonts are available from Data Transforms that include electrical, hydraulic, and solid-state electronics characters, or even eyes, noses and mouths in place of the normal characters.

Performance: Using the features of Fontrix is not easy. The graphics editor is rudimentary at best, and reading text into a Fontrix file is a fairly complex operation that requires you to first select Graphics Writer from the main menu, then open a "graffile" and specify its height and width in sectors, which in turn depends on the height and width, measured in dots, at which you want to print characters. Having to specify a file size (height and width) in advance is inconvenient, and having to specify it in units as obscure as sectors is unforgivable. Data Transforms should change this aspect of the program immediately.

Once the graffile is opened, you must specify the text file that you want to read into the graffile. You can then select the fonts that will be available within the file. Each font is assigned to a function key (F1 through F9), so that pressing a function key selects a font. All of this is done from a Fontrix menu before you actually get into the graffile. You then select "Write to a graffile" to actually enter the file. At this point you finally issue the command to read the text into your file. Alternatively, you can simply type in the text. Then you must exit from

the file and save it to disk in a separate operation.

Fortunately, printing a graffile is a little easier. You return to the Fontrix Main Menu, select graphic print, and enter the name of the file to print. You can then change a series of printing parameters (margin, justification, etc.) before printing the file. Since all output is done in graphics mode, printing is slow—just how slow depends on your printer.

What Fontrix does well is edit fonts. In font editing mode you select the font to edit, or create an entirely new font from scratch. You can elect to alter an existing font and save the alterations under a new name or the original name. Creating a new font from scratch is not easy—you will need a lot of practice to do it well.

The most logical use for Fontrix is modifying existing fonts. These can be the fonts that came with the program or other font packages that you purchase from Data Transforms.

Documentation: Since Fontrix is an involved program to use, the manual is necessarily fairly big. It comes in a loose-leaf binder and slipcase of the same type that Kaypro uses. The main manual for Fontrix 2.5 has 128 pages; a separate update to version 2.85 has 50.

Logically, the first part of the manual covers installing the software on your computer. This is followed by a series of very detailed tutorials. The tutorials cover all options of the program and are well written. The last half of the manual is a reference section for all the commands and their options.

The tutorials take you completely through the operations available in Fontrix, explaining every step in detail. This makes for a lot of reading to learn fairly simple operations. New computer owners will appreciate the detailed tutorials, but experienced users may get impatient.

PRINTRIX

Features: Printrix is a printing and formatting program. It can be menu driven for new users or command-line driven for experts. It prints ASCII or word processor files using fonts created by Fontrix or purchased from Data Transforms. Once you learn the command structure, it is easy to use and produces top-quality output.

Performance: Printing a file with Printrix is a simple operation. Only two disk files are needed—the text file to be printed and a layout file of formatting parameters. When installing the program, you tell it what printer to use and which word processor created your text files. The rest of the operation is simply waiting for the file to print.

The parameter file controls margins, justification, whether or not to print proportionally, and which fonts to use. Up to nine different fonts can be specified in the parameter file. The fonts are referenced by number (one through nine), and font number one is the default font. You can create and save as many layout files as you need.

Other Printrix commands are embedded in your text file. For example, the command to change to font number two is ^F2 (you type a caret before F, not CTRL-F.) Font number two is the font assigned to that key in your layout file. Printrix has 42 embedded commands, including commands to alter fonts, control character spacing, draw lines, merge text and graphics files, and change margins. These commands provide excellent control over the printed document.

Printrix is not a WYSIWYG ("what you see is what you get") system. You do not see the final layout or page breaks until the document is printed. As with Fontrix, printing with Printrix is slow because everything is done in graphics mode, but the quality of the output is excellent. The output of a high-resolution dot-matrix printer can come close to the quality of laser printer output using this program.

Documentation: The Printrix manual is nearly as large as the one for Fontrix, and just as detailed. The manual has tutorials for printing letters, memos, and multi-page documents with graphics, and a complete reference section for all Printrix commands. Like the Fontrix manual, it assumes little knowledge on the part of the reader. It would benefit from a section that simply outlines the layout file and lists the most commonly used embedded commands. Using Printrix is far easier than the length of the manual might lead you to believe.

CONCLUSIONS

These programs are for people who need high-quality printed output for business or personal use. Printrix is flexible and powerful enough to perform many operations usually considered to be the realm of desktop publishing programs. Laying out documents will take some practice, but less practice than you would need with a desktop publishing package.

Though Fontrix is useful for altering existing fonts or creating new character or graphics fonts, its drawing, file handling, and printing interface capabilities are too inconvenient for any but the most persistent user. It's acceptable if regarded strictly as a font editor, but it isn't necessary unless you need to alter a font—and Data Transforms sells enough different font packages that you may not ever need the capabilities of Fontrix.

SCORECARD

Fontrix
Features: Very Good
Performance: Very Good
Documentation: Good
Ease of Use: Fair

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

QUICK REFERENCE SUMMARY

Product: Printrix and Fontrix
Manufacturer: Data Transforms
616 Washington Street, Suite 106
Denver, Colorado 80203
Phone: (303)832-1501
Sugg. List Price: Fontrix 2.8, $155; Printrix 2.45, $165. Font packages, $25 ($50 for laser fonts).

QUATTRO—BORLAND'S POWERFUL NEW SPREADSHEET

BY MARSHALL L. MOSELEY AND JOHN MALIK

Quattro is an integrated spreadsheet, database, and graphing program from Borland International. It is Borland's attempt to compete directly with the most popular MS-DOS spreadsheet program, Lotus 1-2-3. The advertisements for Quattro tout it as "The New Generation Spreadsheet." Is it? Maybe. But one thing's for sure: Quattro in many ways equals and sometimes out-performs Lotus.

FEATURES AND PERFORMANCE

Quattro's most important feature is its interface—the series of menus used to tell the program what to do. In Quattro this interface is *modular*; you can remove the one that came with the program and replace it with a different one.

The different interfaces are stored in files with RSC extensions. The default interface is called QUATTRO.RSC. Included with the program is an interface file named 123.RSC, which provides complete compatibility with Lotus 1-2-3.

You can also create your own interface. Borland provides an add-in program called the Menu Builder. (An add-in is an optional auxiliary program that runs with Quattro and appears as part of the program). Using the Menu Builder, you can modify the current menu structure, extend it, or even create an entirely new structure all your own. You can save the new menus as an RSC file and have Quattro use that file when it runs. Different interfaces can be created for different purposes.

This brings all kinds of possibilities to mind. How about a read-only interface? No novice will ever trash your data again. Do you do a lot of what-if analyses? Create a menu system that quickly accesses Quattro's advanced functions. Have you always thought you could arrange Lotus's graphing menus better? Now you're free to try.

A second add-in utility is Transcript, a program that records keystrokes as you work and places them in a file. Transcript files can be used to "undo" mistakes or to recreate a work session following a disaster such as a power failure. They can also be edited and copied into a spreadsheet for use as macros.

For storing large files, Quattro has a special, built-in version of SQZ PLUS, the file compression utility from Turner Hall Publishing. Just select SQZ from the Save menu.

When Quattro runs, it automatically determines what type of equipment your computer has and adjusts itself accordingly. For instance, if you are using an EGA board and monitor, Quattro displays graphs in the high-resolution EGA mode. If there is a math co-processor installed, Quattro detects and uses it. Also, Quattro uses any expansion memory that adheres to versions 3.2 or 4.0 of the Lotus/Intel/Microsoft (LIM) Expanded Memory Specification.

The program has all the features you would expect to find in a quality spreadsheet: macros, row and column copying and moving, sensitivity analysis, matrix arithmetic, and regression analysis. Quattro is a superset of Lotus 1-2-3, meaning it contains every feature that Lotus has and some it doesn't.

One important feature unique to Quattro is *selective recalculation*. In other spreadsheets, when recalculation is enabled, changing a single cell causes every value in the spreadsheet to be recalculated. With selective recalculation, only the cells affected by the change are recalculated, saving a great deal of time and work.

There are 100 functions available via a menu-driven function table that lists each one along with its syntax. Press Alt F3 to make the table appear, highlight the function you want, press Enter, and the function is inserted into the spreadsheet.

Quattro offers impressive program control from the command line. Type Q along with a spreadsheet file name and the program will run while loading the designated spreadsheet. Add a macro name to the command and Quattro will automatically execute that macro. These features give Quattro a lot of power when used with batch files—you could create a batch file menu system and have a different batch file for each spreadsheet and macro set.

Moving around in Quattro is easier than in other spreadsheets. When you move through a series of menus, for example, it remembers which item on the menu you select. The next time you call up that menu the cursor is positioned on the item you last chose. This lets you repeat an entire sequence of instructions by repeatedly tapping the Enter key.

Quattro printer support is impressive. It works with graphics printers made by 15 different manufacturers, including Epson, Hewlett Packard, Okidata, C. Itoh, and Toshiba. Most dot-matrix printers either are one of the 15 or imitate one of them, so making Quattro work with your printer should be a snap.

Quattro lets you change printers from within the program with just a few keystrokes.

Unlike many other programs, Quattro lets you change printers from within the program with just a few keystrokes. This comes in handy if you change computers and printers frequently.

Quattro also supports plotters, but not as many as it does printers. It works only with Hewlett Packard or Hewlett Packard-compatible, ColorPro, and Sweet P plotters.

TESTING

We tested Quattro in three different areas: recalculation time, macro execution, and file handling (loading and saving). We used a 10 megahertz 286i with a 40-megabyte hard disk, a CGA video board, a CGA monitor, and no co-processor. These tests did *not* constitute a rigorous

examination of the product. They were intended to provide an approximate idea of Quattro's performance only.

For comparison, we ran each test on Quattro and on Lotus 1-2-3 Release 2.

To test recalculation we created a spreadsheet 200 rows by 30 columns. Each cell performed a calculation and depended on the previously calculated cell for input. Lotus recalculated the spreadsheet in 3.5 seconds, while Quattro finished in 6.1 seconds. Lotus beat Quattro's time by 57 percent.

We added two cells to the spreadsheet and linked them with a formula. Then with recalculation set "on," we tested both programs again by changing a value in the latter cell pair. Lotus recalculated the entire spreadsheet, just as before. Quattro, on the other hand, used its selective recalculation feature to recalculate only the cells affected by the change—in this case, one other cell. So while Lotus turned in another 3.5 second recalculation time, Quattro's time was .1 seconds (actually it was much faster—one-tenth of a second was the shortest unit of time we could measure). Quattro was 300 percent faster than Lotus.

Lotus obviously has a better calculation algorithm. Given the same number of calculations to perform it will do them faster than Quattro. But Quattro is built smarter; it knows when to calculate and when not to. In spreadsheets where you have multiple sets of data whose components are linked by formulas, but which themselves are not linked (such as columns of numbers that must be summed), Quattro will beat Lotus every time.

We found that Lotus loaded spreadsheets 23 percent faster than Quattro. They saved files at exactly the same rate.

To test macro execution, we created a macro in which the current system time was written to a cell, the cursor was sent to 165 different cells, and then it returned and wrote the current system time again. Lotus executed this macro in 10 seconds. Quattro configured to imitate Lotus executed it in 11 seconds, while Quattro using its own interface did it in 13 seconds. Note, however, that the Quattro interface required the macro to go down another menu level. This may account for the increased execution time. Overall, Lotus executed macros 10 percent faster than Quattro.

Graphing and charting are very important to users of spreadsheet programs. Part of Lotus 1-2-3's original appeal was its built-in graphics printing program (the "3" in 1-2-3). Though rudimentary by today's standards, in 1984 it caused people to abandon the previous front-running spreadsheet, VisiCalc, in droves. Borland, well aware of this, worked to make Quattro a superior performer in the area of graphics.

Quattro produces nine types of graphs: line, bar, markers, stacked bar, pie, XY, rotated bar, and combined line and markers. By comparison, Lotus offers only five types. Lotus and Quattro both offer 11 character fonts for use in titles and labels.

To test Quattro's graphics abilities, we installed it for an Epson FX-80 dot-matrix printer and a Hewlett Packard 7550A plotter (the printer we actually used was a Star NP-10, which emulates an Epson FX-85).

The graphs and charts created on the dot-matrix were stunning. We found it hard to believe that Quattro could exact such detail from a nine-pin printer. The default triplex font appeared quite clean and professional. The cross-hatching in the graphs, though very detailed, never became blurred or muddy.

When connected to the Hewlett Packard plotter, Quattro produced detailed, colorful, impressive graphs. Looking at a plotted Quattro graph, you understand what "presentation quality" really means—you could project that graph on a wall and its quality would not degrade markedly. The same cannot be said of Lotus.

In fact, in a direct comparison with Lotus 1-2-3's graphics, Quattro wins

Figure 1: A Lotus graph. Notice there is no icon for the 1st quarter. Although we tried several printers and drivers, we could not make the icon appear.

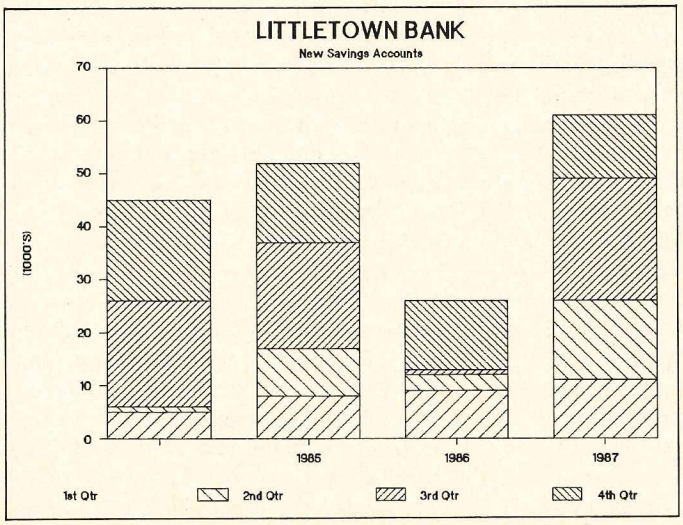
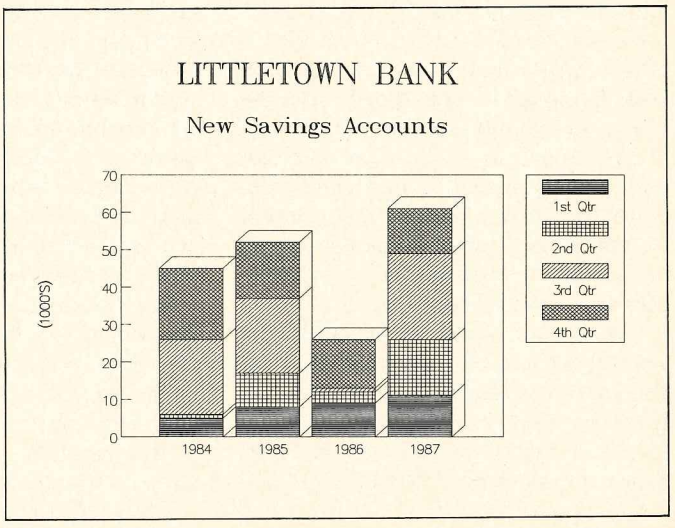


Figure 2: The same data graphed with Quattro. All icons are present.



hands down. Quattro's graphing functions are available from inside the spreadsheet itself. This allows you to print a graph, change some data, and print another graph, all in moments. In Lotus you would have to switch from the spreadsheet program to the graph printing program, which is time consuming.

Quattro allows you to change the format for the XY axis in a graph, combine graph types, change the gridline pattern and color, and include or exclude a frame around the graph. Lotus does none of these things. Quattro's graphs—the fonts they use and the style with which they are put together—simply look better than Lotus's. (See figures 1 and 2.)

Also, Quattro will write your graph to disk using the EPS (Encapsulated Postscript) format. Postscript is a specialized programming language for controlling laser printers and typesetters. Having your graph available in this format lets you include it in desktop publishing documents and print it on any Postscript-compatible printer.

If you want presentation-quality graphs from Lotus, you'll have to buy a dedicated graphing program, such as ChartMaster or Microsoft Chart. Such graphs are built into Quattro.

DOCUMENTATION

The documentation for Quattro consists of three soft-cover manuals: *Getting Started With Quattro*, *The User's Guide*, and *The Reference Guide*.

Getting Started contains cardboard help templates that fit over the function keys. Templates for both the old-style 84-key keyboard and the new 102-key keyboard are provided. The first 15 pages familiarize you with the program disks and tell you how to set Quattro up on your system. From there on the book becomes an excellent tutorial on Quattro in particular and spreadsheets in general.

The User's Guide is probably the greatest resource for someone who has used spreadsheets before and wishes to learn Quattro. If you look up a particular subject in the extensive index, you'll be directed to a clearly written tutorial that covers it.

The Reference Guide does the least hand-holding and contains the most information. It has succinct, complete explanations of every aspect of Quattro. When you need to find out something in a hurry, this is the place to go. The front of the book contains two pull-out maps: one depicts the entire menu structure of Quattro using the Quattro interface; the other depicts the structure of the Lotus 1-2-3 interface.

All three manuals are richly illustrated. The figures are clear and readable, clarifying the points being made in the text.

Quattro's biggest asset is its emulation of Lotus 1-2-3, but Lotus compatibility doesn't limit it.

The Quattro manuals are well thought out and well written. Borland International has a reputation for providing good documentation, and we're happy to see they lived up to it.

EASE OF USE

Quattro's biggest asset by far is its emulation of Lotus 1-2-3. Most spreadsheet users have invested too much time in learning Lotus to give it up for a new program, and with Quattro, they don't have to. By default Quattro uses its own menu system and key commands, but with a few keystrokes you can make it completely 1-2-3 compatible. Quattro's appearance—the use of pop-up menus on the right side of the screen, rather than the Lotus-style menu bar across the top—takes a little getting used to, but keystroke for keystroke, it's the same as 1-2-3.

But Lotus compatibility does not limit Quattro. All of its improvements—file compression, integrated graphing, and more—are available from the Lotus interface. They exist as extra options on the Lotus menu and are denoted by small boxes next to the option names.

The Quattro interface is itself very similar to Lotus. They share many key commands, such as /FR to retrieve a file and /GV to view a graph. In some places, though, Borland has done things differently. These changes range from improvements, such as placing the program defaults in the main menu where they belong, to puzzling annoyances, such as burying the system command in a sub-menu.

The ability to work with other programs contributes to ease of use. Quattro translates dBASE III and Lotus 1-2-3 files into the Quattro format automatically. When you load one of these files, Quattro detects what file type it is and makes the appropriate changes. This is much better than Lotus's translation program, which is separate from the spreadsheet and cumbersome to use.

Two other features that increase Quattro's ease of use are the add-in programs Menu Builder and Transcript. Menu Builder lets you customize the spreadsheet interface to suit your individual needs, and Transcript functions as a full-fledged macro builder and editor. Together, these two programs let you streamline Quattro to a degree not possible with spreadsheets before.

ERROR HANDLING

Quattro's error handling is complete and non-intrusive. When you make a mistake a short beep sounds, and a small box appears containing an error message. The messages displayed are in plain English, not cryptic phrases, and they usually make sense within the context of what you are doing. For instance, an attempt to load a file whose name contains reserved characters produces the message "Error detected. Invalid file name. Press space bar." Pressing the space bar returns you to where you were before the error occurred.

This clarity in error messages is not always carried through to Quattro's higher level functions. If, for example, you are performing a regression analysis (analyzing one set of variables to see how they are effected by other sets of variables), Quattro might inform you "Too few observations." A look at the reference manual

reveals that this means there is not enough source data to generate regression data. Why can't the error message read "Not enough source data to generate regression data"? That would save the step of looking in the manual.

This is a minor complaint, however. On the whole, Quattro handles errors quite well.

SUPPORT

Borland's technical support number is prominently featured on the third page of the *Getting Started* manual. Free telephone technical support, is offered, but there is no toll-free number.

Calls were answered quickly, and all questions were answered by polite, knowledgeable personnel who were eager to help.

Borland also readily admits mistakes. We called with a problem regarding dBASE III (Quattro is supposed to be able to save files in dBASE format, but our version couldn't). The support technician informed us that we had run into a known bug, and that as soon as it was fixed we would receive updated versions of the program. It's refreshing to deal with a company that acknowledges its product is not perfect and works to make it right.

CONCLUSIONS

Quatro is not a "new generation spreadsheet" because it doesn't move the genre forward an evolutionary step, but it does provide business and home users alike with all the power and flexibility they can use. Its exact emulation of Lotus 1-2-3 gives it an immediate niche in the software market; its improvements over 1-2-3 give people reason to buy it instead of the perennial front runner.

What gives Quattro the edge? Chiefly its design. Its built-in presentation graphics, macro builder, and menu builder are all tightly integrated into the spreadsheet itself and immediately accessible by the user. This accessibility and integration make Quattro faster than Lotus and highlight the latter's inefficiencies—what good are 1-2-3's lightning-fast calculations if you have to spend two minutes switching programs to print a graph? In Quattro, the tools with which you manipulate and present data are at your fingertips, rather than in a separate program entirely. This makes Quattro a better spreadsheet in terms of overall performance.

If you compare the two on a price/performance basis, Quattro is the clear winner. Its suggested retail price is $195, while Lotus retails for $495. Lotus costs more than twice as much as Quattro and doesn't deliver as many features. Why buy Lotus?

Quattro's strength comes not from what it imitates, but from the original, powerful features it brings to the spreadsheet user. Any way you look at it, Quattro is a superior performer. ■

Marshall Moseley is assistant technical editor for PROFILES. *John Malik works in Kaypro's corporate accounting department. He has a degree in accounting from San Diego State University and has been a personal computer user for more than four years.*

QUICK REFERENCE SUMMARY

Product: Quattro
Manufacturer: Borland International
4113 Scotts Valley Drive
Scotts Valley CA 95066
Phone: (408) 438-8400
Sugg. List Price: $195

SCORECARD

Features: Excellent
Performance: Excellent
Documentation: Excellent
Ease of Use: Very good
Error-handling: Good
Support: Good

INSIDE THE 286i

BY MARSHALL L. MOSELEY

If you have a Kaypro 286i, you probably know that it's versatile—it can be used for everything from word processing to advanced engineering to networking—and adaptable. But you may need to know more about its internal anatomy in order to understand and take full advantage of its capabilities.

This month we'll go inside the 286i and take a look around. The purpose of this article is to provide you with both general information about how your computer works and specific facts you can use when changing video displays or increasing memory.

We'll explore the different expansion slots, how memory is arranged on the mainboard, and what the various jumper switches do. Also included is a short BASIC program that makes up for a shortcoming in the software provided with the earliest 286i models.

But first the standard warning: Removing your computer's cover *voids your warranty*. If you bought your computer in the past year, think twice before opening it up, even if you're only going to look around.

UNDER THE HOOD

First make sure that the computer is on a sturdy table and is unplugged, and that the power switch is off. Remove the five screws on the rear panel that hold the cover in place. There is one in each corner and one in the top-center of the panel. Stand in front of the machine and pull the cover toward you slowly. Be careful not to snag it on the wires inside the computer. If that happens, stop pulling, reach inside, and free the wires. Pull forward until the cover won't move anymore, then rotate it up and pull it away. Put it aside.

The heart of the 286i is the mainboard—a large, square circuit board. Look down into the machine and you will see it mounted parallel to the bottom of the computer. I'll discuss the mainboard in depth later. For now let's take a quick look at the other boards in the system.

A SLOT MACHINE

In the upper left portion of the mainboard there are several expansion slots. You can add components to your computer by placing them in these slots. Notice that some slots are shorter than others. The short ones are exact duplicates of the expansion slots in the original IBM PC. They are called eight-bit slots because they can receive and transmit eight data bits at a time.

You can add components to your computer by placing them in expansion slots on the mainboard.

The longer connectors duplicate the slots in the IBM AT, reading and writing 16 data bits at a time. The 16-bit slots allow for faster memory access and faster data exchange between hardware devices.

Some devices only transmit and receive eight data bits at a time, making them well suited for short slots. Modems, for example, are ideal for short slots, as are boards that provide parallel and serial ports.

A few of the expansion slots are already occupied by boards that compose the 286i system. The far right slot contains the disk controller board, which controls up to two floppy and two hard disk drives.

To the left of the controller is the I/O (input/output) board containing the parallel and serial ports (notice that it is in a short slot). In one of the other slots there undoubtedly is a video board. This is the standard setup for a 286i: the mainboard, a disk controller board, an I/O board, and a video board.

Of all of these, the most important by far is the mainboard.

ROAMING THE MAINBOARD

The mainboard contains the 80286 microprocessor, a socket for a math coprocessor (an optional specialized chip that helps the 80286 do math), the ROM BIOS, the system clock, sockets for 640 kilobytes of RAM, eight expansion slots, two jumper switches and various support chips.

Look at the lower left portion of the mainboard and you will see the system RAM stored in four rows of sockets, nine sockets to a row. The bottom two rows take 256-kilobit chips, for a total of 256 kilobytes per row and 512K for two rows (there are eight bits to a byte, so eight 256-kilo*bit* chips make 256 kilo*bytes*; the ninth chip is used for memory error checking). The top two rows use 64 kilobit chips, making their double-row total 128K. Add 128 and 512 and you get 640K, the memory limit common to all MS-DOS computers.

If you have 512K in your machine and you wish to add more memory, you can go to your local electronics shop and buy 18 64-kilobit D-RAM chips. If your 286i's system clock has a speed of 10 megahertz, the memory chips must have a rated speed of 100 nanoseconds or less.

Installing memory is more difficult than simply stuffing chips into sockets. To make the computer recognize the additional memory, you have to set a jumper switch located on the mainboard, under the drive cage. This requires that you remove the mainboard entirely from the computer.

Assuming that you are a brave soul and that you've removed the mainboard, you will find the jumper between chip positions U88 and U89. See Figure 1 for the correct settings.

While we're in the neighborhood, take a look above the memory banks. There are two chips labeled 81-692 and 81-691.

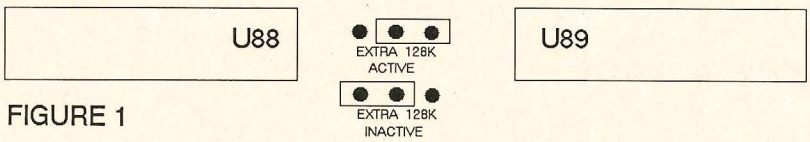


FIGURE 1

These are the system ROMs (Read Only Memory), and they contain the Basic Input/Output System, or BIOS. Notice the pair of empty sockets labeled U17 and U37. These are for additional ROMs that are often sold with AT-specific hardware. Core International, for example, ships auxiliary ROMs with its HC series hard disks.

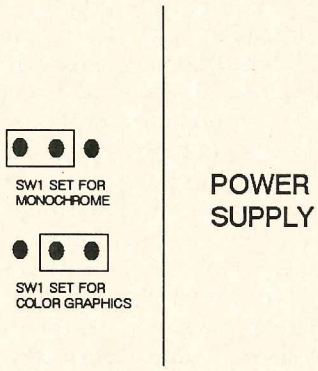


FIGURE 2

The only other user-adjustable setting is the monitor selection jumper. It's located at position SW1, which is in the upper right corner of the board, between the power supply and the disk controller board. This switch tells the 286i if you are using a monochrome monitor or a color graphics monitor. See Figure 2 for the settings.

This concludes our tour of the mainboard, so you can put the cover back in place by reversing the above procedure. There is, however, one more aspect of the 286i to examine.

EGA PROBLEM WITH SETUP

The Kaypro 286i keeps track of the hardware it uses by consulting an equipment list stored in a special section of memory called CMOS RAM. The CMOS RAM is connected to a battery, so its contents don't disappear when the computer is turned off. When you change the type of hardware connected to the computer, you must edit the information in the CMOS RAM to reflect the change. Kaypro provided a program called SETUP.COM with the 286i for just this purpose.

Unfortunately, the early versions of SETUP.COM do not make provisions for the IBM EGA video board or compatible graphics adapters (at the time EGA had just been introduced and was not yet the standard that it is today).

Not to worry. If you have an early version of SETUP.COM and wish to install an EGA board, the following BASIC program will configure the CMOS RAM for you. Kaypro 286i owners with hard disks will find GW-BASIC in the UTILITY subdirectory, while owners of floppy systems will find it on their MS-DOS working disk. Once at the correct system prompt, type **GWBASIC** and press Enter. Then type the following program exactly as you see it:

```
100 REM EGAFIX.BAS by Steve Newsome
110 REM Copyright 1987, PROFILES Magazine
120 REM For use with the Kaypro 286i only
130 OUT 112,20
140 X=INP(113)
150 OUT 112,20
160 OUT 113,X AND 207
170 X=0
180 FOR I=16 TO 45
190    OUT 112,I
200    X=X+INP(113)
210 NEXT I
220 OUT 112,46
230 OUT 113,X/256
240 OUT 112,47
250 OUT 113,X AND 255
```

Now type **RUN** and press Enter. The CMOS RAM will be reconfigured for EGA video. If you like, you can save this program to disk by typing **SAVE "EGAFIX.BAS",A**. Exit GW-BASIC by typing **SYSTEM**, then shut down the computer and install the new board.

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

A LOOK AT THE NEW KAYPRO 286

BY MARSHALL L. MOSELEY

Kaypro recently introduced their newest product, the Kaypro 286. The 286 is an AT-compatible computer that provides speed and power for use with today's software, while its design leaves room for tomorrow's technology.

POWERFUL HARDWARE

At the heart of the Kaypro 286 is an Intel 80286 microprocessor running at a clock speed of 12 Mhz, which can be switched to 6 Mhz if desired. The 286 comes with one megabyte of RAM—640 kilobytes for MS-DOS, and 384K for use as extended memory.

Also included are a fast-access, 40-megabyte hard disk and a high-density floppy disk drive. The floppy drive formats, reads, and writes both 1.2-megabyte disks and standard 360K disks. The 286 has a real-time clock and calendar powered by a built-in battery, so the time and date are maintained even when the computer is off. There is a parallel port for use with printers and a serial port for use with serial devices such as modems. All of these components receive power from a hefty 160-watt power supply, which is also capable of running any hard disk or expansion board that might be installed.

The computer chassis itself has a keyboard lock on the front panel for security. Inside there is room for four half-height drives or two half-height drives and one full-height drive.

Part of the Kaypro 286 package is a high-resolution, 12-inch monochrome monitor and a specially licensed version of the EGA WONDER video board from Array Technologies Incorporated. This board not only displays EGA, CGA, MDA, and Hercules monochrome graphics on the monochrome monitor, it also displays them on CGA, EGA and multi-scanning monitors.

ADVANCED FEATURES

The most notable feature of the Kaypro 286 is its use of "snap-in" technology, which makes upgrades and repairs much easier than before.

This is accomplished by using five different boards inside the computer instead of a single mainboard. There is a bus board, a processor board, a disk controller board, an I/O (input/output) board housing the parallel and serial ports, and, of course, the video board. The bus board contains nine expansion slots. The other four boards fit in these slots and make up the computer system.

Notice that only four of the nine slots are used up. That leaves five slots (two 16-bit and three 8-bit) available for expansion boards.

When more powerful technology becomes available, the current boards can be replaced with new ones. Also, if a part of the system breaks down, a technician can remove the defective part and "snap in" a new one.

SOFTWARE

For running the computer and performing system maintenance, version 3.21 of the MS-DOS operating system is provided. Included with MS-DOS is the GW-BASIC programming language.

WordStar 4.0 Professional, the latest version of the popular word processor from MicroPro Corporation, is shipped with the Kaypro 286. WordStar 4.0 features onscreen underlining and boldfacing, built-in math functions, indexing, and table of contents generation. Included with WordStar 4.0 is the Word Finder thesaurus program from Microlytics Inc., widely regarded as one of the best available. Also provided is SpeedStor, the hard disk formatting and partitioning program from Storage Dimensions.

All of this powerful software is managed by Kaypro's own Master Menu program. Master Menu lets you run any program in your computer by displaying a list of programs onscreen. You select the one you want and Master Menu runs it. Once you become more adept with the computer, you can modify Master Menu and install your own programs on its menu screens.

A COMPUTER FOR THE FUTURE

The Kaypro 286 is a fast, powerful, compatible machine that comes with loads of software, making it a top value as an AT-class computer. But its best feature by far is its open-ended design, which makes it not just a computer for today, but for tomorrow as well.

For more information on this or any other Kaypro product, call 1-800-4-KAYPRO.

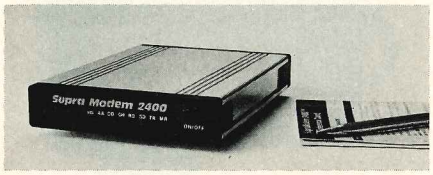
EDITED BY KATRINA KOHANOWICH

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 Katrina Kohanowich, 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.

COMPACT MODEM

The SupraModem is Hayes compatible and supports asynchronous operation at 300, 1200, and 2400 bps.

User configurations are created by issuing commands, thus eliminating



DIP switches. Configurations are then stored in the modem's memory so they are loaded every time the modem is turned on or reset.

The product includes telecommunications software and cables.

$219.95. All Kaypro computers. Supra Corporation, 1133 Commercial Wy., Albany, OR 97321; (503) 967-9075.

DATABASE MANAGEMENT FOR THE 386

Users with large databases and related applications can harness the full power of the 386-based computer with Paradox 386, a relational database management system from Borland International.

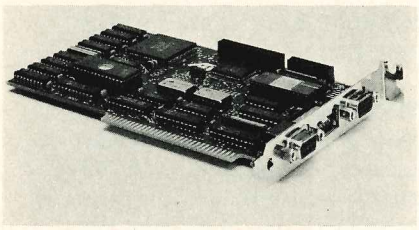
Paradox 386 takes advantage of the 80386 processor by using the 32-bit instruction set to speed performance of typical database operations and by breaking through the 640K barrier using the large memory address space provided by the 386.

The product uses up to 16MB of memory as efficiently as other applications use 640K. It can achieve up to five times faster database sorting, querying, and reporting performance.

$895. All Kaypro 386 computers. Borland International, 4585 Scotts Valley Dr., Scotts Valley, CA 95066; (408) 438-8400.

VGA GRAPHICS ADAPTER

The new VIP (VGA Improved Performance) graphics adapter provides



full VGA (Video Graphics Adapter) compatibility. It also supports EGA, CGA, Hercules, and 800 x 560 digital and analog graphics standards and incorporates EGA Wonder emulation.

The new card automatically senses and switches to accommodate an analog monitor and software. It lets users display all of the 17 new modes on analog monitors and offers up to 256 colors.

$449. All Kaypro MS-DOS computers running MS-DOS 3.3 or greater. ATI Technologies Inc., 3761 Victoria Park Ave., Scarborough, Ontario, Canada M1W 3S2; (416) 756-0711.

TEXT COLLECTOR

The Text Collector lets you find, collect, examine, and analyze scattered blocks of text. It searches an entire disk or group of files for any combination of terms and saves all context blocks meeting the search criteria.

Context blocks can be defined by the user or selected from a list that includes sentences, lines, paragraphs, records, and quotes. It allows you to collect material interactively as you browse through one or more files.

The program permits complex searches using Boolean operators, nested parentheses, and 14 different wildcards. Special searches include Phonetic, for matching terms that sound alike, and Alpha (which ignores non-alphabetic characters) for matching hyphenated, punctuated, or separated terms.

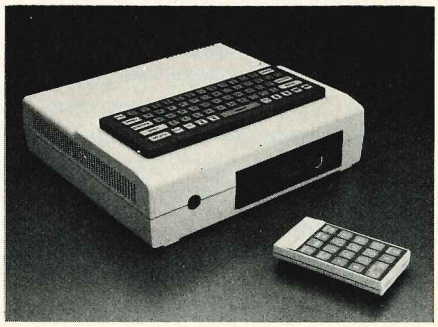
$69. All Kaypro MS-DOS computers. O'Neill Software, Box 26111, San Francisco, CA 94126; (415) 398-2255.

GRAPHICS PRESENTATION SYSTEM

The Kodak Displaymaker is a compact video graphics presentation system. Neither a computer nor computer expertise is needed to create colorful charts, graphics and text.

The system generates graphics of 320 x 200 resolution that can be displayed on any standard television, video monitor, computer monitor, video projector, computer data projector, or Datashow LCD pad. Sixteen shades of the three primary colors can be combined in 4,096 color variations.

Images are stored on 5.25-inch floppies and are easily modified. The system weighs eight pounds and comes with a 1.2-megabyte disk drive, soft-



ware, power and TV connector cables, remote controller, and batteries.

$1,995. Eastman Kodak Company, 343 State St., Rochester NY 14650; (714) 724-3169.

PIN-FEED STOCK SAMPLER

Hard-to-find computer labels, file cards, and name badges are available in a kit containing 16 different types of pin-fed stock.

The Stock Sampler Kit features white and colored labels, labels for audio and video cassette tapes, and Rolodex card stock.

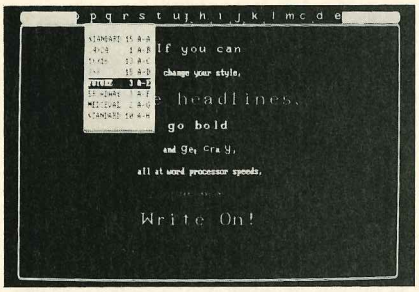
$15. ETS Center, P.O. Box 651, Turtle Trail, Willoughby, OH 44094; (216) 229-2575.

HELP WITH YOUR HARD DISK

Hard Disk Management with MS-DOS and PC-DOS, *by Dan Gookin and Andy Townsend, provides beginning and intermediate users with a guide to making the most of the expanded storage capacity offered by a hard disk drive.*

The book addresses three primary concerns: organization and access to data; data protection and security; and operating performance.

$18.60, paperback. Tab Books Inc., P.O. Box 40, Blue Ridge Summit, PA 17214; (717) 794-2191.



FONT ORIENTED WORD PROCESSOR

Write On! is a word processor from Hercules Computer Technology that demonstrates the potential of the Hercules Graphics Card Plus and the InColor Card, which have Hercules' RamFont feature.

Write On! combines the speed of text mode with the versatility of graphics mode. Users can create memos, reports, and other documents with three different type sizes and an unlimited number of type styles. The package comes with its own fonts, and users can create others.

Hercules will bundle Write On! with both graphics cards. Users can also purchase the software separately.

$15. All Kaypro MS-DOS computers except the 2000 and 2000 + . Hercules Computer Technology, 921 Parker St., Berkeley, CA 94710; (415) 540-6000.

AUTOMATIC PAPER LOADING

The RT-300 Series bidirectional tractors for Okidata printers are new tractor feed mechanisms featuring a patented snap-in mechanism for automatic paper loading.

The auto-load system guides the leading paper edge into and around the platen and shuts the flaps when it reaches the front of the tractor head.

These tractor feeders work with columnar printing, graphics, tables, and sub- and super-scripts.

$290. All Kaypro computers. Rutishauser of America, Inc., 10345 Brockwood Rd., Dallas, TX 75238; (214)-343-9154.

DESKTOP LASER PRINTER

This new mid-range laser printer produces text, graphics, and 39 bar code styles at 300 dpi (dots per inch) resolution. It has 79 resident fonts, eight foreign language character sets, and three user-modifiable Dynamic fonts.

Two card slots accept customized IC cards that can store personalized logos, business forms, fonts, and signatures. Seven built-in emulation modes offer compatibility with most software for office applications.

The printer includes 512K RAM (expands to 1.5 MB), both parallel and serial ports, and a 250-page paper tray.

$2,895. Kyocera Unison, Inc., 3165 Adeline St., P.O. Box 3056, Berkeley, CA 94703; (415) 848-6680.

NEW HARD DRIVE

The Optima series of hard disk drives provides reliable, cost-effective mass storage of 30 to 70 megabytes per drive.

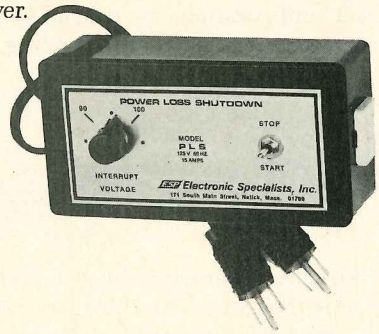
These products are designed for users who want to limit their investment in upgrading an IBM PC/AT, XT, or compatible. The drives feature voice coil head positioning, high-grade ferrous oxide media, and a dedicated servo surface.

Optima drives are available in half-height and full-size models. Half-height drives are available in 30 and 40 MB capacities, while the 70 MB drive is available only in the full-size model.

$1,055 to $1,495. All Kaypro MS-DOS computers except the Kaypro 2000 and 2000 + . Core International, 7171 N. Federal Hwy., Boca Raton, FL 33487; (305) 997-6055.

POWER LOSS SHUTDOWN

Power Loss Shutdown protects microcomputers operating on UPS or SPS power.



The product is an electronic device that is attached to your computer system and shuts the entire system down if commercial AC power has not yet been restored when UPS or SPS batteries have discharged. This prevents undesired computer and power system start-up after a power outage.

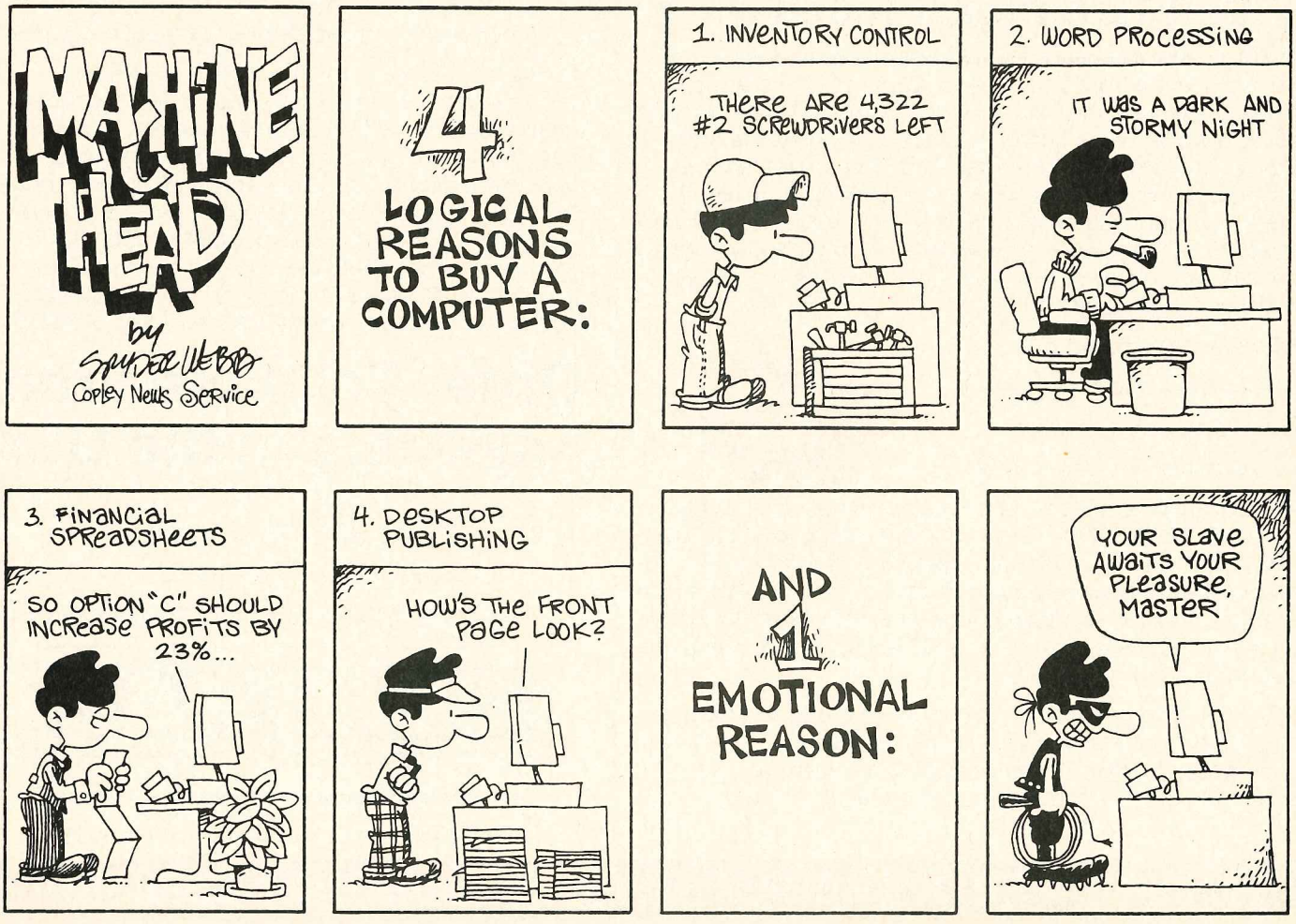
Models with an adjustable AC line drop-out voltage level are available to accommodate the inherent brown-out protection capabilities of some UPS systems.

$150. All Kaypro computers. Electronic Specialists, Inc., 171 S. Main St., Box 389, Natick, MA 01760; (800) 225-4876.

CORRECTION:

On page 94 of the December, 1987 issue of PROFILES we published the phone number of Digital Learning Systems as (201) 538-2426. That is their FAX number. The correct phone number is (800) 992-0264. We apologize for any inconvenience this may have caused.

HowardSoft's 1988 Edition of Tax Preparer automatically creates numerous supporting forms and schedules based on raw data entered on the 1040 form and has the Tax Reform Act built in past 1990. HowardSoft, La Jolla, CA □ Version 3.0 of **Software Bridge**, a file conversion program, has been enhanced to include support for five additonal word processing formats, including WordStar. Systems Compatibility Corporation, Chicago, IL □ **Bookmark Plus**, a program that backs up RAM, now supports the Lotus-Intel-Microsoft EMS 4.0 standard, as well as Microsoft Windows 2.0/386 and the Intel Inboard 386 processor. The new program has the ability to create two different "electronic" bookmarks that can be exchanged with a Swap Key. It enables the user to toggle from one program to another with a single keystroke. Intellisoft International, Novato, CA □ An upgrade is now available of **SOS** (Save Our Spreadsheet), a backup utility that prevents spreadsheet data loss by automatically saving the worksheet in RAM to disk. New features include the ability to salvage previously unretrievable worksheet files on disk; the ability to save "snapshots" of worksheet data in RAM to sequentially named files on disk so work in progress can be saved; the ability to make the interval between saves either a time interval or a certain number of keystrokes. Version 2.0 is compatible with LOTUS 1-2-3, Symphony, SuperCalc4, Framework, Twin and VP-Planner. Goldata Computer Services, Inc., Bryn Mawr, PA □ **Hotline II**, an electronic telephone directory and power dialer for PCs adds dBASE III and network compatibility, new editing and dialing features, unlimited storage capacity, and enhanced built-in directories containing business information. General Information, Inc., Kirkland, WA □ **GEM/3** now offers faster display performance and easier user installation. The new release of this popular graphics extension program uses compressed font files and is fully compatible with Ventura Publisher. Digital Research, Monterey CA ■



INTEGRATED 7+ with TWIN

General Motors Integrated Software Choice

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Menu Driven
No Copy Protection
Supports Math Coprocessor
Dual Monitor Support

- **Min. Sys Requirement**

IBM PC Compatible
2 Floppy or Hard Disk
320k RAM
Mono, CGA & Hercules

- **Twin Spreadsheet**

Lotus 123 Clone
Macro Support
256 x 8192 Workspace

- **Word Processor**

35,000 Word Dictionary
Data Import from Other Modules

- **Datamail**

Merge Database to WP

- **Relational Data Manager**

100,000 Records per File
Multiple Key Sorting
Merge File Capability

- **Graphics**

2D and 3D Graphics
Explosions
Slide Shows
Print and Plot without Exiting Program

- **Terminal Emulations**

IBM 3101, VT-52,100

- **PC Communications**

Hayes Compatible Command Set
9600 Baud Supported

You've long heard the PC Proimise - Increase productivity, less work and more free time. But where is the software to support this dream? We believe that we've found it: Integrated 7+ is a complete package incorporating seven functions best suited to management via microcomputer - and most important to increasing your personal and/or business productivity.
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You've heard it from your friends, fellow business users, perhaps even yourself - many disk backup programs are not 100% reliable: Users complete a backup, format the hard disk, and attempt to restore the data, only to find that the directory/file map on the backup disk was corrupt, and they never got their data back. Back-It to the rescue! Back-It was rated #1 by Software Digest in data security. The raw data transfer rate is slower than some, but the program's flexibility more than makes up for it.

- *Senses unformatted disks*
- *Makes use of two floppy drive*
- *Save data in DOS format*
- *Backup only the data you want*

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Presets are where it's at. This unique method allows you to save only the data you want. Hit a key , and a directory tree map apears. Tag the various directories, files, range of dates, or even changed files and save this as a preset. From then on, only the specified conditions are backed up. Have as many presets as you want, and backup only the data that you want, when you want it.

There are a lot of back up programs out there, and they all have good features, but not one can top Back-It, our choice! Only **$125**. #BACI. Order today and get 30 days of free customer support from the manufacturer.

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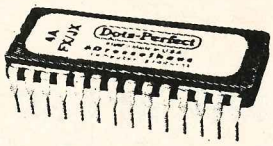

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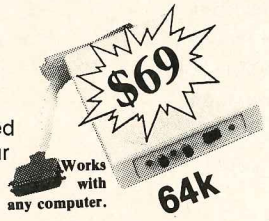

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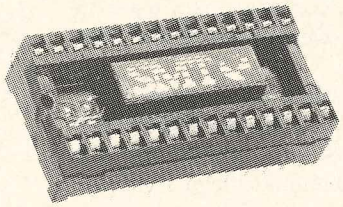

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ADVERTISER'S INDEX

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.

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

Product	Hotline #
Charting with Rembrandt:	
Rembrandt	931-47
WordStar For Power Users:	
WordStar 4.0 CP/M Edition	907-47
WordStar 4.0 MS-DOS	908-47
User-supported ProComm (A First Session):	
ProComm	917-47
Editor's Choice:	
Printrix and Fontrix	930-47
At a Glance:	
Quattro	932-47
Desktop Publishing:	
PC Quik-Art	933-47

Macintosh-Style Drawing on Your CP/M Kaypro

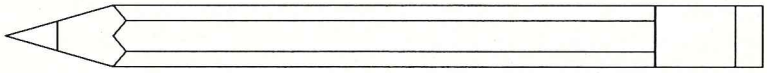
This is it! The only freehand drawing program for your CP/M Kaypro. SCS Draw. It is so easy and fun to use that it turns your Kaypro into a creative graphic tool.

There are other graphic programs, but this is the only real drawing program. With SCS you can do more than just draw. You can edit, refine, save, recall, rework and more. SCS Draw comes with many features that allow you to design special effects. There are 23 predesigned patterns that can be used to add shading and texture. But don't let that limit you. With SCS Draw you can also create your own patterns!

Mix any of the four provided type styles with graphics to create business cards, party invitations, logos, cartoons, or flyers. The sky's the limit! **Requires graphics capable CP/M Kaypro**

Attention Printmaster Owners

Now you can use your favorite Printmaster and Art Gallery I & II graphic images in SCS Draw. The Image Extractor lets you see and change your Printmaster, Art Gallery drawings right on the screen!



Central brings SCS Draw to you for only **$57. DRAW**. If you have Printmaster and want just the Image Extractor, our price is **$19. IMAE**. Or get both SCS Draw and the Image Extractor for only **$69. DRAX**.

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SmartKey Buyers Guide

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SMAP	SmartKey CP/M	$47.
SMAK	SmartKey V5.2 DOS	$57.

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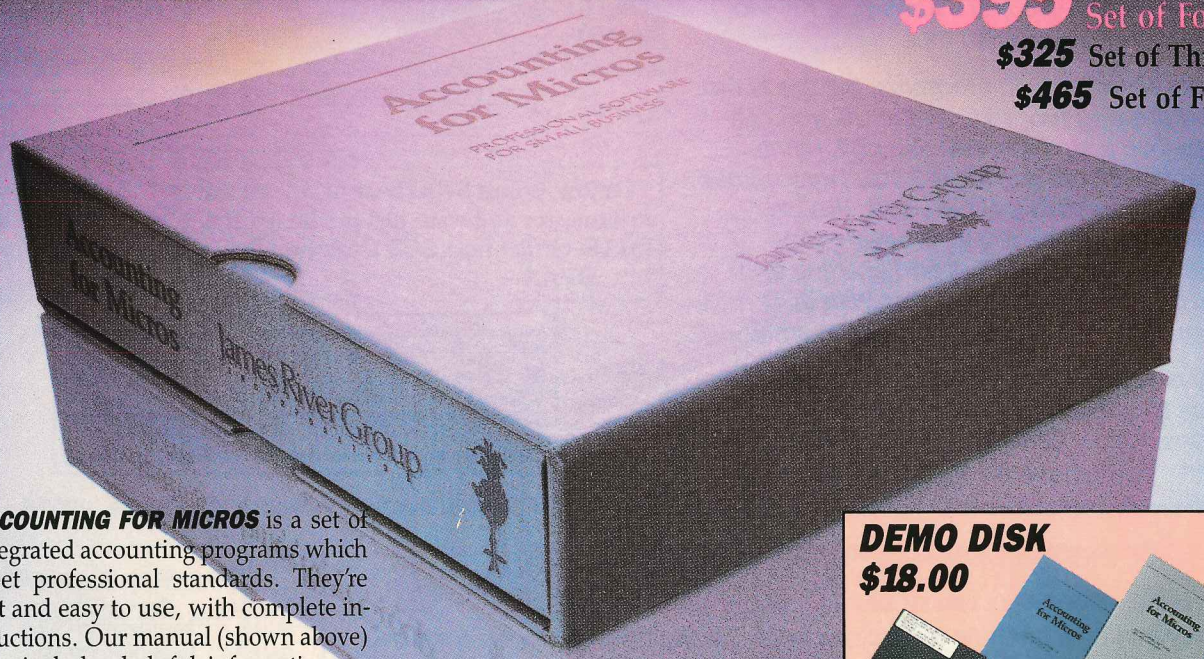

ACCOUNTING FOR MICROS is a set of integrated accounting programs which meet professional standards. They're fast and easy to use, with complete instructions. Our manual (shown above) also includes helpful information on bookkeeping and computers.

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