

PROFILES

The Magazine for Kaypro Computer Users

Volume 5, Number 3 • October 1987

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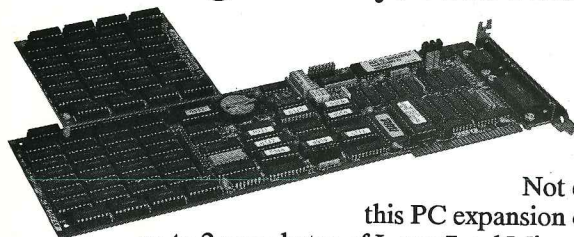
for forms, envelopes, etc. Select direct type through, like your standard typewriter, or line mode, where you can enter and edit a line prior to printing it, just like the new expensive memory typewriters.

The most commonly made ribbons, Diablo HyType II, and printwheels, Qume, are used in this printer. Central offers a complete line of printwheels, ribbons and supplies. Both the optional push-pull tractor and optional cut sheet feed mechanisms can be attached in seconds.

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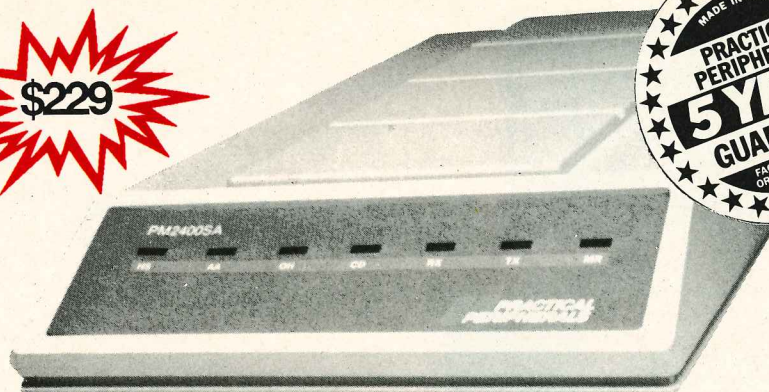
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Kaypro Corporation — electronics innovator since 1952 — has made a good thing even better. The KAYPRO 286i Model C now features a 40-MB hard drive and the 101-key AT-style keyboard.

With the latest standard feature enhancements, the KAYPRO 286i is the smartest choice in advanced computer technology.

Advanced.

The heart of the KAYPRO 286i is the 80286 microprocessor — with a processing rate of 10 MHz and 640 kilobytes of RAM. The perfect match for today's high productivity software.

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The KAYPRO 286i Model C has

a 1.2-MB floppy disk drive, plus a hard disk with 40 MB of storage.

The KAYPRO 286i AT-style keyboard features the new 101-key layout with separate cursor control, numeric keypad, and 12 programmable function keys.

Perhaps the nicest surprise about the KAYPRO 286i/C is the suggested retail price of \$2995.

You won't find distinctive metal construction, 10-MHz processing, and free name-brand software that includes WordStar Professional Release 4 in any other AT-type computer.

Other company's extras are Kaypro standard features.

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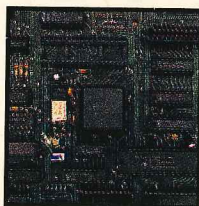
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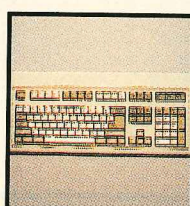
The KAYPRO 286i Model C features...



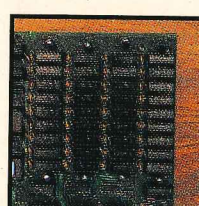
80286, 10-MHz Microprocessor.



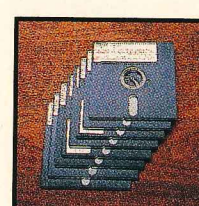
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Enhanced 101-key IBM PC/AT-style keyboard with security keylock.



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Bundled software includes WordStar Professional Release 4.

Trademarks: 286i, Kaypro Corporation; IBM, AT International Business Machines; WordStar Professional Release 4, MicroPro International.



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PROFILES

The Magazine for Kaypro Computer Users

Volume 5, Number 3 • October 1987

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Scanners **16**

BY TED SILVEIRA
Scanners let you put graphics and text directly in your computer without touching a keyboard or mouse. Get the scoop on this new technology and check out the rundown of scanners under \$4,000.

Shortcuts to Formatting with WordStar **24**

BY DON AND SHARYN CONKEY
Create letter-perfect documents with WordStar's dot commands and ruler lines, and put them all together into re-usable format files.

Programs That Program For You **28**

BY JOSEPH COMANDA AND LUCIEN KRESS
Let programs that program make your life easier. We look at some major contenders in the applications generator field.

A First Session with SuperKey **36**

BY JOSEPH I. MORTENSEN
Speed up your work sessions and save time and keystrokes with Borland's powerhouse keyboard redefinition program.

The Next Best Thing to Being There **44**

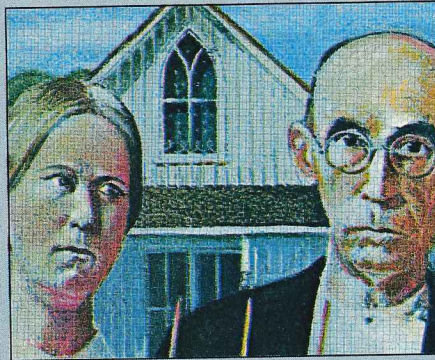
BY JOHN BAUMAN AND TOM ENRIGHT
Remote terminal programs give you the control of the office computer from the comfort of your living room.

Supercharging Perfect Writer **50**

BY JOHN BREWER
Use CP/M's SUBMIT program to bypass Perfect Writer's menus.

Test Driving Turbo Modula-2 **55**

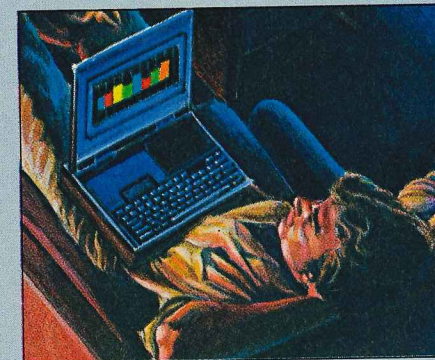
BY JIM SPICKARD
A new programming language enters the field and – surprise – it's for CP/M.



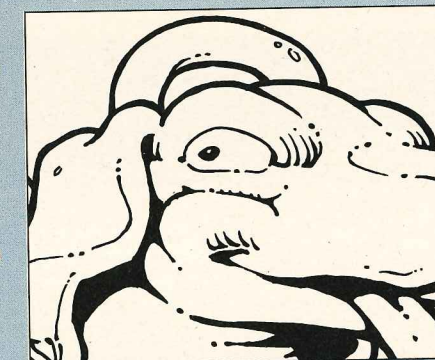
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BY BROCK N. MEEKS

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BY TOM ENRIGHT

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BY WILLIAM McCOY AND JOSHUA M. GREENBAUM

ON THE COVER:

There's more than one way to scan a cat, or a picture for that matter. This month's cover, by illustrator Ed Abrams, features the new high-tech toys – scanners. Abrams has taken "artistic license" with the output of scanners.

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Volume 5, Number 3

PROFILES (ISSN 8755-464X) is published twelve times a year by Kaypro Corporation, 533 Stevens Avenue, Solana Beach, CA 92075.

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Editors' Notes

Though most people are probably used to thinking in terms of keyboards and perhaps mice when they think of input devices, of course there are quite a few others to choose from.

In recent issues we've covered bar code technology and voice data entry. This month, in "Scanners," Ted Silveira takes a look at text and graphics scanners, which can eliminate the re-keying of text and the re-drawing of graphics. Learn the capabilities and limitations of these devices and decide whether you should wait or buy now.

Also in this issue:

- Program generators—programs that write code—can take a lot of the drudge work out of creating data base programs. In "Programs That Program For You," find out how these programs work and who's apt to get the most use from program generators, and take a close-up look at five specific products.

- If you've ever experienced the frustration of not having access to information on the office computer while working at home or in the field—or if you simply don't want to be tied to your office—remote terminal programs may be the answer. These programs let you operate a computer at a remote site as if you were actually sitting in front of it. See "The Next Best Thing To Being There" for a rundown on three such programs.

- Most experienced WordStar users have collected a bag of tricks to make

using the program faster and easier. "Shortcuts to Formatting with WordStar" offers a few more that you may not have thought of—they involve creating format files to streamline chores like creating ruler lines, printing letterheads, and typing envelopes.

- Another big time-saver is key redefinition programs, and SuperKey from Borland International is one of the most popular. If you're thinking of adding this to your computing "toolbox," or if you have it but haven't plunged in yet, "A First Session with SuperKey" should get you up and running.

- Still more shortcuts: Even the most diehard Perfect Writer fans admit the program's menu system is cumbersome, and that formatting and printing documents can be a tedious chore. In "Supercharging Perfect Writer," we explain how to issue Perfect Writer commands at the A0 > prompt and how to use the CP/M utility SUBMIT to automate formatting and printing.

- Finally, we look at Borland's version of Modula, Turbo Modula-2, from the Turbo Pascal user's point of view. Pascal fans can find out what Niklaus Wirth was up to when he developed this successor to Pascal and learn more about what it might offer them.

Enjoy.

Diane Ingalls
Terian Tyre

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Perfect Writer for MS-DOS?

Re: "Two Computers in One—Almost" (August 1987). The ability to use CP/M software in MS-DOS machines provides the owner with the best of both worlds—it eliminates the cost factor of new software (offset by the cost of the emulator or coprocessor), and it eliminates the need to learn a new command structure. The latter might be a greater deterrent than the cost of new software. (A typist who has learned the QWERTY system would be reluctant to purchase a new typewriter if it required the typist to learn the DVORAK system in order to use it.)

Therefore, those of us with older Kaypros who have learned the Perfect Software commands and procedures might be reluctant to buy a Kaypro PC or other MS-DOS machine unless we can also buy Perfect Software in the MS-DOS format. (The users of WordStar, etc., have access to programs in CP/M and MS-DOS formats.)

The use of an emulator or coprocessor might be one way to go, but Mr. Schwager's article indicated there would still be a great deal of incompatibility associated with such an option. Replacing a familiar brand of CP/M software with an MS-DOS version of the same seems to be a better choice. However, I cannot find Perfect software advertised anywhere in *PROFILES*. Does it exist in MS-DOS format? If so, from whom? At what price?

I did see an ad in *Computer Shopper* where a manufacturer in Florida ("Godfather") of a PC clone ("Violin") offered Perfect software bundled as a package with his clone. Can this package be purchased separately for use in Kaypro PCs? Is it really MS-DOS format?

I think readers would be interested in this information as an addendum to the CP/M — MS-DOS compatibility question.

J.A. Lingcodus
Pacific Grove, California

We are not aware of any version of Perfect Writer in MS-DOS format, and we have no way of knowing anything about the software bundled with the clone you mention.

You would have to contact the vendor directly to get the answers to your questions.

However, we do understand that Mark of the Unicorn markets an MS-DOS word processor that it says is a direct descendant of the old Perfect Writer. This program, The FinalWord (version 2.01), is available at a suggested list price of \$395. For information, contact Mark of the Unicorn, P.O. Box 443, Cambridge, MA 02142.

Are early indexes available

Your 1985 and 1986 subject indexes have been very helpful. Were earlier issues indexed? I have been a subscriber since you began.

I hope you plan to index 1987.

George H. Klumpner
Oak Park, Illinois

The 1985 and 1986 indexes are the only ones we have published. The 1983 and 1984 issues were indexed for staff use, but were never published. We have put them on the Kaypro bulletin board [(619) 259-4437] for readers' use.

We plan to publish indexes every year from now on.

What's the advantage?

I was very interested in your review of Lightning (July 1987). However, I find myself confused by your comparison of Lightning and RAM disks for running WordStar.

As you point out, the main problem with RAM disks is that a power interruption can result in loss of all the changes you have made in the entire session. Saves don't help unless you also copy back to the floppy. Then you point out how much Lightning can speed up those annoying disk accesses that accompany calls to WSMMSG.S.OVL.

But here's where the confusion comes in. WSMMSG.S.OVL does not change over the course of a session—if a power interruption erases the RAM disk copy, you simply reload it. The RAM disk problem comes when you have your document files loaded there. But from what I know about caching, it's not obvious that

Lightning would greatly speed up document file accesses (which, in any case, are not a major time-consumer unless you are scrolling back and forth through a long document).

It's true, as you point out, that Lightning saves the time needed to load the RAM disk. But since it must itself be loaded, and then it takes a certain amount of time to "get up to speed," it's again hard to see a clear advantage.

Perhaps there's something I've overlooked. If so, please let me know.

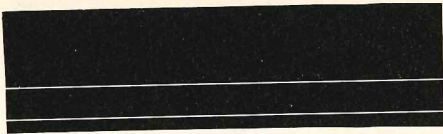
W.A. Thomasson
Oak Park, Illinois

Neither RAM disks or caching software has an overwhelming advantage over the other—both speed up disk I/O considerably. Caching software offers more file security in the event of a power loss and does not require setting up each time it's used, but it takes some time to "come up to speed." Caching software operates at peak advantage during extended editing sessions on large files. RAM disks provide their full advantage immediately, but files stored on them are not safe until copied to a conventional disk. Also, in the case of WordStar, the word processor must be installed to function on the RAM disk (told where to find its overlay files). Each method of speeding up file I/O has advantages and disadvantages. Which is the best choice is mostly a matter of personal preference.

UNIX for micros

Marshall Moseley's article ("There's a Stranger in Town") in the August 1987 issue points out the inadequacies of MS-DOS and the likely inadequacies of OS/2.

I recently read a series of articles on technical word processing systems in the *Journal of the American Mathematical Society*. What I found significant was that in one of the articles, the author said that certain technical microcomputer programs are so complex as to require the continued presence of an expert to teach the users how to use them. But some mainframe programs do not require the presence of experts,



apparently because they are so much easier to use. The mainframe programs would seem to have a long head start on microcomputer programs.

Occasionally I read about UNIX and I assume that it is the operating system used in most mainframe computers. It seems to me that with the increased power of microcomputers (they can do what some not-so-old mainframes do), that there should be a UNIX version for some microcomputers, and that some of the older software could then be utilized.

Perhaps the time has come for you to discuss UNIX, the various software available for it, and why thus far microcomputers have not utilized it.

W.H. Friedman
Silver Spring, Maryland

It's our view that by and large, microcomputer software is far easier for the average user to use than mainframe software. There is a subset of UNIX called XENIX that can run on 16-bit machines, but it's not only not user-friendly, it's downright user-hostile. Furthermore, most of our readers who have 16-bit machines are committed to MS-DOS and applications software that runs under it. Given these considerations, we don't think an article such as you suggest is appropriate for our audience. ■



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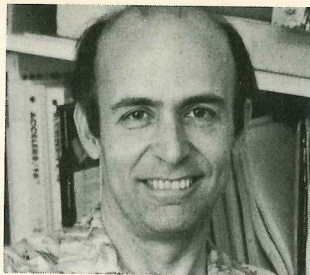
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DESKTOP PUBLISHER

How to talk about type

by Ted Silveira

As I mentioned last month, when you join the world of desktop publishing, you also join the world of traditional printing and publishing. And when you do, you quickly discover that printers, typesetters, designers, and other publishing professionals have a language of their own. In particular, they have special ways of talking about type—its look, its size, its placement on the page, and so forth.

This special language has been adopted by Ventura Publisher, Page-Maker, and other desktop publishing programs because it's useful—it lets you describe precisely how you want a page to look. Unfortunately, the language is also a major barrier to the uninitiated.

Several of the books I listed last month describe the language of type in detail, but to get us all started on the same foot, here's a short (and incomplete) glossary of typographic terms you'll need when you plunge into desktop publishing. I've listed the terms in alphabetical order so it'll be easier to use as a reference later on.

Ascender. In letters like **b** and **d**, the ascender is the vertical stroke that rises above the body of the letter. See also **descender** and **meanline**.

Baseline. The baseline is the imaginary line on which the bodies of letters rest. Letters like **a** and **m** sit on the baseline; the descenders of letters like **p** and **y** go below the baseline.

Body height. The body height of a letter is the height of its main body (minus ascenders and descenders) measured from the baseline to the meanline. The body height is also called the **x-**

height because it corresponds to the height of the lower-case letter **x**. The body height is not the same as the type size: 10 point Helvetica has a greater body height than 10 point Times Roman, for example. To most people, the font with the larger body height *looks* bigger. See also **type size**.

Body type. In type specifications, the body type or text type is the particular typeface, size, and style used to print normal text (like the text you're reading now). A body type must be exceptionally clear so that it's easy to read page after page after page—that's why Times Roman, Palatino, and similar typefaces are so often used for text in magazines and books. More elaborate or visually dramatic typefaces, like those used in ad headlines, are practically unreadable when set in large masses. See also **display type**.

Descender. In letters like **p** and **y**, the descender is the vertical stroke that sinks below the body of the letter.

Display type. In type specifications, display type refers to type set in larger sizes (36 point, for example) to catch the eye, as in headlines or ads. Because display type is used in isolated spots and short phrases rather than in long columns and pages, it can be (and usually should be) more dramatic than body type.

Em/En. Two units of measure commonly used by printers and typesetters are the em and the en, so called because they were originally equal to the width of an uppercase **M** and **N** respectively. In a particular typeface and size, an em

space or em dash is now equal to the point size of the type (usually the same as the width of the **M**). An en space or dash is equal to half an em (usually the same as the width of the **N**).

The advantage of using em and en measures is that they are relative to the type size rather than fixed. Suppose, for example, you specify a three-em indent at the beginning of each paragraph. If you then change the point size of your body type, the size of the indent will increase or decrease accordingly and maintain the proper proportion.

Em spaces are commonly used for indents (such as a one-, two-, or three-em indent at the beginning of each paragraph), while em and en dashes are used instead of hyphens in breaks—like this one—and in dates (1980-1990) and similar constructions. Ventura Publisher and other page makeup programs, as well as some word processors, will let you enter em and en dashes directly using the Alt key and the numeric keypad. Ventura Publisher will also let you specify minimum and maximum word spaces in ems, but it won't, unfortunately, let you specify indents in ems (at least, not in versions 1.00 and 1.01). See also **pica** and **point**.

Flush right/flush left. Flush right and flush left refer to the alignment of text within a column. Text set flush left is even with the left margin of a column, while text set flush right is even with the right margin. See also **justified** and **ragged**.

Font. In traditional typesetting, a font is a complete set of characters (upper and lower-case letters, numbers, punctuation marks, etc.) in a particular type-

face, style, size, and weight. By this traditional definition, 10 point Times Roman, 10 point Times Roman Bold, and 12 point Times Roman are three separate fonts, even though they all share a common design. This distinction between font and typeface was originally made because, in the days of hand-set metal type, a printer had to have a complete set of characters for every different size and style of the same typeface.

But now that almost all professional typesetting is done by computer, the distinction between typeface and font has been blurred. Modern digital typesetting machines usually store a set of master characters for a typeface and then create whatever size and style is needed by scaling the master characters up or down, making them italic or bold, and so forth. As a result, a set of master characters (Helvetica, for example) is often called a font when strictly speaking it should be called a typeface.

A number of page makeup programs, word processors, and graphics programs also use the term font to refer to a typeface—though Ventura Publisher maintains the distinction—and it's likely that this usage will eventually become universal. Keep the terms clear in your own mind, however, as you may encounter typesetters or other publishing professionals who insist on the distinction. See **typeface**.

Italic. Italic refers to a character's posture or style. Italic characters are those familiar slanting letters often used for emphasis like these. Italic is also sometimes called *oblique*, meaning slanted, and some computers and typesetting machines can create oblique type by slanting normal type. A good italic typeface, however, is designed for that posture and will look better than normal type that has been slanted. See **Roman**.

Justified. Text that is justified is set with both the left and right margins even, like the text in this magazine. To create the even margins, the spaces between words (and sometimes between letters) are expanded or reduced so that the line is the proper length. To justify text, especially in a narrow column, you'll need to break certain words by hyphenating them. In fact, in professional typesetting, the whole routine of

justification is known as *h&j* (hyphenation and justification) because the two are so closely connected.

In page makeup programs, the keys to good justification are accurate hyphenation and control over maximum and minimum word spacing. Without these two, you'll inevitably end up with lines that are too tight (words too close together) or too loose (unsightly amounts of space between words). See also comments at **ragged**.

Kerning. When you kern text, you

Kerning is one of the hallmarks of professional typography.

reduce the space between two letters to make them look better. A **T** and an **o**, for example, look too far apart at normal spacing because of their shapes, so this pair of letters is usually kerned to bring the **o** in under the arm of the **T** as in **To**.

Like good justification, kerning is one of the hallmarks of professional typography, but it has been limited in desktop publishing programs. Ventura Publisher versions 1.00 and 1.01 can only kern individual pairs of letters, which makes it impractical to kern body text throughout a document. Version 1.1 of Ventura Publisher reportedly can kern letter pairs throughout a document. See also **tracking**.

Leading. Leading (pronounced *led-ding*) is extra space placed between lines of type. Lines set with no extra leading are said to be "set solid" and usually have a dark, crowded look that makes them hard to read. So 10 point type, for example, is often set with two points extra leading between lines so that the lines themselves are spaced 12 points apart (measured from baseline to baseline) instead of only 10. Such a specification is often called 10-over-12 or 10-on-12 and is written as 10/12.

The amount of leading necessary for clarity is affected not only by the type size but by the design of the typeface itself—its body height, the length of its ascenders and descenders, and other factors. A good page makeup program like Ventura Publisher will let you spec-



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ify leading in fractions of a point. See also **type size**.

Meanline. The meanline is an imaginary line that marks the top of the body of a letter, just as the baseline marks the bottom. The body height of a letter is measured from baseline to meanline, and the ascenders rise above the meanline.

Pica. Printers and typesetters don't usually work with inches or even centimeters. Instead, they use a system of picas and points. A pica is 12 points, approximately 1/6 of an inch. Measurements for column and margins widths and for column lengths are usually given in picas, while those for type sizes and leading are given in points.

Though page makeup programs like Ventura Publisher give you the option of using inches or centimeters, stick to picas and points. That's the language you'll need to speak when you talk to typesetters and other professionals. It's also much more precise.

Point. Along with the pica, the point is a traditional unit of measure for type. It is approximately 1/72 of an inch, giving you 12 points to the pica and about 72 points to the inch. It's important to remember that a point isn't exactly 1/72 of an inch because although the difference isn't noticeable with normal type sizes, it can become so when you work with large display type or other very large measurements.

Ragged right/ragged left. Text set ragged is unjustified, so ragged right text, for example, is set flush on the left margin but uneven on the right. Though many people think that fully justified text looks more professional, a number of well-designed magazines and similar publications use ragged right text.

Ragged right text does have two advantages. First, the spacing of words and letters is consistent throughout the text because no padding is needed to justify lines), which most people agree makes the text easier to read. Second, hyphenation is not nearly as important in ragged right text as it is in justified text, a fact that is important only because the hyphenation routines in word processors and page makeup pro-

grams are often weak and prone to errors.

Roman. Roman refers to a character's posture or style. Roman characters are the normal vertical characters, like these, as opposed to italic or oblique characters, like these.

Sans serif. Sans serif simply means "without serifs," so a sans serif typeface is one whose letters have no serifs, like those used for subheadings throughout **PROFILES**.

Serif. Serifs are the short, light horizontal lines that project from the top and bottom of the main strokes of a letter in many typefaces. The typeface used for the body text in **PROFILES** is a serif face, while the face used for the subheadings in the articles and columns is a sans serif face. For long passages of text, most people find a serif typeface easier to read than a sans serif one.

Tracking. Tracking allows you to reduce the overall spacing between characters and is often useful for headlines set in large type, where the normal spacing will seem to leave the letters too far apart. Tracking, which reduces the space between all letters by a fixed amount, is not the same as kerning, which reduces the space between a particular pair of letters while leaving others unchanged. There's been confusion over these terms because some desktop publishing programs offer tracking but not kerning.

Typeface. A typeface is a particular named type design—such as Times, Helvetica, Palatino, or Optima—complete with all its characters. Technically, a typeface is not the same as a font, though many people now use the words interchangeably.

Type size. The size of the characters in a particular type font is measured in
(continued on page 65)

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LIFE AT 300 BAUD

Going online in your car

by Brock N. Meeks

People will do almost anything in their cars. These days it's not uncommon to see someone talking on a cellular phone. And although mobile voice communications have long been possible, until recently there has been no way to use these cellular phone systems to transmit computer data.

Barriers to transmitting data via cellular

Mobile voice communications are fraught with static, fading signals, and atmospheric interference. Though these are only minor annoyances during voice communications, they wreak havoc on data transmissions. In addition, there is the cellular anomaly called "handoff." (A handoff occurs when a caller drives from one "cell" into another.) During these handoffs, phone connections are temporarily broken. These breaks last from 400 to 700 milliseconds, and are as fatal as the infamous "call waiting" glitch on regular phone lines.

Given all these potential problems, data transmission via a cellular phone would appear nearly impossible.

Patrick Mayben, executive vice president of marketing for Spectrum Cellular Communication Corporation, explains the data transmission problem for the cellular market this way: "There are only three solutions to the problem. The first is to use a standard land-line modem with a cellular interface and transmit at 300 baud. Using this method the user is advised to pull over to the curb and park before transmitting or receiving. For obvious reasons, this is not a popular solution.

"The second solution is a compromise. This is really an 'error control'

scenario. To adjust for the cell site hand-off, the modem would simply reestablish the communication after handoff by sending through information stored in a buffer that might have been lost during the handoff. This method doesn't deal with environmental errors and is unlikely to perform well during a rapid succession of handoffs.

"The third and most effective solution is to control the data flow from end to end. A vehicle-mounted cellular modem and a fixed-base cellular modem with an error correction protocol between them will correct environment-related errors as well as errors associated with handoff."

Enter the Bridge and the Span, both from Spectrum Cellular Corporation.

Cellular white knight

Spectrum Cellular was the first to provide a successful solution to the handoff and noise problems plaguing cellular data transmissions. In February 1985, they introduced two cellular modems called the Bridge and the Span. These are essentially Hayes-compatible land-line modems with a proprietary, packet-switched error-correcting protocol built into them.

Both modems are about the size of a VHS videocassette. They come with a Z-80 microprocessor and 4K of RAM (expandable to 32K). Both modems operate at 300/1200 bps. The Bridge is designed for mobile use. The Span is designed for stationary use, working with your desktop PC or corporate mainframe.

The Bridge comes with a cable and a T-connector that resembles a parallel printer connector. The T-connector plugs directly into the cellular phone base unit. One cable leads to the hand-

set, the other to the modem. The Span includes a standard RJ11 modular jack that connects to a standard telephone line. Both units have cables for standard RS-232 ports.

The modems can be used to access regular land-line modems; however, to gain the advantage of their built-in error-correction protocol, you must use a Bridge and Span in tandem.

"Cellular technology isn't limited to use by people riding in limousines . . ."

You can use this tandem setup as a closed system, or you can configure a cellular modem "gateway." Such a gateway could use Bridge modems in the field to access Span modems at stationary sites. These Span modems, in turn, could be tied directly to a mainframe or linked to land-line modems.

Accessing a land-line modem through the Span would allow remote users to dial into an electronic service or data base just as if they were using a regular phone line. Of course, using the Bridge and Span together, all data being sent to a land-line modem (or a mainframe) would be free of errors.

Customer base slow to grow

"Cellular technology isn't limited to use by people riding in limousines," said Spectrum's Mayben. According to Mayben, anyone needing instant access to information would benefit. He listed several potential users: those involved

in ship-to-shore communications, reporters filing news stories, real estate brokers who need information on properties, and emergency medical personnel who need quick access to a patient's medical history.

In spite of the promise and the potential for practical applications, cellular technology appears bogged down by less-than-overwhelming acceptance.

Part of the technology's growth problem may be limited exposure. Right now there are about 100 areas with cellular networks; two years ago there weren't any.

One vital indicator for the cellular modem market is the growth of the cellular phone market. But even here, the experts disagree.

In 1985, in formal comments made to the Federal Communications Commission, IBM said that it expected the cellular market to reach 2.4 million by 1990. Link Resources Corporation, a New York-based marketing research group, issued a report stating that in 1986 there were approximately 250,000 cellular customers. However, Link claims there is a definite slow-down in cellular use, so it readjusted—downward—an earlier prediction for cellular use: from 1.5 million to 750,000 by 1990. That's a difference of 1.65 million between the IBM and Link predictions.

One explanation of the tentativeness of the market is a misperception of cellular technology.

"I think most people think it's a toy right now," said one industry analyst. "And that's a lot of money to pay for a toy."

However, on closer examination, price doesn't really appear to be a factor.

The Span and Bridge each cost \$695—hardly bank-breaking figures when just a few years ago a 1200-bps modem sold for the same price.

What about the cost of cellular phone calls? Depending on the market, these costs range from 15 to 40 cents a minute. And since FCC regulations state that there must be at least two cellular providers in each cell network (to ensure that no company has a monopoly) competition is likely to drive prices down. (And what's 40 cents a minute when you're trying to save someone's life or when you're negotiating the biggest contract of your career?)

Practical applications

Creating practical applications using cellular data transfer is like pulling a rabbit out of hat: What appears to be magic actually takes careful planning coupled with an educated risk. However, many areas of both the public and private sector are taking that chance.

The applications described below are either in use now or are being tested for implementation in the near future.

Journalists are already using cellular data communications from the field.

Print/Broadcast Media. Mobile computers allow Knight-Ridder journalists to access a data base in Washington, D.C., for background information. They can also compose, enter, and transmit their stories from the scene.

Photographers. Using mobile data communications with a portable facsimile machine, photographers can transmit photos or other graphics from a remote site.

Fire departments. With an on-board terminal and printer, a command unit can access a city data base to view building floor plans while en route to a fire. The firefighters can view "hot spots" to determine safety procedures and check for the storage locations of hazardous materials. The system allows access to a national data base for instructions on temperature reactions of various hazardous or toxic materials.

Land surveyors. State-of-the-art survey equipment now has an on-board computer that must have data dumped to a "black box" daily. The black box is taken to a central office computer where the information is dumped. With a cellular phone and modem connected to a survey device, the data dump can take place instantly.

There are some precedent-setting applications of this technology, too.

Spectrum has found a way to use the government's LORAN-C (long-range aid to navigation) system together with its Span/Bridge modems. Using a system

called AutoTrac (from Spectrum/Jaycor), in connection with the LORAN-C network, the location of any automobile or boat can be pinpointed to within 500 feet. With the aid of a desktop PC, the AutoTrac system can continuously update a CRT display of a vehicle's location on a navigational chart or road map.

In Detroit, real estate brokers access the multiple listing service via a cellular modem link. They can tap into the data base when sitting in a customer's home, without tying up a telephone line.

Even CompuServe is interested in cellular. It recently began an experiment that allows users to access its system using cellular modems: CompuServe simply connected a Span modem to a regular CompuServe telephone port. A user can now access CompuServe using a Bridge. The pilot project is operating in Chicago, New York, Toronto, Los Angeles, Atlanta, and Dallas.

The bottom line

The freedom offered by cellular phone systems, coupled with the luxury of mobile data communications, is now a reality. It's a combination that's pushing the potential of telecommunications to new heights, while providing bottom-line results in the workaday world. ■

COMPUTERS



"With this program, if you have unwanted guests, it'll start showing slides of your vacation."

by Marshall L. Moseley

PROFILES contacts Kaypro dealers each month to find out what questions their customers ask most often. These questions are the basis of this column. Also, questions are drawn from Kaypro Technical Support and from readers' letters.

Get Word Finder working for you

I am having trouble using WordStar and Word Finder together on my two-drive Kaypro PC. Because each program is so large, they are on separate disks and I am constantly swapping floppies. Is there a solution?

Upgrading to a hard disk would solve the problem right away. Barring that, one solution is to put Word Finder's synonym file on a RAM disk. This involves three steps: making a new WordStar disk, setting up the RAM disk, and telling Word Finder to look for the synonym file on the RAM disk. This only works if you have a lot of memory, at least 640K.

First make a WordStar/Word Finder working disk. Format a diskette without the /S option to leave more room for files. Copy WS.EXE, WSINDEX.XCL, WSMMSG.OVR, WSPRINT.OVR, WSSHORT.OVR, and WSPELL.OVR to it.

Now set up the RAM disk. Begin by creating a new system disk (use the /S option) with the files COMMAND.COM and VDISK.SYS on it. Next, use WordStar in non-document mode to create a file called CONFIG.SYS on the new disk. This file contains the two commands below on separate lines:

```
BUFFERS=20  
DEVICE=VDISK.SYS 167
```

The first command allocates disk buffers for WordStar and Word Finder. The second command creates a RAM disk (or virtual disk) of 167K—just big enough for the synonym file. Whenever you start or reset your computer, make sure you boot from this disk. For more information on CONFIG.SYS see "Q & A" in the September 1987 issue of PROFILES.

Next, use Word Finder's installation

program, WFINSTALL.EXE, to make Word Finder look on the RAM disk for its synonym file. Put the Word Finder disk in drive A and type WFINSTALL. You will see a menu with three options, the top one highlighted in inverse video. Use the down arrow key to highlight the second option, "Change Drive/Directory." Press Enter.

WFINSTALL will display a help screen followed by two prompts. The first one asks for the drive where the synonym file is located. Enter the drive letter of your RAM disk. (On the standard Kaypro PC the RAM disk is drive C; if you have other devices installed, the RAM disk may be named D or E.) The second prompt asks you what directory the synonym file will be in. Type \ (backslash) and press Enter. Exit to MS-DOS by selecting "Save Changes and Exit Program" and pressing Enter. Now copy Word Finder (WF.EXE) to the WordStar working disk you created earlier.

Using this setup is easy. Just boot your system from the system disk you just made, which creates the RAM disk. Remove the boot disk from drive A, insert the Word Finder disk, and copy WFSM.SYN to the RAM disk. Then insert your new WordStar disk in drive A and run Word Finder. Now you are ready to run WordStar and take advantage of Word Finder at the same time.

Know your Stars

I have a Star LV-1210 printer that I use with several different software packages. The trouble is, these programs make no provisions for that printer. How do I get my software and printer to understand each other?

Almost every one of Star Micronics's dot-matrix printers provides for your needs by emulating some widely known printer: the IBM Graphics Printer, the IBM ProPrinter, or any one of the Epson FX or LQ lines. When installing software, find out which printer your Star printer emulates and configure your program accordingly.

Following is a list of the Star Micro-nics printers distributed by Kaypro. Each description tells you how many pins the printer uses in its print head (the more pins, the better the print quality), the claimed print speed in characters per second (cps) in both draft and near-letter-quality mode, and the types of printers emulated.

The Star LV-1210. This printer emulates an IBM Graphics Printer and has nine pins. It prints at 120 cps in draft mode and 30 cps in near-letter-quality.

The Gemini 10-X. This is the first dot-matrix printer distributed by Kaypro and the only one that does not fully emulate any other printer. It is very similar to an Epson FX-85 or an Epson MX-80 with Graftrax, but not in graphics mode. If your software is installed for the above-mentioned printers, your Gemini 10-X will print text just fine. But commands to print graphics, such as those produced by PC Paint or Lotus 1-2-3, will fail. Fortunately, the 10-X has been around for so long that most application programs include it in their installation procedures. The Gemini 10-X has nine pins and prints at 120 cps.

The Star NX-10. This printer emulates both an Epson FX-85 and an IBM Graphics Printer. The NX-10 has nine pins. It prints at 120 cps in draft mode and 30 cps in near-letter-quality mode.

The Star NP-10. The NP-10 has two incarnations: version 1 and version 2. Version 1 emulates the Epson FX-85 only, while version 2 emulates both the FX-85 and the IBM Graphics Printer (only version 2 is now sold). Your printer manual should tell you which version you have, or you can have the printer itself tell you. Just run its self-test by holding down the line feed key while turning the printer on. The NP-10 will print its version number along with all its character sets. The NP-10 is a nine-pin printer that prints at 100 cps in draft mode and 25 cps in letter-quality.

The Star NR-15. The NR-15 is a nine-pin printer that prints at 240 cps in draft mode and 60 cps in near-letter-quality mode. It can emulate an Epson FX-85,

an IBM Graphics Printer, or an IBM ProPrinter.

The Star NB-2415. The NB-2415 has a 24-pin print head and can emulate an Epson LQ-1000, an IBM Graphics printer, or an IBM ProPrinter. The NB-2415 prints at 216 cps in draft mode and 54 cps in near-letter-quality mode.

The Star NB-15. Another 24-pin printer, the NB-15 prints at 300 cps in draft mode and 100 cps in near-letter-quality mode.

Accessing added memory

The September "On The Practical Side" was very helpful, but you did not explain how to adjust the multi-function board to access added memory?

The Kaypro PC uses 256-kilobit, 150-nanosecond D-RAM chips, which fit in three rows of sockets on the left side of the multi-function board. Each row holds 256 kilobytes in nine chips.

When you add memory to this board, adjust the DIP switches at SW1 to reflect the changes. The early Kaypro PCs have different memory switch settings than the later ones; both sets are displayed below in charts 1 and 2, respectively. To tell which settings to use, locate the chip at position U51 on the multi-function board. If the chip has the number 968 or 968A, use chart 1. If the chip is numbered 968B, 968C, etc., use chart 2.

Memory switch settings for early Kaypro PCs
(U51 is 968 or 968A)

1	2	3	4	
ON				Parity checking on
OFF				Parity checking off
OFF	OFF	OFF		No memory
ON	OFF	OFF		256K Memory
ON	OFF	OFF		512K Memory
ON	OFF	OFF		640K Memory
ON	ON	OFF		768K Memory

Memory switch settings for later Kaypro PCs
(U51 is 968B or higher)

1	2	3	4	
ON				Parity checking on
OFF				Parity checking off
OFF	OFF	OFF		No memory
ON	OFF	OFF		256K Memory
OFF	ON	OFF		512K Memory
ON	ON	OFF		640K Memory
ON	ON	ON		768K Memory

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(See Note)

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- 15% more formatted space.

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SCANNERS

Scanners: How they work, what they can do – now and in the future

by Ted Silveira

Computers were supposed to bring us the paperless office. But if anything, they've increased the paper load—everyone from the company CEO to the under-assistant West Coast promo man now puts out memos with fancy graphics and impeccable spelling. Dataquest, a market research firm, estimates that by 1990, American business will put out 1.23 trillion pages of information on paper, compared to only 300 billion electronic pages.

With so much information being circulated and stored on paper, it's inevitable that at some time almost every computer user wants to get text or pictures off a printed page and into a computer. For most people, the only alternative has been to redraw or retype the information on the computer, and according to Dataquest, businesses will spend over \$3 billion this year to have documents manually entered into computers.

But there's a better way: Just as a computer can convert electronic information into print, so it can also convert printed graphics or text into an electronic form, using a device called a scanner. A few years ago, scanners were expensive machines, costing from \$20,000 to \$100,000 or more. But like photocopiers and laser printers, scanners have dropped dramatically in price, some to below \$1,000, so that they're now within reach of individuals and small businesses.

Scanners are used for two different jobs—to scan graphics and to scan text. In graphics scanning, the scanners “read” line drawings, photographs, or other graphics and convert them into computer images of the original. In text scanning, also called *optical character recognition* (OCR), scanners “read” printed text and convert the words and characters into ordinary word processor text files. Most new scanners can do both jobs, though not simultaneously.

How scanners work

Like computers, scanners have two components—the hardware that scans the printed original and the software that interprets what the hardware “sees.”

What the scanner hardware does is fairly straightforward. The scanner bounces light off the page containing the text or graphic. The white areas of the page reflect the light, while the black areas absorb it. The reflected light is focused on a group of light-sensitive receptors, which “see” the light and dark areas of the page as a collection of light and dark dots. These light and dark dots are then converted into zeros and ones, the binary digits your computer understands.

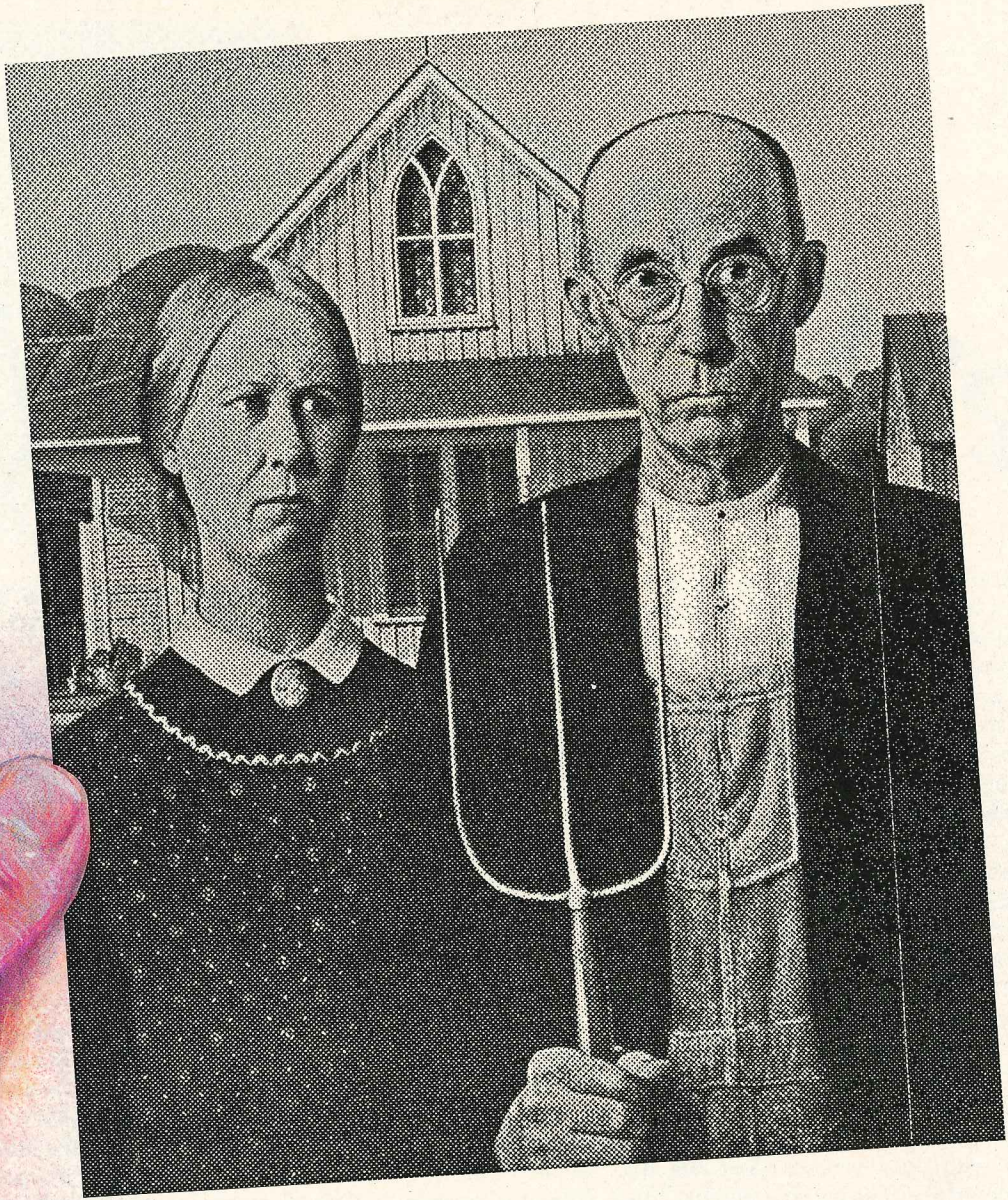
The size of the dots the scanner can recognize determines the scanner's *resolution* (how sharp and detailed the image will be). The more dots per inch, the better the resolution, and the more detail the scanner will record. Today, scanners typically have a resolution of 300 dots per inch (90,000 per square inch), the same as current laser printers.

What the scanner software does with the information it gets from the hardware depends on whether it's scanning graphics (line drawings or photographs) or text.

Scanning graphics

Line Art. The easiest graphic to scan is a piece of line art, a drawing that consists only of black lines on a white background. With line art, the scanner simply looks at a single spot on the page, determines whether it's black or white, stores the result as a single bit (1 or 0) in a file, and moves on to the next spot.

The result is a *bit-map* image of the scanned line art (see “Computer Graphics: Bit-Maps and Vectors” on page 21 for an explanation of bit-map files). The bit-map image will be a



faithful reproduction of the original art within the limits of the scanner's resolution. At 300 dots per inch (dpi), the true vertical and horizontal lines in the scanned image will look smooth, but the diagonal lines will have slightly jagged edges (see Illustration 1 below).

ILLUSTRATION 1: The "jaggies" on diagonal lines in scanned line art

PROFILES

Continuous Tone Art. While it's relatively easy to scan line art, it's more difficult to scan *continuous tone* art—drawings and photographs that contain shades of gray instead of just black and white. The difficulty is not in the actual scanning—most scanners can recognize shades of gray by the amount of light they reflect—but in communicating the results to a printer. How can a dot matrix or laser printer that only knows how to print black dots be taught to print shades of gray?

One solution is to have the scanner software create a *halftone* image, much like the halftones used to print photographs in magazines and newspapers (see "Halftones: Making Gray Out of Black and White" on page 20 for an explanation of halftone images).

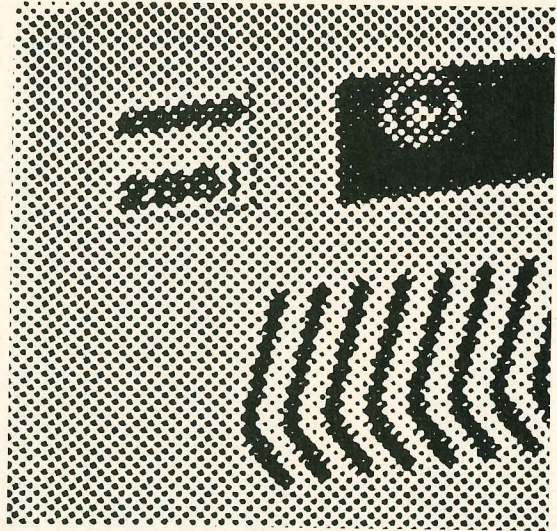
Halftone Scanning. The halftone created by a scanner, called a *digitized halftone*, is not quite the same as an ordinary photographic halftone. In an ordinary halftone, the number of black dots per inch (the density) remains constant while the size of the black dots varies to create the effect of darker and lighter sections.

But laser printers, dot-matrix printers, and similar printing devices can only print a fixed-size dot. So, to create the halftone effect of larger and smaller black dots, the scanner software must group a number of scanned dots together and treat them as a single large halftone dot, called a *grain*. The software can then vary the lightness or darkness of a halftone grain by printing all, some, or none of its constituent dots, imitating the effect of larger and smaller dots in an ordinary halftone (see Illustration 2).

Digitized halftones created by a scanner have two drawbacks. First, the resolution of a printed halftone will always be less than the full resolution of the printer, since four or more printer dots will be needed for each halftone grain. Second, as the number of shades of gray in the printed halftone goes up,

its resolution goes down. For example, if printed on a 300 dpi laser printer, a digitized halftone using grains made up of four printer dots (in a two by two square) would have a printed resolution of 150 dpi, but it would have only five shades of gray. A digitized halftone using grains made up of 64 printer

ILLUSTRATION 2: Smaller printer dots combine to create larger halftone grains for shades of gray in digitized halftones



dots (in an eight by eight square) could be printed with 256 shades of gray, but it would have a printed resolution of just over 30 dpi.

Because of these drawbacks, digitized halftones produced by current 300 dpi scanners can't approach the quality of the photographic halftones people are used to seeing in magazines or even newspapers. Instead, they have a coarser, "computerized" look, as shown in Illustration 3 below, though they still work well in publications like newsletters or flyers where the low resolution doesn't matter.

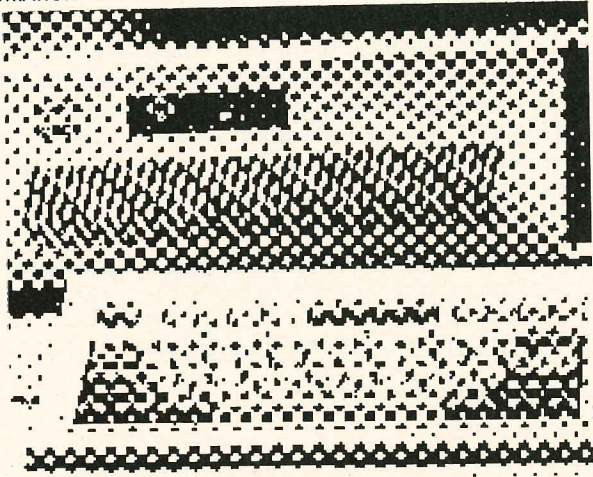
However, some scanners are now starting to offer a new way of creating halftones, using a technique called *gray-scale scanning*.

Gray-Scale Scanning. In the previous method of creating digitized halftones, the scanner reads the shades of gray from the image, creates the digitized halftone itself, and then saves it as a bit-map file, using only a single bit (0 or 1) to store each printer dot. As a result, the file doesn't contain any of the gray-scale information that the scanner originally had, just a simple bit-map for the printer. On the other hand, if the scanner uses more than one bit to store each scanned dot, it can record levels of gray for each dot, up to 256 levels of gray if it uses eight bits (one byte) per dot.

There are at least two advantages to having this gray-scale information stored in the file created by the scanner. First, with the proper software, the brightness and contrast of an image can be modified and a halftone can be created *after* the image has been scanned, something that is not possible in a simple bit-map file.

Second, with this gray-scale information, software can take advantage of a high-resolution output device (like a 2,500 dpi Linotronic typesetter) to produce a higher resolution halftone. The resolution of the halftone grains in the printed image can

ILLUSTRATION 3:



Scanned at 72 dpi



Scanned at 300 dpi



Ordinary photographic halftone

never be higher than that of the original scanned image (300 dpi with current scanners), but the proper software can use the extra resolution of the typesetter to create smaller halftone grains while maintaining a full gray scale. A 2,500 dpi typesetter, for example, could break each 300 dpi scanned dot into an eight-by-eight matrix, giving 256 levels of gray at 300 dpi resolution.

Along with its advantages, gray-scale scanning has at least one disadvantage—the scanned image takes up more space. If not compressed in some way, a straight 300 dpi bit-map of an 8x10 inch image would take nearly 900K. A gray-scale scan of the same image, using eight bits instead of one to store information for each dot, would create a file eight times that size if uncompressed—roughly seven megabytes.

Text scanners work best with monospaced text, in which every character gets the same amount of space.

Scanning text

Compared to a graphics scanner, which can simply look at single dots on a page, a text scanner has a tough job. It must look at the dots from a whole line of text, break them into groups, and then try to match the dot pattern of each group against the patterns of characters it has stored in memory, distinguishing **O** from **Q** and **i** from **j** as it works. If it finds a match, it stores the character in a text file; if not, it tries again or inserts an error marker.

Text scanners work best with *monospaced text*, in which every character occupies the same amount of space (as on a typewriter). They have more trouble with *proportional spacing*, in which each character occupies space according to its real width (so **M** takes more space than **i**). And they have more trouble still reading typeset text that is proportionally spaced and justified (like the text you're reading now) because the spacing between letters and words varies from one line to another.

Most text scanners recognize only specific typefaces. All recognize common monospaced faces such as Courier, frequently used on daisywheel printers and IBM Selectric typewriters, and many will also recognize common proportional typefaces, such as Times Roman and Helvetica. A few, such as the Datacopy scanners with OCR Plus software, can be taught to recognize new typefaces, an important feature for people who have to scan text from a variety of sources.

Even when reading a known typeface, a text scanner is seldom 100 percent accurate, so all scanned files need to be proofread. The software can be fooled by variations in the typeface (ligatures or decorative characters, for example), by low-quality print (something that's been photocopied several times), and by smudged or damaged pages. In these cases, it may record the wrong character or insert an error mark.

To improve character recognition, some developers are now

using a new kind of pattern matching. Instead of trying to match the specific dot pattern of a character, the software views a character as a collection of horizontal lines, vertical lines, and curves arranged in a particular order. The letter **q**, for example, may look different in different typefaces, but it always takes the form of a circle followed by a vertical line that drops downward. Improvements of this kind should lead to text scanners that can automatically recognize a wide variety of typefaces.

As a result, the number of products available is growing rapidly and now includes offerings from such well-known names as Canon, Ricoh, Sharp, and Epson (see the list of vendors at the end of this article). At the moment, the best-established companies in the microcomputer scanner market seem to be DEST (the market leader), Datacopy, CompuScan, and Microtek, all of whom sell scanners in the \$2,500-\$3,000 range that can handle both graphics and text. Just as with laser printers and photocopiers, Canon is a strong presence at the

The current scanners are clearly transitional products — you can expect some major breakthroughs.

Scanners on parade

Even in their current less-than-perfect state, scanners are useful tools in many jobs — in desktop publishing, in all kinds of graphics work, in computer-aided design, and, with optical character recognition, in many text-intensive projects such as creating data bases. And now that usable scanners have become available for less than \$3,000, the market for scanners shows all the signs of a coming boom.

low end of the market, selling its IX-12 scanner for \$895 (the engine of the Canon scanner is also used in a number of other scanners).

One interesting — and cheap — new entry is from Epson. The Epson Scanner Option Kit turns an Epson LQ-2500, EX-1000, or EX-800 printer into a scanner by replacing the ribbon cartridge with a scanning device. This scanner is slower than more expensive dedicated scanners, it has a maximum resolution of 180 dpi on the LQ-2500 (144 dpi on the others), and it

HALFTONES: MAKING GRAY OUT OF BLACK & WHITE



When a printing press is loaded with black ink, it can do only two things — print a black image or leave a white space. So how does a machine that can only print in black and white print a photograph that has shades of gray?

The answer is a *halftone*. To create a halftone, the original continuous-tone picture is rephotographed through a special screen of dots using high-contrast film that records only blacks and whites, no grays. The result is a new photograph made up entirely of black dots on a white background. As the accompanying photo shows, the black dots are evenly spaced, but they vary in size, being smaller where the picture is light and larger (to the point of overlapping) where the picture is dark or black. Viewed at the right distance, the halftone gives the illusion of continuous shades of gray.

The resolution of the halftone is determined by its frequency — the number of dots per inch. Typically, newspapers will use 80-90 dpi halftones, magazines 130 dpi, and high-quality books 150 dpi or higher. Newspapers use the lower resolution because newsprint absorbs ink, causing the halftone dots to spread. If the frequency of the halftone is too high, the blurred dots will muddy the image. — T.S. ■

COMPUTER GRAPHICS: BIT MAPS & VECTORS

The most common type of microcomputer graphic is the bit-map graphic, which is used not only by scanners but also by paint programs, like PC Paintbrush, and other graphics software. In a bit-map graphic file, a picture is stored in the form of bits—individual zeros and ones (the basic language of all computers) that literally make a map of the image.

For example, if you have a piece of graph paper, you can draw a crude picture by blacking in some of the squares and leaving others white. The resolution of the picture (that is, how smooth and detailed it is) is determined by the size of the squares on the graph paper (the number of squares per inch). To create a bit-map of such a picture, you would start at the upper left corner and, moving from left to right and top to bottom, record every square on the paper, writing down a zero if the square were white or a one if it were black.

Using this bit-map, another person could reproduce your picture on a similar piece of graph paper by blacking in a square for each one and leaving a white square for each zero—again moving from left to right and top to bottom.

As cumbersome as this method of bit-map storage seems, it is a perfect match for today's dot matrix and laser printers. Unlike daisywheel printers, which have a typewriter-like wheel containing fully-formed characters, dot matrix and laser printers construct characters and graphics out of dots. These printers must be told, for each position on the page, either to print a black dot or leave a white space.

With bit-map graphics, the resolution of the final printed image can never be higher than that of the bit-map file it is printed from. If the bit-map in the graphic file is created using a resolution of 72 dots per inch (dpi), then it will print as a 72 dpi image, even if the printer is capable of printing at a higher resolution.

scans graphics only, but if you can put up with those limitations, and if you already have the Epson printer, the price is right—\$249.95.

If you're planning to buy a scanner, keep the following things in mind:

If you want to scan graphics, remember that the maximum available resolution at the moment is 300 dpi, which will be fine for some applications but too crude for others (see Illustration 3, on page 19, for a sample of 300 dpi resolution). You can increase the effective resolution by printing an image at 300 dpi and then reducing it photographically, but you end up with a smaller image.

In addition, you'll have to have a hard disk. Scanned graphics, especially large ones scanned at high resolution, take lots of disk space. Even if you already have a 20 megabyte hard disk, you'll probably need to get a larger one unless you have 10 megabytes of free space.

Finally, for graphics, you should look for a flatbed scanner—

Not all programs use bit-map graphics, however. Computer-aided design programs like AutoCAD, drawing programs like GEM Draw and Windows Draw, and other programs that create line art use *object-oriented* or *vector* graphics, in which the image isn't stored as a bit-map at all. Instead, it is stored as a set of instructions or mathematical

With vector graphics, an image is stored as a set of instructions that describe its shape.

formulas that describe the shape of the image (something like "a straight line, 0.1 inch wide, from point A to point B").

Because dot matrix and laser printers only understand dots, the vector graphic is converted into a bit-map at printing time. But before then, it can be scaled up or down without losing resolution, and it can be printed at the highest resolution of the current printer—it is not limited to a particular resolution as a bit-map graphic is.

Because of the way they work, graphics scanners produce bit-map images. Microtek, however, recently announced CADmate, a new software product that will convert a scanner's bit-map graphic into a vector graphic in the standard AutoCAD DXF format. Look for other companies to follow suit. —T.S.

the kind with a glass plate on top on which you place the item to be scanned—rather than a sheetfed scanner, the kind that actually feeds single sheets into the machine itself. The flatbed scanner not only allows you to scan "lumpy" items (like books) but also allows you to accurately align drawings to get the best scan.

If you want to scan text, you should look for a sheetfed scanner if your text is in the form of single sheets that can be fed one by one (books won't work in a sheetfed scanner unless you cut out the pages). With a sheetfed scanner and an accompanying sheetfeeder (at extra cost), you can simply dump a stack of pages in the sheetfeeder and leave the scanner to digest them. If you try to scan text with a flatbed scanner, you'll need someone to stand by and feed the pages one by one, which may cost you as much as hiring someone to type the text in directly.

Also, if your text scanning is going to be an ongoing activity rather than a one-time job, you should look for a scanner that can be taught to read new typefaces. Even though you may

have only a few specific typefaces to scan right now, you will certainly want to scan something in a different typeface in the future. Don't limit your options.

Scanning the future

The current scanners are clearly transitional products. They offer reasonable results at a reasonable price, but there's little doubt that scanners are going to follow the path of laser printers, with prices continuing to drop as speed and quality rise. You can also expect to see some major breakthroughs soon—not just gray-scale scanning, which is already appearing, but color scanning and more flexible processing of images after they've been scanned.

You will also see scanners combined with other products,

particularly copiers, laser printers, and facsimile machines. Last June, in fact, Sharp Electronics announced plans for its PC FAX 1, a combination thermal printer, copier, scanner, and fax machine, to be available by the end of the year at a price close to \$2,000.

In short, if you have a job that cries out for a scanner, start shopping. Though scanners will be better and cheaper 12 months from now, you'll almost certainly recover your investment in the meantime. On the other hand, if your need isn't pressing, be patient and keep an eye out for new developments—the best is yet to come.

Ted Silveira is a contributing editor to PROFILES.

SCANNERS UNDER \$4,000

Product: Abaton Scan 300
Manufacturer: Abaton Technology Corp.
 7901 Stoneridge Dr., Suite 500
 Pleasanton, CA 94566
Phone: (415) 463-8822
Sugg. List Price: \$2,495

Product: AST TurboScan
Manufacturer: AST Research
 2121 Alton Ave.
 Irvine, CA 92714-4992
Phone: (714) 863-0181
Sugg. List Price: \$2,395

Product: Canon IX-12
Manufacturer: Canon USA
 Lake Success, NY 11042
Phone: (516) 488-6700
Sugg. List Price: \$1,190

Product: CompuScan PCS
Manufacturer: CompuScan
 81 Two Bridges Rd.
 Fairfield, NJ 07006
Phone: (800) 631-0951, in NJ (201) 575-0500
Sugg. List Price: \$3,495

Product: Datacopy Jet Reader, Datacopy 730
Manufacturer: Datacopy
 1215 Terra Bella Ave.
 Mountain View, CA 94043
Phone: (415) 965-7900
Sugg. List Price: \$1,300 and \$1,800

Product: PC Scan Plus
Manufacturer: DEST Corp.
 1201 Cadillac Ct.
 Milpitas, CA 95035
Phone: (800) 538-7582, in CA (408) 946-7100
Sugg. List Price: \$3,385

Product: Personal Scanner 2000
Manufacturer: Electronic Information Technology
 373 Route 46 West
 Fairfield, NJ 07006
Phone: (201) 227-1447
Sugg. List Price: \$2,495

Product: Epson Scanner Option Kit
 (replaces print head on Epson EX-800/1000 or LQ-2500 dot-matrix printer)
Manufacturer: Epson America, Inc.
 2780 Lomita Blvd.
 Torrance, CA 90505
Phone: (800) 421-5426
Sugg. List Price: \$299.95

Product: HP ScanJet
Manufacturer: Hewlett Packard
 1820 Embarcadero Rd.
 Palo Alto, CA 94303
Phone: (800) 367-4772
Sugg. List Price: \$1,495

Product: Microtek MS-300A and MS-300C
Manufacturer: Microtek
 16901 S. Western Ave.
 Gardena, CA 90247
Phone: (800) 654-4160, in CA (213) 321-2121
Sugg. List Price: \$2,495 and \$1,795

Product: MacScan w/IBM PC Interface
Manufacturer: New Image Technology, Inc.
 10300 Greenbelt Rd.
 Seabrook, MD 20706
Phone: (301) 464-3100
Sugg. List Price: \$1,547 plus \$250 for interface

Product: Princeton LS-300
Manufacturer: Princeton Graphic Systems
 601 Ewing St., Bldg. A
 Princeton, NJ 08540
Phone: (609) 683-1660
Sugg. List Price: \$1,495

Product: Ricoh IS-30/M2, SS-30
Manufacturer: Ricoh
Phone: (408) 432-8800
Sugg. List Price: IS-30 starts at \$1,900, SS-30 starts at \$1,300

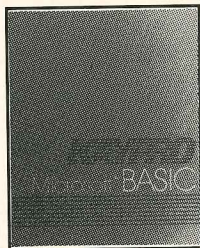
Product: PC FAX 1
Manufacturer: Sharp Electronics
 Facsimile Division
 Sharp Plaza
 Mahwah, NJ 07430
Phone: (201) 529-8949
 Price not yet available

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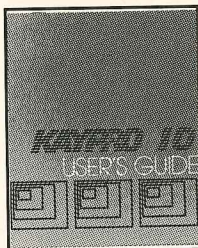
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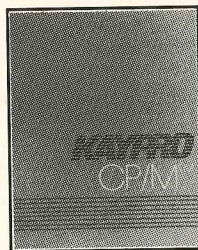
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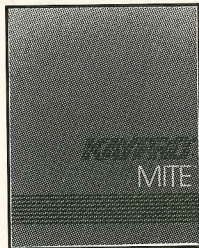
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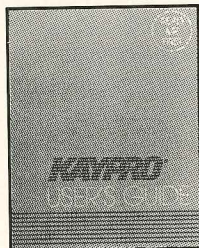
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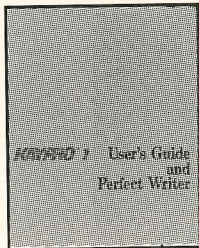
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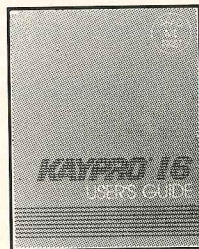
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Short cuts to Formatting with WordStar

Tips for using dot, print, and opening menu commands

by Don and Sharyn Conkey

Once you've learned the basics of WordStar and have developed your typing skills, you're apt to spend as much time formatting your documents as you do writing them. WordStar contains several commands that can make your document formatting more efficient. Here are some tips and tricks for effective, efficient use of dot, print and opening menu commands. These procedures will work for WordStar versions 3.0, 3.3, and 4.0 under MS-DOS or CP/M systems.

WordStar provides default (pre-set) settings for editing text and for print-time page layout. Figure 1, on the next page, illustrates many of these defaults, which we'll address throughout this article.

Rule your roost with a ruler line

If you create documents with formats different from WordStar's default margin and tab settings—for example, if you use letterhead, create outlines, or print envelopes or labels—use ruler lines. They will save you time.

A ruler line specifies margins and tab settings and is stored with the file. To create one:

1. Create a blank line: With INSERT on, type `^N`
2. Type `..^P (Return)`

The two periods create a "comment" dot command, which prevents the line from printing. With `^P (Return)`, you're telling WordStar to overprint the ruler line onto the comment line. This ensures your ruler line input will begin in column one.

3. Type the main body of the ruler line: Space (if necessary) to the column where you want the left margin to begin. Type in margin and tab settings, using `!` for regular tabs, `#` for decimal tabs, and hard hyphens (or a printable character) in all other

columns, beginning and ending at the left and right margins you want. It's advisable to use hyphens, as that's what you're used to seeing in the ruler line WordStar displays at the top of the screen, but they must be hard hyphens. Be sure soft hyphen entry (`^OE`) is off (the default setting) before you type your ruler line. A ruler line with margins at 1 and 35, "regular" tab stops at 10 and 30, and a decimal tab stop at 20 would look like this:

`L-----!-----#-----!----R`

When you want WordStar to use a ruler line, place the cursor anywhere in the main body of the line and type `^OF`. This ruler will remain in effect until you issue another `^OF` with the cursor on a different line or until you reload WordStar.

Time-saver: Store the ruler line (or the first one, if you use more than one) in the same position in every file. As you switch from document to document, you can automatically move to that position to do `^OF`.

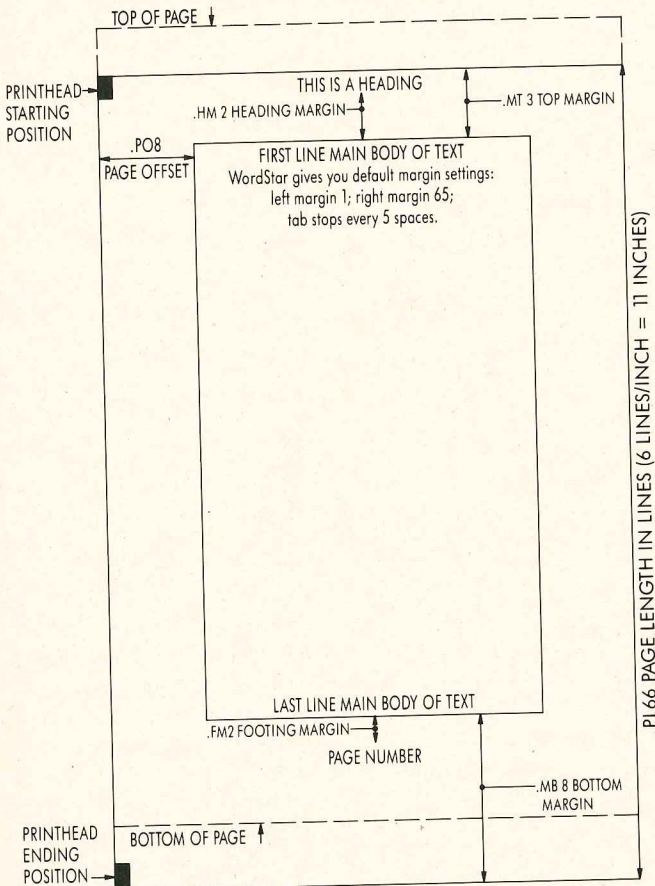
Format files for letterhead, labels and envelopes

Use "format files" to store ruler lines, margin settings, etc., for frequently used format settings. Figure 2, below, shows a format file used to print letters on paper with 1 1/8-inch letterhead.

The `.MT 6` command overrides WordStar's top margin default of three lines. You may have to experiment with this setting. WordStar begins counting from where the printhead is positioned to begin printing, not from the physical top of the page.

The `.OP` command turns page numbering off. Lines 3 and 4 show the ruler line, which sets margins at 6 and 65, as noted in

FIGURE 1: WordStar's Default Page Layout



the .IG comment line following. You will replace the "Date" line with the current date when you create the letter. You should also replace the "Name" field with the name of the person you are writing the letter to if your letter is more than one page long. (If the letter is less than one page, the heading will not be printed, so you don't have to worry about it.)

The date line precedes the heading so that the heading will not be printed on the first page. The .HM 5 command sets the heading margin for maximum white space between the head-

To create a letter, you simply open the letter file, then read in your format file with ^KR,

It's a good idea to name your format files logically and consistently, as you may find you'll have several. For example, we use FMT.LET for the above format file. For printing envelopes, we use FMT.ENV, shown in Figure 3 below.

FIGURE 2: FMT.LET Letter Format

```
.MT 6
.OP
L-----R
.IG margins at 6 and 65
[Date]
.HE [Name]          #-
.HM 5
```

FIGURE 3: FMT.ENV Envelope Format

```
.IG Put envelope where want printing to start
.MT 0
..
L-----R
.OP
.MB 0
.PL 24
.PO 1
[Your Name]
[Your Address]
[Your City, State, Zip]
.PO 40
(Eight Empty Lines Here)
[Recipient's name]
[Address]
```

Use FMT.ENV to address business-size (#10: 9 1/2 by 4 1/8 inch) envelopes that are not preprinted with your return address. The first line (.IG) reminds you to position the envelope in the printer where you want printing to begin. (The .IG command stands for "ignore"; it's the same as a two period (..) comment line and will not print.) Here we've reset both the top and bottom margins to zero and designated a page length of 24 lines (four inches at six lines per inch). With .PO 1, the page offset (the number of spaces from the left margin "indented" by the printer) is set to one so that the return address will print in the top left corner of the envelope. Fill in your name and address to store with the format file. The last dot command resets the page offset to 40, so that the recipient's name and address will print in the proper place on the envelope.

"Prefabricated" format files that you read into your document with ^KR streamline your editing.

We've shown two lines for recipient's name and address in Figure 3 to show placement, but we don't store these lines in the file. We do store eight blank lines following the .PO 40 command. To use the FMT.ENV file, open a new file, read in FMT.ENV, and move the cursor to the ruler line to do ^OF. Then go to the end of the file (function key F10 or ^QC) and input the recipient's name and address.

Alternatively, there are times when the recipient's name and address are available: While you're typing a letter, write the inside address to a file (^KW), called, say TEMP. While you're printing the letter, open the file TEMP, read in FMT.ENV, position the cursor in the ruler line and issue ^OF, move to the line containing the recipient's name, and reformat (^B) the rest of the file to line it up.

If you've got preprinted envelopes, modify FMT.ENV as follows:

1. Change the .MT 0 command to .MT 6.

2. Delete the four lines starting with .PO 1.

3. Change the comment line if necessary.

You can also use WordStar to print fanfold (continuous form) labels using a format file containing the simple dot commands shown in Figure 4 below.

This format file works for one-inch labels (15/16" high by 3 1/2" long). These labels will hold five lines of text. Put an unconditional page break command (.PA) after the last line of each address. To ensure that five-line addresses will not spill off the bottoms of the labels, position the first label so that printing will begin on the top line of the label.

FIGURE 4: FMT.LAB Format for 1-inch Labels

```
.IG Position first label to print on top line
.MT 0
..
L-----R
.OP
.MB 0
.PL 6
.PO 0
```

Why not use a mailing list program instead? If you have one and know how to operate it, or if you'll be printing lots of labels frequently, or if you need the merging and managing capability common to programs like MailMerge, by all means, go for it! The FMT.LAB is simply a convenient way to print labels without knowing anything other than dot commands.

Keys to success

Format files work well for dot commands, but some formatting commands can't be stored in a file. Commands to toggle justification (^OJ) and hyphen-help (^OH), or to change line spacing (^OS), for example, must be entered as WordStar is run. What to do? At the minimum, do the commands in order, so that they become rote, and you won't waste energy wondering whether you did them or not.

A better solution is a key redefinition program. These programs allow you to redefine a key or keys to reflect a sequence of commands. For example, we redefine Alt-F1 to be: ^OJ, ^OH, ^JH3. Pressing Alt-F1 turns justification and hyphen-help off and sets the help level to zero. We press Alt-F1 the first time we edit a file after a fresh load of WordStar. You must be editing a file or the ^O will be interpreted as a "copy" command; if you press Alt-F1 every time you edit a file, you'll be toggling justification and hyphen-help on and off. (*Editor's note: WordStar 4.0 allows you to define commands for function keys in Shift, Alt, and Ctrl states in addition to the normal state.*)

So you've fixed and formatted and your output still doesn't look like it should? Here are some common traps — and tricks to avoid them:

Place dot commands first. Ever have an inconsistency in page layout, where WordStar shows you a page break on the screen, but your printed output does not break the page at the same point? The problem may be in the placement of your dot commands. The line height (.LH), paper length (.PL), and bottom and top margin commands (.MB and .MT) must be placed before any text in your file to get a proper screen display of page breaks.

Check margins. Ever know you've saved a heading or footing command (.HE or .FO) in your file, but the text you specified doesn't print? Check your top and bottom margin commands. If they are zero, your heading or footing won't print.

Numbering pages. By default, WordStar prints the page number in the center of the footing. If you override this default footing by using the footing command (.FO) with text, you won't get automatic page numbering.

You can also turn page numbering off with the .OP (omit page) command. This command is not a toggle: You must instead issue the page number command (.PN) to begin page numbering again.

However, you can turn automatic page numbering off and still print page numbers in your heading or footing. Just include a # in the .HE or .FO command in the position where you want the page number to print. When you do this, remember the .HE and .FO commands themselves take up four columns each (three characters plus a blank space), so to print a page number in column 20, space to column 24 before entering the #.


Underline column headings. Have you ever been confused by the horizontal text layout generated when you underline a heading over a column of text? Because WordStar displays print controls on the screen, the underlined text will be pushed to the right two spaces for every underline command you've entered. Though they may print properly, the headings won't line up over the table on the screen.

You can turn the display of print controls off (^OD) to check text, but you must remember to turn it back on while editing, or you'll run the risk of accidentally deleting a print control character. In addition, adding text is dangerous when you can't see the print controls, because it's sometimes difficult to know whether or not the added text will be subject to the print effect.

The solution: Forget underlining headings until your columns are complete. Then, turn INSERT on and enter the underline commands (^PS) at the appropriate places. The February 1987 "Beginner's Luck" column contains basic information on column alignment.

Double-spaced text. If you need a multi-spaced document, it's often easier to do your initial text entry and major editing single-spaced. You'll minimize the time spent moving the cursor. When you want to output, say double-spaced, first change spacing with ^OS 2. Reformat the document with ^B then print. Alternately, if your printer responds to the line height dot command, set line height to twice the normal setting. If you normally print six lines per inch, change line height to 16 for double spacing. Set line height to 12 for double spacing if you normally use eight lines per inch.

Conclusion

In sum, when formatting your documents, as with any other electronic task, you want to minimize keystrokes and reduce repetitive tasks to rote procedures. Streamline your editing procedures, nail down formatting features, then let WordStar worry about the medium. It'll free your mind to concentrate on the message. 

Don and Sharyn Conkey use WordStar to write about micro-computers for PROFILES and many other national publications.

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PROGRAMS THAT PROGRAM FOR YOU

Applications generators translate your data base designs into code automatically

by Joseph Comanda and Lucien Kress

ILLUSTRATION BY M. LINDSAY



A

Applications generators hold the promise of programming power without the pain. They've been around a long time as programmers' tools on mainframe computers. Now they've come to the PC, and their promoters are reaching out to a new market: data base users who don't know how to program. What exactly do they do, how do they work, and more importantly, how well do they live up to their promise? We looked at five different packages with those questions in mind.

What do they do?

Building a data base system is a lot of work. First you have to think through what you want the system to do. Then you have to build it piece by piece. And finally you have to put all the pieces together. Applications generators provide a set of tools for building the pieces and for putting them together without programming.

Suppose you're setting up a client billing system. After some thought, you might decide on a system that lets you perform the following tasks:

1. Add new client records.
2. Look up and make changes to existing client records.
3. Add new billing items.
4. Add client payments and update client outstanding balances.
5. Produce monthly invoices, update client outstanding balances, and clean out billed items.
6. Produce a client phone list.
7. Produce a report showing clients with outstanding balances.

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Your list almost looks like a menu for your system. And, in fact, it could function as the basis for one, since a menu is simply a list of tasks presented to the user as options. All you need to add is a final option to exit the menu.

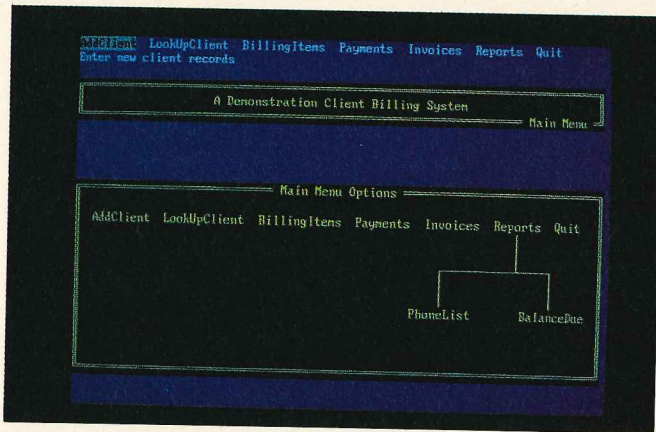


FIGURE 1: The client billing system menu in Paradox

But a menu is only one of the many pieces that make up a system. The specific pieces you'd need would depend to some extent on the data base management program you chose to use, but a typical system would have the following basic building blocks:

- **data files** for storing information
- **data-entry forms** for entering and displaying records on the screen
- **index files** for fast searches and organizing records
- **reports forms** with instructions for report layouts

Most data base management programs come with the tools to design these basic building blocks. In that sense, they have already incorporated some of the features of an applications generator. But a full-featured applications generator also has tools for putting the pieces together. To do this it uses two other building blocks: procedures and menus.

Procedures and menus are the key

A procedure is the series of steps required to perform a given task. Typically, each step involves doing something with one or more of the basic building blocks of the system. Any data base system has numerous procedures connected with it. The client billing system, for example, has eight procedures (counting the one to exit).

Even simple procedures can involve several steps. Take the procedure to print a report of clients who owe money. In dBASE, it would require four steps:

1. Opening up the Client data file.
2. Using an index that imposes an alphabetical order.
3. Selecting records where the current balance is greater than zero.
4. Using the appropriate report form to print the report.

The procedure for entering a payment is even more elaborate. While adding a record to the payment file, it also looks up the client record in another file using the client ID index and updates the client's current balance figure.

Since procedures can get so complicated, they're usually left

for programmers to design. Applications generators offer some non-programming alternatives. They generally provide a number of pre-defined procedures or actions, and they often also let the user build custom procedures by responding to

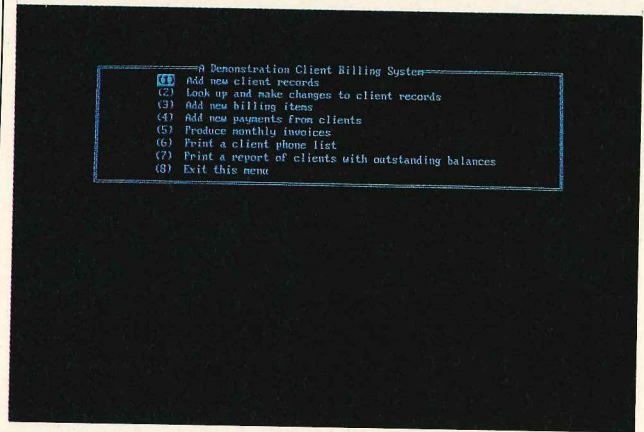


FIGURE 2: The client billing system menu in R:base System V

prompts or by picking options off a menu. Paradox even has a "script recording" feature. You can record a procedure's steps in a script file as you perform them and then have Paradox play back the script when you want to perform the task again.

Applications generators use menus to gather procedures together and make them available to a system's users. Designing a menu involves specifying the options that will appear on it and then linking them to the tasks that will be performed when the user selects them.

How application generators work

Traditionally, programming has involved typing lines and lines of instructions for the computer to follow. But as any good programmer will tell you, writing code, as this is called, is almost anticlimactic. Far more critical is the planning that goes into designing a system before a line of code is written. Essentially, applications generators earn their keep by taking a design and translating it into code.

Of course, there has to be some way for the designer to communicate the plan so the generator will know what kind of code to produce. More importantly— particularly for non-programmers who aren't used to planning systems—the generator must provide a structured way for the designer to think through a plan.

Applications generators generally handle this by providing a menu-assisted approach to system design. R:base's Applications Express and Paradox's ApGen, for example, both lead you through a series of questions about the system first, then generate the code to produce it.

They also employ some variation of the building-block approach to system design. Generally, there are three kinds of building blocks: pieces of the system where information is stored (like data files, indexes, and report forms), stock procedures (for adding records, printing reports, etc.), and menus.

A closer look at some generators

For this article we looked at five different applications generators that work with popular data base management programs.

We started with dBASE III PLUS, Paradox, and R:base System V, since each comes with both a programming language and an applications generator. But dBASE III's applications generator was so limited and inflexible as to be nearly useless, so like many other dBASE-users we turned to third-party products instead. Of the many out there we picked two: Genifer and Flash Code.

In addition we selected SIMPLE, a new data base management program that dispenses with a programming language altogether and makes applications generation an integral part of the way it works.

Let's start with the built-in application generators in Paradox and R:Base, and then move on to Genifer and Flash Code.

Paradox's ApGen

Paradox has a number of built-in applications generator tools for designing data files, data-entry forms, reports, and queries. In addition, it has a supplementary program called ApGen.

(In the newest release of Paradox—version 2.0—ApGen has been renamed Personal Programmer. It was rewritten in C and

Applications generators provide a menu-assisted approach to system design.

is supposed to run faster. We were unable to evaluate it in time for this article.)

ApGen has you start by giving your application a name and specifying its tables (or data files). You can then proceed to menu design, a matter of placing options on the menu and linking them to actions. When you're done with the menu, ApGen finishes the job for you by writing the application's code and scrolling it past the screen.

ApGen's action menu offers a number of built-in procedures for doing basic data entry, viewing tables, and producing reports. It also lets you attach sub-menus and display custom help screens. If you select a built-in procedure, it leads you through the process of making the procedure specific to your application. For example, if you had a menu option called "Add clients" and you linked it to the built-in procedure DataEntry, you would be prompted to specify the table that would store the information, the data-entry form, and any data-entry rules you wanted to establish.

If none of the built-in procedures do what you want, you can attach your own "script" (Paradox's term for a program). The script can be either pre-recorded or written in Paradox's programming language.

One of the nice things about ApGen is its hang-loose style of design. If you're not ready to link an action to a menu option, you can leave it undefined for the time being and fix it later. If you don't have a report that you need, you can either let Paradox create one automatically or go directly into its report generator and design it on the spot. You can even move a menu option down a level without losing its link to an action.

You don't have to be a programmer to use ApGen, but the manual emphasizes that you should be familiar with Paradox's

basic building blocks and how they work. The manual gives further tips on how programmers can modify generated code by hand.

ApGen also has a couple of nice self-documenting features. One menu option, Review, lets you explore an application's menu structure. Another, Summarize, prints out a rather detailed report describing each menu option and listing the building blocks associated with the application.

There is a down-side to ApGen: Compared with the other programs, it lacks adequate context-sensitive onscreen help and performs somewhat sluggishly. But these are the only negative comments we have about an otherwise full-featured product.

R:base's Application EXPRESS

R:base System V's applications generator is accessible from the system's opening menu and has a number of separate parts. The first three—Definitions EXPRESS, Forms EXPRESS, and Reports EXPRESS—are for designing data bases, data-entry forms, and reports. The fourth, Application EXPRESS, is the part that lets you put the other building blocks together into a single menu system.

Application EXPRESS, like Paradox's ApGen, starts with a menu whose options can be linked to a series of actions. Besides the basic pre-defined actions, R:base has a password procedure. It also lets advanced users link their own programs (R:base calls them "macros") to a menu option. The whole process goes very quickly, and the program does a lot of hand-holding with prompts and fast, context-sensitive help screens. You can use a similar process to make changes to the application.

R:base's applications generator seemed less casual than Paradox's and lacked self-documenting features, but it was faster and less confusing.

Now we move on to the dBASE add-ons, Genifer and Flash Code.

Genifer

Genifer is the applications generator that dBASE lacks. It adds features that dBASE-users will appreciate, such as freeform report layouts and field definitions that permit calculated fields, default values, and validation checks complete with error messages. Besides that, it also produces dBASE code for menus and other procedures.

At the heart of Genifer's system is a data dictionary and a set of skeleton files. The data dictionary is a dBASE data file that stores information on all the pieces that make up the application: data files, data-entry screens, reports, menus, and help screens.

The skeletons are special instruction files that determine the shape of Genifer's pre-defined procedures, of which there are only four: menus and help screens, data base maintenance screens (basic data entry), data base inquiry screens, and reports. Though Genifer procedures are well-designed, they can't be changed easily from within the program. Instead, the Genifer manual has instructions on how advanced users can customize the skeletons that produce them.

Working with Genifer involves defining the pieces and then generating the code. The first pieces should be the data files, then the various procedures that use them, such as data base

maintenance and reports, then the menus that hold the other procedures together. Once they are all prepared, Genifer can generate the code for the system using the instructions contained in the skeleton files.

Data Dictionary CALCRUCR Field Definition

* Field name CAPACITY

Type (Character/Numeric/Date/Logical) X

Length (with decimal point & digits) 2

Number of decimal places 0

Default value 24

Validate against (Range/List/File) E

Picture (9/0/1/2/3/4/5/6/7/8/9/./@/function) 99

Ret/Beg/End/Next/Prev/Modify/Add/Copy/Delete/Tally/Help/Quit? I

FIGURE 3: Field definition in Genifer's Data Dictionary

Though Genifer is easy to work with, it presupposes a good understanding of data base concepts. It's definitely not for beginners.

Flash Code

Flash Code is two programs in one. The first is a somewhat limited applications generator for dBASE. The second is a remarkable tool for creating fast, colorful, pop-up screens and menus.

The applications generator works quite simply. You start by designing a data-entry screen. As you do so, you define the fields that will be a part of the data file. When you're done, you generate the program code that will work with it.

The code comes in two varieties: one with special Flash Code pop-up menus and the other with standard dBASE menus. Either way, it offers identical choices. You can add records, look up and change records using a number of different search methods, design reports (using dBASE's report generator), and print them.

Flash Code's applications generator is adequate if your application only uses a single data file and you're satisfied with dBASE's columnar reports. If you want anything more than that, you won't be satisfied.

If this were all Flash Code had to offer, it would hardly merit mention. Its real value is as a programmer's screen and menu generator to be used alongside other development tools. Used this way, Flash Code lets you produce code for splashy data-entry screens that can be incorporated into an independently generated dBASE application.

Its screen editor offers field definition goodies like calculated fields and data-entry rules, but its selling point is color. You can paint screens that are tumultuous with color using every combination available on your monitor.

Even more interesting is its window editor for creating pop-up menus and help screens. It lets you define the color, size, shape, and position of the window and specify the menu options that will appear on it (help screens are just windows without menu options). You can then save it in a library, load it into memory with FlashUp, Flash Code's special memory-

resident program, and summon it anywhere you want in a dBASE application. FlashUp handles the job of popping the window onto the screen instantaneously, accepting a user response, erasing the window, and re-drawing the screen.

The window editor is a very nice tool, and some programmers may wish to buy the program for that feature alone. The downside is that Flash Code's application generator is more limiting than the other generators reviewed here.

SIMPLE: a different breed

SIMPLE has a top-line menu and a visual style reminiscent of Paradox and Lotus 1-2-3, but its similarity to other programs largely ends there. With programs that use procedural programming languages you design the pieces first—data files, data-entry screens, reports—and then develop procedural code for using them. But SIMPLE is different. It has eliminated the procedural language and made applications generation central to the design process. Practically, that means you start out with tasks.

SIMPLE's Develop menu offers seven tasks for data entry, reporting and processing, and importing and exporting. Each task has three separate components: a file sheet describing the data files it will use, a design sheet with instructions for screen or report layouts, and a specification sheet with instructions

SIMPLE employs a Query-By-Example technique.

for special processing. The only required component is the file sheet, so beginners can develop basic data-entry tasks just by describing a data file and letting SIMPLE build the other two sheets. Advanced users can modify the basic specification sheet to accomplish more elaborate tasks.

The specification sheet deserves special mention. It's the closest thing SIMPLE has to a program, and it can contain record selection criteria, formulas for calculations, links to other data files, look-up and update instructions, and much more. Not having a procedural language, SIMPLE employs a Query-By-Example technique for encoding instructions. That means you indicate what you want by using an example. For instance, if you wanted a report to include only clients with balances greater than zero, you would place "> 0" next to the Balance field in the specification sheet and run the report.

When you've developed all your tasks, SIMPLE lets you place them on a menu. As with everything else in SIMPLE, menu-building lets new users design a menu quickly, yet offers more advanced options for experienced users.

We came away from SIMPLE with mixed reactions. Its visual style and its speed make it a nice development tool. It was easy to make a change to a specification sheet, see how it worked, then make another change, all in a matter of moments. It also comes with extensive onscreen helps and offers features like custom help screens for any task or menu level and automatic documentation.

But in the end we decided it wasn't all that simple. It was

easy to get lost in its elaborate menu system, and it had enough arcane terminology and unusual uses for function keys to make it confusing for beginners. Even though experienced users could develop sophisticated applications faster than is possi-



FIGURE 4: A Flash Code application with data-entry screen and pop-up menu

ble with a procedural programming language, they would have to devote considerable time to mastering SIMPLE's finer points before taking advantage of them.

How good are they and who are they for?

As a group, these packages are more versatile than we expected, and they're generally well-behaved, readily permitting corrections and changes. But who exactly are they for?

As tools, applications generators can make work easier, but they tend to serve skilled handlers best. Programmers and experienced users will be able to get more out of them than novices. But we could also see non-programming, intermediate data base users benefiting from most of them, too. Flash Code is the only program we thought best left to programmers.

But what about programmers? Are these products flexible enough to induce them to abandon their hand tools? We'd give a qualified yes. They are at least good enough to build prototype programs quickly—programs that can be altered later. And in point of fact, these application generators can do even more.

We think programmers can get most of what they want most

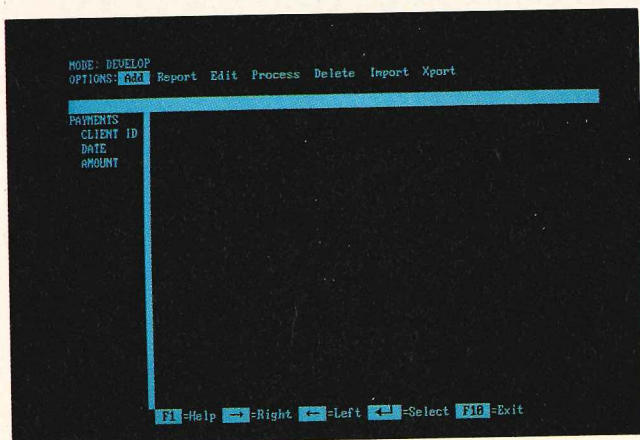


FIGURE 5: SIMPLE's Develop menu

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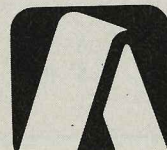
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of the time from the applications generators in R:base and Paradox. After that there's still the programming language. We missed that in SIMPLE. It seemed capable of anything we could imagine, but we'd have to settle more than we'd like for doing things SIMPLE's way. We felt similarly about Genifer for different reasons. It appeared to require a longer apprenticeship and a greater willingness on a user's part to do things Genifer's way than we were comfortable with. And yet we could see doing jobs with Genifer, too. As for Flash Code, we wouldn't use its applications generator, but we wouldn't want to be without its pop-up menus.

How good are they? Some of them are very good. They can take much of the tedium out of a programmer's job and can allow a non-programmer to get a lot farther than ever before, but even the best can't do everything for you.

Both Joseph Comanda and Lucien Kress are data base trainers and consultants for Small Systems Consulting, Inc., in Abington, Pennsylvania.

Quick Reference Summary

Product: Flash Code
Manufacturer: The Software Bottling Company of New York

6600 Long Island Expressway
 Maspeth, NY 11378
Phone: (718) 458-3700
Sugg. List Price: \$150

Product: Genifer
Manufacturer: Bytel Corporation
 1029 Solano Ave.
 Berkeley, CA 94706
Phone: (415) 527-1157
Sugg. List Price: \$395

Product: Paradox
Manufacturer: Ansa Software
 1301 Shoreway Rd.
 Belmont, CA 94002
Phone: (415) 595-4469
Sugg. List Price: \$495 (Ver. 1.11), \$725 (Ver. 2.0)

Product: R:base System V
Manufacturer: Microrim
 3925 159th St.
 Redmond, WA 98073-9722
Phone: (206) 885-2000
Sugg. List Price: \$700

Product: SIMPLE
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A First Session with SuperKey

Unleash the power of macros – a short course

by Joseph I. Mortensen

Picture being able to issue two dozen spreadsheet commands with a single keystroke and becoming a world-class “what-iffier” in Lotus 1-2-3. Imagine using Microsoft Word without ever seeing another menu. Borland International’s SuperKey program will let you do these things and much more. This article and a couple of hours of effort will get you using SuperKey like a pro and give you enough momentum to take the learning curve with ease.

What is SuperKey?

SuperKey, a RAM-resident “keyboard enhancer” for IBM-compatible computers (including the Kaypro PC), lets you change the way you use your keyboard. With SuperKey in your computer’s memory, you can assign many keystrokes to a single key called a “macro.” A macro can consist of complex command sequences, words, or phrases. If, for example, you must type an unwieldy name several times in a letter, you can make a macro of it and call it up just by pressing a key or two. If you can type it at the keyboard, you can make a macro of it. By combining Shift, Ctrl, or Alt with letter, number, symbol, or function keys, you have literally hundreds of “new” keys at hand.

SuperKey has many different features – some are described at the end of this article – but for now we’ll stick to its strong suit, making macros.

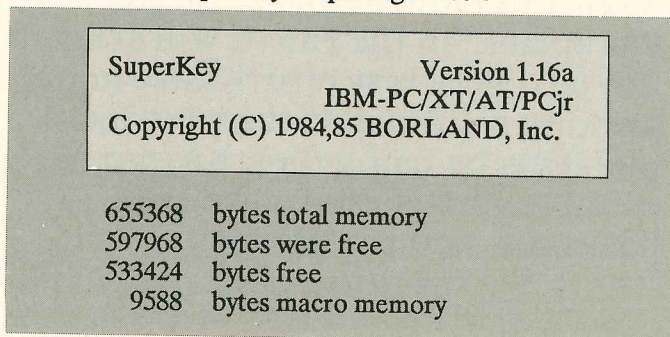
How to load SuperKey

Begin by copying all the files from your SuperKey master diskette to your hard disk, if you have one, or to a blank formatted floppy disk. SuperKey comes ready to run on any IBM-compatible computer, but be sure to run README.COM, a short program on the distribution disk containing the latest update information. Simply type **README** and press Enter at the MS-DOS prompt.

Next load SuperKey into your computer’s memory by typing **KEY** and pressing Enter. (If you also use SideKick, load SuperKey first – see article on page 38 about compatibility problems and loading order in RAM-resident programs.)

You will know that SuperKey is ready to use when you see a message on your screen like the one in Figure 1 below. The number of bytes reported in the message depends on the amount of RAM in your computer. SuperKey uses 48K of RAM, including 8K to hold your macros; “Bytes free” tells you how much memory is left to run application programs.

FIGURE 1: SuperKey’s Opening Screen



How to create a macro using SuperKey’s menu

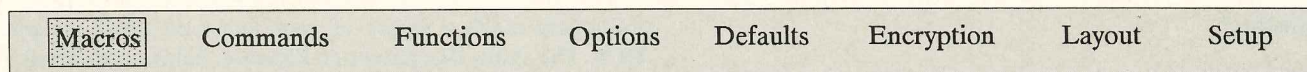
There are four steps to creating a macro: Summon SuperKey from its hiding place, tell it which key to redefine, enter the keystrokes you want recorded, and signal the end of recording. Recalling the macro – playing it back – takes only the press of the key you redefined.

Let’s go through the steps of creating your first macro.

Step One. Wake up SuperKey by pressing **Alt /** (that is, hold down the Alt key and press the forward “slash” or divide sign.) A menu bar like the one in Figure 2, below, appears at the top of the screen. Note that “Macros” appears in inverse video at the left side of the menu. This means that the macros sub-menu is selected – if you press Enter it will appear.

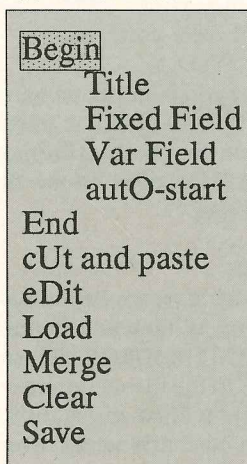
The right and left arrow keys move you across the the menu bar, changing the selected sub-menu. Whenever SuperKey’s menu is showing, you may invoke its Help system by pressing F1 (the file KEY.HLP must be on the logged disk or in the current directory on a hard disk). Press Esc to exit Help. Since you want to make a macro, press M. A window drops from the

FIGURE 2: The Menu Bar



menu bar and displays a sub-menu (see Figure 3). Press **B** to Begin your macro.

FIGURE 3: The Macro Menu



Step Two. Another window opens on the screen and asks for a key to redefine. You can use almost any key, but since you need all the regular alphanumeric ones, choose a function key or the Ctrl key or the Alt key in combination with a letter, number, or function key. Let's suppose you want to create a macro for the MS-DOS directory command, DIR (you wouldn't save many keystrokes with this one, but it's a clear example for our purposes here). You decide on the Alt and D keys. Hold down the **Alt** key and press **D**.

Step Three. Enter the directory command as you normally would by typing **DIR** and pressing Enter. Immediately MS-DOS will obey your command and list the files on the currently logged disk.

Step Four. Tell SuperKey you are done by pressing **Alt /**. The menu bar will appear again. Press **M** for Macro. The sub-menu will reappear. Press **E** to End the job. The menu window will disappear as SuperKey goes back to sleep.

To see if you and SuperKey got it right, press **Alt D**, the keys that hold your macro. The directory listing should appear as if you had typed DIR and pressed Enter. Two keystrokes do the work of four. Until you reset or turn off your computer or redefine Alt D to be something else, Alt D will faithfully give you a directory listing any time the MS-DOS prompt shows on the screen. You'll learn how to save your macros in a file for repeated use a little later.

Before moving to other SuperKey features, let's review the steps you use to create a macro:

- Switch on SuperKey by pressing **Alt /**
- Choose "Macros" from the menu by pressing **M** (the Macro sub-menu appears).
- Begin recording by pressing **B**. A small window pops up and asks you what key you wish to redefine.
- Select the keys to hold your macro (in the example, we

used **Alt D**). Enter the keystrokes, then finish by recalling the SuperKey menu with **Alt /** and pressing **M** for Macro and **E** for End.

Practice making macros of other common MS-DOS commands, such as TYPE, ERASE, or CHKDSK. Follow the same steps you used for the DIR macro. As a rule, you will want to choose easily remembered keys, such as Alt D for DIR or Alt T for TYPE.

Bypassing SuperKey's menu

After you have a few macros under your belt and begin to feel at ease with SuperKey, the menus will get in your way. You can bypass them by using the "hot" keys—keystrokes that execute options buried deep within the SuperKey menu structure. Rather than traveling through menus by hitting five or six keys,

*With SuperKey, you can
make one keystroke do
the work of a whole
series of commands.*

you can press one of the eight hot keys and have SuperKey do what you want immediately.

Start recording a macro by pressing the first hot key, **Alt =**. Then select the key you want to redefine and enter the keystrokes for your macro. Turn off SuperKey by pressing **Alt -** (that's the Alt key and the hyphen key to the left of the = sign on the main keyboard, not the minus key on the numeric keypad). Try creating a few more macros using this method.

How to remember the macros you've created

Once you have made several macros, you need a way to recall what keys you have redefined and what they stand for. Call up SuperKey's menu by pressing **Alt /**. Move the cursor right one space to "Commands" and press Enter. A sub-menu will open. With the down arrow key, move to "shoW titles" and press Enter. A two-part window appears that displays all the currently redefined keys in its smaller left opening. The larger window, now blank, is there to display the descriptive titles you can give your macros. Press **Esc** to close the window.

You assign titles to macros at the time you redefine keys. For example, press **Alt =** to turn on SuperKey. Select a key to redefine—say **Alt N**—to make a macro of your own name. To give the macro a title, press **Alt '—** hold down Alt key and press ', the single quote key. A window pops up and you're asked for a title. Type in **My name** and press Enter. SuperKey now begins recording the macro, so type in your own name, press **Alt -**, and you are done.

Ask SuperKey to show the titles. Press **Alt /**, then **C** (for Commands) and **W** (for shoW titles). You should see the list of keys you have redefined. Opposite Alt N should be the title "My name."

Editing your macros

You've learned how to make macros with and without the menus and to bestow titles on them; now we'll look at the procedure for changing a macro. Say you want Alt D to be the macro for DIR/W instead of DIR. Turn on SuperKey with **Alt =** and choose **Alt D** to redefine it. Since Alt D already holds a macro, a window opens to ask if you really want to change this key. Press **Y** for "yes" and proceed. This time, give Alt D a title by pressing **Alt '**, typing **Wide Directory**, and pressing Enter. With SuperKey recording, type **DIR/W** and press Enter. Turn off SuperKey with **Alt -**.

THE COMPATIBILITY QUESTION

SuperKey lives at peace with most other RAM-resident programs—but not all of them. Like rams butting heads and fighting over their territory, denizens of memoryland can knock each other's brains out. Until a standard way comes along to have these TSR (terminate-and-stay-resident) programs deal with MS-DOS, conflicts will occur.

Borland TSR products like Turbo Lighting and SideKick get along well with SuperKey as long as you follow the proper loading sequence: Lightning, SuperKey, and then SideKick. Always load SideKick last, says Borland, before you start your word processor or spreadsheet. With other, non-Borland RAM-resident programs, you may have to experiment with various loading sequences until you find one that works.

Some application programs simply can't stomach SuperKey. Sometimes there is a simple fix. For example, The Leading Edge Word Processor won't recognize any RAM-resident programs until you press Ctrl Esc and "DOS" appears on the status line. In other cases an updated version of SuperKey will cure the indigestion. If you have a problem, contact Borland's technical support department at (408) 438-8400.

CompuServe members can join the Borland forum (from any menu type GO BORAPP). Borland runs this forum and seems eager to solve users' problems, and in most cases it can. Read through the message thread on SuperKey (in section 4 of the forum). You may find that your problem has already been solved. If not, send a message to the sysop, who will reply promptly. Other forum members will respond, too. In Data Library 4 read or download the file QNAKEY (Questions and Answers on SuperKey). Somewhere there should be an answer. —J.M.

For more complex macros, use SuperKey's macro editor. The editor snaps to attention when you press **Alt /** and then **MD**. Tell the editor which redefined key to edit. For example, you previously made a macro of your name on Alt N, so press **Alt N**. The status line shown in Figure 4, below, appears at the

```
Key: AltN Insert F1-Help AltESC-Exit AltC-Copy AltM-Move
```

top of the screen. "Key" tells which key you are editing. "Insert" means you are in insert mode (toggle it on and off with the Ins key). "F1" brings up SuperKey's help screen. Just below the status line you will see your macro, beginning with **< TITLE > My name < TITLE >**.

Suppose you want to add your phone number to this macro. With Insert mode on, put the cursor at the end of the line and add your phone number. To make the title more accurate, insert **and phone** following "My name" in the title. Then exit the editor by pressing **Alt Esc**.

Saving your macros

Before you try SuperKey in an application program, save your macros. Press **Alt /**, then **M**, then **S**. A window opens and asks for a file name. Name it **MYMACROS**. SuperKey automatically adds the file type MAC to the file name and writes your macros to a file. The macro file will be stored on the disk and in the directory that you are currently using, even if the SuperKey program is on a different disk.

To clear SuperKey's macro memory, press **Alt / M C** (beware—this deletes *all* macros). You'll find that nothing happens when you press Alt D. To reload your macro file, press **Alt / M L**. SuperKey will ask for a file name. Type in **MYMACROS** and press Enter.

When you press Alt D this time, MS-DOS's wide directory command executes. Clear macro memory again by pressing **Alt / M C**.

Using SuperKey with WordStar

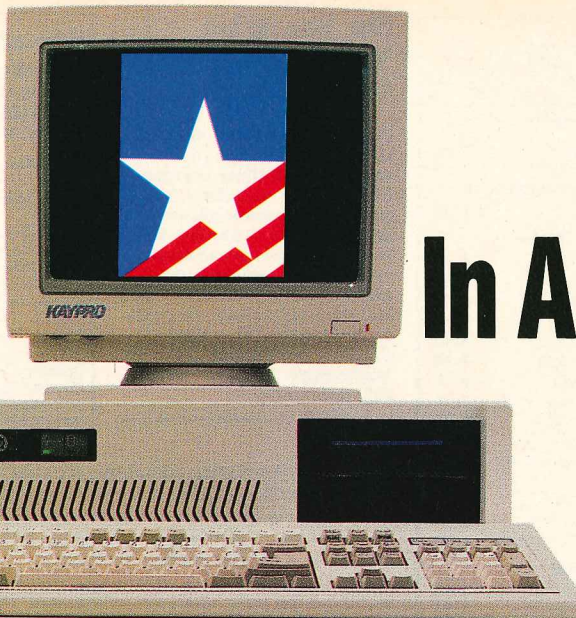
You can now go on to use SuperKey where it really shines—within an application program. The examples that follow use WordStar. If you have not turned off or reset your computer since you loaded SuperKey, you need only run WordStar. If you have had to interrupt this session, reload SuperKey by typing **KEY** and pressing Enter. Then run WordStar and open a new or existing document file.

In WordStar, some commands are assigned to function keys, but many others require multiple keystrokes. You can, in effect, add as many as 30 function keys by combining a function key with Shift, Ctrl, or Alt. (Ed's note: Ctrl is signified by an upcaret, ^.) A WordStar command that's a good candidate for a macro is **^QQ^B**, the command to reformat an entire document. Call up SuperKey with **Alt =** and proceed with your macro exactly as you did with the MS-DOS commands. Assign this macro to **^F5**. Give it a title, and then enter these keystrokes:

```
^OH ^Q Q ^B ^OH
```

End with **Alt -**. This macro turns off hyphen help, reformats the entire document, and turns hyphen help on again. Now

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Trademarks: EGA, International Business Machines, Inc., WordStar Professional Release 4.0, MicroPro International.



For the Kaypro dealer in your area, call 1-800-4KAYPRO.

Color monitor and 3.5-inch drive, optional.

when you type $\wedge F5$, WordStar will go ahead and execute these commands just as if you had typed them yourself. Try another WordStar command—say $\wedge OC$, which centers a line. Store it in $\wedge F6$. (For additional useful WordStar macros, see Ted Silveira's "Flea Market" column in the May and June 1985 issues of *PROFILES*.)

If you write many letters, try the letterhead macro shown in Listing 1 below. At the touch of one key it tells WordStar to turn off page numbering, types your name and address in the center of the page, pauses for you to enter the date, and spaces down to the right spot for you to start typing "Dear"

LISTING 1: Letterhead Macro for WordStar

```

<Alt = >           { Turn on SuperKey }
<AltL >           { The key to redefine }
<Alt' >           { Give it a title }
Letterhead <ENTER >
.OP <ENTER >       { Begin entering macro }
Your Name <CtrlF6 > <ENTER > { CtrlF6 is the centering macro }
Your Address <CtrlF6 > <ENTER >
Your City,State ZIP <CtrlF6 > <ENTER >
Addendum to A First Session with SuperKey
by Joseph I. Mortensen
Page 2
<ENTER >
<ENTER >
<Ctrl- > <Ctrl- > <CtrlF6 > <ENTER > { Variable field for date }
<ENTER >
<ENTER >
<Alt- >           { Turn off SuperKey }
<ENTER >
<ENTER >

```

As you typed away, WordStar dutifully followed instructions—almost. Note the line $\wedge \wedge \wedge F6$ <Enter>. The \wedge (hold down Ctrl key while pressing the minus key) tells SuperKey to make room for a variable field. A variable field is the point in a macro where it stops executing and waits for you to type something. It will accept everything typed (up to 255 characters) until you press Enter. Upon replaying this macro, SuperKey will wait for you to type in the date before spacing down to start the letter.

Open a new document called LETTER. Test your letterhead macro by pressing **Alt L**. With a little imagination you can devise many other shortcuts using SuperKey's variable or fixed field input. The macro shown in Listing 2 below gives you a pop-up phone memo pad to use within WordStar without disturbing your current work. It makes use of the time and date functions in SuperKey.

Save your WordStar macros. Press **Alt / M S** and give the file the name **MYWS**.

Pre-defined macro files

SuperKey comes with two dozen ready-to-use files of macros for popular word processing, spreadsheet, and programming software, including WordStar. The file for WordStar macros,

for example, is **WS.MAC**. To load these macros, while you're still in WordStar press **Alt / ML**—SuperKey's **LOAD** command. At the prompt for a file name, enter **WS** (the **WS.MAC** file must be in either of your disk drives or in the current directory if you have a hard disk). A large window opens on a menu of WordStar macros. Try some of the ready-made macros. Press **Esc** to close it. Recall it with $\wedge F1$. You can add to, edit, or delete the ready-made macros.

You can put the new macros you saved in **MYWS.MAC** into **WS.MAC** by using SuperKey's merge command. Go to the macros menu by typing **Alt / M**, then choose the "Merge"

option by hitting **M**. A box will appear asking you to type the name of macro file you wish to merge. Type **MYWS.MAC**, press Enter, and the macros contained in **MYWS.MAC** will be placed in RAM. If the **MYWS** macros duplicate the ones already called into memory from **WS.MAC**, those in memory will be overwritten. If you alter **WS.MAC** in this way, make sure you save the changes. Type **Alt /**, choose the macro menu by typing **M**, then type **S** to save the file, type the file name, and press Enter.

If you have Lotus 1-2-3, Visicalc, or SuperCalc3, try SuperKey's ready-made spreadsheet macros for those programs, which are stored in macro files. The files are on your SuperKey disk, and their names—**123.MAC**, **VISICALC.MAC**, **SUPER-CALC.MAC**—are self-explanatory. Load the Lotus 1-2-3 file from the MS-DOS command line by typing **KEY 123 /ML** and pressing Enter. Then load your spreadsheet. If you have Visicalc or SuperCalc, put the appropriate macro file name in place of "123." You can also load this file after you have started your spreadsheet program by bringing up the macros menu with **Alt / M**. Load the macro file by typing **L**. Then type the macro file name, making sure you specify the proper drive designation and/or path for the macro files.

If you have either Turbo Pascal or GW-BASIC, check out the

LISTING 2: Phone Memo Macro for WordStar

< Alt = >	{ Turn on SuperKey }
< AltP >	{ Use AltP for this macro }
< Alt' > Phone Memo < ENTER >	{ Give it a title }
< CtrlK > B	{ Mark beginning of block }
Date: < AltF > A Time: < AltF > T	{ Date and time stamp }
< ENTER >	
Telephone Memo to: < Ctrl- > < Ctrl- > < ENTER >	
< ENTER >	
While You Were Out < Ctrl- > < Ctrl- > Called. < ENTER >	
< ENTER >	
Phone No. < Ctrl- > < Ctrl- > < ENTER >	
< ENTER >	
Message: < Ctrl- > < Ctrl- > < ENTER >	
< ENTER >	
Call taken by: < Ctrl- > < Ctrl- > < ENTER >	
< CtrlK > K	{ Mark end of block }
< CtrlK > W	{ Write block to file }
< Ctrl- > < Ctrl- > < ENTER >	{ Enter file name }
< CtrlK > Y	{ Delete block }
< Alt- >	{ End macro }

NOTE: Insert must be ON to use this properly.

pre-defined macro files for them as well.

Advanced features you can explore later

This first session has focused on SuperKey's basics, rather than on its advanced features. SuperKey has a multitude of advanced features you can learn as you go along.

For example, you can create and invoke a display macro—a pop-open window that can display a help screen or the outline of a long document.

Other powerful features include command stack, which records the MS-DOS commands you type and plays them back at the touch of a key; one-key mode, which is especially helpful for handicapped users; cut and paste; custom keyboard layouts; and transparent displays—great for custom-made command menus.

If you own SideKick, you'll find that the ready-made macro files TAPE.MAC and TAPEOFF.MAC enhance the popular pop-up utility by providing a record of the calculator functions.

GRAPH.MAC and GRAPH2.MAC enable your numeric keypad to produce extended characters (lines, boxes, corners, etc.) onscreen.

If data security matters to you, load the included file LUNCH.MAC into memory. It demonstrates a way to leave your computer on but lock the keyboard to keep prying eyes from your data.

For a few minutes of high-class diversion, load the INVENT4.MAC file and listen to SuperKey play music by Bach.

You should also be aware that the SuperKey program can be run from a batch file (batch files are text files that contain lists of MS-DOS commands; type the batch file name and MS-DOS executes all the commands within it). Put the command to invoke SuperKey in the batch file exactly as you would type it at the MS-DOS prompt.

Take a thorough tour of SuperKey's excellent manual. With it at your side you can delve into all the powerful tools SuperKey puts at your disposal.

Joseph I. Mortensen is a freelance writer living in Midland, Michigan, where he serves as pastor of the First Baptist Church.



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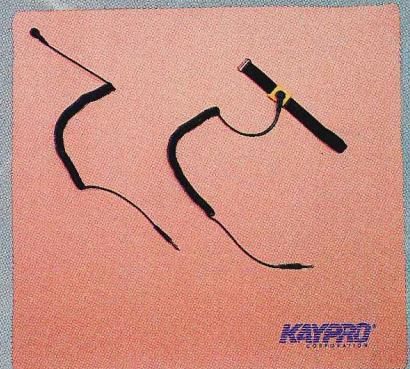
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Intermediate
MS-DOS and CP/M

The Next Best Thing to Being There

Work from home or the field with remote terminal programs

by John Bauman and Tom Enright

Computers are wonderful tools—when you can get access to them. But if you often work at home on your own computer and frequently need information from a data base or spreadsheet on the computer at the office, you may find yourself growling in frustration. You don't want to drag disks back and forth every time you work at home. You could set up the office computer as a bulletin board, but that would only let you transfer files, not run the programs you use at work. Besides, setting up and maintaining a BBS is a major project. So what's the answer? A remote terminal program.

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Remote terminal programs (RTPs) let you operate a "host" computer from a "remote" computer in a different location. You can perform the same operations from the remote computer as you could if you were sitting at the keyboard of the host computer. You have access to its full power — including access to printers, hard disks, and networks. Using an RTP and working at home, it would be possible to finish up office work, send memos on an intra-office network, and transfer data from home to office or office to home.

A couple of scenarios will illustrate other uses of RTPs:

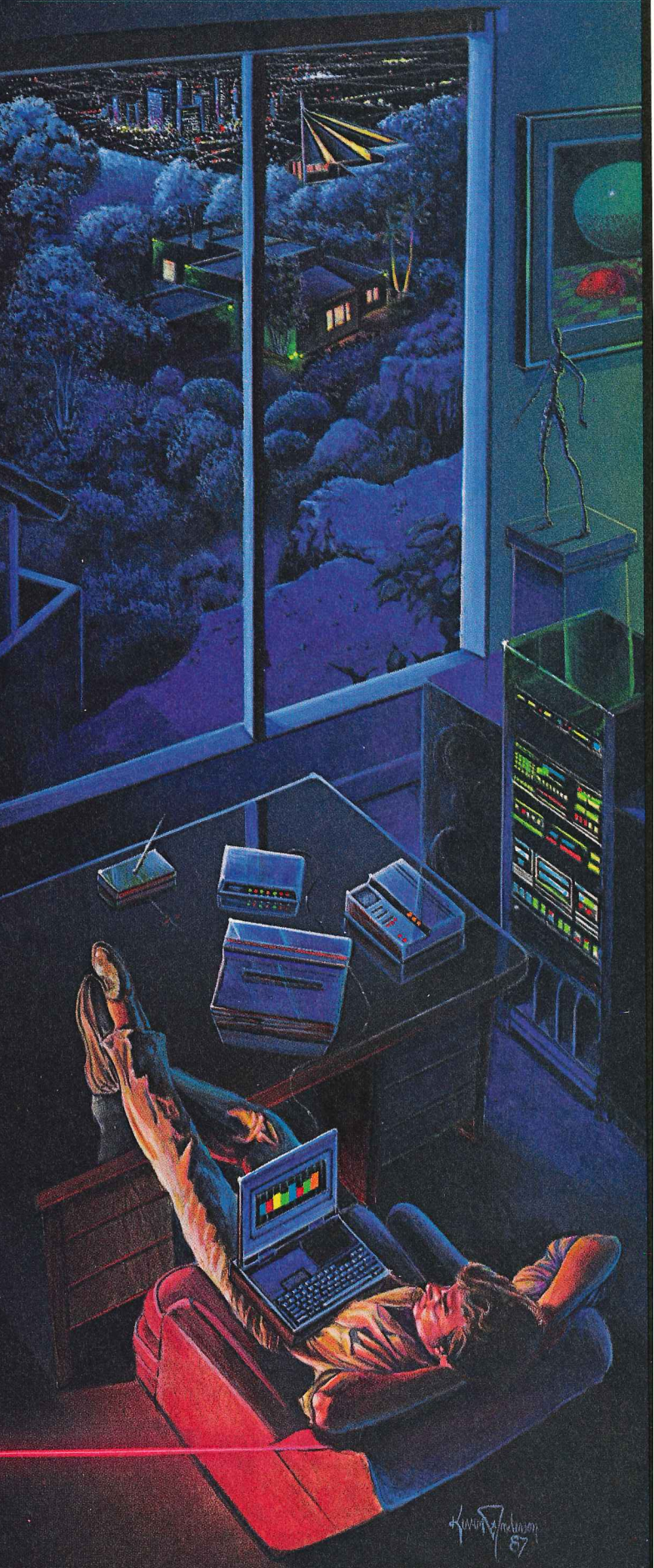
- Sales representatives in the field can process customer orders instantly by running the order entry program, through an RTP, on the office computer.
- Programmers and software houses can provide maximum support to customers in the field. They can answer questions, debug programs, and even teach users the fine points of operating software by phone, minimizing trips to the field.
- RTPs can streamline in-house support and operator training in larger companies. One support-group can deal with operator questions and training throughout a building, a city, or locations across the nation. This type of support is significantly cheaper than arranging seminars, hiring consultants in several locations, or sending support people around the country.

This new generation of communications software is not without its problems: Documentation is frequently geared toward advanced users, and installation (though not use) is perhaps best left to the office expert. But applications of RTPs are widespread, and these programs can provide both freedom and security. In this article we'll provide a brief overview of this type of software and take a look at three popular RTP packages.

Remote terminals

When you use an RTP, your computer is functioning as a "dumb" or remote terminal to the computer on the other end of the line, the host computer. The only thing your computer does is display information sent by the host and send whatever you type to the host. All applications programs are running on the host machine.

Ideally, you shouldn't be able to tell that the programs aren't running on the computer right in front of you. Information will appear on your screen a little more slowly because you're working through a modem connection, but other than slower screen updates, there should be no detectable difference.



Kevin Anderson
87

Since you are connected to the host through a modem, the question of security arises. You don't want just anyone to be able to call in and operate the computer in your office. For that reason RTPs need to have a security system to foil unauthorized callers.

The depth of security provided by RTPs varies. Some provide only passwords, while others tie the passwords to a "phone book" for a maximum-security "call-back" feature. With the call-back option, remote operators call in to the host machine and enter their passwords. The host machine then hangs up the phone and dials the phone number assigned to a particular password. This keeps intruders off the system even if they discover the password, but it means users must always work from the same phone number.

A look at the products

The three programs we'll look at are Close-Up, Carbon Copy Plus, and pcANYWHERE. They were evaluated by executing MS-DOS commands and by running WordStar, dBASE III Plus, and Lotus 1-2-3 over a commercial phone line. All three RTPs functioned well with these programs, but it would be wise to contact the manufacturers to confirm compatibility with your particular software.

Close-Up

Close-Up is designed to be used by programmers or software publishers to provide remote support to customers. It would work just as well to run your office PC from home, ease in-house support in large companies, and permit conference work sessions among people in different locations. It's a very well thought out program that benefits from the experience of the oldest RTP producer, Norton-Lambert.

Close-Up is sold as two separate, menu-driven programs: SUPPORT, which runs on the remote terminal; and CUSTOMER, which runs on the host terminal. (The program names seem a bit counterintuitive—you would expect a program named SUPPORT to run on the host terminal, but that's not the case.) The division of the program into two parts makes sense—a programmer or software house only needs one copy of the program for each technician, and as many copies as necessary for customers.

Both program modules are designed so that each will work only if there's a module of the opposite type at the other end of the line. A support module cannot talk to another support module, and a customer module will not talk to another customer module. Both customer and support packages support CGA-level color and graphics. The hardware on both ends of the connection must be equipped for color graphics if graphics programs are to be run.

The support (remote) program includes a built-in phone book for customer phone numbers, a time and billing feature to track usage, a chat mode, and data-to-voice switching capability so support operators can speak directly to customers during a session.

The customer (host) program runs as a memory-resident utility so customers can bring up programs they're having trouble with before calling the support number. Either module may initiate a call, but only the host site is password protected. Software can switch your modem to voice mode or open a "chat" window if the customer needs to speak directly to a

support technician.

During a session, the two ends of the connection can run in synchronized mode or in full-speed mode. In synchronized mode all screen and printer outputs are 100 percent error checked. The error checking keeps line noise from messing up the screen or output to a remote printer, but it slows down output. In full-speed mode, commands entered from the remote computer are executed immediately without waiting for the full screen to be displayed on the remote computer. This can be confusing at first, but it's very helpful to the experienced user because it greatly speeds operation.

A nice feature of Close-Up is the "Save Current Screen" option. Up to 17,576 screens or "slides" can be saved during support sessions and subsequently played backward and

Slides of support sessions aid technicians and make excellent demonstrations for prospective customers.

forward to help support people diagnose problems. Also, entire support sessions can be recorded like movies and played back in fast or slow motion. In addition to aiding support technicians, the slide or movie sessions make excellent demonstrations of a program for prospective customers.

File transfers—host to remote only—are fast. They use a proprietary transfer protocol that compresses the data before transmitting it. Tests confirm Norton-Lambert's claims that file transfers are faster than those in other remote terminal programs. Because this protocol is proprietary to Norton-Lambert, it can only be used between Close-Up support and customer sites.

Program documentation is fairly well done. Each module has its own large, spiral-bound manual containing installation, reference, and trouble-shooting sections, but no tutorials or information on graphics. The manuals are well organized, use enough white space to avoid intimidating the reader, and present information in a very readable style, but they are intended for experienced users, not novices.

Customer support for Close-Up is provided by phone, though there is no mention of the support phone number in either of the manuals. (Norton-Lambert says this will be corrected in future manuals.) Once you make contact, support is excellent. The support staff knows the product and takes the time to really work with you on problems.

Carbon Copy Plus

Carbon Copy Plus, from Meridian Technology, serves as both a remote operation program and a general-purpose telecommunications utility. The package includes both the remote terminal program (CCHELP) and the host program (CC). CCHELP does terminal emulations and binary file transfer using Xmodem or Kermit protocols. This lets it talk to bulletin boards and information services, and even to act as a terminal to mainframes. Carbon Copy can handle both CGA and Her-

cules Monochrome Graphics when both stations are similarly equipped.

Although you get both the remote and host programs in the package, you will need to buy two copies because the programs on the distribution disk will not speak to each other. (Meridian says it is selling the capability of being either the host or the remote, at the buyer's discretion, with each package.) In operation each program checks the serial number of the program on the other end. If serial numbers on both ends of the line match, the programs will not function. The distribution disk is copy protected, and a program called CCSTART must be run to create files needed by both the host and remote programs. Once CCSTART has created the needed files, you can copy the programs to a normal working disk. At this point you

*Carbon Copy Plus is both
a remote operation program
and a general-purpose
telecommunications utility.*

can also make copies of the working disk — not the master — for backup purposes. This presents a problem for Kaypro 2000 owners who don't have external 5 1/4-inch drives for their systems. (See "A Note To Owners of the Kaypro 2000" accompanying this article on page 48.)

Once installed and running, the software functions well. The host program offers several nice features, including a phone directory keyed to passwords and optional call-back numbers. Also available is a log file to track usage, dual "chat mode" windows, an excellent voice-to-data switch, and a unique printer conversion utility that allows users to convert files to print on different makes of printers at either end of the phone connection.

A screen-save feature is available and may be activated from either end of the connection. A built-in print spooler is also provided. File transfers and control of the host from a remote location are handled by a special utility called CCDOS that uses MS-DOS-like commands for operating the host system.

Carbon Copy operates in a fully error-checked mode at all times. Screen updates occur just about as rapidly as with the other two programs when full error checking is employed. Screen update time is speeded up by selecting "Disable Full Graphics" or disabling screen synchronization. These steps reduce the number of pixels transmitted or leave the remote system blind during rapid changes in screen information.

Documentation provided with Carbon Copy is clear and well presented — as far as it goes. Unfortunately, if the folks at Carbon Copy haven't tested your particular modem, you're in for a trial-and-error session to determine the correct setting. Both the documentation and software are intended for knowledgeable users — tutorials are lacking in depth and are integrated into the reference material.

Support for Carbon Copy is reasonably good. One of us had problems installing the software for a Kaypro 2000 and spoke at length with the support staff. Help was clear, concise, and

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courteous. Only one problem remained unsolved. While using the Kaypro 2000 as a remote terminal and a Kaypro PC as the host machine, the host printer would intermittently echo on-screen characters. Technical support indicated that they had never heard of the problem before, despite handling about 150 calls per day, and could offer no clues as to its cause.

pcANYWHERE

Like Close-Up, pcANYWHERE by EKD Computer Corporation consists of two programs, one for the remote terminal and one for the host. Unlike Close-Up, pcANYWHERE is a general-purpose RTP that can work with a multitude of terminals and transfer files between the remote and the host, or vice versa.

The software comes on two non-copy-protected disks. The entire package consists of four programs: ANYWHERE, the host program; ATERM, the terminal program for PC-compatibles; ASEND, the file transfer program; and AINSTALL, the installation program.

The host program, ANYWHERE, operates in several modes. The default mode is menu driven and better suited for beginners. Advanced users can bypass menus and run ANYWHERE directly from the MS-DOS command line. Additionally, there is a RAM-resident mode in which ANYWHERE stays inactive until a call comes in, or until you press a specific key sequence. Automatic mode is similar to RAM-resident mode, but it allows you to call in, start a time-consuming task, hang up, and call back later to continue working.

Password security in this package takes a different form than in the other packages. Passwords in the host program are linked to command lines that execute when the password is

entered. There can be a single password for all users, different passwords that put the user into specific directories and/or run particular programs, or there can be no password protection at all. It is all up to the person setting up the host program.

pcANYWHERE works best with ATERM running on the remote system, but you can use a real terminal or one of 32 supported terminal emulators on the remote system. When ATERM and ANYWHERE are connected and running, you can run any software on the remote computer that you could run sitting in front of the host. The ANYWHERE/ATERM combination supports CGA, but not EGA or Hercules Monochrome Graphics.

Another feature of the package is dual chat windows. When both windows are open, one for each end of the connection, the data streams are kept separate; the host and remote users can type at the same time and one user's keystrokes won't interfere with the other's.

ASEND is pcANYWHERE's file transfer program. File transfers use a proprietary protocol and are therefore restricted to a host using ANYWHERE and a remote running ATERM, or a remote using ASCOM IV, which is also published by EKD. Under those situations files can be transferred in either direction.

Using AINSTALL, the customization program, you can alter ANYWHERE to change terminal protocols or to switch communication port assignments. It's an advanced program; if you find tweaking software intimidating, then AINSTALL is not for you. If, on the other hand, you are comfortable patching software with DEBUG, using AINSTALL is within your capabilities.

ANYWHERE's ability to link with VT-100, ANSI, and WYSE terminals was tested using a Kaypro 16 with Procomm telecommunications software emulating those terminals. Neither the ANSI nor the WYSE terminal emulations worked reliably. The ANYWHERE/VT-100 combination, however, performed adequately. Graphics characters were translated into analogous ASCII characters, and function keys not found on the VT-100 keyboard were provided for with escape sequences. Most importantly, application programs ran and appeared on the remote in a comprehensible form.

ANYWHERE lists "Kaypro" as one of its terminals; a call to EKD Computer Corporation revealed that it meant CP/M Kaypros. But when the Kaypro option was selected and the host linked to a Kaypro 10, the results were poor—certainly not good enough to get any work done. However, when the Kaypro 10 was running a VT-100 emulator, ANYWHERE performed fairly well. Occasionally screen updates were not perfect, but the terminal emulator—not the host software—is responsible for screen updates on the remote terminal.

Results on the Kaypro 2000 were good. With the laptop running ATERM, every test program ran without problems. With the 2000 acting as host, however, the cursor on the remote terminal was one line above where it should have been.

The pcANYWHERE documentation, consisting of a single wire-bound manual, is quite good. The first chapters are oriented toward beginners. There is a chapter on troubleshooting, along with separate chapters on ANYWHERE, ATERM, and AINSTALL.

The product support toll number is featured prominently on the title page of the manual. A call to that number was

For Kaypro 2000 Owners

The Kaypro 2000 laptop computer is an IBM compatible machine with a liquid crystal display (LCD). It is both portable and compatible with most IBM compatible software. For use with remote terminal software, however, keep the following points in mind.

- Owners of the Kaypro 2000 should not use the COLOR-OFF.COM program provided with their machines when using RTPs. This program is recommended for use with the LCD display when displaying color graphics programs, but interferes with all of the RTPs evaluated here. Instead, install the programs as described in their respective manuals, selecting a monochrome color scheme for both the host and remote menus. Failure to do so will result in inability to see some of the menus or the chat window.

- Carbon Copy Plus must be installed before it can be copied to other disks. Since it is only provided in standard 360K disk format and insists on being installed from the A drive, it must be installed on a computer other than the Kaypro 2000, and then copied to the smaller 720K micro floppy disks.

- Also, the correct modem to select from the Carbon Copy Plus installation menu is the "U.S. Robotics Courier," although the modem in the Kaypro 2000 is actually the "KAT" model by the same manufacturer. Selecting the "Hayes" or "Hayes Compatible" options will prevent successful operation.

—J.B. and T.E.

answered promptly and all questions were fielded by people who knew the product and were eager to help.

Conclusions

Which RTP for which purpose? For support operations, Close-Up is superior. After all, it was expressly designed to operate as a support tool. It has several nice features its competitors lack, most notably the fastest file transfers and the ability to save screens and whole support sessions for future reference.

The other two applications, pcANYWHERE and Carbon Copy Plus, each have their strengths. Carbon Copy can be used as a general telecommunications package, and its security system is more suited to a large number of remote users in business. (Each user has a unique password, and the call-back feature would be enabled.) On the other hand, pcANYWHERE has the price advantage, is more suitable for less experienced users, and will work with CP/M systems on the remote end of the connection. Aside from those differences, pcANYWHERE and Carbon Copy Plus offer very similar performance.

John M. Bauman is the author of several medical articles in the field of nuclear medicine. He uses his Kaypro 2000 on a daily basis to communicate with medical data bases, the office computer, and local and national computer bulletin boards. He may be reached through CompuServe, (71460,3122).

Tom Enright is PROFILES' technical editor.

Quick Reference Summary

Product: Carbon Copy Plus
Manufacturer: Meridian Technology
 1101 Dove St., Suite 120
 Newport Beach, CA 92660
Phone: (714) 476-2224
Sugg. List Price: \$195 per copy; two copies required.

Product: Close-Up, ver. 1.10
Manufacturer: Norton-Lambert Corporation
 P.O. Box 4085
 Santa Barbara, CA 93140-9973
Phone: (805) 687-8896
Sugg. List Price: Support version: \$245; customer version: \$195; one copy of each required.

Product: pcANYWHERE, ver. 2.0
Manufacturer: Dynamic MicroProcessor Associates
Distributor: EKD Computer Corporation
 764 Middle Country Rd.
 Selden, NY 11784
Phone: (516) 736-2111
Sugg. List Price: \$99; complete.

Comparison Table of Features

Program	Full Error Checking Mode	"Fast" Mode	Screen Capture	Session Capture	Color Graphics	Voice to Data Switch	Chat Window	Password	Re-boot Host from Remote	Phone Book	Caller Log	File Transfers	Transfer Time	Print Spooler	Printer Conversion Utility	Baud Rates	Comm Ports	Copy Protection	Cost
Carbon Copy	Yes	No	Yes	No	Yes	Yes	Yes	Yes	No	yes	Yes	Proprietary	34	Yes	Yes	110-19,200	COMM1/COMM2	Yes	\$275
Close Up	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Proprietary	32	Yes	No	300-9600	COMM1/COMM2	No	\$440
pcANYWHERE	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes	No	No	Xmodem	42	Yes	No	50-19,200	COMM1/COMM2	No	\$99



SUPERCHARGING PERFECT WRITER

How to use *SUBMIT* to bypass *PW*'s menus

by John Brewer

Thousands of early Kaypro users learned computer word processing with Perfect Writer, a complex, muscular program that *InfoWorld* recently rated fifth among the ten most-used word processing programs. Since Perfect Writer more recently has been bundled with the Kaypro 1, it has gained a new generation of fans. Many swear by it, pointing out advanced features that include split screen capability, multiple buffers for documents or pieces of documents, a fail-safe "undo" command, easy block moving, footnoting, and indexing.

But while Perfect Writer may be a classic, even rabid loyalists will confess that it could stand improvement in several areas: The Perfect Writer menu is slow and cumbersome, for example. Many of its editing commands are less than obvious, while the steps for formatting and printing a document are a little tedious.

Perfect Writer is not naturally light on its feet, but you can make it fly by using the CP/M utility program *SUBMIT* to bypass the menu system. This article will show you how to use *SUBMIT* to dramatically speed up Perfect Writer, automate it, and make it a friendlier, more facile writing tool.

PW's menus: There has to be a better way

Before discussing *SUBMIT*, let's take a look at how Perfect Writer is put together. It's actually four programs: *PW.COM*, *PF.COM*, *PP.COM*, and *MENU.COM*.

PW.COM is the text editor, the program with which you do the actual writing. The text file you create with *PW.COM* must have the extension *MSS* if it's to be understood by Perfect

Formatter (*PF.COM*). *PF.COM* reads a text file created by *PW.COM* and produces a *format file* with the same name as the text file, but with the extension *FIN*. It contains information necessary for printing, such as what type of printer you have and where in the text to underline and boldface, etc. Perfect Printer (*PP.COM*) uses both the text and format files to print your document.

Controlling these three programs is *MENU.COM*. Once run, *MENU.COM* presents you with a list of options selectable with a single keystroke. You can run *PW.COM*, *PF.COM*, or *PP.COM*, or do some housekeeping by renaming or erasing a file. You can even run the spelling checker Perfect Speller, if you have it.

The problem is that a lot of time is spent staring at the screen and tapping your foot, because *MENU.COM* is slow. It takes too long to load each sub-program, and there is no way to edit, format, and print a document with a single command. You get the feeling that there has to be a better way—and there is: *SUBMIT*.

Getting acquainted with *SUBMIT*

SUBMIT.COM is CP/M's batch processor. "Batch" is a term from the world of mainframes, and in this context it simply means a list of commands. *SUBMIT* can open a text file, read the list of CP/M commands it contains, and execute them, one by one. (Ed. Note: For a more complete explanation of *SUBMIT*, see William Hogan's article "The Best Kept Secret in CP/M" in the July/August 1985 issue of *PROFILES*.)

If, for example, you want to copy all the files on the A drive to

the B drive and then view a directory listing of the B drive, you could use PW.COM to create a text file containing the following commands:

```
PIP B:=A:.*.*[V]
DIR B:
```

Name the file TRANSFER.SUB (all SUBMIT files must end with a SUB extension). Make sure SUBMIT.COM is on the same disk as TRANSFER.SUB. Now, when you see the system prompt (A0>, also called the command line), instead of typing the two commands above, just type **SUBMIT TRANSFER**, press Return, and watch SUBMIT do your work for you.

Perfect Writer's separate programs are linked by an inefficient menu program that doesn't let them work well together. Using SUBMIT you can put them on speaking terms and speed things up quite a bit in the process.

*PW's programs are
linked by an inefficient
menu program; SUBMIT
can speed things up.*

Using SUBMIT to automate Perfect Writer

First things first: make a copy of your Perfect Writer working disk. This is the one you'll use for experimenting with SUBMIT files. Erase MENU.COM from this disk. You don't need it anymore, and besides, when PW.COM, PF.COM and PP.COM finish running, they invoke MENU.COM; that's what we're trying to avoid. Now PIP a copy of SUBMIT.COM from your CP/M disk onto the test disk.

What follows applies to Perfect Writer versions 1.0, 1.03, and 1.20. All references in this article to Perfect Writer also apply to Plu*Perfect Writer from Plu*Perfect Systems (Box 1494, Idylwild, CA 92349; 714/659-4432), an enhancement program that cures some lingering bugs in the original and adds a library of shortcuts, utilities and keystroke savers.

A sprawling, radically revised version 2.0 of Perfect Writer, put out in 1984 by Thorn EMI Software, runs on Kaypros but is not the "standard issue" bundled with the computers. You can't totally bypass the new Perfect Writer's menu—a key to souping up the original program. (See "Perfect Writer the Second Time Around" in the June 1985 issue of *PROFILES* for comparisons of the new and old Perfect Writers and how both programs compare to WordStar.)

Step One. Get used to controlling Perfect Writer from the command line instead of the menu. Let's assume you want to write a report. Start your work session by typing **PW REPORT.MSS** and pressing Return. Once inside Perfect Writer, type at least two pages of text, then save the file with **^X^S ^X^C**.

Once back at the A0> prompt, format REPORT.MSS by typing **PF REPORT** and pressing Return. You don't need to specify the .MSS extension. When Perfect Formatter is

finished you will have a new file on your disk, the format file REPORT.FIN.

Print your report using Perfect Printer. Type **PP REPORT** and press Return (again, no extension is necessary).

That's all there is to it. Eliminating the menu lightens Perfect Writer; it runs much faster, and the absence of MENU.COM leaves 22K of disk space free for utilities, a larger swap file, or even a letter or two. But our goal is to take things a step farther by creating a SUBMIT file to automate the formatting and printing process.

Step Two. We want to create a single SUBMIT file that will print any Perfect Writer document. You can do this by using one of SUBMIT's more advanced features: replaceable parameters. First let's look at the differences between parameters and replaceable parameters.

A parameter is information added to a basic command in any program. It specifies exactly what you want that program to do. You type a command at the command line—that is, at the prompt—and add one or more parameters to make the command more specific.

For example, in Perfect Writer, you might issue the command **PW REPORT.MSS**. The basic command is **PW**, which tells Perfect Writer to open or create a file. The phrase **REPORT.MSS** is the parameter—it tells Perfect Writer to open or create a file with that particular name.

A better example is the command **PP -3 REPORT**. This

*Replaceable parameters
allow you to use a single
SUBMIT file to print any
Perfect Writer document.*

command has two parameters: **-3** and **REPORT**. These tell Perfect Printer to print three copies (**-3**) of a particular file (**REPORT**). (See the list of parameters available for Perfect Formatter and Perfect Printer on page 54.)

A *replaceable* parameter is string of characters—a dollar sign and a number—that act as a placeholder *inside* a SUBMIT file. Each replaceable parameter corresponds to a parameter typed on the command line—**\$1** corresponds to the first parameter, **\$2** to the second, and so on. When the SUBMIT file runs, each replaceable parameter is replaced wherever it appears by its corresponding command-line parameter.

This feature allows you to write a SUBMIT file that prints a different document every time you run it, because you type different parameters—that is, different document names—on the command line every time.

To see how replaceable parameters work with Perfect Writer to format and print a document, use PW.COM to create the following text file, naming it **PRINT.SUB**:

```
PF $1
PP $1
ERA $1.FIN
```

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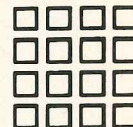
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Parameters for Formatting (no extension needed)

View on your screen	PF filename -c
For different printer	PF filename -dev printer2
Send to printer (Quick print)	PF filename -p
Quick print, with pause between pages	PF filename -p -pause
Name output differently	PF filename -o newname
Change document's mode to verbatim	PF filename -v
Quick print - verbatim	PF filename -v -p

Parameters for Printing (no extension needed)

Start at page after 1	PP filename -page 2
Pause between pages	PP filename -pause
Print without pause	PP filename -q
Print multiple copies	PP -3 filename
Print multiple copies, with pause after each page	PP -3 -pause filename

Save the file with `^X^S^X^C`, make sure your printer is ready, type **SUBMIT PRINT REPORT**, and press Return. The commands in your file will be executed, but SUBMIT will replace the \$1 symbol with the parameter REPORT. The file REPORT will be formatted and printed, and then the format file REPORT.FIN will be erased—all with one easy command!

File names are not the only thing for which you can use replaceable parameters. Both Perfect Formatter and Perfect Printer themselves have parameters that can be used in a SUBMIT file. For example, if you include the parameter -c on the command line, PF.COM will display a file on the screen instead of formatting it. Change the first line in the above PRINT.SUB file to read PF \$1 \$2. At the A0> prompt type **SUBMIT PRINT REPORT -c**, and press Return. This time SUBMIT replaces \$2 with -c, and you can watch your file scroll by. If you don't type a second parameter, the \$2 is simply ignored.

You can find out exactly what symbols SUBMIT understands and what parameters it uses by reading the section on SUBMIT in your Kaypro CP/M manual, or in a good reference like David Cortesi's *Inside CP/M—A Guide for Users and Programmers*, pages 127-133, from CBS College Publishing, Holt Rinehart and Winston. ■

John Brewer is a New York-based executive for the world's largest news service, *The Associated Press*.

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Test Driving Turbo Modula-2

*Pascal's structure and BASIC's power in a
full-featured language for CP/M*

by Jim Spickard

In the beginning (around 1970) Niklaus Wirth created Pascal. As a teaching language it encouraged students to write clear, concise programs. It separated data structures from algorithms, thus avoiding many errors. Wirth looked upon it, and saw that it was good.

But not good enough.

In 1975 Wirth created Modula. Intended to combine Pascal's structure with assembly language's speed, Modula gave programmers direct access to machine functions without sacrificing Pascal's error-trapping. Once again, Wirth saw that it was good.

But still not good enough.

In 1980 Wirth released Modula-2. Here at last was a real language. It was nearly as fast as assembly language, but could run on any machine. It allowed programmers almost complete control of their programs, while discouraging routine errors. And it was enough like Pascal that programmers could switch without losing their current expertise.

Wirth saw that Modula-2 was very good. And he rested.

Borland gets into Modula the act

Borland International recently introduced Turbo Modula-2. It joins Turbo Pascal, Turbo C, Turbo BASIC, and Turbo Prolog—all quick, tight, complete versions of their respective languages.

Unlike its stable-mates, Turbo Modula-2 will only run under CP/M. Also, it's being marketed by Echelon, Inc. instead of Borland.

Turbo Modula-2 is a relatively standard Modula-2, based on Wirth's third edition of the language. If you are careful, the

code you write with it should compile under other Modula-2 compilers. If you want to graduate from Turbo Pascal to a faster, more full-featured language, you can develop programs with Turbo Modula-2 and port them to other machines with little trouble. You'll get the famous Borland editing environment—with some additions, as we'll see later.

Since Modula-2 is descended from Pascal, I'll describe standard Modula-2 in terms understandable to someone familiar with Turbo Pascal. Modula-2 possesses both simplicity and power—considerably more power than Pascal. In standard Pascal you can't directly address memory or manipulate the operating system. Converting data from one type to another is clumsy at best. And above all, Pascal isn't good at “real-time programming”—the kind that keeps subway trains from colliding or air defense systems from shooting down geese.

Standard Pascal couldn't even handle strings—the lifeblood of many computer applications. The real world needed more than standard Pascal could offer.

Modula-2 can do all this, without losing speed or increasing program size.

Modula(r) building blocks

The key to Modula-2's flexibility is its modular structure.

A *module* is a group of related procedures and data—the software equivalent of a “black box.” As with Pascal's procedures, you feed data into the module and get data back out. Unlike Pascal variables, Modula-2 variables are completely “local” to their module: you must declare variables and procedures to be “imported” or “exported” from one module to another. This lets you debug and compile modules separately,

without worrying that changes in one will disturb another.

Take, for example, the following module to write a random set of numbers to the screen:

```
MODULE PrintRandomNumbers;
  FROM RandomNumbers IMPORT Randomize,Random;
  FROM Texts IMPORT output, WriteReal,WriteLn;
  VAR
    Count: CARDINAL;
  BEGIN
    Randomize(1986);
    FOR Count := 1 TO 10 DO
      WriteReal(output,Random(0,5,3);
      WriteLn(output);
    END
  END PrintRandomNumbers.
```

This module depends on two others. It imports the procedures `Randomize` and `Random` from the module `RandomNumbers`, plus the variable `output` and the procedures `WriteReal` and `WriteLn` from the module `Texts`.

Modula-2's syntax looks a lot like Pascal's. Unlike Pascal, capitalization matters—though the Turbo Modula-2 compiler lets you shut off case-checking. Otherwise the languages seem much the same.

But take a close look. Where Pascal contains built-in procedures to write values to the screen (and many other things), Modula-2 requires explicit instructions. This puts more pressure on the programmer, but cuts overhead in the final program because the compiler doesn't have to encode procedures your program doesn't use. `PrintRandomNumbers` doesn't use any "read" statements—so the program doesn't include them.

You can write your own procedures or use those provided with the compiler. Standard "library modules" include procedures to read and write values to the console and to disk files, to calculate exponents, sines, square roots and so on—all the things Turbo Pascal users take for granted.

If you choose to write your own library module, it would consist of two parts: a Definition module and an Implementation module. The Definition module declares the procedures available for export, along with their required syntax. The Implementation module is the actual code that does the work. Once the modules are written and debugged, they become "black boxes" that you don't have to understand in order to use.

First create the Definition and Implementation modules as separate files. If you were writing new modules for our random number program, they would be `RANDOMNU.DEF` and `RANDOMNU.MOD`. Compile them in that order, producing the files `RANDOMNU.SYN` and `RANDOMNU.MCD`. Then, when you compile `PrintRandomNumbers`, the compiler will check the `SYN` files until it finds the proper definition part and include the matching `MCD` file in its code. Turbo Modula-2 lets you group several `SYN` and `MCD` files together in a `LIB` file, to save space, from which the compiler will extract them automatically.

Modula's advantages over Pascal

Modules act like Turbo Pascal's procedures, but they have three advantages.

First, modules are "opaque": unlike Pascal, variables from one module can't affect another unless they are specifically told to. In Pascal, if you use a variable both in a procedure and in the main program, you risk interference. Not so in Modula-2.

Second, modules are easier to use: once compiled, modules need not be recompiled every time you modify your program. I don't know how many hours I've spent recompiling error-free procedures just to check the last line of a 5,000 line program. Modula-2 speeds work considerably.

Third, mentioned above, is low overhead: you only include the procedures you need. Ideally you can get below Pascal's minimum program size. And speed should really improve.

I've saved one of Modula-2's best aspects, co-processing, for last. Pascal—like BASIC, Fortran, C and many other lan-

Pascal can't do two things at once, but Modula-2 can, after a fashion.

guages—can't do two things at once. Sequential languages—which follow instructions one after another—share this trait: they can't cope with anything out of order. But real life is out of order! We do a little bit here, a little bit there. We don't just wait around for a phone call but get some work done while we're at it. Wouldn't it be nice if a computer language could do the same thing?

Modula-2 can, after a fashion. It can either address some of its activities to a second CPU or it can reserve an area of memory for special routines that it *treats* as a separate processor. It then transfers control between these real or imagined processors—back and forth, back and forth.

Like a good juggler, it's really only doing one thing at a time. But it seems to be doing much more.

The tools for this wizardry are called "coroutines."

Coroutines are procedures isolated from the main program, with their own memory location and workspace. The standard procedure `NewProcess` (exported by the System library module) sets them up. The Transfer statement passes control from the main program to coroutines. When control is transferred, the program suspends whatever it was doing; when control is transferred back, it resumes its task.

For example, if you have a coprocessor, you can assign it a given task (for example, intensive math), and ask it to return the result—perhaps to a disk file. The main program periodically checks for the disk file and on finding it incorporates the result into its own calculations.

Most of us don't have coprocessors, but the same logic should let one coroutine do math while another edits text files. After all, most editing time is spent deciding what to type next. Why not divide the CPU's attention among several tasks and make more efficient use of the time?

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Standard Modula vs. Turbo Modula-2

All of the foregoing features are common to both standard Modula and Turbo Modula-2. What are the differences?

Really, there are few.

Standard Modula-2 is case-sensitive: key words such as "BEGIN" and "END" have to be upper case, or else they will be treated as undeclared variables. Turbo Modula-2 lets you write this way, or you can turn off case checking and treat upper and lower case identically. If you are used to Pascal, you'll want the latter, unless you plan to port code to another compiler.

Standard Modula-2 uses separate Read and Write procedures for each type of variable. Libraries typically include ReadByte, ReadCard, ReadChar, etc. to handle reading bytes, cardinal numbers, characters, and so on. Turbo Modula-2 supports these procedures, but also contains generic Read and Write procedures to cover them all. Just include the statement "READ(variable)" in your program, and the compiler substitutes the proper Read routine.

Standard Modula-2 treats strings as arrays of characters, but is not very efficient with them; Turbo Modula-2 handles strings just like Turbo Pascal, which is to say it handles them very well.

In addition, Turbo Modula-2 includes "exception handlers": statements that tell the program what to do in case something unexpected happens. Borrowed from the Ada language, exception handlers can be used to guard against such things as writing to full disks — which makes programs bomb. Modula-2 can't use a function like Turbo Pascal's "IOResult" for such things: functions can't work across modular boundaries. An exception handler — which can be called from any module — tells the program what to do.

Turbo Pascal vs. Turbo Modula-2

Does Turbo Modula-2 live up to its promise? Does it generate small, quick programs with a lot of flexibility?

As a test, I compiled a version of the Sieve of Erastosthenes in both Modula-2 and Pascal. (The Sieve of Erastosthenes is an inefficient method of finding prime numbers, but it is a good test of a compiler's math capabilities.) The Turbo Modula-2 version took only 13 seconds on my 2.5MHz Kaypro IV, as compared to 38 seconds for the Turbo Pascal version. Turbo Modula-2 is three times as fast on this test, which makes it great for long, math-intensive programs.

Unfortunately, Turbo Modula-2 doesn't produce small programs — at least, not if you use the standard library modules supplied by Borland. Modula-2's SIEVE.COM took up 18K, while the Turbo Pascal version was only 8K. It's supposed to be the other way around.

The problem may be the way Turbo Modula-2 reads libraries. Whenever Turbo Modula-2 needs a procedure, it imports the entire module that contains it. If you write your own libraries in which each module contains fewer procedures, you could avoid this problem. Also, if Borland included the source code for its libraries with the compiler, you could extract just the routines you wanted, recompile them, and save space.

Fortunately, longer programs don't increase in size very fast. A 1,000-line program won't call that many more standard procedures than one containing only 100 lines. Turbo Modula-2's minimum size seems to be about 10K, but you can fit a



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whole lot more than you'd expect in CP/M's 64K. As in Turbo Pascal, you can use overlays if your program is really large.

Turbo Pascal, of course, is far better than standard Pascal in speed and ease of use. Its developers cleverly incorporated many of Modula-2's features when they built the dialect—including a rudimentary ability to keep overhead to a minimum. But Turbo Modula-2's speed is reason enough to switch.

The test drive

Let's boot up Turbo Modula-2 and take it for a spin. It's a lot like Turbo Pascal—but with some interesting differences. At the A> prompt you simply type **M2** and press Return. The Turbo Modula main menu is very similar to the one for Turbo Pascal.

```

Selected drive: A
Work File:

Edit      Compile      Run      eXecute
Link      Options      Quit      liBrarian

Dir      Filecopy      Kill      reName  Type
    
```

The primary differences are a few new selections. You don't have to leave Turbo Modula-2 to delete or rename a file, as you do with Turbo Pascal. And there are new selections for linking files and manipulating libraries. As in Turbo Pascal, you simply type the capital letter in a command to execute it.

The Turbo Modula-2 editor is like the Turbo Pascal editor: it uses WordStar commands, though you can change these if you choose. An improvement over the Turbo Pascal editor is that **AKD** saves text as well as exits back to the main menu.

When the Turbo Modula compiler finds an error, it displays the bad line with an error message and asks you to edit or quit. Usually you'll type **E** (for edit) and be dropped into your file at the point of error. Correct the error, exit with **AKD**, and the compiler will continue compiling automatically. Now that's handy—and beats all hollow Turbo Pascal's habit of returning to the main menu after a typo is corrected.

Turbo Modula-2 offers various compiler options—several of which can be set from the options menu rather than embedded in your code.

Type **O** at the main menu to get the Options menu:

```

compiler options:
List (OFF)      Native (OFF)   eXtensions (OFF)
Test (OFF)     Overflow (OFF) Upper = lower (OFF)

Path to search: SYSLIB
Find run-time error
Save current selection  Quit
    
```

Typing **U** tells the compiler to treat upper case and lower case identically. This avoids a lot of compiler errors, but it does sacrifice source code compatibility with other Modula-2 compilers.

L generates a program listing, which you can redirect to a disk file or to the printer. **T** and **O** check variables and array indices for legal values. Turned on, they slow the program considerably—and should only be used for debugging.

X allows you to use Borland's extensions to Modula-2—

again, not a good idea if you want portable code.

The **N** option deserves a comment. Turbo Modula-2 generates two kinds of code: native Z-80 code that your Kaypro executes directly, and M-code. M-code is interpreted code: it's a bit slower than native code, but much smaller. When the Sieve of Erastosthenes was compiled to M-code, it took three minutes and 20 seconds to execute—more than ten times longer than native code and five times longer than Turbo Pascal. But, with M-code, you can pack a lot of program in your Kaypro's 64K.

The Echelon connection

Why did Borland release Turbo Modula-2 for CP/M first, rather than to the MS-DOS world? I'm not privy to the internal politics of this Scotts Valley software developer, so I can only speculate. I've heard that the 16-bit version won't be out for some time—perhaps Borland wants the world to digest Turbo C, Turbo BASIC and Turbo Prolog first.

But none of these languages run on CP/M! How do we rate getting Modula-2?

I suspect that the 8-bit fanatics at Echelon, Inc.—the makers of the Z-System CP/M enhancement—put a little pressure on their software buddies. They seem to like the language, which seems odd, considering that their inhouse newsletter claims that assembly language is the only way to go. But Turbo Modula-2's speed is impressive—and Echelon appears to love speed.

If fact, Echelon has taken over marketing Turbo Modula-2. So don't call Borland about the language: Echelon sells the version that runs on Kaypros.

This may be good or bad. If the Z-System is any indication, Echelon has technical expertise to burn—but does not approach marketing its products the same way. Don't look for many ads, or try to get Turbo Modula-2 at discount. And don't expect to have your hand held while learning.

That doesn't mean you can't get any support from Echelon. When I had a technical question about the compiler, I spoke to someone who knew exactly what I was talking about. No waiting, no "We'll call you back." Just a straight answer. Refreshing.

All in all, \$70 is a pretty good deal for a language as powerful as Modula-2.

Jim Spickard is a remote editor and a regular contributor to PROFILES.

Quick Reference Summary

Product: Turbo Modula-2
Manufacturer: Borland International
Distributor: Echelon, Inc.
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 Los Altos, CA 94022
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EDITOR'S CHOICE

Tap the analytical power of Borland's REFLEX

by Thomas Enright

My "Editor's Choice" for this month is REFLEX The Workshop from Borland International. The "Workshop" consists of data base and report templates along with tutorial material for use with REFLEX, Borland's data base manager and analysis program. Both REFLEX and The Workshop are top-quality tools that should be on every business manager's hard disk.

The Workshop templates are strictly business tools—no neat games or programming tricks. The templates are grouped into applications for administration, accounting, financial planning, marketing, and sales, as well as production and operations. Within each of these groups there are templates for three or more data bases, with at least one report format per template. Each section also includes tips and advice on how to customize the included files to meet your needs.

REFLEX, the analyst

Before you can understand The Workshop, you should know something about REFLEX. As mentioned above, REFLEX is a data base management and analysis program. While it is capable of all the operations expected of a data base manager, its strong points are data analysis and the importation (reading) of files from other programs. REFLEX can read files from dBASE II and III, the PFS series, Lotus 1-2-3, and Symphony, as well as from any program that can produce DIF or ASCII files.

It's the ability to read files from other programs that makes REFLEX so valuable. REFLEX can probably read the data files from the software you already have. So, even if you are committed to some other software for record keeping, you can still use REFLEX strictly for its analytical powers.

REFLEX is chock full of powerful functions for data analysis, but using those functions is another question. Learning how to formulate the reports, graphs, and "crosstab" views to highlight the information you want is time consuming. Many managers know what they want to see, but don't know how to make REFLEX display the data in that

REFLEX and The Workshop should be on every business manager's hard disk.

way. Tapping the resources of REFLEX is where The Workshop comes into the picture.

Templates and tutorials

The Workshop consists of a thick manual and two floppy disks. Both disks have the same files; there is one for CGA and EGA systems, and one for systems using Hercules Monochrome graphics. You copy and use the disk that matches the video board on your system. The files on this disk are the data bases and reports used in the tutorials.

The Workshop manual is daunting at first sight—400 pages of step-by-step tutorials. You'll find material introducing REFLEX to the first-time user, as well as exercises for the advanced power user. The tutorials follow the precepts of "programmed instruction." They grow progressively more complex, each one building upon material from prior exercises. But while the analyses that you perform grow more complex, the instructions for performing them remain step-by-step.

The Workshop manual is divided into three main sections. Section one covers installation and contains a review of REFLEX. Section two contains the tutorial material. The last section has two appendices (a DOS primer and a chart of REFLEX features and the chapters in which they appear) and a well-done index. The only drawback to the manual is its binding—it's bound like a paperback novel, which makes it difficult to lay flat on a desk while you work.

The tutorials are applications for administration, accounting, financial planning, marketing and sales, and production and operations. The administration section, for example, deals with appointment scheduling for a team of managers, project management, and the analysis of an employment applications data base. The marketing and sales section deals with inventory analysis, sales leads, sales representatives, and sales trend analysis.

It's not possible to cover all the applications in The Workshop in this small space, so we'll choose two examples and take a closer look at them.

Project management

The project management data base is set up so that each record tracks the progress and status of a small job that is part of a larger project. Information manually entered in each record includes project number, a job description, planned start and completion dates, actual start and completion dates, and the person responsible for that job. From that data calculated fields store planned and actual job duration, an efficiency rating, and status fields for each record.

The tutorial walks you through loading the data base and describes each field; the formulas and functions used in calculated fields are also explained. For example, the planned job duration

field uses a built-in REFLEX function called DAYSBTWN(DATE1,DATE2). By giving this function two dates, it will return the number of days between those dates. The formula for actual job duration is similar, but it checks to see if actual start and end dates have been entered.

The analysis part of the tutorial covers selecting records, sorting them, and building a "crosstab" view of the results. Record selection involves filling in a tabular form with examples of the fields that you wish to see. Only the records that meet your criteria are selected for the analysis. Sorting is done on another tabular form, ranking fields in the order you want them sorted.

Once the selection and sorting have been done, you're ready for the crosstab analysis. A crosstab view in REFLEX is another way of looking at your data. It is

*It's the ability to
read files from other
programs that makes
REFLEX so valuable.*

similar to a spreadsheet in that information is summarized in rows and columns. It is unlike a spreadsheet in that there is far more flexibility in the way the data is shown. Each column could be a job and each row the person responsible for that job, while the data might be the efficiency rating. A few simple keystrokes change the data to average job duration or only jobs that have taken longer than estimated to complete.

From this point you move on to examining the report formats for the project management tutorial. With REFLEX reports you start with a blank screen, move the cursor to the place where you want information to appear, and enter the name of the field or a formula. You can also tag each line so that it is printed only at the start of the report, at the top of each page, when a field changes, or at the end of the report. The REFLEX report generator is a flexible, powerful piece of software.

This example is from a tutorial that comes fairly early in The Workshop manual and isn't tremendously com-

plex. The next example comes from the end of the book, where the samples are complex and high powered.

Analyzing production costs

The production-cost analysis tutorial does less hand holding than earlier examples. It deals with tracing the causes of cost variances in a manufacturing environment. This example also walks you through the procedure for reading and converting a dBASE data file for use with REFLEX.

Because you are starting out with a data file produced by another program, part of the exercise involves changing the data entry screen to a more readable format. In the process you add three calculated fields to the data base. The new fields are material variance, labor variance, and total variance. These fields are needed in the next part of the exercise, analyzing the production costs.

A crosstab view is used for the analysis because it makes highlighting important areas easier. It quickly becomes evident that total cost variance is excessive. The rest of the exercise focuses on tracing costs to pinpoint where they are getting out of hand.

Total cost variance is made up of labor and material cost variances. The first step is to investigate whether or not labor inefficiency is responsible for the problem. In analyzing the problem you learn to set up crosstab views that look at total variance by operator and item, and by operator and workstation. Then you look at the average variance under the same conditions. While you do find one operator with a higher labor variance than the other workers, it is not enough to significantly affect total costs.

Since labor costs aren't the problem, you examine material costs for hidden expenses. You discover that two vendors have higher material variances than a third vendor. These cost variances are directly attributable to poor-quality materials that are more expensive than materials from the third vendor. You have discovered the reason for high manufacturing cost.

The tutorial now leads you through graphing the results of your investigation to include in your report. There's nothing like a graph to dramatize your results.

Product support

Even the best programs and tutorials benefit from good product support, and Borland's is absolutely topnotch. Technicians know the product and can tell you how to extract the information you are looking for or help you with any other problem you encounter in REFLEX. Customer support is available by phone, by mail, or through the Borland SIG (Special Interest Group) on CompuServe.

Borland's CompuServe SIG has information on all Borland products. The bulletin board section is split into two areas: language products and business products. That way you don't have to wade through questions and answers on Turbo Pascal or other languages to find something on REFLEX or SuperKey.

In the business section you can leave questions strictly for support technicians or for anyone to read and respond to. The board also has data library sections with tips, patches, and templates from other REFLEX users. The data library section is almost as valuable as The Workshop itself.

Conclusions

The Workshop tutorials do an excellent job of explaining how to get the most out of REFLEX. They also explain why you may want to extract certain information or look at the data in specific ways. They don't presume to tell you how to run your business, only why certain data or ways of looking at the data may be valuable to you.

It's rare to find software that offers this much power and has the support structure that Borland provides. The analytical power that REFLEX and The Workshop put at your fingertips is nothing short of massive. You can use REFLEX and The Workshop or hire a consultant. It's up to you.

Quick Reference

Product: REFLEX The Workshop
Manufacturer: Borland International
4585 Scotts Valley Dr.
Scotts Valley, CA 95066
Phone: (800) 255-8008,
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Sugg. List Price: \$69.95



AT A GLANCE

Electronic Power Center/100 and the Isobar Command Console

by William McCoy and Joshua M. Greenbaum

In today's business environment, computers and the data stored on them can be vital to the very survival of a business. Surge protectors play an important role in the preservation of your equipment and data. A surge protector is an electronic device that intercepts sudden surges and fluctuations in electric power that could damage computer equipment or scramble data files irretrievably.

This month we will take a look at two such products: the Electronic Power Center/100 by Dynatech Computer Power Inc. and the Isobar Command Console by Trippe Manufacturing Company.

The performance tests

The performance of both surge protectors was judged by their response to the following laboratory tests:

Clamping. The ability to hold voltage on a line to within a certain voltage range. If a circuit receives 1,000 volts and passes 120 volts while dissipating the rest, it "clamps" at 120 volts.

Lightning strike. In this test high voltages are applied for short periods of time. The clamping points for each voltage are measured, and the high and low readings are the "clamping range" of the device being tested.

Ringwave. Ringwave current does not dissipate immediately. Rather, it comes in waves, each succeeding wave smaller than the previous one. The clamping point for each wave is recorded. The high and low points measure the performance of the unit.

The Electronic Power Center/100

The Electronic Power Center/100 controls the power supplied to a computer and its peripherals, protects the equipment from power surges, and even brings some order to the usual tangle of

power cords. Its surge control circuitry halts incoming power surges before they reach damaging levels, and the unit cuts power to the equipment in case of dropouts or brownouts. This unit also allows the devices plugged into it to be turned on and off in sequence with a single switch.

Features and Performance: The Electronic Power Center/100 is a slim metal case designed to be placed beneath the

resulted in a clamping range from 284 volts to 510 volts. In repeated tests no degradation of clamping levels showed.

The unit operates in either "sequential" or "manual" mode. In manual mode, each outlet is independently controlled with its own power switch. In sequential mode, when power to the "master" device (outlet number one) is turned on, the "slave" devices (the other outlets) are turned on in sequence, at about one-second intervals. When the

Surge protectors play an important role in the preservation of your equipment and data.

monitor. Internal bracing supports even the heaviest of monitors. Five numbered outlets across the back provide power outlets for the computer, a printer, and three other devices. The arrangement of power plugs helps to keep power cords out of sight and out of the way. Corresponding numbered buttons on the front panel control power to the outlets, and LED lights show each outlet's status.

The Dynatech unit meets the Underwriters Laboratory (UL) standard for safety and fire protection, and a similar listing with the Canadian CSA is pending. The unit also meets IEEE standard 587, which defines the effects of lightning strikes and power fluctuations on common electrical circuitry.

The Power Center performed well in both lightning strike and ringwave tests. Repeated ringwave tests give a clamping range of 450 volts to 510 volts (clamping below 600 volts is considered excellent). The lightning strike test

master switch is turned off the slave devices turn off in reverse sequence, at five-second intervals.

Although the reviewer wanted the computer itself to be powered up last in the sequence, this was not possible. The reviewer's modem plug is embedded in a bulky transformer, and the only outlet it would fit into was the last one (number five). Even in this position the edge of the Power Center's case had to be bent up out of the way to accommodate the transformer. The outlets seemed to be unnecessarily close together (there's plenty of room on the back panel), and extra-large plugs may not be able to use adjacent positions.

Once all the devices were plugged in, the sequential mode worked well. It should be noted that because the master device's switch is the one that triggers the shutdown of the equipment, this device is both the first one on and the first one off. If it is critical that the

equipment follow a precise order for switching on, and the exact opposite order for switching off, this would present a problem.

The Power Center's response to brownouts and power loss was exactly as advertised. In the event of sudden power loss, the unit responds by turning off all the outlets and *leaving them off*. This protects equipment from current surges that can occur when power drops or is momentarily interrupted and then restored. In this situation the unit will remain shut down until a reset button on the back panel is pressed.

The Power Center has a 15-ampere main circuit breaker. Each outlet has a five-ampere current capacity, except for outlets four and five, which are wired together on a ten-ampere circuit. Internal wiring ranged from 14 gauge on the circuit breaker to 24 gauge on the reset switch.

Documentation and Support: The Power Center comes with a 16-page manual that clearly explains how to set up the unit and use the sequence mode. The only quarrel with the manual is that it implies that the power-off sequence is exactly the reverse of power-on, whereas the master device turns off first instead of last.

The Power Center is guaranteed for one year after purchase. —W.M.

SCORECARD

Features:	Very Good
Construction:	Very Good
Performance:	Excellent
Documentation:	Very Good
Support:	Excellent

Isobar Command Console

The Isobar Command Console, by Trippe Manufacturing Co., is a surge protector for the user who wants surge protection that can be trusted. Though it lacks some of the gimmicky bells and whistles of other brands, this product delivers what it promises.

Features and Performance: The Command Console comes packaged in a beige metal cabinet designed to fit underneath the computer's monitor. Cushioned stick-on feet keep the unit from scratching the surface underneath

the Command Console. Front panel markings and indicators are clear and easily read. The front face contains a master switch and separate switches for the computer, monitor, printer, and two auxiliary devices. Next to the master switch is a green LED that is lit when the unit is fully grounded.

How complete is this protection? A look at the back of the unit tells part of the story. The rear panel has six three-prong outlets, each labeled according to its degree of surge or spike protection. Unfortunately, this reviewer's modem power supply was too bulky to fit on the back panel, requiring the use of an extension cord. (Adding an extension cord exacerbates the cord tangle that the unit should eliminate.)

The first outlet on the left is labeled "Unswitched/Unfiltered" and is suitable for use with a desk lamp or clock. This is the only outlet not controlled by the master switch. The next four outlets, called Filter Bank #1, provide surge and spike protection isolated from the main computer circuit. One is labeled as "Printer," the other "Monitor," and each is isolated from the other. The next two outlets are auxiliary circuits protected by a common circuit breaker. The final outlet, called Filter Bank #2, is double filtered and isolated, providing excellent protection for the computer itself.

Technical specifications of the unit are impressive. High-frequency noise suppression exceeds 6 db at 500 KHz, 12 db at 1 MHz and 30 db between 5 and 100 MHz. It starts suppressing spikes at 140 volts, has 13,000 amperes peak capacity and provides high voltage spike suppression between all three lines (hot, neutral, and ground) of each circuit.

The no-nonsense design of the console is also reflected in its performance in laboratory tests. Working in as little as one-millionth of a second, it clamped incoming surges before they reached destructive levels. In the lightning strike test, the Isobar clamped, or dissipated, the voltage down to an acceptable 800 volts. During ringwave testing it clamped voltage down to 350 volts. Two units were tested, both of which delivered the same levels of protection.

Internal inspection of the Command Console shows further indications of superior design. The components are well laid out without the clutter found in other units. Power leads are neatly

dressed and are of 14-gauge wire. This is a sturdy and well-manufactured unit.

The Command Console is sleek and has a narrow footprint. It is designed to be inconspicuous, but its narrowness can be a problem when trying to pivot or swivel the monitor. Attempting to move the monitor without moving the Command Console causes the monitor to slip off the edge of the Console.

Documentation and Support: Documentation on a device such as this is necessarily brief. Other than explaining the layout of the plugs and what protection they provide, there isn't much to say. The manual for the Isobar Command Console is entirely adequate for operation of the unit.

The reviewer found the Isobar Command Console to be a powerful first line of defense against incoming surges. The Command Console comes with a one-year unconditional guarantee. —J.G.

SCORECARD

Features:	Very Good
Construction:	Very Good
Performance:	Excellent
Documentation:	Very Good
Support:	Very Good

William McCoy has 24 years' experience in hardware and software engineering. He holds BS degrees in mathematics, general science, and computer science and a Master's in computer science.

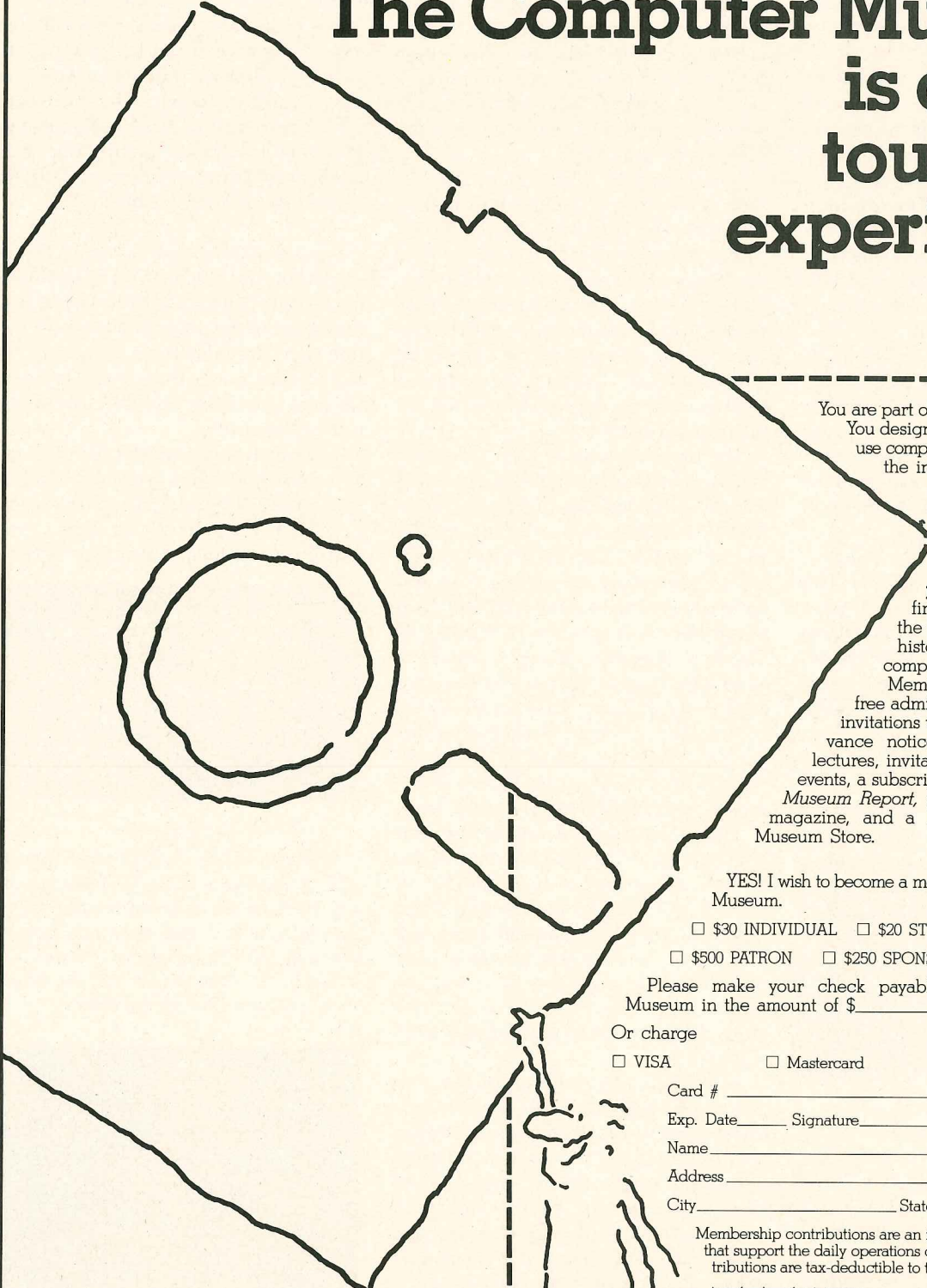
Joshua M. Greenbaum was the former Syndication Editor for the PSPA.

Quick Reference

Product: The Electronic Power Center/100
Manufacturer: Dynatech Computer Power, Inc.
4744 Scotts Valley Dr.
Scotts Valley, CA 95066
Phone: (800) 638-9098
Sugg. List Price: \$189

Price: Isobar Command Console
Manufacturer: Trippe Manufacturing Company
500 North Orleans St.
Chicago, IL 60610
Phone: (312) 329-1777
Sugg. List Price: \$139

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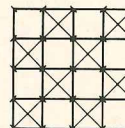
Exp. Date _____ Signature _____

Name _____

Address _____

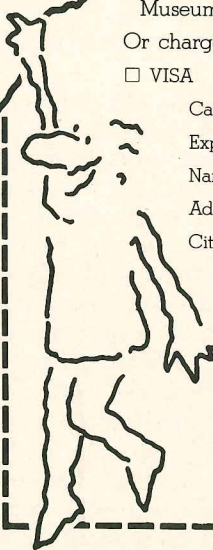
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points. Unfortunately, there's no reliable way to find the size of a font simply by measuring its letters. Often, the rated size will be equal to the distance from the top of a letter's ascender to the bottom of a letter's descender, but sometimes that distance will be less than the rated type size. In addition, you may find that one company's version of a font — 10 point Helvetica, for example — is not exactly the same size as another company's version.

Weight. Weight refers to the relative thickness or heaviness of the strokes used to create a character. Running from lighter to darker, the common weights are light, regular or book, medium or demi, bold, and ultra-bold.

Coming soon

Next month, we'll get to the heart of desktop publishing — handling text and graphics.

"Please,
my little
girl needs
blood."



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User Groups

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

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

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

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

The bottom line is that user groups are a veritable goldmine — and the mother lode is information, 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.

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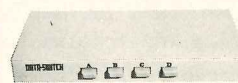


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On the Practical Side

Full-length and half-length multi-video boards

by Marshall L. Moseley

Note: Removing the cover of your Kaypro computer will void your warranty. Take this into consideration before attempting any modifications. Your Kaypro dealer can make authorized repairs and modifications.

This is the third column in a series explaining how to modify your Kaypro PC should you add or change video boards, or add new parallel or serial ports.

This month covers video boards. Your Kaypro PC has one of three different video boards: Older machines have a full-length multi-video board (FLMV), newer ones have a half-length multi-video board (HLMV), and the newest ones have a half-length EGA board.

The boards examined here are the FLMV and the HLMV. The half-length EGA board will be covered next month. If you have the full-length board, it will be in the long slot next to the processor board, while the half-length board is in a short slot near the power supply.

Full-length multi-video board

This board can provide IBM-standard monochrome (MDA) and color (CGA) video. The jumper at position J3 determines which video mode is selected upon power-up; see Diagram 1. The setting of this jumper should agree with the settings of switches 2 and 3 on the processor board (see "On The Practical Side" in the August 1987 *PROFILES*). The jumper at position J2 determines whether software is allowed to change the video mode (using VSWITCH 1.0 or MODE). Diagram 2 has these settings.

Half-length multi-video board

This board can use IBM-compatible monochrome, CGA color, Hercules monochrome graphics, and color emulation mode. Emulation mode allows you to use color graphics software on a monochrome monitor by displaying varying shades of one color. When using color emulation mode, set the DIP switches on the processor board for 80 by 25 color video, so the computer thinks you are using a color graphics adapter.

The three modes available to you on

DIAGRAM 1: Settings at J1 on the FLMV

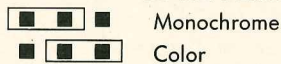


DIAGRAM 2: Settings at J2 on the FLMV

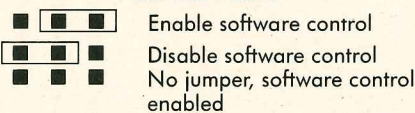


DIAGRAM 3: Settings for Graphics Solution

1	2	3	4	5	6	7	8	
ON	OFF	ON	OFF	OFF	OFF	ON	ON	Monochrome
OFF	ON	OFF	OFF	ON	OFF	ON	ON	CGA Color
OFF	ON	OFF	ON	ON	OFF	ON	ON	Composite Color
OFF	ON	OFF	ON	OFF	OFF	ON	ON	Composite Monochrome
OFF	OFF	ON	OFF	OFF	OFF	ON	ON	Emulation

DIAGRAM 4: Settings for Graphics Solution Plus

1	2	3	4	5	6	7	8	
ON	OFF	ON	OFF	OFF	ON	ON	ON	Monochrome
OFF	ON	ON	OFF	ON	ON	ON	ON	CGA Color
OFF	ON	OFF	ON	ON	ON	ON	ON	Composite Color
OFF	ON	OFF	ON	OFF	ON	ON	ON	Composite Monochrome
OFF	OFF	ON	OFF	OFF	ON	ON	ON	Emulation

power-up are monochrome, color, and emulation. The default video mode is determined by the settings on a switch block located in the upper right corner of the board.

There are two different versions of the HLMV, each with different sets of switch settings. The early HLMVs have the words "Graphics Solution" stenciled on them (see Diagram 3 for switch settings), while later ones say "Graphics Solution Plus" (switch settings in Diagram 4).

The HLMV also offers two 132-column modes for monochrome video: 132 by 25 and 132 by 40. These modes are accessed using the program MS.COM.

Kaypro Corporation makes no promises concerning either 132-column mode. This doesn't mean they don't work, just that Kaypro hasn't tested them and won't guarantee their operation. (These modes have worked on every HLMV/monochrome monitor combination I've used.) To access these modes, your software must allow for 132-column operation.

KAYPRO INSIDER REPORT

by Michelle Breyer

K2000+ features EGA.

Kaypro Corporation recently unveiled the new Kaypro 2000+ with new video screen technology exclusive to the Kaypro laptop.

The 2000+ has a fully IBM-compatible EGA video board built into its main circuitry. Kaypro's EGA video is superior to IBM's for two reasons: First, its EGA text mode has a resolution of 640 by 400 pixels, compared to IBM's 640 by 350. The 2000+ takes advantage of this by using a new custom character set, in which each character measures 8 by 16 pixels rather than IBM's 8 by 14.

Second, unlike the IBM EGA board, the Kaypro 2000+ fully emulates the IBM Color Graphics Adapter (CGA). Programs like Flight Simulator that won't run on the IBM EGA board, run flawlessly on the Kaypro 2000+.

Kaypro User Groups

By the time this issue of *PROFILES* reaches readers, users of KUG ROS, the Kaypro electronic bulletin board, may have noticed some changes and improvements in the system.

As *PROFILES* was going to press, Fred Zuill, KUG manager and KUG ROS sysop, was evaluating new system software for the board: Chairman from DMA. It's the same system developed to work on *PC Magazine's* interactive reader service.

Chairman has a sophisticated yet easy-to-use message system resembling electronic mail, which Zuill said would make the Kaypro board a better message center.

The system works on multiple phone lines, allowing several calls to be answered at one time. Zuill said that if Chairman were adopted, the Kaypro board would use four phone lines, cutting down on busy signals and making it possible to establish special-interest

arms of the bulletin board for Kaypro Users Groups.

Zuill said one of his goals is to use the bulletin board to tie user groups more closely to Kaypro Corporation and to provide quick turn-around on end users' questions.

Zuill said Chairman would make it easier to maintain the board and that he would be able to delegate some of the responsibility for keeping the board updated when he's out of town visiting KUGs.

Zuill also said that if he decided to change to Chairman, he would try to make it resemble the ROS system as much as possible in order to minimize confusion for users.

Kaypro PC Networks going strong

The Kaypro PC Network has been rapidly gaining popularity since its introduction last fall. The system, which incorporates the industry-standard NOVELL Netware Operating System, includes a complete line of high-performance networking hardware and software products.

The system is designed to work with Kaypro's PC, 2000, 286i, and 386 machines to provide a powerful yet economical multi-user network.

The Kaypro PC Network incorporates the most sophisticated software technology. It uses three versions of NOV-ELL's Netware Operating System: Netware 286, designed to run on Kaypro 286i file servers; Netware 86, capable of running all Kaypro file servers; and Netware 86Q, for applications supporting up to eight users.

For network hardware, the Kaypro PC Network uses the Kaypro Token Ring, a 2.5-megabyte ARCNET coax-based network, and the Kaypro Optical Ethernet, a 10-megabyte, Ethernet-compatible, high-performance fiber optic network.

Kaypro also offers high-capacity disk drives and other peripherals to complement the Kaypro PC Network.

Dealerships that wish to sell the system must register as authorized Kaypro PC Network Centers and must attend Kaypro Networking training classes.

Kaypro recently won a record-setting networking bid in Alaska. Alaska Micro Systems, a Kaypro Corp. reseller in Anchorage, Alaska, has been chosen by the Anchorage School District to provide what Kaypro says will be the largest network in a school district in Alaska. The dealer will provide Chugiak High School with \$116,000 worth of equipment for use in computer and typing classes.

Genealogical convention

Kaypro Corporation donated 12 computers for use at the recent North Carolina National Genealogy Conference. The computers were used by genealogists who provided tutorials on the Family Roots genealogy program used at the conference.

Every penny counts

Jason Lucus found a creative way to buy his Kaypro PC for college. The 15-year-old from De Kalb, Illinois, collected and cashed in aluminum cans so he could buy a Kaypro PC. At an average return of 3/4 cent per can from recycling centers, Jason would have had to collect a total of 186,667 cans to pay for the \$1,400 Kaypro computer. With the help of some graduation money and savings bonds, he was able to buy the Kaypro PC.

Jason considers the computer the key to his future—he wants to become a computer programmer. According to his mother, he has been working with computers since he was in kindergarten. ■

Michelle Breyer is Director of Public Relations for Kaypro Corporation.

New Products

edited by Suzanne Kesling

The following new product listings are not reviews and should not be considered endorsements of tested products. To be considered for publication in "New Products," press releases should be sent to Suzanne Kesling, "New Products" Editor, c/o PROFILES Magazine, 533 Stevens Ave., Solana Beach, CA 92075. Releases must state prices and on which Kaypro models products run. Include photos if available.

Enhance your EGA display

Display Master is a font editor and screen control program for users of the IBM or compatible Enhanced Graphics Adapter.

Onscreen displays of word processing, spreadsheet, and data base applications can be improved by the user. Lotus 1-2-3 users get to choose from hundreds of spreadsheet combinations; WordPerfect users can take advantage of onscreen underlining while using 35 to 70 rows of text.

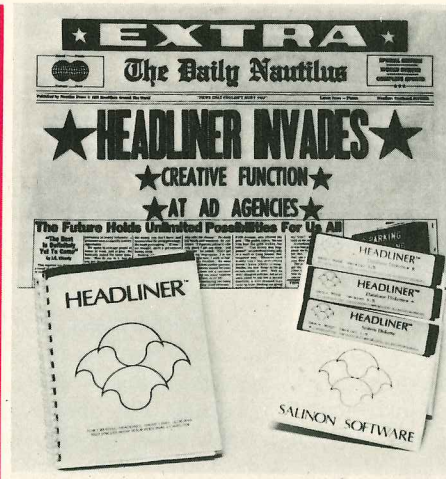
With all EGA configurations, total color control and font editing is possible. Using the color palette menu, shade changes or complete color changes can be made, even to programs that do not support color.

\$69.95. Kaypro MS-DOS computers. Intersecting Concepts, 80 Long Ct., Suite 1A, Thousand Oaks, CA 91360; (805) 373-3900.

Creative thinking

HEADLINER, a program to help create headlines, slogans, and jingles, makes it easy to find and modify a clever or already popular expression to make its message fit the needs of a particular company, product or service.

The software comes with a built-in library of 25 data bases containing more than 33,000 expressions selected from books, movies, advertising, song titles, quotes, idioms, proverbs, and other sources.



You can find phrases that include desired words or acronyms or alliterations or rhymes, for starters, or even substitute one word or phrase for another.

HEADLINER can help you search for expressions containing possible alliterations of interest or identify expressions containing acronyms using a variety of forms. It can even warn of hidden obscenities or possible off-color meanings in five languages, including English, French, German, Spanish, and Italian.

\$495. Kaypro MS-DOS computers. Salinon Corp., 7430 Greenville Ave., P.O. Box 31047, Dallas, TX 75231; (214) 692-9091.

Save money with shareware

Shareware Express is a mail-order company that distributes shareware and user-supported software.

The programs you purchase are complete, not demonstration disks. Documentation is provided on disk at no extra cost.

You are encouraged to register with the author if you like the program, although registration is voluntary. The registration fees range from \$35 to \$65 on the average, and they typically include printed documentation, notification of updates, and technical support.

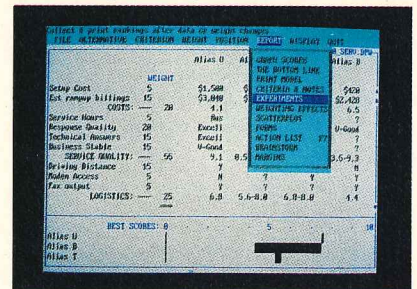
Shareware Express has over 150 user-supported MS-DOS programs ranging from word processors and data bases to communication programs and utilities. A free catalog is available.

Prices are \$5.95 and \$6.95 per program disk. Kaypro MS-DOS computers. Shareware Express, 31877 Del Obispo, Suite 102 N, San Juan Capistrano, CA 92675; (714) 240-1322.

Create a decision-making environment

Decision Pad is a tool for sales and marketing people who want to present the significant competitive facts about their products and companies to their prospective customers.

It generates a set of reports that graphically represent the decision results—and the reasons for them—in ways that can be easily understood and interpreted by others.



Decision Pad allows you to break down your problem situations into individual components of criteria, alternatives, and opinion, and then to manipulate these components in terms of value and importance.

Sample templates are included for personnel, purchasing, product marketing, investment, and sales presentation applications. Included in the package are online context-sensitive help, a tutorial, and a self-contained windowed environment.

\$195. Kaypro MS-DOS computers. Apian Software, P.O. Box 1224, Menlo Park, CA 94026; (800) 237-4565, Ext. 103.

Projecting screen images

Data Display is an electronic transparency panel used to project computer images via an overhead projector.

It can be utilized in a wide variety of applications, including group data sharing, educational presentations, training sessions, and sales presentations. Real-time interaction allows the presenter to make changes instantaneously while the presentation is in progress.



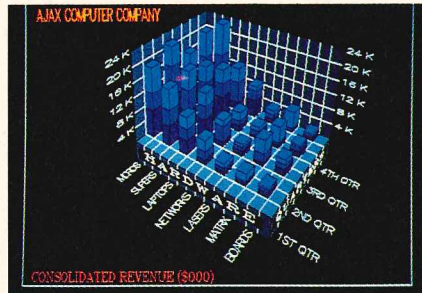
Data Display's LCD panel features "Supertwist" LCD technology, which offers the highest contrast available. This allows easy viewing in ordinary room lighting. The projected images have a resolution of 640 by 200 pixels.

Included with Data Display is a software package, Presentation Partner, which is designed for creating customized presentations on your MS-DOS computer.

\$1,199. Kaypro MS-DOS computers. Computer Accessories Corp., 6610 Nancy Ridge Dr., San Diego, CA 92121; (619) 457-5500.

Create full-color 2-D and 3-D graphs for \$350

Boeing Graph is a business software graphics program that automatically converts data into nearly 70 different kinds of 2-D and 3-D graphs. Each 3-D graph can be viewed from 16 preset angles or can be rotated 360 degrees on its three axes to show the best possible perspective of the data.



Boeing Graph can import information from most leading data base management systems and spreadsheets, or it can use its own multiple-page data manager.

You can modify graphs for particular presentations. Nine basic fonts in a variety of sizes and styles are available for titles and labels. Real-time animation functions allow users to zoom, pan, and distort or change perspective or proportions to create the most effective graphs for communicating specific points.

Boeing Graph's user interface is intuitive, using five function keys for most activities. Online context-sensitive help screens are available.

\$350. Kaypro MS-DOS computers; requires a hard disk, 512K RAM, EGA or compatible video board and high-resolution monitor. Boeing Computer Services, Micro Software Products, P.O. Box 24346, Mail Stop 7W-05, Seattle, WA 98124-0346; (800) 368-4555, outside the U.S. and Canada call (206) 865-5000.

Productivity spreadsheet

Silk is a spreadsheet that enables you to take full advantage of your computer as a tool to improve analysis, productivity and performance.

It automatically checks and validates data, identifying invalid entries and errors. Circular references are traced, eliminating hours of searching. English-language commands such as retrieve, sort and modify replace complex formulas.

A data allocation feature lets you

allocate portions of a total into proportional parts. A simple series of commands allows you to construct "time-series models" that track numbers over time, such as budgets broken down by month.

Silk features an innovative help system that guides you with concurrent displays of help screens that change automatically to correspond to your actions and choices.

\$298. Kaypro MS-DOS computers with 512K RAM. Daybreak Technologies, Inc., 2271 205th St., Torrance, CA 90501; (213) 212-3030.

Share printers and buffers

PrintNet II is a parallel printer networking device that allows up to four computers (IBM PC-compatibles) to share an integral printer buffer and up to two parallel printers. This makes fewer printers more accessible, reducing the time a PC is dedicated to a printing task, and offering improved forms and reprint control.

It also increases the distance possible between printers and computers to over 100 feet.



Special features include: multiple copies of an entire document, as well as specific pages; automatic pause after each page to hand-feed letterhead, forms, or labels; and the ability to temporarily halt printing at any time to adjust paper, realign forms, or change ribbons. In addition, the PrintNet II can reprint pages in the event of paper jams or misaligned forms.

\$695 to \$895, depending on the amount of memory included. Kaypro MS-DOS computers. Support Systems International Corp., Department LA, 150 South Second St., Richmond, CA 94804; (415) 234-9090.

Accounting package for \$249

The Bedford accounting package is aimed at small businesses that have found other packages too elaborate, costly, or slow. It contains all the basic, common accounting functions, including general ledger, payables, receivables, payroll, job cost, and inventory. All modules are fully integrated in one file on a single disk.

The package also includes a user's guide and an accounting manual explaining accounting principles.

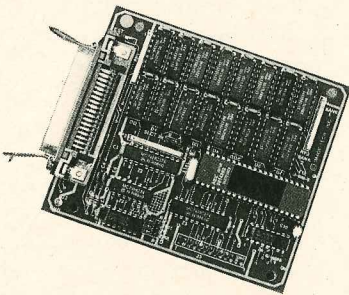
Telephone support is available at \$49 per accumulative hour, and updates, available at \$69 per year, and are sent whenever payroll formulas change.

\$249. Kaypro MS-DOS computers. Bedford Software Corp., 15008 N.E. 40th St., Redmond, WA 98052; (604) 294-2394.

Printer buffer board for Epsens

Image Technology offers a printer buffer for Epson printers that mounts inside the printer. It allows you to transfer data to the printer at computer speed and get back to work immediately while the printer operates at its own pace.

No wires or controls are required; once the buffer is plugged inside your printer it will work automatically every time you print.



\$109 if you furnish DRAM chips, \$133 for 256K, \$157 for 512K. Fits most Epson dot-matrix parallel printers. Image Technology, Inc., 8150 S. Akron St., Suite 405, Englewood, CO 80112; (303) 799-6433.

Error-free 1200-baud modem

MultiModem212E is a desktop modem that uses the MNP error detection and retransmission protocol for transmitting data over normal communications lines.

The modem operates in synchronous or asynchronous modes and can be set to run with, or without, or to auto-detect the MNP protocol. MNP error correction is hardware-based, as opposed to software-based.

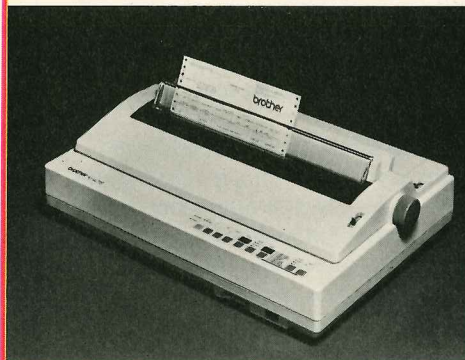
Utilizing a speed conversion feature allows the modem to operate at a fixed speed of up to 9600 bps via its RS 232C serial port, while at the same time communicating at either 300 or 1200 bps over the phone lines.

\$399. Multi-Tech Systems, 82 Second Ave. S.E., New Brighton, MN 55112; (800) 328-9717 or (612) 631-3550.

High-speed color graphics printer

The Brother M-4018 is a heavy-duty data processing and color graphics printer designed to produce invoices, statements, reports, spreadsheets, and other data-intensive documents.

It will feed multi-part forms smoothly with an optional top-mounted tractor that pulls the paper vertically through the 136-column printer. Switching between tractor-fed paper and single sheets without removing paper from the tractor is easy with a paper parking feature.



Speeds range from 480 cps in draft elite to 100 cps in near-letter quality and 67 cps in letter quality (triple pass) printing. It utilizes a unique two-by-nine printhead: two parallel rows of nine pins that operate simultaneously.

For color printing applications, just snap in the optional four-color ribbon—no optional board is required.

\$1,695, including the tractor and dual interface. Brother International Corp., 8 Corporate Pl., Piscataway, NJ 08854; (201) 981-0300.

New C compiler available

QuickC is a new compiler from Microsoft that promises fast compilation speed, excellent code generation, and an integrated debugging environment.

By allowing programmers to edit, compile, and debug programs from within the same development environment, QuickC helps programmers new to C get their programs running quickly.

Features include an in-memory compiler capable of 10,000 lines per minute, support of the Microsoft Mouse, and a source-level debugger based on Microsoft's CodeView debugger.

The program also includes a free graphics library with a wide range of screen-control functions that allow you to take advantage of the extensive graphics capabilities of IBM PC-compatibles. Documentation includes detailed tutorial and reference sections and online context-sensitive help.

\$99 on special introductory offer. Kaypro MS-DOS computers with 384K RAM, including 3.5-inch disk formats for the Kaypro laptops. Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717; (800) 426-9400, in Alaska and Washington call (206) 882-8088.

Cellular communication

Using the Telular Interface, Model MX-1000, any laptop or portable computer equipped with a modem can communicate with another modem/computer from any vehicle or boat equipped with a cellular telephone. It is usable in any location covered by a cellular network and operates at 300 and 1200 baud.

The interface will permit the integration of any off-the-shelf modular telephone equipment, such as a modem, into a cellular network.



The MX-1000 provides telephone central office functions, including dial tone, decoding of rotary pulse or touch tone dialing, valid number recognition, reorder tone after 15 seconds, and ring voltage. It will accept all domestic long-distance and local dialing codes, including 800, 900, 911, 411, operator assistance, credit card calling, 0+ or 1+ formats.

Communication through the interface requires no special procedure. A standard telephone or auto-dial modem takes the place of the cellular radio control head. When the line is accessed, a dial tone is present instantly and the number can be dialed normally.

\$395. Requires a cellular transceiver with antenna and operates on +12VDC power. Telular Inc., 8401 N. Crawford Ave., Skokie, IL 60076; (312) 677-6000.

Search program for paralegals and lawyers

Retrieval Master is a program for paralegals, attorneys, and other legal professionals. It performs searches through documents on your computer in seconds. It can search against many different criteria, including dates, signatures, names mentioned, and more.

Retrieval Master is network-ready and designed for easy use by a law office staff. Easy-to-read menus and prompts guide you through the system.

The program includes six modules: Code Library, Document Manager, Document Retriever, List Master, Report Generator and Utilities.



The Document Manager can link up to nine screens per document record for added-dimension storage of witness or company information, for example. The Document Retriever uses wild cards for inclusive sorting and includes Boolean search (using AND, OR, and NOT connectors).

\$495. Kaypro MS-DOS computers with 320K RAM, available in 3.5-inch disk format. Solution Ware, Inc., 307 West Seventh St., Suite 1914, Fort Worth, TX 76102; (817) 336-1914.

Product Updates

LePrint is a software product that brings near-typeset quality to dot-matrix printers. Release 2.1 allows you to print in landscape mode (side-ways), preview documents on high-resolution monitors, and output graphics in a PCX format. LeBaugh Software Corp., Omaha, NE □ **WordPerfect Library** is a utility program that features a DOS shell, desktop accessories and programming tools. Version 1.1 includes a new cut-and-paste option that allows data to be captured from the screen and appended to Library's clipboard. WordPerfect Corp., Orem, UT □ **Workstation Basic**, version 3.0, adds 13 major new features, including an online HELP facility, asynchronous communications support, and the ability to print to multiple spooled printers on multi-user systems. ABC Development Systems, Saint Paul, MN □ **NAMER**, version 2.0, now includes more ways to create names, more complete dictionaries, and even a multi-lingual check for obscenities. This release also includes an expanded user's guide and naming thesaurus, new editing capabilities and more. The Salinon Corp., Dallas, TX □ **Microsoft C**, version 5.0, is an advanced compiler for the C programmer. The new version is 30 percent faster than 4.0, and 5.0 comes with an enhanced version of the Microsoft CodeView debugger and more than 100 new library functions. Microsoft Corp., Redmond, WA □ **PANEL Plus** is a screen management library and utilities package. New enhancements include complete library source code plus fully upward-compatible screen layouts, an enhanced interactive screen field editor, a more powerful C code generator, and a new graphic mode. Lattice, Inc., Lombard, IL □ **HARMONY**, version 2, now has two more modules. This accounting and business package now includes Inventory and Order Entry modules. Open Systems, Inc., Eden Prairie, MN.

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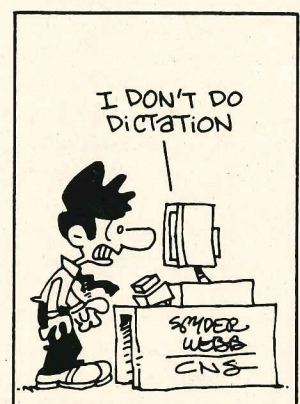
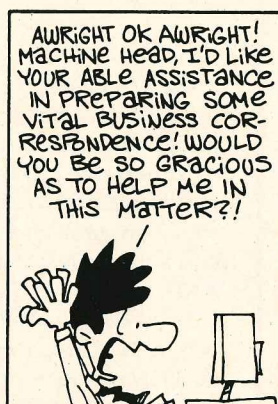
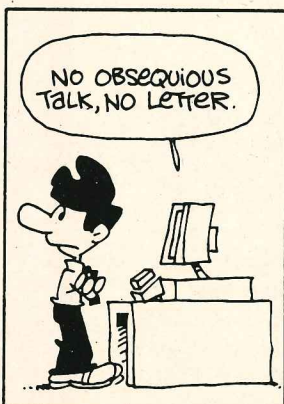
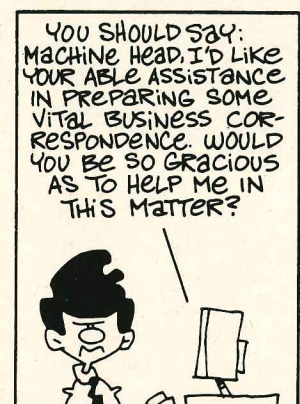
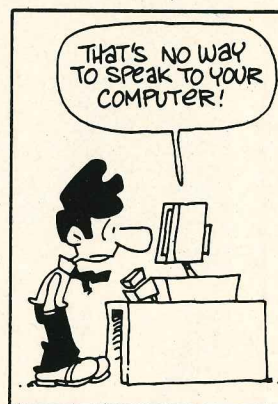
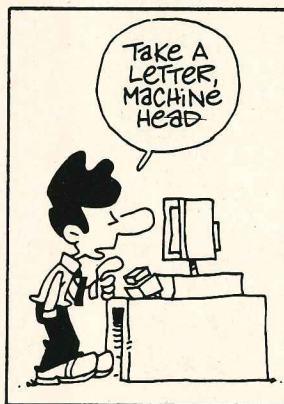
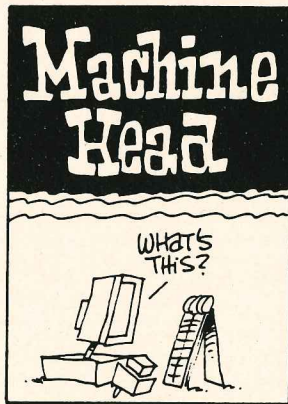
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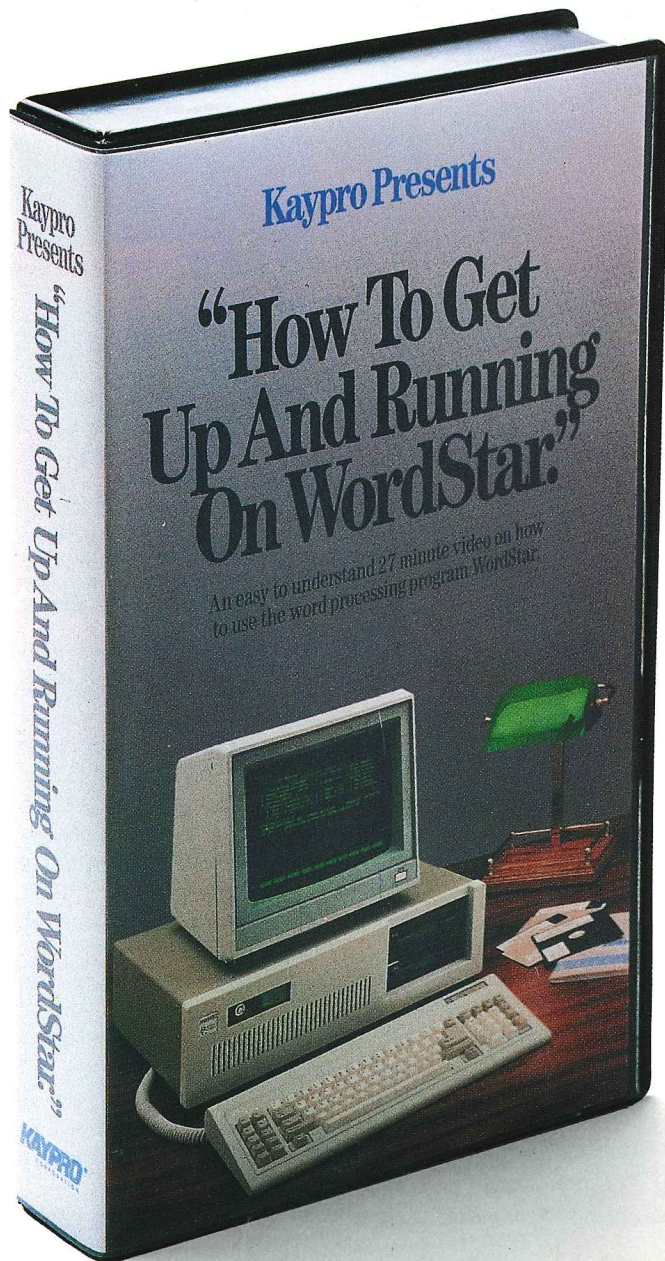
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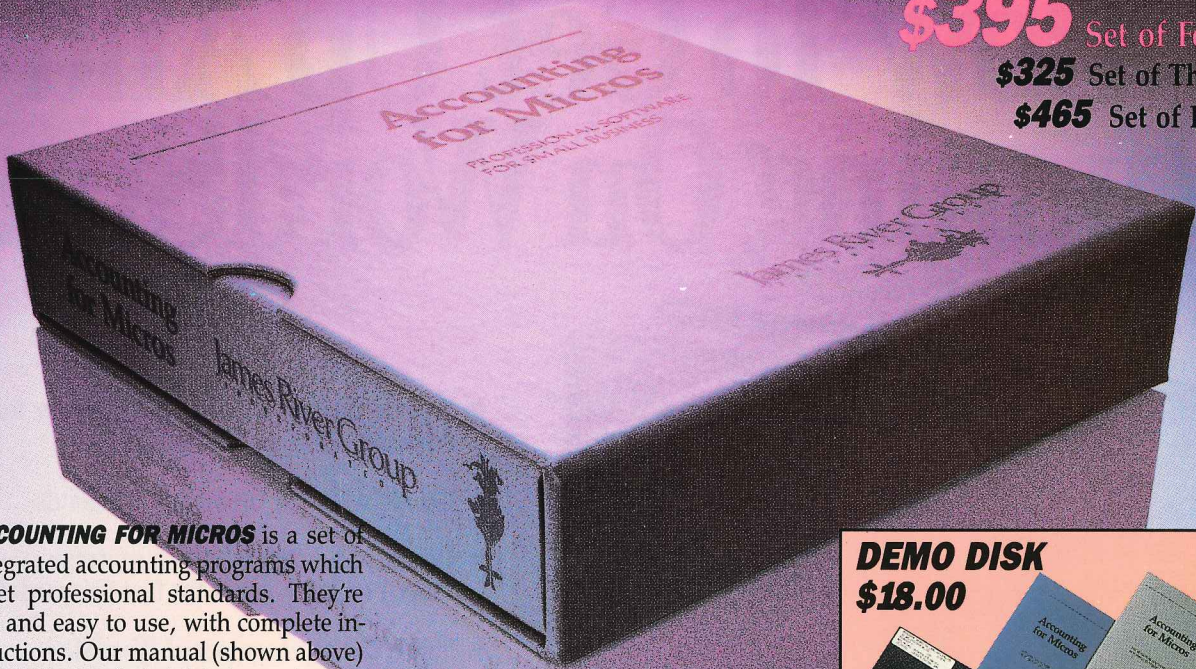
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